

INTERVIEWER: Today is September 22, 2010. I am Karen Arenson.

We are speaking today with Merritt Roe Smith, the Leverett and William Cutten professor of the history of technology. He was one of the contributors to *Becoming MIT: Moments of Decision*, a history of the Institute published by the MIT Press this month to mark MIT's 150th anniversary. He wrote the first chapter, chronicling MIT's founding, and its early years. He is a former director of MIT's Program in Science, Technology and Society and was one of the architects of MIT's doctoral program in the history and social study of science and technology, which he also directed for many years.

He has been a Guggenheim Fellow and a Fulbright Scholar in Sweden. He is also a past president of the Society for the History of Technology, and received its Leonardo da Vinci medal, the Society's highest honor. He is also a housemaster at Burton Connor, one of the largest MIT dormitories, where he walks the halls at 1:00 am to make sure all is well.

Roe, thank you for speaking with us today.

You wrote about the founding of MIT, tell us about how it started.

SMITH: Well, it was in the making for a long time. William Barton Rogers and his brothers as early as the late 1820s began to talk about a polytechnic institute somewhere. I don't know that they ever knew exactly where. But it was an idea that grew over a 30 year period. It really began to take shape in the late 1850s when, by that time, William Barton Rogers had moved to Boston, had married a woman here and set up shop. It was at that point that he joined forces with a number of interested people in Boston to try to establish a number of institutions, one of which turned out to be MIT.

INTERVIEWER: Were there any other institutions like MIT that started around the same time?

SMITH: There were some earlier institutions that were -- they were not exactly like MIT, but they were predecessors. One, for example, was the US Military Academy at West Point which was influenced by French ideas, as was MIT, and that was established in the early 1800s. It was basically an engineering school that was producing people ostensibly for the Army, but in fact, many of these young men left the Army quickly and became civil engineers primarily -- big time railroad builders, canal builders, people in that area. A lot of them are from West Point.

The other school, of course, is Rensselaer, which was founded in 1824. I would say that those are the two that preceded MIT. But MIT had its own unique qualities, too, when it was established.

INTERVIEWER: In what ways was the new MIT different from these predecessors?

SMITH: Well, I think the main thing was that Rogers put a lot of emphasis on laboratory training and laboratory education. Not just replicating famous experiments, but introducing students to research. Actually getting them in a lab to do new work under the supervision of their professors, and that was quite new for its time. I think that was one of the defining features of the Institute during its early years.

INTERVIEWER: Was that more science than engineering, or more science than the other two institutions?

SMITH: The earliest labs were primarily science labs. The first one was a chemistry lab, then hot on its heels came a physics lab. Both of which were wellknown for they're doing not just replications, but really new work.

INTERVIEWER: And what was driving William Barton Rogers? Why was he so consumed by this idea?

SMITH: That's a good question. I think that part of it was just he was a person who was, in his own right, interested in education, improving education, and tried to blend -- I mean the thing that he did was really make the mind and hand come together. MIT's Coat of Arms, its symbol is really appropriate because mind and hand were really defining features of what the Institute was then and is today I think. That's the amazing thing to me is that so much that was original with William Barton Rogers has been carried into the present. I mean in different ways, but the philosophy is pretty much the same.

INTERVIEWER: Was he a man who exhibited both the mind and hand himself? Did this come out of I want to replicate me, or I wish I had more of this, and therefore, let's do it?

SMITH: Yeah, I think it did. Because when he was a younger professor at the University of Virginia he headed the geological survey of that state which was very much a "useful" enterprise, though he saw science projects in it. He and his brother were working on a theory of mountain formations, and they saw their work as doing something more than simply doing a survey that would be useful to industrialists, but rather something that was going to get them and build their scientific reputations.

He basically was a geologist and it was that Virginia experience, I think, was one of those real important moments in his life and which he began to really see the direction of the future and where he wanted to go, both as a person and as an educator.

INTERVIEWER: The other higher ed institutions at that point, many of them had started as religiously oriented universities or colleges at that point. So then here came this engineering beast. Were there other models at that point, or are those the main two?

SMITH: The main two really were the classical liberal arts college, which many of them were religious in nature, founded by religious groups. They emphasized the classical Latin literature history education with some science, but not anything like what Rogers wanted to do at MIT or what was being done at West Point or RPI for that matter.

INTERVIEWER: And how much of that did Rogers feel a need to put into the MIT curriculum? Did he feel we've got to do some of that or nobody will see this degree as being worth anything, or did he just say how do I train an engineer who knows how to do some science in the lab?

SMITH: One of the interesting things he did once he was in Boston was to surround himself with people who were out in the world of engineering and science. I'm trying to remember the name of -- James B. Francis was a very famous hydraulic engineer who was situated in Lowell, Massachusetts, but he became one of Rogers' advisors, as did a number of others. I think it was through those influences that he began to see and really become committed to this mind and hand vision that he had.

INTERVIEWER: And if you looked at the existing engineers in society, say the hydraulic one, where did they get their training, was it mostly on the job?

SMITH: Much of it. Yeah, much of it was on the job. Many of the early engineers, people -- there's a whole story about how people came to call themselves engineers. Some were school educated -- West Pointers, RPI people, they were school educated. But there were many others that were either apprenticed on, say, canal projects or railroads or various factory operations. So eventually come to call themselves engineers.

I was working in the papers of a fellow named Joseph Harrison. He was born and raised in Philadelphia. His father was a well-known merchant who went broke during one of the depressions in the United States, I think it was around late 1820s, thereabouts. In any case, the family lost everything and the son had nothing to inherit. There was no mercantile business to go in to. So he was apprenticed to a machine shop. Later in life he became one of the builders of the Moscow and Saint Petersburg Railroad in Russia -- at that time the longest railroad in the world.

The chief engineer of that project was George Washington Whistler, Whistler's father, the artist's father. But at one point in Saint Petersburg where they both lived, Harrison was not getting his mail and so he wrote to his father-in-law in Philadelphia saying, "Please address me as Joseph Harrison, Civil Engineer." That's the first reference I've ever seen to his calling himself an engineer. But he had no degree or anything like that. That happened a lot.

INTERVIEWER: You open your chapter by talking about the benefactors who helped MIT get off the ground. Who were they and how much fundraising did MIT do after it got off the ground?

SMITH: They were hard to find, especially during the Civil War. But there were a few really important ones. I'm trying to remember the man's name who was one of the big contributors, but I start my essay with him. He, in his letter he says, long live the Institute, or something like that, and he contributed a fair amount of money. He was a surgeon, he was a doctor. He had made a lot of money in local industrial -- he bought stocks in local industrial ventures and he made a lot of money in that area. Then when he saw that Rogers was doing this at MIT, he decided to support him. He was one of the first big supporters of the Institute, and others came, others followed, but he was the first.

I think the thing that's important, though, that I sort of I think have pointed to where others have not is the role of the state was important in all of this. The Commonwealth of Massachusetts really stepped up to the plate. It used the distributions from the famous Morrill Land Grant Act, which was a piece of legislation signed by the US Congress and Abraham Lincoln that was aimed at building what were called agricultural mechanical colleges.

But it was Rogers that lobbied for some of that money and got a piece of it, even though the governor didn't really want to do it. He wanted to try to meld MIT and what later became the University of Massachusetts into one big tripartite operation headed by Harvard. That was one of the early attempts to bring MIT into the Harvard fold -- even before the Institute was started they were talking about things like that.

INTERVIEWER: Did Harvard have political might by then?

SMITH: Oh yeah. Most of these people were Harvard graduates. So, there were institutional loyalties I'm sure. Most of MIT's early faculty were Harvard graduates.

INTERVIEWER: You mention that Massachusetts went along -- what was it about the State, do you think, that helped make it look with favor? Was it that there was a lot of industry here or mills or for--

SMITH: Very much. Yeah, very much.

INTERVIEWER: --the right type of business?

SMITH: Massachusetts was the leading industrial state in the union in 1861. I forget exactly what the statistics are, but it was overwhelmingly larger producer than Pennsylvania or New York or any of the other eastern states at that time. That would change, but at that time Massachusetts was the leading industrial state. As a result, there were a number of people around here who wanted to see an institution built that would produce students that could go into the industries that were here and contribute. So, Rogers saw this.

He also, when he arrived in Boston from Virginia, one of the things that attracted him here, other than his wife who was a Bostonian, but one of the things that attracted him here was the commercial spirit of the place and its knowledge -- I think he uses these terms: the knowledge seeking spirit of Boston. He really was taken with this and knew that if he was ever going to succeed in building a new type of school, this would be the place.

INTERVIEWER: The people, the students that MIT was training in its early years then sound like they were aimed at staff type jobs, if you get back to the training leaders or staff people. It sounds like the early roots were definitely to think out people who could work for other people?

SMITH: Yeah. Many of the early students at MIT were called special students. That is they were not full-time students, they were sort of taking night classes and had jobs in Boston. So they were coming from a job to school to try to develop and get a degree eventually. They outnumbered the so-called regular students well into the 1880s. I think it was around 1886 that you begin to see regular students, four year, full-time students, begin to become a majority at MIT. But before that these so-called specials were sort of the dominant group.

