MODERATOR: Today we're beginning the first of nine seminars, which we are going to attempt to gain some insight into the Institute's past, as remembered by those who were actually there. Dr. Julius Stratton and his administrative assistant, Loretta Mannix, have been researching the Institute's past for many years, and we've asked Doctor Stratton today speak on the founders' perspectives and their philosophies.

Dr. Stratton received his Bachelor's degree in 1923 from MIT, and has been here almost continuously since then. He served as president from 1957 to 1966. Our format for the seminar includes the speaker's presentation, a question and answer period afterward, and then a social gathering afterward. Dr. Stratton?

STRATTON: Thank you, Scott. I must tell you that after I had accepted this assignment and begun to reflect on what I was going to do I became acutely aware that I made a profound error. That it would have been so far better to follow the first suggestion that I join my friends Catherine [? Carol ?] [? Hasan ?], my teachers Carl [? Wiles ?] and Ed [? Bowls ?] here, and just reminisce about the '20s.

Well, that was 50 years ago or so, but I can remember. I know the people. I could talk to you informally about all those funny things that happened, even in Carl [? Wiles's ?] class, or Ed [? Bowls, ?] and that would be easy. But although we've done a good deal of work in the last few years about the beginnings of the institution, I wasn't there at the time, and it isn't quite the same thing.

This is a bit of history, and I'm acutely conscious of what I've done here. And I want you to know is perhaps more formal than I should like it, and I hope not too long, but it's an attempt to give you some sense of how it all began. I've been asked, as you know, this afternoon to talk to you about some of the basic ideas that inspired those who brought MIT into being, and whose approach to a special need an education has left its imprint upon the Institute even to this day.

First, I think it is of paramount importance to stress that our founding was, to use the words of the Lewis Committee report in 1949, "No accident of philanthropy or local interest. It was the culmination of a mature plan centered on a new philosophy of education in response to new conditions of society." This Institute was a direct product of an awakening industrial era.

Again and again, I think it important to remind others, and perhaps especially ourselves, that there is indeed a philosophy of higher education central to our mission, and that the Massachusetts Institute of Technology was created 115 years ago in 1861 as an expression of faith in new and simple concepts that departed radically from the traditions of classical learning.

Historically we look upon William Barton Rogers as the founder. And certainly, he is deserving of every honor. Is indeed doubtful whether without him an institutions such as this would have ever been established in Boston. Doubtful, I say, but not certain. He was the right man at the right time, but he was not alone.

For a number of the leading citizens of the community, whose names should figure more prominently in our accounts of the early days of MIT, recognized the need for technical education at a higher level. It's in that sense, perhaps, Warren, that I'm using your word founders in the plural. To be sure, the Lawrence Scientific School at Harvard had been established in 1847, but it was failing for a variety of reasons to meet that need.

And to the great disappointment of its sponsor, Abbott Lawrence. Henry James, the biographer of Charles W. Eliot-- about whom we shall hear more a little later-- puts it rather succinctly when he says, "The scientific school" referring to Lawrence "pursued the policy of attracting students by making entrance and graduation easy. Its product was manifestly crude in quality." I should remind you that I'm quoting Mr. Eliot who was a Harvard man.

"The college looked down upon it with reason. It's brilliant, but somewhat erratic faculty were doing practically nothing to solve the problem of organizing a solid education for the scientific instead of a classical basis." It's tempting to say more about Harvard, but it would be too long and complicated a story for this afternoon. Just let me indicate that there is ample evidence of an absolutely fascinating interplay between the Rogers brothers on the one hand, and the Lawrence Scientific School and the Rumford Professorship on the other.

Under slightly altered circumstances there might well never have been an MIT, and we might all be sitting up in the Harvard Yard today. Perhaps I might even arouse your curiosity a little bit further by confiding that there is also some evidence that William Barton Rogers was hoping for a job at Harvard, even as late as 1863. At all events throughout the '50s there were discussions in the Boston community about the need for effective higher technical education.

As early as January 26th, 1850, *The Scientific American* was reporting that, "Two gentleman in Boston proposed to open a scientific school for mechanics, in which a regular course of lectures and lessons are to be given in mechanics, drawing, engineering, and so forth, with the ultimate design of a establishing an institution of high order, exclusively for the instruction of mechanics and all those branches of science applicable to their occupations.

