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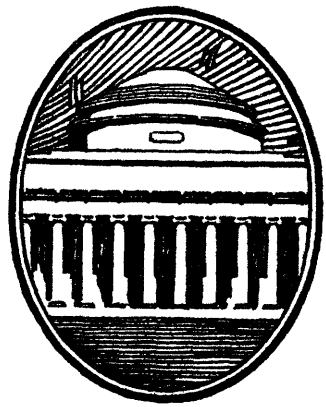

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President's Report Issue

1944-1945

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THE ANNUAL REPORT OF THE PRESIDENT

To the Members of the Corporation:

TWO months ago, final and complete victory crowned four years of desperate struggle, into which every element and section of our nation poured its life, its labor, and its resources.

Our American way of life is the ever developing product of the effort and sacrifice of many generations, spanning many countries and centuries, to achieve personal, political, and religious freedom; to build a civilization in which opportunity, security, and a high standard of living shall be available to all under the ethical principles of Christ. We were all too slow in waking up to the threats against these ideals which gathered, like storm clouds, in the 1930's around the Fascists, the Nazis, and the war lords of Japan. After the storm broke, it was only the most coöperative determination to preserve these ideals which saved the world from domination by ambitious powers bent on an exploitation and self-aggrandizement which would have plunged the world back into the dark ages.

In this coöperative, all-out effort, our educational institutions have played a notable role. Whereas the Army and Navy constitute our first line of national defense, I venture the statement that our educational institutions rank with our manufacturing industry and transportation system as the principal supporting lines of military power in time of war and of reserve strength in time of peace. In peace, they educate men for every aspect of our national economy in which higher education is important. In war, they are ready-made centers for housing and training officer and specialized personnel; their faculties are the most readily available source of experts for

the numerous emergency boards, committees, and expanded technical services; their laboratories and staffs become productive centers for research and development on new instrumentalities of offensive and defensive warfare.

Of this latter aspect I give five of the most significant of some hundreds of illustrations: The most widely used and effective new weapon of this war was radar, which received its principal war development, especially in its microwave version, at the Massachusetts Institute of Technology; the center of development of the devices and methods for rendering the enemies' radar ineffective or its indications misleading was Harvard University; the principal center of development of the important series of rocket weapons was the California Institute of Technology; work on the most important antisubmarine warfare devices was coördinated and organized through contracts with Columbia University; it was scientists from the University of Chicago, the University of California, Columbia University, and other institutions of the United States and Great Britain who developed the atomic bombs which so dramatically delivered the final blow to end the war.

In making the foregoing statement, I do not mean to detract from the magnificent work done by the manufacturing companies and their research and design staffs, or from the generally excellent coöperation of the technical branches of the armed services. Their work was necessary to enable these weapons to be made in quantity and to be used effectively. Very often they contributed important new ideas and improvements. Their research laboratories made splendid records of accomplishment in many, and often unique, lines. But I wish here especially to emphasize the important role of our university groups in the initial conception, reduction to practice, and often initial production for military use of many of our most effective new devices. Although the public frequently conceives of the academic scientists as visionary, impractical, and out of touch

with the facts of life, the record of this war demonstrates their vision, sound judgment, and practical skill to be one of our most significant sources of national security and strength.

Within this general structure of the national war effort, the Massachusetts Institute of Technology has played a role in which we can justly take satisfaction and pride. I believe that our greatest asset, our record of public service in our special fields of competence, has been enhanced. I shall later refer to some of our losses and battle scars, but first let me summarize a few high spots of our war record. We plan later to publish a comprehensive report on the Massachusetts Institute of Technology in World War II.

Former Students in the Armed Services

A total of 8,776 alumni, or 23.6 per cent of all living former students, have been enrolled in the armed forces in this war, headed by 92 generals and 35 admirals. One hundred and forty-eight of these men made the supreme sacrifice for their country. Among the tremendous aggregate accomplishments of this group, far too varied to be detailed, is the fact that every warship in our great Navy was designed by, or under the direction of, naval officers whose postgraduate training was obtained in the Course in Naval Construction and Engineering in our Department of Naval Architecture and Marine Engineering.

War Service by the Staff

Of our prewar staff of 681, a total of nearly 200 were granted leaves of absence to accept a wide variety of war assignments. Every remaining member of the staff devoted full or substantial time to essential war work at the Institute, in research, teaching, or administration.

War Contracts

In the past five years, M. I. T. has engaged in a total of 400 contracts for work in furtherance of the national war effort.

Of these, 161 have been directly with the Army, Navy, or other governmental agencies, 89 with the Office of Scientific Research and Development, and 150 with industrial firms (excluding 275 orders for wind tunnel work). Contracts for research and development totaled $93,031,000, and those for special training courses totaled $5,217,500, giving a combined total for research and training of $98,248,500.

War Training Programs

The Institute, like many other institutions, assumed its share of the great national programs of war training, first under the Engineering, Science and Management War Training Program and later under the Navy V-12 and the Army Specialized Training programs. A total enrollment of 3,291 man-years was handled in these categories. In addition, there were numerous more specialized advanced educational activities like the following.

The M. I. T. Radar School was the center for advanced radar training of naval officers, of whom a total of 4,742 were enrolled. Many of these officers received additional training in naval air-borne radio communication equipment or in sonar equipment, used for underwater detection of submarines or mines. Also, a total of 2,524 Army officers took substantially the same course, modified for their purposes and equipment.

The M. I. T. was one of five institutions selected to train Army and Navy personnel in meteorology and weather forecasting. We handled 994 students, principally members of the Army Air Forces, in eight months' postgraduate courses.

In addition to doubling its enrollment of postgraduate United States naval officers, our Course in Naval Construction and Engineering also admitted a considerable number of naval officers from China, Turkey, and Brazil, at the request of our Government.

Special programs with smaller enrollments were conducted in chemical warfare, fire control, servomechanisms, torpedo design, and other subjects, completing a truly impressive list of educational activities of special war character.

War Research and Development

Both in money spent and in staff engaged, research and development to produce new instrumentalities or materials for warfare composed the Institute's largest war activity. Certain high spots of these achievements can now be told; regretfully only a few high spots can be included within the compass of this report; the rest will be related in due time.

Radar and the Radiation Laboratory. Prior to the summer of 1940 our Army and Navy, and also Great Britain and Germany, had newly developed, highly secret radar equipment and had proved the military value of this new weapon, especially in the Battle of Britain.

In the fall of 1940 the Radiation Laboratory was established at Technology under OSRD contract, as a distinctly coöperative enterprise. Staffed by scientists and engineers made available from institutions all over the country, it embarked on a new approach to radar development, involving equipment, methods, and scientific knowledge that were then largely unknown. This venture proved to be one of the most productive and useful enterprises of the war, and out of it grew a new art, with applications the variety and importance of which were not even dreamed of at the start. Its success is a tribute not only to the practical creative genius of "academic" scientists but also to the wholehearted, effective coöperation of many industrial companies and of forward-looking officers of the Army and Navy. Exchange of information, and even of personnel, was maintained with the radar groups of the United Kingdom.

From its small beginnings late in 1940, this laboratory grew to a scientific and technical staff of 1,200, plus 2,700 technicians, assistants, mechanics, stenographers, business staff. It occupied 15 acres of floor space in Cambridge; it operated large sublaboratories at the East Boston and Bedford airports and smaller ones at various times in Quonset, New London, Orlando, Panama, and elsewhere. It maintained a very active branch laboratory in England and smaller stations in France and Australia. At the close of the war it was organizing a section of over a hundred men and several hundred tons of equipment for Manila, to serve the forward Pacific areas. Its staff have operated in every war theater, from North Africa to China, from the Aleutians to Australia. It was visited by some 86 officials daily from Army, Navy, or manufacturing concerns, and 180 Army and Navy officers were in residence at the laboratory for liaison purposes. Its operating expenses during the last year ran about $3,000,000 a month. With the exception of the atomic bomb activity, it was the largest of the civilian research and development agencies.

Recent reports in the press have told the popular story of these radar developments, but I think you will be interested in a few incidents relating specifically to Radiation Laboratory equipment.

The H_2X air-borne radar set, originally designed in the Radiation Laboratory, was to be built in huge quantities by Western Electric and Philco as standard navigating and "bombing through overcast" equipment for all heavy bombers. But it took time to get assembly lines running, and the urgency was great. At the special request of the Army Air Forces, the Radiation Laboratory (together with its near-by model shop operated by the Research Construction Company) built twelve H_2X sets, with spares, and installed them in Flying Fortress bombers. Lieutenant General Ira C. Eaker sent to Boston twelve of his experienced Pathfinder crews, who flew the

new equipment around New England till all adjustments were perfected and the crews were thoroughly familiar with it. Then they flew the planes to England and led all the "instrument" bombing raids of the Eighth Air Force over Germany from November 1, 1943, to March 15, 1944, at which date the commercially manufactured equipment took over.

Because in this period of the year, only four or five days a month are clear enough for visual bombing, it was this laboratory built equipment which kept the Eighth Air Force bombers effectively in the air during those critical four and a half months.

In 1941, a group from the Radiation Laboratory submitted to the Army and Navy a new scheme for long-range navigation, based on radar principles and now known as "Loran." The Navy undertook to sponsor the installation of the initial equipment to aid in navigating the northern convoy route of the Atlantic. Here the necessity of zigzagging to avoid submarines, the compass variations, the necessity for radio silence, and the inability to see sun or stars through the prevailing fog and clouds introduced such errors of navigation that ships often failed to meet their escorting aircraft by as much as two hundred miles. The Loran equipment, built and largely installed under the Radiation Laboratory contract, proved most successful. Now the Atlantic and Pacific are covered by the Loran network, produced by a few shore stations. Any ship or airplane, carrying lightweight receiving equipment, can locate its position quickly and reliably, independently of chronometer and astronomical observations. Many transoceanic air transports, military aircraft, and ships now use this navigation method, which is one of the permanently useful products of war research.

Among the earlier devices developed in the Radiation Laboratory was the now justly famous SCR-584 set for directing antiaircraft fire. It substitutes radar for visual tracking,

and functions automatically and reliably through fair or foul weather. The production contract for this equipment, which went to General Electric, with Westinghouse and Chrysler as subcontractors, was the first example in the radar field where sufficient faith was shown in a laboratory model to countenance plunging into a huge production contract without the usual time-consuming peacetime schedule of preproduction models, tests, and standardization preceding the production contract. On the basis of the performance of the model built by the Radiation Laboratory, this production contract was placed, exceeding in dollar value the entire cost of the Boulder Dam project. It was one of the war's best investments.

In 1942 the German submarine campaign had created a desperate situation for the Allies. Despite the gallant convoy program of our Navy, enemy submarines and their sinking of our shipping were increasing at an alarming rate. The submarines had learned to avoid and counter a British type of radar detection device which was also in use by us. A more powerful and accurate radar device, and one much more difficult to escape, had just been developed by the Radiation Laboratory and was going into production by Western Electric. But without waiting for this, the Army Air Forces, backed by Secretary of War Stimson, got together a special small squadron of the old B-18 airplanes and had the Radiation Laboratory install its new ASV radar equipment in them at the East Boston airport. It also installed certain magnetic equipment for detecting iron vessels at short range, which had been developed and built under an OSRD contract with Columbia University. Armed thus with equipment to locate submarines at considerable distances on the surface and at lesser distances submerged, and supplied with bombs and depth charges, this little Air Forces squadron pursued the submarines by day and by night all along the coast from Halifax to South America, wherever they were reported. The results were immediate and

effective, and the submarines largely stopped their operations near our coast. This was the turning point of the submarine war. Then the Navy took over with these techniques, and soon with even more advanced ones, and carried the attack to mid-ocean and to the European coast. Thus again it was demonstrated that the strongest defense is a powerful offense.

The most powerful radar set on which information has been released is the huge MEW (Microwave Early Warning). This was designed and built in the Radiation Laboratory and tested in the air-defense network in Florida. Simultaneously, five other introductory sets were built in the Radiation Laboratory and its Research Construction Company's model shop while commercial production was getting under way. These five sets played a notable role in the latter phases of the war. The first was mounted near the southwestern tip of England. It immediately proved its ability to detect the approach of enemy aircraft toward any region of southern England. Only a few days after it was installed, it discovered a formation of American heavy bombers which had lost their way and, low in gas, were headed westward out over the Atlantic about 250 miles away. It guided the planes back to England, this one act saving not only many lives but also a value in planes and equipment far exceeding the total cost of the entire MEW program. Then the set was used to direct our fighter escorts as, in successive waves, they took over the protection of our great bomber formations flying to and from Germany. Finally, after the Normandy invasion, each American army was backed by one of these five MEW sets to guide the close supporting tactical aircraft toward their targets. When the Japanese war ended, these sets were being mounted on near-by Pacific islands to perform a similar function in the attack on Japan.

Still another radar application wholly developed in the Radiation Laboratory is the Ground Controlled Approach system for landing aircraft even when the field and its

approaches are completely obscured by fog or darkness. This differs from all other blind-landing systems in that it requires no equipment whatsoever in the plane except the ordinary radio communication set; it requires only willingness of the pilot to follow instructions received through his earphones, and requires no training in the use of special equipment. The equipment is mounted in a truck and can be run onto an airfield and set up for operation in a few minutes. Its operators see on a screen a line which indicates the proper approach and landing path for the incoming plane. They also see on the screen the location of any obstacles which must be avoided. They see at every instant the location of the incoming plane as a spot moving, if all is well, right along the ideal landing line. They can tell at a glance if the plane is to the left or the right or above or below this ideal line, and by how many feet. They can talk to the pilot over the radio communication system and tell him just what to do to keep on the line.

It is as if the pilot had sitting beside him an invisible copilot who could see the exact path down which the pilot should fly and who says to him: "Get over 50 feet to the right. Let her down just a trifle. Now about 20 feet more to the right. Everything perfect. You are 100 yards from contact. Now!" I have seen a blindfolded pilot land time after time, never varying more than a plane's length or so from the theoretical landing spot and never off line.

Two factors have slowed the rapid adoption of this device: One is the powerful backing for earlier blind-landing systems, and good ones. Another is the greater faith of pilots in an instrument which they can see than in a voice which they can only hear. Nevertheless, this equipment has already saved planes and pilots who had never heard of it until they were caught above an airfield with zero ceiling and were "talked in" to safety. It has enabled countless military missions to be flown which otherwise should not have taken the risk. I

believe that this GCA system has an important future, even though other systems become standard. Small private planes may not afford the luxury of a blind-landing instrument, and some military aircraft — for example, fighter planes — cannot afford the extra weight and space. For such types, as well as for emergencies and for mobile use, the GCA will be a valuable supplement to whatever more elaborate system may be installed at our principal airports.

These are only some of the more dramatic episodes in the work of the Radiation Laboratory and concern only some of the equipment on which information has been officially released to the public. They illustrate but a small fraction of the achievements of this laboratory or the varied applications of radar. Back of these developments went an enormous amount of painstaking scientific research, theoretical and experimental, often on subjects which to the uninitiated would appear to have no relation to radar — subjects like the quantum theory of molecular spectra, or electron optics, or the oscillations of coupled systems.

The organization of the Radiation Laboratory makes it clear that, while M. I. T. can take just pride in its accomplishments, this pride can also be shared with many other organizations. The Institute took the contract, the responsibility for management and performance, and some very considerable financial risks; it furnished a small portion of the personnel and selected and employed the rest; it established the working pattern of the organization. Once established, the technical work of the laboratory was ably guided by its Director, Dr. Lee A. DuBridge, supported by a steering committee composed of the heads of the various departments into which the laboratory was divided. The program was subject to periodic review and occasional redirection by a committee of the National Defense Research Committee of OSRD, headed by Dr. Alfred L. Loomis. This committee, acting much like a board of

directors, included scientists or engineers from M. I. T., the University of California, Columbia University, the University of Rochester, the Bell Telephone Laboratories, the General Electric Company, the Westinghouse Electric Corporation, the Radio Corporation of America, the Sperry Gyroscope Company, the General Radio Company, and the War Production Board. Through these men, constructive criticism and coöperation with industrial firms were always available. Then the programs in their more general aspects, and especially the budgets, were checked and approved by the NDRC, and final authorization was given by Dr. Vannevar Bush as Director of OSRD. At every level in this organization, close contact was maintained with the Army and Navy through their appointed liaison officers or through actual membership of their officers on committees. I mention these organizational details to emphasize the widely coöperative character of the Radiation Laboratory enterprise and hence the widely shared credit for its success.

Finally a word about this success. I have given a few illustrations. The armed services judge the success of a military weapon only by the effectiveness of its performance. As to radar, that judgment is unanimous. Commenting on equipment developed at the Radiation Laboratory, the commanding general of one of our most active European air forces stated that it had increased by severalfold the effectiveness of his air force. The hard-hitting commander of one of our southwest Pacific armies said that in his judgment the technical equipments which had done most to win the war were the bulldozer, the C-47 cargo plane, and radar. And it is common knowledge that radar was largely responsible for our succession of naval victories in the Pacific, frequently fought at night and often against superior odds.

Another yardstick may appeal to the businessman or the congressman. Manufacturing orders for radar equipment

designed by the Radiation Laboratory have totaled $1,775,000,000. Additional orders totaling $425,000,000 have been placed for other radar equipment to the design of which this laboratory made major contributions. Considering the fact that some of the latest and most refined equipment designed by the laboratory was only on the verge of manufacturing orders as the war closed, these figures represent a return on the investment which would please the board of directors of any company.

I have discussed the Radiation Laboratory in such detail, even and regretfully at the sacrifice of similar full discussion of other M. I. T. war achievements of fine caliber, for several reasons: It was by far the largest and most complicated of our war activities. It was the only one which was of such magnitude that mishandling of it could have wrecked the Institute financially and in reputation. The problems still remaining — orderly liquidation, final accountability and financial settlement, and fair treatment of its disbanding staff — are serious and difficult, though I believe they are well in hand. In these circumstances it seemed of importance to put this story into our record in some detail.

The Draper Computing Gun Sight. Next to radar, the M. I. T. development most extensively used in the war was probably the Draper gun sight, which introduces the proper lead angle in firing at moving targets, be they tanks or airplanes or ducks. Some 80,000 are reported to be installed on naval vessels for direction of the vessels' lighter, fast-firing antiaircraft guns, and they have turned in fine performance records against attacking Jap aircraft, especially the suicide planes. The existence of this weapon and some information about it have already been released by the Navy.

This is one of a series of devices employing gyroscopic principles which were invented and built by Professor C. Stark Draper and his able associates in the Instruments Laboratory

of the Department of Aeronautical Engineering. The work began several years before the war, resulting first in a turn-and-bank indicator for aircraft piloting. In 1940, the Sperry Gyroscope Company gave the Institute a generous backing to finance the development of a lead computing sight based on the turn-and-bank indicator previously developed for Sperry.

The Instruments Laboratory has been continuously occupied with advanced fire-control research for both services; the program undertaken during the war, which will continue in part until certain specific tasks are completed, provides the basis for a fundamental attack on peacetime problems of control and instrumentation. The prime objective of this laboratory is the education of students on an advanced level in the philosophy and techniques of instrumentation, and the specific research projects undertaken for government and industry by the group have led to advances in the art which will be reflected in the educational program.

The Servomechanisms Laboratory. For some years, the Institute has pioneered in the theory of servomechanisms and, as far as I know, has been the only educational institution to maintain a laboratory and educational program in this little-known engineering field, a field evidently destined to increase rapidly in importance as automatic controls of machinery multiply. This laboratory, under the leadership of Professor Gordon S. Brown of the Department of Electrical Engineering, has been an important national asset during the war, both in developing equipment and in raising the level of the art of servomechanisms among the chief manufacturing concerns involved in production of devices for transmitting rotational motion with power amplification.

With a staff of 140, the laboratory developed mechanisms which, with great accuracy and stability, followed the directions given by fire-control computing devices, thus providing an essential link between the source of the information and

the gun position. Among the important types of guns thus equipped with servos developed in this laboratory are the 40-millimeter antiaircraft gun of the Army and a similar unit for the Navy.

The laboratory also, by direct research and consultation, aided importantly in the more refined development of automatic controls and in analytical application to the design of dynamic systems. Here again the laboratory originated, and in fact continues, as an educational program. Prior to the war, Professor Brown and his group, together with Professor Draper, were engaged in teaching fire control to naval officers and in developing laboratory facilities for this purpose, and along with this educational program they developed an organization and method of attack which enabled them successfully to meet the very complex problems of control arising during the war.

The Cyclotron. Under Professor Robley D. Evans, the M. I. T. cyclotron was one of the few in America to remain in operation. The staffs of most of the others were diverted to the development of radar and the atomic bomb. Operated on day-and-night shifts, this instrument provided radioactive tracer materials for a wide variety of war projects in metallurgy, medicine, and chemical warfare. Most significant was the use of such materials in the development of methods for preserving whole blood and standardizing the product. In this important contribution to the great blood-donor program, Professor Evans and his colleagues were part of a team including medical specialists from Harvard University, the Massachusetts General Hospital, and other institutions.

The High-Voltage Laboratory. Headed by Professor Robert J. Van de Graaff, in association with Professor William W. Buechner and others, the High-Voltage Laboratory designed and built for the Navy five superhigh-voltage x-ray outfits for examination of castings, and especially of munitions, both our own and those captured from the enemy. Operating at several

million volts, with literally a pin-point focal spot, reliable and easily regulated over a wide range of operating conditions, these instruments proved exceedingly effective and won high praise from the naval officer in charge, himself a distinguished scientist and expert in this field. They represent a peak of achievement in securing penetrating x-ray pictures of sharp definition and high resolving power both in angle and in depth.

Fuel Research. The most significant work in fuels was the investigation of the thermodynamic properties and combustion characteristics of new fuels designed for special purposes. The work was part of a large program of development of such fuels, in which a number of industrial, university, and service laboratories coöperated. Professor Hoyt C. Hottel and Professor Glenn C. Williams of the Department of Chemical Engineering have joined forces with Professor C. Richard Soderberg and Professor Ernest P. Neumann of the Department of Mechanical Engineering in working on fuels and related problems of combustion.

The Laboratory for Insulation Research. One of the busiest groups at the Institute has been the staff of the Laboratory for Insulation Research, headed by Professor Arthur R. von Hippel and devoted to the study of insulating and dielectric materials and especially their characteristics in high-frequency electric fields. In addition to carrying on fundamental scientific studies, this laboratory developed new dielectric materials and found out how to secure the optimum results from older materials. It developed a complete set of techniques and equipment for performing all significant tests on insulating materials under a wide variety of conditions of temperature, moisture, and composition. As a coöperative service, it has produced a comprehensive and widely circulated summary report on high-frequency insulating materials submitted by many industrial concerns and other agencies.

Liquid Oxygen. Submarines, aircraft crews, hospitals, and welders need oxygen. The customary shipment of compressed or liquefied oxygen in tanks from production plants in large cities does not serve the needs at sea or in distant theaters of war. Consequently this war saw a remarkable advance in the efficiency of oxygen production and in transportation of it by lightweight portable units. To these developments, Professor Frederick G. Keyes of the Department of Chemistry and Professor Samuel C. Collins of the Department of Mechanical Engineering made very important contributions of permanent significance.

Here again, war developments may lead to important industrial applications, and we are prepared both in the Department of Chemistry and in the Department of Mechanical Engineering to take advantage of the new art developed during the war. In the latter Department, for example, we are establishing a program in cryogenic engineering under the direction of Professor Collins.

The C. W. S. Development Laboratory. The Chemical Warfare Service Development Laboratory represents a different type of M. I. T. contribution to the war effort. With its Edgewood Arsenal greatly overcrowded, the C. W. S. urgently needed another laboratory for research and development work. It learned that M. I. T. had architects' plans already drawn for a new chemical engineering laboratory, for which the plans to raise funds had been interrupted by the war. At the request of the C. W. S., the Institute proceeded to build this laboratory at its own expense and then to turn it over to the C. W. S. for operation under a contract providing for maintenance expenses plus a fee for use and special services. The net result was that the C. W. S. was thereby enabled to expand its research activities, while the Institute was justified in proceeding with the construction of the building, soon to be freed for our own use, now that the war is over.

The Wind Tunnel. All through the war the Wright Brothers Wind Tunnel has been operating on a two-shift basis in the testing of models of military airplanes in coöperation with the principal aircraft manufacturers. The continuous use of the tunnel on confidential work has not permitted use of it as a laboratory for student instruction. However, the tunnel has trained many engineers for the design and operation of other wind tunnels, such as those at the Boeing Aircraft Company and at the research division of the United Aircraft Corporation. From the latter company nine engineers were sent to the Wright Brothers Wind Tunnel during the war for six months' training periods. With the ending of the war, the tunnel will be used extensively for instruction and thesis work of both our undergraduate and our graduate students.

The Center of Analysis. A similar service function has been rendered all through the war by the group which operates both the old and the new differential analyzers. They have computed the range tables for the new naval guns and ammunition, as well as performed many other computational services for various war agencies. Antenna patterns, characteristics of wave propagation and absorption, and determination of statistical correlation coefficients are some of the other computing jobs quickly performed by the various automatic calculating devices developed and operated by this group, headed by Richard Taylor in the absence of Professor Samuel H. Caldwell, and by their colleagues from several departments. The war gave great impetus to further developments in machine calculation, and as a consequence we have opportunities in this field of a magnitude beyond anything we have yet undertaken.

Miscellaneous. This already overlong report omits a great many significant contributions to the war by the M. I. T. staff and laboratories. Development and evaluation of methods of long-range weather forecasting, improvement of aircraft engines, special missiles, silent weapons, surgical sutures, syn-

thetic vitamins, synthetic rubber, flame throwers and incendiaries, testing of textiles and parachute cord, study and handling of labor relations for industry and government, new alloys, military food processing and packaging, rations, optical materials, medicinal materials, new methods for extraction of metals from ores, emergency housing, explosives, remarkable applications of flash photography, camouflage, standardization of fuses, and an enormous amount of technical consultation — these are some of Technology's other war activities which come to mind as I write this report in Manila, on V-J Day, while awaiting departure on my next, and I hope my last, war assignment.

The Atomic Bomb. Many friends and colleagues will wish to know what part the Institute played in the development of the atomic bomb. This part was minor, though important, and was partially indirect. One of the penalties which the Institute paid, because of its great commitment in the radar program, was its consequent inability to participate more largely with staff and facilities in this, the most portentous scientific development in all history. We must spare no effort and miss no opportunity to participate in the future scientific discoveries and engineering applications of nuclear physics.

The facts of M. I. T. participation, in so far as they may be disclosed, are these: The Institute has operated two contracts in this field, one primarily scientific, the other engineering. In size they ranked with the other large M. I. T. contracts, excluding the Radiation Laboratory, but they were very small in comparison with the major contracts for the atomic bomb. A permanent member of our staff, on leave of absence, had charge of one of the most important engineering aspects of the entire program. A few others participated, also on leave of absence.

The Radiation Laboratory, the initial personnel of which were largely recruited from the prewar ranks of the nuclear physicists, later released some of its top men to help out the

atomic bomb group when this project reached the exciting stage. Among other things, these men contributed their skill and experience in large laboratory administration and later in the organization of model shop production methods, which they had acquired in the work of the Radiation Laboratory. Other top members of the Radiation Laboratory were called into frequent consultation. Three out of the four scientists whose names I have seen mentioned as being present at the "take off" of the bombing missions to Hiroshima and Nagasaki were former members of the Radiation Laboratory staff, and one of them was the scientist who flew as a member of the crew with both missions.

M. I. T. as an Institutional Proving Ground

Not the least important and far from the least difficult and time consuming of the Institute's war activities has been its work in formulating and negotiating war contracts and developing policies for the administration of these contracts. There were few precedents. The accepted simple rule of "no profit, no loss," as applied both to the institution and to its employees under the contracts, sounded well but was of no practical value until translated into specific terms of allowable expense, overhead, property accountability, reserve for terminating expenses, insurance, authority for actions, pay scales, handling of patents and reports, auditing, and an infinity of similar items, large and small.

Because of its strategic position, its early acceptance of a large war contract, and its previous intensive study of somewhat analogous problems of institutional policy, M. I. T. was usually the first of the academic institutions to tackle these problems of policy and contract. Many times it was purposely chosen as a proving ground by various governmental contracting agencies. The results were widely followed in other institutions.

Much is owed to many people, and to none more than our Executive Vice-President, Director of our Division of Industrial Coöperation, Treasurer, Legal Counsel, and Dean of Students, for hammering out a fair and workable set of policies and contractual terms under which we and other academic institutions could do business with the Government in a manner satisfactory to all parties concerned.

Government officials with whom we dealt on the business side were reasonable and competent almost without exception. Usually they tried to reach a decision which would be fair to both parties.

When, on rare occasions, an official held the view that his sole duty was to "follow the book" or to let red tape rather than a logical and fair settlement control his negotiations, we thought longingly of the day when we could again spend our time and energy constructively on our own business.

Cost to M. I. T. of War Program

[I introduce the following discussion of what the war cost the Institute for one principal reason: to relieve the minds of any persons who may have felt that M. I. T. "made a good thing out of the war," for unfortunately this was believed or suspected by some persons who knew only of the existence of large war contracts but who knew nothing about the actual operations. (I might point out also that the Radiation Laboratory contract was accepted by Technology only to save the situation in an emergency after two earlier attempts to set up the work under different auspices and at different places successively failed.)]

Turning now from the Institute's war activities and some of its achievements, let us try to evaluate the effect of its war program on its financial and physical resources. Here it will be found that the Institute made a substantial over-all, out-of-pocket contribution. In other words, the war cost the

Institute money. This contribution was made freely and gladly and was entirely proper, since the war was costly to the entire nation and to every patriotic element in it. Furthermore, it was in line with the obligation of such an institution to render public service. No service could be higher than meeting a challenge to the existence of the republic.

With early realization, in the summer of 1940, that our country was faced with a great crisis, M. I. T. adopted a firm policy *always* to give first precedence to any important opportunity for service in the crisis; *never* to let this service be delayed by arguments over conditions or contracts; *never* to let the self-interest of the institution prevail over the interests of the nation. Though strenuous effort was continually made properly to protect the interests and conserve the resources of the Institute, neither failure nor delay interrupted its response to calls for help. The only embarrassment was sometimes in deciding which of several calls were the most important when limitations of man power or facilities made it impossible to handle all.

The Institute also adopted the policy that it would accept no profit on the war work it undertook for the Government. It deposited with its chief governmental contracting agency, the Office of Scientific Research and Development, a vote of its Executive Committee to return to the Government any net profit, if it should find on termination of the contracts that there had been a profit.

The OSRD adopted a policy of "no gain, no loss" on its contracts. Its auditors periodically examined the books of the Institute and, in accordance with the findings, the allowance of overhead for the next period was adjusted to cancel any gain or loss to date. Further to insure compliance with this principle, the Institute's own auditors, and occasionally an independent outside auditor, were employed at the Institute's own expense to establish further checks.

Financial Losses. (*a*) In a very few cases, the Institute assumed the salary of some member of the staff of another educational institution that had refused to grant him leave of absence with continuing salary and thus would have prevented his filling an important war post because policy considerations would have precluded his acceptance of salary from the Government. Fortunately very few institutions were unwilling thus to make their men available in the emergency. The Institute, together with certain foundations, stepped into the breach by contribution of its own funds to handle these exceptional cases. Though expediency forced me to approve such a procedure, this is the only category of M. I. T. contribution to the war over which I feel any resentment. The Institute's share of this expense was $28,000.

(*b*) By far the major financial contribution of the Institute to the national war effort has been to carry the salaries of members of its staff whose services in full or in part were volunteered to war service without remuneration. Such service included work on governmental boards and committees, like the War Production Board, the National Defense Research Committee, the National Advisory Committee for Aeronautics (or their subdivisions). The men could all have secured remunerative war jobs and thus relieved the Institute of their salary expense, but by their preference and Institute policy they elected to serve in these nonpaid positions when doing so appeared to offer opportunity for greater service. This category of M. I. T. contribution to the war amounted to over $500,000.

(*c*) To construct laboratory buildings for war purposes the Institute has committed or spent a total of $549,500 for which it will not receive reimbursement. For the Chemical Warfare Building the figure includes that part of the Institute's full payment which was not amortized by service and use charges. For the other buildings it includes what the Institute elected to invest in them to secure permanently useful structures

instead of the temporary structures the value of which was paid for by the Government.

In return for such commitments, the Institute has two large and several small buildings of continuing usefulness, which will come to it soon as second-hand buildings. The investment was a good one and cost the Government nothing extra. It must be considered, however, that except for the war emergency the Institute would not have erected these buildings unless it could have raised outside funds for the purpose; its existing capital funds are too urgently needed for purposes more important than new laboratory buildings.

Hence these building items involve the gain of a physical asset at the expense of a loss of productive funds which would not have been incurred except for the war.

(*d*) In addition to the foregoing actual outlays, the Institute at various times incurred financial risks by underwriting important war projects so that they could proceed without delay or interruption until the funds expected for support of them could be assured. Most important such instance was the underwriting by M. I. T. of $500,000 and the securing of additional underwriting of the same amount from John D. Rockefeller, Jr., to permit reëmployment of Radiation Laboratory staff at a time when the decision had to be made before funds to continue this work had been appropriated by Congress. Fortunately, this and other underwritings never had to be called.

(*e*) The final category of war costs cannot yet be estimated. It relates to the expenses of terminating the war contracts, of reconverting our permanent facilities to peacetime use, and of reëstablishing our normal educational program. For termination and reconversion, financial reserves have been set up, but it is not certain that they will prove fully adequate or that all expenses deemed necessary by us will receive governmental approval. As to reëstablishment of the normal educa-

tional program, the net costs are also uncertain. When the accelerated program was established early in the war, we estimated that the transition to our normal academic schedule would cost us about $750,000. That was before the GI Bill of Rights made provision for students in service to return to college. Normal tuition from these students will greatly reduce this reconversion cost and may entirely eliminate it.

Financial Gains. The only financial assistance which the Institute derived from its war activities lay in the fact that its research and war training contracts served to pay salaries of some of its staff engaged on these projects, and to pay part of the general administrative and general overhead cost of operating the institution. These contracts therefore helped to keep the Institute from suffering financial losses which might have arisen from the sharp curtailment of regular student enrollment, with attendantly reduced income from tuitions. The prestige gained from our war research is producing a gain by encouraging industry to make grants-in-aid and to establish fellowships.

I believe that even the assistance which the war contracts provided in maintaining operating commitments was not a financial asset for the Institute, if considered from a cold-blooded financial point of view. Unlike most other institutions, M. I. T. has a staff to whom industrial opportunities are very commonly offered, and at salaries higher than those paid by the Institute. From spot checks among our staff, I know that nearly all of them with great ease could have secured war employment bringing increased income.

If, therefore, M. I. T. had set out to make a financial profit from the war, it would have accepted no war contracts at all. It would have urged and assisted its staff to secure outside paying war jobs. It would have kept only enough teaching and administrative staff to handle the reduced group of tuition-paying civilian students. It would have laid up as annual profits a substantial portion of its income from endow-

ment. Its President would have spent the war years in raising gifts from alumni and friends and in soliciting contributions from the busy, highly taxed corporations. Devotion to war service instead of to such a policy has been, in my judgment, the largest financial sacrifice made by the Institute through its efforts to help win the war.

The Five-Year Epoch Now Ending

The term "epoch" is not customarily used to designate so short a period as five years. Yet in many ways the term is appropriate to these war years. In these five years the Institute spent on its war contracts as much money as it had spent on its normal activities during its previous 80 years of existence. This is a sobering thought; it makes one wonder what tremendous things could be accomplished in peacetime if the same energy, determination, and resources were marshaled to fashion a better world. To those in the Institute and elsewhere who have worked without pause, whose working hours went far into the night, whose full thought was concentrated on doing the job, to all those the last five years have truly seemed like an epoch, short in the vividness of experiences but long in the extent to which many prewar interests and ambitions seem to have faded into a dim and unfamiliar past.

One thing has been accomplished during this epoch besides the winning of the war: The performance of the Massachusetts Institute of Technology, through her alumni, staff, and organization, has demonstrated more vividly than ever before the essential soundness of her conception, the public value of her work, and the justification for her continued endeavor to pioneer in the oncoming lines of technological progress. It is in times of stress that strength is proved, but God grant that our future demonstrations of strength may be made with full effect under the stress of a strong urge to be useful in peace,

and never again under the dread compulsion of war. And one safeguard against another war is to be strong in peace.

The Era Ahead

Man can feel satisfaction or regret over the past, but he lives and works for the future. The same is true for an institution, unless perchance it has outlived its usefulness. The time has now come for the Massachusetts Institute of Technology to concentrate on the problems of the future with a singleness of purpose just as definite and clear cut as was its devotion to war service in the epoch now ending.

A transition period now confronts us: There are some remaining obligations which must be honorably discharged in winding up our war contracts; we face a short, confused period of overlapping staff appointments, as members on leave of absence return while their substitutes are still here; we face a longer period, which will be hectic, during which we will do our best to provide the remaining stages of education to those former students who left college for the armed forces while at the same time we gradually reëstablish our normal peacetime program. Even in this transition period, however, sound planning for the future is now our greatest responsibility, because the most depends on it.

I believe that the first step, of general applicability in this direction, is to provide in orderly fashion for vacation periods for the members of our staff. For several years most of them have had very little vacation, and some have had none whatever. It is a fully established fact of life that an intermediate period of relaxation is a good investment when men shift from one line of intense intellectual concentration to another involving different lines of thought and decisions. This step, together with return to a normal academic calendar, is being taken as fast as commitments permit.

A second and more significant step should be a careful evaluation of our institutional program in every important aspect. We should establish priorities of objectives, requirements of staff and facilities for effectively pursuing these objectives, plans for meeting these requirements promptly. The staffs of a few departments have recently given such consideration to their future, and others should do so. All should be reviewed by the Visiting Committees of the Corporation for additional suggestions, constructive criticisms, and discovery of directions in which the Corporation and alumni can help to achieve these objectives. The volume of research which the Institute is being asked to undertake by Government and by industry is far larger than before the war. We must determine the proper balance between this kind of activity and our educational program, and find ways to insure that sponsored research strengthens our educational program.

Of vital importance will be the reëstablishment of student activities, self-government, and social life. Because a college generation is only four years, the threads of continuity in these matters have been frayed or broken and must be restored as promptly as possible. The special needs of veterans greatly complicate our admission procedures, and we feel strongly our obligation to give special service to returning soldiers. These problems will confront several groups, especially the Corporation's Committee on Student Activity.

In all these plans for the future, we should take due guidance from the fine traditions of the past. But we must not be bound by them. One advantage of embarking on a new era is the opportunity to make a fresh start with minimum complications, wherever this seems of ultimate advantage. Since traditions are strong, and the old path is always easier to follow, I believe that this feature of the situation should be kept continually in mind. With a wealth of past experience on which to build, we organize our program for a new era. Utilizing to the

full our present elements of strength, we must also implement our plans with new blood and new facilities.

In my report last year I outlined the needs which have been carefully formulated in consultation with departments, administration, Visiting Committees, and Executive Committee. Of these, the plans for a *simplified and improved curriculum*, for *increased enrollment*, and for *postwar conversions* are ready to go into effect as rapidly as conditions permit. A partial solution of *staff salaries* has been achieved by adoption of a plan of annual appointments (with reasonable vacation allowance), which will also increase the "use factor" of Institute facilities. A start has been made in the approach to *significant new technological opportunities*, especially through many important new staff appointments, through the projected new sanitary science, gas turbine, acoustics, and electronics laboratories, and through the establishment of a separate Department of Food Technology. Special stipends for *temporary staff appointments* have been established for mature young scientists or engineers who have been denied graduate study during the war and who now seek advanced degrees after brilliant records in war research.

A first step toward enlarged *student housing facilities* has been taken through the decision to build 100 emergency-type houses for married veterans and, with the devoted help of a committee of faculty wives and alumnae, through the establishment of a house at 120 Bay State Road, Boston, to provide living accommodations for some of our women students. Plans for the *new library*, for a building to house *Navy and Army training and research activities*, and for a *Faculty Club* are well advanced, and we are giving intensive study to the long-range development of our plant and the utilization of our land. There has been substantial progress in making definite arrangements for the Institute's continued participation in work for *national security*. These accomplishments of the year, however, are but the small beginning of what must be

achieved during the next few years in order that the new era of the Massachusetts Institute of Technology may be another period of glorious achievement, attuned to the needs and conditions of the postwar world.

Conclusion

I bear testimony to the fine loyalty, effective coöperation, and sincere devotion to duty which have been exhibited during these trying years by the members of the Institute's staff. They, and its good reputation, are its most precious assets. I know they can be relied upon as we face the future. To bring our hopes to pass, I confidently solicit your full coöperation and that of all who would see this nation served by an even greater Massachusetts Institute of Technology.

Respectfully submitted,

Karl T. Compton
President

October 8, 1945

ADDENDUM

Statistics of the War Period and of the Past Year

Finances. The Institute's endowment and other funds now have a total book value of $43,100,000, compared to $36,013,000 five years ago. The increase of $7,000,000 is largely the result of capital gifts and of profits on the sale of securities. Plant assets now stand at $17,208,000 (exclusive of government-financed war buildings), compared to $16,328,000 in 1940. The yield on investments based on market values has steadily decreased, largely because of deliberate increase in holdings of Government securities and in part because of the increased market values. In the last five years the yield has dropped from 4.38 per cent to 3.25 per cent.

The Institute's cumulative surplus for its entire history now stands at $38,424. The year 1944–1945 ended with a deficiency of income of $126,542 on operations totaling over $45,000,000.

The trend of operations of the Division of Industrial Coöperation for the past four fiscal years is shown by the following summary:

D. I. C. Operations

	1945	*1944*	*1943*	*1942*
Total Volume (including Government and Industrial Research)	$39,970,900	$25,461,300	$14,951,800	$7,822,800
Percentage of Salaries and Wage Expenditures Received as Overhead	10.5	12.2	13.6	41.3

Attention is called to the extraordinarily low overhead received by the Institute, an index both of the efficiency with which our Government war research has been handled and of the effect of the large volume of expenditures.

In the educational and administrative operations of the Institute during the war period, marked changes have of course taken place in the distribution of expense and income,

reflecting the decreased enrollment and increased research activities. These changes are shown below:

PERCENTAGE DISTRIBUTION

		1940–1941	1941–1942	1942–1943	1943–1944	1944–1945
EXPENSE	Academic (Teaching and Research)	68	61	61	55	49
	Plant and Administration	27	35	35	41	46
	Miscellaneous	5	4	4	4	5
INCOME	Tuition — Civilian	45	42	34	22	27
	Tuition — Army and Navy	..	..	6	20	13
	Investments	34	29	24	22	28
	Loans and Scholarships	10	8	6	4	3
	Other (including Overhead from Research Contracts)	11	21	30	32	29

The total of gifts each year has increased at a most encouraging rate, as shown in the following table:

	Capital Additions	*Total Gifts*
1940–1941	$511,949	$888,180
1941–1942	534,316	926,897
1942–1943	616,702	884,268
1943–1944	1,132,835	1,367,507
1944–1945	1,245,911	1,736,892

The continued growth of the Alumni Fund demonstrates clearly the enthusiastic support of the Institute by an increasing number of loyal alumni. In 1940–1941, the first year of the fund, 7,867 alumni contributed $65,399; in 1944–1945, a total of 9,681 alumni gave $150,664, thus enabling the Fund to attain for the first time the original goal of $150,000.

As Gerard Swope pointed out in his Alumni Day address last June, the total of $150,000 "is only .06 of one per cent of the income of the alumni, and a large part of this is contributed by the Government, which allows 15 per cent of a net income for gifts to educational institutions free from tax . . . . All this shows great opportunity [to increase the total] first, by raising the number of contributions, and second, by increasing the average amount contributed."

Enrollment. Since the beginning of the war, the Institute has not suffered a severe cut in enrollment, despite the fact that Selective Service obviously decimated the civilian group when the draft age was lowered to eighteen and deferment provisions for engineering students were discontinued. The civilian decline was offset mainly by service personnel assigned to the Institute for study (some of them for regular professional courses), and in part by the influx of foreign students, many of whom came under the direct auspices of their own governments. The pressure of foreign students required limiting action, and after careful study the Faculty set a limit of 300 on foreign student enrollment, 130 in the Undergraduate School and 170 in the Graduate School.

As this report is written, 91 veterans of World War II are enrolled, but inquiries and applications are pouring into the Admissions Office at a rate which indicates that by next spring we will be forced to turn qualified students away, even after enlarging our student body by 50 per cent.

Three years before the war, our total enrollment became stabilized at approximately 3,000 and remained at the same level through 1942–1943. The influx of men assigned to the Institute by the services in 1943–1944 for regular professional courses resulted in an increase to almost 3,600. In 1944–1945, the total fell to approximately 2,000, the lowest since 1918–1919. During the last two years, 255 men assigned here by the Army and Navy have completed the requirements for the S.B. degree, and currently we have about 200 who have been notified that they will remain to complete their work for degrees. In addition, we have had over 10,000 men in residence during the last five years for special short-term programs.

Student Aid. The demands on both the scholarship and the loan funds for undergraduate and graduate financial assistance have decreased, as was expected.

For 1944–1945 the totals were as follows: undergraduate scholarships, $55,393; graduate scholarships and fellowships, $39,360; loans to graduate and undergraduate students, $12,215. The latter affords an interesting comparison with the $162,843 loaned in 1939–1940. Student aid through employment arranged by the Employment Bureau of the Technology Christian Association has remained relatively stable, ranging from $59,600 in 1940–1941 to $56,100 in 1944–1945, except for the year 1943–1944, when it fell to $26,000.

Personnel. New additions to the Corporation and staff have been reported in this section annually; other changes resulting from retirement, death, and altered conditions have been similarly recorded. Hence the following changes are for the last year only.

Frank W. Lovejoy, a member of the Corporation since 1922, died on September 16 after a long illness. He, along with several other Technology alumni who were employed by the Eastman Kodak Company, was responsible for George Eastman's interest in the Institute and his large gifts of new buildings and endowment. The only other changes in Corporation membership came about by reason of regular term expirations and replacements. The term of Edward R. Stettinius, Jr., as Special Term Member, expired in January. His successor is Harry C. Wiess, President of the Humble Oil and Refining Company of Houston, Texas. Alumni Term Members whose terms expired in June were Page Golsan, Egbert C. Hadley, and Irving W. Wilson. Newly elected Alumni Term Members for the next five years are Edward S. Farrow, Horace W. McCurdy, and Raymond Stevens. Ellis W. Brewster was elected to serve until June, 1949, to fill a vacancy. A. Warren Norton, as the new President of the Alumni Association, also joins the Corporation.

The Institute suffered severe losses during the year in the deaths of Alfred V. deForest, Professor of Mechanical Engi-

neering; Penfield Roberts, Associate Professor of History; Robert H. Richards, Professor of Mining Engineering and Metallurgy, Emeritus, who until his death had for many years been the oldest living alumnus of the Institute; and Charles F. Park, Professor of Mechanism, Emeritus, who had been Director of the Lowell Institute School since its establishment in 1903. Mayson W. Torbet died on March 6, shortly after joining the staff as Visiting Professor of Naval Engineering.

Retirements from the Faculty included the following: Professor Frank L. Hitchcock, a member of the staff in Mathematics since 1910; Professor Herman R. Kurrelmeyer, a member of the staff of Modern Languages since 1902, who will continue as Lecturer this year; Professor Newell C. Page, whose service in the Department of Physics also dates back to 1902; Professor Charles H. Porter, a member of the staff in Business and Engineering Administration, who will continue as Lecturer during the present academic year; Jesse J. Eames, Lawrence S. Smith, and Theodore H. Taft, all Associate Professors in the Department of Mechanical Engineering, who have served the Institute since 1910, 1900, and 1903, respectively (Professors Smith and Taft will continue as Lecturers in the Department during the present academic year); and Charles M. Curl of the Section of Graphics, who retired with the title of Assistant Professor Emeritus after having taught drawing at the Institute since 1920.

Professor Henry H. W. Keith, Head of the Department of Naval Architecture and Marine Engineering, will retire on January 1, 1946, after thirty-five years at the Institute as student and teacher. During Professor Keith's current leave of absence, Professor Lawrence B. Chapman has been Acting Head of the Department.

Several new appointments of significance and importance were made during the year. We were fortunate to secure William L. Campbell to head the new Department of Food

Technology and to have Professor Bernard E. Proctor accept the directorship of the new Samuel Cate Prescott Laboratories of Food Technology. William N. Locke was appointed Professor and Head of the Department of Modern Languages and is now in residence after special duty overseas for the Office of War Information. Captain Roswell H. Blair became Senior Naval Officer and Commanding Officer of the Naval Training Schools at Technology, having succeeded Captain Charles S. Joyce, who was retired by the Navy. As Senior Naval Officer, Captain Joyce gave invaluable aid to the Institute in the difficult problems of the war years. When he resigned on February 1, the Institute awarded him the title of Professor Emeritus. Lieutenant Colonel John C. Dunbar was appointed the new Head of the Department of Military Science and Tactics, following the term of Major Augustus A. Wagner.

Kurt Lewin was named Professor of Psychology and Director of the new Research Center for Group Dynamics. Captain Lybrand Smith became Visiting Professor of Naval Engineering; Harold I. Tarpley, Visiting Associate Professor of Electrical Engineering; and Jerrold R. Zacharias, Professor of Physics. New Associate Professors are Ivan Getting, Electrical Engineering; Homer Hoyt, Architecture and Planning; and Arthur T. Ippen and Clair N. Sawyer, Civil and Sanitary Engineering. New Assistant Professors are Richard H. Bolt and Arthur F. Kip, Physics; Edwin A. Boyan, Business and Engineering Administration; Major Alvin J. Brodeur and Major William F. McGonagle, Military Science and Tactics; Dorwin Cartwright and Ronald Lippitt, Economics and Social Science; Godfrey T. Coate and Jerome B. Wiesner, Electrical Engineering; Nicholas J. Grant, Metallurgy; Roland B. Greeley, Architecture and Planning; Lieutenant Richard S. Lovelace, Naval Architecture and Marine Engineering; Ernest P. Neumann and Prescott A. Smith, Mechanical Engineering; and Henry Wallman, Mathematics.

Professor Robert S. Williams, who had been serving as Deputy Dean of Engineering, was appointed Dean of Army and Navy Students and in addition continues in his post as Head of the Department of Metallurgy. Professor Edwin R. Gilliland was named Deputy Dean of Engineering in July, to serve during Dean Edward L. Moreland's absence. James R. Killian, Jr., served as Acting President during the period of President Compton's assignment in the Pacific theater of war. Professor Frederick G. Keyes resigned the headship of the Department of Chemistry to devote full time to his research and teaching in the field of physical chemistry. Professor Arthur C. Cope succeeded him on July 1 as Head of the Department. Professor Leicester F. Hamilton, who had been Acting Head of the Department, became Executive Officer.

Leaves of absence were granted to many members of the Institute staff to continue important research and administrative duties in strategic war assignments, but even now staff members are returning to the Institute fold and before the next academic year we expect that nearly all of our staff will be in residence.

Promotions in rank within the Institute, effective with the new academic year, were as follows:

To Professor: Robley D. Evans, Department of Physics; Henry G. Houghton, Jr., and Hurd C. Willett, Department of Meteorology; John R. Loofbourow, Department of Biology; and B. Alden Thresher, Department of Economics and Social Science. Professor Houghton has also been appointed Head of the Department of Meteorology.

To Associate Professor: Isadore Amdur, Edmund Lee Gamble, and George G. Marvin, Department of Chemistry; Alexander J. Bone, Department of Civil and Sanitary Engineering; Francis M. Currier, Department of Modern Languages; John A. Hrones and William M. Murray, Department

of Mechanical Engineering; and Reinhardt Schuhmann, Jr., Department of Metallurgy.

To Assistant Professor: Michael B. Bever, Department of Metallurgy; Sanborn C. Brown, Martin Deutsch, Herman Feshbach, and Laszlo Tisza, Department of Physics; James V. Eppes and Robert Plunkett, Department of Mechanical Engineering; Pei-Moo Ku and Robert C. Seamans, Jr., Department of Aeronautical Engineering; Ernest E. Lockhart, Department of Biology; and Walter W. Robertson, Department of Naval Architecture and Marine Engineering.

Resignations were accepted regretfully from the following members of the Faculty: Joseph C. Boyce, Associate Professor of Physics; Robert H. Cameron, Associate Professor of Mathematics; Frederick G. Fassett, Jr., Associate Professor of English; Bissell Alderman, Assistant Professor of Architecture; Kenneth R. Fox, Assistant Professor of Textile Technology; Charles A. Stokes, Assistant Professor of Chemical Engineering; and Captain Lawrence J. Cuddire and Captain Donald McAllister, Assistant Professors of Military Science and Tactics.

REPORTS OF ADMINISTRATIVE OFFICERS

Dean of Students

During 1944–1945 the number of *civilian* undergraduate students continued at less than one-half of the prewar average, but the groups of trainees and commissioned Navy personnel kept the *total undergraduate registration* above two-thirds normal for most of the year. These changing trends are described in this year's report, in which are also summarized the Institute's postwar stabilization of enrollment plans and data supplemental to that given in last year's report on the instructional and other operating features of the several uniformed units of the Army, the Army Air Forces, and the Navy.

The gross number of applicants seeking admission as freshmen for the academic year 1944–1945 was 1,775: 1,356 for the class entering in July, 1944, and 419 for the smaller group entering in March, 1945. The comparable figures for 1943–1944 were: total, 2,408; July, 1943, 2,059; and March, 1944, 349.

For 1944–1945, the number matriculating as freshmen was 551: 478 in July, 1944; and 73 in March, 1945. For 1943–1944, the comparable figures were: total, 689; July, 1943, 583; and April, 1944, 106.

The geographical distribution of the 551 freshmen admitted during 1944–1945, compared with the corresponding groups of the previous four years, is shown in Tabulation 1.

Tabulation 1	*Percentage of First-Year Class*				
	1944–45	*1943–44*	*1942–43*	*1941–42*	*1940–41*
From outside New England . .	62.9	62.0	59.5	61.0	61.5
From outside Massachusetts . .	71.4	69.0	68.1	69.3	67.6

From July 1, 1944, student eligibility for deferment under the Selective Service regulations depended solely on physical grounds; the consequent fluctuations in undergraduate registration, other than of members of groups of naval personnel receiving instruction under government training contracts, are illustrated in Tabulations 2 and 3 (page 44). The extent to which these reduced registration figures were offset by the naval groups is shown in Tabulation 4 (page 44).

[TABULATIONS 2 and 3 show CIVILIAN REGISTRATION including military and naval personnel registered as individuals, and not as members of *groups receiving instruction under Government training contracts;* TABULATION 4 shows TOTAL UNDERGRADUATES.]

Tabulation 2	*Seniors*	*Juniors*	*Sophomores*	*Freshmen*	*Totals*
Five-Year Official Count (Average 1938–1943)...	584	592	575	646	2,397*
Opening of Summer Term (July 13, 1944).....	105	137	206	551†	999
Official 1944–1945 Count (November 27, 1944)..	118	231	93	407	849
Opening of Spring Term (March 30, 1945).....	123	209	319	153‡	804
Opening of Summer Term (July 30, 1945).....	207	68	182	703§	1,160

* The maximum deviation from this figure in any one year was 2.3 per cent.
† Including 478 members of the "Class of 2-47" matriculating July 10, 1944.
‡ Including 73 members of the "Class of 10-47" matriculating March 5, 1945.
§ Including 583 members of the "Class of 2-48" matriculating July 9, 1945.

