

**INTERVIEWER:** Well as Paul Harvey says, the rest of the story. Welcome back.

**GRAY:** Thank you.

**INTERVIEWER:** Let's begin, you know we've just seen an amazing sort of political narrative, kind of end in the campaign in 2008 that involved a lot of people on campus. I'm wandering around MIT and seeing Obama this, Obama that. The political involvement of students here at MIT nothing new and I wonder if it recalls for you the period of the greatest tension of the Vietnam War. Recall if you would the extent to which the university was both involved in the Vietnam effort and involved in the politics of the opposition to that war and how it affected you personally.

**GRAY:** From my perspective, and I think this is an accurate perspective, the Institute was not significantly involved in support of the effort, the war effort in Vietnam. The Institute was involved through the Draper Laboratory, then the Instrumentation Laboratory, now the Draper Laboratory. Which, as you probably know, is an independent not-for-profit spun out from MIT. Now more than 30 years ago, 36 years ago. The Draper Laboratory was the sole provider to the Department of Defense of Inertial Navigation Systems, both for submarines, guided missile submarines, and for guided missiles themselves. Although it had nothing to do with Vietnam at that time, it brought a great deal of pressure on the Institute with regard to the Draper Laboratory, Instrumentation Laboratory then.

There's also the Lincoln Lab. But the fact that the Lincoln Lab was 10 miles away and was not doing work that could be tied directly to weapon systems as the Instrumentation Lab was doing left that sort of on the side. But there was a great deal of political protest involving not just MIT students, but students and others from all over greater Boston. One of the marvelous things about living here is with the largest student population of any city in the country, is that when something happens anywhere you can count on support from almost everywhere. That opposition took the form of lots of rallies and protests that were peaceful in nature to be sure. At one point there was a soldier, an AWOL soldier, who took refuge in a student center. And the students were very serious about keeping that as a refuge that was off limits for the police for awhile. That was respected. And eventually he did something else. I don't remember how it ended, but he was not arrested on MIT'S behalf at least. Or anybody involved with MIT.

There were more serious incidents. There was an attempt to set fire to the building that housed the ROTC program, the old Building 20, which was a wooden structure. There was a bomb that went off in the Herman Building in the political science department. Fortunately in the middle of the night and no one was hurt. There were many days when there was the smell of tear gas around the campus. I recall standing with Howard Johnson and Jerry Wiesner in Howard's office which at that point overlooked Mass Avenue. The tear gas was pretty thick and a taxi pulled up at 77 Mass Avenue and out stepped a well-dressed gentleman with an umbrella and a briefcase. And Jerry immediately identified him as Sir Solly Zuckerman, who was a science adviser to the prime minister of Great Britain and was coming to see Jerry. The tear gas didn't seem to put him off at all. He marched right up the steps and into the building.

There were a variety of tough incidents. One was a stand off on the street next to the to the Instrumentation Laboratory, Draper Lab. A standoff between a large group of protestors, several hundred, and a large group of riot police. It was the Cambridge Tactical Squad, the Boston Tactical Squad. Several hundred police separated by about 50 yards. And professor Jerome Lettvin, who was a mythic kind of figure around MIT at that time, got out there in the space between them and persuaded the students that this was not going to be a productive encounter. And that they ought to spend their energy some other way, and the tension was relieved and it ended.

**INTERVIEWER:** Where were you when that standoff happened?

**GRAY:** I was around the edges, watching it. This was during the week which was called the November Actions, I think it was November 19- either '69 or '70. And I was associate provost at that point working for Jerry and had no specific responsibility with respect to this, but was among the members of administration who were trying to keep the peace and keep the uproar under some level of constraint.

The other difficult situation was when a group of students with a big battering ram made in a metallurgy laboratory smashed down the door to the president's office and occupied it for three days. That was a difficult, a very difficult time, because right away the call comes from the outside, particularly from alumni, saying get those guys out of there and lock them all up. And Howard Johnson, president at the time, was determined not to remake the mistake which Harvard had made two years earlier, when Nathan Pusey, president at Harvard, called a riot squad to empty University Hall of a very large number of occupiers. The police emptied the building and arrested more than 300 people. And when the time came to show up in court there was no one who could link a particular student with presence in the building, let alone any activity. Because they were grabbing anybody who got in their way. And everybody was dismissed.

MIT's follow- up to that, with which I was involved to a degree, led to the identification of 28 individuals, 28 probably out of a 100 who'd been in that office complex during the three days. Of 28 who were persistently there. And we took them to court, and the judge, after hearing from the Institute and hearing from their attorney, said "The evidence here is particularly compelling because we had at least two identifications, two people who could identify every one of those 28 people and saw them in that room."

And the judge said to the 28, through the lawyer, "Would you folks be willing to accept a year if probation? This evidence seems to me to warrant a finding of guilty, and if I put you on probation for one year and you do not get in further difficulties then everything will disappear. There will be no one charged and no record that this ever happened." And fortunately the 28 decided to do that, and there was no more awkward business that could readily have followed had they decided to go to trial.

The one thing that I want to say about the whole episode which went really from the fall of 1968 to 1972. Remarkably the protest disappeared once Nixon ended the draft. I mean the protest was nominally against the Vietnam War, but underlying it was the concern that "I don't want to get drafted and go to Vietnam." And once the draft ended the protest at MIT ended. The role of Howard Johnson, then president, played during those five years which occupied three years for him, three of his five years as president, was crucial to MIT. There are very few people who could have kept the lid from blowing off MIT. There were faculty meetings in Kresge Auditorium with a thousand people present. It was tumultuous and Howard conducted those meetings with a sense of humor and a capacity to lower the temperature. And he conducted himself and the Institute, generally throughout that period, brilliantly and we got through it with no splits. Contrast it with our sister institution up the street where the strain still exists over the actions that Nathan Pusey took there during the same time.

**INTERVIEWER:** Tell me a story that explains the challenge that you and the administration had in trying to keep things from escalating? Not being dismissive of the students concerns, but not encouraging them to the point where there is chaos. And also the sense at that time of such paranoia that well at a place like MIT there must be some secret lab where this is going on or that is going on. I mean you had to manage all of that. Tell me a story that sort of explains how difficult that was and the kinds of characters who maybe wouldn't listen to the reasonable things you were saying.

