

MASSACHUSETTS
INSTITUTE
OF TECHNOLOGY

REPORT
OF THE
PRESIDENT
1966

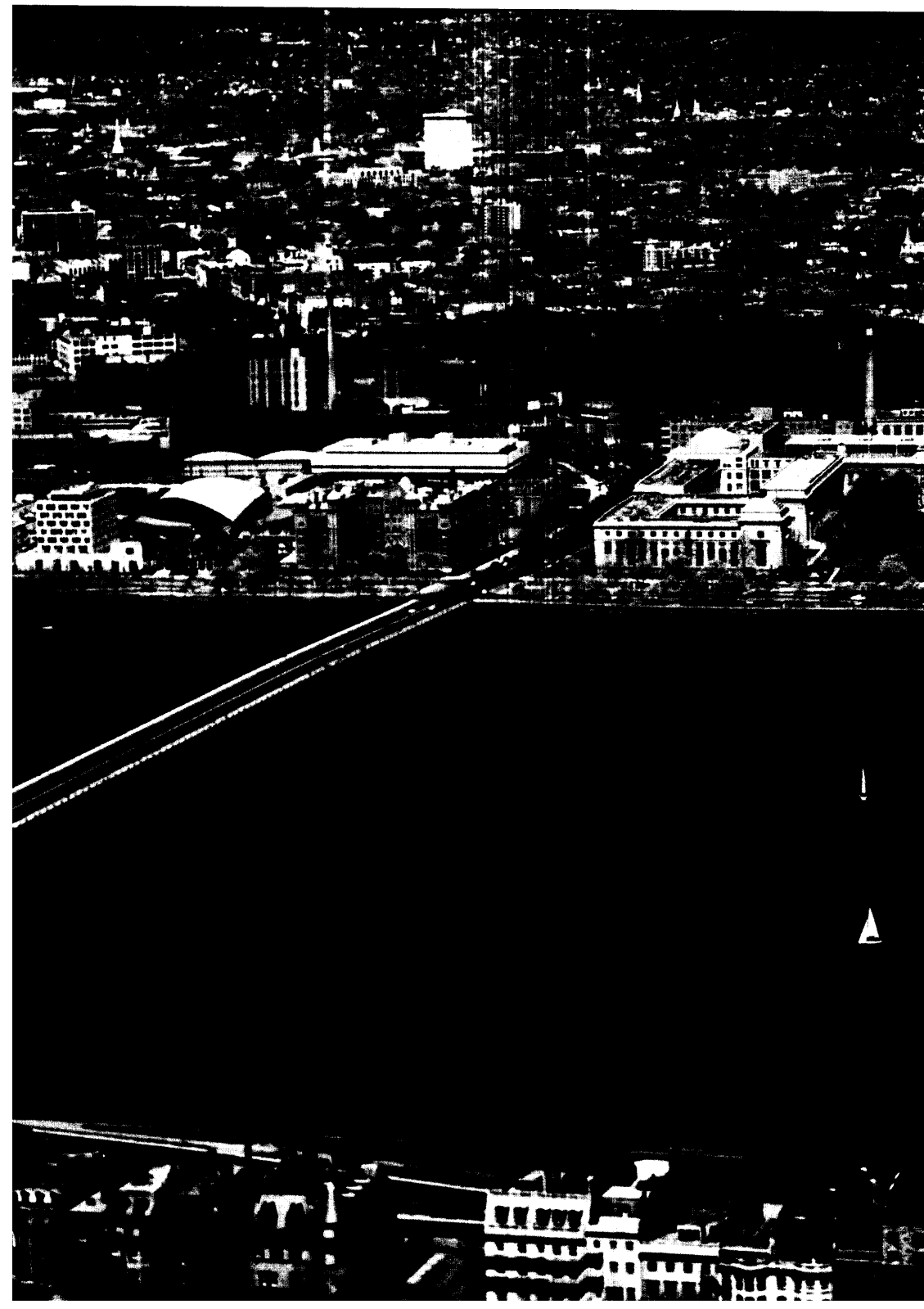


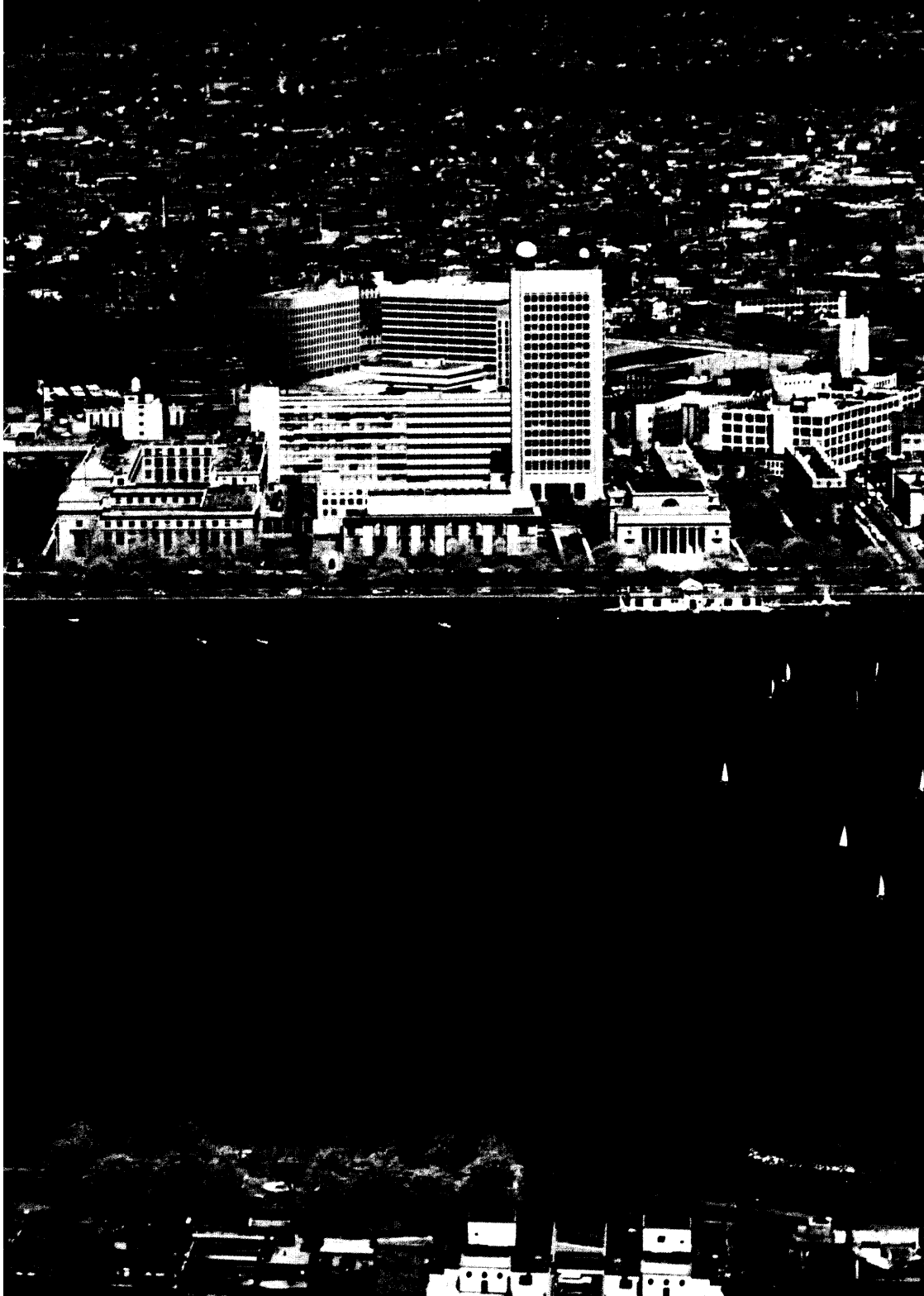
REPORT
OF THE
PRESIDENT

FOR THE YEAR ENDING JUNE 30

1966

MASSACHUSETTS INSTITUTE
OF TECHNOLOGY





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TO THE CORPORATION

I

This is my final report to the Corporation as President of the Institute. On such an occasion the temptation is very great to look backward, to recount the successive stages of progress that have marked the period of one's own tenure of responsibility. These have been critically important years, and they have totally consumed the time, the thought, and the energies of all those who have had a part in the affairs of M.I.T. A number of powerful forces — external as well as internal — have combined to reshape in many respects the traditional character of the Institute. Each October at our Annual Meeting I have reported on new buildings begun or completed; upon the physical transformation of the campus; upon the expanding range of our academic activities; upon the contemporary student — his ability, his preparation, his goals and interests; upon the sweeping revisions that are taking place in the processes of education — in approach and method as well as in substance; upon the diversity of opportunities, demands, and responsibilities that today confront the faculty of any great university; and upon the widening scope of our commitments to problems of the community and the nation. These reports have served, I hope, to convey a sense of forward movement, of constructive force, of vitality, which impart to M.I.T. its special quality. And

so rather than dwell further upon what has been accomplished, I propose to devote these few pages to some quite personal thoughts about the state of the Institute and its needs for the future.

I spoke just a moment ago of external forces that are influencing the character of M.I.T. These are forces of the modern world, pressures that derive from the society of which we are a part — a society which is itself deep in the throes of a revolution generated in large measure through the day-by-day advances of science and engineering, giving access to new powers and resources that challenge the imagination. The Institute has contributed its own share to these advances, and by the very nature of its involvement it has also reacted strongly to the needs and opportunities of the time. They in turn continue to multiply and to diversify, so that a myriad of paths open out before us, institutionally and individually.