Tabulation 3	*Seniors*	*Juniors*	*Sophomores*	*Freshmen*	*Totals*
Five-Year Official Count (Average 1938–1943)...	100%	100%	100%	100%	100%
Opening of Summer Term (July 13, 1944).....	18.0	23.1	35.8	85.3	41.7
Official 1944–1945 Count (November 27, 1944)...	20.2	39.0	16.2	63.0	35.4
Opening of Spring Term (March 30, 1945).....	21.1	35.3	55.5	23.7	33.5
Opening of Summer Term (July 30, 1945).....	35.5	11.5	31.7	109.0	48.5

Tabulation 4	*Civilians* and their Percentage of the Undergraduate Body*	*Navy V-12*	*Navy Officer Program*	*Totals (and Their Percentage Comparisons with the Average Prewar)*
Five-Year Official Count (Average 1938–1943)..	2,397 (100%)	...	..	2,397 (100%)
Opening of Summer Term (July 13, 1944)	999 (50.6)	902	70†	1,971 (82.3)
Official 1944–1945 Count (November 27, 1944) .	849 (48.9)	816	49‡	1,714 (71.6)
Opening of Spring Term (March 30, 1945)	804 (53.5)	699	..	1,503 (62.8)
Opening of Summer Term (July 30, 1945)	1,160 (73.0)	430	..	1,590 (66.2)

* Including military and naval personnel registered as individuals, and not as members of groups receiving instruction under government training contracts.
† Meteorology A, 49; Marine Transportation, 21. ‡ All Meteorology A.

Postwar Stabilization

Soon after President Roosevelt signed Public Law 346, the so-called G. I. Bill of Rights, on June 22, 1944, the mounting daily correspondence and interviewing of the Admissions Office with prospective veterans suggested that many would be anxious to enroll immediately upon discharge and to follow programs enabling them to complete degree requirements without delay.

Of additional qualitative significance were the results of two questionnaires addressed during the summer of 1944: (*a*) to 1,150 former students whose undergraduate careers had been interrupted by call to military or naval service; and (*b*) to 21,040 former students of the Classes of 1920–1942, who were asked to reply only if they desired postwar placement consideration or planned further education at the Institute. By autumn, answers had been received from 793 (69 per cent) of those in group *a*, and of these 99 per cent stated that they intended to return; while of those answering from group *b*, 1,844 were interested in postwar study at M. I. T., 174 for undergraduate work leading to a degree, 868 for graduate work, and 802 for "refresher courses."

It therefore appeared "reasonable to the Committee on Stabilization of Enrollment," as stated in a report unanimously approved by the Faculty on November 15, 1944, "to suppose that, concurrently with the start of large-scale demobilization, the Institute will be confronted by numbers of applicants for enrollment (including returning former students now on leave of absence) greatly in excess of prewar figures. Just when this situation will begin, at what rate and how heavy, and in what Courses the demands will be, and how long the conditions will endure — are among the factors presently difficult to estimate."

In formulating its proposals for dealing with these conditions, the Committee necessarily took into account the matter of the Institute's "*ultimate postwar stabilization objectives*, which are predicated upon two steps which should become effective as soon as possible, viz: (1) Admission of a freshman class only in September; (2) A return to the 'two-term with summer session' calendar."

The Committee recognized that adjustment from the wartime accelerated basis of operation toward step 2 would require a *transition interval* during which "subjects offered in the Summer Session would have to be coördinated with those of the regular academic terms so as to provide a continuity in the several programs of study whereby our former students . . . , and other veterans whose education was interrupted by the war, may realize their justified ambitions to complete degree requirements at the earliest opportunity. Operation of the Institute on this basis would present certain problems, such as the need for offering practically every subject in the undergraduate curricula in each term and in the Summer Session, until such time as each Class may be brought into the position of commencing a given year's curriculum in the Fall."

Freshman Stabilization. From its study of the "upward trend in the number of acceptable candidates for successive freshman classes since the Faculty adopted the policy of a first-year class stabilization range of 575–600 in December, 1935," the Committee recommended that "the ultimate postwar stabilization range for the first-year class be established at 675–700; and for the first September–June postwar academic year the stabilization range of 675–700 for the first-year class be increased by a *maximum of 200* providing that such an increase becomes necessary and desirable in order to accommodate qualified applicants whose matriculation was delayed by the war, or whose continued residence at M. I. T. was interrupted by being called for active military duty, and . . . that the total number of registered first-year students will not exceed 900 in either term [September or February]."

Upper-Class Stabilization. Under peacetime conditions, the Committee observed, "controlling the size of the first-year class has operated . . . to stabilize the total undergraduate registration, which averaged 2,397 for the five-year period 1938–1943 with a maximum fluctuation therefrom of 2.3 per cent in any single year. Subject to a continuing supply of college transfers into the upper years it is hence reasonable to believe that raising the first-year range approximately 16½ per cent . . . would in time be reflected by a corresponding increase in the average total undergraduate registration. From

several points of view, such an outcome would seem to be educationally and administratively desirable. . . .

"As a result of space-staff facility studies made by the President's Office in consultation with Department Heads, this Committee is advised that provisions can and will be made whereby all Courses will be prepared during the *transition interval* if necessary, to cope with registrations in the three upper undergraduate years 50 per cent higher than their accustomed prewar loads."

The Committee therefore recommended that "for the first September-June postwar academic year increases shall be allowable in the registration of the second-, third-, and fourth-year classes each to a maximum of 900 providing that such increases become necessary and desirable in order to accommodate qualified applicants whose matriculation was delayed by the war, or whose continued residence at M. I. T. was interrupted by being called for active military duty. . ." and with the stipulation that in certain Courses which had prewar stabilization limitations, the number permitted to register in any of the upper undergraduate years might not exceed 150 per cent of the prewar sophomore stabilization range maximums for the Course.

Graduate Stabilization. Through the space-staff facility studies referred to above, the Committee on the Graduate School came to conclusions which parallel those "outlined above with respect to Upper-Class Stabilization, *i.e.*, provisions can and should be made to accommodate increased numbers during the *transition interval*, and during that period certain Course limitations . . . should apply, but that no *ultimate postwar stabilization ranges* for graduate students can now be suggested."

The Committee on Stabilization therefore recommended that "for the first September-June postwar academic year an increase shall be allowable in the registration of the Graduate School to a maximum of 850 providing that such an increase shall become necessary and desirable in order to accommodate qualified applicants whose matriculation was delayed by the war, or whose continued residence at M.I.T. was interrupted by being called for active military duty or other wartime civilian

services . . ." and with the stipulation that the number permitted to register in individual Courses be limited according to maximums specified for each Course.

Preference in Admission. The Committee's concluding recommendation, unanimously approved by the Faculty on November 15, 1944, was that "during the *transition interval* preferential consideration in admission should be accorded as follows, insofar as may be consistent with the principle of selection on the basis of the relative qualifications of individual applicants:

"First, to the group of former students whose careers at M. I. T. were interrupted by the war, and

"Second, to (*a*) entering freshmen, (*b*) men to whom admission was granted but who did not matriculate on account of entering military or naval service, (*c*) discharged veterans already on our records by reason of having attended M.I.T., *e.g.* trainees and cadets of the Army Air Forces, AST, Radar School, etc."

Enrollment of Veterans. In the summer term of 1945 the student body included 91 veterans of World War II, 57 being enrolled under Public Law 346, and 34 under Public Law 16, the latter providing greater benefits for men having a certain disability rating. The increasing numbers of veterans registered under the two laws since the summer term of 1944, and their subdivision between those who previously attended M. I. T. and those who did not, and between undergraduate and graduate status, are set forth in Tabulation 5 below.

Tabulation 5		*Summer 1944*	*Fall 1944*	*Spring 1945*	*Summer 1945*
Undergraduates:					
Public Law 346	Former M.I.T.	2	13	18	21
	New	0	3	12	24
Public Law 16	Former M.I.T.	3	3	3	8
	New	4	4	12	22
		9	23	45	75

Tabulation 5 (Continued)		*Summer 1944*	*Fall 1944*	*Spring 1945*	*Summer 1945*
Graduate Students					
Public Law 346	Former M.I.T....	0	1	1	3
	New.....	0	3	7	9
Public Law 16	Former M.I.T....	0	0	1	1
	New.....	0	1	3	3
		0	5	12	16
Totals					
	Former M.I.T....	5	17	23	33
	New.....	4	11	34	58
		9	28	57	91

Foreign Student Stabilization

In January, the President, acting upon a recommendation of the Administrative Council, requested the Committee on Stabilization of Enrollment "to review the broad problem of foreign student quotas for the purpose of formulating a basic policy for the Institute, including the distribution of foreign students, both graduate and undergraduate, within the Institute, criteria to govern their selection for admission, and any other matters which may seem pertinent to the Committee."

The foregoing instructions were the result of a situation which had arisen since the spring of 1944, applications from certain foreign countries having reached very large proportions. In the words of the Committee's report, the question was "whether the foreign groups now seeking entrance, if admitted in accordance with the liberal policies which have hitherto prevailed with us, may not pre-empt places which should be reserved for others, particularly for those who at present are fighting the war."

The Committee found "that the search for a solution raises many difficult questions of principle . . ." and reported "at some length, in order that the whole matter may be thoroughly reviewed, and all the relevant considerations brought before the Faculty." Its recommendations were:

"1. That beginning immediately, admission of foreign students be subject to close control, to the end that the total number enrolled shall not exceed 300.

"2. That a division of this total shall be 170 for the Graduate School and 130 undergraduates, subject to reconsideration by the Faculty on recommendation of the Committee.

"3. That the Admissions Office and the Dean of the Graduate School shall share responsibility for maintaining a reasonable balance among countries of origin, to the end that no one geographical area shall pre-empt an excessive share.

"4. That the qualifications of foreign students be scrutinized with particular care, to insure that so far as possible only those of high promise shall be accepted."

In offering these recommendations, which were unanimously endorsed by the Faculty Council on March 26 before receiving unanimous approval of the Faculty itself on April 18, the Committee recognized that "insofar as they are quantitative, they cannot be defended on the strict ground that they follow logically and inevitably from any available data. They represent rather a considered judgment, based on a general estimate of conditions in the next few years, and taking into account past experience so far as this seems relevant. They are in part arbitrary in the sense that we cannot prove that a higher or lower figure would be wrong. They represent, nevertheless, in our unanimous collective judgment, the best working compromise now attainable."

Navy V-12: Contract NOp73

For the first four terms of operation under this contract (July, 1943, through October, 1944) the assigned quota strength was 900 trainees, and the complements "on board" at the beginnings of the successive terms were: 910 (summer, 1943); 857 (fall, 1943); 853 (spring, 1944); and 884 (summer, 1944).

After the summer term of 1944, the Navy discontinued the enlistments from civil life for the V-12 program, intending that hereafter new trainees would be confined to men assigned from the personnel of "the fleet." For the fall term of 1944, our unit's quota was reduced to 824, and the term began with 761 "on board."

In October, 1944, the Bureau of Naval Personnel, "because of the decreasing need for young reserve officers," reached a decision "to make no input of trainees into the Navy V-12 program on 1 March, 1945. This decision does not affect in any way those men now under training in the V-12." For the spring and summer terms of 1945 our quotas, therefore, were further reduced, as were the starting complements, to 695 and 740, and to 475 and 484, respectively.

Up to July 1, 1945, a total of 508 trainees had successfully completed their assignment to our V-12 unit and had been transferred for precommission training. Only five, or less than 1 per cent of the 508, have so far failed to meet the rigid academic and disciplinary standards of the Midshipmen's schools.

Captain Charles S. Joyce, United States Navy (retired), as Senior Naval Officer at M. I. T., served as commanding officer of the V-12 unit from July 1, 1943, to February 1, 1945, upon which latter date he was relieved by Captain Roswell H. Blair, United States Navy (retired).

Navy, Meteorology "A": Contract NOp72

The last of the three groups to receive instruction under this contract were graduated on February 23, 1945, making a total of 148 naval officers, including 63 Waves, who completed eight-month courses in Meteorology "A" as follows:

Period	*Enrolled*	*Completed*
January 4, 1943–September 6, 1943....	50	46 (including 21 Waves)
October 4, 1943–June 5, 1944.....	63	55 (including 18 Waves)
July 10, 1944–February 16, 1945.....	49	47 (including 24 Waves)

As noted in last year's report, payments for instruction under this contract were made at "the rate of $410 per student for the eight months' course of instruction, based on the number of students enrolled in the course as of the tenth day after the beginning of the terms," *i.e.*, at an average rate of $51.25 per student per month, which compares with the Institute's regular tuition fee prorated at $75 per calendar month.

Army Air Forces, Class "A" Meteorology: Contract W 30–053 ac-602

Upon the graduation of 237 cadets on June 5, 1944, this contract was terminated. Since March, 1942, a total of 699 cadets completed Meteorology "A" training in three groups, as set forth in detail in last year's report.

After audit, a settlement on the contract, which was under the so-called cost analysis arrangement, was reached December 20, 1944. The cadets received reimbursement directly for subsistence and quarters on a commutation basis; and the net total reimbursement to the Institute under the contract was $66,441, of which $2,524 was for activation expenses and $1,454 for the proportionate use of the mess hall. The balance of $62,463 was in lieu of a tuition fee, and the apportionment of this sum over eight months of instruction and among 265 cadets (the average number in attendance) yields an average of $29.46 per student per month, which compares with the Institute's regular tuition fee prorated at $75 per calendar month.

Student Life

Housing. Occupancy of the Graduate House by the Navy V-12 unit continued during 1944–1945, but from the beginning of the summer term, on July 10, 1944, all facilities of the undergraduate dormitories were available to civilian students, graduate as well as undergraduate, except Crafts and the fourth floor of Nichols in the Senior House. These latter sections were reserved as quarters for the detachment of Chinese naval officers who arrived on July 1, 1944, under the auspices of the United States Navy, to undertake a twenty-four-month period of instruction in the Department of Naval Architecture and Marine Engineering.

Fraternities. At the invitation of the President, a dinner meeting of undergraduate presidents and fraternity alumni advisers was held at Walker Memorial on March 6. This meeting was prompted partly by criticism of conditions in certain fraternity houses, but more especially to re-emphasize the Institute's traditional policy of regarding fraternities as "*responsible student groups*, capable and desirous of operating

their chapter houses, and of otherwise conducting their affairs, with respect for law, social customs and usages — and in good taste." Mutual agreement was reached at the meeting that this policy, which has operated for many years to reflect credit both upon fraternities and upon the Institute, should be continued; and to that end proposals were made to form an advisory body, composed of alumni advisers of chapters, for the undergraduate Interfraternity Conference.

All chapters, save two, continued to operate their houses during 1944–1945.

Athletics. Competition has been carried on during 1944–1945 in ten sports: basketball, crew, cross country, golf, lacrosse, rifle (inactive during 1943–1944), squash, swimming, tennis, and track. Seven sports have been dropped temporarily: boxing, fencing (active during 1943–1944), gymnastics, hockey, pistol, soccer, and wrestling. Freshmen-sophomore field days were held on August 26, 1944, and on August 25, 1945. Members of the V-12 unit continued to be eligible, under naval as well as Institute regulations, to participate in intramural sports and as members of varsity teams on the same basis as civilian students.

Publications. The Tech on a weekly basis, and *Tech Engineering News* and *Voo Doo* on their normal monthly schedules, continued to maintain year-round publication during 1944–1945, as in 1943–1944. *Technique 1945* appeared in March.

Freshman Camps. Under the auspices of the Technology Christian Association, this feature of the prewar Institute calendar, arranged to acquaint the incoming freshmen with extracurricular opportunities to be found in the student activity system, took place twice during 1944–1945: on July 7–8, 1944, for the class entering July 10, and on March 3, 1945, for the smaller group entering March 5. The first camp of 1945–1946 was held July 6–7, 1945, for the class entering July 9. In each instance the "camp" was held on the Institute grounds rather than at Camp Massapoag, the scene of prewar Freshman Camps.

Student Aid

Distribution of student aid to undergraduates during 1944–1945 compared with 1943–1944 is set forth in Tabulation 6.

Tabulation 6	*1944–1945* Number	*Award*	*1943–1944* Number	*Award*
Freshman Scholarships	186	$36,225	183	$33,900
Other Undergraduate Scholarships	110	19,168	192	23,225
Total Scholarships	296	$55,393	375	$57,125
Undergraduate Loans	36	11,465	81	34,925
Total Aid to Undergraduates	298*	$66,858	356*	$92,050
Percentage of Undergraduate Registration Receiving Aid	24.9		29.1	

* Allowing for individuals receiving both scholarship and loan.

Tabulation 6, however, does not include grants totaling $3,780 to 14 undergraduates of the three upper classes "born in Massachusetts," made possible by the continued generosity

Tabulation 7	*At June 30, 1945*	*At June 30, 1944*	*Net Changes During 1944–45*
Items of Outgo			
Number of Men Receiving Loans	2,594	2,575	up 19
Total Amount Loaned	$1,889,313	$1,874,301	up $15,012*
Average per Capita Loan	$725	$728	down $3
Items of Income			
Number of Men Whose Indebtedness Has Been Completely Discharged	1,678	1,480	up 198
Principal Repayments *in Advance*	$464,108	$388,203	up $75,905
Other Principal Repayments	892,028	815,872	up 76,156
Total Principal Repayments	$1,356,136	$1,204,075	up $152,061
Collection Ratio, i.e., Percentage of Maturities Paid	97.1	96.5	up 0.6
Matured Principal in Arrears	$34,752	$41,301	down $6,549
Actual "Written off" Accounts	5,194†	2,397	2,797
Total Maturities Unpaid	$39,946	$43,698	down $3,752
Interest Received	$193,887	$180,964	up $12,923
Notes Outstanding	527,892	667,828	down 139,846

* The actual amount loaned during 1944–1945 was $12,215. The figure of $15,012 includes $2,797 of losses incurred in "legal settlements" effected during 1930–1945 which were previously debited against administrative operating expenses of M. I. T.

† $2,397 of seven men deceased prior to 1938 and not covered by insurance; and $2,797 of losses incurred in "legal settlements" during 1930–1945.

of the trustees of the James Melvin Trust, which aided nine men to the extent of $3,900 during 1943–1944.

From both graduate and undergraduate students, the Loan Fund Board received 47 applications during 1944–1945 and acted favorably upon 39, or 83 per cent, $12,215 being loaned. For 1943–1944 the corresponding figures were: 116, 92, 79.3 per cent, and $39,225. Repayments to the Fund during 1944–1945 were $152,061 on principal account and $12,923 for interest, or a total of $164,984. Thus, for the fourth year in the history of the Fund, repayments on principal account exceeded the total of loans made, the excess being $139,846.

The cumulative record of the Fund from its establishment in 1930 up to June 30, 1945, appears in Tabulation 7, page 54. It is notable that the $193,887 received for interest up to June 30, 1945, was nearly five times the amount of matured principal then unpaid, $39,946.

The Student Employment Bureau of the T. C. A. placed a total of 256 individuals compared with 227 in 1943–1944, and those placed in 1944–1945 earned $56,101 compared with $26,608 the year before.

H. E. Lobdell

Dean of the Graduate School

The Registrar's statistics show a total enrollment of 349 graduate students, as compared with 357 for the previous year. In this, the final year of the war, the Graduate School showed a preponderance of registrants from foreign countries. Members of our own armed forces assigned to special training programs were the second most numerous group. Our own nationals in civilian status were in the minority.

During the year, inquiries and applications from servicemen anticipating discharge became more and more frequent. In anticipation of the return of many of those who had to forego or interrupt their graduate training because of the war and who may desire to enter our school with the aid provided under Public Law 346, the enrollment permitted for 1946–1947 will be of the order of 850 by assent of the Faculty to recommendations of the Committee on Stabilization of Enrollment.

Of this permissible number, 80 per cent of the places will be reserved for our own qualified nationals and those of Canada. Limitations of space, facilities, and staff services necessitate restriction of foreign students to not over 170 in the Graduate School. To allow, under this limitation, a fair representation among citizens of cobelligerent countries has compelled the Admissions authorities to deny applications from considerable numbers of properly qualified candidates, particularly from the Far East.

A change in policy for all candidates for the degree of Doctor of Science as well as for that of Doctor of Philosophy has been the adoption of the requirement of demonstrated ability to read scientific literature in two modern languages besides English. The languages most in favor appear to be German and Russian, except in Meteorology, for which the foreign literature appears to be confined largely to the Scandinavian.

The planned establishment of various new centers of research at the Institute, together with continuing governmental contracts involving basic science or engineering, offers to graduate students many opportunities for thesis work. Among the new facilities are the Electronics Laboratory, the Acoustics Laboratory, the Nuclear Physics Laboratory, the Gas Turbine Laboratory, the Servomechanisms Laboratory, the Instruments Laboratory of the Department of Aeronautical Engineering, the Research Center for Group Dynamics, the Samuel Cate Prescott Laboratories of Food Technology, research in Applied Mathematics, and an extension of fields of investigation in various departments based on scientific and engineering developments arising from the participation of M. I. T. in the war effort.

It is a pleasure to announce the establishment of the following new Graduate Fellowships during the period covered by this report: Du Pont Fellowship in Physics, Richard C. du Pont Memorial Fellowship, Goodyear Aeronautical Engineering Fellowship, S. C. Johnson and Son, Inc. Fellowship, National Research Corporation Fellowship, Sperry Gyroscope Company Fellowship, Standard Brands Fellowship, Swift and

Company Fellowship, Gerard Swope Fellowships, and S. K. Wellman Fellowship.

Graduate scholarship aid in the sum of $39,360 was extended to 88 applicants in the period between July, 1944, and July, 1945. (The amount is exclusive of tuition for graduate student staff members charged to departmental budgets.)

One hundred advanced degrees were conferred between July, 1944, and June, 1945, as follows: Doctor of Philosophy, 8; Doctor of Science, 11; Master of Science, 76; Master in City Planning, 5.

JOHN W. M. BUNKER

REGISTRAR

This is an appropriate time to review briefly the decline in the total registration during the war and the numerical aspect of the war training programs given for the armed services on the Institute's Cambridge campus. In the following table, the civilian group includes Course XIII-A. The tabulation does not include the M. I. T. Radar School at 470 Atlantic Avenue, Boston.

REGISTRATION OF CIVILIAN AND SERVICE GROUPS

Term	*Civilians*	*A.S.T.P.*	*Navy V-12*	*Special Service Groups*	*Total*
Sept., 1942–Jan., 1943 ...	3,048	...	...	...	3,048
Feb., 1943–June, 1943 ...	2,210	...	...	559	2,769
July, 1943–Oct., 1943 ...	1,579	401	910	705	3,595
Nov., 1943–Feb., 1944 ...	1,470	889	857	413	3,629
March, 1944–June, 1944 ...	1,165	...	853	322	2,340
July, 1944–Oct., 1944 ...	1,271	...	902	70	2,243
Nov., 1944–Feb., 1945 ...	1,198	...	812	49	2,059
March, 1945–June, 1945 ...	1,173	...	699	...	1,872
July, 1945–Oct., 1945 ...	1,538	...	430	...	1,968

It is interesting that civilian registration reached the level of the decade 1890–1900 (see Table 1, page 60) and that the total registration declined to the pre-World War I level.

The effect of the accelerated program of three terms a year on the number of degrees awarded in science and engineering is shown in the following table:

Year	*S.B. Degrees*	*S.M. Degrees*	*Sc.D. and Ph.D. Degrees*
Ten-Year Average	455	203	55
1943	472	194	43
1944	396	150	39
1945 (Estimated)	259	119	24

The total three-year deficiency in output as compared with the preceding ten-year average is 238 S.B. degrees, or about 52 per cent of one year's output; 146 S.M. degrees, or 72 per cent of one year's output, and 59 Doctor's degrees, or 107 per cent. The decline in the number of degrees awarded in the middle of the previous decade and the decline in registration in the early part of that decade seem to indicate that if corrections for trends were made, the decrease in degrees awarded during the prewar depression would be practically the same as during this three-year war period under an accelerated program.

The situation at the Institute, however, was not typical of American institutions. The Institute was the only engineering school which had well-established courses in all the fields of science and engineering desired by the Navy; consequently our Navy V-12 program was a regular four-year professional training and thereby increased the number of Bachelor's degrees. Our real deficiency in trained United States citizens for advanced degrees was much larger than indicated by the figures, as a great proportion of graduate students were from foreign countries.

The statistics for the year 1944–1945 and summary statistics for preceding years follow (pages 60-78).

JOSEPH C. MACKINNON

STATISTICS ON REGISTRATION AND DEGREES

REPORT OF THE REGISTRAR, JULY 1, 1944–JUNE 30, 1945

All statistics on registration and staff for this year are as of November 27, 1944. Statistics on registration and staff for previous years are as of November 1, except those for 1943–1944 which are as of August 2, 1943.

TABLE 1. Registration of Civilian Students Since the Foundation of the Institute

Year	Number of Students	Year	Number of Students	Year	Number of Students
1865–66	72	1892–93	1,060	1919–20	3,078
1866–67	137	1893–94	1,157	1920–21	3,436
1867–68	167	1894–95	1,183	1921–22	3,505
1868–69	172	1895–96	1,187	1922–23	3,180
1869–70	206	1896–97	1,198	1923–24	2,949
1870–71	224	1897–98	1,198	1924–25	2,938
1871–72	261	1898–99	1,171	1925–26	2,813
1872–73	348	1899–00	1,178	1926–27	2,671
1873–74	276	1900–01	1,277	1927–28	2,712
1874–75	248	1901–02	1,415	1928–29	2,868
1875–76	255	1902–03	1,608	1929–30	3,066
1876–77	215	1903–04	1,528	1930–31	3,209
1877–78	194	1904–05	1,561	1931–32	3,188
1878–79	188	1905–06	1,466	1932–33	2,831
1879–80	203	1906–07	1,397	1933–34	2,606
1880–81	253	1907–08	1,415	1934–35	2,507
1881–82	302	1908–09	1,461	1935–36	2,540
1882–83	368	1909–10	1,479	1936–37	2,793
1883–84	443	1910–11	1,506	1937–38	2,966
1884–85	579	1911–12	1,559	1938–39	3,093
1885–86	609	1912–13	1,611	1939–40	3,100
1886–87	637	1913–14	1,685	1940–41	3,138
1887–88	720	1914–15	1,816	1941–42	3,055
1888–89	827	1915–16	1,900	1942–43	3,048
1889–90	909	1916–17	1,957	1943–44	1,579*
1890–91	937	1917–18	1,698	1944–45	1,198*
1891–92	1,011	1918–19	1,819		

TABLE 2. The Corps of Instructors

	'32	'33	'34	'35	'36	'37	'38	'39	'40	'41	'42	'43	'44
Faculty Members of the Staff	242	235	245	245	244	267	273	282	285	292	313	319	317
Professors	93	88	83	87	78	87	90	98	99	95	97	97	107
Associate Professors	60	57	69	81	87	89	98	89	92	99	104	108	105
Assistant Professors	81	80	82	68	70	76	72	83	83	86	98	99	92
Ex-Officio	3	5	6	6	6	5	6	7	7	7	8	9	10
Instructors	5	5	5	3	3	3	3	3	3	2	3	3	—
Technical Instructors	—	—	—	—	—	—	—	—	—	1	1	1	1
Research Associates	—	—	—	—	—	7	4	2	1	2	2	2	2
Other Members of the Staff	283	263	272	284	291	331	368	401	396	395	370	306	222
Instructors	105	90	86	90	97	101	97	99	91	101	100	97	70
Technical Instructors	—	—	—	—	—	—	—	—	—	6	7	8	6
Teaching Assistants	—	—	—	—	—	—	—	—	—	—	—	1	—
Teaching Fellows	21	22	20	24	51	52	52	52	55	52	60	52	8
Assistants	45	43	70	76	64	69	79	78	85	87	75	49	44
Technical Assistants	28	31	28	—	—	—	—	—	—	—	—	—	—
Lecturers	28	25	25	24	19	29	28	31	31	17	18	16	7
Research Consultant	—	—	—	—	—	—	—	—	—	—	—	1	—
Research Associates	32	25	22	27	31	22	25	36	35	47	34	23	33
Research Assistants	20	21	18	30	24	42	72	90	91	84	64	59	54
Research Fellows (D. I. C.)	3	3	2	1	—	—	—	—	—	—	—	—	—
Research Fellows	—	3	1	12	5	16	15	15	8	—	—	—	—
National Research Council Fellows	—	—	—	—	—	—	—	—	—	1	—	—	—
Special Investigator	1	—	—	—	—	—	—	—	—	—	—	—	—
Staff Members (D. I. C.)	—	—	—	—	—	—	—	—	—	—	12	—	—
Total	525	498	517	529	535	598	641	683	681	687	683	625	539
Other Members of the Faculty	17	25	26	27	31	28	28	28	32	37	40	39	44
Professors: Emeriti	13	21	23	24	29	27	27	27	31	36	39	38	43
Retired	—	—	—	—	—	—	—	—	—	—	—	—	—
Non-Resident	4	4	3	3	2	1	1	1	1	1	1	1	1

* Not including Navy V-12: 910 in 1943–44; 812 in 1944–45.

TABLE 3-A. Classification of Civilian Students by Courses and Years

COURSE NAME AND NUMBER	1942–43 YEAR						1943–44 YEAR						1944–45 YEAR					
	1	2	3	4	G	Total	1	2	3	4	G	Total	1	2	3	4	G	Total
Aeronautical Engineering XVI	—	56	46	39	28	169	106	26	15	34	18	199	65	10	21	12	28	136
Architecture IV, IV-B	12	13	15	14	12	66	2	3	3	3	11	22	5	3	2	5	10	25
Architecture (IV, IV-B) Fifth Year	—	—	—	11	—	11	—	—	—	8	—	8	—	—	—	5	—	5
†Biology and Biological Engineering VII	—	8	11	8	42	69	—	10	—	2	22	34	1	2	—	1	7	11
Building Engineering and Construction XVII	—	8	2	6	—	16	3	3	2	1	—	9	4	4	1	2	—	11
Business and Engineering Administration XV	—	60	63	52	2	177	27	8	8	16	9	68	30	7	12	8	4	61
Chemical Engineering X	—	123	95	41	43	302	127	49	16	14	33	239	79	9	35	21	41	185
Chemical Engineering Prac. X-A, X-B, X-C	—	—	—	28	30	58	—	—	—	21	18	39	—	—	—	—	—	—
Chemistry V	—	18	20	22	52	112	30	10	7	6	42	95	22	10	6	5	34	77
Civil Engineering I	—	21	17	14	20	72	27	12	7	11	15	72	19	9	8	4	22	62
Electrical Engineering VI	—	39	39	42	39	159	95	38	11	18	34	196	80	16	21	7	60	184
Electrical Engineering (Coöperative) VI-A	—	43	27	42	16	128	—	8	10	16	7	41	—	—	18	14	2	34
Food Technology and Indust. Biology VII-B	—	—	—	—	—	—	—	—	—	3	—	3	—	—	—	—	—	—
General Engineering IX-B	—	7	11	20	—	38	9	—	1	10	—	20	3	2	5	—	—	10
General Science IX-A	—	—	3	9	—	12	—	1	1	1	—	3	—	—	1	—	—	1
Geology XII	—	1	2	2	8	13	1	—	—	—	5	6	—	—	—	—	3	3
Industrial Economics	—	—	—	—	15	15	—	—	—	—	8	8	—	—	—	—	5	5
Marine Transportation XIII-C	—	5	9	8	—	22	1	—	—	—	—	1	—	—	—	—	—	—
Mathematics XVIII	—	4	1	7	10	22	4	5	1	2	7	19	5	2	1	2	10	20
Mechanical Engineering II	—	101	99	63	35	298	71	28	13	53	29	194	49	9	32	12	35	137
Torpedo Engineering (in Mech. Eng. Dept.)	—	—	—	—	2	2	—	—	—	—	6	6	—	—	—	—	2	2
Mechanical Engineering (Coöperative) II-A	—	—	11	9	10	30	—	—	—	—	—	—	—	—	—	—	—	—
Metallurgy III	—	20	25	18	19	82	6	2	5	11	14	38	4	1	4	2	24	35
Ceramics (in Metallurgy Department)	—	—	—	—	6	6	—	—	—	—	2	2	—	—	—	—	1	1
Meteorology XIV	—	—	—	—	141	141	—	—	—	—	19	19	1	—	—	3	11	15
Naval Architecture and Marine Eng. XIII	—	31	28	27	—	86	21	8	8	13	1	51	16	3	2	4	—	25
Naval Engineering (in Naval Arch. Dept.)	—	—	—	—	7	7	—	—	—	—	—	—	—	—	—	—	—	—
Naval Construction and Engineering XIII-A	—	—	27	17	18	62	—	—	21	41	17	79	—	—	51	—	24	75
Physical Biology VII-A	—	2	3	4	1	10	2	—	1	1	1	5	2	—	—	—	—	2
Physics VIII	—	28	20	16	39	103	25	16	9	13	37	100	22	6	11	11	23	73
Sanitary Engineering XI	—	—	3	2	1	6	—	—	—	1	2	3	—	—	—	—	3	3
Unclassified	—	15	23	1	—	39	—	—	—	—	—	—	—	—	—	—	—	—
First Year (Not including Course IV)	715	—	—	—	—	715	—	—	—	—	—	—	—	—	—	—	—	—
Total	727	603	600	522*	596	3,048	557	227	139	299*	357	1,579	407	93	231	118	349	1,198

* These totals include fifth year in Architecture IV, City Planning IV-B.
† Includes Public Health, Course VII-T, through June 1944.

TABLE 4-A

Classification of Civilian Students by Courses, Options, and Years

COURSE No.	Name	Option	Opt.	Year 1 Opt.	Year 1 Tot.	Year 2 Opt.	Year 2 Tot.	Year 3 Opt.	Year 3 Tot.	Year 4 Opt.	Year 4 Tot.	Year G Opt.	Year G Tot.	Total	Course Number
I	Civil Engineering			—	19	—	9	—	8	—	4	—	22	62	I
II	Mechanical Engineering			49		9		32		12		29			
	Torpedo Engineering			—	49	—	9	—	32	—	12	2	37	139	II
	Torpedo Reserve			—		—		—		—		3			
	Textile Technology			—		—		—		—		3			
III	Metallurgy	1. Metallurgy	1	4		1		4		2		21			
		2. Mineral Dressing	2	—	4	—	1	—	4	—	2	3	25	36	III
	Ceramics			—		—		—		—		1			
IV	Architecture			—	4	—	3	—	2	—	4	—	1	19	IV
	Fifth Year			—	—	—	—	—	—	—	5	—	—		
IV-B	City Planning			—	1	—	—	—	—	—	1	—	9	11	IV-B
V	Chemistry			—	22	—	10	—	6	—	5	—	34	77	V
VI	Electrical Engineering	1. Electric Power	1	—		1		1		—		—			
		3. Electrical Communications	3	—	80	9	16	9	21	4	7	—	60	184	VI
		4. Electronic Applications	4	—		6		11		3		—			
VI-A	Electrical Engineering — Coöperative			—	—	—	—	—	18	—	14	—	2	34	VI-A
VII	Biology and Biological Engineering	1. Quantitative Biology	1	1		2		—		1		—			
		2. Food Tech. and Ind. Biology	2	—	1	—	2	—	—	—	1	—	7	11	VII
VII-A	Physical Biology			—	2	—	—	—	—	—	—	—	—	2	VII-A
VIII	Physics	1. General	1	—		5		11		9		—			
		2. Applied	2	—	22	1	6	—	11	2	11	—	23	73	VIII
IX-A	General Science			—	—	—	—	—	1	—	—	—	—	1	IX-A
IX-B	General Engineering			—	3	—	2	—	5	—	—	—	—	10	IX-B
X	Chemical Engineering			—	79	—	9	—	35	—	21	—	41	185	X
XI	Sanitary Engineering			—	—	—	—	—	—	—	—	—	3	3	XI
XII	Geology			—	—	—	—	—	—	—	—	—	3	3	XII
XIII	Naval Architecture and Marine Engineering			—	16	—	3	—	2	—	4	—	—	25	XIII
XIII-A	Naval Construction and Engineering			—	—	—	—	—	51	—	—	—	24	75	XIII-A
XIV	Meteorology			—	1	—	—	—	—	—	3	—	11	15	XIV
XV	Business and Engineering Admin.	1. Physical Sciences	1	—		3		10		6		—			
		2. Chemical Sciences	2	—	30	4	7	2	12	2	8	—	4	61	XV
XVI	Aeronautical Engineering			—	65	—	10	—	21	—	12	—	28	136	XVI
XVII	Building Engineering and Construction	1. Heavy Construction	1	—		—		1		2		—			
		2. Light Construction	2	—	4	—	4	—	1	—	2	—	—	11	XVII
XVIII	Mathematics	1. Pure	1	—		1		1		1		—			
		2. Applied	2	—		1		—		1		—			
		3. Industrial Statistics	3	—	5	—	2	—	1	—	2	—	10	20	XVIII
	Industrial Economics			—	—	—	—	—	—	—	—	—	5	5	Ind. Econ.
	Total			407		93		231		118*		349		1,198	Total

*This total includes fifth year in Architecture.

TABLE 3-B. Classification of All Students by Courses and Years

I. Civilian and Navy V-12

Course Name and Number	July 13, 1944 — Year 1 C	1 N	2 C	2 N	3 C	3 N	4 C	4 N	G C	Total C	Total N	Nov 27, 1944 — Year 1 C	1 N	2 C	2 N	3 C	3 N	4 C	4 N	G C	Total C	Total N	Mar 30, 1945 — Year 1 C	1 N	2 C	2 N	3 C	3 N	4 C	4 N	G C	Total C	Total N
Aeronautical Engineering XVI	85	3	28	104	14	17	11	16	15	153	140	65	—	10	82	21	71	12	16	28	136	169	20	—	43	60	43	75	12	15	30	148	150
Architecture IV, IV-B	7	—	2	—	3	—	3	—	2	17	—	5	—	3	—	2	—	5	—	10	25	—	4	—	4	—	5	—	3	—	10	26	—
Architecture (IV, IV-B) Fifth Year	—	—	—	—	—	—	3	—	—	3	—	—	—	—	—	—	—	5	—	—	5	—	—	—	—	—	—	—	4	—	—	4	—
Biology and Biological Engineering VII	6	—	1	14	1	2	—	—	7	15	16	1	—	2	25	—	6	1	—	7	11	31	4	—	7	20	1	8	1	—	10	23	28
Building Engineering and Const. XVII	4	—	3	2	2	—	2	—	—	11	2	4	—	4	—	1	2	2	—	—	11	2	3	—	8	—	2	2	1	—	—	14	2
Business and Engineering Admin. XV	35	—	12	11	2	15	10	12	2	61	38	30	—	7	2	12	9	8	13	4	61	24	9	—	27	3	10	7	4	11	4	54	21
Chemical Engineering X	106	3	45	25	24	28	6	9	32	213	65	79	—	9	2	35	16	21	23	41	185	41	28	—	50	2	28	15	17	20	37	160	37
Chemistry V	33	—	13	1	6	2	2	2	28	82	5	22	—	10	—	6	1	5	1	34	77	2	8	—	15	—	7	—	6	1	39	75	1
Civil Engineering I	31	4	8	9	3	7	6	7	12	60	27	19	—	9	5	8	6	4	6	22	62	17	6	1	16	5	9	6	3	5	31	65	17
Electrical Engineering VI	115	5	41	84	7	42	10	11	24	197	142	80	—	16	38	21	73	7	33	60	184	144	27	1	65	46	16	71	6	28	56	170	146
Electrical Engineering (Coöp.) VI-A	—	—	—	—	13	—	4	—	1	18	—	—	—	—	—	18	—	14	—	2	34	—	—	—	—	—	15	—	12	—	5	32	—
Food Technology VII-B	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2	—
General Engineering IX-B	8	—	3	—	1	4	1	3	—	13	7	3	—	2	—	5	—	—	3	—	10	3	—	—	2	—	3	—	3	2	—	8	2
General Science IX-A	1	—	1	—	1	1	—	—	—	3	1	—	—	—	—	1	—	—	1	—	1	1	—	—	—	—	1	—	—	1	—	1	1
Geology XII	1	—	—	—	—	—	1	—	2	4	—	—	—	—	—	—	—	—	—	3	3	—	1	—	—	—	—	—	—	—	3	4	—
Group Psychology	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	—
Industrial Economics	—	—	—	—	—	—	—	—	2	2	—	—	—	—	—	—	—	—	—	5	5	—	—	—	—	—	—	—	—	—	5	5	—
Marine Transportation XIII-C	—	—	—	—	—	—	1	2	—	1	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mathematics XVIII	7	1	3	—	1	1	1	—	10	22	2	5	—	2	1	1	—	2	1	10	20	2	5	—	12	—	1	—	5	1	14	37	1
Mechanical Engineering II	59	7	27	87	20	75	6	25	29	141	194	49	—	9	4	32	83	12	56	35	137	143	25	2	38	14	25	74	18	50	36	142	140
Torpedo Eng. (In Mech. Eng. Dept.)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2	—	—	—	—	—	—	—	—	—	5	5	—
Metallurgy III	7	—	1	1	3	4	4	4	21	36	9	4	—	1	—	4	1	2	3	24	35	4	3	—	4	—	3	1	1	2	22	33	3
Ceramics (in Metallurgy Department)	—	—	—	—	—	—	—	—	1	1	—	—	—	—	—	—	—	—	—	1	1	—	—	—	—	—	—	—	—	—	1	1	—
Meteorology XIV	—	—	—	36	—	—	3	23	11	14	59	1	—	3	31	—	26	3	20	11	15	77	1	—	1	27	—	24	—	1	7	9	52
Naval Arch. and Marine Eng. XIII	18	—	7	47	4	14	6	11	8	43	72	16	—	3	29	2	23	4	11	—	25	63	2	—	9	12	3	36	3	9	—	17	57
Naval Construction and Eng. XIII-A	—	—	—	24	—	21	—	41	86	—	—	—	—	—	—	51	—	—	—	24	75	—	—	—	—	—	30	—	17	—	20	67	—
Physical Biology VII-A	—	—	—	—	—	—	—	—	—	—	—	2	—	—	—	—	—	—	—	—	2	—	—	—	—	—	—	—	—	—	—	—	—
Physics VIII	28	3	11	9	8	7	4	3	20	71	22	22	—	6	5	11	7	11	7	23	73	19	7	—	18	4	7	6	7	7	28	67	17
Sanitary Engineering XI	—	—	—	—	—	—	—	—	4	4	—	—	—	—	—	—	—	—	—	3	3	—	—	—	—	—	—	—	—	—	3	3	—
Navy V-12 1st term Fully Prescribed	—	68	—	—	—	—	—	—	—	—	68	—	24	—	—	—	—	—	—	—	—	24	—	—	—	—	—	—	—	—	—	—	—
Navy V-12 2d term Fully Prescribed	—	31	—	—	—	—	—	—	—	—	31	—	37	—	—	—	—	—	—	—	—	37	—	24	—	—	—	—	—	—	—	—	24
Navy V-12 1st term College Transfer	—	—	—	—	—	—	—	—	—	—	—	—	7	—	—	—	—	—	—	—	—	7	—	—	—	—	—	—	—	—	—	—	—
Navy V-12 2d term College Transfer	—	—	—	—	—	—	—	—	—	—	—	—	2	—	—	—	—	—	—	—	—	2	—	—	—	—	—	—	—	—	—	—	—
Total	551	125	206	430	137	219	105*	128	272	1271	902	407	70	93	224	231	324	118*	194	349	1198	812	153	28	319	193	209	325	123*	153	369	1173	699

* This total includes fifth year in Architecture. C = Civilian. N = Navy.

II. Other Navy Groups

	July 13, 1944	November 27, 1944	March 30, 1945
Aerology Officers	49	49	—
Marine Transportation	21	—	—
Navy College Training Program (V-12) (Given under I)	902	812	699
Civilians (Given under I)	1,271	1,198	1,173
Grand Total	2,243	2,059	1,872

TABLE 4-B

Classification of Special Civilian Students by Courses and Years

(Included in Table 4-A)

COURSE	YEAR					TOTAL	COURSE
	1	2	3	4	G		
I Civil Engineering	1	—	—	—	4	5	I
II Mechanical Engineering	—	—	3	—	9	12	II
III Metallurgy	—	—	—	—	4	4	III
IV Architecture	—	—	—	1	1	2	IV
IV-B City Planning	—	—	—	1	—	1	IV-B
V Chemistry	1	—	1	—	3	5	V
VI Electrical Engineering	—	—	1	—	19	20	VI
VII Biology and Biological Engineering	—	—	—	—	1	1	VII
VIII Physics	—	—	2	1	8	11	VIII
IX-B General Engineering	—	—	1	—	—	1	IX-B
X Chemical Engineering	—	—	—	—	2	2	X
XIII Naval Architecture and Marine Engineering	—	1	—	—	—	1	XIII
XIV Meteorology	—	—	—	3	1	4	XIV
XV Business and Engineering Administration	—	—	—	—	3	3	XV
XVI Aeronautical Engineering	—	—	—	—	5	5	XVI
XVIII Mathematics	1	1	—	—	7	9	XVIII
Total	3	2	8	6	67	86	Total

TABLE 4-C

Classification of Former Civilian Students Who Returned This Year*

(Included in Table 4-A)

COURSE	YEAR					TOTAL	COURSE
	1	2	3	4	G		
I Civil Engineering	—	1	2	—	1	4	I
II Mechanical Engineering	2	—	2	2	3	9	II
III Metallurgy	—	—	2	—	2	4	III
IV Architecture	—	3	—	—	—	3	IV
Fifth Year	—	—	—	1	—	1	IV (Fifth Year)
IV-B City Planning	—	—	—	—	5	5	IV-B
V Chemistry	1	2	1	—	3	7	V
VI Electrical Engineering	2	2	—	1	4	9	VI
VI-A Cooperative Course in Electrical Engineering	—	—	1	—	—	1	VI-A
VII Biology and Biological Engineering	—	—	—	—	2	2	VII
VIII Physics	—	—	1	2	1	4	VIII
X Chemical Engineering	1	3	6	3	3	16	X
XIV Meteorology	—	—	—	—	1	1	XIV
XV Business and Engineering Administration	—	2	—	—	—	2	XV
XVI Aeronautical Engineering	1	—	1	1	2	5	XVI
XVIII Mathematics	—	—	—	—	1	1	XVIII
Industrial Economics	—	—	—	—	3	3	Ind. Econ.
Total	7	13	16	10	31	77	Total

* Excludes 21 special students.

TABLE 5. Classification of Civilian Students by Courses since 1937

	1937–38	1938–39	1939–40	1940–41	1941–42	1942–43	1943–44	1944–45
Engineering Courses . . . . . *Total*	2,288	2,379	2,418	1,922	1,836	1,861	1,276	976
Aeronautical Engineering XVI	210	230	245	237	147	169	199	136
Architectural Engineering IV-A	5	2	—	—	—	—	—	—
Building Engineering and Construction XVII . . .	27	29	26	17	14	16	9	11
Business and Engineering Administration XV . . .	269	265	251	223	205	177	68	61
Chemical Engineering X, X-A, X-B, X-C	473	524	497	338	348	360	278	185
Civil Engineering I	123	114	104	80	71	72	72	62
Army Engineer (in Civil Engineering Dept.) . . .	15	17	13	—	—	—	—	—
Electrical Engineering VI, VI-A	452	448	432	325	256	287	237	218
‡Electrochemical Engineering XIV	22	9	2	—	—	—	—	—
General Engineering IX-B	64	73	68	42	36	38	20	10
Mechanical Engineering II, II-A	370	401	433	353	345	330	200	139
Army Ordnance (in Mechanical Engineering Dept.)	12	10	22	4	—	—	—	—
*Metallurgy III	84	108	124	129	125	88	40	36
‡Meteorology XIV	—	—	—	—	110	141	19	15
*Mining Engineering III	35	25	10	—	—	—	—	—
Naval Architecture and Marine Eng. XIII, XIII-C	100	89	139	121	125	115	52	25
Naval Construction and Engineering XIII-A . . .	21	28	42	49	46	62	79	75
Sanitary Engineering XI	6	7	10	4	8	6	3	3
Science Courses . . . . . *Total*	501	555	543	453	427	341	265	187
§Biology and Public Health VII, VII-A, VII-B, VII-T	94	86	91	82	81	79	42	13
Chemistry V	186	203	194	162	151	112	95	77
General Science IX-A	25	33	30	22	21	12	3	1
Geology XII	32	45	36	34	27	13	6	3
Mathematics XVIII	27	28	40	30	27	22	19	20
Physics VIII	137	160	152	123	120	103	100	73
Architecture IV, IV-B, IV-C . . . . . *Total*	111	100	108	112	92	77	30	30
Economics and Eng. or Sci., and Industrial Eng. *Total*	3	4	1	3	13	15	8	5
Unclassified . . . . . *Total*	63	55	30	64	60	39	—	—
†*First Year (not including Course IV)* . . . . . *Total*	—	—	—	584	627	715	—	—
Grand Total	2,966	3,093	3,100	3,138	3,055	3,048	1,579	1,198

* June 1940, Mining Engineering discontinued. Metallurgy formerly Course XIX, changed to Course III.
† From September 1940 to November 1942, First Year Students not required to designate choice of course except for Course IV.
‡ June 1940, Electrochemical Engineering discontinued. June 1941, Meteorology, formerly included in Aeronautical Engineering, changed to Course XIV.
§ June 1944, Public Health discontinued

TABLE 6

GEOGRAPHICAL CLASSIFICATION OF CIVILIAN STUDENTS SINCE 1940

UNITED STATES	1940	1941	1942	1943	1944
North Atlantic . . . . . Total	2,060	2,056	2,068	1,002	694
Connecticut	104	116	142	61	48
Maine	22	28	30	12	6
Massachusetts	951	896	906	445	319
New Hampshire	21	28	32	12	10
New Jersey	180	178	168	73	47
New York	558	586	566	303	198
Pennsylvania	165	177	170	76	46
Rhode Island	47	35	41	12	16
Vermont	12	12	13	8	4
South Atlantic . . . . . Total	187	167	192	104	63
Delaware	14	10	12	7	4
District of Columbia	52	42	41	32	21
Florida	26	25	32	14	7
Georgia	11	13	11	1	2
Maryland	36	29	36	14	14
North Carolina	11	16	12	9	1
South Carolina	4	1	6	4	5
Virginia	21	20	30	11	4
West Virginia	12	11	12	12	5
South Central . . . . . Total	99	103	98	45	35
Alabama	9	9	10	5	2
Arkansas	4	8	8	2	3
Kentucky	18	18	14	4	3
Louisiana	12	9	5	5	4
Mississippi	7	8	6	2	5
Tennessee	14	18	20	12	3
Texas	35	33	35	15	15
North Central . . . . . Total	403	377	363	169	123
Illinois	121	103	106	51	31
Indiana	22	23	19	8	6
Iowa	14	5	5	2	2
Kansas	7	7	13	4	4
Michigan	45	47	39	26	13
Minnesota	18	10	20	6	11
Missouri	41	44	39	18	19
Nebraska	13	9	10	7	3
North Dakota	1	4	5	2	2
Ohio	99	99	90	35	26
South Dakota	3	3	3	—	—
Wisconsin	19	23	14	10	6
Western . . . . . Total	154	145	136	72	41
Arizona	6	—	3	2	—
California	44	45	42	26	14
Colorado	26	22	19	8	2
Idaho	—	1	1	—	—
Montana	6	8	7	4	2
Nevada	1	—	1	1	—
New Mexico	6	3	4	2	—
Oklahoma	19	19	11	8	8
Oregon	12	15	16	10	3
Utah	10	7	4	4	4
Washington	21	23	27	7	7
Wyoming	3	2	1	—	1
Territories and Dependencies . . . . Total	11	12	13	12	10
Alaska	—	1	—	—	—
Canal Zone	1	1	1	—	—
Hawaii	5	4	5	2	2
Puerto Rico	5	6	7	10	8
Total for United States	2,914	2,860	2,870	1,404	966

(*Continued on page 67*)

TABLE 6 — (*Continued*)

Foreign Countries	1940	1941	1942	1943	1944
Total	224	195	178	175	232
Argentina	6	4	7	9	12
Australia	1	1	—	—	—
Bahamas	—	—	1	—	—
Barbados	2	—	—	—	—
Belgium	2	—	—	—	—
Bolivia	1	—	2	1	1
Brazil	11	14	13	11	15
British West Indies	1	2	1	1	1
Canada	37	24	21	12	9
Chile	3	—	3	2	3
China	26	37	31	34	82
Colombia	6	6	4	3	5
Cuba	13	15	15	14	10
Czechoslovakia	1	—	—	—	1
Denmark	1	1	—	—	—
Dominican Republic	1	1	1	2	1
Ecuador	—	1	1	—	1
Egypt	1	—	—	—	1
England	2	1	—	—	—
Finland	—	1	1	—	—
France	2	2	—	—	—
Germany	2	1	—	—	—
Greece	2	1	1	—	—
Guatemala	2	2	4	3	3
Haiti	2	—	—	1	—
Honduras	2	2	1	—	—
Iceland	1	—	1	1	2
India	14	11	7	7	[21
Iran	—	1	1	1	2
Iraq	—	—	—	—	1
Italy	3	1	—	—	—
Japan	2	—	—	—	—
Lebanon	—	—	—	—	1
Mexico	8	9	12	10	10
Netherlands	1	1	—	—	1
New Zealand	1	—	—	—	1
Nicaragua	—	—	1	1	—
Norway	7	4	—	—	—
Palestine	1	—	—	—	—
Panama	—	—	—	—	4
Peru	5	6	7	10	10
Philippines	18	11	5	2	—
Portugal	1	2	1	—	—
Rhodesia	1	—	—	—	—
Roumania	2	2	—	—	—
Salvador	1	1	1	1	1
South Africa	—	—	1	—	2
Spain	1	—	—	—	—
Straits Settlements	1	1	1	1	—
Sweden	1	—	—	—	—
Switzerland	4	1	2	—	—
Syria	1	1	—	—	—
Thailand	6	4	—	—	—
Turkey	12	16	17	35	18
Union of South Africa	1	1	1	1	—
Uruguay	—	2	5	3	1
Venezuela	4	4	8	9	13
Grand Total, United States and Foreign	3,138	3,055	3,048	1,579	1,198

TABLE 7. New Civilian Students Entering from Other Colleges as Candidates for Degrees

Class Joined at the Institute	Years Spent at College				Total
	One	Two	Three	Four or more	
First Year	5	2	4	2	13
Second Year	5	10	4	1	20
Third Year	—	5	5	55	65
Fourth Year	—	—	—	—	—
Graduate Year	—	—	12	69	81
Total	10	17	25	127	179

TABLE 8

Women Students Classified by Courses and Years

COURSE	YEAR					Total
	1	2	3	4	G	
II Mechanical Engineering	—	—	—	—	1	1
III Metallurgy	—	—	—	—	1	1
IV Architecture	—	—	1	1	—	2
Fifth Year	—	—	—	1	—	1
IV-B City Planning	—	—	—	1	3	4
V Chemistry	3	1	2	3	10	19
VI Electrical Engineering	3	1	1	—	—	5
VII Biology and Biological Engineering	—	1	—	—	3	4
VII-A Physical Biology	1	—	—	—	—	1
VIII Physics	1	—	—	2	2	5
IX-B General Engineering	—	—	—	3	—	3
X Chemical Engineering	2	—	—	—	1	3
XIV Meteorology	—	—	—	1	2	3
XVI Aeronautical Engineering	1	—	2	1	—	4
XVIII Mathematics	—	—	—	1	1	2
Industrial Economics	—	—	—	—	3	3
Total	11	3	6	14	27	61