**GRAY:** The effort the Institute made, led by Howard and contributed to by everyone who was involved, was to say, "Look, universities are among the most liberal institutions in a society. They're institutions in which anything can be said, anything can be examined, and it is not in anyone's interest to destroy them or too seriously injure them." One of the things that made a difference in this time I think was Jerry Wiesner who had been President Kennedy's science adviser and had been active in anti nuclear activities throughout his entire career, anti ABM activities which got him and MIT on Nixon's enemies list. Jerry marched across the Harvard Bridge and down to the Boston Common with 2,000 protesters in the front rank.

And Jerry made it clear, as Howard did through all this, that protest is fine. Just don't destroy the place. Don't fracture the faculty. Don't get us in a situation in which we spend decades trying to put together the social fabric of the institution. There was a faculty meeting during that time when ROTC came up for a vote. And there was very strong pressure from protesters that ROTC ought to be pushed off the campus as it was everywhere else in New England certainly and a lot of other places. And the faculty voted about 3:2 or 3:1 to retain ROTC. Not many institutions would have done that. No others that I know of did respond to that pressure that way.

**INTERVIEWER:** And was that a sense that we're not going to make changes in this environment? Was it a sense of patriotism that motivated that? Was it a sense that there must be a place for ROTC as well as every other kind of academic endeavor? What motivated that vote?

**GRAY:** I think the vote was motivated in part by a sense of patriotism. It was motivated in part by the fact that in 1970 or '71 a very significant fraction of the faculty at MIT, particularly in engineering and science, had been students here. Much less the case now, but a significant fraction at that point. Who themselves had been in ROTC, some of them had served in Korea, some had served in World War II even and still on the faculty here. And engineering is more conservative than other intellectual disciplines. That was part of it certainly also.

**INTERVIEWER:** From liberal to conservative, if the engineers are the most conservative where does it go from there? You've got the best perspective on that one.

**GRAY:** The faculty who were among the 28 were almost entirely from the School of Humanities Arts and Social Sciences.

**INTERVIEWER:** There you go. There you go.

**GRAY:** Not unexpected. Maybe an architect or two, around the edges. I don't think there were any architects who were in the office.

**INTERVIEWER:** And those solid state physicists, where do they stand? Semiconductor --

**GRAY:** Standing on the edge watching as I was.

**INTERVIEWER:** There we go. Let's just recap a little bit the mission of diversity that became, I think, a real personal quest for you and the administration, and try to relate that to the value that you understood here of mentoring. How important mentoring has been to the transmission of scientific knowledge from generation to generation. It seems like mentoring and diversity go together in some way. How did you come to understand that?

**GRAY:** Well there certainly were faculty members, older faculty members, who were enormously important to me in my faculty career here, early faculty career, as mentors. And even before I was a faculty member. I may have mentioned earlier Thomas F. Jones who subsequently was president of the University of South Carolina. Another was professor Richard Brooks Adler, a professor of electrical engineering, and one I was very close to because we worked hand in hand on the production of those seven books on semiconductor electronics. Dick had the talent of asking just the right question, and if you fudged the answer he kept persisting. I asked him one time, "How did you learn this?" He said, he grew up in a household with the tradition of talmudic disputation. And it carried over into his whole life. So mentors, those two in particular were to me crucial.

I think that part of the difficulty in changing the demographics of MIT, was that when we began that change, the first year we brought 44 African American kids to the campus as freshmen or the first time we began to have large numbers of women in the student body - large meaning 5 or 10 percent in the '60s - there were precious few people who looked like those folks, and to whom they could turn for mentorship. That's not the case now. That was the case I think through much of the '80s. That students, graduate and undergraduate, when talking about the issues that concerned them - minority students or underrepresented students including underrepresented women in those years - would say, "You know there are just too few people around here that look like us, who can help us, who understand what it's like to be a woman or an African American or Hispanic in this institution. You've got to do something about that." And that put a lot of pressure on faculty recruitment, the staff recruitment. We did reasonably well on staff recruitment, but not well at all on faculty recruitment. We're doing better now but it's nothing to write home about. But the issue, the connection between changing demographics, and the lack of folks who were seen as appropriate mentors for some of those folks was a real issue.

**INTERVIEWER:** What do you think the chief difficulty was for you in developing a consensus that would translate into numbers that you could write home about in diversity? Why was that difficult to attain or in some respects unattainable during the time you were here?

**GRAY:** I think there were two issues. One is that the folks whom we needed to hire for faculty positions were not in a pipeline in larger numbers. Just not there. The faculty appointment here requires a PhD or equivalent degree. It requires some postdoc experience at that kind of level, and you couldn't find people. You really could not. Intensive searches. Some things worked out well, but it was a hard time and a long time filling the pipeline. Albert Hill, now deceased faculty member in physics, in the 1960s said, "Look we got to do something about the pipeline." So he made connections with two or three of the predominantly black colleges in the south. He got to know the physics faculty in those institutions. Got to know who they thought were their very best students. Brought them here for summer internships. Brought them here for graduate school in physics, and graduated over the years a double handful of those folks. One or two of whom stayed on, for awhile at least. There may be some who are still on, I'm not sure, here. But it was a very intensive business. It took a large amount of time to maintain the contacts with the southern institutions. It took mentoring and help for these youngsters during the summer and in their time in the PhD. And there weren't many departments, architecture and planning an exception, there weren't many departments who were prepared to invest that much physical and intellectual energy in the issue.

So pipeline was part of the problem, and what I said just a moment ago. The question of getting everybody on board to regard this as a cardinal problem for the Institute needed to be addressed. It was hard. Howard Johnson asked me in 1969 to write the Institute's first Affirmative Action Plan. Never heard of one before, but we figured it out and we wrote one. And he asked me to present the nature of that plan to the faculty council. The faculty council at MIT was all the deans and department heads, about 40 or 50 people. We had a meeting at Endicott House and there were other business. And I presented the Affirmative Action Plan. In my naivete at the time I said now our objective ought to be within the first two years to have one African American faculty member in each department and two in each of the large departments. Well after two years we may have had six or ten somewhere, between six and ten for the whole blooming Institute.