To distinguish the trivial from that which may be useful or worthwhile is relatively easy. The difficulty arises in developing a discriminating taste for the best and in establishing criteria for selection among a host of projects, all of which may be both good and enticing. As I have presided over the development of M.I.T. these past few years, as I have watched the expansion of our efforts both within and without the confines of the campus, I have felt increasingly the need for a reaffirmation of goals and purpose — for a restatement of an institutional philosophy to guide us in the world of today.

One of the most fascinating themes of the academic tradi-

tion is that of the *idea of a university*. Are there in fact certain inherent, fundamental qualities and conditions whose presence is essential for the very existence of a true university, that remain impervious to the passage of time and unaltered by geographic location or the external form of the institution — concepts such as the freedom to learn and teach, the concern for knowledge for its own sake, the isolation from a world of action? The answer to such a question is very likely both yes and no. Surely there exist certain immutable ideals common to the finest scholarly institutions of the past, ideals which will continue to mark the great universities of the future, and to which every faculty aspires. Yet it is equally true that a university is a living, dynamic, social organism. As such it is evolving today in plan, in structure, and in commitment. The real crisis of the university in our time is how to maintain its intellectual integrity, how to hold fast to the essence of its ideals, while striving to interpret and express them in the context of new science, of new economics, of new politics — in sum, of a totally new world.

Among institutions of higher learning M.I.T. is *sui generis*. In many respects it has taken on the form and character of a modern university; yet in fact it is set apart by history, by its own style, by its approach to learning, and by its avowed objectives. It was founded originally upon a plan of extraordinary clarity and firmness — a plan that contemplated an institution of well-defined but limited objectives, and which reflected strongly the philosophical views of the first great industrial revolution. For three quarters of a century that plan

rigorously set the pattern of the Institute, narrowly confining the range of our endeavors, while imparting unity, strength, and effectiveness to our efforts.

But with the conclusion of the Second World War we entered upon a wholly new era. Many factors influenced its transformation. Certainly the groundwork laid by Karl Compton in the Thirties, the wartime experience of the Radiation Laboratory, and the abundance of leadership were prominent among them. Yet the crucial element was the onset of a greater upheaval — the scientific-technological revolution, itself in substantial measure a product of the war. Suddenly M.I.T. ceased to be a narrowly specialized institution. Its particular interests and its resources were caught up in the mainstream of public concern. And M.I.T., for its part, was ready for change.

There is no need for me to recall to the Corporation at this point the events of the past twenty years. It is enough to say that in most respects the Institute today bears only a partial resemblance to the M.I.T. many of us knew in the nineteen twenties. In 1949, on the occasion of a first attempt to adjust to a new role, the Faculty Committee on Educational Survey arrived at this conclusion:

“William Barton Rogers’ original concepts of higher education with a scientific and technical basis, of learning by doing, and of the value of an integrated professional and liberal education are important guiding principles relevant to our educational planning today. However, his concepts must be interpreted broadly and applied with full cognizance of the

many changes that have taken place since his time.”

The validity of Rogers’ ideas as a tenable philosophy of education is not in question. It is simply that they are only partially relevant to the problems that we face today. The plain fact of the matter is that those early concepts serve now only minimally as a guide to institutional policy, for they could never possibly have envisaged the major and most perplexing issues that now are pressing in upon us and that will influence the future development of M.I.T. as a whole.

What basic principles, for example, will determine the relative emphasis to be applied over the coming decade at each level of education — undergraduate, graduate, post-doctoral, and continuing? This is more than a practical matter of allocating space and funds; it affects the interests, the commitments, and the character of the entire faculty and staff.

Then there is that persistently troublesome question of balance between research and the more conventional modes of teaching — an issue confronting every major academic institution in the United States. Over the past twenty years, by force of circumstance, decisions at M.I.T. and elsewhere with regard to grants and contracts have been governed in considerable measure by pragmatic expediency. Research is clearly an essential function of the university. Indeed, research is the primary generator of fresh thoughts, new ideas, and intellectual vitality. It is simply the scale of operations, the magnitude of research effort, that differentiates the present from the past. But that change of scale — again I am speaking generally of the contemporary American university —

has imposed a new order of academic values and new measures of personal and institutional achievement. Moreover, it marks the entry of a third party into university affairs — the federal government. Taken on the whole, the agencies of federal support have exhibited an extraordinary perceptiveness and concern in their desire to safeguard the independence of individual institutions. Nonetheless, the current system of research sponsorship inspires a multitude of questions which have often been asked but which remain largely unanswered. How serious for the ultimate unity of a department or school is the potential divisiveness of the project grant? What are the long-term implications of a partial reimbursement of faculty salaries through federal funds? What will be the influence upon an academic environment of an increased emphasis on highly detailed cost accounting, with attempts to measure the expenditure of individual faculty “time and effort”? How soon will the central planning of science — as foreshadowed in the recent Daddario hearings before Congress — begin to shape the scholarly activities of the university? And how will the private institution insure its financial stability against the ebb and flow of federal appropriations? These are certainly questions of wide import, but especially so for M.I.T. Because of our own deep commitment to research, because of our long background of experience, and in the hope that we may add an influential voice in the formulation of a national policy, I think it incumbent upon M.I.T. consciously and systematically to seek answers and to take positions.

Or again, and this is but one more example out of many,

to what new philosophy or lines of policy do we turn for guidance as our involvement grows in domains that heretofore have been considered wholly nonacademic? In part, of course, this reduces to the question of how far to carry the obligation of service which a university may owe to the community and to the nation. There is on the one extreme the ancient tradition of the ivory tower, through which the scholarly ideal is expressed by isolation as opposed to worldly entanglements. On the other extreme, there is the concept of the university as a broad and diffuse instrument of public welfare and service, a concept inherent in the original idea of the land-grant college.

But today the implications of external involvement go much deeper. It is a mark of the modern age that the old hierarchies, the time-honored divisions of labor, the respected plans of organization and lines of authority upon which we have relied to give order to our ideas — and indeed to our lives — are losing their identity. Our whole society tends to become increasingly mobile. The single-purpose business enterprise is giving way to the multi-product, multi-interest industrial corporation. The task force is a common mode of management and operations. There continues to be much talk about specialization and fragmentation in contemporary scholarship and the professions; yet this ignores powerful counterforces working toward a fusion of fields and problems. The emerging interdisciplinary centers of research on our own campus and at many another university are tangible evidence of such a confluence of interest and effort. And now this new

fluidity among the established academic disciplines is reaching beyond the confines of the university itself — the distinction between what is academic and what is nonacademic has lost much of its simplicity, if not its meaning.

Many factors are contributing to this changing state of affairs. One cannot account for it adequately through a sweeping generalization that all this is but one aspect of the contemporary scientific revolution. For as one examines more closely, the situation proves infinitely complex. With the rising level of scientific and technical sophistication, interest focuses increasingly and by necessity on the study of complete or partial systems. These systems encompass many of our most urgent, humanly significant problems. They challenge the scholar and the intellectual as well as the practical doer. They unite elements of pure science and engineering with considerations that are historical, economic, and political in nature. They provide, moreover, an unbroken passage that leads from the lecture room and laboratory into government and industry. This, essentially, was the theme of my 1964 Commencement address.

Take, by way of illustration, the study of modern transportation. As an engineering school, should M.I.T. confine itself to the technical fundamentals of motors, turbines, roads, and rails? Or should it delve deeply into the bewildering complex of elements that determine a real system, which must be mastered before there can be any hope of moderating the prevailing national crisis? Transportation was once a field left to the civil engineers. Our current Project Transport

was created so that we might effectively bring to bear upon this single problem area all the diverse resources of the Institute. Inescapably, and from the outset, this project has been confronted with novel issues arising out of a new set of relations with industry and with municipal, state, and federal agencies of government. By what criteria shall we now delimit the realm of proper institutional effort beyond which we should be careful not to venture?

Or consider the developing program of the new Center for Space Research, supported through liberal grants from the National Aeronautics and Space Administration. The exploration and mastery of interplanetary space provides the central — and surely legitimate — goal. Pure science is represented through research in biology, geophysics, and astrophysics. Problems of propulsion, instrumentation, materials, guidance, and control give emphasis to engineering. But the interests of the sponsor — and of the faculty — carry us further. The American space program is the largest venture of its kind in history. What is its total impact upon the country? What can one learn from this experience with respect to the large-scale organization and management of research and development, or the interaction of private industry with federal agencies to meet large national objectives? These are questions that fall within the province of the economist, the political scientist, the expert on management, and the historian. To what degree do they fall within the province of an educational institution? And if they are deemed inappropriate as legitimate subjects of academic study, to whom will society turn for the competence

and resources to come to grips with them?

Or finally, in a quite different domain, there is the area of urban studies. Should a professor of city or regional planning be content merely with observing and analyzing the crisis of the cities which has come upon us? At what point and to what extent does he become an active participant, contributing his knowledge to the efforts of others in the search for a solution? And what are the responsibilities of the university of which he is a member?

