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I was born into a family of nine children—seven boys, two girls. People often ask me, “Which one were you?” and I have to stop and count. There were three after me, I guess, so that makes me number six. I was the next-to-youngest boy in the family. My mother died when I was six years old and in the first grade. I remember that very well. It was during the fall of my first year of school. My dad then abandoned the family and my grandmother took all of us in, took all the children in. I had two aunts who lived with her who were young women at the time. They raised us. My three older brothers dropped out of school after the ninth or tenth grade, but the rest of us all finished high school. I was the first in the family to go to college, not the first to desire to go to college. My two next-oldest brothers, who were two and four years older than I, were interested in engineering and in commercial art, respectively, and certainly had the capability to do something like that. The resources just weren't there to go to college.

I grew up in North Carolina, a small town in eastern North Carolina—Mount Olive. I always say the population was 6,000 when I was there, and 5,999 when I was away. The town was about twenty-five percent what we called Negroes in those days, blacks or African-Americans today. It was segregated. It was in the days of segregation, separate high school for each.

When you think about your elementary school and your high school, were there any role models that stood out, either in school or out of school?

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When I think of the elementary school, there were role models in the sense that I was always interested in learning. From the point of view of teachers, I can't think of one teacher that I did not enjoy being around, save one. In elementary school, I guess it was up about the fifth or sixth grade that I really began to identify what I would call role models who were external. Some of the teachers would have photos or pictures on the wall of well-known African-Americans at the time, and they began to ask the question of us, “What do you want to be when you grow up?” So that began to have some impact. Someone expected you to be something, so you began to develop some notion that you could be something, since people were asking those kinds of questions.

In the community there were what I would say were strong people who began to look up to



you, especially if you were a good student academically. I can remember I began selling newspapers when I was in the sixth grade. They would always refer to me, “Here comes my little professor.” I began to think that someone expected me to be a professor, so I began to comport myself in such a way. Then when I was about in the seventh grade, I found that while I was selling newspapers, I could sell some other stuff. So I began at the same time to order stuff from magazines and these kind of plaques you put on the wall that sparkle in the dark with “In God We Trust” and stuff like that. There was at least one fellow—Mr. Wynn—who would always buy anything I had to sell. He’d see me coming and say, “What do you have today?” He would buy anything I had. Sometimes it would be razor blades. It would be a whole assortment of things. So I would make a little profit on that. I began to think, “Gee, I could go into business in some way eventually.” I had the notion at one time, when someone had some used clothes you could order by the pound, “Well maybe I could order these and sell them,” but I never did. But I’m certain Mr. Wynn would have bought some of these. I always kind of respected him. He had confidence in me. Many of my customers were women who also were very supportive. I can remember when I was in the ninth grade, I was selling the brass plaques that you could order for about five bucks or four bucks—whatever it was—and have your name put on it and you could put it on your door. Well, still fifty years later now when I go to North Carolina, there are one or two old ladies who have those plaques on their door and they remember that I sold them to them. They’re beautiful.

So it’s those kinds of things that I think had some impact. Now don’t ask me how did that impact or help. Those are the kinds of things that reassure you that you can do something as opposed to that you can’t do something, which I thought was important.

Where did you get the idea or how did you end up deciding to go to your alma mater, your undergraduate school? How did you make that choice?

Well, part of it was financial. First let me say that when I grew up in the family, I knew that the option was to get an education or to end up working on the farm or being somebody’s hired help. Often when we boys became unruly, my grand-

mother would say, “If you boys don’t apply yourself and do well in school, I’ll buy a farm and we’ll live on the farm.” I knew what living on a farm meant. The other thing she would often say—she would never say, “I want you to be this or that or that”—was, “I want you boys to make something of yourself, to be somebody.” So you began to look at it from that perspective.

I went through high school expecting that I would go to college. I knew nothing about the resources or how that would be achieved or what it cost or anything like that. But as I got into the junior year, there was a math professor I had, Mr. Watson, who began to talk about various fields—accounting, for example—and what his experience as a mathematician had been living in Washington during the Second World War. There were many blacks who had masters’ and Ph.D’s who were working in the post office and working menial jobs. But he said things were changing and that people with Ph.D. degrees knew about a lot of stuff and knew that most of them could do almost anything and that if you got higher education you could do well. So I began to think very positively that way. As I approached my senior year, I began to fill out applications for fellowships with the idea, “If I don’t ask, I won’t know what the answer is. The answer I get, if I get no, that’s no worse than the answer that I had when I don’t apply, because the answer is no if you don’t ask the question.”