INTERVIEWER: As a historian, you've paid a lot of attention to the Civil War and that whole era, do you find it remarkable that MIT was able to get off the ground in the midst of a bitter Civil War, and did anything about the war contribute to the belief that an institution like MIT might be useful?

SMITH: I think there were great doubts. I mean as a historian I marvel at the fact that, indeed, it did get off the ground, because it really had to scratch for funds to support itself. There's no question about that. Even with the support of the State, that wasn't enough. MIT was running in the red well into the early 1900s, if not later. So it was one of those institutions that really had to work at supporting itself, always in debt, but at the same time trying to build a tradition, an educational tradition, that was different and attractive.

I remember that at one point MIT started classes not in 1861 but 1865, and it quickly acquired a reputation as being one of these rising places that people went to if they really wanted to engage in the useful arts -- engineering, science. MIT was the place to go. So, even though it was not well-off, in fact quite the opposite, it was building a reputation at the same time and attracting some very strong faculty.

INTERVIEWER: Was it hard to get into? Did students have to meet some kind of requirements to become a student?

SMITH: Not like today. I'll tell you that, it's not like today. But they did have to demonstrate certain skills in order to be admitted. But the rigor of the admissions process is nothing like what it is today. Of course, over the years as the Institute acquired a reputation, then it became more difficult to pass the screening to get into school and matriculate.

INTERVIEWER: You mention that it kept running in the red, that was kind of operating deficit, the difference between, what, tuition and their expenses and then the gap was filled by benefactors?

SMITH: Yeah, pretty much. Pretty much. The thing that was interesting to me and the research that I did on the Institute, which was relatively new to me, indicated that people like Rogers and his successor, Walker -- Francis Amasa Walker who was a very important person this early history -- were well aware of the financial difficulties they were facing and were out constantly trying to raise money.

But the thing that happened that was so important was that they constantly had to turn to the State of Massachusetts for support to kind of the tip off the bucket so that they could continue to run. I think that State support was sufficient and important because it persuaded private donors that MIT had a future that was worth investing in. So there was always a financial shortfall, but often it was made up by the State, and then that would attract more private contributions, so the Institute would go on.

One of the problems with a school like MIT in those days, of course, was laboratory equipment was very expensive. You see in the correspondence of Rogers and Runkle and even Walker, trying to equip labs--.

INTERVIEWER: Just like today.

SMITH: It is. Yeah, it is. There's something that's very much a continuity from past to present.

INTERVIEWER: Did you come across any kind of opposition among these Harvard educated political leaders saying don't give that money to MIT because they wanted to see Harvard--.

SMITH: Yeah. There was a lot of tension from day one when MIT approached the State Legislature about getting support. There were people at Harvard and elsewhere that wanted to get more than their fair share.

One of the leading, I would say, antagonists of Rogers was a very famous scientist at Harvard named Louis Agassiz. He and Rogers tilted, not just about funding the Institute, but about intellectual questions. I mean Rogers was a supporter of Charles Darwin's theory that appeared in 1859. Agassiz was a deadly opponent. They just had these differences all the way down. But Agassiz whenever he could tried to throw a spanner in the works of MIT. At times he succeeded, but not enough to destroy the place.

INTERVIEWER: Much of MIT's success was clearly attributable to its leaders and the choices that they made. They seem to have been practical problem-solvers, but also men of broad vision and with some political skills. Can you talk some more about these early leaders, and was MIT just lucky to have them, or was there something about the succession that--.

SMITH: Well, there's no question that Rogers himself was a politically astute person. I think he learned a lot from his Virginia experience, which was a very bitter one. He was charged with conducting a geological survey in Virginia in the late '30s and '40s, and it turned out that there were all sorts of political forces and interests there that were vying for his attention. He seemed to be in trouble all the time with either one group or the other. It was a very bitter experience to him. He writes in his letters and things about all of that.

But the thing was that it was also a learning experience. He really learned how to become a politician. I think he put that to good use once he arrived here in Boston and had to lobby with the legislature. He kept his cool, always a person who was under control. I think that the reason why MIT succeeded in finding good leaders, at least during his lifetime and beyond, was that he knew what was needed and he could see them. He was, in effect, the person who hired Francis Amasa Walker, who I consider a very important president of MIT.

Walker came here from Yale. Now today we would describe him as a political economist or even an economist; he was not an engineer or scientist, but he had a great appreciation for what was happening at MIT and wanted to be a part of it. He was a leader who also had really good political skills. He came to MIT not from Yale directly but from the US Census of 1880. He had conducted that census, which in my view is the first great census that was conducted in the United States. It not only did population studies, it also did wonderful surveys of industrialization and the various types of areas of manufacturing and enterprise. Studies that today are still held up in the light of historical scrutiny.

He was the one who oversaw that and shows all the various people that were in charge of these various areas of reporting. It was very good. I think both Rogers and Runkle, who was Rogers' closest friend really -- a mathematician who was his successor for about eight years and then came Walker. The three of them were very important -- MIT was fortunate to have them. But it was Roger's vision and his energy and enterprise I think that sort of continued that tradition of knowing the politics of education, as well as the inner workings, curriculum, things like that.

INTERVIEWER: There are a number of other widely respected universities, nationally and globally, but most of them resemble each other more than they resemble MIT. There are also many technical institutes, but most of them don't rank among the top universities today. Why is MIT so distinctive? Why aren't there more great institutions like MIT with this emphasis on science and technology, but also the elite rankings?

SMITH: When I think of that question, I immediately think of the hundreds of schools that were established under Morrill Land Grant Act, and MIT was one of them, one of the first. But there were places like Ohio State University and University of California at Berkeley, Purdue University, even Cornell, but most of them were state controlled and supported schools much more directly than MIT ever was.

One of the things I've noticed is that state support is up and down and up and down. They play a numbers game that is different than MIT did, I think, even in those early days. Counting students was important but it wasn't the critical factor. I think that state universities suffered because so much depended on how much funding they got each year. Whereas MIT I think from day one had to go out and search for donors to support the Institute. That doesn't become something that's widely practiced in American higher education until after World War II really.

So, MIT was in that game early on. I think it was in that game mainly because Harvard had been doing it for centuries probably, but it was an important difference, and it really differentiated MIT academically from what could be done in a lot of these fine engineering and science institutions that always were facing these serious financial problems. They were at the sufferance of the legislatures, basically.

INTERVIEWER: Although the universities, many of the land grants, tuned into broader-based universities. Maybe with a few exceptions -- Purdue probably still has a science engineering tilt to it more than, say, a Michigan or a Wisconsin or Ohio. It's that they veered off into the broader trying to be a broad university as opposed to MIT, which somehow stayed on the science/technology path.

SMITH: They did. But early on, all of those land grant schools were agricultural, mechanical colleges that branched out, as you say, into other areas, whether it's business or law or humanities or whatever it might be. It wasn't that MIT didn't have a focus on other areas than science and technology. It was really this mind and hand vision that was always kept at the center of MIT's strategy.

I was surprised to find out that from day one MIT had literature professors here and history professors. People like that that you wouldn't have expected to have been here in the 1870s were actually here. They were not the dominant people or anything, but they were around. So even though the Lewis Report, which was so famous later after World War II, really brought that and it made it a more integral part of the Institute, those interest and the considerations are around for a long time.

INTERVIEWER: How did you become involved with this book? You don't usually study higher ed per se.

SMITH: No, I do not. I definitely do not. David Kaiser who is the editor is a colleague of mine in the STS Program. I don't know exactly how he got the idea of doing the book -- I'm glad he did -- but it may have been a part of the celebration of the 150th anniversary. But in any case, he asked me to do this essay. I remember when he sent me the email about it, I thought to myself, oh God, do I have to do that? I mean really it's not what I really am interested in. I'm interested in manufacturing and machine tools and things like that.

But David is a close colleague and I thought how can I say no. So I thought, well I don't know much about the history of MIT, this is a good opportunity so I'll do it. That's how I did it. I spent a lot of time reading various histories of the Institute that had been written over the years and trying to bone up on it and then write what I consider to be more of an interpretive essay -- trying to place an MIT in the larger context of its times. So, that's how it turned out.

INTERVIEWER: Tell us some more about some of the sources you consulted. Was there a huge library of all this stuff in one neat place, or did you roam around the country?

SMITH: I thought there was, but it turned out that the library on the history of MIT is not very big and it's surely not very good. I was surprised at how weak the literature is on the history of MIT. There are some books that have lots of factual information, but as a historian that's not what's important. The important part of it is interpreting information and pulling things out to try to look at the Institute from some sort of perspective. For me it was not just trying to write an essay about one damn thing after another because for me that's just not history, and a lot of the early works on MIT tended to be that way.

Good sources of information for me, but and maybe great that they weren't highly interpretive in nature because it allowed me to do it. So I felt pretty good about that. There's a lot published about MIT but it's spread all over the place. MIT needs a good history, and the starting point is this little book that we put together for the 150th. But it's very selective. If you look at it you'll see--.

INTERVIEWER: It's about certain decisions.

SMITH: Absolutely, moments of decision. But there's a lot that gets left out of that. It's highly selective, and someone needs to come along and write the big history.