TABLE 9

Old and New Civilian Students

Year	1939–40	1940–41	1941–42	1942–43	1943–44	1944–45
Students registered at end of last academic year (including specials)	1,985	1,973	1,897	1,936	855	500
Students who have previously attended the Institute, but were not registered at end of last academic year (including specials)	100	127	77	84	37	98
New students who entered by examination	198	229	318	212	190	118
New students who entered without examination	338	303	264	462	351	266
New students who entered from other colleges as candidates for degrees	419	404	367	326	124	179
New students (specials, not candidates for degrees)	60	102	132	28	22	37
Total	3,100	3,138	3,055	3,048	1,579	1,198

TABLE 10. List of American Colleges and Universities with Number of Graduates Attending the Institute

College		*College*		*College*	
Alabama Poly. Institute	1	Mass. State College	1	University of Maine	2
American University	1	Middlebury College	1	University of Maryland	1
Amherst College	2	Mississippi State Coll.	1	University of Michigan	2
Bates College	2	Missouri School of Mines	1	University of Minnesota	3
Beloit College	1	Montana School of Mines	1	University of Missouri	1
Boston University	2	Mt. Holyoke College	1	Univ. of New Hampshire	1
Bowdoin College	2	Muhlenberg College	1	University of North Dakota	2
Brigham Young University	1	New Jersey Coll. for Women	2	University of Notre Dame	1
Brooklyn College	1	New York University	3	University of Okalahoma	1
Brown University	3	North Central College	1	University of Omaha	1
Bryn Mawr College	1	North Dakota Agric. College	1	University of Pennsylvania	1
Bucknell University	1	Northeastern University	4	University of Pittsburgh	3
Case School of App. Science	2	Oberlin College	1	University of Rochester	2
Catholic Univ. of America	1	Ohio State University	1	University of Scranton	1
Clemson College	1	Ohio Wesleyan University	1	Univ. of Southern California	2
Colby College	2	Polytechnic Inst.of Brooklyn	1	University of Utah	1
College of the City of N. Y.	3	Pomona College	1	University of Vermont	1
College of Wooster	1	Purdue University	4	University of Virginia	1
Colorado College	1	Rensselaer Polytechnic Inst.	4	University of Washington	4
Colorado School of Mines	2	Simmons College	2	Ursinus College	1
Columbia University (N.Y.)	5	Smith College	1	Vanderbilt University	1
Cornell University	4	Southwest. Louisiana Inst. of Liberal & Tech. Learning	1	Vassar College	2
Dartmouth College	1	Stanford University	2	Virginia Polytechnic Inst.	1
Dickinson College	1	State Coll. of Washington	1	Wellesley College	1
Drew University	1	Syracuse University	1	West Virginia University	1
E. Texas State Teachers Coll.	1	Temple University	1	Wheaton College (Illinois)	1
Eastern Kentucky State Teachers College	1	Texas Coll. of Mines	1	William Jewell College	2
Emmanuel College	2	Tri-State College	1	Woodstock College	1
Georgetown University	1	Tufts College	4	Worcester Polytechnic Inst.	4
Georgia School of Tech.	2	Tulane Univ. of Louisiana	1	Yale University	4
Harvard University	10	Union College (N. Y.)	1	Total	328
Howard University	1	U. S. Coast Guard Acad.	10		
Hunter College	2	U. S. Military Academy	1		
Illinois Inst. of Tech.	1	U. S. Naval Academy	41		
Kansas State Coll. of Agric. and App. Science	1	University of Alabama	1	Number of American Colleges Represented	112
Lehigh University	4	University of California	3	Number of Foreign Colleges Represented (Not Listed)	60
Linfield College	1	University of Chicago	1	Total	172
Louisiana State Univ. and Agric. and Mech. College	2	University of Cincinnati	2		
Long Island University	1	University of Colorado	1		
Mass. Inst. of Technlogy	91	University of Delaware	2		
		University of Illinois	3		
		University of Kansas	1		

TABLE 11

Regular Civilian Students from Colleges Classified by Courses

COURSE	No Previous Degree			Graduates of Other Colleges					Graduates of M. I. T. Taking Graduate Work		
	Entered			Entered							
				Nov. 1944		Previous Years					
	Nov. 1944	Previous Years	Total	Undergrad.	Grad.	Undergrad.	Grad.	Total	S B. Degree 10-'44	Other Graduates	Total
Aeronautical Engineering XVI	9	12	21	1	14	—	7	22	—	2	2
Architecture IV, IV-B	—	4	4	—	2	—	5	7	1	1	2
Biology and Biological Engineering VII, VII-A	1	—	1	—	2	—	4	6	—	—	—
Building Engineering and Construction XVII	—	—	—	—	—	3	—	3	—	—	—
Business and Engineering Administration XV	2	4	6	1	—	—	—	1	—	1	1
Chemical Engineering X	1	10	11	—	11	1	25	37	2	1	3
Chemistry V	3	3	6	—	6	—	12	18	2	11	13
Civil Engineering I	3	5	8	—	4	1	10	15	1	3	4
Electrical Engineering VI, VI-A	5	10	15	4	20	2	13	39	4	6	10
General Engineering IX-B	—	2	2	—	—	—	—	—	—	—	—
General Science IX-A	—	1	1	—	—	—	—	—	—	—	—
Geology XII	—	—	—	—	1	—	2	3	—	—	—
Industrial Economics	—	—	—	—	—	—	5	5	—	—	—
Mathematics XVIII	1	—	1	—	1	—	2	3	—	—	—
Mechanical Engineering II	7	5	12	2	4	4	17	27	1	6	7
Metallurgy III	1	2	3	—	4	—	9	13	—	8	8
Meteorology XIV	—	—	—	—	1	—	9	10	—	—	—
Naval Architecture XIII	7	1	8	1	—	1	—	2	—	—	—
Naval Construction and Engineering XIII-A	—	—	—	51	—	—	24	75	—	—	—
Physics VIII	5	5	10	—	2	—	10	12	—	3	3
Sanitary Engineering XI	—	—	—	—	2	—	1	3	—	—	—
Total	45	64	109	60	74	12	155	301	11	42	53

TABLE 12. Number of Degrees Awarded in October 1944, February 1945, and June 1945

Name of Course	S.B.			B.Arch. and B.Arch.C.P.			S.M.			M.Arch. and M.C.P.			Ph.D.			Sc.D.			Total		
	Oct.* 1944	Feb.† 1945	June‡ 1945	Oct. 1944	Feb. 1945	June 1945	Oct. 1944	Feb. 1945	June 1945	Oct. 1944	Feb. 1945	June 1945	Oct. 1944	Feb. 1945	June 1945	Oct. 1944	Feb. 1945	June 1945	Oct. 1944	Feb. 1945	June 1945
tical Engineering	22	—	16	—	—	—	6	—	1	—	—	—	—	—	—	1	—	—	29	—	17
ture	—	—	—	1	2	3	—	—	—	1	—	—	—	—	—	—	—	—	2	2	3
	—	—	—	—	—	—	—	1	—	—	—	—	2	—	1	—	—	—	2	1	1
Engineering and Construction	2	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	—	1
and Engineering Admin.	11	6	15	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	11	6	15
s	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	1
l Engineering	12	2	28	—	—	—	1	3	4	—	—	—	—	—	—	—	—	5	13	5	37
ry	4	—	3	—	—	—	1	—	2	—	—	—	4	1	4	—	—	—	9	1	9
nning	—	—	—	—	—	—	—	—	—	—	2	3	—	—	—	—	—	—	—	2	3
gineering	10	2	4	—	—	—	1	—	5	—	—	—	—	—	—	—	—	1	11	2	10
l Engineering	12	3	32	—	—	—	5	7	7	—	—	—	—	—	—	—	—	—	17	10	39
chnology	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Engineering	3	1	4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3	1	4
Science	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—
al Economics	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	1	—	—
Engineering	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Transportation	3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3	—	—
atics	1	—	5	—	—	—	—	—	2	—	—	—	—	—	1	—	—	—	1	—	8
cal Engineering	19	10	50	—	—	—	4	3	4	—	—	—	—	—	—	—	—	1	23	13	55
gy	1	1	2	—	—	—	2	2	3	—	—	—	—	—	—	—	—	2	3	3	7
logy	—	—	—	—	—	—	3	4	—	—	—	—	—	—	—	—	1	—	3	5	—
rch. and Marine Engineering	14	2	10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	14	2	10
onstruction and Engineering	—	—	—	—	—	—	38	3	20	—	—	—	—	—	—	—	—	—	38	3	20
Biology	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	5	2	12	—	—	—	—	1	1	—	—	—	2	—	1	—	—	—	7	3	14
tive Biology	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
Engineering	—	—	—	—	—	—	3	1	1	—	—	—	—	—	—	—	—	—	3	1	1
Technology	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	1
Course Classification	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	1	—	—
al	120*	29	184†	1	2	3	65	25	51	1	2	3	9	1	7	1	1	10	197	60	258

Includes 70 Navy V-12 students.
Includes 16 Navy V-12 students.
ncludes 130 Navy V-12 students.

TABLE 13

Degrees of Bachelor of Science According to Class in Which They Were Awarded

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

(Continued on page 73)

TABLE 13 — (*Continued*)

Degrees of Bachelor of Science According to Class in Which They Were Awarded

Class (Calendar Year)	Aeronautical Eng.	Architectural Eng.‡	Architecture	Biology or Natural Hist. (Inc. VII-A)	Bldg. Eng. & Constr.	Business and Eng. Admin.	Chemical Eng.	Chemical Eng. Practice X-B	Chemistry	Civil Engineering	Electrical Eng. (Inc. VI-A)	Electrochemical Engineering*	General Eng.	General Science or General Course	Geology	Mathematics	Mechanical Eng. (Inc. II-A)	Metallurgy**	Military Eng.	Mining Eng. and Metallurgy	Naval Arch.	Physics	Sanitary Eng.	Total	Total by Decades
1911	—	—	10	1	—	—	19	—	12	46	49	5	—	2	—	—	49	—	—	17	6	1	15	232	
1912	—	—	21	4	—	—	31	7	55	52	3	—	1	—	—	—	47	—	—	21	3	2	14	261	
1913	—	—	26	2	—	—	30	—	12	58	43	8	—	—	—	—	50	—	—	20	4	1	15	269	
1914	—	—	19	6	—	—	37	9	60	51	8	4	—	—	—	—	65	—	—	17	8	1	19	304	
1915	—	—	30	3	—	—	33	23	49	42	10	3	—	—	—	—	69	—	—	5	7	3	12	289	
1916	—	—	37	5	—	—	32	11	45	56	14	2	—	—	—	—	84	—	—	5	9†	3	18	321	
1917	—	—	27	10	—	37	43	13	49	45	10	5	—	2	—	—	63	—	—	14	9†	1	17	345	
1918	—	—	28	7	—	29	40	10	45	50	11	2	4	1	—	—	75	—	—	10	4	3	5	324	
1919	—	—	16	9	—	28	44	8	45	50	6	3	1	—	—	—	66	—	—	7	7	4	6	299	
1920	—	—	19	2	—	48	63	6	52	30	9	1	4	—	—	—	55	—	—	13	12	2	2	319	2,963
1921	—	—	11	3	—	70	92	9	98	75	15	15	—	3	—	—	128	—	—	24	18	1	3	565	
1922	—	—	32	8	—	126	98	15	11	65	109	25	25	1	—	8	56	—	—	27	16	8	7	637	
1923	—	13	18	6	—	115	73	19	16	64	78	16	23	2	8	3	106	—	—	23	13	9	3	608	
1924	—	6	15	6	—	82	57	8	13	69	125	17	36	4	2	1	82	—	—	19	11	3	1	557	
1925	—	6	18	2	—	94	53	8	18	57	110	9	37	2	3	2	98	—	—	23	10	5	—	555	
1926	—	9	24	5	—	95	45	13	19	76	108	14	33	2	4	1	76	—	—	20	14	1	2	561	
1927	2	15	19	6	—	89	39	6	13	73	121	8	22	2	3	3	72	—	1	9	4	4	3	514	
1928	8	19	16	5	—	73	38	7	13	59	114	11	12	2	1	3	67	—	—	12	3	3	5	471	
1929	29	25	26	7	9	69	37	11	18	46	84	10	14	1	2	5	64	—	—	11	5	4	6	483	
1930	29	15	44	9	23	59	39	12	11	46	76	8	9	1	2	1	48	—	—	6	6	11	4	459	5,410
1931	39	10	18	16	15	68	32	10	12	49	83	6	22	5	3	4	70	—	—	12	13	7	2	496	
1932	27	16	5	15	18	70	45	7	15	38	74	4	29	3	2	3	68	—	4	21	16	21	4	505	
1933	27	9	—	13	9	56	38	3	18	47	86	8	16	3	2	7	86	—	—	14	13	14	2	471	
1934	26	10	—	16	13	78	48	6	15	35	82	7	8	9	1	8	50	—	—	26	25	28	5	496	
1935	27	8	—	18	8	74	43	5	15	18	57	8	19	4	1	3	45	—	—	14	14	19	1	401	
1936	27	3	—	13	12	63	31	20	16	23	68	5	25	6	2	8	47	—	—	10	18	11	2	410	
1937	30	3	—	9	4	61	34	9	13	15	67	5	20	4	—	4	46	—	—	19	19	17	1	380	
1938	25	3	—	11	4	56	51	6	14	22	62	4	28	6	1	2	50	10	—	5	23	14	2	399	
1939	30	2	—	6	7	56	53	12	25	23	67	7	19	13	4	2	72	20	—	9	8	17	1	453	
1940	29	—	—	12	9	59	59	12	23	14	73	2	36	20	6	7	68	22	—	7	24	22	—	504	4,515
1941	36	—	—	6	7	59	54	8	28	22	79	—	23	5	8	6	90	29	—	—	18	23	—	501	
1942	39	—	—	17	3	61	60	8	34	16	66	—	20	11	5	4	98	34	—	—	29	25	1	531	
1943	38	—	—	10	5	49	49	14	21	14	83	—	18	11	2	6	80	24	—	—	33	14	1	472	
***1944	57	—	—	4	3	28	41	20	12	18	47	—	14	4	1	2	78	8	—	—	37	20	2	396	
§1945	16	—	—	1	1	21	30	—	3	6	35	—	5	1	—	5	60	3	—	—	12	14	—	213	
Total	541	172	865	339	150	1,873	1,825	239	930	2,362	3,253	301	534	247	91	90	3,451	150	5	880	647	390	264	19,599	

* Prior to 1909 this Course was designated as Option 3 (Electrochemistry) of Course VIII.
† Two received the degree in Naval Architecture, Course XIII-B, in 1916 and three in 1917.
‡ Prior to 1923 degrees were awarded in Architecture.
* Prior to 1938 included in Mining Engineering and Metallurgy.
* Includes Classes of 2-44 and 10-44.
§ Includes only February and June degrees.

TABLE 14

Degrees of Master of Science Awarded

Class (Calendar Year)	Aeronautical Engineering	Architecture	Biol. & P. H. (Inc. VII-A)	Business and Eng. Admin.	Ceramics	Chemical Engineering	Chem. Eng. Practice X-A	Chemistry	Civil Engineering	Economics and Engineering	Electrical Eng. (Inc. VI-A)	Geology	Marine Engineering	Mathematics	Mech. Eng. (Inc. II-A)	Metallurgy	Meteorology	Naval Architecture	Naval Construction and Eng.	Petroleum Engineering	Physics	Sanitary Engineering	Without Course Classification	Total
1886	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
1887	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
1888	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1889	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1890	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1891	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1892	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1893	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
1894	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
1895	—	1	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	3
1896	—	2	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3
1897	—	2	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	4
1898	—	1	—	—	—	2	—	—	—	—	—	—	—	—	1	—	—	—	—	—	1	—	—	5
1899	—	1	1	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3
1900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1901	—	2	—	—	—	—	—	—	—	—	—	—	—	—	2	—	—	—	—	—	—	—	—	4
1902	—	3	—	—	—	—	—	3	—	—	—	—	—	—	2	—	—	—	—	—	—	—	—	8
1903	—	5	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	1	—	7
1904	—	4	—	—	—	—	—	1	—	—	2	—	—	—	1	—	—	—	3	—	1	—	—	12
1905	—	9	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8	—	—	1	—	18
1906	—	3	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	2	3	—	—	—	—	9
1907	—	6	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	8	—	—	—	—	15
1908	—	1	—	—	—	—	—	—	—	—	3	—	—	—	—	—	—	—	7	—	—	—	—	12
1909	—	6	—	—	—	1	—	1	2	—	1	1	—	—	1	—	—	—	3	—	1	—	—	17
1910	—	6	1	—	—	—	—	1	2	—	1	—	—	—	1	—	—	—	7	—	—	—	—	19
1911	—	5	2	—	—	—	—	2	2	—	4	—	—	—	2	—	—	—	3	—	—	—	—	20
1912	—	4	2	—	—	—	—	3	3	—	2	—	—	—	—	—	—	—	4	—	—	2	—	20
1913	—	4	1	—	—	7	—	—	1	—	1	1	—	—	2	—	—	—	2	—	—	—	—	19
1914	—	3	2	—	—	3	—	5	3	—	2	1	—	—	1	—	—	—	2	—	—	3	—	25
1915	1	4	—	—	—	2	—	2	1	—	10	—	—	—	4	—	—	1	2	—	—	—	—	27
1916	5	7	1	—	—	1	—	3	5	—	6	—	—	—	4	—	—	—	2	—	—	1	—	35
1917	4	3	—	—	—	1	—	1	3	—	5	—	—	—	1	—	—	—	9	—	1	2	—	30
1918	5	1	1	—	—	1	—	1	1	—	2	—	—	—	2	—	—	—	—	—	—	—	1	15
1919	2	—	—	—	—	—	—	3	4	—	4	—	—	1	1	—	—	—	—	—	—	—	—	15
1920	—	—	1	—	—	3	—	2	4	—	7	3	—	1	5	—	—	—	19	—	1	—	4	50
1921	3	—	—	—	—	29	—	6	2	—	4	2	—	—	10	—	—	—	20	—	—	—	17	93
1922	5	—	—	—	—	6	32	4	5	—	37	2	—	2	4	—	—	—	10	—	1	—	18	126
1923	10	—	—	—	—	3	34	1	5	—	45	2	—	—	15	1	—	4	21	—	3	—	26	170
1924	4	—	—	—	—	6	41	1	5	—	34	1	—	—	8	1	—	—	12	—	5	—	28	146
1925	5	—	—	1	—	3	35	3	5	—	35	—	—	—	10	2	—	—	—	—	2	1	21	123
1926	6	—	—	—	—	5	20	2	2	—	60	3	—	—	6	1	—	—	12	—	—	—	25	142
1927	9	—	1	—	—	2	26	4	6	—	54	6	—	1	13	—	—	—	6	—	1	—	32	161
1928	9	—	—	—	—	5	14	2	8	—	63	—	—	2	13	—	—	—	9	—	1	—	43	169
1929	5	—	—	2	—	3	21	4	6	—	79	4	—	2	16	—	—	—	6	—	2	1	45	196
1930	3	—	—	1	—	7	22	5	9	—	51	1	—	2	5	3	—	1	5	—	1	1	53	170
1931	4	—	2	5	—	15	34	5	12	—	57	2	—	5	10	4	4	—	8	—	2	—	20	189
1932	5	—	5	9	—	25	33	8	17	—	56	2	—	3	16	1	4	—	7	—	6	—	40	237
1933	10	—	1	5	—	14	26	7	12	—	46	—	—	1	18	2	—	1	13	—	4	2	20	182
34	7	—	5	5	—	16	19	11	9	—	46	3	—	3	20	5	1	—	11	—	3	1	21	186
1935	3	—	1	2	—	16	14	4	13	—	55	—	—	3	16	6	—	—	10	—	7	2	21	173
1936	5	—	—	4	2	7	30	3	19	—	22	2	—	2	14	—	4	1	7	1	5	—	23	151
1937	12	—	1	5	1	12	29	8	17	7	35	—	—	1	15	4	4	—	8	1	2	1	23	186
1938	13	—	—	8	—	11	28	1	29	2	58	—	—	1	24	1	4	—	7	1	3	—	30	221
1939	8	—	3	8	—	20	34	1	31	3	45	2	—	1	21	6	6	—	8	—	5	2	28	232
1940	9	—	1	9	—	16	37	3	20	—	54	4	—	5	22	7	8	18	10	2	3	2	37	267
1941	16	—	1	12	—	15	42	3	10	3	35	3	1	2	25	7	18	14	22	—	4	1	25	259
1942	9	—	2	16	1	12	23	2	5	1	24	2	15	1	24	8	11	—	9	—	—	1	7	173
1943	21	—	1	—	—	15	36	3	9	—	30	2	7	—	26	5	14	—	18	—	2	1	4	194
†1944	22	—	—	1	1	3	7	2	9	—	13	—	—	—	12	5	11	1	55	—	—	3	5	150
*1945	1	—	1	—	—	7	—	2	5	—	14	—	—	2	8	5	4	—	23	—	2	2	—	76
Total	221	84	37	93	5	296	637	130	302	16	1,102	49	23	41	402	74	93	43	399	5	71	31	617	4,771

Total of degrees in discontinued courses, Architectural Engineering, Electrochemical Engineering, Fuel and Gas Engineering, General Science, Mining Engineering, Naval Construction (Foreign Students), and Railroad Operation (see 1940–41 Report)	126
Grand Total	4,897

*Includes only February and June degrees. †Includes Classes 2-44 and 10-44.

TABLE 15

Degrees Awarded in Architecture and City Planning

Class (Calendar Year)	Bachelor in Architecture	Bachelor of Architecture in City Planning	Master in Architecture	Master in City Planning
1921	—	—	3	—
1922	—	—	2	—
1923	—	—	7	—
1924	—	—	8	—
1925	—	—	5	—
1926	—	—	9	—
1927	—	—	7	—
1928	—	—	6	—
1929	—	—	9	—
1930	—	—	7	—
1931	—	—	9	—
1932	11	—	5	—
1933	24	—	7	—
1934	27	—	—	—
1935	17	4	11	—
1936	14	4	4	2
1937	9	2	11	3
1938	19	1	3	3
1939	14	1	10	3
1940	11	2	21	7
1941	17	2	6	1
1942	15	1	4	4
1943	10	—	3	6
†1944	8	—	2	3
*1945	5	—	—	5
Total	201	17	159	37

† Includes Classes 2-44 and 10-44.
* Includes only February and June degrees.

TABLE 16

Degrees of Master in Public Health Awarded

Class (Calendar Year)	Number
1941	3
1942	11
1943	10
*1944	7
Total	**31**

* Includes Class 2-44 only.

TABLE 17
Degrees of Doctor of Philosophy Awarded

Class (Calendar Year)	Biology	Chemistry	Geology	Industrial Economics	Mathematics	Physics	Total
1907	—	3	—	—	—	—	3
1908	—	3	—	—	—	—	3
1909	—	—	—	—	—	—	—
1910	—	1	1	—	—	—	2
1911	1	—	—	—	—	—	1
1912	—	3	3	—	—	—	6
1913	—	1	—	—	—	—	1
1914	—	2	—	—	—	—	2
1915	—	2	—	—	—	—	2
1916	—	1	1	—	—	1	3
1917	—	3	1	—	—	—	4
1918	—	3	1	—	—	—	4
1919	—	—	—	—	—	1	1
1920	—	4	1	—	—	—	5
1921	1	3	—	—	—	3	7
1922	—	4	1	—	—	—	5
1923	—	5	1	—	—	—	6
1924	2	10	—	—	—	2	14
1925	—	11	—	—	—	—	11
1926	—	2	2	—	—	—	4
1927	2	6	1	—	1	1	11
1928	1	5	1	—	1	—	8
1929	4	8	2	—	1	—	15
1930	—	5	2	—	3	—	10
1931	—	9	—	—	1	—	10
1932	1	12	—	—	1	2	16
1933	2	10	3	—	3	—	18
1934	2	10	2	—	2	1	17
1935	4	15	2	—	3	7	31
1936	—	15	—	—	3	12	30
1937	2	11	4	—	1	10	28
1938	2	12	2	—	4	7	27
1939	1	33	4	—	3	4	45
1940	3	19	5	—	4	5	36
1941	1	18	1	—	3	5	28
1942	1	19	5	—	1	8	34
1943	2	8	2	—	3	8	23
†1944	2	12	—	1	—	9	24
*1945	1	5	—	—	1	1	8
Total	35	293	48	1	39	87	503

† Includes Classes 2-44 and 10-44.
* Includes only February and June degrees.

TABLE 18. DEGREES OF DOCTOR OF SCIENCE AWARDED

Class (Calendar Year)	Aero. Eng.	Ceramics	Chem. Eng.	Chemistry	Civil Eng.	Elec. Eng.	Electrochem. Eng.	Geology	Mathematics	Mech. Eng.	Metallurgy	Meteorology	Min. Eng.	Naval Arch.	Petroleum Eng.	Physics	San. Eng.	Total
1911	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	1
1912	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1913	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1914	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1915	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	1
1916	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
1917	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	1
1918	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1919	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1920	1	—	—	—	—	—	—	1	—	—	—	—	1	—	—	—	—	3
1921	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1922	1	—	—	1	—	1	—	—	—	—	—	—	—	—	—	—	—	3
1923	1	—	—	—	—	—	—	1	—	—	1	—	—	—	—	2	—	5
1924	—	—	2	—	—	1	—	1	—	—	1	—	—	—	—	1	—	6
1925	1	—	3	—	—	—	—	—	—	—	3	—	—	—	—	—	—	7
1926	—	—	1	1	1	1	1	—	—	—	4	—	—	—	—	—	—	9
1927	—	—	—	—	—	1	—	--	1	1	2	—	—	—	—	1	—	6
1928	1	—	5	—	1	2	—	—	—	—	1	—	—	—	—	—	—	10
1929	—	—	3	—	—	—	—	—	—	—	1	—	—	1	—	1	—	6
1930	—	—	9	—	—	6	—	—	1	3	1	—	—	—	—	—	—	20
1931	—	—	3	2	—	3	—	—	—	—	1	—	—	—	—	—	—	9
1932	—	—	5	—	1	2	—	1	—	2	1	—	—	—	—	2	—	14
1933	—	—	10	1	2	3	—	—	1	—	6	—	1	—	—	—	—	24
1934	—	—	3	—	—	2	1	1	—	3	2	1	—	—	—	—	—	13
1935	—	1	2	1	—	4	—	—	2	—	1	1	—	—	—	1	1	14
1936	2	1	12	—	—	1	—	—	—	2	3	—	1	—	—	2	—	24
1937	1	1	9	1	1	6	—	—	—	2	—	—	—	—	1	1	—	23
1938	—	1	12	—	2	7	—	1	—	2	5	3	—	—	—	5	—	38
1939	2	1	10	—	3	1	—	—	—	—	4	1	1	—	—	3	—	26
1940	—	2	12	—	3	1	—	1	—	2	2	—	1	—	—	4	1	29
1941	1	1	15	3	—	3	—	—	—	3	8	3	—	—	—	3	1	41
1942	1	2	14	—	2	—	—	—	—	1	3	1	—	—	—	2	—	26
1943	—	2	10	—	—	1	—	—	—	—	5	—	—	—	—	2	—	20
†1944	2	—	4	—	—	1	—	2	—	1	4	—	—	—	—	1	—	15
*1945	—	1	5	—	1	—	—	—	—	1	2	1	—	—	—	—	—	11
Total	15	13	149	10	17	50	2	9	5	23	61	11	5	1	1	31	3	406

*Includes only February and June degrees. †Includes Classes 2-44 and 10-44.

TABLE 19

Degrees of Doctor of Public Health Awarded

Class (Calendar Year)	Number
1924	1
1927	1
1928	1
1930	1
1939	1
1942	1
*1944	3
Total	9

* Includes Class 2-44 only.

TABLE 20

Degrees of Doctor of Engineering Awarded (*Discontinued after 1918*)

Class (Calendar Year)	Electrical Engineering	Electrochemical Engineering	Total
1910	1	—	1
1914	1	—	1
1916	1	—	1
1917	—	1	1
Total	3	1	4

TABLE 21

Summary of Degrees Awarded (1868–1945)

Bachelor of Science	19,599
Bachelor in Architecture	201
Bachelor of Architecture in City Planning	17
Master of Science	4,897
Master in Architecture	159
Master in City Planning	37
Master in Public Health	31
Doctor of Philosophy	503
Doctor of Science	406
Doctor of Public Health	9
Doctor of Engineering (Discontinued after 1918)	4
Grand Total	25,863

Director of Admissions

As in the preceding year, a small entering class was accepted in March, while the main group of secondary school graduates entered in July. The following comparisons summarize the first-year applications for the past three years:

	June 1943	*Total 1944*	*March 1945*	*July 1945*	*Total 1945**
Total Applications.....	2,059	1,705	419	1,605	2,024
Admissions Granted....	922	845	171	791	962
Actual Registrations....	583	584	149	604	753
Registration as Per Cent of Admissions	63.2	69.0	87.0	76.2	78.3

* To this is to be added the November, 1945, class, for which figures will be included in the 1946 report.

The gap between admissions granted and actual registrations decreased markedly as the war progressed. This decrease was presumably due to the fact that the public had become adjusted to Selective Service; candidates who believed they might not be able to enter at the normal time refrained from applying or simply listed their names as postwar applicants. College-transfer admissions continued at a low level, in consequence of war conditions.

In July, 1945, Amherst College accepted the invitation extended in 1936 to participate in the coöperative three year—two year plan, thus becoming the twelfth college included in the plan. The numerous requests to participate in the plan received from other colleges not included in the original invitation have been held in abeyance pending a possible broadening of the list at a subsequent date. Since all students who entered under the three-two plan had either been graduated or had withdrawn for military service by March, the latter date seemed an opportune time to survey the nine years' experience under the plan. The plan started slowly but was beginning to increase rapidly when the war suspended operation of it. A total of 57 students entered under its terms, 24 of them in 1942, the last year before war conditions supervened. Out of the 57 total, 42 are accounted for by Middlebury, Bowdoin, Reed, and Williams. The group as a whole showed a markedly higher scholastic average than the general

student body. From the Institute's standpoint the plan has been wholly successful and warrants resumption and extension under postwar conditions.

Immediately following the conclusion of the war in August, correspondence and interviews conducted by the office soared to unprecedented proportions, requiring an emergency expansion of staff. Measures had been taken, in coöperation with the offices of the Dean of Students and Registrar, to organize the evaluation of veterans' credits. These procedures were rapidly put in effect, in order that returning students, as well as those newly entering, might start at an appropriate level. The principle followed has been to avoid making "small change" in credits, but rather to survey the student's entire record, taking account of the quality of his performance as well as the subjects covered, and making allowance for the need of some review for students who have been away from formal schooling for several years.

The Director of Admissions has served since January as a volunteer counselor at the Boston Veterans Advisory Center. Donald L. Thomsen, instructor in Mathematics, has assisted in the work of the Admissions Office on a part-time basis since November, 1944.

B. Alden Thresher

Director of Libraries

The Director of Libraries was appointed in October, 1944. The appointment was made at that time with the understanding that he was to continue his full-time duties with the Office of Scientific Research and Development until the close of the war. During this period, he therefore took but one active step in the work of the Library: Beginning in December, and after studying all existing reports and recommendations and conferring with many persons on the staff, the Director prepared the first draft of a program for the new library building. This draft was reviewed with the Library staff. As amended following this conference, the report was similarly reviewed with the full Faculty Committee on the Library in two very vigorous sessions. Revised as a result of these comments, the program

was then submitted for discussion to the Corporation Visiting Committee on the Library. Finally, approval having been received from all these groups, the definitive edition was produced on April 2. This report was intended as a guide to the architects of the new building. It has also been circulated on request to a substantial number of other university libraries.

During the period of preparation of this report, the Director has been materially assisted by his membership on the interuniversity Coöperative Committee on Library Planning which has offered extremely helpful discussion of the problems of all university libraries and of a whole series of very important individual libraries.

The Director participated in committee actions leading toward the selection of the architects for the new building, who had not been announced at the end of the current year.

The Director made a survey of the present Museum holdings and developed a tentative program for postwar exhibits.

Library administration in the absence of the Director of Libraries has proceeded as before; accordingly, the major part of the report on the Library consists of the report of the Librarian, which follows immediately.

JOHN E. BURCHARD

LIBRARIAN

On June 30, the estimated total contents of the Institute Library stood at 383,738 volumes. The year's net accessions, 5,776 volumes, reached the lowest figure recorded since 1930–1931. The total circulation of all kinds, 111,128 volumes, was the lowest since 1936–1937.

These formal statistics of Institute Library activity follow closely the pattern of the two war years preceding — a steady decline in accessions and in circulation, with local exceptions here and there. From a casual glance at the figures one might easily conclude that the Library had been drifting in academic doldrums. Reports from all the branch libraries, however, tell a different story. While the wartime decrease in the student body, the discontinuance of many courses, the absence of faculty members on war missions, and the lapse of the book

and periodical supply from foreign countries have affected normal library growth and use, all the libraries report actual increased use of library material for purposes connected with war research, both by Institute men and by visitors from government agencies and industry. This is an intensive use which makes a definite qualitative impression but does not equal quantitatively the academic use by students and faculty in normal times.

The falling off in accessions occurred in all source groups: purchases, gifts, bound periodicals, and theses. There were compensations, however, such as the Clapp gift, mentioned elsewhere, and the continuing receipt of the Library of Congress Catalog and the new British Museum General Catalogue of Printed Books. We secured our subscription to the latter by taking over the discontinued subscription of the Grand Rapids Public Library; purchase of the volumes already published was made possible by an appropriation from the library growth fund.

To meet the lack of periodicals from enemy countries we subscribed to 33 journals in the reprint form authorized by the Alien Property Custodian. In this way, we were able to reduce to one journal our subscriptions to periodicals in microfilm — a form definitely not popular among research men.

Once again long-range planning for the new library building high-lighted the year. The Librarian and a committee from the Library Staff Council, at a series of meetings held in January, discussed with Mr. Burchard the details of his "Written Program for a New Library Building," making criticisms and suggestions from the operating standpoint. The report, "Supplementary Data About a New Institute Library Building," was revised to March 1, and it was then annexed by Mr. Burchard to the Program in its final form of April 2, 1945.

It is only fair to record that the Library Staff Association made a preliminary inquiry into the deficiencies of our present Central Library as far back as 1938 and undertook careful study of the requirements of a new building in 1940, resulting in its first "Summary of Data About a New Library Building," dated August 4, 1941.

The reference department's service to outside organizations continued to grow. Loans to firms having libraries increased over 15 per cent, to 2,470, and the total to all libraries and firms was 4,701 items; if to this be added 1,105 similar loans over the circulation desk, the total reaches 5,806. This service was rendered to 58 companies, 19 government agencies, 11 universities, colleges, and schools, and seven hospital and medical libraries, a total of 95. Loans by mail were made to 18 alumni. Photostats made for our patrons by the M. I. T. Photo Service totaled 935 items; photostats made by outside services, 72 items. Microfilms made at our request by the Harvard Photostat Department totaled 89 items; microfilms made elsewhere, 46 items. Books and periodicals were borrowed from university and professional libraries in Greater Boston, from state agencies, and from government libraries in Washington. The total was 477 items. Bibliographies prepared totaled 28. The number of telephone calls to the reference department rose to 5,419, having more than doubled in seven years. The extent of clerical work is indicated by a record of 2,587 letters and 1,105 post cards received or sent.

All the work of this department, including the clerical labor, has been handled by the two reference librarians, Miss Mirian Smith and Miss Margaret Hazen, with only occasional assistance at times of unusual pressure. An interesting development in this department has been a steady succession of calls from persons asking information on how to organize libraries for industrial concerns. At least 12 firms were represented by visitors on this errand.

The associate reference librarian, Miss Hazen, in addition to collaborating in the foregoing activities, prepared two exhibits in the main reading room, one of books by early members of the Royal Society of London and one on Basic English. She prepared a new edition (1945) of the Library handbook, *How to Use the Institute Library*, the annual *List of Periodical Publications, Books and Reviews by Members of the Staff*, and the *Technology Bookshelf*.

The report of the supervisor of cataloguing shows a total of 4,396 books catalogued, of which 258, or 5.8 per cent, were in foreign languages, including 109 German and 72 French.

This small proportion of foreign titles (largely old books or reprints) contrasts strikingly with the corresponding figures of 1938–1939 — namely, 6,082 books catalogued, of which 958, or 15.7 per cent, were in foreign languages, including 359 German, 314 French.

The catalogue department lost an efficient member when Mrs. Ethel G. Martin resigned to join the Dartmouth College library staff. This department, none too large when fully staffed, suffered also from other changes in personnel and from temporary absences of members of the department who were called upon for assistance elsewhere in the Library to an equivalent of 45 weeks' time.

In pursuance of our plan to dispose of accumulated duplicate material, Charles R. Currier, M.I.T. '97, was engaged on a part-time basis and has expedited this work. Nearly two tons of duplicate books and periodicals were sold to the library of the Georgia School of Technology and to other college and industrial libraries, always after precaution had been taken to protect our own possible future requirements.

The Vail librarian reports that while the number of accessions was below normal, the number and quality of available books in the electrical and allied fields is improving. An analysis of material circulated showed the most popular subjects to be electronics, measurements, radio, radio apparatus, and general electrical engineering, in the order given. Wartime service continued to the special laboratories, to the Harvard Radio Research Laboratories, and to such industrial firms as Raytheon, Sylvania, General Electric, and Holtzer-Cabot.

Mrs. Margaret H. Packard, Vail Assistant, resigned after five years' efficient service.

Reports from the branch libraries show essentially the same experience in all: a decrease in the amount of material borrowed by students and teaching staff but a continuance of use by Institute research men and outside firms and organizations at a high level of activity. All the branches report an accumulation of dust on the book stock, due to lack of sufficient janitorial staff throughout the war years, and stress the need of thorough cleaning as soon as that is possible.

The Aeronautics Library, continuing the building up of weak spots in its collection, acquired 153 books from its library growth appropriation of $500, made in 1943. The deposit in the Sloan Automotive Laboratory is being increasingly used not only by Sloan staff and students but by other Institute staff and research men. The deposit now contains about 300 books and 470 publications of the National Advisory Committee for Aeronautics, and receives 14 periodicals currently.

In connection with a departmental plan for strengthening and improving the Arthur Rotch Library of the School of Architecture, our space at the New England Deposit Library was used for the storage of 64 boxes of large photographs from that branch. This leaves in our section at the deposit library available space for only about 2,400 volumes.

At Dewey, the engineering librarian continued the sending of monthly lists of periodical literature to all the engineering departments served. Fifteen bibliographies were prepared, including some requested by the Bethlehem Steel Corporation and the Boston Navy Yard. The economics librarian reported a noticeable increase in the use of periodical literature and ephemeral material and fewer loans of books for leisure reading. There was a steady demand for information on industrial reconversion; to meet it, material was collected and bibliographies were made.

The Eastman Library registered users from all but six regular Institute departments. However, out of 1,339 users, 42 per cent were from the special wartime laboratories, and 22 per cent of the total were from the Radiation Laboratory alone. An unusually small number of books was added, because of the decrease in important scientific books published and the lack of complete foreign periodical sets for binding.

At Lindgren Library the circulation drop was due to the few courses being given in geology and ceramics and to the absence of many staff men on war work. On the other hand, the use of material on metallurgy increased, with large patronage by industrial firms, the Boston Navy Yard, and the Watertown Arsenal. There were frequent visits from representatives of other educational institutions and industrial firms seeking advice in the selection of books and periodicals for their

libraries. These visitors included men from the Ecole des Mines, Paris, and the University of Buenos Aires. The crowded condition of this branch grows steadily worse, the limit having been reached with only 15,000 books on the shelves. Either more room must be found or much of the older material must be removed to the Central Library. The map room, intensively used this year, is likewise badly crowded.

Walker Memorial Library also experienced a drop in circulation, due mainly to the departure of A.S.T.P. students in 1944, the decreased number of Army and Navy special students, and less use by the instructing staff. This branch had a large patronage, however, from Radiation Laboratory and other wartime laboratory personnel, including a large number of their nonstaff employees. Mrs. Emily Flint returned from a two-year leave of absence to resume her post as Walker librarian on July 6, 1944, but resigned in December to join the *Atlantic Monthly* staff. Mrs. Randi Richards, formerly supervisor of the stack, was appointed to her place. Barbara Davis resigned in October to take a position with Science Service in Washington; her place was taken by Mrs. Emily Harris.

In October, the Librarian attended a meeting of the board of directors of the Association of College and Reference Libraries in Chicago as representative of the Engineering Libraries Section. In June, he attended a special meeting of the Association of Research Libraries in New York, at which a coöperative plan was adopted for securing wartime publications from Europe. Various staff members attended meetings of the Boston chapter of the Special Libraries Association, the Boston Group of Catalogers and Classifiers, and the New England section of the Society for the Promotion of Engineering Education. At the latter meeting, Ralph McNay spoke before the Engineering Libraries Committee on new developments in plastics. Mrs. Ruth McG. Lane was elected chairman of the Engineering Libraries Committee and Miss Marguerite Chamberlain, secretary. Miss Hazen read a paper on interlibrary loans before the Special Libraries Association, Boston chapter. Mrs. Lane continued to serve on the American Standards Association's Committee Z-39.

The most important gift in years was the library of Frederick Gardner Clapp of the Class of 1901, bequeathed to the Institute in his will. Mr. Clapp was a petroleum geologist whose investigations took him to many parts of the world but particularly to the Near East and Australasia, in the course of which he assembled a large collection of books, geological survey reports, maps, photographs, lantern slides, and so on. This material required many months' labor to sort and list. Thus far 706 volumes have been taken into the Library.

Mr. Clarke Freeman turned over to the Library the correspondence of his father, John R. Freeman, as Secretary of the Class of 1876; Kenneth Bell, of the Class of 1917, presented to the Lindgren Library 50 fine, large photographs of the War Department's Grand Canyon Expeditions of 1871–1872. The Army Map Service made us a depository for two sets of its remarkably fine maps, a by-product of the war, of which over 2,500 have thus far been received. Since the publishing plan of this service contemplates the issue of perhaps 25,000 maps, the storage problem for us is a serious one, involving questions of long-range policy. Clifford W. Ashley presented us two copies of his exhaustive and interesting reference work, *The Ashley Book of Knots*, and a number of professors and alumni presented copies of their books and reprints, unfortunately too numerous to be recorded here. Finally we are indebted to the State Librarian, Dennis R. Dooley, for the gift of many volumes and single issues of some 50 technical journals which had been found not to be within the scope of the State Library.

WILLIAM N. SEAVER

DIRECTOR OF THE DIVISION OF INDUSTRIAL COÖPERATION

The security restrictions which have prevented statements on the war research of the Institute still exist, but it is possible at this time to give some figures showing the magnitude of the work undertaken during the past fiscal year by the Institute through the D. I. C.

DOLLAR VOLUME OF CONTRACTS
(For the Fiscal Year Ended June 30, 1945)

O.S.R.D.	$36,865,700
General Government	2,269,200
Industrial	836,000
	$39,970,900

ACTIVE ACCOUNTS
(On June 30, 1945)

O.S.R.D.	36
General Government	54
Industrial and D. I. C. Allocation	53
	143

PERSONEL
(On June 30, 1945)

Radiation	
Staff	1,169
Nonstaff	2,665
Projects Other Than Radiation	
Staff	320
Nonstaff	453
M. I. T. Faculty	85
	4,692

N. McL. SAGE

ADVISER TO FOREIGN STUDENTS

In recent years the need for centralizing the Institute's counseling services for the foreign student has grown acute. To meet this need the Office of Adviser to Foreign Students was established on October 6, 1944, formalizing and centralizing various activities which have been undertaken at the Institute for many years in assisting foreign students. The Adviser is connected with the Admissions Office because this office faces the Institute's most acute problems in relation to foreign students, because it has extensive information about each student, and because it has immediate access to the files of the Office of the Dean of Students.

The Office of Adviser to Foreign Students fulfills two functions in the relationship between the Institute and the foreign student: The first of these is counseling the student; the second is centralizing information about foreign students, present and

prospective, for the use of other Institute officers. Most of the student counseling service concerns the student's legal duties and privileges — the maintenance of his status under his passport, his registration with Selective Service, issuance of ration books, the possibility of his employment. All of the usual advisory services of the Institute are available to foreign students on the same basis as to any regular students. The office works in conjunction with the many existing organizations of the Institute to further the social orientation of foreign students. Notable among these organizations are the East and West Association, the International Club, the Technology Christian Association, and the Technology Matrons.

In the fall of 1944 it became apparent that a great increase in the number of applications from foreign citizens made necessary some kind of limiting action. The problem was given very careful and exhaustive study by the Committee on Stabilization of Enrollment. Confirming a recommendation of this committee, the Faculty voted a limitation of 300 on the numbers of foreign students, 130 in the Undergraduate and 170 in the Graduate School. A full account of the committee's action will be found in the report of the Dean of Students.

In the term beginning in March, 302 foreign students were enrolled at the Institute. This represented a considerable increase over the Institute's normal foreign population, which in the 20 prewar years averaged about 160. Much of this increase represented groups of students sent to the Institute by their governments for special courses of study. The largest foreign delegation at the Institute is from China and the next largest from India. Representation from Latin America, the Near East, China, and India is considerably larger than in prewar years. Students from the European countries are, of course, notably few at present. Already, however, the Admissions Office is receiving many inquiries from our Allies and from the liberated countries. Within a few months men will be enrolled at the Institute who have been active in the underground resistance movements in the Philippines, Norway, Holland, Belgium, and France.

The table which follows gives a comparison between the Institute's present foreign student enrollment and that of the

average prewar years from 1920–1939. This shows the great increase during the war years from those parts of the world which remained accessible. There is added a listing of the applications, complete and incomplete, on hand April 1, 1945, and September 1, 1945, to indicate the greatly increasing pressure from students in foreign countries which makes selective limitation necessary.

Area	*Average Attendance 1920–1939*	*Registration March 1945*	*Applications on Hand April 1945*	*Applications on Hand September 1945*
Latin America	42	99	95	212
British Empire	14	9	19	73
Northern Europe	15	4	10	64
Western Europe	12	14	40	53
Central and Southern Europe	8	13	17	40
Near East	8	37	61	147
China	36	95	153	82
India	7	31	271	224
Other Far East	14	0	1	12
	156	302	667	907

PAUL M. CHALMERS

PLACEMENT OFFICER

Alumni Placement. The call for young men was even more insistent in 1944–1945 than in the preceding year, and the requests for experienced men fell off very noticeably as the year progressed and industrial expansion ceased.

Applications for assistance in obtaining employment were received from at least one member of each graduating class from 1908 through 1944. Members of the classes of 1898, 1899, and 1902 also registered. The greatest number of men registering for new jobs came from the following classes: 1916, 1922, 1926, 1930, and 1933. For the fourth continuous year, the Class of 1926 provided us the largest number of applicants for work, with 1930 running it a close second.

During the year just past, industry gave up as hopeless its attempts to find more men to work on postwar sales or postwar planning and settled down to produce. Its greatest

need, as in previous war years, was for mechanical and electrical designers.

The relation between number of jobs, available men, and number of men is shown in the following table:

	July, 1944–June, 1945	*July, 1943–June, 1944*
Number of Jobs	1,445	986
Men Who Went on Available List	392	387
Men Who Came off Available List	241	233
Placements	106	107

Undergraduate Placement. The man-power demands of industry far exceeded the supply available from last year's graduates, most of whom went directly into the armed forces. Of the 505 who received degrees between October, 1944, and June, 1945, only 105 sought industrial employment through the Bureau, and of these all but one was placed.

N. McL. Sage

Personnel Officer

The end of the war promptly relieved the critical man-power situation, which had grown steadily worse during the year. The termination of some of the major research contracts permitted the transfer of many personnel to the continuing programs, although it will be several months before we reach a reasonably stabilized condition. The fact that many of our female personnel were summer employees or are wives of servicemen has resulted in a continued deficiency in the clerical and secretarial ranks.

The Executive Committee of the Corporation approved the recommendation that the $10 special allowance be made a part of the regular base pay, effective January 1, 1945. This did not increase the "take-home" pay of the employees, except for those who worked beyond their normal scheduled work week; it did, however, have a salutary effect in assuring the employees that the special allowance would not be discontinued at the end of the war.

The most significant event of the last year was the decision of the Executive Committee to continue the Personnel Office

as a permanent division of the Institute's administration. With the termination of the major war projects, which have had their own personnel offices, all nonstaff activities will be handled by the permanent central office. The office will be responsible to the Wage Board, headed by the Treasurer and including the Bursar, Assistant Bursar, and Assistant to the President. The major responsibilities of the office are clear and simple: to assure fair and equitable treatment to all employees alike and to serve as liaison between the employees and the administration.

Miss Ruth C. Glynn was appointed Personnel Officer, beginning October 1. She had served effectively as Assistant Personnel Officer since the establishment of the office and for the last two years had been in active charge. R. M. Kimball will continue in an advisory capacity as a member of the Wage Board.

In the war years, the critical man-power shortages dictated a defensive policy, each emergency resulting in a stopgap solution. Looking ahead, the Personnel Office should have more opportunity for constructive thinking and action after the transition period from war to peace. As the personnel needs of the academic departments and the sponsored projects become more definitive, it will be possible to offer long-term employment to the best qualified of the present temporary personnel and to re-establish single standards of work schedules, wages, and so forth, for all personnel, except for the relatively small number of transient employees working on projects of short duration.

The following statistics give an index of the activity in the personnel offices (including all war projects) during the fiscal year ending June 30: accessions, 2,258; terminations, 1,635; net increase, 623; total of nonstaff personnel, 4,073.

ROBERT M. KIMBALL

MEDICAL DEPARTMENT

The past year has been an eventful one in the history of the Department. War conditions necessitated a tremendous amount of work by both the medical and clerical staffs, but the results were most gratifying.

During the year, 30,519 visits were made to the Department: In the clinic on the first floor, 29,293 patients were treated; of this number, 28 were referred to outside hospitals. In the Infirmary, 387 bed patients were cared for and 839 outpatients treated after hours, when the clinic on the first floor was closed. A total of 1,226 cases, therefore, were treated in our Infirmary. The previous year, 1943–1944, there was a larger number of outpatients — 1,153, in fact — for the reason that approximately one thousand A. S. T. P. students were under our care during that year.

The Psychiatric Department had 275 consultations, none of which was of a serious nature. The Dental Clinic visits numbered 3,574. Of these, 910 were examinations, 2,007 treatments, 486 oral prophylaxes, and 171 x-rays.

In the X-Ray Department, 1,765 x-rays were taken. Owing to the difficulties experienced with priorities in obtaining equipment for our remodeled x-ray room, 770 of the x-rays were taken at Dr. A. W. George's office.

The total number of laboratory tests made was 5,092. There were hundreds of blood tests (1,097 white-cell counts alone), 1,321 urinalyses, and many serology, blood sugar, sulfa level, spinal fluid, and bacteriological tests. For special D. I. C. projects, 516 complete blood counts were made and 452 urinalyses. Last year, 3,958 laboratory tests were made. The increase of 1,134 for the year just ended indicates the growing usefulness of our laboratory.

There were 3,371 physical examinations completed this year, of which five were faculty, 1,155 students, and 2,211 employees. A special group of men, numbering 255, had military examinations for overseas duty. The 3,371 physical examinations revealed 824 defects, and every effort was made to follow up the cases for correction whenever possible.

Five cases of active pulmonary tuberculosis were found during the year, and 24 patients were held for pulmonary observation.

This year there were but 15 contagious diseases, as compared with 37 last year. This is a record of which the Department can well be proud, since it shows the results of isolation, which was made possible by our remodeled Infirmary.

The prompt care of minor injuries, physical examinations of students and employees on entrance, and the immediate isolation of possible contagious diseases have all contributed to the more-than-average good health of the Institute family. On the whole, the year was very successful for the Medical Department despite unusual situations and decided handicaps.

GEORGE W. MORSE, M.D.

SCHOOL OF ENGINEERING

Aeronautical Engineering

The war forced few curriculum changes but greatly overloaded the teaching staff. The draft removed all assistants and instructors and, while the normal civilian student enrollment dropped sharply from the same cause, special courses restored the enrollment well beyond the prewar level. Fortunately, all senior staff members were retained, in spite of pressure from industry and the armed forces for their critically needed professional services. That this was possible may be attributed to the importance of the war research work undertaken here and to our success in conducting special intensive courses in Aeronautical Engineering for college graduates from the Army, Navy, and industry.

In 1940, it was obvious that the vastly expanded airplane construction program required more trained aeronautical engineers than could be found in the country. The graduates of June, 1940, were eagerly absorbed, but many more were needed. In the summer of 1940, we recruited 50 men of various educational backgrounds for a 10-week intensive course. Forty-five completed the course, were given certificates, and were promptly snapped up by the airplane industry. A second intensive program was undertaken in February, 1941, for 29 men (Engineering Defense Training Program), followed by another in the summer for 40 Naval Reserve officers. These officers were recent graduates of engineering schools and, after training here, were assigned to duty as engineer officers on carriers at sea and at aircraft assembly and repair bases overseas.

From 1941 through 1944, many similar 12-week intensive courses were given to groups of naval officers specializing either in airplane structures or in airplane engines. In all, some 525 officers were so trained and equipped for special duty in naval aviation.

At the same time, the regular curriculum was given to civilian and Navy V-12 undergraduates and to Army and

civilian (largely foreign) graduate students. At the request of the Army Air Forces, two new graduate subjects were offered: Helicopter Design (Professor René H. Miller) and Flutter Mechanics (Professor Manfred Rauscher). In addition, a special airplane structures laboratory was equipped for the V-12 students, on request of the Navy.

In recent annual reports, little could be disclosed concerning specific contributions to the war effort, but it is now possible to give a brief outline of the work of the various divisions of the Department.

Wright Brothers Wind Tunnel. From almost two years before Pearl Harbor up to the present time, the Wright Brothers Wind Tunnel has been continuously engaged in the aerodynamic testing and analysis of models of new designs of military aircraft and their components in coöperation with the principal aircraft manufacturers. The object of this work has been to check and to improve the aerodynamic design, particularly control and stability characteristics. The volume of this work has been prodigious. The tunnel has operated on a two-shift basis without interruption, representing a total of about 4,500 hours a year. There were no vacation periods.

Among the firms with which such coöperative work has been carried on are the Glenn L. Martin Company, United Aircraft Corporation (Chance Vought Aircraft Division and Research Division), Curtiss-Wright Corporation (Airplane Division), Consolidated Vultee Aircraft Corporation, Grumman Aircraft Engineering Corporation, Brewster Aeronautical Corporation, Bell Aircraft Corporation, General Motors Corporation (Fisher Body Division), Boeing Aircraft Company, Lockheed Aircraft Corporation, Ranger Aircraft Engines, and Kaiser Cargo, Inc. (Fleetwings Division).