I applied for an NROTC fellowship, as my older brother did, which he didn’t get. He wanted to go to Howard University for engineering. I applied to a number of schools. I had an English and Thespian teacher because I participated in a number of plays in high school. I had looked into North Carolina Central University and was taken over for a visit on one occasion. I knew they had a business school, and I was interested because of this math professor in terms of business as a possibility. I wrote off to a couple of schools in New York, including New York University. New York University—this is the one in lower Manhattan—offered me a fellowship for several hundred dollars per semester, and that looked very good. Then finally, two people in my class of fifty-two received the James E. Shepherd scholarships the first year that they were given, for two years. So that looked more attractive than the six or seven hundred dollars I would have gotten at New York University.

That money that I got paid for my tuition for two full years, so I decided to go to North Carolina Central for that reason.

At the time I accepted, I was going to go to the business school and get me a degree in accounting. That summer I was reading a newspaper and having no luck at getting a job at the local post office. In the *Raleigh News Observer*, there was an advertisement for a job in upstate New York for a hospital attendant. This hospital was a school for mentally retarded, which I learned later. I wrote off, got the application, applied for the job, and actually got the job. I went off and worked and saved my money in the summer. While I was there, I became interested in medicine. I said, "I'm going to major in medicine." So by the time I went off to North Carolina Central, I decided I was going into medicine. The people there at the hospital had encouraged me. They were very interested in the fact that I would be going into medicine. That's how I ended up going to Central.

You're saying too that's how you sort of began to focus in the sciences as well.

That's true. When I arrived at Central, there was a shock. You come out of high school, you're the valedictorian of your class, people begin to tell you you're smart, you think you're smart, you get to college, they elect you president of your freshman class in college—and you begin to learn what you don't know. Having gone to a small high school, you began to learn that the guys who came from Chester, Pennsylvania, the guys who came from New York, New Jersey, "Gee, they've had calculus. I don't even know what the word means. I've heard the word trigonometry." So you had to take some stuff that you didn't have to take before.

The other thing I began to learn, I had had biology and it began to sink into me, "Hey, in biology there are things you have to do that I'm not good at. You have to look through a microscope. I can do that, but you have to be able to sketch out what you see in the microscope and, gee, I may have trouble at that." Plus, I decided that I was more interested in things that were stronger analytical things than that which required just a lot of memory. Not that I couldn't memorize, I thought that doing a lot of memory wasn't very taxing. It came very easy. So I then decided that I would major in math and chemistry as opposed to biology. But I still had not decided not to go into

medicine. It was at a later time that I decided that. It was through the influence of the people in the math and chemistry departments that I decided to go ahead for a Ph.D. in one of those fields.

You mentioned influence. How would you describe highlights of your education at North Carolina Central?

Well, there was a broad interest. Let me put it this way, there were those who were interested in me as a person—not in terms of interested in Wade, but interested in a person that's a collective body of people, interested in seeing me succeed, interested in seeing me achieve. In part they were interested in me, in part they were interested in propagating themselves in terms of their own achievements, in terms of their own capability and expertise. I saw that in my math teacher, I saw that in my English teacher and all of that in terms of insisting upon the best in us—not letting us do short cuts, at times shocking us. I can remember in my freshman year of English, I had the toughest professor there was and I tried to get from under him—Dr. Farrison. He said, "Leave a margin of an inch on the left side of your page." I passed in my paper and for some reason, I guess I didn't carry a ruler in school, it must have been less than the one inch he required and he took off twenty-five points. I abbreviated February—it was February of that year—and he took off another fifteen points. I went to him and I said, "Dr. Farrison, I got everything right. You indicate I got everything right." He said, "This margin, I told you what it should be. Don't do that anymore and you won't lose the points." I said, "I put February here." He said, "F-E-B, period. How do I know you know how to spell February?" That's the last time I remember abbreviating February.

So you learn those things, things that are sloppy. For example, I remember on another occasion there was a rule that if it's "do not," write "do not," don't write "don't." Don't use apostrophes. I used it once in a theme I had to write, a two-page theme. I got an F. It didn't matter how good it was. You do that once. So that started discipline. You might say it was unnecessary, it was puny, it was retribution, but you learn from that and that's a lesson for life. You must give attention to details that could make a difference somehow.