These are perplexing questions, and the manner in which we respond to them, or ignore them, will determine in a very significant way the future character of M.I.T. The Institute is not alone with its problems. In some degree the same issues confront every major university. Indeed the crucial test of our entire free society, it seems to me, lies in the potential of all our institutions — public and private — to make radical adjustments to technological change, while maintaining clarity of function and purpose. Yet I believe the circumstances of M.I.T., if not unique, are at least special. I am deeply convinced that we have come to a critical juncture in our history. While we must acknowledge the powerful influence of our heritage, we must also recognize that the Institute as we now know it is in fact a product of our own time. It is free of many of the restraints that come normally with age and tradition. There is an enthusiasm for new projects, a willingness to experiment, a freedom from prejudice that are the mark of youth. These are qualities that have made M.I.T. an enor-

mously interesting, exciting place to be, qualities that we should endeavor at all costs to preserve. But something more is needed. As we adapt to change, as we respond to an expanding array of proposals and opportunities, we should make our choices and our decisions within a firm framework, within a clearly defined structure of ideas and values.

And, having said this, it is only right on this occasion that I should set forth those values and objectives that have come to assume the first importance in my own thinking, the culmination of my own experience, and my view of what our future course should be. By their very nature the brief statements of belief that follow are not new. They are a gathering together of ideas that I have expressed and of positions that I have taken over many years. As such, they represent the essence of my own philosophy.

First, I want to reaffirm the central thesis of my inaugural address: that everything that we do, whether for the advancement of knowledge or in the interest of public service, should be viewed in the larger context of our teaching mission. I accept as inevitable and in the nature of progress the close coupling between the intellectual life of the institution and the concerns of the extra-academic community. I recognize, moreover, the importance of each of our three traditional roles — of teaching, of research, and of service. But in only one of these is the university unique, without counterpart — and that is in the preparation of young men and women for professional careers and for their responsibilities as citizens. It

seems to me essential that as we move forward, our overriding concern should be for the development of each individual student — be he undergraduate, graduate, or postdoctoral — and that all our endeavors should reflect this emphasis upon teaching in the broadest, most comprehensive sense.

Next I want to comment on our special province as an educational institution. And here I find it much more difficult to define precisely the confines of our interests. As I noted in my commencement address earlier this month, the original concept of the Institute was centered on the idea of relevance to the needs of the society and the power and strength that come from a unity and focus of objectives. At the outset this was oriented toward the demands of a growing industrial nation, and the efforts and endeavors of M.I.T. were initially directed toward engineering and architecture. But step by step with the passing decades, this commitment to relevance has taken us further afield. It led us thirty years ago into first the physical and then the biological sciences. Successively it has brought us into the fields of management, of economics, of political science, of psychology, reflecting the interlocking and coupling of science and technology with the whole range of human affairs — a theme which I have been stressing throughout this entire essay. This progression was inescapable. Yet in our day no university can realistically claim all knowledge for its province. We have taken as our special charge the pursuit of science for its own sake and the useful application of science, which is engineering. And we have placed on an equal footing those areas of study that relate to the impact of science

and engineering upon the progress of mankind. This has indeed been a wide and expanding mandate, but one that remains valid to this day. In my judgment, as a guideline M.I.T. must always hold fast to the idea of relevance to the needs of contemporary society. But although forecasts of this kind are dangerous, it seems to me that we have now rather staked out the principal boundaries of our academic territory and that we have come to a time for consolidation and deepening.

Perhaps nowhere is the need to clarify our thoughts, to strengthen and deepen, greater than in the humanities. During the past year I have on several occasions singled out this subject for special comment. My own view is that the humanities have become central to our endeavors rather than merely peripheral. They cannot be set apart — they must put down firm roots of their own for an authentic growth in our special environment. We here at M.I.T. are concerned primarily with the rational processes of the mind. We deal in large measure with facts and figures, with elements that are tangible and concrete. These traditional concerns need a leavening of the arts and the humanities that we may become truly professional and abundantly aware of our heritage of ideas, of the sweep of history, of the power of art and literature. For these give balance to the range of our knowledge and understanding and a broader import to the works of science and technology that will constitute our own special contribution to the progress of man. Of course the arts at M.I.T. will not be the same as in institutions of the older liberal tradition, and I am not proposing that we establish a liberal arts col-

lege as a small enclave within the larger Institute. The humanities must develop along with us and achieve their own form and character. It would be absurd to imagine, for example, that all areas of literature would find scholarly representation among us any more than one might expect to find every specialty of science in a liberal arts college. And yet I think we have much to offer to the scholar and the artist who will come to terms with science. There is a vitality here, a sense of involvement, that relevance to the problems of our time of which I have been speaking. And there are students of superb intelligence, eager, extraordinarily receptive, open to ideas. Here, I submit, is anything but sterile ground for humanistic studies.

Before I leave this subject of deepening and strengthening, I feel bound also to stress the needs of one of our oldest and most distinguished schools. With the emergence in recent years of so many exciting new fields of science and engineering, I fear that in the main, institutionally, we have tended to overlook or to underestimate the place of architecture. Yet in the world today there are few problems that more urgently demand attention than the planning of our cities and suburbs or the incorporation of modern materials and technology into architectural design in such a manner as to combine beauty with utility. This is a field of endeavor to which M.I.T. over the course of its history has made outstanding contributions, and for the progress of which the Institute as a whole affords tremendous potential resources. The inherent importance of architecture is much greater

than that of an interesting, ancillary, and rather isolated activity; it is imperative to bring it into the mainstream of our future development.

Over the forty-six years that have passed since I first came to M.I.T. as a student, profound changes have taken place in our institutional view of undergraduate education. These represent not only the normal evolution in content and method to keep pace with the advance of science and engineering; they manifest also a more basic shift in our concept of the design and purpose of an undergraduate experience. We may still legitimately define that purpose in broad terms as the laying of foundations for a professional life. But the time has long since passed when the holder of a bachelor's degree — without the additional benefits of graduate study or industrial practice — may be considered either an “engineer” or a “scientist.” The dimensions of professional education have vastly expanded, and the span of time continues to lengthen. Whereas once, for the overwhelming majority of students, the four undergraduate years represented a complete and self-contained preparation for a specific career, today rather than a culmination they constitute only a stage along the extending road of formal education. For us the issue is one of wise planning for this longer span. At what point along the way do we begin to focus sharply on the requirements of a particular professional objective? Over the past decade there have been radical alterations in the curriculum that reflect a growing emphasis upon fundamentals as opposed to special applications. They have been accom-

panied by a greatly increased flexibility, by a marked freedom for experimentation, and by an added degree of self-determination on the part of the student in the selection and design of his own program of studies. We have cast off much of the rigidity of the older days.

From the beginning I have concurred in the aims of this movement and have given it my firm support. I am convinced that undergraduate education is destined at M.I.T. to assume an increasingly broad and fundamental character and that students will come to us in growing numbers in the belief that, whatever their ultimate professional goals, this kind of education will serve them well in an age so powerfully influenced by the social and practical implications of science. Nonetheless, we should never lose sight of the fact that the greatest strength of our particular plan of education is a sense of purpose. As I have said on many occasions to the entering freshmen, the new freedom that we offer is no mandate to roam at random and without focus. That would be contrary to the spirit of the Institute. Their search should be with an open mind but in a purposeful way, reaffirming an interest, perhaps discovering a new one, making it their own, and gradually forming a commitment — developing their own style and beginning to design a way of life.

To these words I need hardly add further testimony of my own dedication to the cause of the undergraduate. We have much to offer him, but he in turn contributes an equal share to the life and spirit, to the fresh and youthful ideas of this institution. We owe him our best effort.

The much discussed stretch-out in the total educational process is radically altering the composition of our student community. Today graduate students and undergraduates are roughly equal in number. And as we well know, the balance is shifted even further by the presence of some hundreds of postdoctoral students, research associates, and visiting fellows. Graduate education has in fact grown like Topsy in recent years and is singularly lacking in a clarity and coherence of educational philosophy. Admission to the Graduate School is largely decentralized among the departments. Subject to a standard minimum level of academic achievement, the criteria for selection of entering graduate students vary notably from department to department, as do the conditions to be fulfilled for the several advanced degrees. This past spring the Academic Council turned its attention to these problems. One of my final actions as President was the appointment of a committee of the Faculty, under the chairmanship of Professor Harold Mickley, to undertake a careful study, somewhat comparable to the work of the Lewis Committee in 1949 but directed specifically toward the problems and policies of graduate education. The Committee has been directed to consider the educational philosophy and objectives of the Graduate School — its organization, its relation to the other Schools of the Institute — and to recommend a pattern of development that should guide us over the next decade or more.

I have been speaking about ideas, about a philosophy, about the design of education. But none of these has mean-

ing apart from the Faculty itself. Later in this report I shall pay tribute to Alfred Sloan, but I want to record here that the last of his many great gifts to M.I.T. provided a fund for the developing and strengthening of our Faculty. There is no need for me to impress upon the Corporation the enormous importance of this objective. We have held it constantly before us, and I am grateful for all the help that has come to us from alumni and friends of the Institute. Nonetheless, I sense the need at this time to give it special and explicit emphasis. Only through a brilliant and gifted Faculty will we impart the highest quality to our manifold undertakings. This will be no easy task. As one looks about, one may discern comparable aspirations on the part of institutions all over the country. For the nation as a whole this is good; for us it is a clear challenge. We have no grounds whatsoever for complacency. We must not only maintain our present position of excellence, but enhance it. I urge that we give to this objective our highest priority.