But when I made that presentation a department head stood up and said, "Would it help if I put on black face?" Yes. Absolutely true statement. Shocked a lot of people in the room including me. But it took a while to bring around what was then 27 or 28 departments to the recognition that this was a serious issue. The Institution was serious about it. And you had to work at this or you weren't going to hold your job if you were in a leadership position for very long.

**INTERVIEWER:** And that message took a long time to get delivered?

**GRAY:** Yes.

**INTERVIEWER:** Now this sort of "black face joke." I mean I suppose there's a sort of racist component in there, but as well there's just an issue that nobody really saw the significance of this right away.

**GRAY:** Yes. Yes. I think that's right.

**INTERVIEWER:** Kind of why are we bothering with this for heaven's sake?

**GRAY:** Yeah, why are we doing this business? We got other things that are more important. I think that was very much a part of it.

**INTERVIEWER:** And getting people to understand the importance was really the aircraft carrier you had to turn. And that was the slow moving part -

**GRAY:** That's right.

**INTERVIEWER:** - That frustrated the solid state electronics scientists the most?

**GRAY:** Yes. Now you see the other thing that made a difference here, between undergraduate and graduate, this task of filling up the pipeline, is that at the undergraduate level admissions is controlled by the administration. There is an admissions office. And the policies and priorities of the admissions office are set by faculty committee. And that faculty committee back in the 1960s began to push on this. Nothing much happened until the late '60s, when we got involved in serious recruiting at predominantly black schools across the country. That's when we went from six or eight per class to 40 something.

At the graduate level, every department does its own admissions. Only way you can have it. There is no role for the central administration there except to prod and suggest priorities, but every department does its own admissions. And every department is looking for the best, you pick your number, new students you can possibly find. And we had to break that lock step. We had to say, "Look, there have to be other considerations here. You have to look for people that have potential, have talent, who can hack it, but are not like ones we've had here before." So that's part of the pipeline problem. You know after 10 years at this we were turning out, at the MIT undergraduate level, 40 to 50 -- now much larger numbers -- of under represented minority kids. Hispanics, Native Americans and African Americans. And after a few years at it we were also bringing larger and larger numbers of women to the campus.

But that was under the control of the administration. And there may have been different views among faculty about whether this was a good thing to do or not, but they had to get on board. At the graduate level, the first place where the pipeline narrows is in high school, it narrows more at the undergraduate level, and it really gets skinny at the graduate level because youngsters of any description who graduated from here in those years could go to a quite well paying career in Wall Street or in industry or for consulting. And the idea of spending another three or four, or five years at a cost, all in at that point of probably \$30,000 to \$35,000 per year instead of going to work didn't look attractive to many.

**INTERVIEWER:** Given that since 2000 there's been an internet bubble burst, you've had sort of a financial bubble burst which affects lots of mathematicians and computer scientists who went off to Wall Street let alone the business school people who went off and a bit of a manufacturing bubble. Do you suspect that that may have a positive influence on diversity at the graduate school level and that people might be encouraged to stay at an institution like this rather than go off and seek instant riches that were so easily obtainable during the last two decades?

**GRAY:** I expect it will, yes. In fact some of my advisees, now seniors who are graduating at the master of engineering level, have said to me when we meet to talk about what's coming, what's next for you, "I hadn't really thought about more higher education. But given the job market maybe I will stick around." Now that's electrical engineering, computer science, I don't know what students are saying at Sloan. There was an article I think in *Tech Talk* not long ago which said that Sloan students were on a whole still pretty bullish about jobs. Companies are still going to be hiring more selectively and I think most of most of the Sloan undergraduates who saw themselves in some extravagantly high- paid Wall Street job are looking at different venues at the moment.

**INTERVIEWER:** When you walk through the campus and see the kinds of faces that constitute the graduates and undergraduates, do you get a sense as you look back at the faces that you saw when you walked through here as a student that things have changed? That the vision that you had imagined has come to fruition in some tangible sense?

**GRAY:** Yes, yes. Very much so.

**INTERVIEWER:** It must be an emotional feeling for you.

**GRAY:** It is. It's particularly the case with almost 50 percent of the place now at the undergraduate level being women. You can't miss that. One of the misperceptions of change around MIT that I struggle with is a visitor will come and say "Golly, you've got an awful lot of Asian kids here haven't you?" And I say, well, not really. Roughly 30 percent of the undergraduates are American kids of Asian background. That's compared with four percent of the US population. And it's because they have grown up in a culture which has a high regard for education and almost a reverence for teaching and learning. Now we do have a larger fraction of Asian, Asian kids in the graduate school for sure. But not at the undergraduate level.

**INTERVIEWER:** Last story on this subject and then I want to shift to a particular initiative that I know that you want to talk about. As a scientist you're trained to notice detail that indicates a phenomenon that you may be looking for on the molecular level or the subatomic level or the atomic levels actually taking place. And so when you design experiments you might want to make sure that a hard to perceive relationship is actually going to emerge in your experimental data. I'm wondering as you think about the difficulty of diversifying this campus, if there's a mentoring story that you can tell between a student and a faculty member or a graduate student and a student that you observed, maybe casually, that said to you, This is growing, by God, this is actually sustainable. The torch is being passed. Something like that.

**GRAY:** John, that's hard for me because I'm an engineer. And academic background and my years on the faculty, 17 more or less altogether, were in the engineering department. And I really can't.

**INTERVIEWER:** That's okay.

**GRAY:** I can't come up with an example.

**INTERVIEWER:** But certainly your sense that this is working came from observing new faces and a lot of different kinds of things. And undoubtedly you observed, on some level and you were at a very high level for most of this period, that things were actually moving forward, that people were understanding and acquiring this consensus.

**GRAY:** Yes.

**INTERVIEWER:** Tell me about the Africa Internet Technology Initiative.

**GRAY:** In 1997, the Institute created a program called Leadershape which has run every year since then. The first two years they ran it in June after the end of classes. And now they run it in January in IAP. In 1998 I was asked to participate in LeaderShape when it was still being run at a camp outside. Warm weather. The way it worked is there was an older person, typically a faculty member or staff member, who was paired up with 12 students as a team. And for the four days of LeaderShape they did things together. One of the persons on my team was a freshman. Big tall fellow from Nairobi, Kenya whose name was Paul Njoroge. And Paul was full of desire and passion as a freshman to do something for people in Africa.