It sounds like you're talking about some real strong figures during that period. Let me move from there, unless there's something else you can think of. Obviously you

did exceedingly well at your undergraduate institution. If you can recall in general what your thinking was getting ready to decide what you were going to do after you left your undergraduate school, do you have any sense about how you decided what you would do and what you actually did with the help of others or yourself? How did you come to the point where you decided where you were going to go and what you did from there?

I don't know. At no point do I recall asking someone, "What should I do?" You know, "I got these choices to make. I have these eleven or twelve graduate schools that have accepted me for graduate work, what should I do?" I always looked at it from the point of view of what do I want and what might help me most in terms of heading toward the goal I was going toward. At some point in my undergraduate studies, I decided that I was going to earn a Ph.D. degree at a major university in the U.S., that I was going to do research, and that I was going to teach and do those things in combination. That was my objective. Once I decided that, it didn't matter what school. Of course, you had professors. My chemistry professor had gone to Wisconsin and he was interested in Wisconsin. Another professor had gone to another major university, Illinois, and was interested in steering me toward Illinois. I applied to those schools as well as others, and got accepted to all the graduate schools that I had chosen.

At the same time, I applied for a number of other fellowships at the suggestion of Dr. Hughley, who was then, as you know, at Central and was responsible for our inspirational concerns. He had approached a number of us who were doing well in class and said, "Have you considered applying for this or that fellowship?" There was the Danforth Fellowship, which pays for all of your educational experience for four years providing you're going into university teaching. There was the Fulbright, which is competed for nationally for study in a number of countries for a period of a year, and that's administered under the State Department. Then there was the Rhodes Scholars program. I applied for all of those and moved to various stages through each one of them. I ended up receiving both the Fulbright and the Danforth Graduate Teaching Fellowship. Once I received these grants, the question was, do I want to do my graduate work now or do I really want to risk a gap? That's the time when I really had discussion with people in terms of, "Do I want to go off to

Germany and study for a year and interrupt my chain of progression toward a Ph.D.?"—which I figured I could get in about four years—or, "Do I really want to get that experience?" I did discuss that with other persons and listened to advice. In fact, part of the advice I sought was from my German professor, who had taught me German for four years. He had just been appointed to head the U.S. Agency for International Development, USAID. He suggested that I would find the experience in Germany invaluable, so I did decide to go ahead and study at the University of Bonn for a year.

I went and studied physics and chemistry for a year and never regretted that. In fact, I decided that I was going to do my doctorate there and started studying for the exam. But I changed my mind and decided to come back to the States. Then the eleven schools that had accepted me for graduate school, I rescinded those offers and actually applied to the University of California at Berkeley because there was some work going on by a professor who had just written a book on chemical kinetics that I found very interesting. I decided I would apply there. I got in and then decided to go to Berkeley when I came back to the U.S.

When did you give up on the idea of medicine? You mentioned earlier that at one point you decided that you wanted to go into medicine.

Well, I've found that it's not that you decide you don't want to do something, you decide you do want to do something. So I was deciding that I did want to go into another field. The other thing that came up was the reality of, "Hey, who is going to give me money and where am I going to get money to go to medical school?" I was reading about these fellowships and schools were offering you at least some fellowships for part of your tuition or rescinding tuition, especially in some of these technical fields, but I wasn't reading anything in the medical fields. Perhaps they were there and nobody was just calling it to my attention at the time. So that reality began to set in. It was more that than not being interested in medicine. At first, I was beginning to find the technical field, the research aspect of it, very challenging and rewarding in terms of mental activity. I was very interested not only in chemistry and physics, but math also. I felt that the research field would give me a very

good opportunity to apply my math more than the medical field, albeit that could have been wrong. That was my perception at that particular time.

Think about Berkeley, where you finally decided to do your graduate work. What comes to mind as far as the highlights of that experience?

It wasn't just the graduate school. One is so absorbed in terms of what you're there for. But you know you aren't there for enjoyment. I'm trying to recall an expression. I asked my daughter who is in graduate school now working for her Ph.D., "Are you enjoying it?" She said, "Dad, I'm not here to enjoy it. I'm here to endure it." I think that was well put because, as I look back on it now, I was there to endure it. The highlight again for me was, number one, finding an environment that I could function in. As an African-American, you approach various stages of things with some trepidation. How will I be received?