The attainment of this goal is closely coupled with the top level of faculty salaries. But salaries alone are not enough. There is also an intangible income whose importance looms very large in the ultimate, critical decision to come or to stay. That intangible income embodies the spirit of the institution, the physical and intellectual environment, the opportunities for scholarly work and professional development. I believe that the quality of this environment, the climate for scholarship, demands our constant attention and concern.

One of the predominant characteristics of the Institute is

the intensity of its life. This is not something imposed upon faculty and students from above but is the product of the multitude of their own interests and of a certain driving force that prevails throughout. Much of the appeal of M.I.T. has been the sense that things can be done here. Few institutions to my knowledge have been so successful in the breaking down of disciplinary lines or in the development of an ability to mobilize total resources for concentrated attacks on major problems. This is by no means unrelated to a remarkable unity among the faculty, an absence of factionalism, a readiness to work together — all of which bear directly on this subject of environment. To my mind this state of affairs is one of our greatest strengths and one that we should consciously foster. Indeed, I think it inevitable that we will continue to develop in this fashion — because of the experience that we have amassed, because of the increasing complexity of science and engineering, and because of the mounting costs of research.

And yet I feel very strongly that if we want to reach our highest fulfillment, we must never forget that the special role of a university is to offer a haven and an intellectual climate in which the highly creative, highly individual scholar can fruitfully pursue his own course in his own way with the esteem of his fellows. The climate for action must allow also a place for serenity and reflection. This becomes all the more imperative as we move further into areas of pure science, of the arts, and of fundamental research. In sum, we should cultivate this other dimension in our academic environment.

We need to stimulate and encourage individual peaks of scholarly achievement.

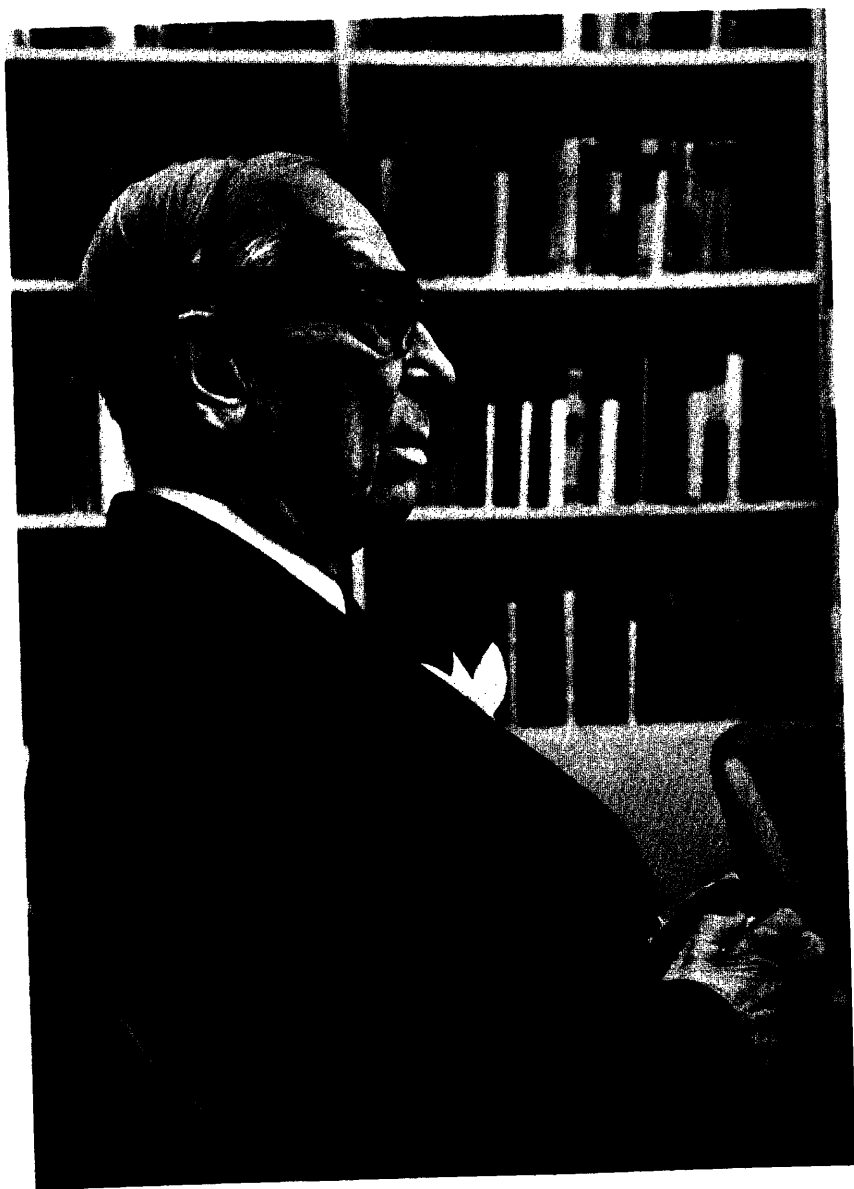
The import of these comments carries beyond the realm of the Faculty alone. They bear directly on our need also to create an environment that brings out the innate originality of the student, that develops his imagination, that encourages him to strike out intellectually upon his own. There is no one subject in the catalogue, no special curriculum, that fulfills these particular Institute requirements. They derive only from the style of the institution, from its own spiritual and intellectual ambiance, from all the forces which modulate and temper and fortify both talent and character. This is the kind of environment that we must never cease to cultivate.

The factors that I have just been discussing are largely intellectual. But as all who have listened to me in these recent years know well, I have deep convictions about the subtle influence that our *physical* environment also exerts upon the whole community. There may very well be a few people who are insensitive to their surroundings. Yet I think that the quality of architecture, the care and design of our campus, the evidence of taste and style within and without, are supremely important in giving distinction to an institution. Indeed, they reflect in large measure its inherent educational philosophy and its concern for the human element.

The Institute is extraordinarily fortunate in its location along the Charles. We have come a long way since the days of graveled courts and of treeless, barren expanses of land. Nonetheless, there remains much to do. By force of necessity the

demands on our few remaining open spaces will grow more insistent, placing an ever greater premium on thoughtful, imaginative planning and development. The entire visual aspect of the buildings and the campus, both inside and out — the landscaping of the grounds, the display of art and sculpture, the design and the proper lighting of the interiors — deserve our most serious attention. And this is an appropriate point to express sincere thanks to the M.I.T. Art Committee for their dedicated efforts to give prominence to the place of art at the Institute as well as tangible support.

I come finally to one further idea which is always foremost in my thinking about M.I.T. It is the idea of the wholeness of education — that what we have to offer the student, undergraduate or graduate, is a total experience, an experience that goes beyond the formal curriculum, beyond a program of courses and a series of examinations. It is more than lectures and classrooms and laboratories, however excellent they may be. It is the sum of all the associations with faculty, all the friendships that are formed among classmates. It is the maturing that comes from participation in student activities, the new perspectives awakened by visiting lecturers, by theater, and music. It is the experience of living as part of a community — a community that shares a common concern for things of the mind and the spirit. And for the realization of this broader view of education, the entire plan of a residential community is paramount. It is for just this reason that I have attached so much weight to every effort directed toward the betterment of student residences and student life.



Alfred P. Sloan, Jr.

II

I turn now from these general observations to record several events of this past year.

On the sixteenth of February, M.I.T. and all its alumni were saddened to learn of the death of Alfred P. Sloan, Jr. He was in his ninety-first year, a graduate of the Class of 1895, and a member of the Corporation for nearly forty years. Through a long succession of gifts he became our greatest benefactor, but in his loyalty to the Institute he drew upon vastly more than his wealth. He cared about M.I.T., and he believed in its purpose. He challenged us constantly with bold new ideas, and he made it possible for us to carry them through. His interest never flagged. We were grateful for his generous support and proud of his own great achievements as the outstanding industrial leader of his time. We shall miss his wise counsel and remember him always with affection and respect.

Then on June third we lost another distinguished alumnus, Welles Bosworth of the Class of 1889, who died in Paris at the age of ninety-seven. It was fifty years ago almost to the day since the dedication of the magnificent buildings which he had designed for our new campus in Cambridge. They will stand for all time as a mark of his genius as an architect and of his love for M.I.T. On the occasion of the seventy-fifth

reunion of his class, we sent to him in 1964 this testimonial of our appreciation:

“Architect — whose creative vision half a century ago — endowed the Institute with a grand and timeless design — central to its purposes — favorable to its growth and flexible in its mobility — symbolic of its aims and accomplishments.”

In 1960 we embarked upon a program of new construction and physical expansion to be compared only with the great move from Boston half a century ago. With the completion in 1969 of the currently projected buildings, we shall have added two and three-quarter million gross square feet at a cost of the order of \$91 million.

Within the past twelve months several major buildings initiated under this program have been finished, and others have begun to rise. Of all these, the largest — indeed the largest single academic addition since the erection of the central group in 1916 — is the Center for Materials Science and Engineering. On the afternoon of the Corporation meeting last October we gathered at a dedication ceremony to name this new building in honor of Vannevar Bush, and there is now inscribed upon the wall of the lobby this fine tribute:

“An engineer distinguished for his creative contributions to science, engineering and the Nation. Honored for his achievements in research and education; for his devoted service to the Massachusetts Institute of Technology as teacher, administrator, and Corporation Member; for his acclaimed



Welles Bosworth

leadership of the Carnegie Institution of Washington; for his mobilization during World War II of the Nation's scientific resources to achieve advances in military technology decisive in the winning of the War; for his statesmanship in formulating and advocating sound policies for the advancement of science, engineering and education."