Beginning the next year, his sophomore year, Paul came to me and said, "I want to try and create a program that will help high school students, upper level high school students or lower level college students, in Africa learn how to exploit the capacities to the internet." I said "Okay let's see what we can do." He recruited a set of folks, six or seven I think that first year, who would go with him to his high school in Nairobi and teach for I think it was four weeks that first summer. He also persuaded the 3Com corporation to give him half a dozen routers and some other computer equipment. And I managed to work through the gift nature of that to MIT and also work through the customs problems of getting them out of the country and in to Kenya. He almost single handedly raised the money to support those students. Not that they got paid for this but it cost each one about \$2,000 for subsistence and for air travel. And it was a splendid success. We got wonderful letters back from the principal of the school. And it was much cried, "Let's expand this!"

Paul continued to run the program for another two or three years, I guess until he graduated here. And he won a Rhodes' Scholarship, in large part I think because of the AITI program that he personally had created. Went off to Oxford. My wife and I visited him while he was in Oxford studying economics. And he's now back here just about to finish up a PhD in electrical engineering, computer science.

The remarkable thing about this effort, AITI, is that it is entirely student run. It was student initiated, it's student managed. Students raise the funds. They sign folks up. They train them. And they send them over, follow it up. They deal with the crises when they come along. One year there was a young woman who was in Ghana I think and her father died. And we had to get her home quickly. They arranged that. I just watched it happen. One year they were planning to go to Ethiopia and there were riots at an Ethiopian college, a university. And the state department said this is not necessarily a good situation and they turn turned around on a dime on that one and sent the group somewhere else. So it's a student run activity. They appoint their own continuing leadership. Each person who's a leader of it, and I've known four of them now, appoints a successor or two successors. Co-presidents if you will. And the thing continues.

**INTERVIEWER:** Has it broadened beyond African student's involvement?

**GRAY:** Oh, yes. Right from the beginning there were some US students, not of color, who wanted to do this. Right from the beginning.

**INTERVIEWER:** And in many ways - And this began in the early '90s.

**GRAY:** The first program ran in either '00 or '01. I think in '00. The summer of 2000.

**INTERVIEWER:** So really a precursor for a lot of the global initiatives in Africa that involve healthcare and technology and education that huge philanthropists have engaged. This one very much an initiative of students, as successful -

**GRAY:** Very much so, very much so.

**INTERVIEWER:** That's great.

**GRAY:** It has, I think, changed the lives of a great many youngsters who had no idea what life in Africa was like until they went on this program. The greatest number they sent off I think at one time, they got up to three teams going. They've been to places beyond Kenya like Ghana, Rwanda. And they took one year off. They took last year off because they said, "We want to rethink how this program works. The internet stuff is now more widely understood. Not only because of what we done but just because the world changes. And what are we gonna do next?" And I haven't been as closely connected to it in the last year as I was for awhile. When Paul and the first two successors of his were the leaders of this group we spent a lot of time together talking about fundraising strategy and about training of the people who are going to go. But there's been less of that recently. In fact I couldn't tell you now who the leader is. I know there is one, but I can't come up with a name.

**INTERVIEWER:** But alive and well?

**GRAY:** Yeah.

**INTERVIEWER:** How would we describe the way students and faculty viewed you and your wife here? Were you a power couple on the MIT campus or more of a kind of mom and pop counselor to the whole organization?

**GRAY:** I think more the latter. More the latter. And when I say that I mean in the time frame when I was chancellor, president, or chairman. In the time after all that, the 10 years from '97, when I ceased being chairman, to '07, when I retired -- not that it's changed very much -- I was just another grey haired old guy. I mean, I'd teach a class for a whole semester and most of the students in that class had no idea that I'd had any administrative role here.

**INTERVIEWER:** What was the role of your wife in all those years?

**GRAY:** Well both during my time as chancellor and during my time as president then again as chairman, she was an absolutely crucial part of the support system for me. One of the things about these jobs, particularly the presidency, is you find - Let me back up and say, when I came into the president's office I'd worked as his deputy to Jerry Wiesner for nine years. And I said to myself, Gray, "You know what this job is like, this ought not be something new." And I learned very quickly that it was new. And the thing that was most new about it all was all of a sudden you had no one else you could turn to, to have a conversation about some issue that you needed to just talk out and have some advice about. You had trustees for sure, members of the Executive Committee. But they weren't on the ground. And you had the chairman and sometimes it was appropriate to talk with the chairman and sometimes it wasn't. But there was a kind of loneliness in that sense with the job which I had in no way anticipated in spite of my nine years, or actually more than that, of working for Jerry first as associate and then as chancellor.

Priscilla was one of the persons I could talk with about anything. She was leakproof she also provided a set of eyes and ears that I didn't have. And people, interestingly, people would grouse to her or people would tell her things that they wouldn't tell me. And the word would get around that there's this problem you need to think about.

**INTERVIEWER:** Such as?

**GRAY:** Concern that, let me pick a good one. Living conditions in a dormitory. Too much drinking. Not often came up, but did. Toward the end of this time we were in the age of binge- drinking which now seems to have subsided a good bit. Occasionally unhappiness about some issue that had been under discussion and there was an aspect of concern about that that I hadn't picked up yet. She also, throughout this time, managed entirely everything that happened at the president's house. Everything. I mean would talk about the schedule. The schedule was set way, way ahead and we would agree on what the conditions would be and what this particular event would be like and all of the planning was in her hands. And in fact when I was chancellor and we lived in a big old Victorian house out in Winchester, Massachusetts every year we had the entire, what was called the administrative council which was all the deans, department heads, and lab directors and heads of major organizations like facilities or personnel and so on, that was about 100 people. And we would split it spring and fall. We had a house that was big enough that we could feed 35 people at a sit down dinner. And we would typically do it Friday evening, Saturday evening. So we had everything and we didn't have to pick it up and put it up again right away. Had two days back to back. And we get we fell into a pattern in which the main course, the meat, typically rack of lamb, was cooked here at MIT in one of the dining rooms. And I'd pick it up at the end of the day and take it home and all of vegetables and the salad and the dessert and all that were put together by my wife and a woman who helped her.