INTERVIEWER: That's not your next project?

SMITH: No. I'm writing a book about the Civil War, actually, and MIT will be part of that, but it's just a part and not the whole.

INTERVIEWER: Were you particularly fascinated by any of the sources you consulted for this project, or did you find any that were especially useful?

SMITH: Yes. I would say there were three moments that were especially useful to me. One was discovering the correspondence that William Rogers had. It was a two volume set, edited by his wife after he died, of his correspondence. That was very, very interesting and valuable because it was sort of the first hand look at what he was thinking about, what people were saying and things like that. I liked that a lot.

Then the other things were the annual reports. Once I started reading certain books, they were referencing annual reports. I thought well this is something I need to look at. Actually, I wrote the essay before I started to read the annual reports. But I went back and read a number of them. One of the most interesting was, I think it was the 1894 report of Francis Amasa Walker in which he says, "The battle of the new education is won."

Well the new education was William Barton Rogers' vision of the new education, which he says MIT is now recognized, the MIT model is now being followed. There was a point in the 1890s that MIT really crossed a barrier and was recognized. So that was important.

Then after I had drafted a part of my essay, there was a biography that appeared about William Barton Rogers by a young person, I've not met him, named Angulo and it's very good. It was very good and it backed up a lot of the things I had been thinking about. That was very helpful in sort of solidifying what I had written. It gave me some confidence that I wasn't off in left field writing an essay about MIT. So that was a very nice piece too.

INTERVIEWER: Where was the correspondence that you came across?

SMITH: Mainly in the printed literature. This was a project that I did not have time to go into the archives. This is not an archival essay. So for me it was meant to be a popular essay for a large audience based on mainly on the work of others, and not on my original research and archives. Usually when I do research, I get myself to the National Archives or the Library of Congress or wherever and do -- I love to work in archival material. But this was one of those things--.

INTERVIEWER: But you found a book of the letters--

SMITH: I did, yeah.

INTERVIEWER: --in MIT's library or in the Boston Public?

SMITH: I bought that. I bought that on Amazon. I saw the citation, I thought I'm going to look this up on Amazon and there it was. For something like \$10.00--

INTERVIEWER: It was a used copy.

SMITH: --I got. Yeah, In almost new condition. It was amazing. I loved it. It was one of the great coups of the whole process was buying these books. Yeah, it was wonderful.

INTERVIEWER: So you have a whole shelf full now?

SMITH: I do. Yes, I do.

INTERVIEWER: And the MIT annual reports, were they neatly findable on a shelf somewhere?

SMITH: They're usually available at the archives and the library.

INTERVIEWER: People kept pretty good track from the beginning.

SMITH: They did. The annual reports are very valuable because it's the opportunity for the presidents to tell the Corporation what has been done during the past year, what are the problems, what are the triumphs.

INTERVIEWER: What evidence did Walker point to in '94 to say the battle had been won. Was he citing anything in particular to say, see, you've really done it or was he just declaring it?

SMITH: Yeah. I don't recollect that he actually points to specifics. He may have, I'm not sure. But he surely is indicating that other schools are paying attention to what's happening here and using MIT as a model, and that's why this new education is being won. He goes so far as to say I think at one point that even these old classical, liberal arts colleges that were so opposed to what Barton Rogers wanted to do in the 1860s were now coming around and establishing their science programs. Not at the same degree of intensity as MIT but nonetheless, the new education had made a dent in a way that I don't know that Rogers ever expected that it would ever go that far. So this was like, what, at least eight or nine years after his death I would say that Walker makes this recognition.

INTERVIEWER: Will anything that you learned about MIT's history changed the way you think about the Institute now or anything you do here?

SMITH: Well, it doesn't change anything. I wouldn't say it changes anything, but it surely gives me a good perspective on why MIT is MIT. What I mean by that is that I think one of the great things about MIT is the great pride that the faculty have in place. You can see that, you clearly see that from the early days of Rogers, Runkle, Walker, and all the people that they hired to come on the faculty here.

There's a tremendous pride in the place, and I think it makes it a great place because people work hard here, work very hard here. Whether you're in the humanities or in the biology labs or wherever, you work very hard at MIT. I think that that coupled with this intensity of looking at new materials and searching for new solutions is something that has been around a long time, but it's really part of the greatness of the place, from my perspective anyway.

INTERVIEWER: How do you think about MIT's role in the world now and how that role has changed over the years?

SMITH: Oh boy. I think it has changed. I've been here since 1979, and even in that relatively short period of time, I've seen just the campus change in the sense that nearly 50 percent of our students are now women. In 1979 that just wasn't the case. If I had a class and if there were two women out of a class of 15 or 20, that was an acceptable number. Today, oftentimes, more than half of my class are women, and I think that's -- I like that.

I think that's been a very good thing for MIT because it has brought another dimension to the Institute and another degree of seriousness, if you want to put it that way. Because I think that some of the women that live in our dorm are just amazing. I think MIT was losing out on a lot of talent by not having focused on that problem sooner. It has, and I think it has, again, if Rogers declared winning the new education, I think that battle of gender has been won at MIT, too, because it's now very balanced and it just is better. The general environment of the place, in my view, is better.

INTERVIEWER: In one of the early annual reports that you were referring to, I was struck by the fact that they talked about the number of women who were there, and that there seemed to be larger numbers of women among their special students in the days when they had a lot of them than I would have expected. It wasn't just one or two.

SMITH: I was surprised at that too. They were not huge numbers, but there were always a representation of women. Rogers was actually in favor of that. It wasn't that he said keep women out. I never detected that in any of the early correspondence, and at one point he's very explicit about his desire to see women in the Institute. But the problem was, of course, getting people to pay the way for them, too. I suspect parents, the cultural mores of the time. Most women in those days would have been sent off to state teachers colleges, if at all. Or would just say look, find a husband, it's your time to raise a family. The educational process was just not as available to women in the 1860s or '70s as it became.

INTERVIEWER: Did you come across anything that referred to where they were put in the laboratories? I vaguely remember some story about Ellen Swallow Richards who I think was the first women student--

SMITH: One of the first.

INTERVIEWER: --being in a separate lab somewhere. I don't know where you might have found something like that.

SMITH: Yeah, there was a separate lab that was built for women fairly early. I didn't see a lot about that, but I have seen references to it. I don't know exactly what the implications of that were. That would be an interesting thing to really delve into the archives and look for. There may or may not be material there. MIT's archives is one of the best university archives in the world. But like all early periods, people were not collecting materials like they do today. If you want stuff on MIT for World War II, we're loaded, but go back to 1865 and it's a little sparse.

INTERVIEWER: At least there was something.

SMITH: There is something. Absolutely there's something.

INTERVIEWER: So when MIT started originally, it sounds like its role was partly to educate engineers for local businesses and for local industry. MIT's role now, how do you think about that? Clearly broader than that.

SMITH: Oh, it's very international. All the international programs that exist. As a housemaster, one of the great things about being a housemaster is you get to talk to students in the fall term, like I have in the last month, what did you do last summer? They tell me about all these really exotic places that they've--. One young woman was in Kenya working on projects in Kenya that are engineering projects primarily aimed at helping people living in that country.

Others were in Italy. Others are in Spain and France. Just all over the place. Many, of course, work in the United States at summer jobs and that's the way they eventually find jobs in certain firms. But they're all over the place. Then there are all of these other enterprises today, the Alliance of Singapore, and others that are taking place that has made MIT a very international place. It's quite remarkable.

You probably have experienced this like I have. When you go to a foreign country and you say you're from MIT, it's amazing the sort of, ah, MIT. It's this international recognition that is there that is quite remarkable.

INTERVIEWER: What do you think William Barton Rogers would make of MIT today? In what ways has it continued along trajectories that he established, and has it departed in any significant ways do you think?

SMITH: I think he'd be enormously pleased. Really pleased. It has adhered to the basic vision. I think he would marvel at what has happened in terms of how his vision has been worked out to encompass so many different areas of inquiry and enterprise. I think he would marvel at the number of business institutions that have grown out of MIT's graduates, basically. So that has been very, I think very positive, and I can't imagine him being anything other than enormously pleased. Remarkable.

INTERVIEWER: I wonder if the science research was something he could conceptualize?

SMITH: Well, he was a person who had a grasp of physics, and then he gravitated toward geology. For his day he was well educated. I'm sure he would shake his head and say, computers? Or the Human Genome Project? Mind boggling to him. But I think that he would surely bring himself up to snuff pretty quickly once he heard about all these new and interesting developments and say, oh my God, why didn't I live in the 20th century or something, or 21st century.

INTERVIEWER: Was there a component of the early MIT it was really focused on expanding knowledge?

SMITH: Well, as I said earlier, one of the things that surely had something to do with expanding knowledge is the emphasis MIT placed on laboratory education. I think that was the critical, novel part of what MIT did in terms of trying to fashion a new way of educating students in science, engineering, bringing the mind and the hand together. I think that was really the important thing. So, yeah.

INTERVIEWER: Was there anything you found particularly interesting in your research that you weren't able to include in your book chapter?