In December, also on the occasion of a Corporation meeting, we dedicated the Uncas A. and Helen F. Whitaker Building, which makes more than 130,000 gross square feet of laboratory, classroom, and office space available to the Center for Life Sciences. In responding that afternoon on behalf of the Institute, and in thanking the Whitakers for their generosity and for their confidence in M.I.T., I remarked that the Whitaker Building represents more than a tangible presence on our campus — it has also a symbolic meaning:

"It testifies to a deeper commitment of M.I.T. to the life sciences. It foreshadows the work of many minds, the labor of many intellects. In its own way it represents the students from one generation to another who will come here to learn and who, in their turn, will go out to make their own mark, to contribute their individual shares to the progress of biology, of medicine, and of nutrition. I believe, too, that it is symbolic of the triumph of man's mind and spirit in the unremitting search for knowledge, in the marshaling of our forces for the battles that must be waged in the conquest of hunger and disease."

A convocation of alumni of the Sloan Fellowship Program in October marked the opening of the Grover M. Hermann

Building. This is a four-story structure of striking appearance standing adjacent to and linked with the Alfred P. Sloan School of Management on land that is to be known henceforth as the Sloan Campus. The Hermann Building comprises four floors, a basement, garage, and penthouse, amounting to nearly 100,000 gross square feet of space to meet the expanding needs of the School of Management and to house the new Department of Political Science, the Center for International Studies, and the Dewey Library.

In 1930 Dr. Compton brought with him to the Institute from Princeton Professor Robert J. Van de Graaff, who continued here his fundamental, pioneering work on the design of high voltage electrostatic generators. One of his first assistants was John A. Trump, then a graduate student in electrical engineering. Dr. Trump undertook the engineering development of vacuum-insulated electrostatic machinery, and then over the years brought the results of his research to bear upon some of the most difficult medical problems that vex mankind. Although the influence of the High Voltage Research Laboratory is incalculable, it has been estimated that in one clinic or another over a thousand patients are currently treated each day for cancer by techniques developed at M.I.T. It would be difficult to find a better example of the potential of engineering for the advancement of medicine and human welfare. Recently, however, it became necessary to demolish the old building housing the Laboratory to make way for the new Center for Space Research. We are grateful to the Fannie E. Rippel Foundation, the Damon Runyon

Memorial Fund for Cancer Research, the Lahey Clinic Foundation, and the Godfrey M. Hyams Trust for the assistance which has made possible a fine new laboratory at 155 Massachusetts Avenue. There is now adequate space for three Van de Graaff generators in the megavolt range, clinical facilities, research laboratories, and a library. For the first time in many years our research activities in the field of medical radiation have been consolidated and thereby strengthened.

On May 7 still another ceremony took place deserving of very special mention. Earlier in this report I commented on the influence of physical environment upon the character of an institution. Mr. and Mrs. Eugene McDermott hold this same view with deep conviction. We owe to their concern and imagination our new McDermott Court, which has transformed the East Campus. The central focus of attention is Alexander Calder's forty-foot black stabile, La Grande Voile, standing out against the towering Green Building. And the Court itself is the realization of a complete idea and plan, of which the trees and shrubs, the lawn and benches, the paths and paving blocks are essential elements. It has been our hope that McDermott Court by example would encourage the development of other areas of our 120 acres in Cambridge. And I think I may say that already it has. For the small piece of arid land bounded by the Materials Center and the main buildings, while on a much less ambitious scale, has been transformed by landscaping and benches into a delightful garden.

And finally in this record of dedications I come to the event which understandably will always remain most vivid in my own memory of the past year, or indeed of all the years that I have spent at the Institute — the opening of the Student Center and the naming of the building in my honor. Whoever has had any close association with students at M.I.T., any insight of their needs, has long recognized how much just such a center might contribute to the quality of student life on this campus. The use of the Center during the winter and spring has surpassed our every hope and expectation. To the members of the Corporation and to the students themselves, among whom the proposal for this tribute originated, I can only say again that nothing conceivably could have afforded me greater pride and satisfaction than that this particular building should bear my name.

At least seven other projects are moving rapidly ahead.

Last year a grant of \$300,000 from the Harold Whitworth Pierce Charitable Trust made possible the long desired and sorely needed new boathouse on the Charles River directly across Memorial Drive from Baker House and Burton House. The total cost will be in excess of half a million dollars. It will provide storage for forty-eight shells and our first indoor rowing tank for winter crew practice. Construction is well along, and the opening ceremonies have been planned for September.

Mrs. Stanley McCormick has demonstrated once again her interest in and loyalty to M.I.T. as well as her concern for

the education of women in the many fields of science, engineering, and architecture. Through her encouragement and help we have undertaken an addition to McCormick Hall which will double the housing that can be offered to undergraduate women. There will be single rooms around common lounge areas for 111 students and three tutors, as well as a library, an art studio, a music room, and other general recreational lounges serving the entire Hall. To make way for this second tower several of the old brick row houses on Memorial Drive must be demolished. As a result, Theta Delta Chi Fraternity will move to Moore House, and a new home will be built near by for the Dean of Residence. All this work is scheduled for completion in 1968.

Along Massachusetts Avenue the Institute will very shortly present an unbroken front from Memorial Drive to Vassar Street. The difficulties of arriving at a design appropriate for the site and in harmony with the existing buildings have been very real and have substantially delayed the start of the new home for the Center for Advanced Engineering Study. These difficulties were aggravated further by the ever-present soil and water problems common to our part of Cambridge. However, the foundations have been laid, the structure is finally under way, and we may look for completion in the summer of 1967. Ultimately the Center will accommodate some 100 engineers and scientists returning from industry, government, and universities for a period of continuing education. For the present Professor Harold S. Mickley, the Director, has been compelled to limit the group

to twenty-five in temporary quarters but is proceeding nonetheless towards the development of a diversity of programs.

Around the corner on Vassar Street still another building destined for interdepartmental studies is taking form — the Center for Space Research, the general concept of which has been described in my earlier reports. The new laboratory will provide facilities for research on propulsion, space navigation and control, space biology and related problems of nutrition, for studies relating to fluid and gas dynamics as well as to the storage and retrieval of data. The intermingling of the sciences and engineering will be particularly in evidence through the association of a group working with Professor Bruno Rossi on astrophysics, another engaged in geophysical research, while a group from diverse fields of the social sciences will study the impact of our national space program in all its aspects. The completion date for this Center has also been set for the summer of 1967.

Among the most gratifying developments to be reported is the progress towards an improvement in housing for the M.I.T. community.

To counsel and assist the faculty and visitors in finding housing in the Cambridge and Metropolitan area, as well as to give help and advice to those students desiring to live off campus, we have this year established a Community Housing Service with a professional staff.

In November construction was begun on a four million dollar apartment tower, to be known as Eastgate, adjacent to the Sloan School and bordering on Kendall Square. It

will rise thirty stories to a height almost equalling that of the Cecil and Ida Green Building and will provide 204 apartments for both married students and faculty.

Few needs, if any, have grown more urgent of late than that of adding to our undergraduate residences. Earlier in this report I have commented upon the influence of quality in the student environment. Twenty years have passed since the opening of Baker House, and for want of adequate renewal and because of overcrowding, the conditions in many sections of our existing houses are nothing short of intolerable — unworthy of the standards of our institution. The problems and requirements have been thoroughly studied, and they lead to an imposing figure for the sum that must be expended at the earliest possible date towards this objective.

Happily we are now both ready and able to take the first step. Pietro Belluschi, Dean Emeritus of the School of Architecture, in association with The Architects Collaborative, has developed a very appealing design for a complex of two dormitories on Memorial Drive west of Burton House. In December, Mr. Frank S. MacGregor of the Class of 1907, made a gift of \$2 million toward the cost of one of these two dormitories. It will be named MacGregor House, and plans are proceeding rapidly for construction, although we can hardly hope for occupancy before the fall of 1969. The plan of the building incorporates ideas that emerged from a series of exceedingly thoughtful, painstaking studies undertaken by staff and faculty during the years 1961 to

1965, and the cost reflects the nature of the program itself rather than a lavishness of design. Almost every student will have a private room arranged as part of a suite, which will include a living room shared by four to eight students. The suites will be grouped into entries of thirty to forty residents sharing a commons room. A tutor will be assigned to each entry. The two basic architectural elements are a single seventeen-story tower and a four-story "walk-up." Three hundred twenty-five students and ten tutors will be in residence, almost equally divided between the two parts of the complex. In the lower portions of the House there will be a reception and commons room, dining room, library, and seminar room. Included also will be a Master's residence, an apartment for a senior tutor, and accommodations for one or two visiting scholars.

For the past several years the academic department that clearly has suffered most from inadequate space is Chemistry, and an intensive effort has been made to remedy this critical situation. I. M. Pei has designed a new Chemistry Building to be located in Eastman Court in proximity to the Center for Earth Sciences and the Center for Life Sciences. It will be a structure of major proportions, adding approximately 137,000 gross square feet at a cost in the neighborhood of \$7.5 million, with a further \$1.4 million needed to cover the burden of added operating expense. In December the National Science Foundation awarded to M.I.T. a facilities grant of \$2,946,700 towards this cost, subject to certain

time limits on the matching requirements. At the present moment we have every hope that the necessary funds will be found and that construction will begin early this coming spring.