During this period 290 reports have been prepared on separate projects. Airplane models analyzed include the A-30 (Baltimore), B-26, PBM flying boat, Mars, XP-55, C-46 (Commando), SC-1 (Sea-Hawk), SB2C (Helldiver), F4U (Corsair), F7F, B-32, and XP-75. In addition, models of new dive bombers, future fighters, new torpedo bombers, flying wings, jet-propelled fighters, heavy bombers, and patrol planes as yet unreleased or unbuilt have been analyzed. Research work

has included the development of airfoil sections; elevator and rudder control and hinge moment studies; cowl, ducting, cooling fan, and related internal airflow studies; special cowl problems of in-line engines; aerodynamics of guided missiles and radar projectors. The staff has aided government agencies and manufacturers in other fields. Special wind tunnel equipment for the study of heat transfer in aircraft oil coolers and radiators was designed for the Clifford Manufacturing Company.

The wind tunnel has been operated under the direction of Professors John R. Markham, Shatswell Ober, and Joseph Bicknell. Project engineers and shift leaders whose contributions were important include Messrs. Henry H. Hoadley, H. W. Withington, Michael Witunski, Frederic W. Watriss, Lawrence Bernbaum, Don H. Ross, Robert D. Taylor, Arthur P. McCabe, James H. Grimes, and Paul H. Lee. The operating staff normally included three or four project engineers, two operating shifts of three men each, and a computing staff of eight women.

During the period from 1940 to 1945 numerous additions have been made to the equipment of the tunnel in order to keep pace with the advancing art. Through the generous assistance of the United Aircraft Corporation and the Curtiss-Wright Corporation, a 100-horse-power variable-frequency generator with the necessary equipment for control has been provided for the testing of models with motor-driven propellers. This equipment has been of great value in studying the effect of power on the control and stability of airplanes. An application of the Ruge-deForest wire strain gages to the determination of control hinge moments has contributed needed information for predicting control force variations. This technique — originating here in March, 1941 — has been widely adopted by other laboratories. A current problem is to create a heated jet of air for investigating the effects of the jet discharge on control and stability of jet-propelled aircraft. This has been done by employing as an air supply the output of the compressor normally used for varying the tunnel pressure.

Flutter Laboratory. The activities of the Flutter Laboratory began in 1940, when the 5 by 7½-foot wind tunnel was completed and made available for research on flutter. The

research programs were carried out for the National Advisory Committee for Aeronautics, the Army, and the Navy.

For the N. A. C. A., an oscillator has been constructed to give to a wing harmonic motions vertically and in pitch with arbitrary phase relations between the two motions, and means have been developed for recording continuously the lift, drag, and pitching moment on the moving wing at various frequencies, air speeds, amplitudes, and angles of attack. This project was aimed at the collection of basic data on the effect of unsteady flow. The project ties in directly with flutter studies and should furnish long-wanted experimental coefficients for use in flutter calculations. The oscillator and the force-recording apparatus have been completed and set up in the tunnel, and we are starting a series of systematic measurements on wings under two-dimensional conditions.

Under Army sponsorship, model wings were constructed on which the interplay between aerodynamic, elastic, and inertial effects could be studied in an over-all way through a comparison of the flutter speeds observed in the tunnel and the speeds indicated by theory. The Army project involved over 3,000 flutter runs, with models having different aspect ratios, densities, center-of-gravity locations, elastic axes, aileron balances, and aileron restraints, in all the different combinations possible. The primary item wanted was the critical speed, but to get the record as complete as possible, a special camera with a 12-inch roll film was built, arranged to work with Edgerton stroboflash equipment. The information gathered is so extensive that sifting and coördination of it will require many months.

For the Navy, a study of the feasibility of simulating the elastic properties of complex structures by simplified models and a demonstration of the workability of the proposed simulation scheme was undertaken. This work has included the building and testing of three dynamic scale models of Navy aircraft wings. The first two models had stiffnesses reduced to give flutter speeds attainable in our tunnel. The data gathered did not, therefore, show the possible effects of compressibility on the behavior of the full-scale wing. To introduce these effects properly, it is necessary to give the model the flutter

speed of the full-scale airplane. The feasibility of building such a high-speed model of the necessary strength and stiffness was demonstrated in the last of the three models mentioned. This model, of all-metal construction, successfully passed preliminary tests at 500 miles an hour at Langley Field and is believed ready to withstand the 600 miles an hour for which it was designed.

The Flutter Laboratory, under the direction of Professor Rauscher, has a staff of 20 people. Important work has been done by Messrs. Thomas Gouzoule, Rodney H. Smith, Robert G. Porter, and Ares G. Bogosian. Many former staff members have gone to the armed forces and to industry, frequently to do outstanding work. As the laboratory's techniques have developed, interest in flutter has expanded into an interest in dynamics of elastic aircraft structures generally. This has naturally led to regular instruction in this field, for which our facilities are believed to be unique.

Professors Eric Reissner and Francis B. Hildebrand of the Department of Mathematics worked in collaboration with the Aeronautical staff on the theory of wing flutter. Their original contributions proved to be especially helpful in determining the probable range of error involved when wing structures were proportioned without proper allowance for "shear lag" effects. Their work was embodied in a report to the N. A. C. A.

Structures. Because of the nearly continuous teaching of special courses of instruction during the war in addition to the regular teaching commitments of the staff, fundamental structural research was curtailed. Nevertheless, three research projects were completed for the N. A. C. A., two for the Army Air Forces, and one for the Bureau of Aeronautics of the Navy. These were done mostly by students working on thesis projects, although they involved special supervision and time from the staff. Two other projects were completed as student theses and will be published by the N. A. C. A. One of these may prove to be a major contribution in its field and will almost certainly afford topics for further study.

Under the direction of Professor Joseph S. Newell, plans have been made for activating the Aircraft Structures Laboratory, and some equipment has already been purchased for the

investigation of the special stress problems encountered in structures built of thin elements. More equipment is on order, and when that becomes available the laboratory will be well provided with the special strain measuring devices required for the experimental solution of static or dynamic load problems in aircraft structures. The Structures Laboratory and the Vibrations Laboratory will coöperate in the use of special equipment, and it is expected that much can be accomplished toward the solution of problems in aircraft structural design which involve static as well as dynamic or shock loadings.

Instruments Laboratory. At the start of the national emergency, the Instruments Division of the Department organized laboratory facilities to carry on classified work for the armed forces. The work has been under the general direction of Professor C. Stark Draper, with Professor Walter McKay and Professor Robert C. Seamans, Jr., as assistants. The following men made notable contributions to projects which have been successfully completed: Professor Frederick H. Norton, Professor Henry B. Phillips, Professor Philip Franklin, Professor John A. Hrones, Dr. E. P. Bentley, Dr. R. K. Mueller, Dr. Y. J. Liu, and Dr. J. F. Hutzenlaub. Those who have occupied positions of responsibility with the laboratory at some time during the past five years include Messrs. W. W. Dunnell, P. S. Westcott, W. D. McCrea, S. L. Williams, J. J. Jarosh, N. J. Smith. H. Ashworth, R. P. Congdon, W. C. Howard, R. W. Gras, J. W. Tone, R. S. Henderson, C. A. Haskell, W. Gedritis, and G. D. Roberts.

The principal work of the laboratory has been in aircraft flight test instruments and in fire control. Special instruments for the remote recording of data from high-performance fighter airplanes have been developed for the Bureau of Aeronautics. In the field of antiaircraft fire control, the laboratory developed and assisted in production of the Mark 14 gun sight, which has been widely used on naval vessels. The Mark 14 project was completed in 1942. Since that year, the laboratory has been intensively engaged in further antiaircraft projects for the Navy. Several important projects have also been undertaken for the Army Air Forces in connection with air-borne fire control. Including engineering assistance engaged from

outside consulting firms, approximately 100 individuals are working on Instruments Laboratory projects.

The past year was marked by a comprehensive survey of the Department's facilities, methods, and objectives by the Visiting Committee of the Corporation. The Committee, through its Chairman and its individual members, had been in touch with the Department's problems and postwar plans but had not met as a body during the war until August 17.

Postwar plans included a Gas Turbine Laboratory with modern facilities for research in combustion, compression, and supersonic aerodynamics. The Visiting Committee Chairman, Gordon Rentschler, had previously assumed responsibility for raising the necessary funds, and at the meeting in August he announced that the full amount required had been contributed by Alfred P. Sloan, Jr., M.I.T. '95, and by the United Aircraft Corporation, the Curtiss-Wright Corporation, the General Electric Company, the Westinghouse Electric Corporation, and the Hooven, Owens, Rentschler Company. Professor Edward S. Taylor, who has served as vice-chairman of the Power Plants Committee of the N. A. C. A., will take charge of the design and construction of the laboratory. It will contain a supersonic wind tunnel having a test section about one foot in diameter and an airfoil cascade tunnel for testing turbine and compressor blades capable of operating up to the velocity of sound. There will be equipment for testing compressors and turbines up to approximately 1,000 horsepower. Provision for studying the bursting strength of turbine and compressor rotors is also contemplated.

Professor Richard H. Smith was granted a year's leave of absence to organize a school of aeronautical engineering for the Brazilian Government. In the meantime, his courses are being given by Professor Rauscher and Professor Bicknell, and Professor Otto C. Koppen is acting as Department Chairman. Professor Miller was on leave of absence for the summer term to work for the McDonnell Aircraft Corporation on an advanced fighter aircraft and a new helicopter. Professor Newell has continued to serve as a member of the Aircraft Structures Committee of the N. A. C. A. Professor Koppen has served as a member of the Aerodynamics Committee of the N. A. C. A.

and as design consultant to the Navy Bureau of Aeronautics, the M. I. T. Radiation Laboratory, and various companies developing new airplanes.

JEROME C. HUNSAKER

BUILDING ENGINEERING AND CONSTRUCTION

The curriculum for the Department's two options has been changed in minor ways to meet the general recommendations of the faculty for simplification of curricula in general. The first three years are now practically the same for both options, with only a slight change in Building Construction courses during the third year. Four additional graduate subjects in advanced concrete and structural steel design and in advanced job management have been approved by the Committee on the Graduate School and added to the list of available subjects in the Department.

Professor Albert G. H. Dietz was away from the Institute the major portion of the year, serving as field service consultant to the Office of Field Service. Upon his return from his leave of absence, he has embarked upon a survey of the research facilities in this country devoted to the evaluation of the engineering properties of plastics materials.

During the year two new grants for departmental research were received. One of these, sponsored by the Reynolds Metals Company, Inc., is for study of the characteristics of metal and wood laminates and is under the direction of Professor Walter C. Voss. The other, sponsored by Godfrey L. Cabot, Inc., is for the study of particle size, surface area, and characteristics of finely divided particles and is under the direction of Professor Howard R. Staley. The National Lime Association grant was continued, with Professor Staley in charge. The current work includes a study of the sedimentation of limes for the evaluation of properties and the study of surface area of limes and other particulate materials by the nitrogen adsorption method. The modified Emmett apparatus was installed under a grant from Research Corporation.

The work on the plastic flow and shrinkage of plain and prestressed concrete was continued under Professor Staley's

supervision. A study of the behavior of sheet-metal gutters and roofs was carried on under Professor Voss's supervision, and great assistance has been given this work by the research division of Revere Copper and Brass, Inc. Preliminary results leading to rational mathematical analysis of the problem have been encouraging; these analyses were prepared by Dr. Eric Reissner of the Mathematics Department. Professor Voss spent considerable time as a consultant for the Herreshoff Manufacturing Company on the design and construction of a life float under the sponsorship of a combined committee of the armed forces. Professor Dean Peabody, Jr., has continued tests and consultation work on Army and Navy materials and projects. The study of prefabricated housing proceeded under an additional grant from the Institute. Professor Voss, Professor Peabody and Professor Staley addressed meetings of the Designers Section of the Boston Society of Civil Engineers. Professor Voss made several talks on postwar housing and plastics.

Staff participation in professional society affairs has continued. Professor Peabody served on the executive committee of the Designers Section of the B. S. C. E. and is now its vice-chairman. Professor Staley, as the chairman of Subcommittee II of Committee C-7 of the American Society for Testing Materials, has completed the "Tentative Specifications for Lime for Structural Purposes" and has developed a standard method of test for sedimentation of limes for submission to Committee C-7. The activities of the executive committee of the Citizen's Committee on Uniform Safety Law, of which Professor Voss is chairman, has seen its suggestions carried into law by the present Massachusetts Legislature. This committee will now try to prepare a more rational and broader approach to legislative and regulatory laws for future action by the legislature. Subsequent to his election to full membership in the American Institute of Architects, Professor Voss was made a member of the Committee on Materials and Methods of the Boston chapter of the institute.

WALTER C. VOSS

Business and Engineering Administration

The major contribution of the Department to the war effort during the past year has been that of carrying forward undergraduate courses for the Navy V-12 program and preparing students for productive service on the home front. Probably a greater total contribution to victory may be assembled from the efforts of individual members of the departmental staff who have been temporarily released to give their services to the country in a variety of ways.

We are informed that Professor Karl D. Fernstrom, now Vice-president in Charge of Production of the Cramp Shipbuilding Company, has materially expedited their output of submarines, destroyers, and cruisers. Professor Wyman P. Fiske, who continues on leave of absence to assist the National Association of Cost Accountants as Executive Secretary, has exercised a national influence in the promulgation of sound techniques of operating control over war production. Professor Ronald H. Robnett and Professor Ross M. Cunningham, who have been serving respectively as Fiscal Officer and Assistant Fiscal Officer of the Division of Industrial Coöperation, have been giving their entire attention to financial problems involved in the Institute's wartime contractual relationships. Professor Herbert F. Goodwin has been responsible for the marked acceleration of output and improvement of quality in a large New England war plant engaged in the production of a highly critical military product. John M. Hartwell, Jr., and Richard Muther in the Navy and Edwin A. Boyan in the Control Division of the Radiation Laboratory have made splendid records.

The brunt of the teaching load has fallen upon the shoulders of Professors Charles H. Porter, Albert A. Schaefer, and Gerald B. Tallman, and their services in registration and thesis supervision during a year of peculiarly difficult scheduling have earned the heartfelt appreciation of the student body no less than of their associates.

At the request of the Lowell Institute, members of the Department collaborated in the presentation of a special course on administrative techniques which was offered to government officials in the Greater Boston area. The program, consisting of 20 evening lectures, served to coördinate prin-

ciples and practice in the conduct of large operating responsibilities which the war has brought to governmental agencies.

The special five-week program in managerial problems relating to shipbuilding was repeated for the benefit of the naval constructors undertaking graduate work in the Department of Naval Architecture and Marine Engineering, and we have been requested to enlarge this subject to cover a full term.

For foreign students wishing training in the Department, special subject groupings have been developed, either minors in relation to doctoral work or programs to complement technical training in allied fields.

Close contact has been maintained with alumni. Seven letters have been issued during the year to the more than 2,000 Course XV graduates, in addition to monthly letters sent to graduates overseas. Informal meetings have also been held with past students in Chicago, Rochester, and New York City. Activities of departmental faculty members in professional associations have not lessened.

The Department will stand greatly to benefit from the establishment of the endowed Professorship in Industrial Management, a gift of Alfred P. Sloan, Jr., M.I.T. '95, and from the endowed Fellowships in Physics, Electrical Engineering, Chemistry, and Industrial Management given by Gerard Swope of the same class. We shall do our best to merit the confidence that is thus placed in our future efforts.

ERWIN H. SCHELL

CHEMICAL ENGINEERING

By the end of the year, transfers from the junior instructional group left only one man of the staff of the preceding year, but the Department was able to get thoroughly satisfactory replacements. Professor Charles A. Stokes resigned to go into industrial research, but there were no other important changes in the status of faculty members. While the work of the Practice School has remained in abeyance, plans are under way for prompt resumption after the emergency. The period of educational transition after the war is exactly the sort of a situation

in which the Practice School, if ready to meet it, can make an outstanding contribution.

The Department is disturbed by the fact that in recent years its record of publications has suffered greatly relative to those of similar departments in other institutions. The members of its staff have made serious sacrifices in their research programs because of the completeness with which they have devoted themselves to the emergency. Nevertheless, important progress can be reported.

The work on determination of local heat-flux densities in the cylinders of air-cooled engines was reported to the American Society of Mechanical Engineers; that on the effect of the ratio of length to diameter in heat transmission in tubes was completed and is being prepared for publication. An experimental study of the design factors in flow of gases at low pressures laid the groundwork for further detailed investigations in high-vacuum operations — a field of rapidly growing importance in the chemical industry. Analyses of data on absorption, obtained during recent years in the School of Chemical Engineering Practice, have furnished a major advance in the understanding of processes of absorption in which chemical reactions are occurring in the liquid phase. Studies on the selective adsorption of gases on activated carbon have brought to light extraordinary differences in selectivity of olefins and paraffins having substantially identical volatilities; this knowledge should prove of industrial importance in the separation of gases of these types.

Methods which the Department formerly developed in the colloidal field are finding widespread use in industry. An outstanding example is the use of stream double refraction of colloidal clay suspensions in the study of problems in fluid flow, in the production of mica substitutes and highly flexible insoluble films, and in the reclaiming of synthetic rubbers — particularly of neoprene.

During the year a new technique for the microscopic study of lyogels has been developed, which has already proved its value in enabling better insight to be obtained into the molecular structure of high-molecular compounds. It has the advantage of making possible observations under the ultra-

microscope of chemical reactions such as vulcanization and the physical changes resulting from tension or pressure. Because of its manipulative simplicity and the convincing character of the direct visual observation of conditions which it makes possible, it promises to develop into a new method of outstanding importance in the study of amorphous materials.

The war has kept in abeyance the work on solar energy and the Department's general program on fuels. The research effort has gone entirely into special war projects for which the background and experience of the Department are of particular value. This work has important peacetime implications, and an early resumption of the Department's program in fuel engineering is anticipated. Professor Hoyt C. Hottel served as chairman of a symposium on trends and developments in industrial furnaces for the American Society of Mechanical Engineers.

WARREN K. LEWIS

CIVIL AND SANITARY ENGINEERING

The past year has been characterized by some definite accomplishments in postwar planning carried out against a background of constantly varying demands on the staff, resulting from wartime conditions.

Registration in undergraduate subjects has remained fairly small, although the subjects have been given much as usual to limited civilian registrations augmented by Navy students. The Summer Surveying Camp could not be operated because both students and staff had to remain in Cambridge throughout the summer. An increase in the number of graduate students has brought our graduate registration almost back to normal.

The undergraduate curriculum in Civil Engineering was substantially revised, the total time allotted to Surveying and its allied subjects having been reduced. The time thus released is devoted to greater emphasis on Fluid Mechanics, Soil Mechanics, and Materials. A new subject, Professional Problems, has been added, which coördinates the various phases of Civil Engineering by approaching problems from a broader

view than is possible in subjects wherein the content is more closely defined. A new group of general professional electives has been added to the fourth year, whereby the student may choose to develop some background in each of the fields of Sanitary Engineering, Transportation Engineering, and Hydraulic Engineering, rather than devote all of his elective effort to a single field.

The instructional program in Sanitary Engineering subjects has been enlarged to include new subjects covering Sanitary Chemistry, Water and Sewage Analysis, Sanitary Bacteriology, Sanitary Science, and Public Health. Dr. Murray P. Horwood has transferred to Sanitary Engineering and will teach Sanitary Bacteriology and Public Health subjects. Dr. Clair N. Sawyer of Wisconsin, formerly on the teaching staff at New York University, was appointed Associate Professor of Sanitary Chemistry. The development of laboratories to be designated the "William T. Sedgwick Laboratories of Sanitary Science" has been authorized, and space is being made available for them in the basement of Building 1.

Dr. Arthur T. Ippen, formerly of Lehigh University, was appointed Associate Professor of Hydraulics. Under his direction, we are looking forward to the development of a new Hydraulic Laboratory as part of a program to strengthen our work in this field.

Work in the Structural Analysis Laboratory was confined largely to graduate laboratory courses and to thesis work. A notable contribution was made by S. Y. Lee in the development, as part of his doctor's thesis, of a very satisfactory new type of condenser strain gage, which was applied successfully to a number of typical structural models, by use of a very novel technique for loading the models. In the Soil Mechanics Laboratory, investigations of pressures in the pore water of clays from the foundation of a proposed dam were conducted for the United States Engineer Corps.

Special wartime assignments have been carried out by staff members: Professor J. D. Mitsch was assigned to administrative work for the Division of Industrial Coöperation. Professor Allan T. Gifford devoted half of his time to a confidential project under the Division of Industrial Coöperation, necessi-

tating the return of Professor Emeritus Harold A. Barrows to give subjects in Water Power Engineering during the summer of 1944. Professor Arthur C. Ruge remained on leave of absence, devoting most of his time to special war problems, although he taught a subject in Vibration Theory to a group of Army officers at M. I. T. Professor John B. Wilbur continued as Consultant to Division 2 of the National Defense Research Committee. Professor Russell continued as a member of the Advisory Committee of the United States Coast Guard Academy. Professor Herman J. Shea again assisted the Department of Mathematics.

The Department coöperated with the Massachusetts Department of Public Works in sponsoring the second New England Traffic Engineering Conference, held at the Institute. The conference was attended by over 200 engineers and planners from the New England states. Professor William E. Stanley has been active on committee work for the American Society of Civil Engineers, the American Water Works Association, and the Sewage Works Federation.

Throughout the year, Professor Charles B. Breed consulted on various special transportation problems brought about by war conditions. Professor Horwood continued as Director of Food Sanitation Service at M. I. T. and served as a consultant to the Boston Health Department and other organizations. Professor Shea was surveying consultant for a war project. Professor Donald W. Taylor conducted for the United States Engineer Corps a review of earth-pressure distribution data at numerous airport and earth dam projects. Professor John B. Wilbur continued as a consultant on the Smith-Putnam Wind Turbine Project.

John Lowe, 3d, resigned as Instructor in Civil Engineering to accept a position at the David W. Taylor Model Basin of the United States Navy. Thomas W. Lambe was appointed to succeed him. At the end of the year, Sing Hon Louie resigned as Assistant in Civil Engineering. He is succeded by C. M. Liang.

In December, a department news letter was sent to the 2,436 living graduates of this Department. It was very favorably received and elicited some 200 personal replies.

JOHN B. WILBUR

Electrical Engineering

As in the past three years, over half of the members of the Department's staff have been engaged on war projects. This work has prevented normal academic research and the resulting contributions to technical literature. Many restrictions will no doubt be lifted during the next year so that a part, at least, of the war research which has been done in the Department during the past five years can be published. Professors Louis F. Woodruff and John G. Trump are expected to return from leave very soon.

The Navy V-12 program continued in the three upper undergraduate years, but with a smaller enrollment. This decrease has been exactly offset by a rise in the number of civilian students, and increases in the first and graduate years make for an increase of about 10 per cent in the total enrollment for the Department.

The Coöperative Course has had a substantial increase in student enrollment. As a result of negotiations initiated by the Philco Corporation with a view to procuring men well trained in communications and electronics, that organization has been added to the list of coöperating companies.

Fortunately the faculty during the past year adopted postwar curricula which took effect on July 1. The rearrangements which were made in the various options of the Electrical Engineering Course include a rearrangement of the content of our basic Principles of Electrical Engineering subjects. Many men already have advanced credit in third- and fourth-year work but lack some basic Electrical Engineering, and this rearrangement makes it possible for a returning student or a new man transferring from elsewhere to pursue the basic work of two consecutive terms simultaneously and thus be in a position to advance more rapidly than might otherwise be possible.

The Department has been able to offer a reasonable selection of graduate subjects. The graduate-student group has comprised members of our own staff who were engaged in teaching or war research, officers of the United States and foreign services, and foreign civilians. With the expectation of a large graduate registration in the fall term of 1945, plans were

made to offer a much more complete selection of graduate subjects.

The graduate program in Ordnance Electronics arranged last year for the Navy's Postgraduate School at Annapolis is now in operation and seems to be working out satisfactorily. Two graduate programs have been arranged by the Department for Army Air Forces officers, one for men who wish to emphasize the electrical equipment of the airplane, and the other for men who wish to emphasize servomechanisms. Six officers are enrolled in each program. Both of these curricula constitute a balanced program, including thesis, and lead to the Master's degree. For the first of these A.A.F. curricula, Professors Arthur E. Fitzgerald and Charles Kingsley, Jr., have developed a new graduate subject, Aircraft Electrical Systems and Machines. Both the Army and the Navy programs include instruction in radar. During the present year this has been conducted at the M. I. T. Radar School, located at 470 Atlantic Avenue, Boston. The Army Air Forces have provided specialized equipment for both the radar and the aircraft electrical machinery programs.

Discussions have been held with representatives of the Navy relating to a postwar undergraduate or graduate program emphasizing radar but leading to a Bachelor's or a Master's degree. Graduate curricula in communications have been prepared and submitted to representatives of the Signal Corps and the Army Air Forces.

The Radar School has completed four years of operation as a war-training project for Army and Navy officers. During the past year the enrollment and activities of the school reached an all-time high, particularly in the number of kinds of specialized instruction offered. In April, 1945, a total of 1,094 students were enrolled, the teaching staff numbered 156, and other employees of the school numbered 164. Instruction for the Army was completed on August 18, but instruction for the Navy still continues. The number of officers trained during the four-year period of operation of the school exceeds 7,200. Since each student spent an average of four months at the school and this is the equivalent in training effort of one-eighth of a four-year S.B. program, the 7,200 students could be

compared to 900 Bachelor's degrees, or about 55 per cent as many as have been granted by the Institute during this same period. The staff of the Radar School has completed a text, *Principles of Radar*, which is used in the school. Work is also under way on a text on sonar. Both of these are now classified and cannot be made available for general distribution, though the school has plans for the preparation of unclassified editions as soon as possible. Request has been made for space in one of the Institute buildings in Cambridge to continue instruction in radar at fourth-year and graduate levels as a permanent part of the Department's educational program.

An evaluation of the course at the Radar School, which was of from three to four and one-half months' duration at various periods in the school's history, has led to the conclusion that it can be credited for about one-half of a term's work either as the minor requirement for the Master's degree or as a senior professional elective of the fourth year in Electrical Engineering. A sufficient portion of the work is of fourth-year level to make this evaluation very reasonable, and announcement of this decision resulted in the stimulation of student effort. A large number of our radar students have indicated a desire for further education either at the Institute or elsewhere.

Because of the large interest in servomechanisms, a graduate laboratory subject was added a year ago to the two-term theory subject given for some years. More space has been allocated for the general instructional laboratory available in this field to civilian students. During the war the research program of the Servomechanisms Laboratory has been entirely under the Division of Industrial Coöperation. This work attained an all-time high during the past year with a total number of staff and employees approximating 140 and contracts totaling about $1,000,000. All of the crash projects were completed by June in preparation for use in the Pacific theater in the fall had the war continued. This laboratory has research projects of a more fundamental nature which will extend over the next two years.

In the field of illumination, Professor Parry Moon has conducted theoretical research on the analytical representation

of weighting functions in photometry and colorimetry, on the use of integral equations in the calculation of interreflections of light in rooms, and on the computation of tables for the engineering application of the interreflection method to lighting design.

The Instruments and Materials Research Laboratory has continued its work on the development of Alsifilm, which is currently manufactured on a small scale for service applications and which seems to hold considerable promise as a postwar insulating material where high-temperature electrical insulation is required. Work was also done on solderless terminals and on the development of pulse networks.

The Center of Analysis normally has three principal functions: instruction, research and development, and operation as a computation laboratory. During the past year, high-priority war problems made it necessary to limit the instruction to the United States Navy Fire Control officers, whose curriculum called for work in this laboratory, and to conduct research and development on a reduced scale. Now that the amount of high-priority computation has decreased substantially, it is expected that the normal programs of instruction and research can be resumed or expanded.

The Laboratory for Insulation Research served during the war as center of dielectric research and development for the National Defense Research Committee. In close coöperation with the Radiation Laboratory, it helped in the solution of many radar problems by the improvement of existing dielectrics and the development of new materials. As consultant of the Army and Navy, the laboratory advised on service problems involving insulators and semiconductors and evolved urgently needed equipment and components. As information center, it evaluated the dielectric materials produced in this country, thus providing the manufacturers with the necessary information on properties, advantages, and limitations of existing materials. In addition, photoelectric research and work on dry rectifiers was carried on for war purposes. Problems in physics, chemistry, and electrical engineering were handled by fundamental and development research. It is intended to strengthen this interdepartmental activity of the

laboratory as research center in the dielectrics and to take full advantage of its educational possibilities.

This Department is an active partner in the new Electronics Laboratory, to which reference is also made in the report from the Department of Physics. It is the point of view of the Electrical Engineering Department that a combined activity at the Institute in this field in which there are close association and active coöperation among all persons interested in electronics, ranging from the theoretical physicists to those engineers interested in specific practical applications, is the one sound approach to a subject of this breadth. Subjects such as the following are possibilities in the program: the communications possibilities offered by the large extent of frequency range explored during the war; the great increase in the application of electronic devices to industrial measurements and control; the extension of the knowledge of the mechanism for electrical conduction and its application to insulation; switching electronic control tubes; the application of the war-developed radar and related techniques to practical applications in many fields.

On February 13 a dinner was held at the Engineers Club in Boston honoring Professor Dugald Caleb Jackson on his eightieth birthday and commemorating the 28 years of his outstanding leadership as Head of the Department. Although wartime restrictions made a large gathering impossible, nearly 100 of the Alumni, Institute staff, and members of the engineering profession were in attendance. Tribute was paid to Professor Jackson by the speakers, and a bound volume containing nearly 200 letters of appreciation was presented to him.

Various members of the staff have been active in professional societies, but the number of papers presented has been necessarily small. However, two books of staff authorship have appeared and two others are nearing completion.

Norwich University honored Professor Edward L. Bowles by awarding him the degree of Doctor of Science on March 31 for his outstanding contribution to the War Department in military communications.

During the year a committee consisting of members of the staff, the administration, and the engineering profession made

a thorough study of the objectives and future needs of the Department in the postwar years. The committee considered those aspects of the field which should be emphasized in our teaching and research programs and indicated a number of outstanding men whom we should attempt to attract to the staff.

CARLTON E. TUCKER

SECTION OF GRAPHICS

No basic changes have occurred in the Section during the year. The many new drafting techniques and practices developed during the war, principally in the airplane industry, are being studied and evaluated for the purpose of including the important innovations in our own subjects. The Section is studying the possibilities of various postwar projects which will serve to increase the scope of the activities of its staff members.

JOHN T. RULE

MECHANICAL ENGINEERING

The teaching load of the Department was similar to that of the preceding year. While there were further losses in the junior instructing personnel because of Selective Service, and while many of the senior staff continued to devote a considerable portion of their time to war activities, the losses were, to a degree, made up by the temporary employment of lecturers from other educational institutions in this district.

The undergraduate curriculum was given much study during the year, particularly with respect to the changed circumstances of the postwar period. Mechanical Engineering covers such a wide range of professional activity that there is a natural tendency toward specialization in narrow fields, which could weaken our program of basic engineering science. It is recognized that the larger number of our students regard the four-year undergraduate course as their sole preparation for professional work, while a smaller number of particularly gifted students could take advantage of more advanced training. These gifted students should be encouraged to continue

into the Graduate School. Both categories of students are valuable, but it is important that the gifted students get the opportunity for appropriate training for professional leadership.

A revised curriculum, representing the first step in a solution of this problem, was put into effect in July of this year The essential changes relate to the establishment of three options for the fourth year: (1) General Mechanical Engineering; (2) Engineering Science; (3) Automotive Engineering. In Option 1, emphasis is placed upon practical application of basic principles to a variety of fields, covered by a series of electives. In Option 2, emphasis is placed upon a more extensive mastery of theoretical studies in preparation for graduate work. Option 3 is essentially a special form of Option 2, in which the facilities of the Sloan Laboratory are used.

The key to the success of the new curriculum lies in the professional electives offered. Through these electives the undergraduate has an opportunity for contact with the senior professors. These electives also serve as introductions to graduate subjects in their respective fields. Such electives, to achieve our purpose, must be given by professionally mature teachers and must afford adequate illustration of fundamental science in more than one field. The professional leadership of the staff is reflected in the senior electives and in their counterparts in the Graduate School. We look upon them as our most effective means of presenting applications of engineering science. New subjects can be added as additions are made to the staff and as younger men advance.

One of the most important new things which have emerged during the war is the gas turbine. It is not only a new prime mover of great promise but it has a unique significance in engineering education because its design problems embody the entire range of mechanical engineering science. It can also be a focus for research in aerodynamics of compressible flow, combustion, materials to resist high temperatures, and many other topics. A separate laboratory for graduate instruction and research has been under consideration for some time, and preliminary plans were made in 1943 for an extension to the Sloan Automotive Laboratory for this purpose. Part of the projected structure was completed in 1944 for a war research

project on torpedoes. With the assistance of the Visiting Committee on the Department of Aeronautical Engineering, the necessary funds have now been raised, and a complete Gas Turbine Laboratory is expected to be functioning within about one year. The new laboratory will include a supersonic wind tunnel and facilities for testing compressors, combustion devices, and turbines.

In the meantime, Professor Joseph H. Keenan has established an undergraduate elective in Gas Turbines, and Professor C. Richard Soderberg has offered a graduate course on Gas Turbine Problems. Both subjects have been well received by the students. Professor Keenan and Professor Joseph Kaye have published a volume on thermodynamic properties of air which has greatly facilitated gas turbine design studies.

Additional information on the activities of the different divisions of the Department is presented below in greater detail than for many years.

Applied Mechanics Division. With the return to active teaching of several key staff members, the revision of the Applied Mechanics program, which was begun before the war, will be completed in the near future. The most important change contemplated in the undergraduate program is to bring sophomore Applied Mechanics into closer accord with the work of the succeeding years. The principal objectives are to raise the intellectual level of instruction and to develop the subjects around engineering problems of current importance, in order to stimulate in the students a more active interest. These objectives have already been fairly well realized in the junior and senior years. As soon as conditions permit, we hope to give senior instruction to smaller groups of students.

In the graduate curriculum and in research, Applied Mechanics is being merged to an increasing extent with other subjects. Professor William M. Murray, for example, is teaching Stress Measurements and Photoelasticity, with the necessary fundamentals of the theory of elasticity included. Professor John A. Hrones is teaching Control of Mechanical Systems, with the necessary dynamics included. Professor Charles W. MacGregor is teaching Plasticity in the light of the basic concepts of the theory of elasticity. In each of these fields we are

gradually developing laboratory facilities for graduate instruction and research. All of these staff members are taking an active part in the undergraduate instruction program in Applied Mechanics.

Professor Soderberg has given a considerable portion of his time to Sections 6 and 12 of the National Defense Research Committee. He is also serving on the Gas Turbine Committee of the National Advisory Committee for Aeronautics, the Research Committee of the Society of Naval Architects and Marine Engineers, and several committees of the American Society of Mechanical Engineers. He is also consultant to industrial firms developing gas turbines. He has been Acting Head of the Department during the frequent absence in Washington of Professor Hunsaker.

Professor Archibald W. Adkins devoted full time to a research project in the Chemical Warfare Service during most of the year. More recently he has been giving attention to revision of sophomore subjects, but is specially concerned with the Theory of Structures and with Elasticity, in which he is developing graduate subjects. Professor J. P. Den Hartog will take the lead in Dynamics and Vibration Theory and will establish a Dynamics Laboratory when he arrives this year.

During the absence of Professor John T. Burwell, Jr., on naval service, Professor Brandon G. Rightmire and Dr. B. H. Sakmann have carried on two of his research projects in the Lubrication Laboratory for the N. A. C. A. The first of these is concerned with the determination of metal transfer between sliding surfaces, one of which is radioactivated to make the measurements possible. The material pair being investigated are nitralloy steel and chromium plate, of interest in piston-ring and cylinder wear. The second project is a study of the effect of changes in atmosphere on the fretting-corrosion damage sustained by various materials rubbed together. Both problems are of great interest to engine builders.

The cavitation apparatus has been used at intervals to assist industrial clients of the Division of Industrial Coöperation with their special problems. Professor Rightmire has, nevertheless, made further progress in his research on the fundamental mechanism of cavitation.

An introductory text on fluid mechanics was prepared by Professors Hunsaker and Rightmire covering the material presented during the past several years to undergraduate students of Courses II and XIII.

Heat Division and the Engineering Laboratories. Professor Jesse J. Eames retired in July, after 35 years of service. Professor James Holt has been appointed to succeed him in the management of the Engineering Laboratories and as Budget Officer for the Department. A staff committee under the chairmanship of Professor Holt has reviewed methods of instruction and facilities in the Engineering Laboratories. This committee has recommended a modernization program for the laboratories and a rationalization of the teaching in order to bring laboratory exercises into step with classroom instruction.

The first move in the modernization of the laboratories will be the scrapping of the Allis-Corliss triple-expansion steam engine and replacement of it by a pair of Westinghouse single-stage steam turbines directly connected to electric generators. The turbine plant will be complete with its own condenser, feed heater, and superheater, and will be arranged for compounding. It is planned to introduce illustrations of modern power-plant practice as a regular exercise for undergraduates. The second move will be the scrapping of much obsolete hydraulic equipment, including the hydraulic turbine with its approach flume and discharge weir, which take up much valuable floor space.

Professor Gordon B. Wilkes' Heat Measurements Laboratory will be altered to emphasize heat-transfer fundamentals. The Refrigeration and Air Conditioning Laboratories will be consolidated under the management of Professor August L. Hesselschwerdt, Jr.

The return of Professor Samuel C. Collins has permitted us to add laboratory facilities for low-temperature refrigeration as applied to the liquefaction of air and industrial gases. Professor Collins will offer a graduate course in this subject, which has become of great importance as a result of recent war research in which he has had a leading part.

Professor Keenan has served as chairman of a technical committee of the National Advisory Committee for Aeronautics and as consultant to several industrial concerns developing

war material. Professor Ascher H. Shapiro has devoted full time to a research on naval torpedo power plants.

Division research has included projects on heat transmission, the flow of metastable water, and phenomena of compressible fluid flow. For the latter an effective Schlieren shadow apparatus has been built to make visible and to photograph supersonic flow patterns.

Division of Machine Design and Machine Drawing. Members of the staff of this division have been carrying an unusually heavy teaching load due to the inclusion of the subject of Machine Design in the V-12 curricula of Courses VI, XIII, and XVI. Furthermore, at the request of the Navy Department, instruction in the subject as given to the torpedo engineers' group has been considerably expanded.

Professor Hrones has devoted part of his time to control problems with Professor C. Stark Draper. He has also been conducting an investigation of high-speed cam design which gives promise of substantial improvements in this important machine element.

Professor Arthur L. Townsend was appointed Director of the Lowell Institute School in October, 1944, after having served as Acting Director since the death of Professor Charles F. Park.

Machine Tool Laboratory. Last year the Machine Tool Laboratory was found to be the bottleneck in the scheduling of classes for the whole undergraduate program. As a result, it has been proposed to move the laboratory to a new location, with a 50 per cent increase in floor space. Further plans are being discussed relative to re-equipping the laboratory with new and modern tools (both as replacements and as additions). To direct the establishment and re-equipment of the laboratory in its new location, as well as to have charge of its operation, Prescott A. Smith, M.I.T.'35, Course II, son of the late Professor Robert H. Smith, longtime head of the Machine Tool Laboratory, has been appointed to the staff. When modernized, this laboratory should become a center for the study of metal-cutting problems for this area.

Materials Processing Division. Sixty per cent of the staff time of this division was devoted to an N. D. R. C. project on

examination of enemy matériel. Time was available for this work because of the drop in registration of V-12 and civilian students.

Professor Frederick R. Evans has continued with work on steam-hammer piston-rod failures. Professor Edward L. Bartholomew is working on a problem of grain coarsening of steel-forging operations. Both of these problems are being done under the direction of Professor John M. Lessells. Malcolm S. Burton has resumed a project on fatigue of spot welds which was discontinued at the start of the war.

Professor Peter E. Kyle returned on November 1, 1944, from a year's leave of absence with the War Metallurgy Committee of N. D. R. C. He has been elected Chairman of the Boston section of the American Welding Society for 1945–1946.

Curriculum changes have resulted in the setting up of an introductory course in Engineering Materials, offered to Courses II, XIII, XV-A, and XVI.

A plan for expansion of the Metal Processing Laboratories is now being drawn up in coöperation with the Department of Metallurgy. The purpose is to extend the possibilities of thesis and graduate research work in this field, which has become increasingly important during the war years.

Materials Division. Three new subjects were added to the division during the year as a result of research and experimental work which has established their content. They are: Experimental Stress Analysis, Fatigue of Metals, Mechanical Properties of Metals. The discussion-demonstration method of undergraduate instruction, inaugurated two years ago, has been continued. Experience has demonstrated that the loss of some routine experience on the part of the student is more than compensated by the increased scope of the material presented. Because of the new method of instruction the Materials Testing Laboratory has handled, in a satisfactory manner, an unusually large number of students despite a reduced staff.

During the year the Department suffered the untimely loss of Professor Alfred V. de Forest, who pioneered in the development of special methods of inspection, magnetic testing, wire resistance strain gages, and the brittle lacquer method of stress measurement. His work will be continued by Pro-

fessor Murray as part of his Laboratory for Experimental Stress Analysis. Professor de Forest's research on brittle failure at reduced temperatures, sponsored by the Welding Research Council, is being continued by Paul R. Shepler.

A number of the staff were engaged during the year on a research project for the Bureau of Ordnance of the Navy. Among them were Louis F. Coffin, Jr., John C. Fisher, C. S. Hofmann, and Professor MacGregor, who has also given assistance on special ordnance problems to the Watertown Arsenal. Professor Lessells has been on leave to devote full time to industrial problems related to the war effort. Various other members of the division served on committees engaged in war activities.

Some division research was continued, including investigations on the relation between temperature and true strain rate in connection with the true stress-strain properties of metals, creep and relaxation of lead, residual stresses, rolling load wear tests, and special fatigue studies.

Professor Murray is Secretary-Treasurer of the Society for Experimental Stress Analysis, and Professor MacGregor is serving on the executive committee for the Boston section of the A. S. M. E.

Sloan Automotive Laboratory. The staff of this laboratory has been carrying an unusually heavy teaching load because of the groups of naval aviation officers sent here to follow a special program of studies. In addition, the staff has assisted in the design of the new Gas Turbine Laboratory and has carried on five confidential research projects for the N. A. C. A. Professor C. Fayette Taylor and Professor Edward S. Taylor are both serving on technical committees of the N. A. C. A.

Textile Division. On January 3, the Samuel Slater Memorial Research Laboratory was dedicated at informal exercises, attended by members of the Corporation, administration, faculty, and invited guests. Established by S. Slater and Sons, Inc., as a memorial to the founder of the cotton textile industry in this country, the laboratory is equipped with electronically operated apparatus for studying time-temperature-load-deformation-humidity-temperature relationships in fiber, yarn, and fabric. Long-time creep tests at constant load and impact

tests employing effective loads up to 5,000 pounds at test durations of less than 1/100 second are made possible by specially designed and built equipment not available elsewhere. A fund has been established to provide for the operation of the laboratory.

JEROME C. HUNSAKER

METALLURGY

While the normal activities of the Department continued, the primary accent was on research projects sponsored by industry and by the government. During the year well over 50 per cent of the total time of staff members was devoted to such projects. Many of the laboratories were taken over entirely for war research and others were used a large share of the time for that purpose. In addition, some laboratories were used considerably by industry for the solution of problems related to the production of materials for war.

A considerable number of the research projects were of a secret nature. Others included the development of processes for the production of tin from Bolivian ores and of aluminum from West Indies bauxite, the effect of particle sizing on the properties of whiteware casting slips, the measurement of weld stresses, the dimensional stability of metals, structural changes in steel, particularly high-speed steel, dephosphorization of molten steel, the solubility of carbon in molten copper, and the effect of certain alloying elements on the creep and rupture properties of nickel-chromium-cobalt-iron base alloys at 1,500 degrees Fahrenheit.

The academic program was curtailed, but sufficient courses were offered to satisfy requirements for both undergraduate and graduate degrees. Considerable thought was devoted to the study of postwar curriculum requirements for students of Metallurgy. A revised curriculum went into effect in July, but it is thought that additional changes will be necessary within the next few years.

With deep regret we record the death of Robert Hallowell Richards, Professor of Mining Engineering and Metallurgy, Emeritus, and Head of the Department of Mining from 1873

to 1914, and that of Rufus Cook Reed, a member of the staff since 1904.

CARL F. FLOE

METEOROLOGY

The final special training program for naval officers in Meteorology was completed in February. The last of the similar programs for the Army Air Forces was completed in June, 1944. Present indications are that a number of the men who took one of the war training courses in Meteorology will return for advanced training and degrees. At present two classes of Navy V-12 students are receiving instruction in Meteorology. One is scheduled to complete the course in February, 1946, and the other in October, 1946. Although the number of students decreased sharply from the preceding year, the teaching load did not decrease because of the two V-12 classes and the subjects given for civilian graduate students and undergraduate students.

The Navy V-12 curriculum in Aerological Engineering is very similar to the undergraduate course in Meteorology which was approved by the faculty last year, and the experience gained has been of assistance in developing the undergraduate subjects. All of the subjects in Meteorology have been reviewed and modified, and new ones have been added to present a well-rounded offering of undergraduate and graduate subjects.

Continued progress has been made on the long-range forecasting research being carried out for the Weather Bureau under the direction of Professor Hurd C. Willett. A new instrument for the measurement of horizontal visibility has been designed under contract with the Weather Bureau. The research program on airplane de-icing for the Army Air Forces has continued. Some of the instrumentation developed as a part of this investigation should yield data of general meteorological importance.

Charles J. Hubbard joined the staff during the year to work on the problems connected with the establishment and maintenance by air of arctic meteorological stations.

A new research program has been initiated during the year as a joint effort of the staff. This is intended to be a broad,

long-range program aimed at obtaining a better understanding of the physical processes of weather and their application to forecasting. The Army, Navy, and Weather Bureau have expressed considerable interest in this program, and one or more of these organizations may furnish financial support. The Army has assigned from four to five officers and the Navy one officer to assist with the project.

The Army Weather Station, which was originally established as an aid to the instruction of Army cadets and later served as a research station, was deactivated on July 1. This necessitated the installation of our own weather teletypes to supply the current weather data essential for instruction and research.

Two texts by staff members, *Descriptive Meteorology* by Professor Willett, and *Climatology* by Professors Bernhard Haurwitz and James M. Austin, appeared during the year. The books will be used for instruction in subjects for which no adequate texts were available.

Professor Willett, Professor Austin, and Professor Thomas F. Malone have been on leave for periods of from two to three months each to permit them to serve as consultants to the Army Air Forces in both foreign and domestic regions.

The staff have been active in the affairs of the American Meteorological Society, which has recently been reorganized to serve more completely the needs of the expanding meteorological profession. Professor Willett and Professor Henry G. Houghton, Jr., have served on the council of the society, Professor Austin is chairman of the committee on admissions, and Professor Houghton is chairman of the editorial committee and also chairman of the committee on professional ethics and standards.

The principal need of the Department at present is adequate support for a long-range research program of the type mentioned above. Real improvement in weather forecasting is dependent on an expansion of our basic knowledge, and this can be best furthered by a concerted and integrated attack over a period of some years.

HENRY G. HOUGHTON, JR.

Military Science and Tactics

During the past year there were no notable changes of policy within the Department although, for various reasons, personnel changes were numerous. Because of the wartime inactivation of the Advanced Course of the Reserve Officers' Training Corps, instruction was again confined to the Basic Course of the Corps, composed of freshmen and sophomores only. The strength of the R. O. T. C. unit varied from a low of 193 at the close of the spring term in June to a high of 634 at the start of the summer term in July. The demands of Selective Service continued to cause class shrinkages over and above the normal attrition that can be expected. The Technology unit continues to be by far the largest in New England. It was again rated as "excellent" by the inspector of the First Service Command in his annual visit to the Department.

With the exception of Technical Sergeant Samuel L. Frey, who has been with the Department since 1924, all military members of the department staff have joined during the last year. Major Augustus A. Wagner, Ordnance Department, was relieved as Professor of Military Science and Tactics on April 26 by Lieutenant Colonel John C. Dunbar, Coast Artillery Corps, whose last assignment had been as Assistant Chief of Staff, G-3, of the Northeastern Sector, Eastern Defense Command. Major William F. McGonagle, Field Artillery, joined the Department as Assistant Professor of Military Science and Tactics on June 27 after two and one-half years of overseas duty with the Ninth Division in North Africa and Europe. Captain Lawrence J. Cuddire, Infantry, was relieved on July 23 to take another assignment and was replaced as Assistant Professor of Military Science and Tactics on July 24 by Major Alvin J. Brodeur, Corps of Engineers, whose last previous duty had been as chief of the unit training branch, Military Training Division, First Service Command.

Master Sergeant Alexander Holmes was retired by the War Department on July 31 after 30 years' service, 23 of which were devoted to honorable and faithful service with the Military Science Department of the Institute. Technical Sergeant Frank Cronk and Sergeant Arnold J. Bianchi joined the staff as Instructors on May 10 and July 20, respectively.

Of Sergeant Cronk's many years of service, 24 were spent with the R. O. T. C. at Massachusetts State College and with the Army Specialized Training Program at Amherst College. Sergeant Bianchi's experience includes overseas service with the Eighty-Eighth Division in North Africa and Italy.

The R. O. T. C. Rifle Team enjoyed a successful season, climaxed by winning the second-place Hearst Trophy in the National R. O. T. C. Rifle Match among universities and colleges in the First Service Command.

JOHN C. DUNBAR

NAVAL ARCHITECTURE AND MARINE ENGINEERING

During the past year the activities of the Department have been mainly concerned with training students for the United States and foreign navies. The new class in Course XIII-A, which began the Review of Mathematics in May, is made up of 16 regular officers of the United States Navy, 14 United States Naval Reserve officers, and three United States Coast Guard officers. This class is an increase of 65 per cent over the previous class, and larger groups are anticipated in the future.

As Course XIII-A is now open only for officers of the United States Navy, a new three-year graduate course in Naval Construction, known as Course XIII-B, has been established for civilians and officers of foreign navies.

No students have been enrolled in Course XIII-C during the past year, but we anticipate that the number of men taking this Course during the next few years may be larger than that in Course XIII.

Captain Lybrand Smith, United States Navy (retired), was appointed Visiting Professor of Naval Engineering and took up his new duties on July 1. He is in charge of the marine engineering work of Course XIII-A. Mayson W. Torbet, who was appointed Visiting Professor of Naval Engineering in the winter, died suddenly in March, about a week after he arrived at the Institute. In April the Navy detailed Lieutenant Richard S. Lovelace, United States Naval Reserve, to the Institute, and he has been appointed Assistant Professor of Naval Construction. Captain Roswell H. Blair, United States

Navy (retired), who succeeded Captain C. S. Joyce as Commanding Officer for the United States Naval Training Schools at the Institute, has been appointed Professor of Naval Science in the Department. Professor H. E. Rossell, in charge of Course XIII-A, is still on leave of absence from the Institute, while serving as President of the Cramp Shipbuilding Company. Professor Henry H. W. Keith, Head of the Department, has been absent most of the time since October, 1944, on account of illness, and will retire on January 1, 1946.

During the summer and fall, Gordon G. Holbrook, M.I.T. '10, Works Manager of the Federal Shipbuilding and Dry Dock Company, gave a series of eight lectures on some of the practical phases of shipbuilding. During the year the Bureau of Ships of the United States Navy sent a number of officers and one civilian to give instruction on some of the latest phases of naval construction and to assist in the drawing room during the illness of Professor George C. Manning.

LAWRENCE B. CHAPMAN

SCHOOL OF SCIENCE

Biology

Important changes in the scope of the Department were made during the year. The name was changed to "Department of Biology." The work in Food Technology was transferred to a new Department of Food Technology under the headship of Professor William L. Campbell; Professors Bernard E. Proctor, John C. Sluder, and Cecil G. Dunn joined the staff of the new Department. Professor Murray P. Horwood joined the staff of the Department of Civil and Sanitary Engineering, and work in Sanitary Bacteriology will be conducted in that Department. The curricula of the courses in Quantitative Biology and Physical Biology have been somewhat revised to provide additional coherence. These changes define the teaching and research program of the Department along the general lines of physical and chemical biology, with particular reference to those aspects susceptible of quantitative treatment.

Teaching was restricted largely to undergraduate courses required by premedical students. The last Navy V-12 class is completing its training now. Graduate courses were limited to those required by candidates for advanced degrees.

Research on medical war problems under contract with the Committee on Medical Research has been brought to a conclusion. Certain fundamental aspects of this work will be continued under contract with the Quartermaster General's Office. Investigations on the ultrastructure of proteins and tissue components, involving electron microscope, x-ray diffraction, and double refraction studies, have been extended under the direction of Professor Francis O. Schmitt, Professor Richard S. Bear, Professor David F. Waugh, and Cecil E. Hall. Appreciation is expressed to the Gillette Safety Razor Company, the A. C. Lawrence Leather Company, the Dewey and Almy Chemical Company, and Godfrey L. Cabot, Inc., for generous support of these studies.

Partial release from war work has permitted staff members to return to their normal research interests. Professor Irwin W.

Sizer resumed investigation of enzyme systems, including crystalline chymotrypsin and tyrosinase. The latter enzyme was shown to be effective in inactivating the irritant principle of poison ivy; further studies have been made possible by a grant from Eli Lilly and Company. Professor Bernard S. Gould resumed investigations of the role of phosphatase in vitamin C and fat metabolism and has continued, in collaboration with Professor Kurt S. Lion, a study of the effect of high-frequency waves on the production of penicillin and other metabolic products of micro-organisms. Professor Marshall W. Jennison has collaborated in a project on the microbiological decomposition of cellulose materials.

As in preceding years, the program of the Laboratories of Nutritional Biochemistry, under the direction of Professor Robert S. Harris, includes matters of international and national significance. Following a fairly extensive analysis of nutritional problems of Mexico last year, Professor Harris made a survey of similar problems of Guatemala at the request of government officials of that country. He is currently undertaking a somewhat similar investigation of Chinese nutritional problems in collaboration with the Foreign Economic Administration, the War Department, and the Chinese Government. Four Chinese students, subsidized by the W. K. Kellogg Foundation, are being trained at M. I. T. before returning to China where they will continue the program. Research is also being pursued on the metabolism of deuteriumated and hydroxy fatty acids, mineral metabolism as studied with radioactive isotopes, and experimental osteogenic sarcoma. For support of this work, grateful acknowledgment is made of grants which the Department has received from the W. K. Kellogg Foundation, the Rockefeller Foundation, the Nutrition Foundation, and Lever Brothers Company.

Under a grant from the Baruch Committee on Physical Medicine, a program was established to further the application of physics and technology in physical medicine. Baruch Fellows and other qualified physicians are given a concentrated course of lectures and laboratory exercises in the elements of the subject. Those wishing to engage in research are encouraged to do so, and two new laboratories have been equipped for the

purpose. Professor Lion is in charge of this training program and of the research on instrumentation in biology and medicine. A welcome grant along similar lines was received from the Submarine Signal Company for long-range research on the application of supersonics in biology and medicine.

Plans previously made for the postwar period are rapidly being implemented. Research Associateships, whereby superior students might take part in the research program, were announced. The most serious limitations at present are those of space and modernized laboratory equipment. Carefully considered plans for adequate permanent quarters for the Department have been prepared by the staff and will be brought to reality as soon as the Institute's reconversion plans permit.