SMITH: Well, I think the thing that I would have liked to have done more with would have been to have even broaden the story out more to encompass MIT's place in American history. I'm an author for an American history textbook, so I like to look at big projects, big stories, how they relate to the larger history of the United States. I would have liked to have done more of that.

INTERVIEWER: Do you think you might come back to that some day?

SMITH: I might. Yeah. That could be. I'm not going to write the whole history but I'd like to look at that theory.

INTERVIEWER: Maybe a couple of partners. Do occasions like MIT's 150th anniversary matter? What purposes do celebrations like the sesquicentennial serve, if any?

SMITH: I think they serve a purpose. I think they help to reinforce the vision of the institution. It's not just to reflect on the past, obviously. MIT doesn't look over its shoulders much. But it's always good to pause, look over the shoulder and say hey, where are we going, how does it relate to where we've been, and how does it help us think about the future? I think those are MIT type questions. So I think the 150th is a good moment to do this.

The other moment that appears to have been that type of time would have been in 1916 when President Maclaurin inaugurated the move from Boston to Cambridge and the festivities that took place then sound pretty interesting to me. I think there was some interesting reflection going on there. It was a moment of shift to be sure in which Maclaurin was taking the Institute more toward an applied industrial focus and more away from the pure science ideal type. That would shift again under Compton in the 1930s. But those are important moments, and I think this is an important moment, too, for MIT.

INTERVIEWER: Do you see a particular shift occurring now that you've been thinking about in terms of what the moment represents, other than 150 years?

SMITH: I'd like to preface this by saying first of all, that my world ends in 1918, OK. But having said that, as someone who is here living in the 21st century and looking around the Institute, the thing that impresses me most is the tremendous growth of the life sciences. And not just reflecting in new buildings, but reflected in the number of students I encounter who are majoring either in biology or biological engineering. I think it's the first department in the country. So it's things like that. I think that's the area that really is fascinating to me.

The other thing that's fascinating to me, I don't know if this it's happening elsewhere, I suspect that it is, it's just here I am at MIT, but the amount of boundary crossing that takes place here is amazing to me. Just amazing. Mechanical engineers working in biology. Chemists working in electrical -- you know, whatever it might be. There are all sorts of these combinations of various disciplinary backgrounds that I don't remember being there 40 years ago or before that. I think that the academic world was more bounded by narrow disciplinary blinders so to speak, and those blinders I think have been removed.

INTERVIEWER: I've heard people say that boundary crossing is easier at MIT than at other places.

SMITH: It probably is.

INTERVIEWER: The schools are more tightly bound to each other.

SMITH: Yeah. There's truth to that I think. Because MIT has always been a place -- the key word to use around here, if you want to get support for something say, I want to conduct an experiment, and everyone gets excited. That's an MIT way of thinking about things. Experiment, new, innovation. These are things that really attract people. Not just at MIT, but I think those who are around MIT and have graduated from MIT, they're all part of that culture and it's a very interesting one.

INTERVIEWER: Together with your colleague, professor David Mindell, you've been teaching a course on MIT's history.

SMITH: Yup.

INTERVIEWER: What do you cover and who takes it and what have been trying to convey to the students?

SMITH: Well, we cover the entire span of the Institute's history starting with -- well, my talking about Rogers and the background to all of that. But the thing that's interesting is that even in that course, we've had to do a certain amount of selecting because there are not good materials for the entire span of the Institute's history. Hopefully that will get worked out, perhaps, because we are now teaching a course and there will be more papers written about the history of the Institute, and hopefully that'll work itself out. But it is aimed at giving students a good overview of the history of MIT from 1861 to the present.

INTERVIEWER: As your students last year conducted their own research about MIT, did any of them delve into areas that had not been previously studied or written about extensively?

SMITH: Yeah. One of the assignments we gave them last spring was to write a paper about some aspect of student life that interested them. MIT has a lot written about it in terms of what happened in mechanical engineering or the various disciplines that are here. It's very famous for that, and historians of science and technology continually use MIT as sort of a reference point. But when you look at the internal history of MIT, one of the things that is not well documented is the student life side of the Institute. In a way that's really too bad because there's more than one lifeblood at MIT.

One would be the professoriate, of course, and then there's the staff -- very important for the running of this place. But especially important are the students. They really bring life to this place. We know so little about what they do or who they are as people, how their lives on the other side of Mass Ave relate to what happens on the academic side of Mass Ave. So we've had them write papers about things that interest them. It could be as a member of the crew team, or one of the students last spring started a history of Burton Connor, because nothing is known about that house.

INTERVIEWER: The dormitory?

SMITH: Yeah.

Projects like that I think will eventually be posted on a website and, especially, not all papers are really good ones, but some of them were very good. I'd like to see them posted on a website in some form of electronic publication to contribute to this overall growing history of MIT. Have students participate in that because they know that part of the beast pretty well.

INTERVIEWER: Did any of the papers reveal things that surprised you or that you found particularly interesting?

SMITH: Yes. I'm trying to remember -- there were about 35 students in this class as I recollect -- 30, 35. It was not a huge class. It was just the right size, actually. But there were things in these papers that, yeah, did surprise me. I can't think of something right off the bat about what -- well, the history of Burton Connor was very interesting to hear about how that house sort of morphed into what it is today. That was interesting and different. I had no idea about that.

INTERVIEWER: How did that happen?

SMITH: Well, it happened very slowly, and sort of I think in an unplanned way. It's still not clear. There's a lot of work that's still being done. This student is still working on that paper, by the way. So it's continued beyond the semester into a project that will hopefully tell us more about what specifically, how did this house grow from being -- I think it was originally a hotel or something like that. Then it grew into a dorm and the different parts of it. Then it was redesigned and converted into a dorm that had suites rather than just individual rooms.

One of the things that surprised me in the early history is that early on when the house was first used for student housing, evidently, in order to get in your room you often had to walk through another student's room because they were oddly connected. It was either an apartment house or a hotel, but the rooming layout was totally not right for student life. So there were a lot of curious things like that that were happening around the house.

INTERVIEWER: What were some of the other topics that students wrote about?

SMITH: Well, a number of clubs, athletic clubs. Oh, someone wrote a history of the rifle team. MIT's rifle team is very famous, actually, and has won the NCAA championship, beating out West Point and the Naval Academy. So you encounter papers like that. There were papers written about certain fraternities. A variety of subjects that were--. Oh, and a wonderful paper about art at MIT. The placement of art at the Institute, and what it meant in a science and engineering institution. It was a fascinating piece, really good.

INTERVIEWER: So you don't have specific plans yet to post these, say, on the web during the sesquicentennial, but maybe?

SMITH: I spoke with David Mindell yesterday and we haven't actually begun to plan the course for the spring, but we're definitely going to do something like that because there's some very interesting papers here.

The other thing I should mention is this class attracted not just students, but members of the staff came to this class and they really added a nice dimension to it. Because they see the Institute from yet another direction. Many of them are very deeply involved in undergraduate education in big departments like electrical engineering and things like that.

INTERVIEWER: Let's talk about your own personal history. Tell us about where you were born and raised and about your family and your childhood.

SMITH: I was born and raised in a little town called Towanda, Pennsylvania, which is up in the northeastern but more central part of Pennsylvania right on the New York State border. On the north branch of the Susquehanna River, if that's helpful. It's a town of about 3,000 people, so it's a very small, rural sort of town. The biggest industry there is probably lumbering. But there are a few industrial plants, like GTE, Sylvania, things like that, a small Dupont place.

But my family were all, on my mother's side they were all farmers dairy farmers. On my father's side, my grandfather was a machinist. So my father was an optometrist and my mother was a school teacher. I was raised in this little town and loved it. It was a great place to grow up. I think of all the things that we did in school in those days. I'd probably be in jail now for half the stuff that happened, but it was just a different era when you could go out on your own and do things. It was really a lot of fun.

But that was sort of my roots. I went from there to college at Georgetown University in Washington, and then I went on from there to Penn State to do my graduate work.

INTERVIEWER: Were you interested in history as a child?

SMITH: Yes. Yes, I was. My father was an avid stamp collector, and I got interested in commemorative stamps, which are, obviously, historically oriented. That's how I got interested in history was collecting stamps and learning about why particular stamps were issued at certain times. Things like that, pretty simple things, but it was a lot of fun and I got interested in that. I think that's the first influence.

Then in high school in my junior year I took an American history class. The teacher said the first day of class, now I'm going to give lectures. I'm going to teach this course like I would teach a college course. Well, that cinched it for me. I loved that class. I took notes like crazy. I wasn't a great student in high school. I got through, but that class really interested me because I thought it was more advanced. So that hooked me on history in high school.

INTERVIEWER: Do you still have a stamp collection?

SMITH: Yeah, I do actually. It's been neglected for many years, but I hope some day when I retire I'll go back to it and try to rekindle and revive it, yeah.

INTERVIEWER: Did you have favorite commemorative stamps when you were growing up?

SMITH: Yeah, I did. There's a number of issues. But I would say the one that interested me most was Abraham Lincoln. There have been many stamps issued in honor of Abraham Lincoln, as you might imagine. Lincoln, as someone who reads history, and even today, I have a great admiration for him. He's a remarkable human being.