This we consider," the article goes on to say, "to be a grand proposition, and hope that it will be successfully carried out. The object is a noble one, and would be a vast benefit to Boston. The only difficulty lies in getting the mechanics to support it." End of quotation. Now, who those two gentlemen were I can not tell you. It would fit very neatly into my story if I could say that they were William and Henry Rogers, and perhaps one day soon we may be able to prove out such a speculation.

One thing I can say, however, the leading citizens of Boston were very clear about the demands that a highly industrialized New England would make upon education, but they were not so clear about how to achieve their desired goal. What was needed was a definite plan, a rallying of public support, and concerted action to bring it into being. It was Rogers who crystallized this talk into reality.

He was a man of rare genius. One cannot claim that he brought to the world concepts that were wholly new and original. He was born and brought up at a time when certain ideas were beginning to take form. Ideas about the importance of useful knowledge, about the nature of progress, about the role that science must play in the advance of American society and independence. There was a growing sense of need for new powers in education not to supplant the traditional course in the classics, but to parallel it and to prepare youth for the world of action, of industry, and agriculture.

Now, though Rogers did not originate those ideas, throughout his youth he absorbed them. In his mind they took form and material. But what distinguished him from many another enlightened philosopher of his time was that he was not content merely to think and talk about those ideas. He was impelled to act. To do, as well is to speculate. To experiment and demonstrate. To test them at first hand.

For him, it was not enough simply to subscribe to a philosophy. You must give a life through the physical reality of a school, and the Massachusetts Institute of Technology became the tangible expression of this philosophy-- of a cluster of ideas and moral principles which had come to dominate his beliefs, and which underlay his faith in the validity of a school where mind and hand might learn together.

Just thinking-- as I wrote that about Rogers, realizing and saying that he was a man of genius, and then speculating a little to myself. Well, what does a man of genius do? What is genius? There are few occasions, perhaps, in all history where a genius produces some idea-- something that is wholly new. Never been considered or thought of before. It happens in art, perhaps more frequently.

But normally, I think the man of genius is in an environment of ideas, or of happenings, emotions, and he absorbs that. He recognizes what it means. He organizes it in his mind. He makes a plan, and he does something, and he gives it back to the society. And the thoughts came through me from my old electrical days that here you had, really, that a genius was nothing but another form of feedback circuit. [INAUDIBLE] Processing back into the society, more often than not.

That's not to say that occasionally some true genius comes along that initiates everything himself. Well, let me try to state briefly what are commonly recognized as the fundamental principles of Roger's philosophy, which is my [? aside. ?] First, he believed in the importance of being useful and doing useful work. In his first address to the students at the Institute here, or over there across the river, he stressed the value and dignity of the practical professions for which they were preparing.

Next, he maintained that science was fundamental to the progress of technology, an idea that we take for granted today which was by no means so clearly understood a century or so ago. And again and again, he emphasized the value of science to the practical arts of life, to human comfort and health, and to social wealth and power.

This view-- this perspective-- is expressed most eloquently in a document prepared by Rogers entitled The Objects and Plan, of which I know you're familiar, and which proved basic to the ultimate charter of MIT. In it he says, "The education which we seek to provide, although eminently practical in its aim, has no affinity with that more empirical routine which has sometimes been vaunted as the proper education for the industrial classes." And that word the operative classes-- the industrial classes-- returns again and again.

"We believe," he says, "on the contrary, that the most truly practical education-- even in an industrial point of view-- is one founded on a thorough knowledge of scientific laws and principles, and which unites with habits of close observation and exact reasoning a large general cultivation." There you have, in a concise statement, the basic philosophy of education which has governed the Institute from the beginning.

In those early years science had an important role of MIT-- basic science-- a role that faded somewhat later, but was restored in the 1930s under President Compton. It's tempting here again to diverge from my text here, and talk about that change. There's no question whatsoever that in the beginning science and its rols-- and pure science-- was fully appreciated. It was carried out in the sense that it was of that time.

And then in the '80s and '90s, particularly in the first part of the 20th century, the concept changed. There was physics, chemistry, mathematics, and so on. But it was what was even then called or thought of as a service course. It was for the support-- the preparation of the engineer, and not for itself. I think some number of us here can remember back in some problems in Woods and Bailey, the old mathematics book, and certainly in physics, how many problems would-- say, a problem in teaching you differential calculus.