FRANCIS O. SCHMITT

CHEMISTRY

The admission of students in March and July required adjustments to enable the Department to offer every subject every term through the third year. The curriculum in undergraduate chemistry has been revised to conform to the recommendations of a special committee on simplification of curricula, whose report was adopted by the Faculty. As a result, the curriculum in physical and organic chemistry in the fourth year has been strengthened by the addition of new subjects, and a comprehensive program in the humanities has been included without sacrificing the continuous elective time in the schedule of the third and fourth years. To make the changes, it was necessary to omit required instruction in industrial chemistry; these subjects, however, may be elected by those who have a particular interest in this field.

Graduate subjects have been scheduled as required to provide complete instruction for candidates for the degree of Doctor of Philosophy. Graduate registrations have averaged 30 students, as opposed to a normal stabilized enrollment of 85. The majority of students enrolled at the graduate level were participating in war research or other essential projects so that their work toward the degree was limited to part-time participation.

Professor Frederick G. Keyes has been engaged entirely on war research. Professors James A. Beattie, Alberto F. Thompson, Jr., and William M. Hearon have been on leave of absence, the latter two being commissioned in the Army of the United States. Professors Arthur C. Cope, Earl B. Millard, Walter C. Schumb, George Scatchard, Avery A. Morton, Ernest H. Huntress, Louis Harris, Ralph C. Young, Gerhard Dietrichson, Nicholas A. Milas, E. Lee Gamble, George G. Marvin, Isadore Amdur, John W. Irvine, Jr., and Walter H. Stockmayer have been directly connected with government research projects at the Institute or elsewhere on either a full-time or a part-time basis; many of them have also participated in the teaching program and have directed the research of graduate students.

Professors Avery A. Ashdown, Stephen G. Simpson, Arthur R. Davis, Charles M. Wareham, Lawrence J. Heidt, Clark C. Stephenson, and Thomas R. P. Gibb, Jr., and an equal number of junior members of the staff, devoted their full attention to administration and teaching. In spite of the complications of an accelerated and irregular program, they have taught continuously, effectively, and enthusiastically.

The program of the Sugar Research Foundation, Inc., of New York has been operated successfully through the second year of a five-year contract. The entire program is designed for the development of fundamental knowledge in carbohydrate chemistry, particularly as related to sucrose. Funds from this grant have been used in part to support the research programs of candidates for higher degrees. The active work of the laboratory is directed by Dr. Allen Scattergood, who is assistant to Professor Robert C. Hockett, now on leave of absence to continue as scientific director of the foundation.

Dr. Milas has continued to direct the program on vitamin synthesis under grants from the Research Corporation and other sponsoring companies. Funds have also been available to Dr. Morton for research in sodium polymerization under a grant from the Rubber Reserve Company.

The Department gratefully acknowledges funds from the Harshaw Chemical Company, the Abbott Laboratories, and Sharp and Dohme. These grants, together with funds previ-

ously allotted to the Department from Swift and Company, will be used for fundamental research in the postwar period, and, as soon as properly qualified personnel are available, to provide financial assistance to candidates for the degree of Doctor of Philosophy.

Work has been completed on alterations in the freshman laboratories, which now have accommodations and equipment for the proper instruction of a maximum of 836 first-year students. Funds are now available for rebuilding the undergraduate organic laboratory and adjacent service rooms to accommodate 300 students. This work will be completed for the opening of the term in March, 1946. Similar plans are in process for increasing the facilities of the qualitative and quantitative laboratories to provide adequate instructional facilities for the large number of students who are now on leave of absence but who have completed one year of work at the Institute. Space reallocation to increase still further the facilities of the Department, particularly of the Graduate School, is under consideration.

On July 1, Dr. Keyes asked to be relieved of his responsibilities as Head of the Department, and Dr. Cope was appointed to succeed him. Professor Hamilton, who had been Acting Head during Dr. Keyes' leave of absence for war work, was appointed Executive Officer.

LEICESTER F. HAMILTON

FOOD TECHNOLOGY

Food Technology was made a separate Department in January. Revised curricula leading to the Bachelor's and to the Master's degree have been established. Research has been currently maintained, chiefly with the Office of the Quartermaster General, on Army rations. A postwar research program on dehydration, sterilization, packaging, and flavor is in preparation, in coöperation with industry.

All members of the staff have been absorbed in the war effort, whether on leave with the armed forces or as consultants on food research and production. Assistance is being rendered on the future Army and Navy food program in addition to the other postwar planning.

WILLIAM L. CAMPBELL

Geology

During the past year, as was true during the two preceding years, the instructional and research activities of the Department have been curtailed as a consequence of war conditions. Professor Louis B. Slichter has resigned. Professors Walter H. Newhouse, Robert R. Shrock, and Roland D. Parks are still on leave of absence. Professor Newhouse, who has been serving with the United States Geological Survey, is rejoining the Department in November. Professor Shrock is expected to terminate his leave of absence in November. Professor Parks will return early in 1946. The Department has not lost any one of its staff, so widely scattered by wartime activities.

Professors Frederick K. Morris, Martin J. Buerger, Harold W. Fairbairn, and Walter L. Whitehead have been in residence. Professor Morris has conducted several General Studies and has worked on the preparation of a book on the relation between topography and the war. Professor Buerger has directed the work of several graduate students in mineralogy and has carried on research in x-ray crystallography. Professor Fairbairn has divided his time between teaching physics and working on a government D. I. C. project. Professor Whitehead has handled the instructional work in engineering geology and has directed a research project sponsored by the American Petroleum Institute. Professor Mead, who has been on a part-time basis in order to serve as consultant in connection with wartime activities, has returned to full-time duties.

Warren J. Mead

Mathematics

War research continued to be a major activity, but plans were made to have nearly all the staff on full-time department work in November. At that time we expect to re-establish the program in Applied Mathematics, which was put into operation just before the war but had to be dropped.

The mathematics teaching diminished slightly, but reached a level only about 20 per cent below the prewar normal. With so many department members engaged in war research, it was necessary to get help from teachers in neighboring schools.

We were particularly fortunate in again having the assistance of Earl G. Boyd of the Chelsea High School and James D. Ryan of the Roxbury Memorial High School.

In December, Professor Robert H. Cameron received the Chauvenet Prize of the Mathematical Association of America, awarded for the best expository paper by any member of the association. Professor Raphael Salem was appointed Associate Editor of the *Duke Mathematical Journal.*

Professor Norbert Wiener was invited by the Mexican Mathematical Society to participate in the Congress of Mathematicians at Guadalajara in June. On his trip to Mexico he was also a guest of the Instituto Nacional de Cardiologia and the University of Mexico. During his stay he gave some 12 lectures at the university and at the congress and participated in research work on the nature of fibrillation and flutter in the heart with Dr. Arturo Rosenblueth.

HENRY B. PHILLIPS

PHYSICS

The year has seen a gradual transition from wartime work to postwar planning. Many members of the Department were still away on duties connected with the war. Professor John C. Slater returned to active service as Head of the Department during the year, relieving Professor Bertram E. Warren, who had ably acted as Executive Officer. Professor Julius A. Stratton, Professor Nathaniel H. Frank, and Lieutenant Colonel William P. Allis were absent full time in the War Department. Professors Philip M. Morse, M. Stanley Livingston, Walter E. Albertson, Edward S. Lamar, and Charles F. Squire continued to spend much of their time with the Navy Department. Dean George R. Harrison and Professors Arthur C. Hardy, Joseph C. Boyce, Seibert Q. Duntley, and Clark Goodman spent a large proportion of their time with the National Defense Research Committee administration. Professors Wayne B. Nottingham and George G. Harvey worked full time in the Radiation Laboratory. Professor Francis W. Sears left during the summer to teach for a year in the Shrivenham American University, established in Shrivenham, England, for the temporary educational program of the Army. Professors

Hans Mueller, Robley D. Evans, Donald C. Stockbarger, Robert J. Van de Graaff, and William W. Buechner, though in Cambridge, spent large parts of their time on research projects for the Office of Scientific Research and Development and for the Committee on Medical Research. Dr. Martin Deutsch was absent on a government project. Dr. William F. Whitmore was in Europe for several months on a special mission.

With the large number of absent faculty members, it is rather remarkable that a nearly normal teaching program was carried out. First- and second-year teaching continued as usual, complicated by the necessity of teaching each subject every term. Not only the third- and fourth-year subjects but a wide selection of graduate subjects were offered and taught to large classes, including a good many special students from the Radiation Laboratory and other government laboratories at M. I. T. The few members of the teaching staff who have remained in Cambridge during the war and have made this teaching program possible have carried out a service which is perhaps less spectacular than some other forms of war work but which is equally valuable.

As the end of the war approached, postwar planning occupied more and more time. The research program has been formulated. Major emphasis is likely to be placed on nuclear physics, electronics, and acoustics, in addition to the other fields previously carried out. In nuclear physics, an outstanding addition to the staff is Dr. J. R. Zacharias of Hunter College and the Radiation Laboratory, formerly a member of Dr. I. I. Rabi's molecular beam laboratory at Columbia University, who joins the Department as Professor. The planning in electronics and acoustics has proceeded particularly fast on account of the presence in Cambridge of the Radiation Laboratory and other projects in this field. Professor Stratton has been appointed Director of the new Electronics Laboratory, a joint project of the Physics and Electrical Engineering departments, which will carry on research in electronics, microwaves, and related fields, continuing into peacetime some of the types of fundamental research carried on by the Radiation Laboratory. Professor Morse has been active in the organization of the Acoustics Laboratory, a joint project of Physics, Electrical

Engineering, and Architecture, and Professor Richard H. Bolt has joined the Department as Assistant Professor to act as Director of this project. A further addition to the Department during the year was Arthur F. Kip, who joins as Assistant Professor.

Active steps are under way to strengthen the staff still further, both through permanent appointments and through the awarding of Research Associateships to a group of men who had their postgraduate education interrupted by the war but who have gained practical experience in war research, making them the equal of our usual Research Associates in experimental skill. Many of them have acquired family responsibilities which would prevent their return as regular graduate students. The widespread interest in these appointments indicates that many men will thus be able to continue their graduate work who otherwise would have had to give up the idea of further education. The Research Associateship plan will therefore help counteract the great deficiency of trained personnel resulting from the war.

The level on which the Department will operate henceforth will inevitably be considerably above the prewar standard, as a result of the increased importance which physics has attained during the war. This added prestige is illustrated by the two most conspicuous scientific developments of the war, the atomic bomb and radar, which are reflected in the Department's programs in nuclear physics and electronics.

Professor Newell C. Page, after many years of useful and active work for the Department, retired during the year, and Professor Boyce resigned to become head of the physics department at New York University.

JOHN C. SLATER

SCHOOL OF ARCHITECTURE AND PLANNING

A small enrollment has given us the opportunity to examine carefully our curricula, methods of teaching, and staff. We support with great enthusiasm the common first year for all freshmen, as it means that this School is more an integral part of the larger picture. Though there are many paths leading to architecture, the staff of this School feel that our choice of direction should be that which will embrace the strength of the Institute. This means a technical approach which will utilize the M. I. T. laboratories, courses on materials, and such subjects as sanitation, acoustics, illumination, and heating and ventilation. The planner, on the other hand, needs only such portion of these as will give him discipline in analysis. Our undergraduate course in City and Regional Planning is unique in the educational field and should fill a valued place as a result of the heavy demand for trained planners.

During the past year we have been able to individualize the educational process; that is, we have judged and criticized each problem with each student and have not used the moderate or poor student merely as a foil for the brilliant one. We are seeking to broaden the base of architecture by having the student recognize the important role of the social sciences, which must become part of technical training. There is an increasing interweaving of the courses in Architecture and Planning, so that each group looks over the fence into the other's field and thereby gains greater understanding.

Princeton, Columbia, Yale, Brown, Harvard, and M. I. T. are participating in an educational radio program sponsored by the World Wide Broadcasting Foundation. We are sponsoring the course entitled "Building Tomorrow's World," which deals with the field of architecture and planning in a series of 13 weekly talks.

Visiting lecturers are adding to the life of the School. Lewis Mumford, social historian, spent the week of May 7 in residence at Technology. He conducted two seminars — one for architects and one for planners — and gave two lectures.

In addition, he had office hours for individual student interviews. Dr. C.-E. A. Winslow is giving three lectures this fall which will serve to bring us his views and experience in the three fields in which he is nationally outstanding: public health, housing, and the studies of bodily comfort. The Harvard Graduate School of Design, the Littauer School of Public Administration at Harvard, and our School are cosponsoring a week's residence of David Lilienthal, chairman of the Tennessee Valley Authority. This will particularly strengthen our work in the field of regional planning, so rapidly becoming a profession of its own. During the year the Cambridge Discussion Group (composed of Harvard and M. I. T. architectural and planning students and young alumni) presented a series of speakers. The 1944 Conference in City and Regional Planning, which has become justly famous, was held last October, with 20 attending the two-week course. This course brings together students of civic affairs and planning officials from every corner of our country and is composed of seminars which are conducted by Professors Frederick J. Adams and Flavel Shurtleff, as well as by visiting lecturers.

It is a pleasure to report the following staff matters: Professor Herbert L. Beckwith is returning for full-time work this fall, after two and one-half years' leave of absence on a war project. Alvar Aalto, distinguished Finnish architect, will re-establish his former tie with the Institute and be in residence for the November-February term. Gyorgy Kepes, author of *The Language of Vision*, will become Associate Professor in charge of Freehand Drawing. He will come to us next March following experience in the School of Design in Chicago, the Texas Agricultural and Mechanical College, and Brooklyn College. Roland B. Greeley has been added as an Assistant Professor in charge of Regional Planning. He brings to us his experience in the New England regional office of the National Resources Planning Board, with which he was associated for eight years. Henry-Russell Hitchcock, chairman of the department of art at Wesleyan University, architectural critic, and present holder of a Guggenheim Fellowship, will give the History of Architecture course as a lecturer. Robert Woods Kennedy, who has been on the staff as a part-time instructor,

came to us full time in August to assume charge of the site planning and construction of the veterans' housing. Homer Hoyt, director of economic studies for the Regional Plan Association, Incorporated, of New York, has been appointed Associate Professor of Land Economics.

Miss Margaret H. Beale has become the Assistant Librarian in the Rotch Library, in charge of Planning, and Miss Anna W. Cutler has become clerical assistant in the library. Talbot Hamlin, director of the Avery Library at Columbia, made an inspection and prepared a comprehensive report on our library; we are immediately following many of his recommendations, and others are to be acted on gradually.

The School desires to express a deep appreciation for the opportunity of working on the plans of the proposed new Faculty Club and on the site plan and construction of the veterans' housing project. Such definite responsibilities, in which we coöperate with other departments, weld our group into a congenial unity which should be reflected in the teaching.

WILLIAM W. WURSTER

DIVISION OF HUMANITIES

Economics and Social Science

The work of the Department continued on a reduced wartime scale. Graduate classes were discontinued, and the undergraduate teaching in Economics and Psychology was geared to the V-12 program. Some members of the staff were engaged full time and others part time in the government service. Professor Paul A. Samuelson went to the Radiation Laboratory, Professor Douglass V. Brown became a member of the Regional War Labor Board, and Professor Norman J. Padelford was executive officer of Commission IV at the United Nations Conference on International Organization in San Francisco, and in September went to the first regular meeting of the Foreign Ministers in London as technical consultant on the organization of internal waterways in Europe.

Progress has been made in adapting the Department to the role it will be called upon to play in the Institute's new humanities program. Instructors responsible for the subjects to be offered have been preparing new material, for some of which a considerable amount of writing has had to be done. A new course in Economic Principles is being planned for the first term of the third year. For the Labor Relations and Psychology options in the second term, fundamental revisions of existing courses have been necessary. Professor Padelford has devoted much of his time to the International Relations option of the fourth year.

The most important new venture of the past year was the launching of the Research Center for Group Dynamics, with Kurt Lewin as Director. By means of experimental devices developed by Professor Lewin, the staff and students associated with the Center will devote themselves to the study of groups in action. The chief aims will be to discover how the individual is influenced by the various groups to which he belongs, and to find out the most effective techniques of group leadership. Since special attention will be given to groups of workers in industry, this project ties in closely with our Indus-

trial Relations Section. Minority groups will also be investigated.

A good beginning has been made in organizing the Center. Work is now in progress upon some of the significant projects that have been laid out. An able staff have been recruited, — though some of them are still retained by government agencies. A small group of graduate students are enrolled for the fall term, most of them candidates for the Ph.D. in Group Psychology, which degree was established last spring. We believe that this venture in experimental psychology will strengthen the Department and increase its usefulness in the Institute.

RALPH E. FREEMAN

ENGLISH AND HISTORY

The end of the Army Specialized Training Program and the smaller enrollment in the Navy V-12 have made it possible for us again to devote some time to studying the content and organization of the required subjects in English and history. Some revision has already resulted. In the freshman course in English Composition, Professors William C. Greene and Lynwood S. Bryant have introduced a series of realistic problems and exercises designed especially to develop habits of careful analysis, straight thinking, and orderly presentation.

The United States in World History, now a subject required of sophomores as part of the humanistic program, has had a year's trial. Since its basic plan seems sound for college students who study history but one year, only minor changes in the reading are being made under the direction of Professor John B. Rae. The problem of providing well-integrated reading for large numbers of students continues to be difficult because of the lack of suitable textbooks. We have watched with much interest the increasing number of history departments which have adopted a similar approach for students who have no intention of majoring in history.

As an experiment a small number of freshmen whose ability and training in English impressed their instructors as being outstanding were selected at the end of the first four weeks of the first term to study composition at a more advanced level.

The students in groups of five worked with professors of long experience. The consensus was that the results were highly satisfactory. Because of the large entering class in July, however, we were unable to continue the small groups during the summer term.

Professor Penfield Roberts' sudden death in October, 1944, was a severe loss to the Department. His outstanding ability as a teacher and scholar enabled him to make many constructive contributions during his 27 years of loyal service to the Institute.

In spite of many difficulties Professor Dean M. Fuller has guided the Drama Shop through the successful public performance of three plays. Professor Bryant has assisted the Servomechanisms Laboratory in the preparation of technical reports and manuals. In August, Professor George de Santillana was granted a leave of absence to go to Italy as a special correspondent for the *Atlantic Monthly*. Professor Howard R. Bartlett has been appointed to the executive committee of the division of humanistic-social studies of the Society for the Promotion of Engineering Education.

HOWARD R. BARTLETT

GENERAL STUDIES

The chief event of the current year was the introduction in July of the coördinated four-year program in the humanities and social sciences, which will eventually replace the former program of General Studies. The first five terms of this program are a required sequence of English, History, and Economics; limited options commence in the second half of the junior year and continue through the senior year. The comparatively small number of students this past summer made it possible to introduce these options under favorable teaching conditions.

In the junior year, somewhat to the surprise of the Committee on General Studies, the number of students who have decided to continue Economics has been almost equal to those who have selected the alternative, Psychology. Eighty seniors are now enrolled in the four regular options, with a reasonable

section in each. In order of size, the courses rank as follows: International Relations, definitely larger than the others; Fine Arts; History of Thought; and Western World Literature. The nature and content of these courses will undoubtedly be modified and improved before we have the full complement of 600 or more seniors annually.

The older program of General Studies has been continued for credit on a transitional basis, with a varied list of possibilities in each term. During the fall term of 1944, a total of 329 students were enrolled in 16 General Studies, of which the most popular were Economic Geography, Topography in the World War, Human Relations, and Introduction to Music. In the 1945 spring term, 311 students were enrolled in 14 subjects, of which two of the most popular were Geology and Problems of Modern Philosophy. In the recent summer term, along with the new options in the humanities six General Studies were offered to 110 students enrolled in almost equal numbers in subjects varying from Comparative Political Institutions to Elementary Russian. Similar programs are planned for the coming academic year. In the meantime, the new options will be available for returning students.

The new program, like the old, will be under constant supervision and study. The Committee has recommended that the new options be regularly scheduled for final examinations on the same basis as other subjects.

ROBERT G. CALDWELL

MODERN LANGUAGES

Conditions during the year have been so unusual and confused as far as our Department is concerned that any statistical statement or analysis would have little significance. Now, with the end of the war, there are so many fundamental educational problems as yet unsolved that it is too early to recommend definite new policies in the foreign language field.

Courses were given in German and French as usual, with repetitions of some half-year courses to meet the need of Navy men. In Spanish and Russian the registration was very small, as these languages are not required in any professional Course.

Spanish (second term) was given in the summer session only; Russian, in the fall and spring terms. In the three terms there were 450 registrations, of whom about 40 per cent were Navy men.

The long service of Professor Herman R. Kurrelmeyer, who has been on our staff since 1902, terminated this year, but as Professor Emeritus he will continue teaching with us on a part-time schedule as Lecturer in German. Professor Richard F. Koch devoted part of his schedule time in the summer term to the teaching of English to foreign students, under the auspices of the Department of English and History. In the two following terms he was granted leave of absence and spent the time in travel and study in Mexico. George A. Znamensky, Instructor in Russian, was called to the University of Saskatchewan, Canada, to fill there the chair of Assistant Professor of Slavonic Languages, but he has now returned to the Institute to offer again his course in Russian. During his absence his work was taken over by Nicholai P. Vakar. Part-time service in the teaching of French was rendered by Dr. Courtney Bruerton, and of German by Dr. Herbert Moller.

A year ago Professor Ernest F. Langley retired as official Head of the Department, but he continued in service this year as Acting Head in the absence of his successor, Professor William N. Locke, who for the past two years has been in service with the armed forces in Europe under the Office of War Information. Professor Locke arrived during the summer to assume his duties as the new Head of the Department. He was graduated from Bowdoin in 1930 and obtained at Harvard the degrees of A.M. in 1937 and Ph.D. in 1941. He has taught on the staffs of the Ecole Normale de Montbrison, France (1935), Middlebury College, French Summer School (1937–1941), Harvard University (1938–1943), and Radcliffe College (1941–1943).

ERNEST F. LANGLEY

REPORT OF THE TREASURER

AUDITORS' CERTIFICATE

To the Auditing Committee of the Massachusetts Institute of Technology:

We have examined the accompanying balance sheet of Massachusetts Institute of Technology as at June 30, 1945 (pages 162 and 163) and the related statements of educational and administrative operations (pages 164 and 165), current surplus (page 166) and certain reserve funds (page 151) for the year ended June 30, 1945, have reviewed the system of internal control and the accounting procedures of the Institute and, without making a detailed audit of all the transactions, have examined or tested accounting records and other supporting evidence by methods and to the extent we deemed appropriate.

In our opinion, said financial statements present fairly the position of Massachusetts Institute of Technology at June 30, 1945 and the results of its educational and administrative operations for the year then ended.

LYBRAND, ROSS BROS. & MONTGOMERY

Boston, Massachusetts
September 25, 1945

REPORT OF THE AUDITING COMMITTEE

To the Corporation of the Massachusetts Institute of Technology:

The Auditing Committee reports that the firm of Lybrand, Ross Bros. & Montgomery was employed to make an audit of the books and accounts of the Institute for the fiscal year ended June 30, 1945, and their certificate is submitted herewith.

Respectfully,

WALTER HUMPHREYS
HENRY E. WORCESTER
PHILLIPS KETCHUM, *Chairman*

October 1, 1945

TREASURER'S STATEMENT

To the Corporation:

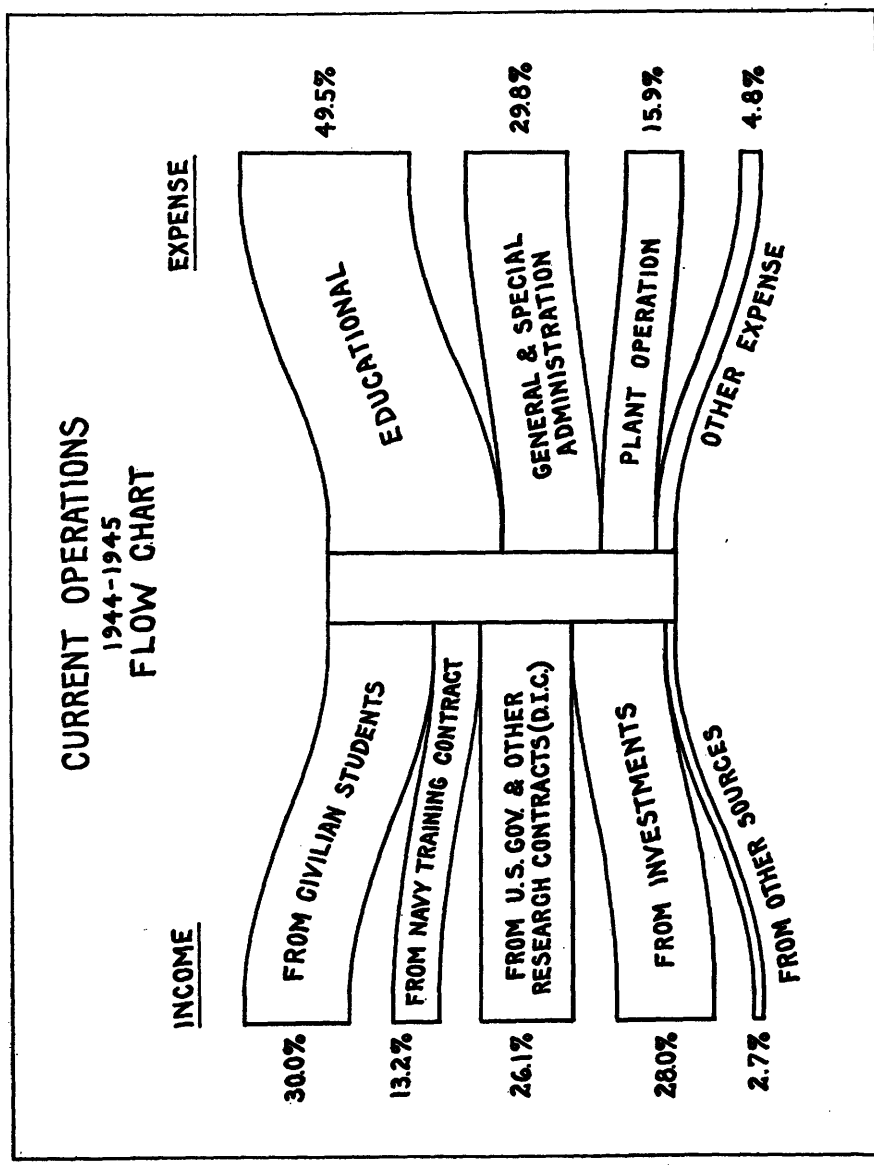
The statements and schedules submitted herewith, in accordance with Section VI of the By-Laws of the Corporation, show the financial condition of the Institute as at June 30, 1945, and also the financial transactions during the year ended on that date.

Three major schedules present (A) BALANCE SHEET, (B) EDUCATIONAL AND ADMINISTRATIVE OPERATIONS FOR THE YEAR and (C) CURRENT SURPLUS. The first two are broken down into supporting schedules designated A-1, B-1, etc.

EDUCATIONAL PLANT

Total plant assets, $17,208,000 (Schedule A-13), have increased $100,000 during the year, principally by payment of the balance of the mortgage given in 1916 to complete the first group of Dormitories. It should be noted that buildings on the campus which have been erected from funds provided through government contracts are not included in the above total.

The sources of plant capital are shown in Schedule A-14, listing the principal gifts and appropriations for the Educational Plant.


CURRENT OPERATIONS
1944-1945
FLOW CHART
INCOME
EXPENSE
FROM CIVILIAN STUDENTS
30.0%
FROM NAVY TRAINING CONTRACT
13.2%
FROM U.S. GOV. & OTHER RESEARCH CONTRACTS (D.I.C.)
26.1%
FROM INVESTMENTS
28.0%
FROM OTHER SOURCES
2.7%
EDUCATIONAL
49.5%
GENERAL & SPECIAL ADMINISTRATION
29.8%
PLANT OPERATION
15.9%
OTHER EXPENSE
4.8%

Educational and Administrative Operations

The flow chart, opposite, shows the sources of budgeted income and the expenses for the year ended June 30, 1945. It excludes income and expenses of Dining Services and Dormitories, of Current Funds, and of the War Research Projects, which latter are summarized in a following paragraph.

Income from students — civil and military — including loan and scholarship awards, $1,418,000, was $540,000 less than last year. Of this reduction $120,000 was on account of civilian students and $420,000 on account of the Government Training programs.

Income from investments, $922,000, barely exceeded 1944, but reflected a lower interest return as funds were substantially increased, as indicated.

Income from other sources, largely from research contracts to reimburse the Institute for administrative and plant expenses, amounted to $950,000.

Expenses exceeded income by $126,500, but adjustment account of previous years' operation, as shown in Schedule C, brought the cumulative Operating Surplus to $38,424.43.

War Research and Contract Operations

There follow two summaries of contract operations of the Division of Industrial Coöperation, of which the first shows the contract revenues and direct costs for the year ended June 30, 1945, and the second presents an interesting and significant comparison of operations over the past four years. The number of contracts in force as at June 30, 1945, was 148.

D. I. C. OPERATIONS FOR 1944-45

Costs reimbursed:	
Salaries and Wages	$12,529,676.23
Materials and Services	23,937,777.43
Travel, Communications, Shipping, etc.	1,662,327.09
Building Construction	346,300.76
Other	182,481.49
	$38,658,563.00
Overhead allowances under contracts to reimburse the Institute for administrative and plant expenses and for the use of Institute facilities and funds (inclusive of $100,469 surplus from industrial contracts — see page 164)	1,312,352.67
Total Contract Revenues	$39,970,915.67

The following is a four-year summary of the operations of the Division of Industrial Coöperation.

	Fiscal 1945	*Fiscal 1944*	*Fiscal 1943*	*Fiscal 1942*
Total Volume (Revenues).	$39,970,900	$25,461,300	$14,951,800	$7,822,800
Dollar increase over previous year	14,509,600	10,509,500	7,129,000	
Percentage increase over previous year	57%	70%	91%	
Salaries and Wages	12,529,700	9,412,100	6,250,000	2,088,900
Overhead Allowances	1,312,300	1,142,500	851,000	862,400
Percentage of Salaries and Wages	10.5%	12.2%	13.6%	41.3%
Percentage of Revenues	3.3%	4.5%	5.7%	11.0%

Endowment and Other Funds

The book value of the Endowment and other funds now stands at $43,100,000 — an increase of $2,980,000 during the year. Of this increase, $1,245,000 was from new capital gifts. The Endowment Reserve Fund showed a net increase of $874,000 during the year, and the balance was by additions to certain Reserve Funds, transfers from Current Funds for purposes of investment as well as investment income to funds.

ENDOWMENT RESERVE FUND

BALANCE June 30, 1944 (including $68,513.97 Income Equalization Reserve Fund transferred)		$319,913.03
Add:		
Balance of 1945 income from general investments not allocated to funds		6,886.28
Net gain from sale of general investments		1,055,125.05
Appropriation from 1945 research contract revenues, for interest on the use of funds		53,035.00
		$1,434,959.36
Deduct:		
Appropriation to reduce book amount of certain real estate investments	$189,750.00	
Amortization of bond premiums and custodian fees	51,999.24	241,749.24
BALANCE June 30, 1945		$1,193,210.12

INDUSTRIAL FUND

BALANCE June 30, 1944		$438,029.65
Deduct Adjustments Applicable to Prior Years:		
Portion of 1941–1944 revenues from research contracts originally carried to Industrial Fund now transferred to current surplus on account of charges made against income and surplus in those years for administrative and plant expenses and for the use of Institute facilities	$201,825.00	
Additional appropriation from prior year industrial research contract revenues for the use of facilities on such contracts, transferred directly to Reserve for Use of Facilities	60,161.00	261,986.00
		$176,043.65
Add:		
Allocation from general investment income — 1945		11,375.00
Appropriation from 1945 industrial research contract revenues		100,469.91
		$287,888.56
Deduct:		
Special appropriations to current funds	$77,600.00	
Salary and other payments	10,666.66	88,266.66
BALANCE June 30, 1945		$199,621.90

RESERVE FOR USE OF FACILITIES

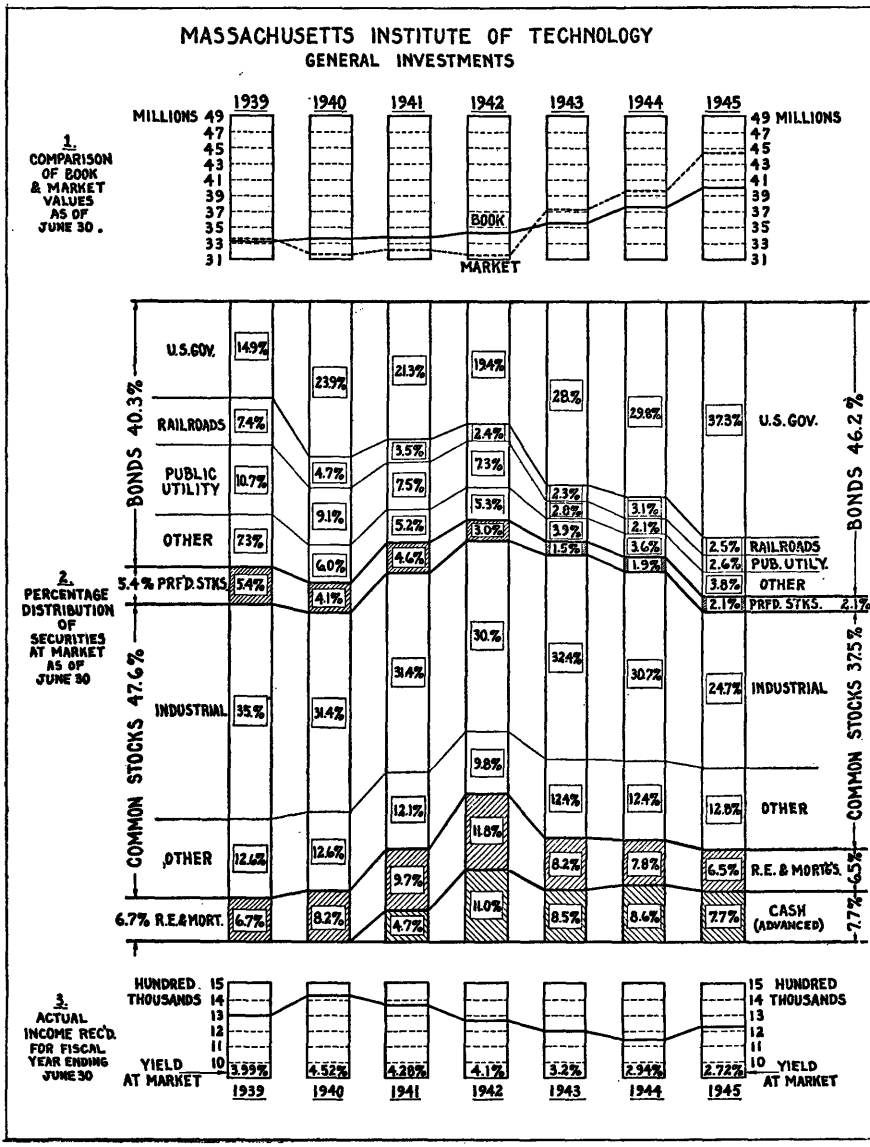
BALANCE June 30, 1944		$396,186.50
Add:		
Allocation from general investment income — 1945	$10,920.00	
Appropriation from 1945 research contract revenues	252,083.00	
Additional provision for use of facilities on research contracts in years 1941–1944 ($76,534 from Surplus and $60,161 from Industrial Fund)	136,695.00	399,698.00
		$795,884.50
Less special appropriations (principally to renovate and enlarge the capacity of chemistry laboratories)		81,900.00
BALANCE June 30, 1945		$713,984.50

INVESTMENTS

SUMMARY OF INVESTMENTS AS AT JUNE 30, 1945

General Investments	*Book*	*Market*	*Per Cent at Market*
Bonds —			
United States Government	$16,443,535	$16,709,092	37.3
Canadian	330,332	344,060	.8
Industrial	743,382	791,545	1.8
Public Utility	1,141,250	1,184,187	2.6
Railroad	1,040,103	1,130,595	2.5
Other	498,389	516,645	1.2
Total	$20,196,991	$20,676,124	46.2
Preferred Stocks —			
Total	$760,629	$932,954	2.1
Common Stocks —			
Industrial	$7,891,773	$11,052,451	24.7
Public Utility	1,063,084	1,198,841	2.7
Railroad	334,499	400,700	.9
Bank	2,206,914	2,442,363	5.5
Insurance	1,083,518	1,410,025	3.1
Other	241,471	250,462	.6
Total	$12,821,259	$16,754,842	37.5
Real Estate	$2,655,769	$2,655,769	6.0
Mortgages	$208,960	$208,960	.5
Cash — Advanced (Schedule A)	$3,449,704	$3,449,704	7.7
Total General Investments	$40,093,312	$44,678,353	100.0
Special Investments	$3,005,265	$3,143,292	
ALL INVESTMENTS	$43,098,577	$47,821,645	

Trends in the pooled or general investments during the past seven years are shown in the one hundred per cent component bar graph presented on the opposite page.


MASSACHUSETTS INSTITUTE OF TECHNOLOGY
GENERAL INVESTMENTS
1. COMPARISON OF BOOK & MARKET VALUES AS OF JUNE 30.
MILLIONS
BOOK
MARKET
2. PERCENTAGE DISTRIBUTION OF SECURITIES AT MARKET AS OF JUNE 30
BONDS 40.3%
U.S.GOV.
RAILROADS
PUBLIC UTILITY
OTHER
5.4% PRF'D.STKS.
COMMON STOCKS 47.6%
INDUSTRIAL
OTHER
6.7% R.E.& MORT.
BONDS 46.2%
COMMON STOCKS 37.5%
7.7% 6.5%
U.S.GOV.
RAILROADS
PUB. UTILY.
OTHER
PRFD. STKS. 2.1%
INDUSTRIAL
OTHER
R.E. & MORTGS.
CASH (ADVANCED)
3. ACTUAL INCOME REC'D. FOR FISCAL YEAR ENDING JUNE 30
HUNDRED THOUSANDS
YIELD AT MARKET
3.99%
4.52%
4.20%
4.1%
3.2%
2.94%
2.72%
1939
1940
1941
1942
1943
1944
1945

INVESTMENTS

Attention is called to the increase in U. S. Government obligations and also to the drop in common stocks held — from 43 to 37 per cent.

The book value of the Institute's investments (including advances for Current Operations) increased $2,926,000 to $43,100,000. The market value increased $5,588,000 to $47,822,000 or $4,723,000 in excess of book — a ratio of 111 per cent. This compares with 105 per cent last year.

INVESTMENT INCOME

The income allocation to funds sharing the general investments was 3.25 per cent — the same figure as last year.

GENERAL

On the pages immediately following will be found (1) a record of the gifts and bequests received by the Institute during the year, (2) a report of the Trustees of the M. I. T. Pension Association, (3) a report of the operation of the Technology Loan Fund Committee.

Respectfully submitted,

HORACE S. FORD
Treasurer

September 1, 1945

GIFTS AND BEQUESTS RECEIVED DURING YEAR ENDED JUNE 30, 1945

CAPITAL

Contributions to M. I. T. Alumni Fund, 1944–45	$58,860.07
Contributions to M. I. T. Alumni Fund, 1945–46	87,276.56
E. C. Emery to M. I. T. Alumni Fund Special	1,000.00
Contributions to Class of 1874 Fund	256.05
Contributions to Class of 1895 Fund	24,780.00
Contributions to Class of 1919 Fund	3,237.50
Contributions to Class of 1920 Fund	1,447.75
Contributions to Class of 1922 Fund	250.00
Contributions to Class of 1945 Fund	25.00
Anonymous	520,470.36
James A. Carney Estate for James A. Carney Fund (additional)	4,170.01
Lt. Sterling M. Clark Estate for President's Fund Special	50.00
W. A. Conant Estate for W. A. Conant Scholarship Fund (additional)	66,105.24
Arthur J. Conner for Arthur J. Conner Fund (additional)	5,000.00
Bertha L. Elson Estate for Arthur Elson Fund	500.00
E. C. Gaffield Estate for Erastus C. Gaffield Fund (additional)	207,854.42
Estate of Louise K. Gunn for L. G. Hall Scholarship Fund	50,000.00
James H. Haste Estate for James H. Haste Fund	70,150.49
William T. Henry Estate for William T. Henry Fund	13,305.00
Abby W. Hunt Estate for Abby W. Hunt Fund	3,400.00
E. Adella Kenney Estate for Carrie Belle Kenney Fund	1,000.00
Alexander G. Mercer Estate for Hall-Mercer Scholarship Fund (additional)	2,954.87
C. Lillian Moore Trust for J. A. Grimmons Fund (additional)	1,937.54
Florence E. Prince Estate for Florence E. Prince Fund	151.78
Elizabeth R. Stevens Estate for A. G. Boyden Fund (additional)	2,578.59
Gerard Swope for Graduate Fellowships	100,050.00
Marcella B. Upham Estate for Thomas Upham Fund (additional)	7,800.00
Grant Walker Estate for Grant Walker Fund	10,000.00
Marion Westcott Estate for Marion Westcott Fund (additional)	1,300.00
TOTAL CAPITAL GIFTS	$1,245,911.23

MISCELLANEOUS

Contributions to Corporation Flowers Fund	60.00
Contributions to Executive Committee Special Account	152.50
Contributions to Friends of Library Fund	3,574.50
Contributions to Industrial Economics Graduate Program Fund	5,000.00
Contributions to Industrial Relations Fund	36,675.04

Contributions to Kurrelmeyer Fund	$10.00
Contributions to Geology Department for Geophysics Research	1,350.00
Anonymous for Cosmic Terrestrial Research Fund	500.00
Abbott Laboratories for Abbott Laboratories Research	5,000.00
American Jewish Congress, Inc. for Research Center on Group Dynamics	25,000.00
American Society of Tool Engineering for Research	500.00
E. B. Badger Co. for E. B. Badger Fund	10,000.00
Baruch Committee for Research on Physical Medicine	50,000.00
Boston Manufacturers Mutual Fire Insurance Company for Insurance Engineering Fund	835.13
Bruce's Juices, Inc. for Research	6,000.00
H. H. Burne for Apple Fellowship	5,000.00
Vannevar Bush for Tech Press Special	250.00
Godfrey L. Cabot, Inc. for Cabot X-Ray Fund	6,000.00
Coöperative Foundation Fund	1,577.44
Bradley Dewey for President's Fund	200.00
Alfred L. Loomis for President's Special Fund "L"	5,000.00
E. I. duPont de Nemours & Co. for duPont Fellowship	1,500.00
H. B. duPont for Boat House Equipment	200.00
Fabric Research Laboratories for Textile Equipment Special Fund	500.00
Field Foundation, Inc. for Research Center on Group Dynamics	15,000.00
Israel Friedlander for Phillip J. Friedlander Fund	1,000.00
General Ceramics & Sleatite Corporation	200.00
Morris H. Gens for Boston Stein Club Fund	1,000.00
Gillette Safety Razor Company for Research	15,000.00
Goodyear Tire & Rubber Company for Aero Engineering Fund	1,500.00
Harshaw Chemical Company for Research	5,000.00
Elizabeth T. Kent for A. Norton Kent Fund	100.00
Margaret E. Kent for A. Norton Kent Fund	100.00
Anna A. K. Kniesner for Amelia S. Kniesner Scholarship Fund	500.00
William Kniesner for Amelia S. Kniesner Scholarship Fund	5,000.00
Wilma E. Kniesner for Amelia S. Kniesner Scholarship Fund	500.00
Lever Brothers for Lever Brothers Scholarship	2,250.00
Jacob Lichter for Jacob and Jennie Lichter Fund	5,000.00
Eli Lilly & Company for P. I. Research	5,000.00
J. F. Lincoln Arc Welding Foundation for Library	100.00
Arthur D. Little, Inc. for Arthur D. Little Memorial Lectureship	6,100.00
Joe Lowe Corporation for Research	1,500.00
Magnaflux Corporation for Research	10,000.00
Mayo Clinic for Radioactivity Center	750.00
J. C. Melvin Trust for Melvin Trust Scholarships	5,100.00
National Academy of Sciences for Welch Fund	1,000.00
National Company, Inc. for Electronics Fund	1,500.00
National Lime Association for Building and Eng. Construction	5,000.00
National Research Corporation for Graduate Fellowships	2,500.00

New England Carbide Tool Company for Research	$1,500.00
Nutrition Foundation, Inc. for Research	2,400.00
Oilgear Company for Research	6,000.00
Parke-Davis Company for Raa Center (Radioactivity)	2,500.00
Plastic Materials Manufacturers Association for Research	3,000.00
Polaroid Corporation for Library	100.00
Radio Corporation of America for Cosmic Terrestrial Res. Spec.	5,000.00
Research Corporation for Vit. A. & D. Research	5,000.00
Revere Copper & Brass, Inc. for Research — Metallurgy	1,600.00
Rockefeller Foundation for Research	89,571.53
Sharp & Dohme, Inc. for Chemistry Department	800.00
Sheffield Foundation for Sheffield Foundation — Metallurgy	5,000.00
S. Slater & Sons, Inc. for M. E.-S. Slater & Sons, Inc. Fund	30,000.00
Sperry Gyroscope Company for Fellowships	5,000.00
Submarine Signal Company for Research	25,000.00
Sugar Research Foundation, Inc. for Sugar Research Fund	25,000.00
Towle Manufacturing Company for Towle Fund	4,000.00
United Eng. Trustees for M. E. Disc Research	4,625.00
United Eng. Trustees for Welding Research Fund	3,600.00
Vanadium Alloys Steel for Fellowship	3,000.00
Wallace & Tiernan Company for Research	5,000.00
S. K. Wellman & Company for Fellowship Fund	7,500.00
Mrs. Julia P. Whitney for Granger Whitney Scholarship Fund	200.00
TOTAL MISCELLANEOUS GIFTS	$490,981.14
TOTAL CAPITAL AND MISCELLANEOUS GIFTS	$1,736,892.37

REPORT OF THE TRUSTEES OF THE M. I. T. PENSION ASSOCIATION

COMPARATIVE BALANCE SHEET

Assets

	June 30, 1944	*June 30, 1945*
Cash	$37,203.04	$48,629.64
Investments (page 160)	1,786,547.87	[1]1,818,386.05
Total	$1,823,750.91	$1,867,015.69

[1] Market Value June 30, 1945, $1,933,890

Liabilities

Teachers' Annuity Fund (5% salary deduction, plus interest)	$1,065,357.86	$1,102,304.00
*M. I. T. Pension Fund (3% appropriation, plus interest)	678,416.94	705,276.03
Special Reserves for Annuity Payments	46,188.61	34,967.38
Total Liabilities	$1,789,963.41	$1,842,547.41
Reserve Fund (including undistributed income)	33,787.50	24,468.28
Total	$1,823,750.91	$1,867,015.69

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

RECEIPTS AND EXPENDITURES FOR 1944–1945

Receipts

5% salary deductions added to Teachers' Annuity Fund	$82,751.46
3% appropriations added to M. I. T. Pension Fund	49,803.93
Income from investments (Net)	63,533.06
Profits on sales of securities	10,737.99
Total Receipts	$206,826.44

Expenditures

Paid on account of withdrawal or decease of members	$38,005.97
Used to purchase annuities for retiring members	118,489.27
Pensions paid directly to former retired members	6,943.18
Losses on sales of securities	123.24
Total Expenditures	$163,561.66
Net Increase of Ledger Assets	$43,264.78

Trustees of the M. I. T. Pension Association

Karl T. Compton — Horace S. Ford — Ralph E. Freeman
Charles B. Breed — John R. Macomber

A Record of Investments Held for Account of the Trustees of the M. I. T. Pension Association

Par Value or Shares				*Book Value*	*Net Income*
$100,000	U. S. Treasury	2s	1951–53	$100,000.00	$2,000.00
90,000	U. S. Treasury	2½s	1968	90,000.00	2,250.00
75,000	U. S. Treasury	2½s	1964–69	75,000.00	1,875.00
100,000	United States, G	2½s	1954	100,000.00	2,500.00
100,000	United States, G	2½s	1955	100,000.00	2,500.00
100,000	United States, G	2½s	1956	100,000.00	2,500.00
60,000	United States, G	2½s	1957	60,000.00	.....
9,000	Dom. of Canada	3s	1958	8,865.00	270.00
33,000	Dom. of Canada	2½s	1948	33,000.00	825.00
37,000	Dom. of Canada	3s	1953	37,000.00	1,110.00
35,000	Alabama Power	3½s	1972	35,000.00	1,225.00
50,000	Brooklyn Union Gas	3½s	1969	54,125.00	515.28
50,000	Com'th Edison	3s	1977	52,875.00	258.33
50,000	Detroit Edison	4s	1965	51,200.00	2,000.00
50,000	Illinois Power	4s	1973	50,503.32	2,000.00
50,000	Louisiana Pr. & Lgt.	3s	1974	51,750.00	508.33
50,000	Pac. Gas & Elec.	3s	1974	52,000.00	875.00
50,000	Philadelphia Electric	2¾s	1974	50,687.50	580.55
35,000	So. California Edison	3s	1965	37,175.00	247.91
25,000	Balt. & Ohio	4s	1948	25,000.00	1,000.00
35,000	Southern Pacific	4s	1955	33,638.79	1,400.00
200	du Pont			29,504.20	1,050.00
200	Eastman Kodak			28,500.00	1,200.00
1,200	General Electric Co.			52,597.76	1,740.00
600	General Motors			29,332.24	1,800.00
197	Int. Business Machines			26,152.29	1,212.00
800	National Biscuit			21,220.31	960.00
400	Sears Roebuck			29,391.89	1,700.00
800	Standard Oil, N. J.			39,798.13	2,000.00
500	Union Carbide and Carbon			41,575.54	1,500.00
500	United Fruit			38,575.21	1,875.00
500	United Shoe Machinery			35,910.62	1,562.50
200	Am. Tel. & Tel. Co.			34,184.26	1,800.00
480	Bankers Trust Co., N. Y.			23,687.50	588.00
500	Chemical Bank and Trust, N. Y.			25,187.50	900.00
500	First National Bank, Boston			27,500.00	1,000.00
50	Guaranty Trust, N. Y.			12,550.00	600.00
225	Firemans Fund Insurance			15,300.00	675.00
200	Hartford Fire			18,300.00	500.00
200	Insurance Co. of N. A.			14,000.00	600.00
200	Phoenix Insurance			16,900.00	600.00
	Real Estate, Albany, N. Y.			60,398.99	2,771.50
	Income from investments sold or called				10,458.66
	Total			$1,818,386.05	$63,533.06

REPORT OF THE TECHNOLOGY LOAN FUND COMMITTEE

COMPARATIVE BALANCE SHEET

Assets

	June 30, 1944		*June 30, 1945*	
Cash	$89,448.91		$165,039.85	
Investments (Schedule A-2)	962,748.02	$1,052,196.93	1,056,048.02	$1,221,087.87
Student Notes Receivable (Schedule A-6):				
Loans 1930 to date	$1,874,300.75		$1,886,515.75	
Less Repayments (including Write-Offs, $5,193.99) to date	1,206,472.80	667,827.95	1,358,533.73	527,982.02
Total Assets		$1,720,024.88		$1,749,069.89

Liabilities

Technology Loan Fund (1930 to date):				
Total Subscriptions		$1,450,785.18		$1,450,785.18
Add:				
Investment Income (net)	$347,898.60		$375,069.81	
Interest from Loans	180,963.95	528,862.55	193,887.17	568,956.98
		$1,979,647.73		$2,019,742.16
Deduct:				
Net Loss on Securities	$204,633.96		$197,385.52	
Write-Offs, Deceased Borrowers	2,397.35		2,397.35	
Write-Offs, Legal Settlements	.....		2,796.64	
Life Insurance Premiums	52,591.54	259,622.85	68,092.76	270,672.27
		$1,720,024.88		$1,749,069.89

RECEIPTS AND EXPENDITURES FOR 1944–45

Receipts

Income (Investments)		$27,171.21
Interest (Loans)		12,923.22
Net Gain on Sales of Securities		7,248.44
Repayments on Loans	$152,060.93	
Less: Loans Made	12,215.00	139,845.93
		$187,188.80

Expenditures

John Hancock Mutual Life Insurance Company Premium (net)	$15,501.22	
Write-Offs, Legal Settlements (1930–1945)	2,796.64	18,297.86
Net Increase in Cash and Investments		$168,890.94

Technology Loan Fund Committee

Karl T. Compton, *Chairman*

Gerard Swope — Pierre S. du Pont — John E. Aldred

Edwin S. Webster — Horace S. Ford

BURSAR'S STATEMENT

To the Treasurer:

The following principal Schedules

BALANCE SHEET	(A)
EDUCATIONAL AND ADMINISTRATIVE OPERATIONS	(B)
CURRENT SURPLUS	(C)

together with their respective supporting schedules (A-1, B-1, etc.) have been drawn from the Institute's books of account. These summarize the financial condition of the Institute as at June 30, 1945, as well as the transactions during the year.