INTERVIEWER: Was that a one or two cent stamp?

SMITH: It was like a one -- what was it? There were almost all denominations issued on Lincoln -- one cent, two cent, five cent. You know, they just are all over the place. Then this past year was his 200th anniversary. He was born in 1809, so 200 years. There was a whole outpouring of stuff on him.

INTERVIEWER: Did you read many history books as a boy? Did you have favorite biographies or histories?

SMITH: I wasn't a great reader as I recollect. It's interesting because I remember as a small child my mother used to read to me all the time. Then I would read certain things that interested me. My favorite book from my childhood is a little book called *Paddle-to-the-Sea*, I'll never forget it. I actually found a copy that my mother had given to my sister-in-law for her kids and it's all tattered and torn, but I've got that book. That was a wonderful book because it talked about the travels of this little wooden canoe that an Indian boy had carved and how he set it on a river up in northern Minnesota and how it made its way to the Great Lakes and ended up in the Atlantic Ocean. It was just one of those travel log type things that really fascinated me.

INTERVIEWER: Did you canoe in the Susquehanna?

SMITH: I did. Yes, I did. I did a lot of canoeing as a kid. We had little place on a fresh water lake. Then later as a teenager I canoed down the Susquehanna and had a lot of fun. You see things from a river, the landscape is so different when you're on a river looking up at things as opposed to being on the land looking out. It's fascinating.

INTERVIEWER: Were you interested in science and technology as a boy? Were you a tinkerer of any sort?

SMITH: Not really. I guess to a degree I was but not much. My father, in addition to collecting stamps, was a great hunter. Loved to hunt small game, especially birds. My brother and I would go with him often and hunt on weekends. Even when we were too young to carry firearms, we would go. When you hunt for pheasants and things like that you hunt hedgerows, basically. So he was on one side and my brother and I were on another side. He had a dog that would work the row and then flush out these ringnecks.

Well, this is a story -- I don't know if you want to hear it or not, but you can always cut it. We were out one day and neither my brother and I had a gun, but this bird went up, my dad shot and winged it. Hit it in the wing and it went down on our side of the hedgerow and it was flopping around on the ground.

So my brother and I ran up to the bird and my dad says "Ring it's neck!" I looked at my brother and I said, "Jerry, ring its neck." My brother said "I'm not ringing its neck." So we got in an argument and the bird jumped up and started running away and my dad was just going bananas. But finally the dog caught the bird and my dad wrung its neck. But that was one of the most embarrassing moments of my childhood I think was "Ring the bird's neck."

INTERVIEWER: Was Jerry older or younger?

SMITH: He's younger.

INTERVIEWER: But he didn't take direction well.

SMITH: No. But to make that story come back to the history stuff, my dad when I was a teenager kept being offered old Civil War guns and stuff like that that farmers would find in their barns. They would hear about Doc Smith being interested in old guns and stuff. They started giving them to him. So he had this collection of old guns, and I got very interested in that, especially in the mechanical workings of them, I could take them apart and do all--. So there was some interest in mechanical things.

INTERVIEWER: Cars? Did you--?

SMITH: Oh yes. That was very much a part of my life, and I knew how to take apart a flathead engine and all that at a very young age.

INTERVIEWER: So you really were very hands-on.

SMITH: Yeah, I was to a degree. But I had friends that were really hands-on. I mean they were modifying things in a way that -- I watched and I helped but I didn't really do it. But I've always had an interest in mechanical things, I know that.

INTERVIEWER: And as a kid, did you ever think about what am I going to do as a career? Can I combine history and guns?

SMITH: Not really. I didn't think about that until probably my senior year in college. I knew I liked history, but I also had a summer job in high school and in college working in a sand and gravel company producing asphalt and concrete and things like that. I thought for a while that I wanted to go into that business, and I had some family members that wanted to go into the business. Really on a lark I applied to go to graduate school. I just thought my senior year, well why don't I apply.

I knew I didn't want to go to law school. I just had no interest in the law. So I thought well I'll apply to some history programs, I've really enjoyed it. So I applied and I was accepted. I applied I think to four different places and I got accepted, but only one of them offered me money. My rule was go where the money is. They want you to the most, you go there. So I ended up at Penn State and I had a great experience there.

INTERVIEWER: Back up. How did you choose to go to Georgetown?

SMITH: That was an interesting question. I chose to go there not because I studied the place, but because my father told me his best friend went there and loved it. That was good enough for me. I never visited Georgetown, believe or not. I applied and--.

INTERVIEWER: What was your experience there like? Did you love it too?

SMITH: When I was there I liked it. I wouldn't say I loved it. At that time it was a school in which a lot of kids went there that had a lot of money, and I was on a very limited budget. I had a next door neighbor, I'll never forget him, he was from Boston actually. I will not mention his name because he's still around here. But he had an amazing allowance and a brand new car, and every weekend he would leave the school and go over and rent a room at -- there was some motel over on the other side of the Key Bridge and he would stay over there on the weekends. He'd call us up, come on over.

Well, I couldn't do that. So it sort of eliminated, not just me but a number of others from doing that. That was a shortcoming I think. But in retrospect, I got a good education there. I've got no complaints there.

It was at Georgetown that I encountered a professor named Joseph Huthmacher who was a biographer of Robert Wagner, New York's famous Mayor Wagner, later I think became a US Senator, if I'm not mistaken. But in any case he was a biographer of Wagner. It was in his seminar my junior year in college that I really got turned around intellectually, and that was when he had us read a book called *An Economic Interpretation of the Constitution* by Charles Beard. Have you ever heard of that book?

INTERVIEWER: I've heard of Charles Beard.

SMITH: Charles Beard was one of the great historians of the early 20th century, and he wrote this book arguing, basically, that the Founding Fathers of the United States created the US Constitution because they wanted to make a fast buck on depreciated currencies that had been issued during the Revolutionary War, had depreciated to about \$0.10 on the dollar. They know that if they established a new Constitution as a strong central government, these debts would be paid off, the value of these things would go up, and they're out there buying the cheap currency.

Well, it turned out to be not true, but it was a very famous book. It was in that seminar that Huthmacher introduced me to history as an interpretive discipline. Up until that time I just thought if I read one big, thick history book, I knew everything there was to know about history.

INTERVIEWER: And memorized all the facts.

SMITH: Yeah. You had it. Of course, that was wrong. So that really hooked me. I love the open-endedness of history and the interpretive dimensions of all of it. That's really what fascinates me about it.

INTERVIEWER: What happened when you got to Penn State and here you were now working on a PhD. How did you choose your focus?

SMITH: That again happened in a seminar my first term. I fully intended to study the Civil War as a student, and military history. I got in this seminar and I remember the professor said, I want you to propose a topic. So I proposed a topic on the aesthetics of the Pennsylvania Kentucky Rifle, which was the so-called long rifle, and very famous in American history. My dad had collected a few of these things. So I knew about them, and read about them. I thought I could write an interesting paper about that.

So I made the proposal, and the professor said, "Mr. Smith, that's far too complex a topic for a first year graduate student." And so he pooh-poohed that idea and I was sent back to think of something else. I just really was so shaken by that experience that he wouldn't let me do it that I finally went to see him. I said, can you recommend something? He said, well, I've heard of this guy named John H. Hall, why don't you look into the background of Mr. Hall. He did interesting things with firearms.

Well, that got me interested and Hall turns out to be one of the earliest inventors of interchangeable manufacturing in the world. That led to a paper and it led to my dissertation and that led to my first book. It was a lot of work. It sounds like it's one, two, three, four. But it was really, that was my real baptism.

INTERVIEWER: What about the aesthetics of the rifle that had grabbed you in the first place?

SMITH: Well, it was the fact that you could look at one of these rifles and they could be carved, the wood would be carved in certain ways, different types of brass would be configured in different ways. There were different identifying marks on these guns that would allow you to say, well that gun is from York County, this one is from Lancaster, this one was from Lehigh Valley. And I just thought that would be an interesting thing is to see what are the differentiating features of these firearms and how can you tell this.

INTERVIEWER: Did you ever come back and write that paper?

SMITH: No, I never did. But I did put it to good use in my dissertation, which I talked about how those Pennsylvania armsmakers influenced what happened at the Harper's Ferry Armory, which was what I ended up focusing on.

INTERVIEWER: As you graduated, did you think of yourself as a historian of technology or not?

SMITH: Well, I sort of did, but it was at a time -- I got my degree in 1971, and at that time the field of the history of technology was around 10 years old. It was a new field. When I was at Penn State I didn't really know that there was such a field. I had, fortunately, mentors at Penn State who were working on problems related to technology. A guy named Hugo Meier was very influential. I was reading his work, reading Leo Marx's work, a professor here at MIT. And getting interested in this thing called the history of technology, though I was being trained as a plain, vanilla American historian. That was my training.

The real change came when I was ready to -- I finished my general examinations and I needed to find funding for my dissertation research. I learned that there were these pre-doctoral Fellowships at the Smithsonian. So I applied for one of them. At that time it was called the Museum of History and Technology; it's now the Museum of American History. I had this correspondence with this curator, a wonderful man named Edwin Battison who was the most knowledgeable person I have ever met with reference to machine tools. He knew machine tools and watches and things like that very deep, very deep knowledge.