Suppose that water from a mill was running over a dam, and so on-- start that way, then you make a calculation. In other words, it was directed toward an immediate use of that mathematics rather than the theory itself. And that was not always so. And then of course it came back in the '30s. Very much so. And then note, too, those words-- a general cultivation. Close observation, exact reasoning united with a large, general cultivation.

Rogers perceived no conflict between science and a liberal culture. He rejected the view of the classicists that a concern for utility corrupted liberal education. And he endeavored to incorporate into the curriculum studies in history, economics, modern languages, literature, and philosophy. Subjects that we refer to today as the humanities. And too often we forget that they were here from the very beginning.

A number of you in this particular audience will recall-- will not recall it, but will be aware of the fact-- that as early as the third year catalog, '68, course six. Of course, there was no electrical engineering. Course six was a course called Science and Literature. And a few years later, by 1873, course 10 was not chemical engineering, but was philosophy-- just philosophy.

If I had more time to go back and tell you about those courses, and look at the curriculum, it's very interesting as to what science meant in that sense there. And in the course in science you have a little difficulty in distinguishing it from just other subjects, or other courses. But there it was, and it had some very good people-- Atkinson there-- first class people. And it was a course of science and literature.

You look at the curriculum in the course 10, the first years of philosophy, very definitely. That is, a course in philosophy. Perhaps even more so than, or as much so as we have today. And I think the memory of that has completely departed, that that was there in those years. Then came the Great Depression of the '70s-- cutbacks in budgets, which you may have heard-- and they disappeared that way.

They remained as general studies, but only to come back in our own period. This mixing of professional and liberal education at the undergraduate level, as you perceive, constituted a radical departure from the classical approach. According to the prevailing view, the undergraduate years should be devoted wholly to the building of a broad, basic culture purged of all career objectives. Only after completing those first four years would the student be prepared to enter a professional school of law, of medicine, or theology.

I must tell you a little anecdote about that to show that that hasn't, perhaps until recently, wholly disappeared-- that approach to education. About 10 15 years ago I was a member of a visiting committee at Harvard College. And it was a very fine committee, a committee to visit Harvard College-- the college, not the whole department. The undergraduate part, of course. And it was a very interesting experience.

And this particular meeting was devoted to-- the problem was concerning a number of people at that time, why more and more students, after graduating, were going on to master's degrees, then going on to doctors' degrees, then going on to post doctoral work, and kept putting off more and more the decision of a career. Where you're going to do what it was. And so the issue of the day was at that focus of, where are they going?

And it was an interesting interchange. After, late in the afternoon we finished, and went over to Lowell House. And we had-- in the Master's chambers we had tea with a number of undergraduates, we all sitting around about the floor talking one thing or another. And finally, one of the members of the committee-- it was not I, happily-- addressed the undergraduates and said, now tell me, how-- or said to one of them-- how do you choose your many electives? How do you choose your course here, or design it toward what you're going to be or do in life.

And the young man drew himself up and said, Sir, it's clear that you do not understand the meaning of a liberal education. A liberal education is one that is not destined to go anywhere. This is true story. And he was very serious that you should not begin to pick your careers. Well, as you're no doubt aware, throughout our first half century there were repeated proposals to unite MIT with Harvard.

They began with charge with Charles William Elliot who in 1869, left the chemistry department of this institution for the presidency of Harvard, and with warm wishes for the Institute's continued success. Only to attempt, almost immediately thereafter, to effect a merger. He worked very hard on it. By January in 1870, we find then President Runkle writing to Rogers, "Last night at the meeting of the Academy," the American Academy, "I had a long talk with Elliot, and found him still full of the idea of a consolidation of the Institute and Harvard University."

Such attempts at annexation were to continue at intervals for the next several decades. Along the way there were obvious obstacles involving property and the powers of governments. Each plant failed, the last-- as Stan will remember-- in 1919. These difficulties were real, but they might perhaps have been eventually overcome. Yet, I have always believed that the truly irreconcilable problem was a basic difference in educational philosophy.

It was an issue that evoked deep cleavage among our alumni, and members of our corporation, and our faculty. The problem undoubtedly coupled with the Institute's severe financial difficulties at that time drove President Runkle to the point of exhaustion and back, as we say today, to teaching and research. And it certainly forced the resignation of one president, Pritchett.