Let me go back. Just out of high school, when I was going off to upstate New York to work at this hospital for the mentally retarded, I can remember after I got the letter of acceptance with my hundred and some bucks every two weeks and I was all excited, my history professor looked at me and said, "Do they know what hue you are?" "Oh my gosh, what does he mean?" I always had the feeling of looking at things positively, so I began to worry and be concerned about myself only at that time when the question was raised. I had some trepidation when I approached the place that Monday morning, to approach work. It was without cause. Things went very well. The same thing when I went to Germany. I had heard tales about Germany and the African-American soldiers who served in the Second World War. The Germans had been told by some of the white soldiers that African-Americans had tails. Therefore, I wondered, "What will they think about me? How will I be received?" Those kinds of things would concern one, especially if you've grown up in an environment that's as segregated as it was in those days.

So I did not approach Berkeley without some of those reservations, but also with the assurance that, "Hey, I'm not out here to be loved. Just respect me and I can make it." That aside, let me say something. You asked about the highlights. The highlight was being in an environment where I could actually function, actually live with people—not

only American, but people of all races and nationalities. I lived in the International House for two years, where people from about fifty countries lived. That living environment was invigorating, having just come from Germany, having had that taste—and traveling a lot—of internationalism. Also, being in a department where, albeit I was the only African-American in it, I seemed to have been well-received. Things worked very well. I had nothing but very good experiences in my graduate studies, which is unlike what has happened at many places at major universities across this country in the last twenty years.

Yes. And you're talking about what date?

Late 1950s, 1957 when I went to Berkeley.

What I hear you saying is that you had a real positive experience.

Yes. But I think it has to do with numbers. My experience has been that when there are very few African-Americans, very few of anybody, people seem to be less threatened than when there are more. And the more doesn't have to be large numbers. For some reason, three or four of us appear as large numbers to some people.

Does anybody stand out very strongly in that period of your education, like mentors or people who were very influential?

Well, there were a couple of professors. I got my doctorate in physical chemistry, which is a cross-breed between a lot of stuff in physics and chemistry, so it required me to have lots of interaction. I have always looked to see where I can get advice. Advice sometimes comes to you in subtle ways. I can remember during my first year, I was concerned because I came from an environment where you get the bachelor's degree, then you get the master's degree, then you get the Ph.D. Well, I had been admitted to Berkeley for the Ph.D. program, so my advisor—of course, he was a Caucasian fellow—I went in to him one day and I asked, "Professor Connick, what do I need to do to get my master's?" He looked up at me and said, "Young man, we invited you here as a doctoral candidate. We reserve the master's that you referred to for those who don't make it." I only said, "Thank you, sir," and left. I never asked another question about getting a master's, period.

I prize that kind of openness and I saw one or two people who dropped out, who I assume got

master's degrees and didn't make it. They had a class of seventy who started out. In that class of seventy—one female Caucasian, one African-American, and sixty-eight white Americans. No Asians in that class. Berkeley has a large Asian population now.

That's a huge change.
Yes, it is.

When you go back there now, probably the majority in your particular field would be Asians.

Yes, at least about half Asians. There has been a population shift in that sense.

How did you come to MIT?

There again, when I came out, I took a year's post-doctorate. You may argue that I was prolonging remaining a student, which perhaps would have been in part true.

Enjoy that education!

The educational experience. It does get good at the end when you leave, you know, and you've got to go face the real world. Then, as you finish, you start thinking about earning a living and you start looking in terms of what people are paying in different places. But I had a commitment to go into teaching, because I had gone to graduate school for three and a half years as a Danforth Graduate Teaching Fellow. I did apply for teaching posts at a number of universities. I applied for teaching posts at many major universities for that time-frame—and perhaps for today—although I was not admitted. The process is, you just don't fill out an application because you want to go to University X. The professor will approach you and then say, "Hey, you should apply to these universities," which means he has put in a little bit of a good word for you. Among those were the University of California at Los Angeles, Columbia, and several others.

So it wasn't a matter of being directed to second-rate universities. They were very good universities. I interviewed with Harvey Mudd and some of the others with disappointing results. I'll not recite those. But then it became a matter of what was the next best thing. As I said earlier, I was interested in doing research, not just teaching. I had an option of going to teach. I was made offers at a number of small colleges where I could go and teach. But when asked about research, "Yes, we encourage research," but the teaching

load was sixteen hours, which meant that they encouraged research but did not allow a lot of time for research, as opposed to the nine hours or so that most of the major universities were requiring in those particular days. So then I had to make the decision, "Gee, I want to do teaching and research." If I had to choose one, I was going to choose to remain strong in the research area and take the chance of later shifting back into the teaching field. So I conferred with the people at the Danforth Foundation.