Anyway, I corresponded with him about doing a history of the Harper's Ferry Armory where this John H. Hall had worked on interchangeable manufacturing. He wrote back and he said, Mr. Smith, I'm sorry to tell you this, but the Harper's Ferry records were destroyed during the Civil War when the south raided the armory and burned it down. I wrote back, being sort of a naive student, I wrote back and I said well, I think I could reconstruct the history of that armory by working in the National Archives. I had no idea if I could or not. So finally he gave up and he said, OK, if you want to come down here. So I got this Fellowship.

It was really my experience at the Smithsonian that really turned me in the direction of what I do now, history of technology.

INTERVIEWER: So you were able to put something together enough to get your degree.

SMITH: Yeah, I did. I reconstructed the whole thing. It took about a year to do the research, but I did it.

INTERVIEWER: Is being a historian of science and technology very different from being a historian focused on other subjects or themes?

SMITH: Well, I think the most important thing is that you have to be comfortable about writing about engineering and technological change, and not be intimidated by it. Unfortunately, I think there are a number of colleagues in the field of history who you mention the word science or technology to them and they go oh -- you know, they just don't want to talk about that. They're not happy with it. But that's changing.

I think today that word technology and science is becoming much more acceptable, much more integrated into general history. I worked very hard. That's been part of my career to try to do that. I think that those changes are taking place and will continue to take place.

INTERVIEWER: So it sounds like what you focus on is somewhat different, but the methods maybe are fairly similar?

SMITH: The research methods are very much the same. I mean I was trained, as I said, as a general historian. I use those methods in my research. So the methods are the same virtually.

INTERVIEWER: Has the field changed much since you entered it, other than to say there are many more people working in it or that it's more established?

SMITH: Yeah. I think it definitely has. When I started out the main focus of the history of technology was to do what is called the internal history. That is, it was quite common in those days for somebody to want to write a history of machine tools and to describe who did what first in great detail about what made this milling machine different from that milling machine. Great technical detail, very good stuff, but very internal. That's the sort of things most general historians will look at, and their eyes will blur up and say, I have no interest in that.

The thing that happened in the 1970s was that there was a turn away -- well now a turn away. That type of history continued to be done, but there was a turn toward thinking about the history of technology in a different way as more having the social component, a political component to it. I was an avant-garde basically, and it was a very interesting experience that it helped to integrate that field with general history.

INTERVIEWER: And with the increased prevalence of technology in our lives, have the history and study of technology become really hot now in history?

SMITH: I think they're becoming hotter. They've had a hard time making an inroad into the general history textbook. But in recent years that's been changing, which is a good sign because I've felt very strongly that when you think of the history the United States and you read about it in our journalistic literature or wherever, how many times do you encounter the phrase, "America is a technological society." You encounter that all the time. That really means that we need to understand what does that mean and how did we become that way?

So, I think that especially given all the changes that have taken place since World War II, that this is becoming a very important consideration for any way of thinking about American history.

INTERVIEWER: What did you do after graduate school?

SMITH: I consider graduate school as ending with the ending up my Smithsonian thing. I looked for a job, and it was a very bad job market. It was in 1971. Funding for universities was declining -- that was not a good time to go look for a job. But I got very lucky. When I was at the Smithsonian I had met a number of other historians who were there doing research, one of whom was a woman named Mary Young from Ohio State University. Mary and I struck up a friendship.

I went back to Towanda, Pennsylvania thinking -- I was aiming for a career at a small state teachers college up in Pennsylvania. That's where I thought I would be. I got this call from Mary saying we have an opening at Ohio State in the history of technology. Would you be interested in applying? I hadn't seen any ads or anything. I said, Ohio State? So I was invited to go out there for an interview and I got the job.

So my first encounter with the academic world was at Ohio State in this huge history department. It had about 50 faculty. By contrast, the history faculty at MIT is around 15, so it gives you an idea of the difference. Ohio State's one of the big universities in the country. It was a great experience. I fortunately had -- interestingly, talk about important women in my life.

Mary was one of them, but another one was June Fullmer who was on the history faculty there. She was a historian of science who had been a former chemistry professor at Tulane University. And then had gotten interested in history and shifted and then came to Ohio State. But June literally became my mentor and she taught me about university politics and how to behave, all of these things.

INTERVIEWER: How to teach classes.

SMITH: Yeah, right. I mean if I had a question, June was there. So I owe a great deal to her in terms of just -- I had built up a knowledge part of my profession, but I wasn't really a professional. She made me into what I would call a professional person. She really taught me the ropes.

INTERVIEWER: And you were there -- how long before you moved to--.

SMITH: That was eight years.

INTERVIEWER: So you had tenure probably.

SMITH: I did. Yup, I did.

INTERVIEWER: And then what happened next?

SMITH: Then I was invited to come to MIT to give a lecture, and that started a process by which I ended up being made an offer here at MIT. I came here. My wife, Bronwyn and I moved here in 1979, and the rest is history.

INTERVIEWER: What were your first impressions of the Institute?

SMITH: Oh, great question. I had a wonderful experience at Ohio State University, but one of my complaints was there was nothing going on there. It seemed like I taught my classes, I went to faculty meetings, but there were no interesting visitors, OK? So I came to MIT for this interview. The first thing, I gave a lecture, and then there was a discussion.

The thing that impressed me was the remarkable questions that these people -- I mean really penetrating questions. I thought who are these people? They are so damn smart. I was just awed by the intellect. The intellectual power in the room around me. Ken Keniston, Leo Marx, Leon Trilling. There were a group of people there that I greatly admire, and Loren Graham I think was there at the time. These are all really first rate people in the history of science and technology.

So I left there thinking wow, this is an environment that is different than what I've been in. Then I got the offer to move and there was no question about what I was going to do. Because at that time Cyril Stanley Smith, I don't know if you remember him. He was a well-known metallurgist who was in material science at MIT. He did the history of technology in his older years, too. Wrote a lot about metallography and the early history of metals. Well, he was there. There was a reason to come to MIT, because MIT is for technology, the center of the universe. For a historian it's the place to be. So there was no question about whether I was going to come here or not, I just did.

INTERVIEWER: Has it turned out to be a good place to study the history of technology and innovation? Did you talk much? Do you talk much with science and engineering professors? Did you change your direction at all when you got here?

SMITH: I didn't change directions that much, but what I did do was I did encounter a number of, especially people in the School of Engineering, who were very interested in the history of technology. Leon Trilling is one of them from the aero department, was one of the first people I interacted with. Then there were others. Louis Smullin from another electrical engineering department. Joe Weizenbaum, people like that, but that I intersected with, interacted with.

I taught with both Leon and Louis. Historian and engineer teaching classes together. You know that just doesn't happen at other universities, or it doesn't happen very often. It happens -- I shouldn't say it doesn't happen. But at MIT it becomes possible. MIT has this open, experimental feeling about it that you can do things like that. So I did it. Those intersections have actually increased over the years.

Like most changes, the culture of MIT is so different from what I came from at Ohio State or Penn State. It took me a while to get used to this place. I couldn't really call Cambridge home or MIT home for about six years. It was just a different environment. I liked it, but I just didn't feel like I was part of it. If you get that drift.

INTERVIEWER: Was there something specific that was a turning point, or was it just a gradual accretion.

SMITH: I just think it was a gradual accretion. And getting more comfortable, getting to know more people. Learning how the Institute worked, which was different than Ohio State. It's a different breed of cat, and I had to learn that and it took a while. But that was a process that worked itself out, surely by the mid-1980s, and it was a very interesting learning experience. That's the way I think about it.

INTERVIEWER: In what other ways was it different? What do you recall?

SMITH: The most important way was the intellectual firepower that's here. It was just fabulous. I actually think it has made me a better historian to be here. I think I've learned so much from my colleagues, whether they're in the School of Humanities or Social Sciences or in the School of Engineering, that it's been a wonderful experience. That's been very, very important. That's the most important thing for me intellectually, so I learned a lot.

INTERVIEWER: Did you have any concerns about being a historian at MIT rather than a scientist or engineer and whether they were sort of on different planets even within the same university?

SMITH: No. The answer is no, because at Ohio State University, the Schools of Science and Engineering there were very strong. So when I moved to MIT, I saw that ratcheted up that science and engineering I feel sort of run the place. Our presidents are either scientists or engineers -- there are a few exceptions. But it wasn't that big a change for me. It was I think just learning the ropes, learning how the place operates that was interesting, but not different. I wouldn't say it was a different thing.

INTERVIEWER: And when you came, did you go into the history department or into science, technology and society? Where did you get planted?

SMITH: Yes. I was hired by STS, the Science, Technology and Society Program, but I also asked for a joint appointment in history because I came from a history department and I consider myself a historian. So, I hold a joint appointment in STS, which pays the bills, and also in history, but I'm a voting member of that faculty and participate in its deliberations and things like that.

INTERVIEWER: What was the STS program like when you arrived and how has it evolved since then?