But for Rogers there was never a question. The spirit and goals of MIT were alien to the environment of a university. He opposed union and his spirit prevailed. To Rogers, the method of education was of supreme importance. He believed that in building a program around a professional objective, the student should derive both motivation and intellectual discipline. And the right method, he maintained, was to learn by doing.

That's a familiar phrase, and an idea that was by no means original with Rogers, but completely in harmony with his own view of education. And so it became basic to teaching at the Institute. Learning by doing meant that the mere study of textbooks followed by routine classroom recitations were not enough. They must be supplemented by a direct, personal experience on the part of the student with tangible objects and processes. An experience that could be derived only through work in the laboratory, a shop, and the drafting room.

From the time of our founding, laboratories and shops have, in large measure, shaped the character of an MIT education. The first teaching laboratory in physics was established here, and it was with that same objective of learning by doing that mining and surveying camps became part of the regular curriculum. In later years, cooperative courses were introduced to afford students an opportunity to observe first hand the nature of industrial operations.

I'm sorely tempted at this point-- and I must resist-- to express to you some of my own feelings about the trends of today. I don't mean just at MIT, but in what's happening in society. It's a consequence of the tremendous accumulation of knowledge-- its intricacy, complexity-- knowledge that can only be handled by mathematical and analytic methods. And so you see a transformation, more concentration on the analytic at the sacrifice of the experience by your hands.

Many of the older ones of us here will remember-- and remember with affection, I think-- the hours that we spent in the shop, in the foundry right down the street here, in the drafting room. Not that any of us were going to be machinists necessarily, or draftsman, and so on. But you got a feel-- a sense of the tangible. It was learning by doing, if you will, that brought in something there of the tangible, realistic side of the world.

There just isn't the possibility of doing that, and many laboratories of the undergraduate have disappeared. One of the reasons I think so very, very highly of this program UROP, undergraduate research opportunities, that in part that is an effort to restore some opportunities of that kind. To give opportunities for students to see and to do themselves directly.

And this-- and I must not enlarge upon it-- as say, is not merely a trend here. Something has transformed, for example, totally the character of mechanical engineering as taught at MIT from what it once was. It's the inevitable consequence, and the change in the character of knowledge. I happened to be at a meeting this morning.

It was of the board of the Draper Laboratory, and much of the discussion centered upon the drifting away-- the minutia, let us say, of say the work in the laboratories and what we'll call the hardware being replaced by the software. And I think that confrontation there is something that we all need to think about. What does it mean?

It's more than just a method. It's a situation in which we're moving-- and I think we will, as somebody said, if the components disappear wholly, the software won't do us much good. But to return to Rogers. His, and in sum, our philosophy was built on these convictions. That there is a dignity and importance in the mastery of useful knowledge.

That science and technology are legitimate foundations of higher education for those who hope to apply the fruits of scientific discovery to the satisfaction of human wants. That the process of learning, whether in the classroom or the laboratory, must be active rather than merely passive, in the sense that direct experience must give life and meaning to knowledge acquired otherwise as secondhand through reading. And finally, that professional training may be combined with and contribute to a liberal education in the undergraduate years to the enrichment of both.

All that Rogers thought and wrote in mid 19th century about the importance of useful knowledge was focused in an undergraduate curriculum designed as a preparation for technical leadership in the thriving industrial life of the country. And our country has no less need today for sound and thorough training in the professional fields of science and engineering. Let's talk a little now about where these ideas came from and how they took form. They came, first of all, from family attitudes and beliefs. From the environment of childhood. From the atmosphere of the home.

From a father who believed in rigorous study at home mixed with fresh air and exercise, and who fostered curiosity and the desire to know and experiment, they came from the larger intellectual movements of the day and the enormous vitality and changing scene of a fast growing, still underdeveloped country. They came, too, from experience. From the interaction of four gifted brothers, all men of science, with a deep respect for education and a natural bent for lecturing and teaching.

Inevitably they came also from the institutions which they served. To begin, one might almost say that Boston tech was actually a product of Philadelphia. William Rogers's father had taken refuge there from the Irish rebellion in 1798, at a time when this country was barely underway as an independent republic. It was a time when immigrants were arriving in that city from many parts of Britain and Europe, bringing with them to what was then thought of as an intellectual center of the United States-- as the intellectual center-- a new strain of thought which we know historically as the Enlightenment.