The month of June, by chance, marked two anniversaries for the Institute. First, it was the occasion of our 100th Commencement, by official count, although we must remember that M.I.T. throughout its early years of austerity indulged in no ceremonial exercises. It was also just fifty years ago, as I noted earlier, that the final graduation took place in the old Rogers Building on Copley Square and the move began across the Charles. The voyage of the barge Bucentaur to the Cambridge shore has gone down in our history. For the benefit of those who came to Alumni Day on this past June 13, the Class of 1916 re-enacted scenes from that memorable celebration. It must indeed have been a gala occasion, with pomp and ceremony for three days such as the residents of our city have scarcely seen before or since, and which least of all they might have expected from staid and sober Boston Tech.

As a matter of fact, we landed on what may have seemed a rather dismal place. The site upon which the Institute now stands was then little more than a wasteland, redeemed only shortly before from the original salt marsh. But it was a wise and fortunate choice. We owe much to the environment of Cambridge, and we are most sincerely appreciative of the cordial and constructive relations that have prevailed over

the years with the governing councils of this city. For our own part, we believe that we have contributed a significant share to the resources that make Cambridge unique among all cities of our country.

Anniversaries such as these impress upon us again that M.I.T. indeed has a history and that it belongs to the larger story of education in the United States. They remind us, too, of our obligation to preserve the records of the past and to document for future generations the development of a kind of institution that is peculiar to our country and to our time. Rather belatedly, we took action this year to acknowledge our responsibilities through the formal establishment of an archival policy and the appointment of Professor Neal Hartley of the Department of Humanities as Institute Archivist.

III

And so, finally, I return once more to the point at which I began this report. The month of June marks also the end of my own term of office and brings with it a change of regime. One does not conclude an active involvement of forty-six years without trace of trauma. Yet I must say here, as I did in May when I presided for the last time over a meeting of the Faculty, that I come to this milestone without sadness or regret, but with a sense of deep gratitude for the opportunities that have been mine and for the friendships that I have enjoyed. For M.I.T. these have indeed been gloriously exciting, productive years, and no one could have asked more of life than to have had in all of this even a modest part. I have been supremely fortunate in many things, but especially in the time and tide which have moved M.I.T. forward. I have been supported by my absolute faith in the Institute, by my convictions about the validity of its principles, with no illusions whatsoever about our shortcomings, but with a firm belief that our aims are right, that they are timely, and that we would succeed. I have been helped by my ties to the faculty, by the fact that I have always considered myself to be a part of that body. Never have I felt that I had left it to cross over to some other foreign domain, or never have I been willing to accept the supposedly inescapable dichotomy between the interests of faculty and administration. I have been extraordinarily fortunate in the circle of immediate

associates who over the past nine, intensely busy, often trying, years have stood by me with a loyalty and effectiveness beyond my powers to describe. And by no means least, my warm relationship with the students of M.I.T. is a remembrance which I shall carry with me all my life.

My indebtedness to members of the Corporation, to alumni, to colleagues, and to friends of the Institute is too vast to acknowledge individually. However, I cannot allow this occasion to pass without a warm and grateful tribute to one colleague in particular — to Charles Townes, who has chosen to relinquish the duties of Provost to pursue his own dedication to scholarship as an Institute Professor. Over the five years since he joined our faculty and administration, Dr. Townes has labored unremittingly to strengthen M.I.T. and to further its objectives. His penetrating comprehension of the ideas that underlie all science and engineering, his remarkable store of detailed and precise information, and his highly discriminating judgment on matters of scientific merit will leave a lasting mark upon the intellectual quality of the Institute. I know that I speak for all the members of the Corporation in expressing to him our thanks and in wishing him well as he continues a brilliant career in physics.

There remains now only one word to add. With the guidance of a new president, M.I.T. takes another step along the path of history. The way will be marked by many old and familiar problems, but also by new issues, fresh ideas, differing approaches, and certainly by success. I shall follow the

continuing progress of our Institute with utter confidence in the leadership of Howard Johnson and pledge him my un-failing support.

June 30, 1966

J. A. STRATTON

IV

STATISTICS OF THE YEAR

The following paragraphs report briefly on various aspects of the Institute's activities and operations during 1965-66.

REGISTRATION

In 1965-66 student enrollment was 7,408, an increase of 257 over the 7,151 enrolled in 1964-65. This total was comprised of 3,755 undergraduates and 3,653 graduate students.

Graduate students who entered M.I.T. last year held degrees from 304 colleges and universities, 175 American and 129 foreign. The foreign student population was 951, representing approximately 13 per cent of the total enrolled. The foreign students were citizens of 72 different countries.

Degrees awarded by the Institute in 1965-66 included 829 Bachelor's degrees, 845 Master's degrees, 126 Engineer degrees, and 360 doctoral degrees — a total of 2,160.

STUDENT AID

This past year 1,969 undergraduates, over 50 per cent of those enrolled, received \$1,730,722 in scholarship aid and \$1,389,339 in loans. These two categories of direct aid thus totalled \$3,120,061, an increase of 14 per cent over the year before.

The scholarship assistance granted included \$887,317 from outside sources and \$843,405 from M.I.T.'s own en-

dowment fund. The endowment for undergraduate scholarships was increased by \$1,978,500 during the year. Total endowment now stands at \$14,465,176 reflecting a 15.8 per cent increase over 1964-65.

Of the loans provided during the past year, \$540,191 came from the Institute's Technology Loan Fund and \$738,465 from the National Defense Student Loan Fund. An additional \$110,683 in loan funds was received from other sources.

Besides the loan total recorded above, forty-six students received \$25,486 under the Installment Credit Program which permits a portion of the tuition fee to be paid over a ten-year period.

Term-time campus employment, as reported by the Manager of Student Personnel, provided 2,350 students with \$1,398,250 — an average earning of \$595 per student. An additional \$55,000 was earned by 150 students employed off campus.

To graduate students the Institute awarded \$2,285,525 in fellowships, traineeships, and scholarships; \$676,442 in staff tuition grants; \$5,573,422 in staff salaries; and \$457,872 in loans, for a total of \$8,993,261.

The corresponding figures for last year were \$1,816,560; \$389,187; \$4,876,672; and \$366,060, respectively, for a total of \$7,448,479.

Fellowships awarded to our graduate students in 1965-66 by major outside agencies amounted to an additional \$2,033,984.

Figures 1 and 2 show the increases over the past decade in most of the foregoing categories of financial aid for both graduate and undergraduate students at the Institute.