SMITH: It was intellectually very high-powered. Before I arrived there, I mean it was like unbelievable. Leo Marx, arguably, in my view, one of the foremost literary scholars in America was here. Loren Graham who was surely the foremost scholar in Soviet-Russian history of science was here. Ken Keniston who is a well-known person in the field of psychology studies and education, youth in America was here -- very smart guy.

Elting Morison who was, at that time, a very well-known historian of technology. Leon Trilling from the aeronautical engineering department, European bac-- An amazing guy because he was like Walter Rosenblith. These are people who came to the United States from Europe, and they had this deep appreciation for not just the engineering sciences that they were involved with, but also for the humanities and social sciences.

So here you have this department that consisted of these people, old boys, if you want to call them that. Then there was a younger group, Sherry Turkle was in the younger group, untenured professor at the time. David Noble, Kenneth Manning. Who else? Larry Bucciarelli from mechanical engineering was in there. Larry was a tenured professor. But there were probably -- Charles Weiner in the history of science. So it was a really interesting cluster of people to be with. It was very exciting.

INTERVIEWER: Were there other STS programs around the country or was this a kind of unusual cluster, and what was trying to do?

SMITH: There are really two questions in there. One is that it was not the first in the country. The first STS program that I'm familiar with was at Cornell. But I think the first program that really took root and blossomed was at MIT. Though Cornell has a very good program, but it had some rough spots I think during the 1970s and today it's a thriving program. That was the one thing.

But there's also a political side of this was that one of the things that I noticed when I first arrived at MIT was that for a number of people at MIT, and you would appreciate this, the, you know, ask the question, who are you and what do you do? That's the sort of MIT question. I kind of gathered from my conversations from people who asked that question was that they had certain questions about STS and why it was at MIT and why was it founded. I wasn't here at the founding, but I learned that basically STS was sort of decision that was made from the top, Jerry Weisner, Walter Rosenblith, persuaded by people like Elting Morison I think, decided that MIT needed this program.

At one point -- and I really shouldn't be the one to tell this story but I know a part of it, is that they were actually thinking about creating another college at MIT, another School called Science, Technology and Society. My understanding of the story is that Mr. MacArthur, of MacArthur Foundation fame, had actually talked with Weisner and was going to put up the money to establish this new school were upon he died and things were reconfigured and the money didn't come to MIT.

So MIT was left holding this bag of people called STS scholars and had to take them on. There was foundation funding -- it was really run on soft money for the first six or seven years, but that money ran out. I remember that around 1984 there was a discussion, a very serious discussion, with Francis Low who was provost at the time about whether to fold STS, call it quits, because there was just no hard money to support it.

Of course, the other question was well, can you put it on the regular budget line at MIT. Of course, lots of people said it's not coming out of my skin that you're going to do--. You know, the typical expectations that you would have. But the decision was made to continue the program after some very serious discussions. I think it came fairly close to being closed down. Fortunately it didn't.

INTERVIEWER: Do you think of STS as an academic discipline like history?

SMITH: That is a very good question. I personally, if it was 10 years ago I would say no, I do not think of it as an academic discipline. As you would say history is. But I have colleagues like David Mindell who are younger generation who have really grown up through this STS process who think of STS as being a discipline now. And really have begun to think about it from a disciplinary perspective and think about the special methodologies that it needs to have in order to call itself a discipline. They were not around 30 years ago, but they're around now.

People like Mindell and David Kaiser and other colleagues I think would say, yeah, there's a discipline forming here. I don't know that it's fully formed but it's forming. I'm the old guard who's saying, well I'm still a historian. You scratch me, I'm a historian, OK? I'm in STS, I love it, don't want to change. But whether it's a discipline, it's still a question I'm not fully convinced of. But I know I have colleagues who would say now, wait a minute, Smith, you're just going too far on that.

INTERVIEWER: You were named director of STS in 1992. At that point it was described as one of MIT's truly interdisciplinary academic programs, and you were described at the time as the ideal person to help chart the next generation of STS, and to build bridges between it and the Schools of Engineering and Science. So, what did you do in your years as director, and where did you start, where did you leave it, and were you able to build bridges?

SMITH: Well, I hope I did. There were two types of bridge building activities that I really thought were important. One was to build bridges between STS and other humanities departments, like history. There were tensions when I arrived here. I don't know exactly what the source of them were but there were tensions. I worked very hard to try to talk with history colleagues and get them involved in STS program activities.

One of the things I got deeply involved with, which speaks to both this and to my trying to find support in the School of Engineering and build collegial relationships there was that I was very much involved in the founding of a graduate program in the late 1980s. I think the doctoral program, it was first called the Doctoral Program in the History and Social study of Science and Technology. It is now called History, Anthropology and STS, I think. It's a very curious name, but it reflects the three departments that are involved in it.

But it was in that process of building a graduate program that we tried to bring in colleagues from history and anthropology and build bridges that would make them feel part of the enterprise, even though it was originally an STS thing. I mean I'm the one that had to go -- I think John Deutch was the provost at the time. And Nan Friedlaender, bless her soul, was the one who really helped pave the way for that process.

INTERVIEWER: She was dean of the School of Humanities.

SMITH: She was the dean of the school. Philip Khoury was the associate dean. Nan was still alive at the time and Philip picked up where Nan left off. But they were both very important in helping to cultivate this program. I surely didn't do it all.

INTERVIEWER: And managed to attract doctoral students and to place them.

SMITH: Right. Oh, our record in placing graduate students has been very, very good. Very good.

INTERVIEWER: Did they end up in STS programs or public policy or history?

SMITH: They end up in a variety of places. My students tend to end up in academic positions. But I've had a few that have ended up in museums. A graduate of, what, maybe seven years ago is now the chief curator at the New Bedford Whaling Museum. Places like that. My first graduate student, not here at MIT but at Ohio State is a very eminent aeronautical historian who is the senior historian at the Smithsonian.

So not all go to the academic world. And students of other professors do have policy jobs. One of our early graduates went to work for *Science Magazine*. Things like that. So it's a variety, but mainly academic I would say.

INTERVIEWER: You were the co-author of an unusual history textbook, *Inventing America: A History of the United States*, along with Pauline Maier of MIT, and two other professors from Harvard and Yale. Tell us about that project. It was a big project.

SMITH: Yeah, and it got started in a very curious way. It came out of nowhere the opportunity to do this. At one point, the Society for the History of Technology, which is my primary organization, professional organization, was called to the Sloan Foundation in New York to talk about the future of the field. There were about a half dozen of us who went to New York that day to talk about the field. Having just been involved in the establishment of a graduate program here, I went to New York to make a pitch for graduate student support -- how much we needed tuition supports and things like that, fellowships.

The president of the Foundation at that time was a fellow named Ralph Gomery, who had been the former chief scientist of IBM. We were surrounded on this table, but he was sitting almost directly across from me. So I made my pitch and I could tell Gomery was not interested at all. His eyes were cast down and he didn't seem to react at all. Except at some point, I don't know why I said it, but I said something about my being just so disappointed in American history textbooks because they really push technology to the side or completely ignore it. It's really something that needed to be corrected. I saw his eyes glance up and then they went back down again. I finished my talk and went my merry way.

I don't know, a week or so after I got a call from Art Singer who was the program officer there saying we're interested in this thing about American history that you mentioned at your talk, and would you be interested in doing a textbook because we would be willing to fund that textbook if you're interested. So, I was really taken aback because I hadn't thought about that at all. I was speaking the truth when I said I was really disappointed, but I hadn't thought about doing one myself. So I scurried around and I talked with Pauline, who was a close colleague of mine here at MIT.

A few days later I got a call from Dan Kevles who was very well-known historian of science at Yale. He said I heard that you've been selected to do a textbook. I'm interested in this. I thought well, that would be good. Dan does 20th century things, very well-known. So he signed on. Then the three of us I think talked about getting someone else and that turned out to be Alex Keyssar who at that time was at Duke University, he's now at Harvard. But that's how the team was put together.

INTERVIEWER: And his area was complimented the other three?

SMITH: He did. Each of us had a slightly--. Pauline is a person who focuses primarily on American Revolutionary and Colonial history, early American history, very much in political history. Just is about to publish a new book on the ratification of the Constitution. Absolutely first rate. Probably the smartest person I've ever met. Pauline is a very, very smart person. Then Dan does history of science pretty much 20th century, though broadly gauged. Then Alex brings sort of a social labor history dimension to it. I thought all of us complemented one another. We were all in different areas, so we could read our works, our various chapters and comment and self-critique. That worked out pretty good.

INTERVIEWER: So how much does it resemble traditional American history? You had to cover all that stuff?

SMITH: Yeah.

INTERVIEWER: And where and how did you bring in the technology? Is it a history of technology? Not really.

SMITH: Not really, no. It's meant to be an American history textbook that really talks about the role that technology plays in American history, but we still deal with the politics. I was responsible for the chapters between the presidency of Thomas Jefferson and the end of the Civil War. Basically what I tried to do in those chapters is to talk about well now, during the presidency of Thomas Jefferson, we know about the XYZ Affair and the undeclared war with England and all this stuff, and the war of 18 -- well afterwards, was of 1812.