At that point I began to apply to a number of places associated with universities, as well as to some industries not associated with universities, because in those days the aerospace industry was very strong. Sputnik had flown—the satellite, Sputnik, that the Russians had flown in '57. The U.S. was beginning to move into space, that is, in the late 1950s and early '60s. So the aircraft industry and other aerospace industries were growing, and I learned about a place called MIT that had a large research laboratory named the Lincoln Laboratory. I applied to that and was accepted. I was accepted at several other places. Then it becomes a matter of, do you take the place with the most money or what? I began to ask myself what each one had to offer. At first I said, "Being poor, I'll take the place with the most money," which was not MIT. After thinking about it, I conferred with another colleague of mine who was a post-doc who had come out and interviewed at Lincoln. We discussed it and he began to point out what he saw as being the positive things. He was going off to the University of Pennsylvania. He had gotten a position at a major teaching university. As a result of some of those conversations, looking at the pros and cons and looking at the fact that I was recently wed and my wife had her family on the East Coast, I said, "Gee, if I stay in California, we are going to be making many trips back to the East Coast and that will cost a lot of money." I decided that we would live on the East Coast for that reason.

There are composite reasons that I ended up at MIT. I wanted to be at a place that was strong technically, a place that had a good reputation, a place based on a little exposure to the point where my interviews seemed to be in an environment that I thought I could work inside. There again, I approached MIT with a positive attitude and expectation. Show me that you are as good as I

think you are, that you are as receptive as I think you are.

I have to come back and ask, is there anything you can say about those disappointments that you mentioned?

With any disappointment, the thing is always the lack of forthrightness of individuals—whether it's in terms of finding a place to live or whether it's in terms of employment. It has nothing to do with how good you are. Let me just cite a couple things. I visited UCLA, gave the seminar as was required for candidates, talked to about a half dozen professor as was required. Excellent reception, et cetera. I talked to the lead person—Harold Urey, who was a Nobel laureate. I spoke with him. As we talked, his talk was less about my work. His conversation went, “You know, down at Southern University”—an African-American university—“they've got some positions down there you might be interested in.” So it was obvious that he was not seriously considering me for UCLA, based on those comments. He was telling me where I would be well received.

The other one was at Harvey Mudd, which is in Claremont, California. It's one of the Claremont Colleges, a conglomerate of very good liberal arts colleges that are small and would be excellent, an ideal place to start. I remember the fellow—it was one of those places again that was recommended by a professor—came up and interviewed me at Berkeley. He never invited me down to interview at Harvey Mudd. He came back to Berkeley to have lunch. He was chairman of the department of chemistry. He started out by saying, “You know, you will have a problem finding a place to live in Claremont.” My response was, “Gee, I was looking for a place to work. I'll take care of myself in terms of finding a place to live.” So that kind of fizzled out there. The fact is that he went through the motions knowing that he never would make me an offer. It may be that after the first interview he went back and sized up his people and raised the “What if one were to come here?” question, and did not get an encouraging response. Maybe that's the reason he came off that way.

Now, those responses are no different than the responses you get when you look at the housing in those places. I remember—my wife and I, when we first got married in Berkeley—the woman who we had called through a newspaper ad that described a particular house. We were plan-

ning to move from a one-bedroom to a two-bedroom apartment. The woman said, “Well, I have a place that you might be interested in. This young man is supposed to be going into military service. If he goes, you'll have first option on it.” So one afternoon I came to the lab. About six o'clock, I got a call. She said, “The place is free. Would you like to come take a look at it?” I said, “Certainly, but my wife's at work. I'll come over.” It was only about three blocks to the house. I drove over and parked. She came up. Her car was parked. I walked around the house and I came around the house. She came and started feeling her pockets. She said, “Oh, I forgot the key.” I looked at her. “What do you mean, you forgot the key? You called me, I didn't call you. You said you would meet me here. You didn't forget the key.”

That's no different to me than the university situations. I could give you a litany of many others over the past thirty years that are things of that sort.

Talk a little bit about your overall experience at MIT. Identify what you would consider as significant things that have happened over your years here. Again, we're talking about a fairly long span. Overall, what can you say about the time you've spent here?