Neither of us at the time may have realized how important that was to the people who came. But you still hear people talk about it because it was an informal setting. It was off the property so to speak. And it brought people together in a way that there weren't many opportunities to bring them together.

**INTERVIEWER:** So it's having dinner at Uncle Paul's and Aunt Priscilla's house.

**GRAY:** One of those times we took the rack of lamb home, the kitchen crew had forgot to cut the chops. Normally they'd cut between each chop so you just could pick out the chop and put it on a plate. This time they forgot to cut that bone. And we didn't discover this until it was time to serve.

**INTERVIEWER:** Have to go into the garage and get the ax?

**GRAY:** I did everything except get out the chainsaw. And finally we realized we were not going to cut this bone. So with the help of one of the guests who was dean of students at that time, we managed to carve the meat off the bone and serve it up that way. It delayed dinner somewhat.

**INTERVIEWER:** More Greek- style I guess.

**GRAY:** Yeah, yeah. But I can't imagine doing the job without her involvement. It was that kind of relationship.

**INTERVIEWER:** What would she push you on that maybe you weren't dealing with as aggressively as she wanted? Do you recall any initiatives that she had a real impact on aside from the smaller ones you mentioned?

**GRAY:** Well she pushed me hard in the '80s on taking on a renewal of the student center. The student center, in its present configuration which is result of a major internal restructuring in the '80s, is still a somewhat off-putting building. I mean it looks like a fortress from the outside. And the inside at the entry level had no open space. So you had to know where you were going. There was no place for people to hangout. And she pushed me to get going on a redo of that. And then she served on the, what did they call it? The Advisory Committee to the Architects. The Client Committee which had mostly students and people involved with student life. on it. She served on it. And that change didn't remove all the problems, but it created open space and the entry level and it created better circulation within the building by putting that big open staircase in the center. Made a real difference.

**INTERVIEWER:** As hard work as it was for both of you, was it great fun?

**GRAY:** Yes. Yes. It was fun because we got to know so many people in this place. She also started, she pushed me to start, what are called student dinners. She learned early on, the first year we were there, talking with students, that many students had never been inside the president's house. The only chance they had, and everybody had it when they were admitted as freshmen or new graduate students because those cohorts were invited to a reception, for the freshman it was usually with parents. But the majority of kids didn't show up. Their parents may have gone but they didn't go to that president's reception. And graduate students came for a reception at the house, but some of them didn't do it either. And she discovered it.

She said, "It isn't right that somebody spends four years or more and has never been inside the president's house." So she created what were called senior dinners in which we invited the whole freshman class, the whole senior class I'm sorry, these were the students who were about to graduate. Spring term, senior year. We invited the whole class to dinner, 60 or 70 at a time. And it was February. The whole month of February for those dinners. We learned the first year that you don't serve lasagna every time. The people who have to come other than the president and his spouse get pretty tired of it. The president and his spouse get tired of it too. So we varied the menu after that. But that went on through Chuck Vest's term. Susan has not continued it. She's found other ways to connect with students.

But it has made a real difference. I mean we will encounter alumni 20 years out in an airport somewhere. Somebody will come up and see the brass rat and say I was so and so. "I came to your house for dinner when I was a senior." People remembered it. That was something she pushed me hard on and we did it.

**INTERVIEWER:** And they remember her?

**GRAY:** Yes, they remember her. Yes. People tend to remember us together because we were together so much.

**INTERVIEWER:** In an institution so known for its kind of hard edged, scientific inquiry and pursuit of truth, to have that soft human touch of things like those dinners and the rack of lamb out of your house, how important was that?

**GRAY:** Well it was it was very important to us. You know we did a lot of visiting dormitories. We had dinner at fraternities or sororities. We got around that way. And I think it was important to the community. I mean people who were here 40 years ago and are still here, not many left anymore, often will come up to one or the other of us and say, "You know, we remember such and such an occasion when we were with you for whatever." And for the people in the union ranks, the facilities people, the police, the people who are hourly- paid secretaries and the like, not yet staff, these were important opportunities to meet other folks and get to know who lived there and what they were up to. We met lots of interesting people not involved directly with MIT as well.

We spent a lot of time, the president inevitably spends a lot of time on the road, mostly raising money, sometimes speaking about MIT to clubs. I spent a particularly large amount of time in Germany, I'm sorry not Germany, in Japan during the '80s and the '90s because that was for us at that time a major source of large capital gifts creating professorships, research funds and the like. We would have never got to have dinner with Margaret Thatcher without my MIT involvement or with the King of Thailand or with reception at Buckingham Palace with the queen and the prince consort. That wouldn't have happened.

**INTERVIEWER:** And Priscilla made a big impression at all of those?

**GRAY:** Yes. Yes.

**INTERVIEWER:** There was a moment during your time as president when you had to make the tough decision to shut a department down. Can you describe the background of that decision and what it was like as it actually took place?

**GRAY:** Yes. This was a hard time. That department that was shut down started out its life, around the turn of the previous century maybe a little before the turn, as the Department of Food Technology. And at that time this was an extremely important issue, because the providers of food were just learning how to can stuff safely. And when you can food, particularly if it's sweet food and rich in terms of butter and nourishment, if you don't can it properly you can grow anaerobic bugs in there. And there are one or two of those bugs that will kill you in a couple of hours.

**INTERVIEWER:** Botulism.

**GRAY:** Botulism. It was two people, an MIT professor named Prescott who was the founder the department, and a fellow named Underwood who appropriately ran the Underwood Company which manufactured canned meats. Still does.

**INTERVIEWER:** Deviled ham.

**GRAY:** Yep. Underwood and Prescott figured out what the time-temperature tables had to be for all kinds of things that got canned. And once that was understood and accepted, people no longer died from eating canned food or got sick from eating canned food. It was an enormously important development.