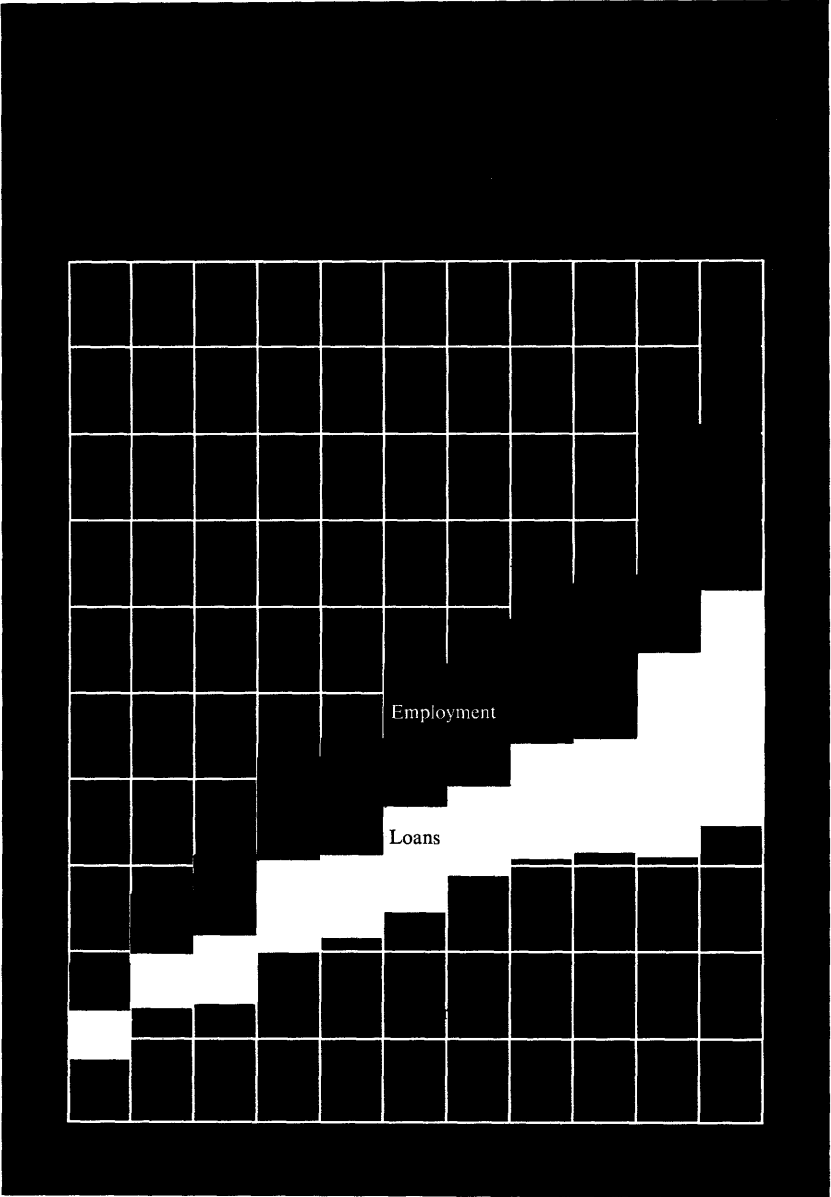
PLACEMENT

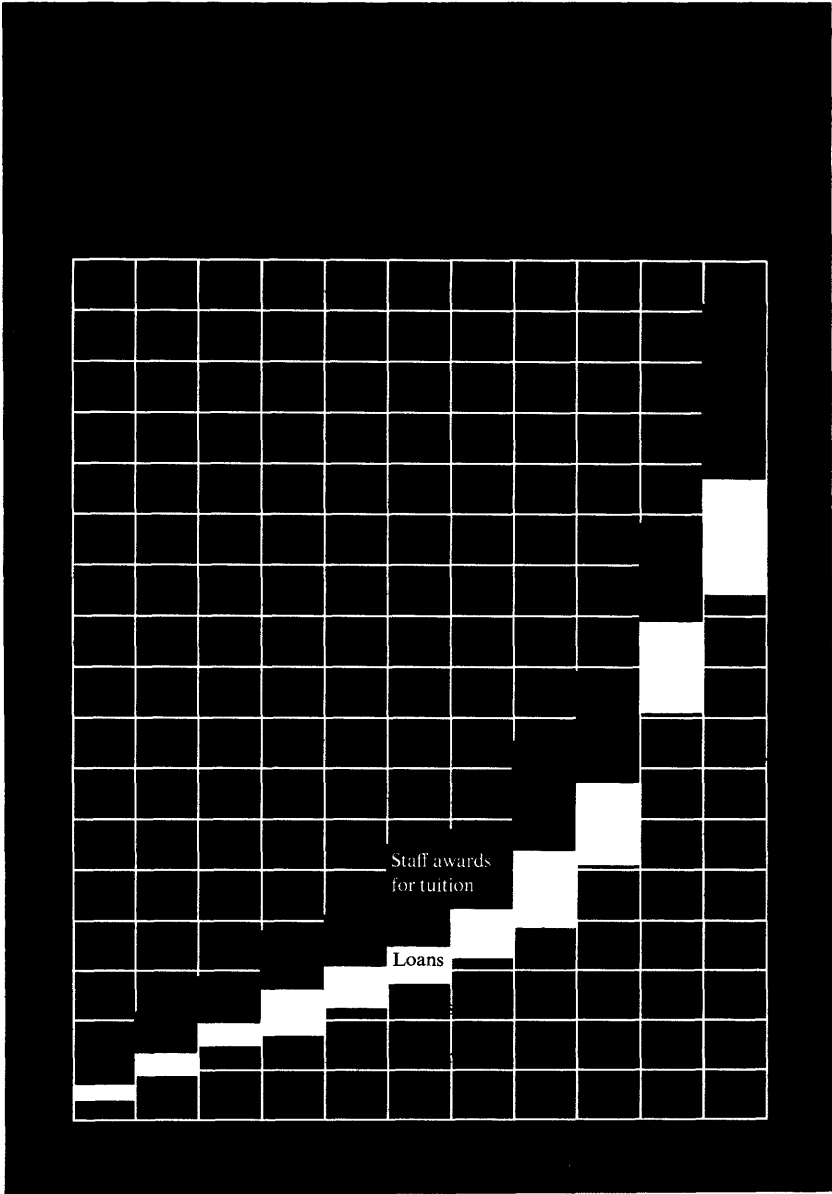
A total of 396 companies, 37 government agencies, and 13 graduate schools actively recruited in the Placement Bureau during the past year. Nearly one-third made second and, in some cases, third visits. The 822 company and other representatives who participated in these visits interviewed a total of 1,733 students who participated in a combined total of 7,374 interviews.

The median salary offer to this year's graduating seniors was \$690 per month; to Master's candidates, \$835; and to doctoral candidates, \$1,050. About four-fifths (79%) of the seniors planned to go on to graduate work.

FINANCES

As reported separately by the Treasurer, the Institute's educational and general expenses — excluding the direct expenses of departmental and interdepartmental research and of the Lincoln Laboratory and the Instrumentation Laboratory — amounted to \$41,666,000 during 1965-66 as compared to \$35,235,000 during 1964-65. This increase in educational and general expenses during the year reflected, as noted by the Treasurer, a further expansion of teaching, research, and other activities, carrying through the implementation on a larger scale of the programs financed by the





Second Century Fund as new physical plant was occupied.

The direct expenses of general departmental and inter-departmental sponsored research increased from \$33,735,000 to \$37,382,000; and the direct expenses of major laboratories and special departmental research increased from \$91,161,000 to \$93,972,000. These changes represent increases of eleven per cent and three per cent respectively.

The large construction program of the Institute continued to make further progress in 1965-66, with the book value of plant facilities increasing from \$87,524,000 to \$96,182,000. A part of the expenditures for most of the buildings cited earlier in this report was added to the plant account during the year. In addition to these major new facilities for student life, for teaching, and for research, the Institute began during the year the construction of a parking garage, the fourth facility of this kind at the Institute, and undertook important extensions of the supporting utilities for the Institute's plant.

The Institute's investments, excluding retirement funds, had a book value at the end of the fiscal year of \$219,038,000 and a market value of \$317,544,000. This compares to book and market totals of \$177,474,000 and \$280,667,000 last year. Endowment and other funds increased this year from \$190,722,000 to \$229,112,000.

Funds sharing in the income from the general investments earned 6.10 per cent, and 5 per cent was allocated to the endowment funds. There was also, as in the previous year, an extra distribution of one per cent to these funds.

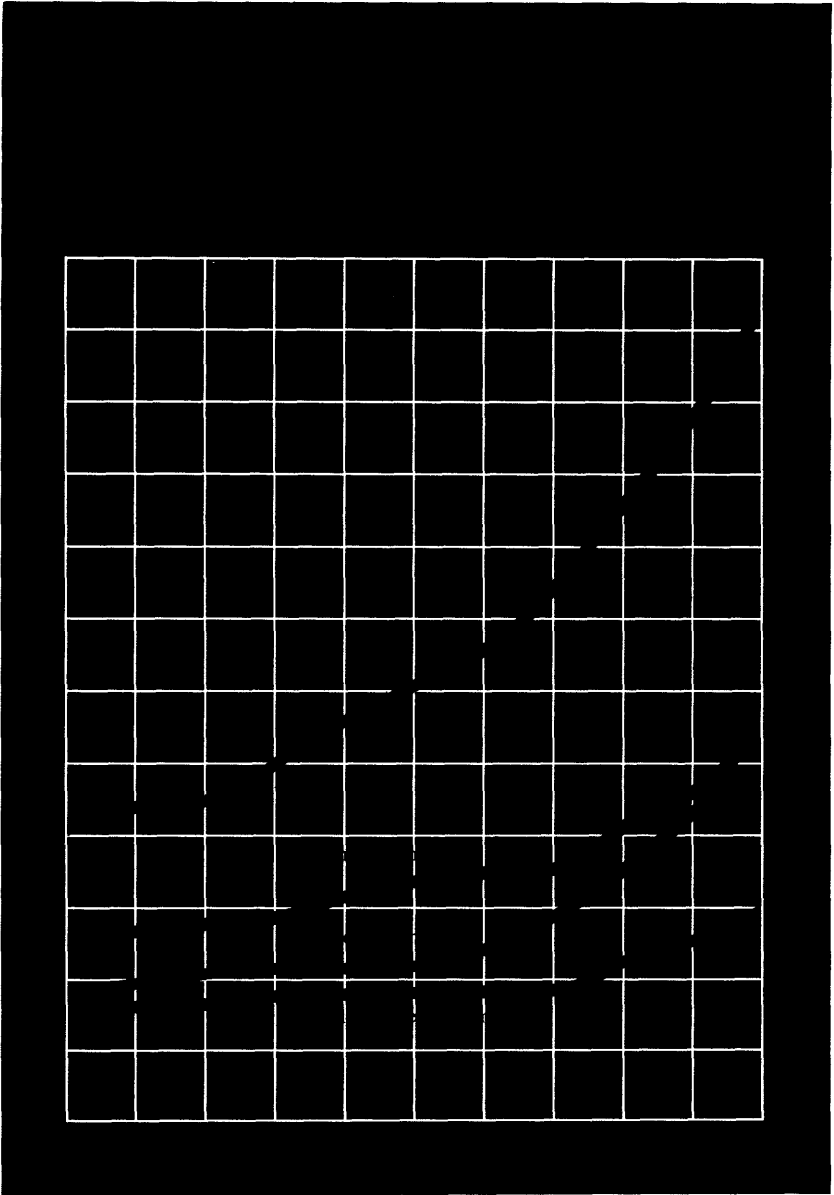


Figure 3 shows the growth of M.I.T.'s fund and plant assets from 1956 to 1966.

GIFTS

Gifts, grants and bequests to M.I.T. from private donors totaled \$40,740,000 during fiscal 1965-66 as compared with \$23,451,000 the previous year. This gift total included \$3,737,000 in Second Century Fund pledge payments and unrestricted direct gifts to the Alumni Fund of \$624,000 which made up a part of the total of \$2,210,000 included in the Alumni Fund in 1965-66.