D. L. RHIND
Bursar

W. A. HOKANSON
Assistant Bursar

September 1, 1945

SCHEDULE A

BALANCE SHEET

JUNE 30, 1945

INVESTMENTS

GENERAL INVESTMENTS:

U. S. Government Bonds		$16,443,534.91
Other Bonds		3,753,455.53
Preferred Stocks		760,629.08
Common Stocks		12,821,259.03
Real Estate and Mortgages (including $685,914.46 Campus properties)		2,864,729.25
Total General Investments	(A-1)	$36,643,607.80
Investments of Funds Separately Invested	(A-2)	3,005,264.87
Advances for Current Operations (per contra)		3,449,703.91
		$43,098,576.58

STUDENT LOANS

Notes Receivable	(A-6)	$543,056.51

CURRENT AND DEFERRED ASSETS

Cash: For General Purposes			$2,225,606.87
Advance by U.S. Government for Research (per contra)			4,838,000.00
For Students' Safe-Keeping Deposits			45,517.39
			$7,109,124.26
Accounts Receivable, U. S. Government and Other (less $5,978,409.64 advances)	(A-7)		1,572,861.95
Contracts in Progress—Unbilled Costs:			
Costs disbursed at June 30, 1945 (less $2,345,985.04 advances)	(A-8)	$1,463,516.51	
Costs represented by Accounts Payable and Accrued Wages		2,013,615.32	3,477,131.83
Inventories, Prepaid Expenses and Deferred Charges	(A-9)		287,138.13
			$12,446,256.17

EDUCATIONAL PLANT

Land, Buildings and Equipment	(A-13)	$17,208,646.69

SCHEDULE A

BALANCE SHEET

JUNE 30, 1945

ENDOWMENT AND OTHER FUNDS

Endowment and Other Funds for General Purposes	(A-3)	$27,111,117.78
Funds for Designated Purposes and Unexpended Income thereof	(A-4)	11,124,010.25
Special Funds, Deposits and Reserves-Invested	(A-5)	4,863,448.55
		$43,098,576.58

STUDENT LOANS, CAPITAL

Total	(A-6)	$543,056.51

CURRENT LIABILITIES, FUNDS AND SURPLUS

Advance on Radiation Research Contract (per contra)		$4,838,000.00
Borrowed from Endowment and Other Funds (per contra)		3,449,703.91
Accounts Payable and Accrued Wages		2,159,079.33
Students' Advance Fees and Deposits	(A-10)	170,972.07
Students' Safe-Keeping Deposits		45,517.39
Federal Tax With-holdings, War Bond and Other Deposits	(A-11)	350,770.42
Unexpended Current Funds, Appropriations and Reserves	(A-12)	1,393,788.62
Balance in Current Surplus	(Schedule C)	38,424.43
		$12,446,256.17

EDUCATIONAL PLANT CAPITAL

Endowment for Educational Plant	(A-14)	$17,208,646.69

SCHEDULE B

EDUCATIONAL AND ADMINISTRATIVE OPERATIONS

INCOME FOR YEAR ENDED JUNE 30, 1945

EDUCATIONAL AND GENERAL			
STUDENTS:			
Tuition Fees	$856,824.00		
Scholarship Awards	119,240.00		
Student Loans	10,415.00		
NAVY V-12 PROGRAM	427,266.43		
Total Tuition Fees		$1,413,745.43	
Locker, Examinations and Other Fees		4,558.95	
			$1,418,304.38
INVESTMENTS:			
Income from General Investments (A-1)		$1,224,674.28	
Income from Special Investments (A-2)		113,005.81	
		$1,337,680.09	
Income Added to Funds (A-5)	$449,289.17		
Less Income Appropriations from Funds	34,523.52	414,765.65	
			922,914.44
OTHER SOURCES:			
Receipts from Research Contracts to reimburse the Institute for administrative and plant expenses and for use of the Institute facilities and funds:			
Government Contracts		$1,104,290.61	
Industrial Contracts		208,062.06	
		$1,312,352.67	
Less appropriations therefrom:			
Non-reimbursable items and contract losses	$45,856.28		
To Reserve for Use of Facilities	252,083.00		
To Endowment Reserve, for use of funds	53,035.00		
To Industrial Fund, from Industrial Contract revenues	100,469.91	451,444.19	
Balance		$860,908.48	
Federal Aid		22,088.35	
Rentals and Other Income (B-1)		67,693.87	950,690.70
Total Educational and General			$3,291,909.52
AUXILIARY ACTIVITIES			
Dormitories — Graduate and Undergraduate (B-12)		$298,809.74	
Dining Service, Walker Memorial (B-13)		305,453.44	
Dining Service, Graduate House (B-14)		361,199.94	
Total Auxiliary Activities			965,463.12
Total Operating Income			$4,257,372.64

Note A. Costs of research activities and the reimbursements thereof from research contracts to the amount of $38,658,563 (page 150) are excluded from this statement of income and expense. Current gifts and appropriations for research and expenditures therefrom, which are also excluded, are reflected in Schedule A-12, current funds.

SCHEDULE B

EDUCATIONAL AND ADMINISTRATIVE OPERATIONS

EXPENSE FOR YEAR ENDED JUNE 30, 1945

EDUCATIONAL AND GENERAL			
EDUCATIONAL EXPENSES			
Salaries and Wages	(B-2)	$2,179,341.26	
Less portion appropriated from Current and Special Funds for Research	(B-3)	661,537.54	
		$1,517,803.72	
Departmental Expenses	(B-4)	105,620.30	
Library and Museum Expenses	(B-5)	90,500.80	
			$1,713,924.82
GENERAL EXPENSES			
Salaries of Officers		$182,235.80	
Clerical and Office Expense, Administration	(B-6)	194,144.06	
General Administration Expense	(B-7)	404,311.35	
Division of Industrial Coöperation	(B-8)	252,680.48	
			1,033,371.69
PLANT OPERATION			
Department of Buildings and Power	(B-9)		552,675.18
OTHER EXPENSES			
Medical Department	(B-10)	$72,585.60	
Undergraduate Budget Board	(B-11)	95,850.31	
			168,435.91
Total Educational and General			$3,468,407.60
AUXILIARY ACTIVITIES			
Dormitories — Graduate and Undergraduate	(B-12)	$248,853.97	
Dining Service, Walker Memorial	(B-13)	305,453.44	
Dining Service, Graduate House	(B-14)	361,199.94	
Total Auxiliary Activities (Note B)			915,507.35
Total Operating Expenses			$4,383,914.95
Deficiency of Income (Schedule C)			126,542.31
			$4,257,372.64

Note B. Expenses of auxiliary activities include $34,469.52 transferred to reserves from dining service operations.

SCHEDULE C

CURRENT SURPLUS — YEAR ENDED JUNE 30, 1945

BALANCE June 30, 1944	$6,725.37
Adjustments of Previous Years' Operations:	
Appropriations unexpended	32,950.37
Portion of 1941–1944 revenues from research contracts originally carried to Industrial Fund now transferred to current surplus on account of charges made against income and surplus in those years for administrative and plant expenses and for the use of Institute facilities	201,825.00
Additional provision for the use of facilities on U. S. Government contracts in the years 1941–1944	*76,534.00**
Deficiency of Income for the Year Ended June 30, 1945	*126,542.31**
BALANCE June 30, 1945	$38,424.43

Denotes deduction.

SCHEDULE A-1

GENERAL INVESTMENTS

U. S. Government Bonds

Par Value				*Book Value*	*Net Income*
$2,000,000	U. S. Treasury.....	2s	1954–52	$2,000,000.00	$21,076.25
1,000,000	U. S. Treasury.....	2s	1953–51	1,000,000.00	20,000.00
5,000,000	U. S. Treasury.....	2¼s	1959–56	5,147,016.41	*12,845.46*
1,000,000	U. S. Treasury.....	2½s	1954–52	1,004,500.00	25,000.00
50,000	U. S. Treasury.....	2½s	1970–65	50,000.00	625.00
6,825,000	U. S. Treasury.....	2¼s	1972–67	6,825,000.00	*9,273.50*
417,000	U. S. Savings "G" .	2½s	1953–56	417,000.00	10,425.00
25	U. S. Savings "F"..	2½s	1957	18.50	.....
	Income from bonds sold.....				174,905.52
	Total U. S. Government Bonds.....			$16,443,534.91	$229,912.81

Canadian Bonds

$100,000	Canadian Nat.Ry.Co.	4½s	1956	$115,000.00	$4,500.00
100,000	Canadian Nat.Ry.Co.	4½s	1957	114,500.00	4,500.00
35,000	Ottawa.....	5s	1945	35,000.00	1,750.00
67,000	Gatineau Power	3¾s	1969	65,831.60	2,512.50
	Income from bonds called.....				10,402.47
	Total Canadian Bonds			$330,331.60	$23,664.97

Industrial and Other Bonds

$200,000	Adams Express.....	4¼s	1946	$199,388.81	$8,500.00
200,000	American Tobacco ..	3s	1969	200,000.00	2,350.00
100,000	Central Soya.....	3¼s	1959	100,000.00	1,394.79
200,000	Eastern Gas and Fuel	4s	1956	176,382.02	8,000.00
96,000	National Dairy Prod.	3¼s	1960	96,000.00	3,120.00
52,000	National Oil Prod. ..	3¼s	1955	52,000.00	1,690.00
35,000	National Oil Prod. ..	3¼s	1957	35,000.00	1,137.50
96,000	Ry. and Light Sec.Co.	3¼s	1955	96,000.00	3,120.00
84,000	Schenley Distillers ..	4s	1952	84,000.00	3,360.00
200,000	Tri-Continental Corp.	3½s	1960	203,000.00	*526.16*
	Income from bonds sold or called				5,950.99
	Total Industrial Bonds.....			$1,241,770.83	$38,097.12

SCHEDULE A-1 — (Continued)

Par Value				*Book Value*	*Net Income*
	PUBLIC UTILITY BONDS				
$100,000	American & For. Power.	5s	2030	$91,250.00	$1,402.78
50,000	Am. Tel. & Tel.....	3¼s	1961	50,000.00	1,625.00
140,000	Eastern Mass. St. Ry...	4s	1962	142,000.00	1,882.22
100,000	Elec. Power & Light....	5s	2030	103,000.00	972.22
100,000	Florida Power & Light..	3½s	1974	104,000.00	3,500.00
97,000	Florida Power & Light	4⅛s	1979	97,000.00	4,001.25
150,000	Illinois Power.....	4s	1973	150,000.00	6,000.00
198,000	Puget Sound Pwr. & Lt..	4¼s	1972	204,000.00	8,415.00
200,000	United Gas Corp.....	3s	1962	200,000.00	2,050.00
	Income from bonds sold or called				3,717.25
	Total Public Utility Bonds.....			$1,141,250.00	$33,565.72
	RAILROAD BONDS				
15,000	Baltimore & Ohio.....	4s	1948	$15,000.00	$600.00
50,000	B. & O., P., L.E. & W.Va.	4s	1951	48,668.75	2,000.00
100,000	Boston & Maine.....	5s	1955	90,000.00	5,000.00
128,000	Delaware & Hudson ...	4s	1963	128,000.00	1,280.00
115,000	Northern Pacific.....	4s	1997	105,228.29	4,450.00
100,000	Oreg. R.R. & Navigation	4s	1946	99,410.83	4,000.00
99,000	Penn. Ohio & Detroit..	3¾s	1968	99,000.00	3,712.50
100,000	Southern Pacific.....	4s	1955	97,007.73	4,000.00
150,000	Southern Pacific.....	4½s	1981	147,787.50	82.49
110,000	Union Pacific.....	4s	1947	110,000.00	4,400.00
100,000	Virginian Corp.....	5s	1952	100,000.00	5,000.00
	Income from bonds sold.....				15,282.19
	Total Railroad Bonds.....			$1,040,103.10	$49,807.18
	INDUSTRIAL PREFERRED STOCKS				
Shares					
1,000	Cornell-Dubilier Electric.....			$100,000.00	$5,250.00
1,005	Servel, Inc.....			106,575.00	975.93
500	U. S. Steel.....			51,706.42	3,500.00
	Income from stocks sold.....				3,314.50
	Total Industrial Preferred Stocks.....			$258,281.42	$13,040.43
	PUBLIC UTILITY PREFERRED STOCKS				
900	Columbia Gas & Elec. A.....			$84,916.85	$1,350.00
1,000	Niagara Hudson Power.....			95,852.27	.....
1,000	Public Service N. J., $5.00.....			101,926.84	5,000.00
	Income from stocks sold.....				4,248.75
	Total Public Utility Preferred Stocks...			$282,695.96	$10,598.75

SCHEDULE A-1 — (Continued)

Shares		*Book Value*	*Net Income*
	RAILROAD PREFERRED STOCKS		
2,000	Atch., Top. & Santa Fe	$139,627.30	$10,000.00
1,000	Pere Marquette, Pr. Pref.	80,024.40	1,250.00
	Total Railroad Preferred Stocks	$219,651.70	$11,250.00
	INDUSTRIAL COMMON STOCKS		
2,500	American Can	$254,123.66	$7,500.00
300	Borg Warner	10,690.92	480.00
2,000	Caterpillar Tractor	92,194.13	4,000.00
265	Christiana Securities	681,970.00	21,611.25
2,000	Chrysler Corp.	109,990.05	6,000.00
2,000	Dewey & Almy Chemical	53,574.77	2,000.00
1,500	Diamond Alkali	87,750.00	3,000.00
1,600	Dow Chemical	203,000.05	4,800.00
2,350	Draper Corp.	112,955.20	6,937.50
2,000	Dun & Bradstreet	71,964.40	1,500.00
10,000	Eastman Kodak	877,921.69	67,800.00
2,000	Firestone Tire & Rubber	117,118.23	1,000.00
8,900	General Electric	231,292.47	12,905.00
4,000	General Motors	146,161.96	12,000.00
2,500	Gulf Oil	130,025.05	1,250.00
1,500	Hercules Powder	110,229.94	3,750.00
12,300	Humble Oil & Refining	399,167.64	23,062.50
2,000	Inland Steel	199,974.49	9,000.00
835	International Business Machines	89,635.34	4,893.00
3,100	International Harvester	123,863.98	9,765.00
6,000	International Nickel, Canada	212,508.68	8,160.00
1,500	Johns Manville	131,768.70	4,500.00
2,000	Kennecott Copper	84,591.29	5,000.00
1,500	Liggett & Myers Tobacco	103,445.82	5,250.00
2,500	Liquid Carbonic	37,825.90	3,750.00
3,000	Merck & Co.	109,633.44	951.25
2,000	Monsanto Chemical	145,182.12	4,500.00
4,000	National Lead	118,093.64	2,500.00
2,000	National Steel	149,488.34	6,000.00
4,000	Owens Illinois Glass	234,263.43	8,000.00

SCHEDULE A-1 — (Continued)

Shares		*Book Value*	*Net Income*
	INDUSTRIAL COMMON STOCKS (*Continued*)		
2,000	J. C. Penney	$180,191.07	$10,000.00
2,000	Phillips Petroleum	76,795.71	4,000.00
2,500	Pittsburgh Plate Glass	138,661.89	10,625.00
4,000	Procter & Gamble	184,785.16	8,000.00
3,500	St. Joseph Lead	153,993.10	7,000.00
2,100	Sears Roebuck	163,620.55	8,925.00
1,000	Sherwin Williams	100,988.10	3,000.00
5,000	Standard Oil, Ind.	170,222.92	3,750.00
9,000	Standard Oil, N. J.	377,834.12	22,500.00
5,000	Union Carbide & Carbon	291,331.20	15,000.00
1,000	United Carbon	68,782.98	3,000.00
4,000	United Fruit	185,613.18	15,000.00
3,000	United Shoe Machinery	206,807.06	9,375.00
9,000	Westinghouse Electric	161,740.71	9,000.00
	Income from stocks sold		123,424.17
	Total Industrial Common Stocks	$7,891,773.08	$504,464.67
	PUBLIC UTILITY COMMON STOCKS		
5,000	Am. Gas & Elec.	$203,626.96	$9,000.00
1,825	American Tel. & Tel.	240,747.23	16,425.00
7,275	Boston Edison	262,990.81	14,550.00
10,000	Commonwealth Edison	285,340.24	14,000.00
3,000	Philadelphia Electric	70,378.36	1,800.00
	Income from stocks sold		19,281.70
	Total Public Utility Common Stocks	$1,063,083.60	$75,056.70
	RAILROAD COMMON STOCKS		
2,000	Atch., Top. & Santa Fe	$180,079.31	$4,500.00
2,000	Great Northern (Pfd.)	95,877.13	3,000.00
400	Norfolk & Western	58,542.78	4,000.00
	Income from stocks sold		2,025.00
	Total Railroad Common Stocks	$334,499.22	$13,525.00

SCHEDULE A-1 — (Continued)

Shares		*Book Value*	*Net Income*
	BANK AND FINANCE STOCKS		
1,495	Amerex Holding Corp.	$34,178.22	$1,308.13
3,750	Bankers Trust, N. Y.	189,613.75	4,593.75
2,000	Central Hanover Bk. & Tr., N. Y.	233,650.00	8,000.00
5,000	Chase National, N. Y.	261,212.50	7,000.00
3,000	Chemical Bank & Trust, N. Y.	190,618.75	5,400.00
2,000	Commercial Credit Corp.	85,002.58	2,500.00
2,000	Commercial Investment Trust Finance	92,782.12	840.00
2,400	Cont. Ill. Nat. Bank, Chicago	172,201.50	9,600.00
4,936	First National, Boston	297,874.96	9,872.00
1,025	Guaranty Trust, N. Y.	318,443.04	12,300.00
667	Harris Trust & Savings, Chicago	146,587.00	6,501.00
2,000	Lincoln Alliance Bk. & Tr., Rochester.	96,000.00	3,000.00
6,000	National City, N. Y.	260,712.50	6,900.00
100	New England Trust, Boston	40,000.00	3,000.00
	Income from stocks sold		1,181.24
	Total Bank and Finance Stocks	$2,418,876.92	$81,996.12
	INSURANCE AND OTHER STOCKS		
275	Boston	$180,786.00	$5,775.00
1,700	Continental	68,383.05	3,400.00
2,500	Firemans Fund	199,600.00	4,500.00
2,600	Hartford	164,725.01	6,500.00
3,000	Ins. Co. of North America	197,300.00	9,000.00
500	National Union	80,000.00	2,500.00
2,500	Phoenix	192,724.50	7,500.00
1,000	Stone & Webster, Inc.	29,507.65	750.00
	Income from stocks sold		7,125.00
	Total Insurance and Other Stocks	$1,113,026.21	$47,050.00

SCHEDULE A-1 — (Continued)

	Book Value	*Net Income*
REAL ESTATE		
111 Bay State Road, Boston	$19,600.00	$784.00
120 Bay State Road, Boston	12,104.50	220.00
Broad and High Streets, Boston (40%)	50,000.00	5,706.43
Franklin Street, Boston	150,000.00	3,151.10
Memorial Drive, Cambridge	260,070.90	*5,949.33*
Memorial Drive, Cambridge	40,000.00	*1,307.55*
Graduate House, Cambridge	645,914.46	6,000.00
Bexley Hall, Cambridge	176,731.08	7,200.00
*Gloversville, N. Y.	121,743.07	6,095.98
Harrisonburg, Va.	30,814.12	1,495.00
New Bedford, Mass.	78,484.26	4,634.30
New London, Conn.	259,176.73	12,464.00
Plattsburgh, N. Y.	215,778.62	9,927.00
Taunton, Mass.	212,462.22	9,685.00
Willimantic, Conn.	172,816.98	7,874.00
Worcester, Mass.	210,072.60	9,575.00
Total Real Estate	$2,655,769.54	$77,554.93

* Not including first mortgage of $23,750 with Connecticut Mutual Life Insurance Co. of Hartford, Conn.

MORTGAGE NOTES		
Edward Babb & Co.	$44,500.00	$2,070.00
Bigelow	4,200.00	210.60
Common St.	8,750.00	407.82
Palfrey, J. G.	11,125.00	514.70
Walton Trust	39,000.00	1,660.00
Alpha Tau Omega	16,100.00	805.00
Beta Theta Pi	13,500.00	675.00
Delta Kappa Epsilon	27,000.00	1,125.00
Delta Tau Delta	3,000.00	75.00
Kappa Sigma	9,000.00	450.00
Phi Beta Delta	4,769.71	251.06
Phi Beta Epsilon	1,150.00	57.50
Phi Delta Theta	750.00	194.48
Phi Gamma Delta	4,625.00	382.72
Phi Kappa Sigma	5,000.00	250.00
Phi Mu Delta	4,990.00	311.90
Sigma Chi	3,500.00	131.25
Theta Chi	8,000.00	418.18
Income from mortgages paid		5,099.67
Total Mortgage Notes	$208,959.71	$15,089.88

SCHEDULE A-1 — (Continued)

	Book Value	*Net Income*
RECAPITULATION, GENERAL INVESTMENTS		
U. S. Government Bonds	$16,443,534.91	$229,912.81
Other Bonds		
Canadian	$330,331.60	$23,664.97
Industrial and Other	1,241,770.83	38,097.12
Public Utility	1,141,250.00	33,565.72
Railroad	1,040,103.10	49,807.18
	$3,753,455.53	$145,134.99
Preferred Stocks		
Industrial	$258,281.42	$13,040.43
Public Utility	282,695.96	10,598.75
Railroad	219,651.70	11,250.00
	$760,629.08	$34,889.18
Common Stocks		
Industrial	$7,891,773.08	$504,464.67
Public Utility	1,063,083.60	75,056.70
Railroad	334,499.22	13,525.00
Bank and Finance	2,418,876.92	81,996.12
Insurance and Other	1,113,026.21	47,050.00
	$12,821,259.03	$722,092.49
Real Estate	$2,655,769.54	$77,554.93
Mortgage Notes	208,959.71	15,089.88
	$2,864,729.25	$92,644.81
Total General Investments	$36,643,607.80	$1,224,674.28

SCHEDULE A-2

INVESTMENTS OF FUNDS SEPARATELY INVESTED

Par Value or Shares			
	INVESTMENTS, BABSON FUND		
950	American Public Welfare Trust	$10,000.00	$118.75
	INVESTMENTS (Real Estate), ALBERT FARWELL BEMIS		
	Miscellaneous building lots and land in Wellesley and Weston carried at	$17,866.56	.....
	INVESTMENTS, MALCOLM COTTON BROWN FUND		
$2,500	United States G 2½s 1954	$2,500.00	$62.50
30	General Electric	1,019.70	43.50
	Total Brown Fund	$3,519.70	$106.00
	INVESTMENTS, CLASS OF 1919 FUND		
$4,600	United States Savings F	$3,404.00	.....
	INVESTMENTS, CLASS OF 1920 FUND		
$1,875	United States Savings F	$1,387.50	.....

SCHEDULE A-2 — (Continued)

Par Value or Shares				*Book Value*	[1]*Net Income*
	INVESTMENTS, DRAPER FUND				
$29,900	United States G.....	2½s	1954	$29,900.00	$747.50
24,000	United States G.....	2½s	1955	24,000.00	600.00
10,000	Ontario.....	5s	1959	9,950.00	500.00
5,000	Baltimore & Ohio ...	4s	1948	5,307.00	*42.78*
5,000	Central Pacific.....	4s	1949	4,866.66	200.00
5,000	Northern Pacific.....	4s	1997	4,598.31	200.00
5,000	Southern Pacific.....	4½s	1981	5,175.75	*29.38*
20,000	Montana Power.....	3¾s	1966	19,852.49	750.00
	Income from bonds called.....				505.00
	Total Draper Fund.....			$103,650.21	$3,430.34
	INVESTMENTS, ARTHUR D. LITTLE MEMORIAL FUND				
466	Arthur D. Little, Inc., Pfd			$46,600.00	$2,796.00
5,543	Arthur D. Little, Inc., Com.....			110,860.00	27,715.00
$53,000	U. S. Treasury.....	2s	1951–53	53,000.00	1,060.00
30,000	U. S. Treasury.....	2s	1954–52	30,000.00	62.77
20,000	U. S. Treasury.....	2s	1954–52	20,000.00	198.80
	Total Little Fund.....			$260,460.00	$31,832.57
	INVESTMENTS, RICHARD LEE RUSSEL FUND				
$3,600	Mortgage Note (participation).....			$3,600.00	$180.00
	INVESTMENTS, SOLAR ENERGY FUND				
5,000	Godfrey L. Cabot, Inc.....			$647,700.00	$20,248.50
71	United Carbon.....			5,218.50	.....
$13,000	U. S. Treasury.....	2s	1949–51	13,000.00	260.00
13,000	U. S. Treasury.....	2s	1954–52	13,000.00	27.20
	Total Solar Energy Fund.....			$678,918.50	$20,535.70
	INVESTMENTS, FRANCES E. AND SAMUEL M. WESTON FUNDS				
$8,950	Mortgage Note, Bartlett.....			$8,950.00	$357.96
	INVESTMENTS, JONATHAN WHITNEY FUND				
$100,000	United States G.....	2½s	1954	$100,000.00	$2,500.00
100,000	United States G.....	2½s	1955	100,000.00	2,500.00
100,000	United States G.....	2½s	1956	100,000.00	2,500.00
15,000	Canada.....	3s	1953	15,000.00	530.42
40,000	American & For. Power	5s	2030	37,178.70	527.08
40,000	Pacific Gas & Elec...	3s	1974	41,600.00	483.33
25,000	Montana Power.....	3¾s	1966	24,826.99	937.50

[1] Net after Premium Amortization.

SCHEDULE A-2 — (Continued)

Par Value or Shares				*Book Value*	[1]*Net Income*
	INVESTMENTS, JONATHAN WHITNEY FUND (*Continued*)				
$25,000	Northern Pacific	6s	2047	$27,191.81	*$570.83*
30,000	Southern Pacific.....	4s	1955	28,822.77	1,200.00
250	Boston Edison.....			8,250.00	500.00
300	Bankers Trust, N. Y.....			14,187.50	367.50
100	du Pont.....			15,279.10	525.00
250	First National, Boston.....			11,525.00	500.00
500	General Electric.....			13,188.05	725.00
50	Guaranty Trust, N. Y.....			14,850.00	600.00
300	Standard Oil, N. J.....			12,277.35	750.00
200	Union Carbide & Carbon.....			13,888.00	600.00
150	United Fruit.....			10,690.25	562.50
	Income from bonds sold.....				3,757.71
	Total Whitney Fund.....			$588,755.52	$19,495.21
	INVESTMENTS, TECHNOLOGY LOAN FUND				
$100,000	United States G.....	2½s	1954	$100,000.00	$2,500.00
100,000	United States G.....	2½s	1955	100,000.00	2,500.00
100,000	United States G.....	2½s	1956	100,000.00	2,500.00
100,000	U. S. Treasury.....	2s	1953	100,000.00	2,000.00
175,000	U. S. Treasury.....	2¼s	1959–62	175,000.00	*181.48*
80,000	U. S. Treasury.....	2½s	1958	80,000.00	2,000.00
80,000	U. S. Treasury.....	2½s	1954	81,500.00	1,500.00
20,000	New Orleans Pub. Serv.	3⅜s	1974	20,500.00	*19.69*
15,000	Pacific Gas & Elec....	3s	1974	15,500.00	81.25
18,000	Southern Pacific.....	4s	1955	18,200.00	185.00
300	American Can.....			22,935.23	900.00
200	du Pont.....			29,304.00	1,050.00
1,000	General Electric.....			25,813.25	1,450.00
50	Guaranty Trust, N. Y.....			12,825.00	600.00
500	National City, N. Y.....			12,375.00	575.00
207	Engineers Pub. Service, Pfd.....			15,000.00	1,138.52
1,000	North American.....			36,447.80	1,319.24
600	Standard Oil, N. J.....			24,862.79	1,500.00
1,250	Stone & Webster, Inc.....			36,698.75	937.50
400	Union Carbide and Carbon.....			27,726.00	1,200.00
300	United Fruit.....			21,360.20	1,125.00
	Income from bonds sold.....				2,310.87
	Total Technology Loan Fund.....			$1,056,048.02	$27,171.21

[1]Net after Premium Amortization.

SCHEDULE A-2 — (Continued)

Par Value or Shares				*Book Value*	*Net Income*
	INVESTMENTS, JOSEPH HEWETT FUND				
$50,000	United States, G.....	2½s	1954	$50,000.00	$1,250.00
9,000	Dom. of Canada.....	2½s	1948	9,000.00	225.00
10,000	Dom. of Canada.....	3s	1953	10,000.00	300.00
12,000	Adams Express.....	4¼s	1946	12,000.00	510.00
15,000	Alabama Power.....	3½s	1972	15,000.00	425.00
15,000	Puget Sound Pr. & Lt...	4¼s	1972	15,400.00	537.50
12,000	Baltimore & Ohio	4s	1948	12,734.30	*102.67*
10,000	Northern Pacific	4s	1997	10,595.50	117.44
10,000	Southern Pacific.....	4s	1955	10,450.00	*27.78*
10,000	Southern Pacific.....	4½s	1981	10,351.50	*58.75*
120	Bankers Trust, N. Y.....			4,775.00	147.00
20	Guaranty Trust, N. Y.....			5,130.00	240.00
100	American Can.....			7,520.00	300.00
50	du Pont			8,271.55	262.50
300	General Electric.....			8,107.50	435.00
200	Standard Oil, N. J.....			8,177.60	500.00
100	Union Carbide and Carbon.....			6,944.20	300.00
100	United Fruit.....			7,120.00	375.00
	Income from bonds sold or called.....				1,903.48
	Total Hewett Fund.....			$211,577.15	$7,638.72
	INVESTMENTS, GEORGE S. WITMER FUND				
$5,800	United States, G.....	2½s	1954-55	$5,800.00	$145.00
5,000	Atlantic Coast Line..	4s	1952	4,854.44	200.00
4,000	Central Pacific.....	4s	1949	4,080.00	141.12
5,000	Northern Pacific.....	4s	1997	4,903.79	200.00
5,000	Capital Transit.....	4s	1964	5,000.00	66.11
3,000	Eastern Gas & Fuel ..	4s	1956	2,845.84	120.00
5,000	Florida Power & Light	4⅛s	1979	5,130.00	192.50
50	Elec. Power & Light 6% Pfd.....			3,550.00	.....
50	General Electric.....			1,718.25	72.50
25	General Motors.....			1,310.96	75.00
40	Standard Oil, N. J.....			1,706.32	100.00
30	Union Carbide and Carbon.....			2,051.85	90.00
36	Bankers Trust, N. Y.....			1,665.00	44.10
15	Cont. Illinois Nat. Bank & Trust, Chicago			1,387.50	60.00
20	Guaranty Trust, N. Y.....			5,980.00	240.00
	Real Estate, Sanford, Fla.....			5,143.76	319.46
	Income from bonds sold.....				73.56
	Total Witmer Fund.....			$57,127.71	$2,139.35
	Total of Investments of Funds Separately Invested.			$3,005,264.87	$113,005.81

SCHEDULE A-3

ENDOWMENT AND OTHER FUNDS FOR GENERAL PURPOSES

No.		*Balance, June 30, 1944*	*Investment Income Added to Fund*	*Other Receipts*	*Expended or Transferred from Fund*	*Balance, June 30, 1945*
	RESTRICTED FUNDS					
101	George Robert Armstrong..	$5,000.00	.....	.....	.....	$5,000.00
103	George Blackburn Mem...	961,249.84	.....	.....	.....	961,249.84
105	Clara H. Briggs.....	12,514.55	.....	.....	.....	12,514.55
107	James A. Carney.....	13,000.00	.....	$4,170.01	.....	17,170.01
109	Charles Choate.....	35,858.15	.....	.....	.....	35,858.15
111	Eben S. Draper.....	103,843.36	.....	275.00	.....	104,118.36
113	Coleman du Pont.....	221,325.48	.....	.....	.....	221,325.48
115	Eastman Contract.....	9,498,869.55	.....	.....	.....	9,498,869.55
117	Charles W. Eaton.....	261,148.19	.....	.....	.....	261,148.19
119	Educational Endowment..	7,573,855.60	.....	.....	.....	7,573,855.60
121	Martha Ann Edwards.....	30,000.00	.....	.....	.....	30,000.00
123	William Endicott.....	25,000.00	.....	.....	.....	25,000.00
125	Francis Appleton Foster...	1,000,000.00	.....	.....	.....	1,000,000.00
127	John W. Foster.....	299,650.64	.....	.....	.....	299,650.64
129	Alexis H. French.....	5,000.00	.....	.....	.....	5,000.00
131	Jonathan French.....	25,212.48	.....	.....	.....	25,212.48
133	Henry C. Frick.....	1,831,053.42	.....	.....	.....	1,831,053.42
135	General Endowment.....	1,527,449.00	.....	.....	.....	1,527,449.00
137	Eliot Granger.....	21,568.43	.....	.....	.....	21,568.43
139	Charles Hayden.....	1,000,000.00	.....	.....	.....	1,000,000.00
141	John Marshall Hills	366,430.96	.....	.....	.....	366,430.96
143	James Fund.....	163,654.21	.....	.....	.....	163,654.21
147	Thomas McCammon	15,000.00	.....	.....	.....	15,000 00
149	Kate M. Morse.....	25,000.00	.....	.....	.....	25,000.00
151	Everett Morss.....	25,000.00	.....	.....	.....	25,000.00
153	Richard Perkins.....	50,000.00	.....	.....	.....	50,000.00
155	J. W. and B. L. Randall ..	83,452.36	.....	.....	.....	83,452.36
157	Wm. Barton Rogers Mem..	250,225.00	.....	.....	.....	250,225.00
159	Saltonstall Fund.....	65,813.06	(1) $539.62	.....	.....	66,352.68
161	Samuel E. Sawyer.....	4,764.40	.....	.....	.....	4,764.40
163	Andrew Hastings Spring...	50,000.00	.....	.....	.....	50,000.00
165	George G. Stone.....	4,677.35	.....	.....	.....	4,677.35
167	Seth K. Sweetser.....	25,061.62	.....	.....	.....	25,061.62
169	William J. Walker.....	23,613.59	.....	.....	.....	23,613.59
171	Horace Herbert Watson...	34,076.69	.....	.....	.....	34,076.69
173	Albion B. K. Welch	5,000.00	.....	.....	.....	5,000.00
175	Everett Westcott.....	171,394.00	.....	.....	.....	171,394.00
177	Marion Westcott.....	238,952.00	.....	1,300.00	.....	240,252.00
179	George Wigglesworth	26,381.73	(2) 85.80	.....	.....	26,467.53
181	Edwin A. Wyeth.....	254,703.94	.....	.....	.....	254,703.94
		$26,334,799.60	$625.42	$5,745.01	.....	$26,341,170.03

Note. Where no investment income is indicated the amount allocated has been carried directly to Current Income.
(1) One-fourth net income carried to Fund.
(2) One-tenth net income carried to Fund.

SCHEDULE A-3 — (Continued)

No.		*Balance, June 30, 1944*	*Investment Income Added to Fund*	*Other Receipts*	*Expended or Transferred from Fund*	*Balance, June 30, 1945*
	UNRESTRICTED FUNDS					
201	Anonymous (H)	$10,000.00	.....	.....	.....	$10,000.00
203	Anonymous (M)	1,500.00	.....	.....	.....	1,500.00
205	E. B. Badger Co.	.....	.....	$10,000.00	.....	10,000.00
207	Edmund Dana Barbour	20,736.94	.....	.....	.....	20,736.94
209	Stephen L. Bartlett	122,603.39	.....	.....	$1,815.60	120,787.79
211	Coöperative Foundation	.....	.....	1,577.44	.....	1,577.44
213	Carbon P. Dubbs	5,000.00	.....	.....	.....	5,000.00
215	Erastus C. Gaffield	180,000.00	.....	207,854.42	120,000.00	267,854.42
216	William T. Henry	21,335.00	.....	13,305.00	.....	34,640.00
218	Ellis Hollingsworth	10,000.00	.....	.....	.....	10,000.00
219	Abby W. Hunt	.....	.....	3,400.00	.....	3,400.00
220	Insurance Engineering	.....	.....	835.13	.....	835.13
221	Carrie Belle Kenney	.....	.....	1,000.00	.....	1,000.00
222	Hiram H. Logan	24,500.00	.....	.....	.....	24,500.00
223	Charles E. Merrill	2,300.00	.....	.....	.....	2,300.00
225	John Wells Morss	50,000.00	.....	.....	.....	50,000.00
227	Christel Orvis	539.42	.....	.....	.....	539.42
229	Emerette O. Patch	2,276.61	.....	.....	.....	2,276.61
231	Towle	4,000.00	.....	4,000.00	.....	8,000.00
233	Charles A. Tripp	100,000.00	.....	.....	.....	100,000.00
235	Grant Walker	60,000.00	.....	10,000.00	.....	70,000.00
237	Frank G. Webster	25,000.00	.....	.....	.....	25,000.00
		$639,791.36	.....	$251,971.99	$121,815.60	$769,947.75
	Totals, Schedule A-3	$26,974,590.96	$625.42	$257,717.00	$121,815.60	$27,111,117.78

SCHEDULE A-4

FUNDS FOR DESIGNATED PURPOSES AND UNEXPENDED INCOME THEREOF

	FUNDS FOR SALARIES					
251	Samuel C. Cobb	$36,551.31	.....	.....	.....	$36,551.31
253	Sarah H. Forbes	500.00	.....	.....	.....	500.00
255	George A. Gardner	20,000.00	.....	.....	.....	20,000.00
257	James Hayward	18,800.00	.....	.....	.....	18,800.00
259	William P. Mason	18,800.00	.....	.....	.....	18,800.00
261	Henry B. Rogers	25,000.00	.....	.....	.....	25,000.00
263	Nathaniel Thayer	25,000.00	.....	.....	.....	25,000.00
265	Elihu Thomson	23,680.87	.....	.....	.....	23,680.87
		$168,332.18	.....	.....	.....	$168,332.18

Note. Where no investment income is indicated the amount allocated has been carried directly to Current Income.

SCHEDULE A-4 — (*Continued*)

No.		Balance, June 30, 1944	Investment Income Added to Fund	Other Receipts	Expended or Transferred from Fund	Balance, June 30, 1945
	FUNDS FOR DEPARTMENTS AND RESEARCH					
301	Applied Mathematics.....	$25,812.50	$838.50	.....	.....	$26,651.00
303	William Parsons Atkinson..	13,082.20	425.75	.....	$425.75	13,082.20
305	Baruch Com. on Phys. Med.	.....	650.00	$50,000.00	10,000.00	40,650.00
307	Albert Farwell Bemis.....	328,062.19	10,663.25	12,000.00	5,060.16	345,665.28
309	A. F. Bemis Land Account.	36,466.56	.....	3,000.00	21,600.00	17,866.56
311	Biology-Rockefeller Found.	46,788.43	1,521.00	.....	6,805.89	41,503.54
313	Frank Walter Boles Mem...	35,444.52	1,150.50	.....	57.67	36,537.35
315	Samuel Cabot.....	56,367.20	1,833.00	.....	.....	58,200.20
317	Center of Analysis.....	.....	1,300.00	40,000.00	.....	41,300.00
319	William E. Chamberlain...	7,309.77	237.25	.....	237.25	7,309.77
321	Chemical Eng. Practice ...	257,772.97	8,378.50	.....	1,184.89	264,966.58
323	Cosmic Terrestrial Research	9,255.30	269.75	5,380.63	6,000.00	8,905.68
325	Crosby Honorary Fund ...	2,092.29	68.25	.....	68.25	2,092.29
327	Susan E. Dorr.....	95,955.67	3,120.00	.....	3,120.00	95,955.67
329	George Eastman.....	400,000.00	13,000.00	.....	13,000.00	400,000.00
331	Electronics, Special.....	51,625.00	1,677.00	.....	.....	53,302.00
333	Harold H. Fletcher.....	10,865.98	341.25	.....	400.00	10,807.23
335	John A. Grimmons.....	7,624.27	273.00	1,937.54	.....	9,834.81
336	Group Dynamics, Research	.....	650.00	40,000.00	3,266.45	37,383.55
337	Hayden (Dental Clinic) ...	6,607.84	227.50	1,884.50	502.00	8,217.84
339	Industrial-Economics, Grad.	11,083.55	425.75	5,000.00	.....	16,509.30
340	Industrial Fund.....	438,029.65	11,375.00	100,469.91	350,252.66	199,621.90
341	Industrial Rela. Section....	222,114.99	7,757.75	36,675.04	35,942.26	230,605.52
343	Instrumentation Fund	215,002.50	10,010.00	162,500.00	11,375.00	376,137.50
345	William R. Kales.....	75,391.48	2,437.50	.....	502.85	77,326.13
347	Arthur E. Kennelly.....	75,016.61	2,437.50	37.10	.....	77,491.21
349	A. Norton Kent.....	100.00	9.75	200.00	.....	309.75
350	Arthur D. Little Memorial.	241,766.72	31,832.57	.....	3,000.00	270,599.29
351	Katherine Bigelow Lowell .	5,000.00	162.50	.....	162.50	5,000.00
353	Mathematics Statistical Res.	8,260.00	269.75	.....	.....	8,529.75
355	John Lawrence Mauran ...	3,175.74	104.00	.....	.....	3,279.74
357	George Henry May.....	5,000.00	162.50	.....	162.50	5,000.00
359	Susan Minns.....	40,000.00	.....	.....	.....	40,000.00
361	Forris Jewett Moore.....	26,869.80	874.25	.....	.....	27,744.05
363	F. Ward Paine.....	10,000.00	325.00	.....	.....	10,325.00
365	Edward D. Peters.....	6,378.88	208.00	.....	208.00	6,378.88
367	Pratt Naval Architectural .	395,676.29	12,860.25	.....	12,860.25	395,676.29
369	Radioactivity Center	.....	1,625.00	50,000.00	.....	51,625.00
371	Ellen H. Richards.....	24,658.82	802.75	.....	.....	25,461.57
373	Richards Memorial.....	898.30	29.25	.....	.....	927.55
375	Charlotte B. Richardson ..	51,093.03	1,660.75	.....	.....	52,753.78
377	William Barton and Emma Savage Rogers...	162,085.07	5,268.25	.....	79.20	167,274.12
379	Frances E. Roper.....	2,000.00	65.00	.....	65.00	2,000.00
381	Arthur Rotch.....	25,000.00	812.50	.....	812.50	25,000.00
383	W. T. Sedgwick.....	84,714.69	2,752.75	.....	15,000.00	72,467.44

SCHEDULE A-4 — (*Continued*)

No.		Balance, June 30, 1944	Investment Income Added to Fund	Other Receipts	Expended or Transferred from Fund	Balance, June 30, 1945
	FUNDS FOR DEPARTMENTS AND RESEARCH (*Continued*)					
385	Servo-Mechanism Lab.	$25,812.50	$838.50	.....	.....	$26,651.00
387	Sloan Automotive Lab.	11,975.65	357.50	.....	$8,000.00	4,333.15
389	Solar Energy	673,467.48	20,535.70	.....	4,832.10	689,171.08
390	Special Research, Padelford	.....	19.50	$2,500.00	.....	2,519.50
391	Henry N. Sweet	10,966.97	357.50	.....	.....	11,324.47
393	Submarine Signal Co.	.....	195.00	25,000.00	9.30	25,185.70
395	Swift Protein Research	20,325.00	659.75	.....	.....	20,984.75
397	Textile Research	1,771.18	58.50	.....	.....	1,829.68
399	Nellie Florence Treat	609.00	19.50	.....	.....	628.50
401	Edmund K. Turner	[1]278,247.40	9,041.50	.....	6,781.13	[1]280,507.77
403	William Lyman Underwood	13,447.92	435.50	.....	435.50	13,447.92
405	William R. Ware	15,344.18	500.50	79.68	264.97	15,659.39
407	Wind Tunnel	.....	.....	100,000.00	.....	100,000.00
		$4,572,416.09	$173,911.77	$636,664.40	$522,474.03	$4,860,518.23
	FUNDS FOR LIBRARY					
451	Walter S. Barker	$10,371.36	$338.00	.....	$350.00	$10,359.36
453	Samuel Berkowitz	10,162.50	331.50	.....	.....	10,494.00
454	Boston Stein Club	.....	.....	$1,000.00	.....	1,000.00
455	Frank Harvey Cilley	83,566.80	2,717.00	.....	3,667.00	82,616.80
457	Class of 1874	256.05	9.75	.....	.....	265.80
458	Arthur Elson	.....	16.25	500.00	.....	516.25
459	Charles Lewis Flint	5,759.24	188.50	.....	200.00	5,747.74
461	Friends of the Library	350.00	.....	3,574.50	3,924.50	.....
463	William Hall Kerr	4,421.57	143.00	.....	44.33	4,520.24
465	Library Growth	.....	520.00	16,000.00	.....	16,520.00
467	George A. Osborne	11,757.14	383.50	.....	.....	12,140.64
469	Arthur Rotch, Architectural	7,089.37	230.75	.....	256.10	7,064.02
471	John Hume Tod	3,639.64	117.00	.....	45.39	3,711.25
473	Theodore N. Vail Memorial	70,086.57	2,278.25	200.51	2,000.00	70,565.33
		$207,460.24	$7,273.50	$21,275.01	$10,487.32	$225,521.43
	FUNDS FOR GRADUATE SCHOLARSHIPS AND FELLOWSHIPS					
501	Abbott Laboratories	.....	$81.25	$5,000.00	.....	$5,081.25
503	Anonymous	$509.75	29.25	800.00	.....	1,339.00
505	Edward Austin	421,884.29	13,711.75	.....	$12,575.00	423,021.04
507	William Sumner Boles	29,860.52	971.75	.....	750.00	30,082.27
509	Malcolm Cotton Brown	3,646.79	106.00	.....	.....	3,752.79
511	Francis W. Chandler	11,014.14	357.50	.....	350.00	11,021.64
513	Collamore	14,806.43	481.00	.....	450.00	14,837.43
515	Dalton Graduate Chemical	7,601.79	247.00	.....	.....	7,848.79
517	du Pont de Nemours	.....	.....	1,500.00	1,500.00	.....
518	Harshaw Chemical	.....	81.25	5,000.00	.....	5,081.25

[1] One-fourth net income carried to Fund.

SCHEDULE A-4 — (*Continued*)

No.		Balance, June 30, 1944	Investment Income Added to Fund	Other Receipts	Expended or Transferred from Fund	Balance, June 30, 1945
	FUNDS FOR GRADUATE SCHOLARSHIPS AND FELLOWSHIPS (*Continued*)					
519	Rebecca R. Joslin	$11,161.58	$364.00	.....	.....	$11,525.58
521	Wilfred Lewis	6,558.76	214.50	.....	.....	6,773.26
523	George S. May	666.66	.....	.....	$666.66	.....
525	Moore	35,612.12	1,157.00	.....	.....	36,769.12
527	National Research Corp.	.....	39.00	$2,500.00	.....	2,539.00
529	Willard B. Perkins	6,490.63	211.25	.....	.....	6,701.88
531	Proprietors Locks & Canals	1,471.77	48.75	.....	.....	1,520.52
533	Henry Bromfield Rogers	26,117.83	848.25	.....	850.00	26,116.08
535	Richard Lee Russel	3,841.52	180.00	.....	.....	4,021.52
537	Henry Saltonstall	11,301.16	367.25	.....	350.00	11,318.41
539	James Savage	13,950.73	455.00	.....	425.00	13,980.73
541	Sperry Gyroscope	.....	81.25	5,000.00	.....	5,081.25
543	Susan H. Swett	10,893.55	354.25	.....	175.00	11,072.80
544	Gerard Swope Grad. Fellow.	.....	.....	100,050.00	.....	100,050.00
545	Frank Hall Thorp	10,833.06	351.00	.....	.....	11,184.06
547	Thomas Upham	441,480.65	14,348.75	7,800.00	.....	463,629.40
549	Luis Francisco Verges	10,721.97	347.75	.....	350.00	10,719.72
551	Jonathan Whitney	576,525.86	19,495.21	12,872.53	18,013.02	590,880.58
		$1,656,951.56	$54,929.96	$140,522.53	$36,454.68	$1,815,949.37
	FUNDS FOR UNDERGRADUATE SCHOLARSHIPS					
601	Louie G. Applebee	$443.12	$13.00	.....	.....	$456.12
603	Elisha Atkins	5,021.83	162.50	.....	$150.00	5,034.33
605	Thomas Wendell Bailey	2,228.38	71.50	.....	75.00	2,224.88
607	Charles Tidd Baker	36,660.11	1,192.75	.....	275.00	37,577.86
609	Billings Student	50,269.24	1,634.75	.....	1,600.00	50,303.99
611	Levi Boles	10,125.65	328.25	.....	300.00	10,153.90
613	Jonathan Bourne	10,039.60	325.00	.....	325.00	10,039.60
615	Albert G. Boyden	620,842.01	20,247.50	$2,578.59	6,117.15	637,550.95
617	Harriet L. Brown	6,887.25	224.25	.....	600.00	6,511.50
619	Mabel Blake Case	25,555.59	832.00	.....	800.00	25,587.59
621	Nino Tesher Catlin	2,357.28	78.00	.....	140.00	2,295.28
623	Lucius Clapp	5,096.97	165.75	.....	150.00	5,112.72
624	Class of 1895 Memorial	.....	.....	24,780.00	.....	24,780.00
625	Class of 1896	†8,279.06	269.75	.....	.....	†8,548.81
627	Class of 1909	3,791.40	123.50	1.55	.....	3,916.45
629	Class of 1917	1,064.56	35.75	.....	.....	1,100.31
631	Class of 1922	3,548.63	117.00	205.00	.....	3,870.63
633	Class of 1922, Special	4,904.00	159.25	50.00	.....	5,113.25
635	Class of 1938	810.38	26.00	7.97	.....	844.35
637	Fred L. & Florence L. Coburn	5,267.51	172.25	.....	200.00	5,239.76

† Exclusive of students' notes receivable. (See Schedule A-6.)

SCHEDULE A-4 — (*Continued*)

No.		Balance, June 30, 1944	Investment Income Added to Fund	Other Receipts	Expended or Transferred from Fund	Balance, June 30, 1945
	FUNDS FOR UNDERGRADUATE SCHOLARSHIPS (*Continued*)					
639	Coffin Memorial	$42,077.48	$1,368.25	.....	$1,300.00	$42,145.73
641	William A. Conant	72,735.58	3,630.25	$66,105.24	.....	142,471.07
643	Albert Conro	25,535.64	828.75	.....	800.00	25,564.39
645	George R. Cooke	3,521.08	113.75	.....	50.00	3,584.83
647	Lucretia Crocker	79,916.58	2,596.75	.....	3,950.00	78,563.33
649	Isaac W. Danforth	5,152.48	169.00	.....	175.00	5,146.48
651	Ann White Dickinson	40,062.88	1,303.25	.....	1,250.00	40,116.13
653	Dormitory Fund	2,764.42	91.00	.....	75.00	2,780.42
655	Thomas Messinger Drown	50,309.84	1,634.75	.....	1,600.00	50,344.59
657	Frances & William Emerson	†102,258.60	3,328.00	150.00	3,515.00	†102,221.60
659	Farnsworth	5,244.59	169.00	.....	175.00	5,238.59
661	Charles Lewis Flint	5,050.22	165.75	.....	150.00	5,065.97
663	Sarah S. Forbes	3,467.62	113.75	.....	100.00	3,481.37
664	Friedlander	.....	16.25	1,000.00	.....	1,016.25
665	Norman H. George	94,673.64	3,077.75	.....	3,000.00	94,751.39
667	Arthur B. Gilmore	10,084.75	328.25	.....	300.00	10,113.00
669	Barnett D. Gordon	10,216.25	331.50	.....	300.00	10,247.75
670	Lucia G. Hall	.....	260.00	50,000.00	.....	50,260.00
671	Hall-Mercer	66,539.33	2,210.00	2,954.87	2,100.00	69,604.20
673	James H. Haste	192,666.67	7,962.50	70,150.49	7,050.00	263,729.66
675	Charles Hayden Memorial	93,182.36	3,029.00	.....	.....	96,211.36
677	George Hollingsworth	5,034.48	162.50	.....	150.00	5,046.98
679	T. Sterry Hunt	3,036.51	97.50	.....	100.00	3,034.01
681	William F. Huntington	5,188.83	169.00	.....	150.00	5,207.83
683	David L. Jewell	27,005.99	877.50	.....	800.00	27,083.49
685	Joy Scholarships	17,524.85	568.75	.....	950.00	17,143.60
686	Kneisner	.....	97.50	6,000.00	.....	6,097.50
687	Llora Culver Krueger	3,156.86	104.00	.....	600.00	2,660.86
689	William Litchfield	5,166.41	169.00	.....	150.00	5,185.41
691	Elisha T. Loring	5,062.88	165.75	.....	175.00	5,053.63
693	Lowell Institute	3,249.15	107.25	.....	.....	3,356.40
695	Rupert A. Marden	2,185.98	71.50	.....	.....	2,257.48
697	George Henry May	†10,483.63	341.25	500.00	400.00	†10,924.88
699	Robert W. Milne	76,217.72	2,476.50	.....	2,400.00	76,294.22
701	James H. Mirrlees	2,528.48	81.25	.....	.....	2,609.73
703	Fred W. Morrill	2,047.55	65.00	.....	50.00	2,062.55
705	Nichols	5,068.27	165.75	.....	200.00	5,034.02
707	Charles C. Nichols	5,199.15	169.00	.....	150.00	5,218.15
709	John Felt Osgood	5,293.88	172.25	.....	175.00	5,291.13
711	George L. Parmelee	17,203.41	559.00	.....	550.00	17,212.41
713	Richard Perkins	50,172.71	1,631.50	.....	1,600.00	50,204.21
715	Florence E. Prince	7,706.50	250.25	151.78	200.00	7,908.53
717	Thomas Adelbert Read	21,339.17	692.25	.....	900.00	21,131.42
719	Charles A. Richards	31,890.04	1,036.75	.....	1,000.00	31,926.79
721	John Roach	6,402.69	208.00	.....	200.00	6,410.69

† Exclusive of students' notes receivable. (See Schedule A-6.)

SCHEDULE A-4 — (*Continued*)

No.		Balance, June 30, 1944	Investment Income Added to Fund	Other Receipts	Expended or Transferred from Fund	Balance, June 30, 1945
	FUNDS FOR UNDERGRADUATE SCHOLARSHIPS (*Continued*)					
723	William P. Ryan Memorial.	†$4,684.82	$152.75	.....	.....	†$4,837.57
725	John P. Schenkl.....	43,896.38	1,426.75	.....	$1,400.00	43,923.13
727	Thomas Sherwin.....	5,051.98	165.75	.....	.....	5,217.73
729	Horace T. Smith.....	33,262.95	1,082.25	.....	.....	34,345.20
731	Sons and Daughters of New England Puritan Colony.	708.63	22.75	.....	.....	731.38
733	Anna Spooner.....	11,046.01	357.50	.....	350.00	11,053.51
735	Tech Club of Chicago.....	5,039.00	175.50	$2,200.00	1,200.00	6,214.50
737	Samuel E. Tinkham.....	2,437.11	78.00	.....	100.00	2,415.11
739	F. B. Tough.....	800.64	26.00	.....	.....	826.64
741	Susan Upham.....	1,068.50	35.75	.....	50.00	1,054.25
743	Samson R. Urbino	1,036.85	32.50	.....	.....	1,069.35
745	Vermont Scholarship.....	25,873.55	841.75	.....	300.00	26,415.30
747	Ann White Vose.....	60,037.27	1,950.00	.....	1,975.00	60,012.27
749	Arthur M. Waitt.....	9,709.54	315.25	.....	300.00	9,724.79
751	Grant Walker.....	55,300.00	1,797.25	.....	1,600.00	55,497.25
753	James Watt.....	13,873.78	451.75	.....	400.00	13,925.53
755	Herman E. Weihmiller....	655.15	22.75	.....	.....	677.90
757	Louis Weisbein.....	4,043.86	130.00	.....	75.00	4,098.86
759	Frances Erving Weston ...	8,481.47	341.48	.....	500.00	8,322.95
761	Samuel Martin Weston ...	5,480.49	240.73	.....	175.00	5,546.22
763	Amasa J. Whiting.....	4,532.27	146.25	.....	150.00	4,528.52
765	Granger Whitney.....	.....	6.50	200.00	.....	206.50
767	Elizabeth Babcock Willmann	5,563.99	182.00	.....	400.00	5,345.99
769	Morrill Wyman.....	71,252.21	2,317.25	.....	2,350.00	71,219.46
		$2,400,654.17	$81,643.71	$227,035.49	$58,847.15	$2,650,486.22
	STUDENT LOAN FUNDS					
801	Bursar's Fund.....	†$27,433.46	$893.75	$1,343.75	$80.00	†$29,590.96
802	Class of 1898 Loan.....	11,183.08	364.00	.....	.....	11,547.08
803	Dean's Fund.....	†8,339.96	279.50	888.68	325.00	†9,183.14
805	Carl P. Dennett.....	†1,124.33	35.75	193.20	.....	†1,353.28
807	Nathan R. George.....	29,847.37	968.50	.....	.....	30,815.87
809	Summer Surveying Camp..	†2,493.95	81.25	.....	.....	†2,575.20
811	Technology Loan Fund ...	†1,052,196.93	27,171.21	174,282.74	32,563.01	†1,221,087.87
		$1,132,619.08	$29,793.96	$176,708.37	$32,968.01	$1,306,153.40
	FUNDS FOR PRIZES					
819	American Soc'y of Tool Eng.	.....	.....	$500.00	.....	$500.00
821	Babson.....	$10,593.75	$118.75	.....	.....	10,712.50
823	Robert A. Boit.....	5,998.91	195.00	.....	.....	6,193.91
825	Class of 1904.....	699.21	22.75	.....	$5.00	716.96
827	William Emerson.....	2,374.70	78.00	.....	70.00	2,382.70

† Exclusive of students' notes receivable. (See Schedule A-6).