**INTERVIEWER:** And it allowed the scaling up of the manufacturing.

**GRAY:** Right.

**INTERVIEWER:** So instead of just a dozen you could do a million.

**GRAY:** You could do it in batch, yeah. So at the beginning that department was extremely important to the nation and to the Institute. Over time the department involved and its name change probably half a dozen times. It became next the Department of Food Science and Technology. Along the way it became the Department of - The technology disappeared and it was I think just the Department of Food Science. And then eventually it was the Department of Applied Biological Science, A.B.S. By the late '80s the department did not have a focus. It was always a smallish department, not back early in the 20th century, but in modern times it was a smallish department. But it lacked a focus. It had people who are doing excellent work in metabolism. It had people that were doing really world class work in toxicology. It had people who worked on nutrition, human nutrition. And there were these centers of activity, but there was nothing at the center that kind of held it together. There was no organizing principle.

It was having difficulty recruiting faculty. And the thing that we noticed that led us I think to take this action -- I say us here I mean, myself and the provost John Deutch -- was that A.B.S. was in fact attempting to hire new faculty, assistant professors, who had been turned down by the biology department as not up to it. And then when they would bring it to the Science Counsel where it has to be signed off on before it goes to the central administration, it would get turned down on those appointments. So we reached the decision that it was time to shut it down as a full academic department.

Now there are some decisions in life and some decisions in academia which you cannot consult widely about before you take them. Had we announced that it is our intention to shut down the Department of Applied Biological Sciences we would have been in uproar from present faculty and students, from alumni, from the visiting committee, maybe from other quarters. And it would end up being quietly dropped. So we made that decision and then announced that that was the decision. And it produced an uproar of concern which far transcended A.B.S. I think the reason being that faculty said, "Oh my goodness! If the administration can shut down a department, they could shut down mine." And what happens? Eventually it was shut down. Eventually. Within the year. There were arrangements made for tenured faculty to take up positions in other departments, for untenured faculty to finish out their research or with the students they were then working with and then leave to go somewhere else. There were very few undergraduates in the department, almost none, it was almost entirely a graduate department.

One of the things that happened was a committee, a faculty committee, was formed to set a set of rules about terminating a department. And those rules have been shown to work in fact. A decision was made here now two or three years ago, I think it was still in Chuck's watch so more than two or three years ago, to merge the Department of Ocean Engineering, which was formally the Department of Naval Architecture and Marine Engineering, very small department, small faculty, very few students. Many of the students were sent here by the US Navy because they were going to learn to run engineering programs for the navy. And they still do. But to merge that department and mechanical engineering. There had been a time in the past when mechanical engineering and naval architecture had the same department head. One department head served both departments. And that merger was made and the work that those folks want to do will continue as long as it's valued and as long as it gets support. And that was done without drama, but it took three years to work it through. So it was a decision that neither of us regretted. Some of the people who were affected by it came around later and said, "You know you did the right thing, but it was still hard."

**INTERVIEWER:** And nobody's died of botulism, so you've got that going for you.

**GRAY:** Yeah. I had another decision like this is my life, interestingly at about the same time. I was chairman of the Board of Trustees at Wheaton College and the president and the board concluded in 1986 that if Wheaton was to survive as an academic identity it had to become coeducational. And that decision was announced six months before it occurred. And it was a firestorm.

**INTERVIEWER:** And this Wheaton College ?

**GRAY:** In Norton, Massachusetts. A Liberal Arts college. Not the Wheaton of Illinois. And that change which eventually was settled, I won't go into any more about that about the pain and strain, but it was clearly the right thing to do. The college is now thriving. At that point it was not thriving. The number of applicants was getting smaller and smaller each year. The admitted class was getting smaller and it was going to gradually fade away if we had not done that. And it may have been that experience made me bold enough to say we're going to have to do this one the same way. We're going to have to announce our intention and take the flak, but it was a very tough time.

**INTERVIEWER:** So by the time, if we take the time span from 1969 to the period of all these decisions, you were pretty good at firestorms.

**GRAY:** Yeah.

**INTERVIEWER:** You got pretty good at them.

**GRAY:** Yeah.

**INTERVIEWER:** You and Priscilla.

**GRAY:** Yes. She was a Wheaton alumna by the way and wasn't at all sure at first that this was a good thing to do. And when I'd have meetings in the president's office with 15 or 20 Wheaton students and alumni of an age, 20s or 30s, who wanted to come see me to talk about this, she would always come because she had some civilizing and calming influence on that. I mean I got shouted at in vigorous terms by a lot of people through that interval at Wheaton. It never happened at MIT during that problem, that interval, the interval of shutting the department. But it did happen at Wheaton College.

**INTERVIEWER:** What would you say are the big challenges for science and technology and the Institute in this new century?

**GRAY:** Well I'd identify two things. One is the growing universe of institutions, educational institutions, with which we compete. And I use as an example the American Association of Universities which is the principle research institutions in the country. It was founded in 1900. And in 1900 there were 12 founding members. They were all the ones you'd think of. MIT was not one of them. But it was Harvard and Dartmouth and Yale and Princeton and Cornell. All the Ivies plus Michigan. And who else? I don't know there were several others not among the Ivies, 12 in all. And this was an organization that was intended to promote intercourse among these institutions and to promote in Washington, it was a lobbying institution, the welfare of these institutions.

When I became president and therefore went to two meetings a year of the AAU, president's meetings, there were other meetings for treasurers, for provosts, for academic deans, whatever. Same group. There were about 48 members. MIT came in in 1938. There are now I think 65 members and probably another 20 institutions who are banging on the door saying, "Hey look, our research program now has grown to the level where we should be able to be a member of the AAU." What that indicates is that a federal budget for supportive research in universities which has been for the most part one of no real growth for the last 30 years, there have been ups and downs to be sure but if you look at in real terms there's either been very little, sluggish growth, or no growth and some periods of downturn. The whole of the '70s in real terms had dropped. And the 1960s research support of universities was growing in double digit numbers. And then when president Johnson discovered he couldn't have both guns and butter, whack! And it was less than flat in nominal terms and quite down in real terms, through the '70s. And President Carter began to do something about it.

What I'm trying to get at here is that the welfare of MIT, its educational system and what it does for the nation or for the world, all depends on a rich environment of research. UROP would not exist without that. And the places that have tried UROP and found it didn't work, some have tried it and it does work, but some who tried it have found it didn't work, doesn't work because the environment isn't rich enough. There aren't enough people that a student can go to and say my interest is A and it looks like it might align with yours. And if person one says no, person two may say no, person three may say oh yeah. But you have got to have an environment that is rich in intellectual terms and people terms for that to happen.