Secular, in contrast to the earlier Puritan spirit of New England, humanistic, and democratic. Basic to the philosophy of the Enlightenment was the idea of progress-- the belief that the laws of nature can be applied to useful purpose for the benefit of mankind. That man need not be a victim of predestination, but by thought and action can improve his lot. The advance of science and the Industrial Revolution were promoting these ideas abroad, and early in the 19th century they found expression in the British utilitarian movement pressed forward by such people as Jeremy Bentham, John Stuart Mill, Herbert Spencer, Lord Brougham, and others.

There began to be talk about a need for the diffusion of useful knowledge, which became a very, very familiar saying later but a far cry from the ideals of classical culture. And in Germany, France, and Switzerland Polytechnic schools of the highest quality were founded. Philadelphia has been called the port of entry for the enlightenment in America. Certainly, in those first years of the 19th century that city was alive with teachers, doctors, artists, scientists, and philosophers.

William's father became a doctor in a chemist. The family was a very closely knit, and through Williams was himself but a child during their Philadelphia days, it is clear that we must look to that city-- the roots of a philosophy that was to mature through the years, a deep faith in science and material progress and in the dignity and importance of useful labor. We can hardly call Rogers a man of the Renaissance, but throughout all his life he was a perfect model of the man of the Enlightenment.

In 1812, the Rogers family moved to Baltimore. In *The Life and Letters of William Barton Rogers*, Emma, his wife, tells us that they were beset with poverty and debt, that the boys had few luxuries but that they had educated parents devoted to their welfare. And she adds, "The seven years of Baltimore life as far as we know passed without special incident." It's particularly amusing to think about that sentence in the light of the circumstances in Baltimore at that time, for they moved to that city as the War of 1812-- often known as the Baltimore War-- was just breaking out.

We're told that Baltimore then was big and prosperous, a rambunctious upstart of a town that liked crowds, ship launchings, mass picnics and parades, was proud of its private warships and enjoyed seeing its soldier companies drilling in the streets with the town boys following behind. The British attacked in 1814. The Star-Spangled Banner was written.

Rembrandt Peale- and by the way, I believe there are two of his pictures right here, came down through Robert-- was painting in Baltimore, and in 1814 he established a museum of Natural History and art gallery, where a giant mastodon was on display and where he was soon to demonstrate lighting by gas. And Patrick, the father, got into trouble with the authorities over his methods of vaccination.

It is difficult to believe that a lively, curious, knowledgeable teenager could have passed through this environment untouched and unaffected. Yet, that proper Bostonian Emma called it a rather quiet seven years. Baltimore was to figure prominently again in the later lives of the Rogers brothers, for James was to receive his medical education there and William and Henry were to embark upon careers in teaching.

In the 1820s, after running a school in the countryside nearby, they began courses of lectures at the Maryland Institute on subjects connected with the mechanic arts. Soon, they were involved in the early stages of plans for a technical high school under the auspices of the Institute-- even then. And so they were in Baltimore again at a time of ferment and change, of growing industrial power and the excitement of railroads pushing to the west and altering forever the nature of commerce and trade, of manufacturing, of agriculture, indeed, of life itself.

But I must go back a few years to another and very different kind of institution which would influence the ideas of William Rogers. In 1819 the family moved to Williamsburg where the father had been appointed professor of natural philosophy and chemistry, and where William would later succeed him in that post at the age of 24. A major innovation at William and Mary was the elective system. It appeared afterwards at the University of Virginia and Harvard, both of which, at one time or another, have claimed first priority.

Often it has been said that William brought the elective system from Virginia to MIT, but surely that is stretching a point. Or at least, it's one that I have never understood. For if one looks carefully at the early curriculum here, it is easy to see that the system was elective only in the sense that one could elect or choose, after two years of completely prescribed study, to take one of several professional courses-- all with prescribed subjects-- for the remaining two years.

That eased away in some later years to the fact there were general studies. But even in our time in the '20s the first two years were prescribed. Except the second term of the sophomore year you began to choose whether you do course 600 or some other subject. But the election was only whether you-- the elective system was, I want to be an electrical engineer, or a mechanical engineer, or a chemist. Something of that kind. There have been a lot of changes.