SCHEDULE A-4 — (Continued)

No.		*Balance, June 30, 1944*	*Investment Income Added to Fund*	*Other Receipts*	*Expended or Transferred from Fund*	*Balance, June 30, 1945*
	FUNDS FOR PRIZES (*Continued*)					
829	Roger Defriez Hunneman..	$990.69	$32.50	.....	$25.00	$998.19
831	James Means.....	3,705.88	120.25	.....	.....	3,826.13
833	William B. Rogers.....	†45,273.54	1,478.75	$369.38	.....	†47,121.67
835	Arthur Rotch.....	8,072.22	263.25	.....	.....	8,335.47
837	Arthur Rotch, Special.....	12,754.63	416.00	.....	.....	13,170.63
839	Henry Webb Salisbury....	1,191.89	39.00	.....	.....	1,230.89
841	Samuel W. Stratton	1,801.87	58.50	.....	.....	1,860.37
		$93,457.29	$2,822.75	$869.38	$100.00	$97,049.42
	Totals, Schedule A-4.....	$10,231,890.61	$350,375.65	$1,203,075.18	$661,331.19	$11,124,010.25

† Exclusive of students' notes receivable. (See Schedule A-6.)

SCHEDULE A-5

SPECIAL FUNDS, DEPOSITS AND RESERVES—INVESTED

	ALUMNI AND CLASS FUNDS					
851	Class of 1887.....	$2,767.07	$91.00	.....	.....	$2,858.07
855	Class of 1914.....	882.12	29.25	.....	.....	911.37
856	Class of 1918, Organ.....	1,504.38	48.75	.....	.....	1,553.13
857	Class of 1919, Special.....	166.50	.....	$3,237.50	.....	3,404.00
858	Class of 1920.....	.....	.....	1,447.75	.....	1,447.75
860	Class of 1923.....	14,672.16	481.00	369.54	$150.28	15,372.42
861	Class of 1924, Anonymous...	2,624.02	84.50	.....	.....	2,708.52
862	Class of 1924.....	26,684.21	867.75	160.00	115.69	27,596.27
863	Class of 1925.....	16,360.64	533.00	123.55	142.45	16,874.74
864	Class of 1926.....	21,860.28	721.50	648.50	.....	23,230.28
865	Class of 1927.....	20,480.56	666.25	.....	.....	21,146.81
866	Class of 1928.....	40,669.90	1,322.75	.....	.....	41,992.65
867	Class of 1929.....	16,490.64	536.25	4.06	.....	17,030.95
868	Class of 1930.....	13,255.63	432.25	100.00	.....	13,787.88
869	Class of 1934.....	528.89	16.25	.....	.....	545.14
870	Class of 1934, Special.....	704.75	22.75	.....	.....	727.50
871	Class of 1935.....	432.20	13.00	.....	.....	445.20
872	Class of 1936.....	594.30	19.50	.....	.....	613.80
873	Class of 1939.....	886.54	29.25	18.32	.....	934.11
874	Class of 1945.....	.....	.....	25.00	.....	25.00
875	Assn. of Class Secretaries....	2,592.83	84.50	.....	.....	2,677.33
877	M.I.T. Alumni Assn., Perm...	99,588.62	3,175.25	.....	1,905.00	100,858.87
879	M.I.T. Alumni Assn.,Sp. Gifts	1,000.00	35.75	1,000.00	35.75	2,000.00
881	M.I.T. Alumni, 1940–45.....	241,466.46	8,450.00	69,512.83	53,622.32	265,806.97
883	M.I.T. Alumni, 1945–46.....	.....	195.00	87,276.56	9,177.06	78,294.50
		$526,212.70	$17,855.50	$163,923.61	$65,148.55	$642,843.26

SCHEDULE A-5 — (*Continued*)

No.		Balance, June 30, 1944	Investment Income Added to Fund	Other Receipts	Expended or Transferred from Funds	Balance, June 30, 1945
	Funds for Buildings					
901	Anonymous	$720,240.00	$29,900.00	$500,000.00	.....	$1,250,140.00
903	Arthur J. Conner	19,963.26	724.75	5,000.00	.....	25,688.01
905	George Eastman Buildings	119,124.04	3,870.75	25,000.00	.....	147,994.79
907	Matilda A. Fraser	922.23	29.25	.....	.....	951.48
909	Charles D. Waterbury	14,950.15	487.50	.....	.....	15,437.65
		$875,199.68	$35,012.25	$530,000.00	.....	$1,440,211.93
	Funds and Deposits for Student Activities					
921	Major Briggs	$34,603.67	$1,124.50	.....	.....	$35,728.17
923	Ednah Dow Cheney	17,616.03	572.00	.....	$204.14	17,983.89
925	Edward F. and Mary R. Miller	10,961.90	357.50	.....	100.00	11,219.40
927	Henry A. Morss Nautical	2,291.15	74.75	.....	.....	2,365.90
929	W. B. S. Thomas	2,428.14	78.00	.....	.....	2,506.14
931	Alice Brown Tyler	1,882.33	61.75	.....	22.49	1,921.59
933	Undergrad. Activities Trust	1,593.12	52.00	.....	.....	1,645.12
935	Undergrad. Publications Trust	13,803.68	390.00	.....	2,500.00	11,693.68
937	Undergrad. Dues, Athletics	16,584.65	539.50	$1,000.00	.....	18,124.15
939	Undergrad. Dues, Res. & Cont.	18,465.26	585.00	.....	765.76	18,284.50
		$120,229.93	$3,835.00	$1,000.00	$3,592.39	$121,472.54
	Miscellaneous Funds and Deposits					
1001	Albert	$6,097.50	$162.50	.....	$1,949.75	$4,310.25
1003	Alpha Chi Sigma House	3,650.21	130.00	$833.31	100.00	4,513.52
1004	Anonymous (Q)	.....	.....	1,593.74	.....	1,593.74
1005	Anonymous (X)	.....	240.50	18,076.62	.....	18,317.12
1006	Basket Ball Fund	3,743.00	.....	3,466.21	7,209.21	.....
1007	Bess Bigelow	32,789.24	1,066.00	.....	.....	33,855.24
1009	Davis R. Dewey Memorial	523.45	16.25	.....	.....	539.70
1011	Drama Club Theatre	499.89	16.25	.....	.....	516.14
1013	Joseph Hewett	212,185.00	7,638.72	1,062.49	7,980.00	212,906.21
1014	Jacob and Jennie Lichter	.....	97.50	5,000.00	.....	5,097.50
1015	Arthur D. Little Lectureship	.....	97.50	6,100.00	.....	6,197.50
1016	M. I. T. Employees	85.35	.....	.....	85.35	.....
1017	M. I. T. Teachers Insurance	110,573.02	3,087.50	8,346.17	13,610.70	108,395.99
1019	President's Fund, Special	11,800.36	386.75	50.00	700.00	11,537.11
1021	William Patrick Ryan Special	2,053.81	55.25	.....	500.00	1,609.06
1023	Sedgwick Memorial Lecture	14,255.83	468.00	205.20	269.59	14,659.44
1025	Lillie C. Smith	6,040.30	195.00	.....	132.84	6,102.46
1026	Walter G. Snow	13,874.04	451.75	.....	.....	14,325.79
1027	Teachers' Fund	116,036.38	4,030.00	7,960.75	3,700.10	124,327.03
1029	Technology Matrons' Teas	9,049.37	292.50	.....	295.75	9,046.12
1031	George S. Witmer	58,089.89	2,139.35	136.10	1,880.81	58,484.53
		$601,346.64	$20,571.32	$52,830.59	$38,414.10	$636,334.45

SCHEDULE A-5—(Continued)

No.		*Balance, June 30, 1944*	*Investment Income Added to Fund*	*Other Receipts*	*Expended or Transferred from Fund*	*Balance, June 30, 1945*
	RESERVES					
1051	Army & Navy Tr. Res..	$73,954.52	$1,322.75	.....	$47,470.47	$27,806.80
1053	Endowment Reserve...	*319,913.03	6,886.28	$1,108,160.05	241,749.24	1,193,210.12
1057	Photo Service Reserve..	.....	390.00	21,000.00	.....	21,390.00
1959	Reserve for Use of Facilities.....	396,186.50	10,920.00	388,778.00	81,900.00	713,984.50
1063	Walker Mem., Reserve.	.....	195.00	12,000.00	.....	12,195.00
1065	W. M. Dining Serv., Res.	.....	1,300.00	52,699.95	.....	53,999.95
		$790,054.05	$21,014.03	$1,582,638.00	$371,119.71	$2,022,586.37
	Totals, Schedule A-5...	$2,913,043.00	$98,288.10	$2,330,392.20	$478,274.75	$4,863,448.55
	Totals, Endowment and Other Funds.....	$40,119,524.57	$449,289.17	$3,791,184.38	$1,261,421.54	$43,098,576.58

(*Schedule A*)

* Includes $68,513.97 transferred from Income Equalization Reserve Fund.

SCHEDULE A-6

STUDENTS' NOTES RECEIVABLE

Fund	*Notes Receivable June 30, 1944*	*Loans Made 1944-45*	*Loans Repaid 1944-45*	*Notes Receivable June 30, 1945*	*Interes Received 1944-45*
Technology Loan	$667,827.95	$12,215.00	$152,060.93	$527,982.02	$12,923.22
Bursar's	3,890.83	80.00	1,189.53	2,781.30	154.22
William B. Rogers	2,114.05	.....	166.05	1,948.00	203.33
Dean's	1,555.06	325.00	250.00	1,630.06	38.68
Summer Surveying Camp	100.00	.....	.....	100.00	.....
Carl P. Dennett	652.30	.....	187.30	465.00	5.90
George Henry May	3,600.00	400.00	500.00	3,500.00	.....
Medical Special	3,279.81	135.33	270.70	3,144.44	.....
Class of 1896	1,000.00	.....	.....	1,000.00	.....
Frances and William Emerson ...	300.00	.....	.....	300.00	.....
William P. Ryan Memorial.....	205.69	.....	.....	205.69	.....
President's.....	50.00	.....	50.00	.....	3.33
	$684,575.69	$13,155.33	$154,674.51	$543,056.51	$13,328.68

(Schedule A)

SCHEDULE A-7

ACCOUNTS RECEIVABLE

United States Government:		
O.S.R.D. — Radiation Laboratory	$5,978,409.64	
Less Advance Payments thereon	5,978,409.64	
All Other O.S.R.D. Contracts		$440,931.79*
Army, Navy and N.A.C.A. Research Contracts		690,490.37*
Chemical Warfare Service		152,508.17
Navy — Radar School		119,332.03
Navy — V-12 Training Program		30,170.50
Other Tuition Fees		57,110.58
Other Governmental Departments or Agencies		1,004.40
Total United States Government		$1,491,547.84
Industrial Corporations — Research Contracts		33,482.91*
Others:		
Aeronautical Engineering Department — Wind Tunnel Accounts	$21,917.00	
Physics Department—Cyclotron Rental	11,035.00	
Students' Fees and Deposits	2,146.16	
Miscellaneous Accounts	12,733.04	47,831.20
Total (Schedule A)		$1,572,861.95

*Total under direction of Division of Industrial Coöperation $1,164,905.07.

SCHEDULE A-8

CONTRACTS IN PROGRESS

United States Government:		
O.S.R.D. — Radiation Laboratory	$2,756,624.58	
Less: Advance Payments thereon	2,345,985.04	$410,639.54*
All Other O.S.R.D. Contracts		198,766.32*
Army, Navy and N.A.C.A. Research Contracts		511,719.73*
Navy — V-12 Training Program		48,710.00
Weather Bureau Research Program		1,569.99
Total United States Government		$1,171,405.58
Industrial Corporations — Research Contracts		281,254.33*
Other		10,856.60
Total (Schedule A)		$1,463,516.51

* Total under direction of Division of Industrial Coöperation $1,402,379.92.

SCHEDULE A-9

INVENTORIES, PREPAID EXPENSES AND DEFERRED CHARGES

Inventories:		
Department of Buildings and Power:		
Maintenance Supplies	$36,978.70	
Coal	22,892.35	
Oil	2,579.80	
	$62,450.85	
Laboratory Supplies	21,995.10	
Dining Halls, Food and Supplies	19,052.74	
Photographic Merchandise and Supplies	7,639.03	
Dormitories, Room Service Supplies	5,036.52	
Stationery and Stamps	2,735.39	
Radar School — Book Inventory	479.84	
Total Inventories		$119,389.47
Prepaid Expenses and Deferred Charges:		
Deposits with Mutual Fire Insurance Companies	$47,366.90	
Unexpired Insurance Premiums	9,166.78	
Insurance Claims for Fire Losses	9,711.97	
Coöperative Foundation Plan — Insurance Premiums	1,459.12	
Building 18 used by Radar School, less Amortization	29,422.75	
Equipment acquired by Division of Industrial Coöperation, less Depreciation	30,946.89	
Other	39,674.25	
Total Prepaid Expenses and Deferred Charges		167,748.66
Total (Schedule A)		$287,138.13

SCHEDULE A-10

STUDENTS' ADVANCE FEES AND DEPOSITS

1945 Summer Term:		
Tuition Fees	$146,842.00	
Students' Deposits	9,067.88	
Dormitory Rentals	8,428.00	
		$164,337.88
1944-45 Students' Deposits, Returnable		5,734.19
1945-46 Tuition Fees		900.00
Total (Schedule A)		$170,972.07

SCHEDULE A-11

FEDERAL TAX WITHHOLDINGS, WAR BOND AND OTHER DEPOSIT ACCOUNTS

	Balance June 30, 1944	*Receipts or Transfers*	*Expenditures or Transfers*	*Balance June 30, 1945*
Additional Group Insurance	.....	$8,115.70	$8,022.00	$93.70
Blue Cross Hospitalization Program	$3,794.90	45,982.22	35,546.27	14,230.85
Boat House Equipment Account	585.94	407.00	.....	992.94
Building Key Account	3,253.62	1,011.00	872.78	3,391.84
Carnegie Foundation Pension Account	.....	55,823.82	55,823.82	.....
Corporation Flower Fund	.....	60.00	.....	60.00
Dean's Fund Special	600.00	.....	600.00	.....
Division of Industrial Coöperation A.M.P. Royalty Account	1,531.50	4,290.53	.....	5,822.03
Division of Industrial Coöperation No. 5973 Key Account	.....	565.93	.....	565.93
Division of Industrial Coöperation B.B.R.L. Staff Salary Suspense	843.12	3,153.48	3,083.17	913.43
Duperial Scholarship	659.00	.....	659.00	.....
Employees' Fund	.....	85.35	.....	85.35
Faculty Flower Fund	380.15	8.00	107.90	280.25
Greater Boston United War Fund	.....	5,615.03	5,570.97	44.06
Greater Boston United War Fund and Red Cross — Radiation	.....	1,729.75	1,672.75	57.00
Iraqi Education Directorate Account	.....	20,150.00	11,987.01	8,162.99
Lowell Institute	.....	1,555.00	1,555.00	.....
Melvin Trust Scholarships	1,000.00	5,100.00	3,780.00	2,320.00
Nautical Association	309.00	941.00	667.00	583.00
Radar School Harbor Building Book Account	.....	928.24	928.24	.....
Rockefeller Foundation Emergency O.F.S. Expense Account	5,000.00	.....	3,367.99	1,632.01
Technique	25.40	103.50	85.90	43.00
Technology Christian Association	1.00	427.50	428.50	.....
Undergraduate Dues	1,378.50	12,750.50	12,482.00	1,647.00
United States Non-Resident Alien Tax	.....	395.29	395.29	.....
United States War Savings Bonds	28,362.38	844,219.57	795,917.23	76,664.72
United States Withholding Tax	162,882.03	2,264,416.17	2,194,117.88	233,180.32
	$210,606.54	$3,277,834.58	$3,137,670.70	$350,770.42

(Schedule A)

SCHEDULE A-12

UNEXPENDED CURRENT FUNDS, APPROPRIATIONS AND RESERVES

Department Accounts	*Balance June 30, 1944*	*Receipts or Transfers*	*Expenditures or Transfers*	*Balance June 30, 1945*
Aeronautical Engineering:				
Aerodynamic Research	$267.88	.....	.....	$267.88
C. A. A. Pilot Training Program	16,621.43	$18.91	$5,000.00	11,640.34
Goodyear Fellowship	.....	1,500.00	.....	1,500.00
Instrument Lab. — Maintenance	.....	2,641.32	1,705.91	935.41
Special 500–762 Acct., Draper	1,468.51	.....	.....	1,468.51
Special Appro. No. 1938	4,625.89	2,600.00	532.06	6,693.83
Special Appro. No. 1990	4,361.72	.....	16.01	4,345.71
Special Appro. No. 2065	.....	20,000.00	2,189.12	17,810.88
Structural Lab. Equipment	525.34	.....	.....	525.34
Summer Shop Course, Markham	65.67	.....	.....	65.67
Vibration Research No. 1333	.....	811.35	156.40	654.95
Wind Tunnel	186,471.35	149,550.74	[1]209,903.55	126,118.54
Architecture:				
City Planning Conf. Account	876.89	1,000.00	893.95	982.94
Housing Res. Special No. 1899	4,059.59	.....	560.25	3,499.34
Lecture Special No. 2031	.....	300.00	300.00	.....
Traveling Fellowship	1,975.00	.....	.....	1,975.00
Bemis Research:				
Expense Account	.....	1,745.16	1,745.16	.....
Salary Account	.....	3,325.00	3,325.00	.....
Biology and Biological Engineering:				
Baruch Fund	.....	10,022.56	2,846.95	7,175.61
Baruch Committee on Physical Medicine Fellowship	.....	1,500.00	450.00	1,050.00
Biological Shop Account	1,388.91	105.52	318.11	1,176.32
Biological Shop Sp. Appro. 1648	2,517.19	.....	.....	2,517.19
C. E. M. Account	6,019.12	1,077.19	7,096.31	.....
Corn Industries Research Foundation	2,092.24	.....	1,583.02	509.22
Diversey Corp. Fellowship	852.67	.....	.....	852.67
du Pont Cell. Research Fund	523.33	.....	52.29	471.04
Electron Microscope Research	.....	6,805.89	6,805.89	.....
Equipment Special	.....	924.67	924.67	.....
Gillette Safety Razor Co.	.....	15,000.00	.....	15,000.00
Haskins Fellowship	1,666.64	.....	.....	1,666.64
Hoffman La Roche Fund	2,500.00	.....	2.06	2,497.94
A. C. Lawrence Fund	4,894.93	.....	16.75	4,878.18
Lilly P. I. Fund	.....	5,000.00	7.50	4,992.50
Lever Bros. Fellowship	744.63	2,250.00	2,575.72	418.91
Moore, Emma B., Ration Research	500.00	.....	160.19	339.81
Nutrition Research	731.04	104.00	770.93	64.11
Pan American Fund	.....	21,583.63	20,512.59	1,071.04
Penicillin Special	3,473.23	.....	2,854.53	618.70
Rockefeller Fd., Biological Engineering	428.47	44,971.76	19,977.94	25,422.29
Rockefeller Fd., Nutrition Research	41.44	3.56	45.00	.....
Royalty Receipts Pat. 665135	6,508.67	1,924.70	6,471.98	1,961.39
Rubber Research Special 1915	5,224.65	.....	1,223.06	4,001.59
Submarine Signal Co.	.....	9.30	9.30	.....
Vitamin K Fund	1,913.51	2,400.00	2,489.85	1,823.66
Building Engineering and Construction:				
National Lime Association	805.14	5,000.00	3,864.44	1,940.70
Research Corp. Build. Material	2,727.42	.....	225.00	2,502.42
Special Appro. No. 1985	1,294.20	503.49	1,797.69	.....
Tucker (Ross Francis) Memorial Fund	140.12	.....	6.39	133.73

[1] $100,000 transferred to Wind Tunnel Research Account (see page 180).

SCHEDULE A-12 — (Continued)

Department Accounts (Continued)	*Balance June 30, 1944*	*Receipts or Transfers*	*Expenditures or Transfers*	*Balance June 30, 1945*
Bus. and Eng. Administration:				
Case Research	$29.35	.....	.....	$29.35
Human Relationships Account	61.53	.....	.....	61.53
John R. Macomber Fund	11.21	.....	.....	11.21
Newman M. Marsilius Fund	578.31	.....	$552.61	25.70
Office of Emergency Manage., Special A-35	295.63	.....	.....	295.63
Puerto Rico Fellowships	608.92	$9.94	320.31	298.55
Sloan Book Account	343.04	12.50	123.89	231.65
Special Appropriation No. 1850	385.63	42.97	.....	428.60
Special Appropriation 1931	323.51	.....	.....	323.51
Sponsored Fellow., Operating	2,612.10	.....	.....	2,612.10
Sponsored Fellow., Research	2,340.54	4.00	.....	2,344.54
Chemical Engineering:				
Alsifilm Research	199.86	.....	.....	199.86
Colloid Chemistry Special 1207	281.28	.....	.....	281.28
S. C. Johnson & Son, Inc. Colloid Chemistry Fellowship	.....	5,000.00	.....	5,000.00
Fuels Research	2,354.26	.....	.....	2,354.26
Paint Films Special No. 1992	3,416.48	.....	644.13	2,772.35
Special Research No. 1421	250.00	.....	.....	250.00
Chemistry:				
Davis Special Account	$185.13	.....	$23.75	$161.38
Inorganic Equipment Account	931.30	.....	.....	931.30
Arthur D. Little Spec. Fellowship	220.00	217.50	437.50	.....
Physical Chemistry Royalties	4,412.57	928.47	.....	5,341.04
Polymerization Research	1,915.25	.....	.....	1,915.25
Polysodium Research	1,025.15	572.00	1,597.15	.....
Research Corp. Vitamins A and D Research	209.74	5,002.18	4,392.86	819.06
Royalty Receipts Pat. 665135	.....	4,056.95	282.69	3,774.26
Sharpe and Dohme, Inc.	.....	800.00	.....	800.00
Sugar Research Fund	12,167.58	25,076.02	32,665.29	4,578.31
Special Appro. No. 2048 — Freshman Laboratory	.....	75,000.00	60,459.32	14,540.68
Welch Fund	.....	1,000.00	4.00	996.00
Civil Engineering:				
Cement Research Special 1056	1,397.44	.....	.....	1,397.44
Equipment Special 1326	338.82	.....	.....	338.82
Freeman Hydraulic Research	800.00	.....	.....	800.00
Laboratory Special No. 2032	.....	516.66	516.66	.....
Retaining Wall Laboratory Special	.....	200.00	.....	200.00
River Hydraulic Laboratory	935.14	250.00	.....	1,185.14
Sanitary Science Laboratory Spec. No. 2087	.....	15,000.00	.....	15,000.00
Soil Mechanic Laboratory	620.03	1,327.15	1,482.38	464.80
Special Research No. 1364	2,581.42	.....	.....	2,581.42
Structural Laboratory	.....	733.58	675.58	58.00
Summer Camp Construction Reserve	4,091.07	1,191.36	.....	5,282.43
Wallace and Tiernan Grant	.....	5,000.00	.....	5,000.00
Economics:				
Post War Science Survey	.....	*6,978.64	6,978.64	.....
Rockefeller Foundation Grant 41042	4,595.71	500.00	4,683.90	411.81

* Includes balance of work in progress.

SCHEDULE A-12 — (Continued)

Department Accounts (Continued)	Balance June 30, 1944	Receipts or Transfers	Expenditures or Transfers	Balance June 30, 1945
Electrical Engineering:				
Balsbaugh Research	$3,115.87	$1,965.01	$4,250.85	$830.03
Balsbaugh Research Special	2,750.00	.....	.....	2,750.00
Center of Analysis	36,703.73	141,634.33	162,160.26	16,177.80
Center of Analysis Special No. 2028	.....	12,560.85	12,560.85	.....
Coating Metals Special No. 1946	598.00	.....	.....	598.00
Communications Laboratory, U.H.F. Research	1,874.94	.....	.....	1,874.94
Course Revision Special No. 1250	815.69	57.48	190.31	682.86
Course VI-A Travel Account	1,014.84	1.31	397.72	618.43
Edgerton Film Research	1,103.80	82.50	.....	1,186.30
Electronics Special	2,500.00	.....	1,841.00	659.00
Hyams Radiation Research	.....	*9,657.88	*9,657.88	.....
Int. Tel. and Tel. Research 1940-41	399.38	.....	.....	399.38
Int. Tel and Tel. Research	865.70	.....	.....	865.70
Micro Calibration Research	120.90	.....	.....	120.90
Micro Wave Research	6,357.06	.....	.....	6,357.06
Network Analyzer	11,605.82	6,382.99	814.50	17,174.31
Network Analyzer Special	3,601.11	.....	3,601.11	.....
Notes Account Special 1642	8,133.52	16,946.65	25,080.17	.....
Oil Gear Research	.....	6,000.00	.....	6,000.00
Oncologic Research	.....	*14,556.28	*14,556.28	.....
Photoelectric Cells Research Special 1874A	4,157.98	.....	.....	4,157.98
Radio Research Special 1550	1,724.15	.....	.....	1,724.15
Rapid Selection Research	6,981.62	.....	.....	6,981.62
Research Corp., Arithmetical Machine Special	420.28	.....	2.75	417.53
Research Corp., High Voltage Research	164.70	2.75	112.78	54.67
Round Hill Research	117.13	.....	.....	117.13
Servos Royalty Account	823.47	.....	.....	823.47
Servos Special, Brown	2,804.34	154.51	501.92	2,456.93
Shop Equip. Special (Lathe)	800.00	.....	.....	800.00
Special Appropriation No. 1986	5,000.00	.....	.....	5,000.00
U. H. F. Dielectrics Research Special 1874B	6,000.00	.....	.....	6,000.00
U. S. Navy Fire Control Research	.....	850.99	850.99	.....
von Hippel Research Sp. 1219	118.89	.....	.....	118.89
English and History:				
International Relations Library	91.89	.....	.....	91.89
Food Technology:				
Apple Fellowship	.....	5,000.00	28.50	4,971.50
Bartlett Arkel Fund	623.46	.....	557.78	65.68
Bruce's Juices Inc. Fellowship	.....	6,000.00	.....	6,000.00
Food Technology Special	.....	847.08	847.08	.....
Food Research	346.18	274.28	468.91	151.55
Joe Lowe Corp. Research	.....	1,500.00	.....	1,500.00
Kroger Grocery and Baking Co. Fellowship	817.10	.....	.....	817.10
Moore, Emma B., Ration Research	500.00	.....	.....	500.00
Proctor Special Fund	24.84	.....	.....	24.84
Underwood, William, Fellowship	635.87	.....	208.59	427.28
Geology:				
Geological Research Special 1863	4,551.38	.....	.....	4,551.38
National Research Council, Research	242.01	.....	98.41	143.60
Geophysical Research	.....	1,892.78	1,681.40	211.38
Graphics:				
National Research Council, Grant	184.21	.....	.....	184.21

* Includes balance of work in progress.

SCHEDULE A-12 — (Continued)

Department Accounts (Continued)	*Balance June 30, 1944*	*Receipts or Transfers*	*Expenditures or Transfers*	*Balance June 30, 1945*
Industrial Relations Section:				
Special Appropriation No. 1955	$557.41	$119.18	.....	$676.59
Mathematics:				
Applied Mathematics Program	11,700.00	.....	.....	11,700.00
Journal of Mathematics and Physics	816.91	4,032.81	$1,830.73	3,018.99
Putnam Fund	310.52	.....	20.00	290.52
Mechanical Engineering:				
A. S. M. E. Research	192.59	.....	68.96	123.63
Automotive Laboratory Special 1953	353.24	.....	332.44	20.80
Cavitation Research	1,771.80	800.00	339.07	2,232.73
deForest Research Special 1254	6,287.50	1,407.00	1,476.63	6,217.87
Disc Research	3,623.34	4,625.00	8,248.34	.....
A. S. R. E. Research	.....	500.00	1.30	498.70
Gas Turbine Research	19,768.72	.....	145.83	19,622.89
Harvey — Nonferrous Forgings Fund	5,000.00	5,000.00	.....	10,000.00
Keenan Research	8.75	.....	.....	8.75
Magnaflux Research Fund	.....	10,000.00	47.36	9,952.64
Mechanics of Materials Special No. 2041	.....	25,000.00	.....	25,000.00
Shop Maintenance Account	7,941.14	5,227.21	3,818.45	9,349.90
S. Slater & Sons Inc. Fund	11,238.98	33,822.25	29,292.57	15,768.66
Sloan Building Special 1951	108.63	.....	108.63	.....
Sloan Building Special 2008	1,287.21	24.79	1,312.00	.....
Sloan Building Special No. 2056	.....	8,000.00	4,920.86	3,079.14
Special Research	594.75	.....	238.82	355.93
Testing Machine Special 1624	89.81	43.11	43.11	89.81
Testing Machine Special 1963	235.49	.....	34.72	200.77
Testing Materials Laboratory Special	2,679.31	5.54	6.34	2,678.51
Testing Materials Laboratory Sp. 1523	347.22	.....	.....	347.22
Textile Equipment Special	468.33	562.60	487.42	543.51
Textile Foundation Research	2,555.09	999.99	1,052.36	2,502.72
Medical:				
Homberg Infirmary Alterations	30,987.86	.....	28,416.35	2,571.51
Special — Needy Student Fund	†1,977.16	270.70	135.33	†2,112.53
Metallurgy:				
Cates Equipment Special	2,215.94	.....	1,972.60	243.34
Chipman Research Special 1337	.....	1,246.82	1,066.83	179.99
Clay Research	1,377.25	200.00	954.17	623.08
Dust Removal Special 1945	44.95	.....	.....	44.95
Engineering Foundation Welding Research	3,297.09	4,100.00	5,158.14	2,238.95
Equipment Special No. 1234	1,027.06	1,121.40	18.00	2,130.46
Equipment Special No. 1259	2,486.64	1,693.80	124.28	4,056.16
Equipment Special, Hayward	200.00	.....	150.75	49.25
Magnet Generator Purchase Account	14,260.00	.....	.....	14,260.00
Magnetic Laboratory Special 1222	362.89	.....	3.57	359.32
Mineral Dressing Research	.....	958.50	565.84	392.66
New England Carbide Research Associateship at M.I.T.	.....	1,500.00	333.37	1,166.63
Revere Copper and Brass Co. Research	2,067.35	1,600.00	554.24	3,113.11
Sheffield Foundation Research	719.46	5,020.52	5,119.20	620.78
Special Research No. 1354	478.53	.....	.....	478.53
Special Research No. 1818	2,108.98	.....	1,695.68	413.30
Vanadium Corp. Fellowship	578.41	3,000.00	2,975.28	603.13
Wellman, S. K., Fellowship	.....	7,500.00	.....	7,500.00

† Exclusive of students' notes receivable. (See Schedule A-6.)

SCHEDULE A-12 — (Continued)

Department Accounts (Continued)	*Balance June 30, 1944*	*Receipts or Transfers*	*Expenditures or Transfers*	*Balance June 30, 1945*
Meteorology:				
Cosmic Ray Research	$500.00	.....	$500.00	.....
Pamphlets Deposit Special	164.00	.....	.....	$164.00
Weather Bureau Research	.....	$10,044.99	10,044.99	.....
Weather Bureau Special	226.96	.....	226.96	.....
Military Science:				
Freshman Uniform Account	384.09	2,439.89	1,887.93	936.05
Senior Uniform Upkeep Account	134.97	.....	.....	134.97
Naval Architecture:				
Propeller Tunnel Special 1548A	2,933.64	967.00	1,071.23	2,829.41
Special Fund (Anonymous)	2,614.92	.....	425.11	2,189.81
Physics:				
American Petroleum Institute Fund	.....	9.860.00	9.721.56	138.44
Cabot X-Ray Fund	.....	6,000.00	.....	6,000.00
Carnegie Institution of Washington, Boyce	1,767.23	.....	.....	1,767.23
Carnegie Institution of Washington, Vallarta	860.00	.....	.....	860.00
Crystal Research	538.12	368.65	81.79	824.98
Evans Research	860.98	445.27	509.79	796.46
G. S. A. Grant — Sheppard	268.48	1.63	270.11	.....
Glass Industry Fellowship	250.00	.....	.....	250.00
Gulf Oil Corp. Research	1,100.00	.....	550.00	550.00
National Co. Electronics Fund	.....	1,500.00	.....	1,500.00
Nuclear Research	9,896.78	.....	24.16	9,872.62
Radioactivity Center	27,238.18	100,079.47	104,600.42	22,717.23
Roentgen Ray Research	232.26	.....	.....	232.26
Rockefeller Foundation Grant No. 45050	.....	50,000.00	78.67	49,921.33
Special Appropriation No. 2047	.....	30,000.00	773.70	29,226.30
Spectroscopy Special	10,644.52	.....	.....	10,644.52
Zeeman Effect Program Special 1755	660.25	.....	.....	660.25
Solar Energy Research:				
Chemistry	805.96	.....	4.04	801.92
Electrical Engineering	656.44	.....	.....	656.44
Geology	485.83	.....	.....	485.83
Headquarters Account	808.64	500.00	179.54	1,129.10
Metallurgy	46.39	800.00	260.91	585.48
	$643,719.63	$1,019,854.46	$900,006.75	$763,567.34
Other Accounts				
Library:				
Crafts Library	$479.53	.....	.....	$479.53
Dewey Library	24.57	$6.00	$16.72	13.85
Humanities Library	184.69	.....	.....	184.69
Library Growth	16,449.93	1,921.40	16,960.43	1,410.90
Special No. 1	722.78	68.95	691.57	100.16
Special No. 1853	1,281.36	.....	202.27	1,079.09
Walker Memorial Library	2,462.08	3,028,00	2,848.18	2,641.90
	$21,604.94	$5,024.35	$20,719.17	$5,910.12

SCHEDULE A-12 — (Continued)

Other Accounts (Continued)	*Balance June 30, 1944*	*Receipts or Transfers*	*Expenditures or Transfers*	*Balance June 30, 1945*
Research (other than those under Department Accounts):				
All American Aviation, Inc. Richard G. duPont Memorial	$5,000.00	.....	.....	$5,000.00
Chemical Warfare Service Development Laboratory "G"	.....	$790,714.59	$790,714.59	.....
Cosmic Terrestrial Research	2,371.37	13,500.00	9,188.06	6,683.31
Division of Industrial Coöperation	34,788.38	*7,747.81	.....	42,536.19
General Radio Company Fund	2,000.00	.....	.....	2,000.00
Radar School, Harbor Building	.....	828,932.80	798,729.85	30,202.95
Research Associates 1943	3,000.00	.....	.....	3,000.00
Plastics Materials Manufactures Assoc.	.....	3,003.39	3,003.39	.....
	$47,159.75	$1,643,898.59	$1,601,635.89	$89,422.45

* Net increase in Funds.

Miscellaneous:				
Alumni Fund, Bulletin Special 1560	$845.57	.....	.....	$845.57
Emma Rogers Room — Social Account	.....	$732.09	$655.80	76.29
Executive Committee Special Account	.....	152.50	152.50	.....
Guide Service Special 1558	169.80	.....	.....	169.80
Gymnasium Special	915.53	.....	.....	915.53
Historic Memorials	57.19	500.00	81.16	476.03
Kasch Fellowships	330.00	.....	150.00	180.00
Kurrelmeyer Fund	.....	10.00	.....	10.00
Lecture Fund	860.00	.....	.....	860.00
Museum Committee Account	159.46	1,679.23	1,838.69	.....
Patent Committee	77.51	.....	.....	77.51
Photographic Service	1,969.79	142,241.85	143,894.19	317.45
President's Fund	1,006.63	403.33	526.81	883.15
President's Portrait Fund	230.40	.....	.....	230.40
President's Special Fund "L"	.....	5,050.00	2,210.45	2,839.55
Sailing Trophy Fund	3.52	.....	.....	3.52
Salvage Fund	802.45	.....	.....	802.45
Steam and Electric System Special 1879	32,281.01	.....	32,281.01	.....
Swimming Pool Equipment	80.90	.....	80.90	.....
Technology Club of Philadelphia	100.00	.....	100.00	.....
Technology Press	.....	24,979.00	.....	24,979.00
Technology Press — Shimer-Shrocks Index Fossils	.....	8,660.95	8,660.95	.....
Technology Press Special 1494	458.45	822.35	1,280.80	.....
Technology Press Special 1468	5,411.24	.....	5,411.24	.....
Technology Press Special 1468A	1,398.87	468.87	1,867.74	.....
Travel Suspense Account	7.43	24,551.60	24,356.65	202.38
United States Government Army and Navy Training Program Navy V-12 Program	.....	891,058.57	891,058.57	.....
United States Government Engineering, Science and Management War Training No. 2	86,157.63	.....	86,157.63	.....
United States Government Engineering, Science and Management War Training No. 3	.....	2,798.00	2,798.00	.....
Veterans' Administration Account No. 16	.....	9,426.14	9,426.14	.....
Veterans Administration Account No. 346	.....	15,612.91	15,612.91	.....
Visiting Committees Reports, Special	147.03	.....	47.44	99.59
Walker Memorial Fire Account	.....	7,732.42	7,732.42	.....
	$133,470.41	$1,136,879.81	$1,236,382.00	$33,968.22

SCHEDULE A-12 — (Concluded)

Other Accounts (Continued)	*Balance June 30, 1944*	*Receipts or Transfers*	*Expenditures or Transfers*	*Balance June 30, 1945*
Reserves:				
Alterations Special No. 2091	.....	$1,900.00	$156.50	$1,743.50
Bemis Real Estate	$1,174.72	.....	236.61	938.11
Building 8 New Electric Lines Spec. No. 2022	3,000.00	.....	1,867.55	1,132.45
Division of Industrial Coöperation	115,209.35	*1,366.51	.....	116,575.86
Dormitory Equipment	18,327.47	3,723.52	22,050.99	.....
Graduate House Dining Service	5,304.72	13,318.00	3,723.00	14,899.72
Graduate House Equipment	312.00	877.00	.....	1,189.00
Photographic Service	12,000.00	.....	‡12,000.00	.....
Radar School, Harbor Building	15,721.39	19,736.39	8.32	35,449.46
Space Changes Special No. 2053	.....	5,000.00	1,001.22	3,998.78
Special War Reserve Fund 1941–42	†324,993.61	.....	.....	324,993.61
Walker Building	6,000.00	.....	‡6,000.00	.....
Walker Memorial Dining Service	55,414.82	12,000.00	‡67,414.82	.....
	$557,458.08	$ 57,921.42	$114,459.01	$500,920.49
Total	$1,403,412.81	$3,863,578.63	$3,873,202.82	$1,393,788.62

(Schedule A)

* Net increase in Funds.
† Formerly carried under Endowment and Other Funds.
‡ Includes transfers to Major Fund Group for investment purposes (see page 186).

SCHEDULE A-13

[1]EDUCATIONAL PLANT ASSETS

Land in Cambridge:		
Campus — east of Massachusetts Avenue ..	$1,125,766.67	
Campus — west of Massachusetts Avenue..	850,014.82	
		$1,975,781.49
Educational Buildings, Cambridge:		
Main Group	$5,633,419.62	
George Eastman Research Laboratories....	1,225,098.58	
Pratt School of Naval Architecture	674,971.70	
Chemical Engineering Laboratories (Bldg. 12)	536,268.99	
Guggenheim Aeronautical Laboratory	293,637.46	
Wright Brothers Memorial Wind Tunnel...	217,506.25	
Magnetic Substation	76,272.73	
Sloan Automotive Laboratories	234,868.15	
Mechanic Arts Building	83,658.89	
Nuclear Research Laboratory	34,891.27	
Cyclotron Laboratory	20,247.92	
Solar Energy Laboratory	10,500.00	
Hyams Radiation Laboratory	13,500.00	
Research Building	76,835.88	
Hydraulic Laboratories	11,000.00	
Chemical Engineering Laboratory (Bldg. 38)	31,000.00	
		9,173,677.44
Educational Equipment		2,039,953.60
Undergraduate Dormitories		1,458,923.79
Infirmary, Recreational and Athletic Buildings:		
Homberg Memorial Infirmary	$188,441.60	
Walker Memorial	714,587.02	
Alumni Swimming Pool	377,992.93	
Boat House	54,244.13	
Barbour Field House	84,042.54	
Sailing Pavilion	28,849.09	
Briggs Field House and Track	121,197.99	
		1,569,355.30
Summer Camp:		
East Machias, Maine	$120,558.00	
		120,558.00
Miscellaneous:		
Power Plant	$389,064.17	
Steam and Electrical Distribution System..	154,055.24	
Service Building and Garages	55,369.74	
Other Plant Assets	271,907.92	
		870,397.07
Total, June 30, 1945 (Schedule A)		$17,208,646.69

[1]Not including Graduate House (see investments, page 172), nor Buildings 20, 22 and 24, built for and used by U. S. Government Research.

SCHEDULE A-14

PRINCIPAL GIFTS AND APPROPRIATIONS FOR EDUCATIONAL PLANT

For Land:		
T. C. du Pont	$625,000.00	
A. F. and Ida F. Estabrook Funds	105,000.00	
Maria A. Evans	169,080.60	
Edmund D. Barbour Fund	234,634.18	
From Miscellaneous Contributors	277,222.89	
Appropriations from Funds — Blake, $5,000; Lyman, $5,000; Kimball, $10,000; McGregor, $2,500; Philbrick, $2,000; Richards, $1,000; Perkins, $3,252.32; Current Income, $6,500	35,252.32	
		$1,446,189.99
For Educational Buildings (including President's House, Power Plant and buildings other than Dormitories and those used for Student Recreational and Athletic Purposes):		
*George Eastman	$5,778,222.86	
T. C. and P. S. du Pont, Charles Hayden, Arthur Winslow for Mining Engineering Building	225,000.00	
Maria A. Evans Fund	100,000.00	
C. A. Stone and E. S. Webster	187,500.00	
Sale of Land and Building in Boston (1938)	972,283.33	
Pratt Fund, for School of Naval Architecture	675,150.00	
Guggenheim Fund, for Aeronautical Laboratory	230,000.00	
Appropriations for Aeronautical Laboratory— From Funds: Perkins, $12,508.02; Hayden, $42,700.76; Frisbie, $7,614.98	62,823.76	
Alfred P. Sloan, Jr., for Automotive Laboratory	152,464.35	
Appropriation for Automotive Laboratory— From Current Income	60,000.00	
Edmund D. Barbour Fund for:		
Nuclear Laboratory	32,341.27	
Magnetic Laboratory	40,772.73	
Power Plant	90,006.59	
Miscellaneous Contributions and Appropriations from Funds for: Magnetic Lab., $5,500; Nuclear Research Lab., $2,500; Cyclotron, $20,247.92; Hyams Radiation Lab., $13,500; and Solar Energy Lab., $10,500; Anonymous, $1,000, Bldg. 6	53,247.92	
†Subscriptions to Wright Brothers Memorial Wind Tunnel	95,795.00	
Appropriation for Wind Tunnel — Current Income	9,000.00	

* Includes Mr. Eastman's original gift of $3,500,000 together with appropriations from the Building Fund of $2,500,000 which he established.

† Otherwise paid for from Eastman Building Fund.

SCHEDULE A-14 — (Continued)

For Educational Buildings (*Continued*):		
Miscellaneous Appropriations from Current Income for: Compression Lab., $31,000; Tractor Garage, $6,400	$37,400.00	
		$8,802,007.81
For Educational Equipment:		
Emma Rogers Fund	$528,077.06	
F. W. Emery Fund	126,423.80	
C. L. W. French Fund	100,843.34	
Equipment moved from Boston (1916) Est.	500,000.00	
Alumni Fund	82,119.38	
Appropriations from Funds — Drew, $305,171.52; Peabody, $52,238.89; duPont, $12,500; Tuttle, $50,000; Thayer, $25,000; Dorr, $49,573.47	494,483.88	
Appropriations from Current Income	193,576.34	
Miscellaneous Contributions	14,429.80	
		2,039,953.60
For Dormitories:		
Maria A. Evans Fund	$261,192.55	
T. C. duPont	100,000.00	
Alumni Dormitory Fund	566,945.66	
Edmund D. Barbour Fund	258,599.40	
Erastus C. Gaffield Fund	120,000.00	
Appropriations from Funds — Robb, $28,750; Thorndike, $15,000; Hodges, $57,316.26; Wood, $28,750	129,816.26	
Appropriated, Current Income	22,369.92	
		1,458,923.79
For Summer Camp:		
Edward Cunningham Fund	$15,000.00	
Charles W. Eaton Fund	15,501.45	
Appropriations from Current Income	90,056.55	
		120,588.00
For Infirmary, Recreational and Athletic Buildings:		
Julius Rosenwald and family — Homberg Infirmary	$110,225.00	
Appropriations from Funds — Homberg Infirmary — Chase, $4,090.09; A. H. Munsell, $7,908.28; M. A. Munsell, $1,105.32; Industrial, $41,137.61; A. F. Estabrook, $10,000; I.F. Estabrook, $2,157.51; Perkins, $764.66	67,163.47	
Appropriation for Homberg Infirmary from Current Funds	11,500.00	
Walker Memorial Fund	167,303.96	
Improvement Fund, for Walker Memorial	24,491.34	
Alumni Fund, for Walker Memorial	490,000.00	

SCHEDULE A-14—(Continued)

For Infirmary, Recreational and Athletic Buildings (*Continued*):		
Edmund D. Barbour Fund, for Field House.	$55,000.00	
Alumni Fund, for Swimming Pool.....	228,479.15	
Stephen Bartlett Fund, for Swimming Pool.	117,071.64	
Class of 1923, Sun Garden.....	10,000.00	
Alumni Fund, for Briggs Field House and Track.....	156,169.13	
Edmund D. Barbour Fund, Sailing Pavilion.	13,363.89	
Anonymous for Boat House.....	30,000.00	
Appropriations from Current Income for:		
Boat House.....	6,500.00	
Sailing Pavilion.....	15,485.20	
Squash Courts.....	29,042.54	
Rifle Range.....	1,500.00	
		$1,533,295.32
Miscellaneous:		
From Sale of Land and Buildings in Boston 1916.....	$656,919.45	
Other Contributions, Appropriations, etc....	1,150,798.73	
		1,807,718.18
Total June 30, 1945 (Schedule A).....		$17,208,646.69

SCHEDULE B-1

RENTALS AND OTHER INCOME

Anonymous for Chemical Engineering.....	$1,000.00
Photographic Service, Rental.....	5,000.00
Land Rentals, etc.....	4,114.82
Lecture Notes.....	1,172.55
General Electric Company for Course VI-A.....	7,000.00
General Radio Company for Course VI-A.....	1,200.00
Boston Edison Company for Course VI-A.....	1,200.00
Philco Corporation for Course VI-A.....	10,000.00
Recoveries of Student Fees Prior Years (Net).....	93.81
Royalties Received.....	185.75
Inventory Adjustments (Net).....	162.34
Legal Expense Recoveries.....	1,890.47
Trustees of H. C. Frick Estate.....	3,924.13
United States Navy Fire Control Research.....	750.00
U. S. Government—Chemical Warfare Service.....	30,000.00
Total (Schedule B).....	$67,693.87

SCHEDULE B-2

SALARIES AND WAGES OF STAFF, ACCESSORY TO TEACHING AND LABORATORY SERVICE

Department	*Staff Salaries*	*Wages Accessory to Teaching*	*Wages Laboratory Service*	*Total*
Aeronautical Engineering	$124,603.25	$2,259.88	$25,567.37	$152,430.50
Architecture	58,307.18	7,198.93	560.25	66,066.36
Bemis Research	3,325.00	.....	.....	3,325.00
Biology	71,196.07	6,059.77	15,499.68	92,755.52
Building Eng. and Construction	21,696.10	1,355.15	2,442.46	25,493.71
Business and Eng. Adminis.	48,259.95	5,246.75	.....	53,506.70
Chemical Engineering	89,423.46	6,437.09	10,040.94	105,901.49
Chemical Eng. Practice School	4,537.50	.....	.....	4,537.50
Chemistry	207,562.32	11,025.02	20,901.66	239,489.00
Civil Engineering	93,982.08	3,120.00	6,344.80	103,446.88
Division of Laboratory Supplies	.....	.....	22,269.74	22,269.74
Economics	60,026.86	4,326.09	.....	64,352.95
Electrical Engineering	180,213.32	13,252.52	41,787.36	235,253.20
English and History	69,699.89	2,127.96	.....	71,827.85
Food Technology	10,665.79	556.93	.....	11,222.72
Gen. Eng. and General Science	4,000.00	1,266.26	.....	5,266.26
Geology	23,878.32	2,827.24	3,022.10	29,727.66
Graphics	32,699.93	820.93	.....	33,520.86
Group Dynamics	2,558.34	.....	.....	2,558.34
Industrial Relations Section	29,421.81	.....	.....	29,421.81
Lantern Operation	.....	.....	1,351.86	1,351.86
Mathematics	93,179.92	2,831.94	.....	96,011.86
Mechanical Engineering	244,143.20	10,902.85	29,756.35	284,802.40
Metallurgy	100,478.34	4,758.73	9,723.93	114,961.00
Meteorology	59,032.57	8,356.47	.....	67,389.04
Military Science	3,118.97	1,260.00	.....	4,378.97
Modern Languages	21,483.31	.....	.....	21,483.31
Naval Architecture	53,135.62	2,439.82	2,118.56	57,694.00
Physics	130,152.94	7,788.53	37,421.20	175,362.67
Solar Energy Research	3,532.10	.....	.....	3,532.10
Totals	$1,844,314.14	$106,218.86	$228,808.26	$2,179,341.26

(Schedule B)

SCHEDULE B-3

APPROPRIATIONS FROM FUNDS AND OTHER CREDITS FOR SALARIES AND WAGES OF STAFF, ACCESSORY TO TEACHING AND LABORATORY SERVICE

	D. I. C. Credits	*Other Credits*		*Total*
Aeronautical Engineering				$84,073.71
Staff Salaries	$9,471.96	Staff Salaries:		
Lab. Service Salaries	427.80	Wind Tunnel	$39,536.34	
		Industrial Fund	8,666.66	
		Pilot Training Acct.	5,000.00	
		Lab. Service Salaries:		
		Wind Tunnel	20,970.95	
Architecture				3,410.28
Staff Salaries	2,000.03	Staff Salaries:		
		City Planning Conf.	600.00	
		Special 1899	250.00	
		Lab. Service Salaries:		
		Special 1899	560.25	
Bemis Research				3,325.00
		Staff Salaries:		
		Bemis Research Fund	3,325.00	
Biology				57,711.13
Staff Salaries	17,340.61	Staff Salaries:		
		Baruch Fund	90.00	
		Cabot Electronic Microscope	4,670.00	
		Corn Industries Research	1,543.30	
		Lever Bros. Fell.	1,800.00	
		Pan American Research	4,165.00	
		Penicillin Research	400.00	
		Electron Microscope	3,000.00	
		Rockefeller Research	9,567.15	
		Special 1915	170.00	
		Vitamin Research	1,400.00	
		Patent Royalty Acct.	2,500.00	
		Lab. Service Salaries:		
		Cabot Electronic Microscope	1,427.21	
		Lever Bros. Fell.	445.25	
		Pan American Research	570.64	
		Electron Microscope	2,387.94	
		Rockefeller Research	2,925.70	
		Vitamin Research	615.00	
		Acc. to Teaching Salaries:		
		Pan American Research	796.25	
		Penicillin Research	1,552.58	
		Vitamin Research	344.50	
Building Construction				3,292.46
		Staff Salaries:		
		National Lime Assoc.	850.00	
		Lab. Service Salaries:		
		National Lime Assoc.	2,442.46	
Business and Engineering Administration				12,799.98
Staff Salaries	12,799.98			

SCHEDULE B-3 — (Continued)

	D. I. C. Credits	*Other Credits*		*Total*
Chemical Engineering				$38,883.83
Staff Salaries	$11,081.62	Staff Salaries:		
Lab. Service Salaries	2,376.35	N. D. R. C. (Hottel)	$3,557.69	
Acc. to Teaching Salaries	1,051.53	Chemical Warfare Service	20,816.64	
Chemical Engineering Practice				3,593.52
Staff Salaries	3,593.52			
Chemistry				97,498.89
Staff Salaries	49,107.54	Staff Salaries:		
Lab. Service Salaries	10,310.96	Sugar Research	25,800.84	
Acc. to Teaching Salaries	2,305.02	Harvard University	5,245.31	
		Vitamin Research	3,500.00	
		Insurance Credit	88.57	
		Lab. Service Salaries:		
		Sugar Research	562.89	
		Acc. to Teaching Salaries:		
		Sugar Research	577.76	
Civil Engineering				5,973.32
Staff Salaries	5,933.32			
Lab. Service Salaries	40.00			
Economics				7,557.03
		Staff Salaries:		
		E. S. M. W. T.	762.00	
		Post War Science Survey	3,270.03	
		Rockefeller Grant	2,618.00	
		Acc. to Teaching Salaries:		
		Rockefeller Grant	907.00	
Electrical Engineering				87,130.79
Staff Salaries	29,877.58	Staff Salaries:		
Lab. Service Salaries	3,802.45	Harbor Bldg. Navy	18,604.55	
		Center of Analysis	6,300.00	
		Hymans Research	1,166.72	
		Network Analyzer	334.65	
		Oncologic Research	2,333.28	
		Lab. Service Salaries:		
		Center of Analysis	16,137.33	
		Hymans Research	3,551.40	
		Oncologic Research	2,128.27	
		Acc. to Teaching Salaries:		
		Harbor Bldg. Navy	1,538.56	
		Center of Analysis	1,356.00	
Food Technology				2,415.23
Staff Salaries	1,858.30	Acc. to Teaching Salaries:		
		Arkel Fund	556.93	
Geology				3,179.96
Staff Salaries	1,777.76	Staff Salaries:		
		Geophysical Research	1,170.00	
		Lab. Service Salaries:		
		Geophysical Research	232.20	
Group Dynamics				2,558.34
		Staff Salaries:		
		Group Dynamics Research	2,558.34	
Industrial Relations Section				29,421.81
		Staff Salaries:		
		Industrial Relations Fund	29,421.81	

SCHEDULE B-3 — (Continued)

	D.I.C. Credits	*Other Credits*		*Total*
Mathematics				$28,332.09
Staff Salaries	$21,855.26	Staff Salaries:		
		Harvard University	$3,999 96	
		New York University	2,476.87	
Mechanical Engineering				51,816.43
Staff Salaries	37,447.43	Staff Salaries:		
Lab. Service Salaries	1,193.42	Slater Fund	5,067.21	
Acc. to Teaching Salaries	140.00	Textile Fund	1,000.00	
		deForrest Fund	300.00	
		Lab. Service Salaries:		
		Slater Fund	951.96	
		Shop Account	3,131.57	
		Acc. to Teaching Salaries:		
		Slater Fund	1,440.00	
		deForrest Fund	1,144.84	
Metallurgy				51,398.72
Staff Salaries	35,221.90	Staff Salaries:		
Lab. Service Salaries	690.04	Clay Research	533.34	
Acc. to Teaching Salaries	1,605.60	New England Carbide Research	333.37	
		Revere Brass and Copper Fellowship	404.24	
		Sheffield Foundation	3,825.00	
		Special 1818	1,066.68	
		Vanadium Alloys Co., Research	2,900.00	
		Welding Research	4,713.67	
		Lab. Service Salaries:		
		Special 1818	104.88	
Meteorology				14,823.49
Staff Salaries	5,942.99	Staff Salaries:		
		Weather Bureau Research	8,880.50	
Naval Architecture				5,000.00
		Staff Salaries:		
		Pratt Fund	5,000.00	
Physics				63,809.43
Staff Salaries	26,706.87	Staff Salaries:		
Lab. Service Salaries	5,227.66	Am. Pet. Inst. Research	3,700.00	
		Gulf Fellowship	550.00	
		Radioactivity Research	7,281.32	
		Lab. Service Salaries:		
		Am. Pet. Inst. Research	3,063.68	
		Radioactivity Research	15,273.50	
		Acc. to Teaching Salaries:		
		Radioactivity Research	2,006.40	
Solar Energy Research				3,532.10
		Staff Salaries:		
		Solar Energy Fund	3,532.10	
Total D. I. C.	$301,187.50	*Total Other*	$360,350.04	$661,537.54

(Schedule B)

SCHEDULE B-4

[1]DEPARTMENTAL EXPENSES

Aeronautical Engineering				$5,677.45
General	$2,925.30	Aero. Inst. Lab.	$1,986.50	
Staff Scholarships	60.00	Vibration Research	705.65	
Architecture				4,353.27
General	2,243.27	Staff Scholarships	150.00	
Lecture Special 2031	300.00	Staff Moving Expense	1,000.00	
		Staff Travel Expense	660.00	
Bemis Research				1,735.16
General	1,735.16			
Biology				2,629.13
General	1,679.46	Biol. Eng. Equip.	924.67	
Staff Scholarships	25.00			
Building Engineering and Construction				887.45
General	383.96	Special 1985	503.49	
Business and Engineering Administration				2,358.24
General	2,358.24			
Chemical Engineering				9,849.07
General	6,353.16	Practice School	240.91	
Staff Scholarships	3,255.00			
Chemistry				12,613.39
General	8,191.39	Staff Scholarships	3,922.00	
Staff Moving Expense	500.00			
Civil Engineering				10,942.55
General	3,378.29	Structural Laboratory	733.58	
Staff Scholarships	1,100.00	Summer Camp	3,264.02	
Staff Moving Expense	500.00	Special 2032	516.66	
Soil Mechanics Laboratory	1,200.00	Hydraulic Laboratory	250.00	
Economics and Social Sciences				3,279.71
General	2,279.71	Staff Scholarships	300.00	
Staff Moving Expense	700.00			
Electrical Engineering				8,969.52
General	6,743.52	Staff Scholarships	2,226.00	
English and History				714.26
General	714.26			
Food Technology				613.30
General	613.30			
General Science and Engineering				31.48
General	31.48			
General Studies				199.11
General	199.11			
Geology				1,705.20
General	1,705.20			
Graphics				384.09
General	384.09			
Group Dynamics				708.11
General	708.11			
Humanics				275.58
General	275.58			
Industrial Relations Section				6,520.45
General	6,520.45			
Mathematics				4,678.22
General	1,478.22	Journal Math. & Physics	3,200.00	
Mechanical Engineering				12,612.91
General	11,882.91	Staff Scholarships	730.00	

SCHEDULE B-4 — (Continued)

Metallurgy				$4,677.95
General	$2,631.73	Chipman Research	$1,246.22	
Staff Scholarships	300.00	Mineral Dressing Research	500.00	
Meteorology				6,412.46
General	4,627.46	Staff Scholarships	1,785.00	
Military Science				581.34
General	581.34			
Modern Languages				525.22
General	525.22			
Naval Architecture				1,391.84
General	1,391.84			
Physics				9,257.56
General	5,507.56	Staff Scholarships	3,500.00	
Staff Travel Expense	250.00			
Solar Energy				1,300.00
General	1,300.00			
Total				$115,884.02
Less Credits from Funds:				
Bemis Research			$1,735.16	
Group Dynamics			708.11	
Industrial Relations			6,520.45	
Solar Energy Research			1,300.00	
				10,263.72
Total (Schedule B)				$105,620.30

[1] Departmental Expenses include certain appropriations carried to Current Funds not fully expended at June 30, 1945.