Two major factors contributing to the unusually high gift income figure this year were the munificent distribution from the estate of Alfred P. Sloan, Jr. '95, and the payment in full of the large Ford Foundation grant to strengthen and expand the Institute's educational and research activities in international fields. These benefactions together accounted for slightly more than fifty per cent of the total gift income for the year.

V

PERSONNEL CHANGES
AS OF
OCTOBER 1, 1966

CORPORATION

DEATHS

ALFRED P. SLOAN, JR.

APPOINTMENTS

HOWARD W. JOHNSON
President

GEORGE W. THORN
Special Term Member

ROBERT B. WOODWARD
Special Term Member

JOHN K. JAMIESON
Alumni Term Member

JOHN LAWRENCE
Alumni Term Member

GEORGE R. VILA
Alumni Term Member

CHANGES OF APPOINTMENT

JULIUS A. STRATTON
Life Member

UNCAS A. WHITAKER
Life Member

WALTER J. BEADLE
Life Member Emeritus

DUNCAN R. LINSLEY
Life Member Emeritus

ELECTION

THEODORE A. MANGELSDORF
President of the Alumni Association

FACULTY

DEATHS

ARTHUR C. COPE
Camille Dreyfus Professor of Chemistry

WILLIAM H. RADFORD
Professor in Electrical Engineering and
Director, Lincoln Laboratory

CARLE R. HAYWARD
Professor Emeritus in Metallurgy

LAURENS TROOST
Professor Emeritus in Naval Archite-
cture and Marine Engineering

CARLTON E. TUCKER
Professor Emeritus and Executive
Officer in Electrical Engineering

ERNEST N. GELOTTE
Associate Professor Emeritus in
Architecture

RETIREMENTS

JOHN C. SLATER
Institute Professor Emeritus

ANTOINE M. GAUDIN
Professor Emeritus in Metallurgy

WILLIAM C. GREENE
Professor Emeritus in Humanities

JOSEPH H. KEENAN
Professor Emeritus in Mechanical
Engineering

ALEXANDER SMAKULA
Professor Emeritus in Electrical
Engineering

JOHN T. RULE
Professor Emeritus in Mechanical
Engineering

ROLAND D. PARKS
Associate Professor Emeritus in
Geology and Geophysics

RESIGNATIONS

Professors:

LT. COL. JAMES W. GILLAND
Head, Department of Military Science

EDWARD H. BOWMAN
Sloan School of Management

COLUMBUS O. ISELIN
Geology and Geophysics

HENRY P. MCKEAN, JR.
Mathematics

ALAN S. MICHAELS
Chemical Engineering

Associate Professors:

MAJOR LEVERNE E. ALLEN
Military Science

JOHN BLAIR
Electrical Engineering

GEORGE A. BROWN
Mechanical Engineering (to Lecturer)

WILLIAM M. EVAN
Sloan School of Management

LOUIS C. FILLIOS
Nutrition and Food Science

MARVIN E. GOODY
Architecture (to Research Associate)

MAJOR JOSEPH A. HART
Aerospace Studies

NORMAN N. HOLLAND
Humanities

THOMAS P. HUGHES
Humanities

IRWIN M. JACOBS
Electrical Engineering

JOHN F. KENNEDY
Civil Engineering

EDWARD F. KURTZ, JR.
Mechanical Engineering

MORTON LOEWENTHAL
Electrical Engineering

PERRY A. MILES
Electrical Engineering (to Lecturer)

ROBERT E. NEWNHAM
Electrical Engineering

COMMANDER WILLIAM R. PORTER
Naval Architecture and Marine Engi-
neering

GEORGE S. REICHENBACH
Mechanical Engineering

HERBERT M. TEAGER
Electrical Engineering

H. MARTIN WEINGARTNER
Sloan School of Management

JOHN W. WINCHESTER
Geology and Geophysics

Assistant Professors:

DONALD H. AVERY
Metallurgy

DANIEL BELTRAN MALDONADO
Civil Engineering

FRED CHERNOW
Electrical Engineering

WALTER C. CLEMENS, JR.
Political Science

PAUL G. FEDERBUSH
Physics

DENNIS W. FIFE
Electrical Engineering

WARD D. GETTY
Electrical Engineering (to Lecturer)

IRA A. GLAZIER
Humanities

MORTON GORDEN
Political Science

IMRE HALASZ
Architecture

JOSEPH L. HALL II
Electrical Engineering

JAMES H. HEASLEY
Metallurgy

WILLIAM H. HEISER
Mechanical Engineering

TOM D. HUMPHREYS, II
Biology

RICHARD Y. KAIN
Electrical Engineering

PAUL D. KAY
Political Science

EMMET J. LARKIN
Humanities

PAUL A. LEE
Humanities

JAMES J. LINN
Sloan School of Management

ERIC G. MANNING
Electrical Engineering

VICTOR H. MATTFELD
Humanities

WILLIAM G. MAY
Electrical Engineering

MICHAEL A. MCKERVEY
Chemistry (to Research Associate)

DILEEP R. MEHTA
Sloan School of Management

ALOJZY A. MIKOLAJCZAK
Aeronautics and Astronautics

HAL L. MOSES
Mechanical Engineering

HENRY NATHAN
Humanities

DAVID E. NEWLAND
Mechanical Engineering

EMMANUEL PARTHENIADES
Civil Engineering

ROBERT J. PFEIFER
Electrical Engineering

EDWARD S. PIERSON
Electrical Engineering

JOHN W. PODUSKA
Electrical Engineering

BIRENDRA PRASADA
Electrical Engineering

PAUL O. ROBERTS, JR.
Civil Engineering

QUINTON R. ROGERS
Nutrition and Food Science

ARTHUR SHAVIT
Mechanical Engineering

JOHN D. SHERMAN
Chemical Engineering

JAGDISH N. SHETH
Sloan School of Management

BARRY B. SPACKS
Humanities (to Lecturer)

PETER R. SPERRY
Chemical Engineering

THOMAS G. STOCKHAM, JR.
Electrical Engineering

CHAU-HSING SU
Mechanical Engineering

MIKIO SUO
Mechanical Engineering

SAMUEL J. TODES
Humanities

OLEH J. TRETIAK
Electrical Engineering

WILLIAM L. WHITE
Sloan School of Management

SAMUEL WILENSKY
Nuclear Engineering

LYLE A. WOLFSKILL
Civil Engineering (to Research Associate)

JOHN H. WOOD
Physics

YISHAK YACOBY
Electrical Engineering

GEORGE ZAMES
Electrical Engineering

RICHARD N. ZARE
Chemistry

PROMOTIONS
To Professor:

MICHAEL ARTIN
Mathematics

DAVID J. BENNEY
Mathematics

AMAR G. BOSE
Electrical Engineering

WILLIAM F. BRACE
 Geology and Geophysics
P. L. THIBAUT BRIAN
 Chemical Engineering
PAUL H. COOTNER
 Sloan School of Management
MAURICE S. FOX
 Biology
FREDERICK W. FREY
 Political Science
JAMES G. GLIMM
 Mathematics
LEE GRODZINS
 Physics
KERSON HUANG
 Physics
K. UNO INGARD
 Physics
SHIH-YING LEE
 Mechanical Engineering
WINSTON R. MARKEY
 Aeronautics and Astronautics
ALAN L. MCWHORTER
 Electrical Engineering
JAMES R. MUNKRES
 Mathematics
JOHN T. R. NICKERSON
 Nutrition and Food Science
ROBERT E. OGILVIE
 Metallurgy
NORMAN A. PHILLIPS
 Meteorology
THEODORE H. PIAN
 Aeronautics and Astronautics
WILLIAM F. POUNDS
 Sloan School of Management
HARALD A. T. O. REICHE
 Humanities
PHILLIPS W. ROBBINS
 Biology
LT. COL. JACK R. SHIELDS
 Military Science
ZENON S. ZANNETOS
 Sloan School of Management

To Associate Professor:

DONALD S. APPLEYARD
 City Planning
MICHAEL ATHANS
 Electrical Engineering
JOHN G. BARRY
 Athletic
CHARLES A. BERG
 Mechanical Engineering
ARON M. BERNSTEIN
 Physics
FORBES T. BROWN
 Mechanical Engineering
SECOR D. BROWNE
 Aeronautics and
 Astronautics
EDWARD A. CROCKER
 Athletic
THOMAS H. DUPREE
 Nuclear Engineering
ALVE J. ERICKSON
 Mechanical Engineering
DONALD E. FARRAR
 Sloan School of Management
ALBERT R. GURNEY, JR.
 Humanities
E. NEAL HARTLEY
 Humanities
JAMES S. HEKIMIAN
 Sloan School of Management
FREDERICK C. HENNIE, III
 Electrical Engineering
RUSSEL C. JONES
 Civil Engineering
LOUIS KAMPF
 Humanities
ROY KAPLOW
 Metallurgy
DEAN C. KARNOPP
 Mechanical Engineering
TAKESHI KOTAKE
 Mathematics
WILLIAM A. LITTLE
 Civil Engineering

ROBERT D. LOGCHER
Civil Engineering
PAUL W. MACAVOY
Sloan School of Management
RICHARD I. MATELES
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Design by the M.I.T. Office of Publications. View of M.I.T. by Gregory Smith '30; photograph of Alfred P. Sloan, Jr. by Martha Holmes. Charts by Giardini/Russell Advertising Art. Typesetting by Atlantic Typesetting Company. Printing and binding by Lew A. Cummings Company, Inc., January, 1967.