William graduated from William and Mary, and it was an institution that had a high respect for science. In 1835, he was called as professor of natural philosophy to the University of Virginia, an institution conceived and built by Jefferson and, in many ways, an expression of his own philosophy. In Thomas Jefferson we have one of our earliest and finest examples of the Enlightenment. That was his philosophy.

He believed that it was the function of the university to train men for particular professions of law, medicine, or engineering, or scientific pursuits. And furthermore, to prepare them to assume positions of leadership in society. His ideal was not merely a skillful man, but a responsible and thoughtful one. He rejected as empty and meaningless the alleged conflict between liberal and vocational modes of education.

Jefferson had a great personal love for science. He saw in it the surest means of advancing social progress and human happiness. Throughout his whole life he was constantly occupied with some scientific or technological problem, or pondering some practical application of science. He was fascinated by gadgets of every kind. He was definitely a Utilitarian, but his interest in useful knowledge was directed primarily toward the world of nature-- toward crops and agriculture rather than manufacturing. That's a very important thing to remember.

He was fascinated by inventions and contrivances of every sort, but especially seed boxes, threshing machines, and plows. In his earlier years he opposed manufactures of almost any kind, for he preferred agriculture as a way of life for Americans. He was against the urban development. A time in history-- the War of 1812, the problems of the embargo of European products, the need to produce our own-- all that caused him to modify that position and to support, at least in part, the development of industry.

How directly the legacy of Jefferson and the later environment of the University of Virginia affected the perspective of Rogers is difficult to determine, but there was a manifest harmony in their views. Rogers is remembered in Virginia as a spellbinding teacher, a fountain of inspiration, and one of the most extraordinary men ever associated with the university. He served as chairman of the faculty-- there was no president in that system-- at a time of violent student disorders.

Turbulence, such that by comparison 1969 might seem a period of relative tranquility, really. They not only rioted at the University of Virginia in those days, but they celebrated the anniversaries of the riots with other riots, and even went so far as to shoot and kill a professor. A distant relative of my wife, incidentally.

The faculty seemed almost to be meeting daily in the years between 1835 and the early '50s, and much of their deliberations centered on the problems of discipline. And I might add that William appears always to have taken a hard line. William found time also for a geological survey of Virginia as a state geologist. There's no doubt that through the necessity to defend the university and its appropriation before the legislature, in the face of rising disenchantment as a result of the student uprisings, and through his dealings with that same legislature in the course of his geological duties, he gained practical experience in the art of politics which he was later to need to use in Massachusetts.

I should say that none of these years was spent in academic isolation. In addition to the Virginia survey and papers with his brothers on problems of geology and in the field of chemistry, there were the meetings and the business of the early professional societies and a growing correspondence with other scientists and naturalists, both here and abroad and within and without the university scene. I come now to two forebears of the actual plan for MIT, and Philadelphia re-enters the picture.

In the picture, also, is William's brother, Henry. A geologist, too, but intensely interested in education, serving on the faculty of the University of Pennsylvania and closely associated with the Franklin Institute. It was 1837, and Henry appealed to William for help in the preparation of a memorial to the legislature of Pennsylvania proposing the establishment at the Franklin Institute of a school of arts. I should point out here that in the mid 19th century, when we talk about arts we mean technology.

We know that William responded, but the Rogers papers in the MIT archives contained no copy of his suggested plan. The Franklin Institute has unearthed for us, however, a printed version of the final document. It has proved to be a fascinating statement that clearly foreshadows our own objects and plan. Curiously enough, the existence of this paper and its significance have been largely overlooked in the historical studies so far of MIT.

Yet, so many of the words, the phrases, even the curriculum to be offered are identical to the contents of that statement which led to our own charter. That was 1837. The Franklin Institute did not get a school of arts in that year or any year. Despite strong public support, the proposal failed. Some say in large measure because of the financial panic at the time. Some say because of the utter ignorance of the legislature.

The debates in the Committee on Education would appear to be lost to us forever, for the Pennsylvania State archives confides that somewhere along the line someone decided to dispose of all committee reports as ephemeral material, a phenomenon that some of you are familiar with. On balance, I think that someone may have been right. Though I wish he, or more likely she-- and those words were added by Miss Mannix-- hadn't made that decision in this particular case.