One of the questions then about the future is will we be able to sustain research support? Now it looked pretty grim a couple of years ago, because as you're well aware the federal budget has a very small piece that's discretionary when you do all of the entitlements and the Department of Defense and everything else. And for many people in Washington, university research is something like what makes the grass grow green? And why are we supporting that in the first place. Well President Obama has a different view. And even in his inaugural speech referred to putting science in its proper place and building on the technology that comes out of it. So there's a reason to be more hopeful now. But one concern, one thing I know has been a concern throughout President Hockfield's tenure here, is what about research support? How are we going to make out in the future in that domain? That's one.

**INTERVIEWER:** Before you leave that. Is research support in this century more a multichannel approach or is it getting back to government alone being the primary sponsorship of university research?

**GRAY:** It certainly got away from the government being the primary sponsor in the '80s and to a greater degree in the '90s and early in this decade. There were a great many MIT name your industry partnerships which provided relatively unconstrained research support. And that still continues, but my hunch is that it's going to be harder to maintain that in the present climate as companies are laying off people and cutting back production and so on. So it will be less of a factor I think in the near term.

The other problem is the educational pipeline. When I went to high school and probably when you went to high school, if you were going to college you took math for four years and you took a science for four years. You had four years of math and science. And that made possible, when you got to college, if you did the right thing there, necessary thing there, it made possible not only careers in science or engineering but careers in medicine or dentistry. And what else? Anything that depends at all on understandings mathematics beyond arithmetic or that depends on having some knowledge about the world works, how things work.

At the present time, fewer than 30 percent of American high school graduates have had four years of math and four years of science. They typically are required to take two years of math and two years of science, but after that it's optional. And so if they take that option and drop out, only a quarter of the kids coming out with high school diplomas have the kind of background that would get them into MIT or Caltech or any college offering which produces a career that depends on math and science. And that has been getting worse.

That trend started in the 1960s. Sputnik produced this great upsurge of interest, I said the other time we talked, in science and mathematics. And there were scholarships and fellowships. There was a great improvement in science and math education in the schools. If you look at the kids who came to MIT in the middle '60s, they were in my view the best- prepared cohort we ever had because they had benefited from the terror which Sputnik produced in the government.

**INTERVIEWER:** In the '60s they were the most prepared?

**GRAY:** Yes.

**INTERVIEWER:** And that was partly as a response to the terror of Sputnik and the Cold War but also as an indication that if the vision is there and the resources are provided, results happen.

**GRAY:** It makes a difference. That's right. Now things began to slide a bit during that period of the turmoil and demonstrations and the like that went with the Vietnam War. It was a period in which colleges and universities and high schools loosened up curricula. More choice. Brown went whole hog with it and said, "We have no requirements for graduation at Brown. You pick your program and you spend four years here and you'll get a degree." And they still operate on that premise. They may have put some more structure in it but it's below the surface. It is invisible. MIT did not do that needless to say.

But the fact that that happened, and was extant during the '70s and '80s, began to change the interest of high school youngsters in math and science. And were that to continue it would be bad for the United States because it will cut into the supply of domestic U.S. citizens who can do science and engineering and medicine. It all ready has in medicine. I mean look at the number foreign doctors who are in medicine. And also industry is constantly lobbying the congress to give exemptions to quotas for highly trained people in science and engineering. Many, many graduate schools of science or engineering now have far more foreign students in their programs as graduate students than we do, than American citizens have and more than we do by the way. Some departments having more, some having less. This is not a good trend and I'm hopeful that a new president who wants to put a greater priority on science and it applications may succeed in turning that trend around.

There are in the United States, I'm told, some 25,000 school districts and it's not going to change unless those 25,000 thousand school districts all somehow get pointed in the same direction. And how you make that happen and still maintain the prerogative of local control is a question that somehow got answered in the 1950s, early '60s, but is it possible to develop an answer for that now in the second decade of the 21st century?

**INTERVIEWER:** Well from the perspective of a former MIT president, let's stipulate for the moment that you can't go back to Sputnik you can't envision an event which suddenly turns people in one direction, nor would you necessarily want to emphasize math and science over other disciplines understanding that we've come this way from the Sputnik era, what is the argument that will change the educational establishment so that we are producing literate, fluent, scientifically aware, mathematically proficient students that will help us in this century?

**GRAY:** I don't know how to make that argument. I mean the fact is that when you survey parents about their impressions of public school, high schools, they will mostly say, "Well we're aware that there are problems in some schools but my kids schools are alright." And a lot of them where that answer emerges are not all right, and it's not just math and science. It's slackness in reading and in writing. Many youngsters, even at MIT, come here unable to put together a coherent paragraph. And these are kids with scores in the high 700s in the SATs. I believe it's because there hasn't been enough emphasis in the high school on teaching the structure of language, and insisting that the kids read because it's from reading you learn how to write. But that's a problem that transcends science and engineering. It's a problem for the culture broadly.

Young people end up taking jobs and have to be helped to learn how to do the writing that's required in those jobs. Or to do the critical reading and understanding. It's just not good for the nation and I don't know how to fix it. There's got to be some equivalent to the kick in the pants that Sputnik produced. And the trouble is this is a slow, steady, almost unnoticed change.

**INTERVIEWER:** Well I'm imagining myself at one of your tables eating dinner with you and Priscilla, is it possible that it is as simple as simply delivering the message that have to do better and we have to want to do better?

**GRAY:** If that message is delivered over and over again by the president, I think that could make a difference. But they're certainly was no interest in delivering that message in the last decade. Or in the last three decades I think. Other things took priority.

**INTERVIEWER:** What is it about the experience of being at MIT that prepares so many people who leave this institution to take leadership roles at other academic institutions and technological institutions around the country do you think?

**GRAY:** Well, one of the requirements I think at a premier institution, a high grade institution, one of the requirements when you're looking for a president is to find someone who has had relevant experience. You want someone who's been a dean of a school or provost, or in some cases even a president of another institution, who knows what the job is before stepping in. That's one factor. And what I mean by that is that search committees sort of start their search, as we have done here, by looking at other educational institutions.