SCHEDULE B-5

LIBRARY AND MUSEUM EXPENSES

Library		$79,687.01
Salaries of Officers	$15,450.00	
Wages, Office and Clerical	49,206.04	
Expenses	17,697.97	
	$82,354.01	
Less Credits — Vail and Cilley Funds	2,667.00	
Museum		10,813.79
Museum Committee	$4,141.01	
Dard Hunter Museum	5,000.00	
Pratt Museum	1,672.78	
Total (Schedule B)		$90,500.80

SCHEDULE B-6

CLERICAL AND OFFICE EXPENSE — ADMINISTRATION

	Salaries	*Expense*	*Total*
President	$8,295.07	$6,666.59	$14,961.66
Dean of Engineering	1,853.67	278.30	2,131.97
Dean of Science (Net)	1,698.87	208.28	1,907.15
Dean of Humanities	.....	237.33	237.33
Dean of Students	2,038.80	723.20	2,762.00
Dean of Graduate School	.....	335.54	335.54
Registrar (Net)	27,566.93	11,869.74	39,436.67
Director of Admissions	11,825.05	6,104.26	17,929.31
Treasurer and Bursar (Net)	55,875.28	14,467.60	70,342.88
Superintendent	11,288.65	1,231.27	12,519.92
News Service	2,277.95	709.41	2,987.36
Undergraduate Scholarship and Loan Fund Board	5,860.43	1,481.24	7,341.67
New Student Publicity	.....	1,885.85	1,885.85
Placement Bureau	7,817.61	1,572.54	9,390.15
Register of Former Students	.....	5,086.44	5,086.44
Personnel Office	4,174.99	713.17	4,888.16
Total	$140,573.30	$53,570.76	$194,144.06

(Schedule B)

SCHEDULE B-7

GENERAL ADMINISTRATIVE EXPENSE

Bulletins				$19,958.64
President's Report	$4,125.64	General Catalogue	$15,448.00	
Directory	385.00			
Other Publicity				2,643.33
Honoraria	750.00	Tech Review to Tech Clubs	560.00	
Tech Review to Schools	1,333.33			
General Expense				300,927.68
Allowances	5,000.00	Employees' Pensions and Insurance	61 167.21	
Pensions	19,787.60	Commencement, etc.	5,576.04	
[1]Insurance, etc.	35,451.35	Travel	7,176.57	
Taxes, Cambridge	4,785.82	Telephone Service	50,924.14	
Auditing	16,910.00	Dues, Fees, etc.	7,924.95	
Staff Pensions	81,696.95	Services (net)	4,527.05	
Special Expense				80,781.70
Special 2029	2,490.00	President's Ent. Fd.	2,620.31	
Alumni Fund	2,400.00	Group Air Insurance	1,722.09	
New Equipment	830.76	Employees' Allow.	30,503.00	
Tech Matrons	500.00	Sabotage Insurance	405.00	
Space Changes	5,648.34	Foreign Travel Insurance	1,656.31	
Historic Mem. Comm.	500.00			
War Service Guide Book	625.00	Safety Committee Expense	30,380.89	
Society of Arts	500.00			
Total (Schedule B)				$404,311.35

[1] Includes Workmen's Compensation, General Liability and all coverages except Fire Insurance (see Schedule B-9)
[2] Audit Expense includes special accounting to meet expanded operations.

SCHEDULE B-8

DIVISION OF INDUSTRIAL COOPERATION

Direct Expenses:	
Salaries and Wages	$156,457.15
Materials and Services	8,208.25
Travel	2,409.37
Insurance	29,364.86
Radiation Visitors' Account	5,646.25
Auditing and Professional Services	16,854.58
Depreciation	11,892.00
Miscellaneous	3,176.13
Physics Shop Replacement Account	1,837.66
Servomechanisms Laboratory Overhead Account	16,834.23
Total (Schedule B)	$252,680.48

SCHEDULE B-9

DEPARTMENT OF BUILDINGS AND POWER

Building Service				$167,171.14
Janitors	$59,679.03	Heat'g and Vent'g	$16,184.91	
Night Cleaners	49,869.16	Shop Foreman (net)	4,071.16	
Watchmen	16,230.21	Mail and Elevators	9,684.03	
Window Clean.	4,747.09	Shipper, Stock Room, Matron, Messenger	6,705.55	
Power Plant and Electric Power				245,221.29
Fuel Oil			$52,052.60	
Coal			64,140.45	
Cambridge Electric Light Co., Power			134,123.87	
Salaries			26,285.30	
Repairs			13,459.63	
Water Supplies, etc.			4,848.54	
Coal Conversion Expense (Add.)			8,860.61	
Total Operating Cost			$303,771.00	
[1]Less: Credits — Electric Power		$24,310.51		
Steam		34,239.20	58,549.71	
Repairs, Alterations and Maintenance				135,602.72
Buildings	$48,126.29	Water and Gas	$21,126.94	
President's House	4,412.49	Furniture	4,831.26	
Grounds, Roads, etc.	23,527.14	Elevators	3,558.42	
Mains and Conduits	11,708.59	Lighting Special 2016	6,526.72	
Lighting Special 2052	1,564.61	Miscellaneous (net)	10,220.26	
Fire Insurance				4,680.03
Total (Schedule B)				$552,675.18

[1] Including Dormitories, Graduate House, Walker Memorial and Bexley Hall.

SCHEDULE B-10

MEDICAL DEPARTMENT

Salaries, Staff				$22,599.00
Expense of Clinic				26,092.26
Salaries	$14,859.43	X-Ray Operation	$2,648.88	
Supplies, etc.	2,733.82	Physical Examinations	5,850.13	
Expense of Infirmary				24,794.34
Salaries	17,802.81	Food (net)	3,676.47	
Equipment	1,017.43	Laundry	2,297.63	
				$73,485.60
Less Credits—Hayden and Fletcher Funds				900.00
Total (Schedule B)				$72,585.60

SCHEDULE B-11

UNDERGRADUATE BUDGET BOARD

Athletic Coaches Salaries	$20,941.66	
Undergraduate Dues	12,750.50	
Walker Memorial (excluding Dining Service) (net)	14,458.55	
Athletic Fields, Maintenance	24,777.60	
Sailing Pavilion and Activities (net)	5,502.52	
Boat House and Launches, Maintenance	8,811.54	
Musical Clubs	600.00	
Swimming Pool (Excluding Wages)	7,419.02	
Publicity and Administration Expense	588.92	
Total (Schedule B)		$95,850.31

SCHEDULE B-12

GRADUATE HOUSE OPERATION

Income:			
Rentals		$121,082.00	
Miscellaneous		1,889.46	
Total			$122,971.46
Expense:			
Salaries	$37,258.26		
Real Estate Tax	8,713.21		
Light, Heat, Power and Water	16,098.73		
Repairs	16,641.99		
Supplies (net)	2,352.59		
Laundry	2,429.85		
Administration	4,600.31		
Depreciation	28,876.52		
Total		$116,971.46	
Balance — Income (Schedule A-1)		6,000.00	
Total			$122,971.46

UNDERGRADUATE DORMITORY OPERATION

Income:			
Rentals (net)		$172,494.00	
Miscellaneous		3,344.28	
Total			$175,838.28
Expense:			
Salaries	$67,352.91		
Light, Heat, Power, Water	18,628.66		
Repairs	18,954.05		
Supplies (net)	5,309.69		
Equipment	70.56		
Laundry	4,647.67		
Administration	2,418.97		
Mortgage Interest	4,800.00		
House Tax Allowance	3,700.00		
Total		$125,882.51	
Balance		49,955.77	
Total			$175,838.28

Summary

Graduate House Income	$122,971.46	
Undergraduate Dormitory Income	175,838.28	
Total (Schedule B)		$298,809.74
Graduate House Expenditures	$122,971.46	
Undergraduate Dormitory Expenditures	125,882.51	
Total (Schedule B)		$248,853.97

SCHEDULE B-13

WALKER MEMORIAL DINING SERVICE

Income:			
Cash		$305,453.44	
Total (Schedule B)			$305,453.44
Expense:			
Food	$160,784.57		
Salaries	81,601.45		
Light, Heat, Power, Water	6,876.74		
Laundry	2,893.23		
Equipment	8,114.24		
Repairs	4,271.73		
Administration	3,443.85		
Occupancy	12,000.00		
Total Expense		$279,985.81	
Add: Decrease in Inventory at June 30, 1945		4,316.11	
		$284,301.92	
Transferred to Walker Memorial Dining Service Reserve		21,151.52	
Total (Schedule B)			$305,453.44

SCHEDULE B-14

GRADUATE HOUSE DINING SERVICE

Income:			
Cash		$361,199.94	
Total (Schedule B)			$361,199.94
Expense:			
Food	$241,379.37		
Salaries	88,068.94		
Light, Heat, Power, Water	3,760.22		
Laundry	1,257.26		
Equipment and Supplies	4,746.87		
Repairs	5,703.95		
Administration	5,267.40		
Total Expense		$350,184.01	
Deduct: Increase in Inventory at June 30, 1945		2,302.07	
		$347,881.94	
Transferred to Graduate House Dining Service Reserve		13,318.00	
Total (Schedule B)			$361,199.94

A BRIEF DESCRIPTION OF THE ENDOWMENT AND OTHER FUNDS OF THE INSTITUTE

Including funds which have been wholly expended since 1916 for plant, equipment, facilities and special projects. The reference numbers correspond with the active funds, listed by groups on pp. 177–186, Schedules A-3, A-4 and A-5.

501 ABBOTT LABORATORIES FUND, 1944, $5,000. Postwar Fellowship in Organic Chemistry.

1001 ALBERT FUND, 1930–44. Gifts from anonymous donor covering seventeen years rental of M. I. T. Student House on Bay State Road, Boston.

1003 ALPHA CHI SIGMA HOUSE FUND (Alpha Zeta Chapter), 1935–1945, $4,513.52. Deposited for investment purposes only.

819 AMERICAN SOCIETY OF TOOL ENGINEERS, 1945, $500. Gift of Boston Chapter of the Society for a prize of $100 to be offered annually for the best graduation thesis on a subject related to Tool Engineering.

201 ANONYMOUS (H), 1942–43, $10,000. For general purposes of the Institute.

203 ANONYMOUS (M), 1941, $1,500. For general purposes of the Institute.

1004 ANONYMOUS (Q), 1945, $1,593.74. Subject to special annuity provisions.

1005 ANONYMOUS (X), 1944–45, $18,076.62. Subject to special annuity provisions.

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

503 ANONYMOUS, 1944, $1,300. For fellowship.

601 LOUIE G. APPLEBEE, 1941–42, $400. Bequest for assisting deserving students.

301 APPLIED MATHEMATICS FUND, 1943, $25,000. Appropriated from surplus to provide support for postwar program.

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

1051 ARMY AND NAVY TRAINING FUND, 1943–44. Balance $27,806. Special reserve for renegotiation and possible termination expenses incidental to war training contracts.

875 ASSOCIATION OF CLASS SECRETARIES FUND, 1940–45, $2,677.33. Held for investment purposes only.

603 ELISHA ATKINS SCHOLARSHIP FUND, 1894, $5,000. Bequest of Mary E. Atkins. For undergraduate scholarship.

303 WILLIAM PARSONS ATKINSON FUND, 1918, $13,082. Bequest of Charles F. Atkinson as a memorial to father — for English Department of the Institute.

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

821 BABSON FUND, 1938, $10,000. Gift of Babson's Statistical Organization, Inc. Income to be applied at intervals of not more than three years as prizes for one or more persons for certain studies and research in Economics.

205 E. B. BADGER CO. FUND, 1944, $10,000. Gift for general purposes.

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

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

207 EDMUND DANA BARBOUR FUND, 1926, $847,000. Bequest. Principal and income for general purposes of Institute. Over $826,000 used for buildings and equipment.

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

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

209 STEPHEN L. BARTLETT FUND, 1939–41, $369,822.40. Bequest. Principal and income unrestricted—$247,000 appropriated for educational plant including swimming pool and current purposes.

305 BARUCH COMMITTEE ON PHYSICAL MEDICINE FUND, 1944, $50,000. Gift to be used for support of five-year program in research in electronics, instrumentation in physics, as related to physical medicine.

307 ALBERT FARWELL BEMIS FUND, 1938, $270,000. Bequest. To establish and maintain the Albert Farwell Bemis Foundation for research on housing. Increased in 1941–45 through proceeds of sale of land carried under No. 309.

309 ALBERT FARWELL BEMIS FUND — LAND ACCOUNT, 1938, $119,450. Estimated book value of land in Wellesley, Newton and Dedham received under bequest. Proceeds of sales carried to No. 307.

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

453 SAMUEL BERKOWITZ FUND, 1943, $10,000. Gift. Income for general purposes of the Institute Library.

1007 BESS BIGELOW FUND, 1936–38, $25,000. Anonymous donation for special purposes as suggested by donor, but subject to approval of President.

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

311 BIOLOGY—ROCKEFELLER FUND, 1941, $70,000. For purchase of electron microscope and research thereunder. Present balance $41,505.

103 GEORGE BLACKBURN MEMORIAL FUND, 1931–43, $961,249.84. Bequest of Harriette A. Nevins. Income for general purposes.

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

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

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

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

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

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

615 ALBERT G. BOYDEN FUND, 1931–45, balance $637,550.95. Bequest. Estate of Elizabeth R. Stevens. Income for scholarships. Preference to students from Fall River and Swansea, Mass.

105 CLARA H. BRIGGS, 1941, $12,514.55. Bequest. Income for general purposes.

921 MAJOR BRIGGS FUND, 1940–42, $32,969.71. Bequest under will of Frank Harrison Briggs, the principal and/or income to be used as Advisory Council in Athletics may decide. No part of either principal or income to be used to defray living expenses or tuition fees of any student.

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

509 MALCOLM COTTON BROWN FUND, 1919. Under agreement between Caroline Cotton Brown, Charles A. Brown and M. I. T., to establish memorial to son, Lieutenant Brown, R. A. F., for advanced study and research in Physics.

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

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

107 JAMES A. CARNEY FUND, 1944–45, $17,170.01. Bequest. Income for general purposes.

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

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

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

317 CENTER OF ANALYSIS FUND, 1945, $40,000. Transferred from current operating fund as a reserve — for investment purposes only.

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

511 FRANCIS W. CHANDLER FUND, 1927–36, $4,511. Originally a gift from Architectural Society and used as a loan fund to be administered by Head of Architectural Department. Increased by $5,000 in 1939, gift of Mr. and Mrs. William Emerson and income to be used for Travelling Fellowship in City Planning.

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

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

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

109 CHARLES CHOATE FUND, 1906–21, $35,858.15. Bequest. Income for general purposes.

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

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

457 CLASS OF 1874 FUND, 1934, $180. For purposes of the Library.

851 CLASS OF 1887 FUND, 1941, $2,668.58. Held for use of Class and for final distribution as provided in Declaration of Trust.

624 CLASS OF 1895 MEMORIAL, 1945, $25,000. Gift of the Class on fiftieth anniversary, income only to be used to provide scholarships to suitably qualified descendants of members of the Class. Balance of unexpended income in any year to be added to Technology Loan Fund.

625 CLASS OF '96 FUND, 1923–41, $2,397. Gift. Award subject to approval of Class Secretaries. Preference to descendants of members of Class. Scholarships to be considered a loan to be repaid when and if able.

802 CLASS OF 1898 FUND, $11,547. By subscription of certain members of class from 1927–31. Income only for scholarship loans, as authorized by committee of Class.

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

627 CLASS OF 1909 SCHOLARSHIP FUND, 1934–37, balance, $3,916.45. Accumulated through contributions and from proceeds of life insurance policies. Principal to be invested, income available for scholarship aid with preference to direct descendants of members of Class of 1909.

855 CLASS OF 1914 FUND. Held for investment purposes only.

629 CLASS OF 1917 SCHOLARSHIP FUND, 1942, $1,032.06. Established on the twenty-fifth anniversary of the Class, the income and principal to be used to assist deserving students with preference to descendants of members of Class. Scholarships to be repayable without interest.

856 CLASS OF 1918 (ORGAN) FUND. Subscriptions by Class members toward purchase of an organ for Walker Memorial.

857 CLASS OF 1919, SPECIAL, 1944, $3,404. Contributions from class members toward gift to M. I. T. on the occasion of the twenty-fifth reunion of Class.

858 CLASS OF 1920 FUND, 1945, $1,447.75. Gift of U. S. Savings "F" Bonds and cash on the occasion of the twenty-fifth reunion of the Class.

631 CLASS OF 1922 SCHOLARSHIP FUND, 1942, balance, $3,870.63. For scholarships.

633 CLASS OF 1922 SPECIAL SCHOLARSHIP FUND, 1944, balance, $5,113.25. For special scholarships.

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

635 CLASS OF 1938 SCHOLARSHIP FUND, 1938–42, $599.14. Gift of Class of 1938. Income for scholarships.

860–874 inc.
CLASS ENDOWMENT FUNDS

Note: These funds are being accumulated for the several classes whose members took out life insurance toward a gift to the Institute on their Twenty-Fifth Reunions. From certain of these, a portion may be applied in accordance with the terms of the several plans toward keeping alive policies that might lapse on account of non-payment or as otherwise designated. By vote of the Class of 1923, $10,000 was appropriated in 1940 from their Class Fund toward construction of the sun garden adjoining new swimming pool.

251 SAMUEL C. COBB FUND, 1916, $36,000. Bequest. Income for salaries of President and professors.

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

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

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

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

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

641 WILLIAM A. CONANT FUND, 1943–44, $138,081.62. Bequest. The income to provide for scholarship carrying annual stipend of $800 for New England Protestant boy of Protestant parents, preference to be given to graduates of the public schools of Brookline.

903 ARTHUR J. CONNER, 1941–45, $24,000. Gifts in anticipation of and for ultimate addition to residue of a trust for construction of a dormitory.

643 ALBERT CONRO FUND, 1943, $25,000. Bequest for scholarship.

645 GEORGE R. COOKE, 1939–40, $3,500. Gift of George R. Cooke, Jr. Income to be awarded, preferably in Civil Engineering or related field, to student preparing for Public Service and Government.

211 CO-OPERATIVE FOUNDATION FUND, 1945, $1,577.44. Cash surrender value of first insurance policy taken under Plan. Use of fund not yet determined.

323 COSMIC TERRESTRIAL RESEARCH FUND, 1938–44, $73,600. Gifts (anonymous) for special research.

CRANE AUTOMOTIVE FUND, 1928, $5,000. Gift of Henry M. Crane. Used for purchase of equipment for Aeronautical Laboratory, 1928–40.

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

325 CROSBY HONORARY FUND, 1916, $1,633. Contributions in honor of William Otis Crosby (Professor Emeritus). Income for upbuilding of the Geological Department, especially its collections.
EDWARD CUNNINGHAM FUND, 1917, $15,000. Gift. For new building and equipment at Civil Engineering Summer Camp, Maine.

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

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

N. LORING DANFORTH FUND, 1937, $5,000. Bequest. Principal and income for general purposes. Appropriated for educational plant, 1940.

803 DEAN'S FUND, 1924, $3.350. Contributions To be loaned by Dean to needy students.

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

1009 DAVIS R. DEWEY MEMORIAL FUND, 1943, $500. To provide a suitable memorial for the late Professor Dewey.

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

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

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

327 SUSAN E. DORR FUND, 1914, $95,955. Bequest. Income for use and benefit of Rogers Physical Laboratory.

1011 DRAMA CLUB THEATRE FUND, 1938, $400. Deposited by Drama Club of M.I.T. toward future purchase of theatrical equipment.

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

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

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

213 CARBON P. DUBBS FUND, 1943, $5,000. Gift. For general purposes.

113 COLEMAN DU PONT FUND, 1931–38, $221,325. Bequest. Income for support and maintenance of the Institute.

PIERRE DU PONT FUND, 1938, $25,000. Gift. Used for new equipment.

517 DU PONT DE NEMOURS FUND. For graduate scholarship in Chemical Engineering.

115 EASTMAN CONTRACT FUND, 1924, $9,499,000. Gift of George Eastman. Income for general purposes of the Institute.

905 GEORGE EASTMAN BUILDING FUND, 1916–17, $2,500,000. Gift of George Eastman on condition that $1,500,000 be raised by alumni and others. Balance to be used as needed for new educational buildings. $1,225,000 used for George Eastman Research Laboratories in 1932, $725,000 for Rogers Building and Wind Tunnel in 1939, $268,700 for one-half of building No. 12 in 1943, $80,000 for Medical Department alterations in 1943.

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

The total of the gifts of GEORGE EASTMAN to the Institute for both buildings and endowments was $20,500,000.

117 CHARLES W. EATON FUND, 1929–43, $261,148. Bequest. Income for advancement of general purposes of Institute. (From 1911 to 1923 Mr. Eaton gave $15,501.45 for Civil Engineering Summer Camp in Maine.)

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

121 MARTHA ANN EDWARDS FUND, 1890, $30,000. Bequest. Income for general purposes.

331 ELECTRONICS SPECIAL FUND, 1943, $50,000. Appropriations from surplus for postwar research.

458 ARTHUR ELSON FUND, 1944, $500. For the purpose of special book purchases for the Library.

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

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

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

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

1053 ENDOWMENT RESERVE FUND, 1924. Created and otherwise increased by gains from sales or maturities of investments and decreased by premium amortization of bonds and losses and charges from sales or maturities. Belongs to all funds sharing general investments.

ARTHUR F. ESTABROOK FUND, 1923–38, $100,800. Bequest. Used for purchase of land and equipment.

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

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

HENRIETTA G. FITZ FUND, 1930, $10,000. Bequest. For general purposes. Appropriated for educational plant, 1940.

333 HAROLD H. FLETCHER FUND, 1942, $10,000. Bequest under will of Herbert H. Fletcher. To endow a bed in the Institute's Infirmary.

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

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

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

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

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

127 JOHN W. FOSTER FUND, 1938, $299,650. Bequest. Income for purposes of the Institute.

907 MATILDA A. FRASER FUND, 1942, $859.89. Bequest. Towards construction of a women's dormitory.

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

CAROLINE L. W. FRENCH FUND, 1916, $100,843.34. Bequest. Used for new equipment, 1928.

131 JONATHAN FRENCH FUND, 1915–16, $25,212.48. Bequest of Caroline L. W. French. For purposes of the Institute.

133 HENRY CLAY FRICK FUND, 1925–38, $1,831,000. Bequest. Institute received ten shares of a total of one hundred shares of his residuary estate. Income for general purposes.

664 PHILIP JACOB FRIEDLANDER FUND, 1945, $1,000. Gift. Income to be used to aid qualified students in need of assistance.

461 FRIENDS OF THE LIBRARY FUND. Contributions for purchase of books and for other purposes of the Institute Library.

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

215 ERASTUS C. GAFFIELD FUND, 1944–45, $387,854. Bequest. Principal and income available for general purposes. In 1945, $120,000 was applied to retirement of Dormitory mortgages.

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

135 GENERAL ENDOWMENT FUND, 1921, $1,527,449. Contributions by alumni and others to meet George Eastman's condition relative to gift of $2,500,000, his building fund (No. 905).

807 NATHAN R. GEORGE FUND, 1943, $29,197.37. Bequest. Income to be loaned to undergraduates under certain administrative conditions.

665 NORMAN H. GEORGE FUND, 1919–25, $93,400. Bequest. Income for assistance of worthy and needy students.

667 ARTHUR B. GILMORE FUND, $10,000, 1941. Bequest. Net income to assist needy students, members of Beta Theta Pi — not more than two students in any one year.

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

669 BARNETT D. GORDON FUND, 1942–44, $10,000. The income to be used as scholarships for deserving students.

137 ELIOT GRANGER FUND, 1936, $21,568.43. Bequest under will of Mary Granger in memory of deceased son. Income for the general purposes of the Institute.

335 JOHN A. GRIMMONS FUND, 1930–45. Bequest of C. Lillian Moore of Malden. Principal held by Old Colony Trust Co., Trustee. Income for loans to undergraduates in Electrical Engineering. Unused balances available for purchase of apparatus and equipment in Department of Electrical Engineering.

336 GROUP DYNAMICS RESEARCH FUND, 1945, $40,000. Gift. For conduct of research in this field.

670 LUCIA G. HALL SCHOLARSHIP FUND, 1945, $50,000. Bequest of Louise K. Gunn. The income only used for aid of worthy students.

671 HALL-MERCER SCHOLARSHIP FUND, 1940–45, $68,284.59. Bequest under will of Alexander G. Mercer. The income to be used for tuition and other necessary expenses of students.

GEORGE WYMAN HAMILTON FUND, 1935, $54,414.15. Appropriated for new equipment, 1937–39.

518 HARSHAW CHEMICAL FUND, 1944, $5,000. Gift. For Fellowship in Chemistry.

673 JAMES H. HASTE FUND, 1930–45, $251,150.49. Bequest. Income for aid of deserving students of insufficient means.

139 CHARLES HAYDEN FUND, 1937, $1,000,000. Bequest of Charles Hayden. Income for general educational purposes of the Institute.

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

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

675 CHARLES HAYDEN MEMORIAL SCHOLARSHIP FUND, 1940–43, $100,000. From the Charles Hayden Foundation. For entrance scholarships. Preference given to students from Boston and New York.

337 CHARLES HAYDEN FOUNDATION DENTAL CLINIC FUND, 1940, $10,000. To assist in establishment of and necessary equipment for a Dental Clinic available to entire student body, faculty and employees.

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

JAMES W. HENRY FUND, 1935, $8,226. Bequest. Used for new equipment.

216 WILLIAM T. HENRY FUND, 1943–45, $34,640. Income from Trust Fund held outside M.I.T. Fund and income for general purposes.

1013 JOSEPH HEWETT FUND, 1921–24, $200,000. In Trust subject to special annuity provisions.

141 JOHN MARSHALL HILLS, 1941–42, $366,430.96. Bequest. Income for general purposes of M. I. T.

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

218 ELLIS HOLLINGSWORTH FUND, 1940, $10,000. Bequest for unrestricted use.

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

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

219 ABBY W. HUNT FUND, 1936–44, $79,400. Bequest. For general purposes. $60,000 used for alterations, 1937. $16,000 for new equipment, 1938. Balance unexpended.

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

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

340 INDUSTRIAL FUND, 1924–45. This fund succeeded "Tech Plan" Contracts, payments under which went to the Educational Endowment Fund. Now receives surplus from indústrially sponsored operations of Division of Industrial Coöperation and Research. Used for purchase of new equipment and support of special research.

339 INDUSTRIAL ECONOMICS FUND, 1940–45. Balance $16,509. Contributions in support of Graduate Program in Economics.

341 INDUSTRIAL RELATIONS FUND, 1938–45. Balance $230,605. Contributions in support of the Industrial Relations Section of the Department of Economics.

343 INSTRUMENTATION FUND, 1943–45, $400,000. For research in the field of instrument design.

220 INSURANCE ENGINEERING FUND, 1944, $835.13. Established by private subscriptions and donated to M. I. T. through the Boston Manufacturers Mutual Fire Insurance Co. For unrestricted use.

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

143 JAMES FUND, 1898–99, $163,654. Bequest of Julia B. H. James. Income for development of M. I. T.

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

519 REBECCA R. JOSLIN FUND, 1924–36, $6,540. Gift and Bequest. Income awarded as a loan to advanced student in Chemical Engineering on recommendation of that Department — restricted to native and resident of Massachusetts. Beneficiary to abstain from using tobacco in any form.

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

345 WILLIAM R. KALES FUND, 1944, $75,001.48. Gift of Mrs. Kales and family. To establish and maintain Eye Clinic in Medical Department.

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

347 ARTHUR E. KENNELLY FUND, 1940–44, $66,883.09. Bequest. Income only to be used for the study of mathematics directed toward physics or physical applications.

221 CARRIE BELLE KENNEY FUND, 1945, $1,000. Bequest. No restrictions as to use.

349 A. NORTON KENT FUND, 1944, $300. Gift. For research in Physics.

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

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

686 AMELIA S. KNEISNER SCHOLARSHIP FUND, 1945, $6,000. Gift of the family. Income only to provide scholarship and to meritorious or needy students — preference to students from Danbury (Conn.).

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

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

1014 JACOB AND JENNIE LICHTER, 1944, $5,000. Gift. To accumulate income and ultimately added to bequest.

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

350 ARTHUR DEHON LITTLE MEMORIAL FUND, 1937, $157,460. Bequest under will of Dr. Arthur D. Little. Income to be used in Departments of Chemistry and Chemical Engineering. (The income from 5,543 shares of common stock of Arthur D. Little, Inc., held by Voting Trustees for the benefit of the Institute under declaration of trust dated November 18, 1936 and in force for twenty years is included in this total.)

1015 ARTHUR D. LITTLE MEMORIAL LECTURESHIP FUND, 1944, 6,100 Gift of Arthur D. Little, Inc., for purpose indicated.

222 HIRAM H. LOGAN FUND, 1933–44, $43,955. Bequest. Principal and income for general purposes of M. I. T. $19,455. appropriated for educational plant, 1940.

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

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

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

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

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

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

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

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

M. I. T. ALUMNI FUND, 1907. Total subscriptions of alumni to 1924, $632,500. $632,000 appropriated for new equipment, Walker Memorial, 1916 Reunion and Dormitories.

M. I. T. ALUMNI GYMNASIUM FUND, 1938–42. Total subscription $400,000. Appropriated for Briggs Field House, Athletic Field and for new swimming pool unit of the proposed alumni gymnasium.

879 M. I. T. ALUMNI SPECIAL GIFTS, 1944–45, $2,000. Gifts to provide annual contribution to Alumni Fund from earned income.

881 M. I. T. ALUMNI FUND, 1940–45. First four years of plan adopted by the alumni of the Institute for the annual raising of funds for support of the Alumni Association and the *Technology Review* — the balance to be applied toward specific purposes other than operating expenses of the Institute. Balance $265,807.

883 M. I. T. ALUMNI FUND, 1945–46. Subscriptions to date of the sixth year of operation. Balance $78,294.

877 M. I. T. ALUMNI ASSOCIATION PERMANENT FUND, 1929–44. Balance $100,858. Deposited with M. I. T. for investment purposes only.

M. I. T. TEACHERS FUND. Balance of two per cent salary deductions under M. I. T. Pension and Insurance Plan in excess of Group Insurance Premiums paid.

1017 M. I. T. TEACHERS' INSURANCE FUND, 1928–45. Refund of premiums paid on Group Insurance under M. I. T. Pension and Insurance Plan held at interest and accumulated. Appropriated for special pension purposes only.

353 MATHEMATICS, STATISTICAL RESEARCH FUND, 1943, $8,000. Appropriated from Industrial Fund to finance postwar objectives.

355 JOHN LAWRENCE MAURAN FUND, 1934, $10,000. Bequest. Principal and income for benefit of Department of Architecture. Used, in part, toward house projects in Wellesley and Wakefield, 1937–40.

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

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

523 GEORGE S. MAY FUND, 1944, $2,000. Gift. For Fellowship.

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

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

223 CHARLES E. MERRILL FUND, 1943, $2,300. Not restricted but suggested for use of maimed or wounded boys on their return after the war.

METALLURGY, SPECIAL FUND, 1938, $10,000. Subscription (anonymous) used for special equipment for Department of Metallurgy.

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

925 EDWARD F. and MARY R. MILLER FUND, 1941, $10,000. Bequest. To be used at discretion of Bursar as a fund in assisting needy students who have been found by the medical director to require special medical or surgical treatment.

699 ROBERT W. MILNE, 1943, $70,000. Bequest. Income for assistance of worthy and needy students.

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

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

361 FORRIS JEWETT MOORE FUND, 1927-31, $32,000. Gift of Mrs. F. Jewett Moore as a memorial to husband. Income or principal (under special conditions) expendable subject to approval of Executive Committee by a committee of three members of the Department of Chemistry — to make the study of Chemistry more interesting and surroundings of such study more attractive.

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

703 FRED W. MORRILL FUND, 1941, $2,000. Bequest. Income for financial assistance to students.

149 KATE M. MORSE FUND, 1925, $25,000. Bequest. Income for general purposes of M. I. T.

151 EVERETT MORSS FUND, 1934, $25,000. Bequest. Income for general purposes of M. I. T.

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

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

225 JOHN WELLS MORSS FUND, 1940, $50,000. Bequest. Principal and income for general purposes.

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

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

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

705 NICHOLS FUND, 1895, $5,000. Bequest of Betsy F. W. Nichols. Income for scholarship to student in Chemistry.

707 CHARLES C. NICHOLS FUND, 1904, $5,000. Bequest. Income for scholarship.

WILLIAM E. NICKERSON FUND, 1928, $50,000. Gift. Principal and income used to finance chair in Humanics, 1928–40.

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

227 CHRISTEL ORVIS FUND, 1942, $539.42. Bequest. For general purposes.

467 GEORGE A. OSBORNE FUND, 1928, $10,000. Bequest. Income for benefit of mathematical library.

709 JOHN FELT OSGOOD FUND, 1909, $5,000. Bequest of Elizabeth P. Osgood in memory of husband. Income for scholarship in Electricity.

363 F. WARD PAINE, 1944, $10,000. Bequest. For special research in Geology.

711 GEORGE L. PARMELEE FUND, 1921, $17,000. Bequest. Income for tuition of either special or regular worthy students.

229 EMERETTE O. PATCH FUND, 1935–38, $8,240.84. Bequest. $5,964 used for special expenditures, 1938–40.

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

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

H. B. PERKINS, 1940, $250. Bequest. Used for new equipment, 1940.

153 RICHARD PERKINS FUND, 1887, $50,000. Bequest. Income for general purposes.

713 RICHARD PERKINS FUND, 1887, $50,000. Bequest. Income for scholarships.

529 WILLARD B. PERKINS FUND, 1898, $6,000. Bequest. Income to be expended every fourth year for travelling scholarships in architecture.

365 EDWARD D. PETERS FUND, 1924, $5,000. Bequest of Elizabeth W. Peters. Income for the Department of Mineralogy.
E. S. PHILBRICK FUND, 1922, $36,213.92. Bequest. Used for educational plant, 1926.

1057 PHOTO SERVICE RESERVE, 1945, $21,000. Transfer for investment purposes.

PRESTON PLAYER FUND, 1933, $20,000. Bequest. Used for educational plant, 1938.

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

1019 PRESIDENT'S FUND, SPECIAL, 1941–44, $10,500. Gifts. Principal and/or income to be used by President as desired.

CHARLES O. PRESCOTT, 1935, $30,640.78. Principal and income used for educational plant, 1938.

715 FLORENCE E. PRINCE, 1943, $7,537.50. Bequest. Income for aid to worthy students.

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

369 RADIOACTIVITY CENTER FUND, 1945, $50,000. Appropriation for post-war research.

155 J. W. & B. L. RANDALL FUND, 1897, $83,452. Bequest of Belinda L. Randall as a permanent fund or in erecting a building with those names.

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

1059 RESERVE FOR USE OF FACILITIES FUND, 1945. Balance $714,000. Appropriated for reëstablishment or improvement of physical plant and facilities.

719 CHARLES A. RICHARDS, 1939, $31,719.32 Bequest. Income only to be used for assistance of poor Protestant students in the Institute.

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

373 RICHARDS MEMORIAL FUND, 1929. Balance of subscriptions from friends for portrait of Professor Richards available for the Department of Metallurgy.

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

721 JOHN ROACH SCHOLARSHIP FUND, 1937, $3,000. Bequest under will of Emeline Roach, income to provide annual scholarship to needy and deserving student in Naval Architecture and Marine Engineering.

RUSSELL ROBB FUND, 1928, $28,750. Bequest. Appropriated for new dormitories, 1930.

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

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

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

ROBERT E. ROGERS FUND, 1886, $7,600. Bequest in memory of his brother, William B. Rogers. Used for new equipment, 1940.

833 WILLIAM BARTON ROGERS FUND. Present, $47,121. Established by subscriptions of members of Alumni Association through Prof. R. H. Richards for loans to students. By vote of Executive Committee in March 1935, approved by Alumni Council, the income, not now needed for loans, is made available for special scholarship aid in the discretion of the President and Treasurer.

157 WILLIAM BARTON ROGERS MEMORIAL FUND, 1883–84–85, $250,225. Contributions from 91 persons. Income for support of Institute.

377 WILLIAM BARTON AND EMMA SAVAGE ROGERS FUND, 1937, $102,064.18. Bequest of Dr. Francis H. Williams. Income to be added to principal for twenty years — after which eighty (80) per cent of income may be used for research in pure science — balance to be added to fund.

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

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

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

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

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

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

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

1021 WILLIAM PATRICK RYAN SPECIAL FUND, 1933, $3,000. Appropriation. Educational fund for three children of late Prof. W. P. Ryan.

839 HENRY WEBB SALISBURY, 1941, $1,100. Gift. Income for award to outstanding student in Aeronautics — initially in form of reference books in Aeronautics. ($100 of gift to be considered as income.)

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

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

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

161 SAMUEL E. SAWYER FUND, 1895, $4,764. Bequest. Income to be used in such manner as will best promote interests of M. I. T.

725 JOHN P. SCHENKL FUND, 1922, $43,800. Bequest of Johanna Pauline Schenkl in memory of father. Income for scholarships in Department of Mechanical Engineering.

THEODORE EDWARD SCHWARZ MEMORIAL FUND, 1937–38, $4,391.86. Gift. For equipment of a suitable room for proposed map collection.

1023 SEDGWICK MEMORIAL LECTURE FUND, 1930–38, balance, $14,659. Bequest of Mary Katrine Sedgwick in memory of husband. Proceeds of interest in copyrights and from contracts with publishers for benefit of Department of Biology and Public Health.

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

385 SERVO-MECHANISM LABORATORY FUND, 1943, $25,000. Appropriation from Industrial Fund for postwar research.

RICHARD B. SEWALL FUND, 1919, $30,000. Bequest. Used for educational plant, 1924.

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

387 ALFRED P. SLOAN, JR., 1929–41, $165,000. Gift. Largely expended for automotive laboratory. Balance held for use of department.

ELLEN VOSE SMITH FUND, 1930, $25,000. Bequest. Used for new equipment.

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

1025 LILLIE C. SMITH FUND, 1937, $4,800. Bequest to M. I. T. Women's Association for purposes of the Association.

1026 WALTER B. SNOW, 1938–44, $14,326.00. Reserve funds of Technology Christian Association. Deposited for investment purposes.

389 SOLAR ENERGY FUND, 1938, $647,700. Gift of Dr. Godfrey L. Cabot. Principal to be held for fifty years — income to be used in development of the art of converting energy of the sun to use of man by mechanical, electrical or chemical means. After fifty years, fund becomes part of general unrestricted endowment of the Institute.

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

961 SPECIAL WAR RESERVE FUND, 1942–44. Balance of Excess over O.S.R.D. allowed overhead for 1941–42, held by M. I. T. against possible renegotiation and/or termination expenses, less authorized appropriations.

737 ANNA SPOONER FUND, 1939–41, $10,896.14. Bequest. Income to be used in assisting meritorious students.

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

CHARLES A. STONE, 1912–24, $15,000. Gift for land. 1928, $25,023.59. Gift for dormitories.

GALEN L. STONE, 1912, $10,000. Gift for land. 1916, $10,000. Gift for Mining Building.

165 GEORGE G. STONE, 1939, $4,677.35. Bequest by will of Eliza A. Stone, as memorial to brother, a graduate in Mining Engineering in 1889. Income to be used in manner most useful to Institute as well as a most fitting memorial.

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

393 SUBMARINE SIGNAL COMPANY FUND, 1945, $25,000. Gift. To be used for fundamental studies relating to application of ultrasonics to Biological problems.

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

391 HENRY N. SWEET, 1936, $8,036.50. Bequest. For industrial research.

167 SETH K. SWEETSER FUND, 1915, $25,061. Bequest as a permanent fund. Income for general purposes.

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

395 SWIFT PROTEIN FUND, 1944, $20,000. Gift. For research.

544 GERARD SWOPE GRADUATE FELLOWSHIPS FUND, 1945, $100,050. Gift. Income annually or from time to time to be granted as Gerard Swope Scholarships under certain conditions and with certain preferences. Principal to be maintained except under conditions presented.

1027 TEACHERS' FUND, 1899–1900. Gifts of $50,000 each from Augustus Lowell and A. Lawrence Lowell to establish fund for use in case of retirement, disability or death of members of instructing staff.

735 Tech Club of Chicago, 1944, $5,000. Gift. For scholarships.

811 TECHNOLOGY LOAN FUND, 1930–41, $1,450,735.18. Contributed by eighteen alumni to provide loans for students.

1029 TECHNOLOGY MATRONS TEAS FUND, 1916–22–31, $8,500. Gifts of Mrs. F. Jewett Moore. Income for social activities of Technology Matrons.

397 TEXTILE RESEARCH FUND, 1937, $3,065. Gift. For research.

STURGIS H. THORNDIKE FUND, 1928, $15,000. Bequest. Appropriated for new dormitories, 1930.

NATHANIEL THAYER, 1906, $25,000. Gift. Used for educational plant.

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

929 W. B. S. THOMAS FUND, 1935–37, $2,000. Gift of parents of W. B. S. Thomas '29, the income only to be expended, one-half for the benefit of the M. I. T. Crew and one-half to other activities of the M. I. T. A. A.

265 ELIHU THOMSON FUND, 1933–37, $23,680. Contributed toward fund for Professorship in Electrical Engineering.

ELIHU THOMSON, 1912, $25,000; 1924, $5,000. Gift. Used for purchase of land.

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

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

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

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

231 TOWLE FUND, 1944–45, $8,000. Gift. For general purposes.

399 NELLIE FLORENCE TREAT, 1944, $609. Bequest. For use in the field of Food Technology.

233 CHARLES A. TRIPP FUND, 1943, $100,000. Bequest. For dormitory construction — or such other use of all or part as may seem advisable.

401 EDMUND K. TURNER FUND, 1915–41, $206,814. Bequest. Income, three-quarters for Department of Civil Engineering and one-quarter to be added annually to principal.

LUCIUS TUTTLE FUND, 1916, $50,000. Bequest. Used for educational plant, 1918.

931 ALICE BROWN TYLER FUND, 1937–41, $1,559.64. Gift of Prof. and Mrs. H. W. Tyler. Income to be used for benefit of women students at the Institute.

933 UNDERGRADUATE ACTIVITIES TRUST FUND, 1935, $1,097.26. Established by 1915 Technique Board from which recognized student activities may borrow if deemed necessary and desirable, at a low rate.

935 UNDERGRADUATE PUBLICATIONS TRUST FUND, 1935. Deposited by Alumni Advisory Council on Publications for investment purposes only.

937 UNDERGRADUATE DUES RESERVE FUND, ATHLETICS, 1924–45. Transferred from Undergraduate Dues (current operating account) to secure investment income.

939 UNDERGRADUATE DUES RESERVE FUND, CONTINGENT, 1924–45. Transferred from Undergraduate Dues (current operating account) to secure investment income.

403 WILLIAM LYMAN UNDERWOOD FUND, 1932, $16,252. Bequest. For benefit of Biological Department or otherwise for general purposes.

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

547 THOMAS UPHAM FUND, 1939–45, $399,800. Bequest of Marcella B. Upham. Principal to be held as a permanent trust fund, the income to be used in assisting poor and deserving students or graduates of the Institute.

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

473 THEODORE N. VAIL FUND, 1925–42, $68,800. Bequest. For benefit of Vail Library.

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

745 VERMONT SCHOLARSHIP FUND, 1924–37, $25,000. Gift of Redfield Proctor, '02, in memory of Vermonters who, having received their education at the Institute, served as engineers in the armies of the Allies in the World War. Income to students preferably from Vermont. Mr. Proctor reserves right to designate recipients as long as he lives.

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

HORACE W. WADLEIGH FUND, 1916–20, $22,143.14. Bequest. Appropriated for new buildings, 1924.

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

235 GRANT WALKER, 1943, $70,000. Bequest. For general purposes.

751 GRANT WALKER, 1944. $55,000. Bequest. Income for scholarships.

169 WILLIAM J. WALKER FUND, 1915–17, $23,613. Bequest. Income for general purposes.

1063 WALKER MEMORIAL RESERVE FUND. Present balance $12,000 For purposes of repair and renovation.

1065 WALKER MEMORIAL DINING SERVICE RESERVE FUND. Present balance $54,000. For repair and replacement.

405 WILLIAM R. WARE FUND, 1939, $15,000. Gift of Mr. and Mrs. William Emerson, the income to be at the disposal of the Dean of the Architectural School for extra budgetary purposes.

909 CHARLES D. WATERBURY, 1941, $13,407.28. Bequest. For erection of a building as a memorial to above named at such time as M. I. T. shall decide.

171 HORACE HERBERT WATSON FUND, 1930, $34,076. Bequest of Elizabeth Watson Cutter as a permanent fund. Income for general purposes.

753 JAMES WATT SCHOLARSHIP FUND, 1942, $13,259.72. Bequest under will of Jennie A. Douglas. For scholarships in Mechanical Engineering.

EDWIN S. WEBSTER FUND, 1912–24, $15,000. Gift. Used toward purchase of land.

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

755 HERMAN E. WEIHMILLER, 1942, $1,000. Gift. For assistance to deserving students in aeronautical engineering with approval of Dr. E. P. Warner.

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

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

CHARLES G. WELD FUND, 1907, $15,000. Gift. Used for educational plant, 1924.

175 EVERETT WESTCOTT FUND, 1935–38, $171,394. Bequest as a permanent fund. Income for general purposes.

177 MARION WESTCOTT FUND, 1938–44, $240,252. Bequest for endowment. Income for general purposes.

759 FRANCES ERVING WESTON FUND, 1912–31, $5,000. Bequest. Income to aid a native-born American Protestant girl of Massachusetts.

761 SAMUEL MARTIN WESTON FUND, 1912–31, $5,000. Bequest of Frances E. Weston in memory of husband. Income to aid a native-born American Protestant boy; preference to be given one from Roxbury.

ALEXANDER S. WHEELER FUND, 1907–16, $30,000. Contributed by friends. Used for new dormitories, 1924.

GEORGE R. WHITE FUND, 1912, $10,000. Gift. Used toward purchase of new site.

763 AMASA J. WHITING FUND, 1927, $4,500. Bequest of Mary W. C. Whiting. Income as scholarship to deserving students; preference to students from the Town of Hingham, Massachusetts.

EDWARD WHITNEY FUND, 1910, $37,171. Bequest as a memorial to him and his wife, Caroline. Principal and interest used (1930–38) for conduct of research in geophysics.

765 GRANGER WHITNEY FUND, 1942. For scholarship.

551 JONATHAN WHITNEY FUND, 1912, $525,000. Bequest of Mrs. Francis B. Green. Income to assist poor and deserving young men and women in obtaining an education at M. I. T.

179 GEORGE WIGGLESWORTH FUND, 1931, $25,000. Bequest. Ten (10) per cent of gross annual income to be added to principal, balance of income for general purposes of the Institute.

GEORGE WIGGLESWORTH, 1917–24, $65,000. Gift. Used for additional land purchase, 1924.

767 ELIZABETH BABCOCK WILLMANN FUND, 1935, $5,065. Bequest. Income to be used toward tuition of young women students taking Chemistry courses.

407 WIND TUNNEL, 1945, $100,000. Transferred from operating account for reserve and investment purposes.

1031 GEORGE S. WITMER FUND, 1938–45. Balance, $58,484.53. In Trust subject to special annuity provisions.

KENNETH F. WOOD FUND, 1926, $25,000. Bequest. Appropriated for new dormitory, 1930.

WRIGHT MEMORIAL WIND TUNNEL, 1937–41, $95,795. Contributed by friends toward construction of new wind tunnel.

181 EDWIN A. WYETH FUND, 1913–35, $254,703. Balance of Trust Fund held by M. I. T. since 1913 for itself and five other beneficiary institutions subject to annuity. Distributed January 1935. Fund separately invested until June 30, 1943. Net income available for general purposes of the Institute.

769 MORRILL WYMAN FUND, 1915–16, $66,000. Bequest. Income to aid deserving and promising students upon understanding that if in after life the person receiving aid shall find it possible, he shall reimburse said fund — not a legal obligation.

PERIODICAL PUBLICATIONS, BOOKS, AND REVIEWS BY MEMBERS OF THE STAFF

(Persons desiring reprints of articles should apply to the Department concerned.)

DEPARTMENT OF AERONAUTICAL ENGINEERING

ROGOWSKI, AUGUSTUS R., and C. F. TAYLOR. Part-Throttle Operation and Control of a Piston-Ported Two-Stroke Cylinder. *N. A. C. A. Tech. Note*, No. 919, November, 1943. (Released from restricted status.)

DEPARTMENT OF ARCHITECTURE AND PLANNING

HOYT, HOMER. The Importance of the Economic Background in City Planning. *Am. Inst. Planners J.* 11, pp. 16–19, January, February, March, 1945.

HOYT, HOMER. The Appraisal Process in a Price-Controlled Economy. *Appraisal J.* 13, pp. 138–147, April, 1945.

KENNEDY, ROBERT W. Towards an Old Architecture. *Pencil Points* 25, pp. 78–83, August, 1944.

WURSTER, WILLIAM W. Toward Urban Redevelopment. *Arch. and Eng.* 157, pp. 37–39, June, 1944; 158, pp. 25–28, July, 1944.

WURSTER, WILLIAM W. San Francisco City House. *Pencil Points* 25, pp. 84–88, August, 1944.

WURSTER, WILLIAM W. Berkeley: Apartment Above Four Garages. *Pencil Points* 25, pp. 63–65, September, 1944.

WURSTER, WILLIAM W. Berkeley: Imaginative Flight From House to Garden. *Pencil Points* 25, pp. 88–89, September, 1944.

WURSTER, WILLIAM W., and FRANKLIN & KUMP, *Architects*. Public and Commercial Structures, Chabot Terrace (F. P. H. A.), Vallejo, California. *Pencil Points* 25, pp. 79–85, October, 1944.

WURSTER, WILLIAM W. San Francisco Garden Court Houses. *Arch. Forum* 81, pp. 129–131, December, 1944.

WURSTER, WILLIAM W. San Francisco Bay Portfolio. *Mag. Art.* 37, pp. 300–305, December, 1944.

WURSTER, WILLIAM W. Trends in American Architecture, 1940–45. *Nuevo Mundo*, 1945.

WURSTER, WILLIAM W. For a Balmy Climate — Modern House in California. *House and Garden* 87, p. 89, May, 1945.

WURSTER, WILLIAM W. Freedom of Differences (Supporting Dean Hudnut). *Pencil Points* 26, p. 14, May, 1945.

WURSTER, WILLIAM W. A Minimum House, Designed by W. W. Wurster of Wurster & Bernardi, Architects. *Pencil Points* 26, pp. 70–72, June, 1945.

DEPARTMENT OF BIOLOGY

BEAR, RICHARD S. X-Ray Diffraction Studies on Protein Fibers. I. The Large Fiber-Axis Period of Collagen. *Am. Chem. Soc. J.* 66, pp. 1297–1305, August, 1944. II. Feather Rachis, Porcupine Quill Tip and Clam Muscle. *Am. Chem. Soc. J.* 66, pp. 2043–2050, December, 1944.

BEAR, RICHARD S. Complex Formation between Starch and Organic Molecules. *Am. Chem. Soc. J.* 66, pp. 2122–2123, December, 1944.

BLAKE, CHARLES H. Orthography of Scientific Names. *Science* 101, pp. 174–175, February 16, 1945.

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