But what's going on during this period? How did those political events influence what happened in the area of American technological development and industrialization. So in all of those chapters I kept pressing at that theme, trying to fit it in and relate it to politics, and it works, of course, like a charm. Because politics is -- well, I should say technological change in engineering, you don't do that without politics. Those are politically based subjects. So it worked really well.

INTERVIEWER: Why did you think it was so important to look at technology so explicitly in the history? In other words, why not arts or education? Could you -- what is that about technology in America?

SMITH: Well, first of all it was being ignored. But secondly and more importantly, the reason for looking at technology is that the United States has been a very utilitarian oriented society. William Rogers was right -- mind and hand are very important in this country. I thought that this was something that was being left out and needed to be treated and I can't imagine, really, reading American history without reference, and more than reference -- really understanding how does technology fit into the understanding of the course of history that this country's experienced. You can't do. I really don't think you can.

INTERVIEWER: I think I remember little bits from traditional history.

SMITH: Eli Whitney invented the cotton gin.

INTERVIEWER: You bet. That was what I was going to give you.

SMITH: That's what we got.

INTERVIEWER: And the steam engine?

SMITH: Yeah, and the steam engines. That's about it.

INTERVIEWER: How has the book done? **SMITH:** It's done reasonably well. It's a very competitive market. I frankly think our publisher has marketed the book incorrectly. Although it's a book that is a history textbook, our publisher was very worried that people were going to say oh, it's a history of technology book and not buy it. But I really think all the reviews that came out and things like that acknowledged immediately that this is a book that really emphasizes the role of technology in American history. But it does the history too.

INTERVIEWER: You got a lot of attention for it--

SMITH: We got a lot of attention.

INTERVIEWER: --much more than a traditional history textbook.

SMITH: Yeah, we did. We did. We should have marketed it that way. Because a lot of teachers have adopted it because it had that component to it that really nothing else had. It's been very interesting to see that our competitors all of a sudden have seen our book come out and now they're inserting stuff about technology that wasn't there before. So it's been a success on a number of different levels. I'm glad they're doing it, actually.

INTERVIEWER: About the time your textbook was published, you also were pulled into an examination of the history of invention and creativity in America for a project sponsored by the National Science Foundation and the Lemelson-MIT Program. What was that about?

SMITH: Well, I was involved with the Lemelson program on some of their screening committees and I'd served, I don't know, quite a few years. At one point, Mert Flemings who was the person who directs it, wanted to put together I think a panel, as I recollect -- I'm trying to remember how that got started. But I think we had a meeting or something in which we talked about the role of invention in history and how it was, again, essential to understanding what was happening, how this country became what it is.

I wrote a little essay for a booklet that was published that came out later about invention in American history. But it was really trying to, as I recollect -- it seems like it's so long ago now -- but it was really aimed at trying to enhance a better understanding of what the Lemelson program was about and see it in a somewhat larger light. I think that would be fair to say.

INTERVIEWER: Did you learn anything new about invention in the development of America or what it takes to foster creativity? Were those topics you touched on?

SMITH: Those are topics I touch on every day. I'm very interested in the origins of technical creativity. How does it happen? How do you get into the heads of inventors and try to really understand what they're doing and how they're thinking about things? That, for me, has been more of an iterative process. It's not something that I focused on for three years and then stopped studying -- it's something that doing what I do, really my interest is in the history of American industry, and especially metalworking, manufacturing processes.

You have to try to get into the heads of inventors and try to understand what pushes them to do what they're doing. I have a pretty good understanding of that part of American history. I can't claim that it's true for every aspect, but I have a good understanding of that, that part.

INTERVIEWER: That sounds like something that one would want to think about in terms of MIT's undergraduate curriculum. Have you gotten involved in discussions of, so how do you educate a young person and what curriculum should be like?

SMITH: I wish I had been involved in that. I've only been at the very far periphery. That's a question that interests me a great deal as a housemaster, even more so now. That I really didn't participate in those discussions at the ground level. I learned about what was happening later when certain decisions had been made and proposals were about to be made. What do you think of this and that.

INTERVIEWER: So let's give you a magic wand. If you were William Barton Rogers the second, in the year 2010, how would you shape an undergraduate education if it were up to you?

SMITH: I actually like the balance that exists at MIT's educational processes. I think the problem is trying to parse out how much attention do you devote to science, how much--. For example, should the general Institute requirements require any introduction to engineering? Well, I would think yes.

INTERVIEWER: Which we don't.

SMITH: Which we do not. But I would think that it's important to do that because so many people are undecided about what they want to do well into their first year, and oftentimes beyond that. They just haven't decided. Finally they'll decide, but it's not necessarily a decision they've really come to because it fascinates them, it's because they've got to make a decision. So I would like to see sort of a broader menu there.

On the humanities side I think that MIT has really been very good about introducing students to humanistic and social science subjects.

INTERVIEWER: And the arts.

SMITH: And the arts, absolutely. It's a quite a menu that students here have, and far better than most universities I think that I'm familiar with anyway.

INTERVIEWER: That's interesting. So there are requirements for physics and chemistry and math and biology, and some more science distribution courses. Then there are the eight semesters of social science and arts and humanities, but no engineering required.

SMITH: Not that I'm aware of.

INTERVIEWER: I wonder how many students graduate never having taken any engineering? Probably not very many, although they may not take it as an introductory course.

SMITH: Yeah, that's an interesting question. I have encountered students who are science majors who have taken engineering classes. But I can't say that all have. But there are some who definitely has.

INTERVIEWER: Sometimes the computer stuff grabs them, and that's usually in engineering.

SMITH: The other thing that's happening here, too though, is we mentioned boundary crossing earlier, that that is definitely happening, even happening with undergraduates. You may be majoring in biology, but there's nothing to prevent you from hooking up in a research team that's going to have mechanical engineers or whoever, chemical engineers working with you. That introduces you to that area. It may not be quite as formal an introduction as you'd like, but it's definitely happening.

INTERVIEWER: Or students talk to their roommates over dinner.

SMITH: Definitely.

INTERVIEWER: How did you become a housemaster, and was it hard to convince your wife that this was a good thing for the two of you to do?

SMITH: Yes and yes.

INTERVIEWER: How did it come about?

SMITH: I had thought about being a housemaster for a number of years because something really troubled me about my being at MIT, and that was that I felt that I only got to know students as people in the classroom. That course ended and that was the end of that and I rarely saw them again. My wife's name is Bronwyn, and one night at dinner we were just talking about MIT, what's going on, and I happened to say to her that I felt that I was at MIT but I didn't really feel like I was of MIT. By that I meant that I just didn't feel like I was integrated into, especially the undergraduate world. Graduate world was fine -- that's a different world.

INTERVIEWER: STS was more of a graduate program than an undergraduate.

SMITH: Much more a graduate world, and most of my career has been devoted at that level. But I just felt that there was this lack.

So I was asked by one of my graduate students to become a fellow on a floor in MacGregor House, which is an undergraduate house on the west side of Mass Ave. I loved it. That prompted me to go see dean Larry Benedict at the time and asked if there were any openings for a housemasters job. And that is--.

INTERVIEWER: He said he hugged you and--.

SMITH: Well, he said no, there aren't this year but I'll keep you in mind. So the next year the Burton Connor position opened up and I interviewed for it. Actually, Bronwyn and I interviewed for it. Bronwyn did not want to do it. She was very skeptical. She did it primarily because I kept pleading. I can be very I guess--.

INTERVIEWER: Persuasive?

SMITH: Well, persuasive isn't the right word -- overbearing would be a better word. Anyway, I persuaded her to at least come and look at the house, because I had seen it once and it has this fantastic kitchen in it, and Bronwyn loves to cook. So I thought if I can get her in to see this kitchen -- it's a kitchen she and I will never afford -- she may go for it. I got her in, I showed her the kitchen and reeled her in. But now it turns out that she is, I think, as engaged, probably more engaged in housemastering than I am. You know the great thing about being a housemaster are the students. It is just really exciting and interesting.

Every year the place changes, given the different students and backgrounds that come in there. We have 370 students in that house, and I can honestly say that every year we may get 10 or so that get in trouble, not because they're malicious, it's just that they're bright people who can do stupid things at times. But that leaves you with a huge number of really well-balanced, interesting young people that I thoroughly enjoy interacting with, and so does Bronwyn. I feel well, that's the right attitude to have about being a housemaster. So that's why we do it.

INTERVIEWER: We're about out of time, but I can't resist one last question. You're someone who studies technology and its impact on society. How techie are you? Do you own an iPhone or a BlackBerry or a Kindle or a Nook?

SMITH: No, I don't. I do email, I surf the web, and I obviously use a computer. My main interest in electronics is word processing -- that's what I write with. But I don't have a BlackBerry. I do have a cell phone, but I use it only for making calls, I do not receive calls on it. Because I bet I get 150 emails a day or something like that, most of which is garbage, but you've got to look at everything. It's great if I need to contact someone in Australia, but if it's down the hall -- I get so much crap from people who are down the hall that really shouldn't be sending things around. So I'm not a techie in that regard.

INTERVIEWER: We appreciate your taking the time to talk to us today. It's been fun.

SMITH: I've enjoyed it.

INTERVIEWER: Thank you.

SMITH: Thank you.