Second factor is that over the last 50 years MIT has emerged as a premier institution. If you looked at MIT in the teens or 20s or 30s of the 20th century, it was a premier engineering school. It did not have world- class science. It had very little world- class humanities and social science. But it has emerged now as a premier institution in almost all disciplines. It's always first as far as *US News and World Report* in engineering. Many of the science departments are rated first in the country. Economics is first or second. Linguistics and philosophy are right up there. It is visible as a place that sets high standards. And I think that those two factors -- the fact that your natural place to look is a university to start with, and that MIT is among the places that you look at even if you are a liberal arts university, which has some engineering and science but is not focused on that -- is what has made the difference.

**INTERVIEWER:** It's almost as though when institutions are looking for presidents, getting somebody from Harvard or Yale or Princeton has the sense of being an obvious choice. But it's almost always the case that when you hire someone who has an MIT background it's a bold choice. Why?

**GRAY:** I'm not sure I'd agreed that it's a bold choice. I mean it was an MIT alumnus who was president of the University of Southern California. May still be president of the University of Southern California. Been there a long time and has a distinguished record there. Was that regarded as bold at the time? I don't know. I have no idea. I don't think it was regarded as bold when Larry went to Tufts, Larry Bacow went to Tufts. In part because Larry was a city planner, an economist really. And that may not have seemed out of line. Was it bold when a world class physicist went off to head the University of Toronto and then later Berkeley? I don't think so. I think that was just accepted. He had been Dean of Science here. Shirley Jackson at RPI. That was natural. I mean she had government experience, great government experience and academic experience and also had the kind of vision for an institution that they were looking for.

**INTERVIEWER:** Describe your role in at least observing the decision by President Sharp to take and then not take the job at a very particularly interesting moment in his career.

**GRAY:** Phil Sharp was and is an enormously skilled and highly respected biologist. He came into the sights of the search committee in 1989, '90 where I was planning to leave the position in June of '90. And in February they converged on Phil, and the committee told me that this is what was coming. And they said, "We want you to invite Phil and have him for dinner, and talk about the job, whatever he wants to ask. Show him the president's house. Do whatever you wish."

We did that. I think Priscilla and I had two meetings with Phil and his wife. After that the announcement was made by the committee that Phil would be the next president.

**INTERVIEWER:** Before we get into the announcement, the fact that he was from the life sciences, how meaningful with that? In terms of taking the leadership position at this institution.

**GRAY:** Oh I think that was perfectly normal. Perfectly normal. Yeah. You know, Howard Johnson was a social scientist. Jim Killian was not a scientist or an engineer, he was a manager. But they were all of MIT and that's what made the difference I think. The next week after that announcement there was a meeting at the Beckman Center in Irvine, California of the councils of the National Academy of Engineering and the National Academy of Science. Those two groups always met together for February meetings of the council and had some joint meetings in the course of it. And of course we were all in the same building and all staying in the same hotel. Each council has order of magnitude 12 or 15 people on it. And I was at that point a member of the engineering council. And Phil was there as a member of the National Academy of Science's council. And all of his colleagues on that council, most of them were distinguished scientists. Some of them in biology, some in other fields.

And it was clear to me, that week, that everybody there knew that the decision had been announced. They knew what the intention was. And most of them were saying to Phil, loudly and clearly, "You've got to be out of your mind. You're throwing away a fantastic scientific career to become an administrator." That was part of it I'm sure. And I saw it playing out. I saw it playing out. I think another part of it was, once the announcement was made, Phil and maybe his wife had not expected the media to descend on them in such a way. Now by going out to the meeting at the Beckman Center, he got away from that for a little bit. But I think he was a little shocked by that. I've never talk with Phil about this. I'm just telling you what my wife and I think. She was not at the Beckman Center but she saw it back here. Think what happened here. But Phil, the week after we came back from California, called the executive officer of the Search Committee, Walter Milne and called Carl Mueller who was the chair of the Search Committee and said, "I changed my mind. I'm not going to do it."

And that was a big jolt. I remember full well the call I got from Walter Milne soon after he heard from Phil producing this news. The search committee of course had cleared the decks up to the time they had made the decision for meetings. They then had to reconvene and try to clear the decks for the next months ahead. They didn't know how long. This was in February. David Saxon was then chairman, I was president, and we told the Corporation immediately. There was a March meeting of the Corporation at the end of February, first Friday in March. We told them that we would carry on in those jobs as long as they wished, until they found the new president. And I was going to become the chairman when David retired and I retired as president. So that provided some ease and took a little pressure off the search committee.

**INTERVIEWER:** Disrupted your plans?

**GRAY:** Disrupted our plans in a major way. But you get over that. We had planned, if a new president was coming in on July 1st, we were going to be invisible at least until September. Go away somewhere and then be around but let whoever it was to have the summer as a time of less tension and less pressure to figure out where the Men's room was and what the job was. And then we'd be around in the fall to answer questions if either he or his spouse had questions. Of course the next question that came up, very publicly, was how are you going to get somebody to do this job now who isn't second best? Who doesn't perceive himself or herself as second best?

And the Search Committee pointed out, when that question came up that, that first of all Chuck had not been in the search the first time around. He was not among the people who were considered. And when he was invited to interact with the committee and considered taking this job, he did that willingly, no hesitation. Becky was not sure that was a good idea. I mean they had been at Michigan all of their academic career. Their friends were there. It was a situation they were comfortable with, and is this a good thing to do, to move? Eventually Chuck made up his mind and said, "I can't take the job on in July. The University of Michigan fiscal year ends in August. I've got to be around at least through that. I will come after that, still having to attend some things back in Michigan, but get acquainted with MIT before I take on the job. And then on a date you folks want to set sometime in the fall or early winter we'll make the transition." And that date was set at October 16th on a weekend. I was president on Sunday, Chuck was president on Monday.

We had a press conference of course to introduce the new president to the press. And the first question out of anyone's mouth was to Charles Vest saying how do you deal with the sense of being second best? And Chuck had obviously thought about that one. I haven't got his whole phrasing, but he said, in effect, "I am proud to be associated with an institution that has faculty members the caliber of Phil Sharp." And that was the end. I don't think the question got asked again. And he did a brilliant job.

**INTERVIEWER:** Sure did.