Nine years later while William was still at Virginia, an urgent appeal came from Henry once more. This time from Boston, where he was incidentally busy trying to get the Rumford professorship at Harvard. Now he said that John A Lowell might well be interested in founding, in connection with the Lowell Institute, a school of technology such as they had dreamed of, and he urged him to send a proposal for a polytechnic school of the useful arts as soon as possible.

William received a letter on March 13th, 1846, and the same day sent off not only the first installment, but the second as well, of a paper entitled A Plan for a Polytechnic School in Boston. This now famous plan of 1846 never came to fruition. Partly, we have been told, because Mr. Lowell concluded that it could not be done within the limitations of the trust of the Lowell Institute. Now, we have no physical proof of what Mr. Lowell actually thought of it.

Of the extent of its dissemination in the Boston community-- if it was circulated at all-- and once again, the Rogers papers yield no clue. I must say, in this kind of research one meets many frustrations. We've found ours in the classical references the two volumes of The Life and Letters of William Barton Rogers that Emma Rogers, his wife, edited. And it follows a style which I believe was coming very often, particularly by members of a family who edited a book after the facts.

You read along and then it will be dot, dot, dot. And you read along-- dot, dot, dot. And what has been excised is always the most important thing. Anything that refers to an individual-- somebody that you're just trying to trace down and know what happened-- really, the human part is gone. There are a lot of letters in the archives here. Unhappily, there was an accident many years ago by which a number of them were destroyed.

I suspect strongly that Emma removed those particular ones. But it's just the frustration of trying to get down to the particular thing you want to know about. The generalities are beautifully told. Well, coming back to the plan of 1846. In many ways it's a baffling document. At least I found it so. And I think those of us who have quoted it out of context for years have often failed to take into consideration that it was written at top speed by William Rogers in not much more than a day, and it was prepared specifically for the benefit of Mr. Lowell whose interests in this case were very definitely oriented toward the "operative classes," quotes, of society.

A common phrase again. Is perfectly apparent that William Rogers sincerely shared that interest, too. But one can find it in its support for almost any idea on technical education that one may wish to emphasize. It contains eloquent statements on the importance of fundamentals, and advocates breadth and elevation in educational standards. And other points, the talk is focused on problems of the most practical nature.

But it is also evident that Rogers was beginning to glimpse a higher ideal in the many ways he succeeded in foreshadowing the concept of technical education in its most modern form. Leaving aside the specific details of the proposed law, we can, I believe, separate out the underlying principles and concepts. A school of practical science embracing full courses of instruction in all the principles of physical truth, a specific emphasis upon their direct relation to a detailed assortment of practical fields.

Here you have at the outset, the entwining of two strands which one may trace through the entire history of our academic develop. The one is fundamental-- deals with principles, theory, abstractions. The other is practical, useful, applied, pragmatic. It is the interweaving of these two strands which differentiates our type of institution from the traditional colleges.

He proposes courses of lectures for a broad and solid foundation, for without a sufficient groundwork in general physical laws, the details of applied science would have but little attraction. Again, the fundamental and the practical. He proposes the establishment he started in a modest scale, but he expresses his conviction that it would be so successful as ultimately to expand into a polytechnic college on the most ample scale.

In a word, he says, "I doubt not that such a nuclear school would, with the growth of this active and knowledge seeking community," he meant Boston, "finally expand into a great institution comprehending the whole field of physical science and the arts, with the auxiliary branches of mathematics and modern languages, and would soon over top the universities of the land in the accuracy and the extent of its teachings in all branches of positive knowledge."

That's a most prophetic statement. And when he adds that there is "No class of operatives to whom the teaching of science may not become a direct and substantial utility and material usefulness," we can only believe that he has suddenly recalled Mr. Lowell's original interests, which was for a very different kind of thing. Though the proposal was to be filed away-- and I hope it will one day be found-- with appropriate comments and correspondence in the 76 boxes and three chests that are now sitting unsorted in the Houghton at Harvard, it was nevertheless a document whose most elevated ideas would one day find expression in a city which was to be his home for the rest of his life.

In 1853, he resigned from the faculty the University of Virginia and came north to settle in Boston. Several motives impelled him to take this step. There is evidence of some frustration with affairs at the university. He had actually resigned a few years before, but had later withdrawn the resignation at the urging of his colleagues. He felt isolated in Virginia, was uncomfortable with slavery, and undoubtedly foresaw the trouble that lay ahead.

But the determining factor, although not indicated as such in *The Life and Letters*, was no doubt the need for Emma Rogers to return to Boston and care for her father, James Savage, of an old and prominent Boston family. That is not in *The Life and Letters*, by the way. Certainly, it must have been this family connection that made it possible for William, during the next five or six years, to live a life of comparative ease and leisure. Lecturing occasionally for the Lowell Institute, pursuing his interests in geology, and physics, and chemistry, but apparently free of professional commitments.

Although, he eventually took on the job of gas inspector for the state at the urging of Governor Andrew. Gas inspector did not mean reading the meters, by the way. It is curious that throughout this period, despite the earlier expression of his belief that Boston, of all places, was the most appropriate for the founding of great polytechnic, we find no record of an organized effort on his part to press for action.

But he was coming to know Boston and its people, meeting and establishing friendships with many of the intellectual, the industrial, the political leaders of this community. Relationships which were soon to prove invaluable. The time was right. Unlike the Western states, in New England agriculture had little to offer and must look to thriving manufacturers and related commercial enterprises. There was, above all, a need to compete with and out-rival the manufacturers from abroad.

There was a recognition on the part of a number of far sighted citizens that the key to industrial leadership is a more effective use of science and technology. The desire to convey this message to the public, to arouse interest in scientific topics, and especially to meet the need for more adequately trained engineers and technicians-- all of these were mounting. And a vigorous public movement began to promote the public interest in science and its uses.

The particular stimulant was the filling of the back bay lands over there by Copley Square, and a proposal to make a portion of those lands, and the revenue derived from them available, for the advancement of education. A committee of citizens was formed, and in 1859 a first proposal went to the legislature for the establishment of a conservatory of arts and sciences. A very grand, imaginative idea, encompassing in a collected museum the interests of horticulture, natural history, the fine arts, mechanics, manufacturers, and commerce.

Grand, imaginative, but too much for the legislature and it was turned down. Though William Rogers was listed as a member of that committee, he apparently took but little part in its efforts. But for the second and third rounds, he took the lead. And events of 1860 and 1861 make a fascinating story, but one far too long to repeat this afternoon. It's a story of the many interests that were alive in Boston at that time.

The conflicting hopes and aspirations of various groups, and the final amalgamation of all these goals by Rogers into a plan that was acceptable by the legislature. He was a superb politician, as he had demonstrated throughout his entire career, and he was acutely sensitive to the interests of his audience. That phrase, the practical education of the industrial classes, is in fact a dominant theme throughout the entire proposal. But clearly, it is in response to a need expressed by his supporters for more and better technicians.

The Institute of Technology described in the objects and plan was, in his words, "a triple organization." They comprised a society of arts presenting lectures to the general public, a museum or conservatory of arts-- again, meaning technology-- and the last-- Warren Siemens wasn't there at that time or it might have been different-- and a school of Industrial science. The orientation of both the society of arts and the museum was clearly directed toward an audience engaged in industrial occupations.

Or in any event, fascinated by the rapid advances of science and its useful applications. There was something in his plan for everybody, but it was the third part-- the school of industrial science-- that he wanted most to have, and that was to become MIT as we know it today. The competition for funds from the back bay lands was intense. By his large concept of an Institute of Technology he marshalled the popular support from the community that finally led to our charter.

He made speeches, he testified, he kept a list of enemies-- really-- and he may even have written the favorable report of the legislator's committee on education. And interestingly enough, we've tried very hard to find that list of enemies. Just who was who around there? But we will keep trying. He told one and all that his position was a mere outline sketch of a broad plan of truly practical education in the highest sense, in which we hope to interest those representing the material prosperity of the Commonwealth and directing us great mechanical, mercantile, and manufacturing energies.

He wished to show the happy influence of science on the arts of life, and he extolled the advantage which accrue to any state from the establishment of such an institute, now peculiarly within the reach of the people of Massachusetts-- the great manufacturing and commercial hive of New England. There were many who agreed, and Alderman Otis Clapp was heard to say that the plan promised to elevate the masses from low and sensuous pleasures to pursuits and aims at one noble, practical, and of public utility. Which conveys to you a little, also, of the spirit of the times.

I've covered too much material. I've had to do it very superficially, and too long. But I do hope this conveys to you a little sense of how much there is there, and what a fascinating story it can be. And I thank you very much.

[APPLAUSE]