Let me at least treat it at a top level and not make it any kind of griping session or go overboard in terms of being laudatory about things that we need not be laudatory about. I came to MIT, as you well know, in the early 1960s, in '62. That was certainly well before the days of affirmative action. It was in the days of riots, et cetera, in the South, cross burnings, marches and things of that sort. Those overtones existed across the United States. I came into a research environment. There again, I was well received as a peer among equals in the technical sense. I found MIT a very welcoming place when I came here. If you ask what stands out, what stands out for me was the fact that I had considerable freedom in terms of my research project—being given general directions, but being left to succeed or fail in terms of how my project went. Fortunately, I was one who did not require day-to-day direction, that kind of thing. I learned from early childhood to find a way to do things, and if I needed resources to go and ask. I had the idea that if you don't ask, you don't get. If you don't ask, the answer is no; if you do ask, the worst answer you can get is no. So always ask.

In those early years, I can't think of any outstanding things that were impediments. I can think of one or two things that happened that I thought were positive. There were two instances I remember. Someone at the Institute was responding in 1966. Then Vice President Humphrey had a program called Plans for Progress and was drawing upon, was pulling together about two hundred young people—African-Americans—from across the country, from industry, from academia, who in teams of three, four, or five people would go out and visit universities, spend one or two days talking to young people in the universities about careers, career opportunities, and moving forward. It was then that a vice president of MIT, I forget his name, wrote and asked me if I would be willing to have the president nominate me to be a member of that team. I accepted and went and served for about three years, and I found that was a door that was open.

Those are the things that happened in the early years that haven't happened frequently in the later years. As a result of that, I was invited to the inauguration of the head of the Atomic Energy Commission. I was later invited to the White House. I went camping one weekend, got home, and there was a telegram in my mailbox saying that President Johnson invited me to be present that Monday morning at an eleven o'clock ceremony of the installation of this person in the East Wing. Now there again is evidence of the freedom of the place that I work. It's Sunday night I got home. They want you to be there Monday morning, and do you ask some boss can you go? I made the decision that I was going and I went. The Laboratory paid the expenses for it. Nobody raised a question about it.

So those I found very interesting experiences that, of course, had reverberations later on in my career—the people I meet and things of that sort. Those things don't happen to us often these days.

No, I can imagine not. One of the things I would like for you to talk about is being the first in several regards. You're talking about the early 1960s up to the '90s. When you look at your career, you've been able to succeed, to get all of the appropriate promotions—all the way from group leader and then manager, and all the way up to division head, which is a first in MIT's history. Basically, for a large portion of that time, you were the only African-American in this professional group. What

kinds of skills, what kind of advice would you give to someone in terms of what you've learned about how to go through a maze like that?

I think there is no recipe, but there are ingredients that one must be aware of. Maybe I speak from hindsight now. I certainly didn't stand at some time some thirty years ago and lay out some strategy and say, "This is the strategy I'm going to follow." If I laid out a strategy, it was, "I'm going to be good. I'm going to be very good. I'm going to remember what my ninth-grade English teacher told me." When I went to Miss Davis and said, "Miss Davis, I did everything you told me to do. I passed in all my homework, I aced it. Why do I have a B-plus? I'm not on the A honor roll this month." She looked at me and she said, "You didn't have to try," telling me I did not go beyond what was expected. So from that day forward, I didn't just do what was expected. It was, "Hey, I'm going to be as good or I'm going to be better than everyone else." I find that it's important to try to be better than everyone else. Being the best is no assurance. That's only an ingredient.

The other thing, I have something that I call the four A's of things. I think it's good to have a good attitude about things; and, of course, to have aspiration; it doesn't hurt to have innate ability; and also, to achieve something. When I talk to students, I quite often use this thing that I call "journey to success." I draw it in terms of a Venn diagram, three circles that overlap. It's not just having these things individually, it's being able to find a coalescence among them, to bring them together. That's important. So that's a beginning. Quite often we think, "Hey, I'm smart. I'm the valedictorian. I'm the best at this. They will recognize me. I finished MIT, the best school in the country. Therefore, they'll give me a job and I'll do well." Yes, they'll give you a job, but whether you do well depends on these other things—whether you have a good attitude in terms of approaching what you are doing, and whether you have some aspirations, some goals of where you are headed and what you want out of it.

The other thing I found helpful is what I call a game, a triad of things, one's personal mission. What are you looking for? What do you want? What I was looking for was being the best and achieving the most. I've always felt that if it's human and somebody can do it, why not me? I've always looked around. At first you approach these

things with apprehension, “Let me not lecture you.” At first you’re sitting there and the teacher is teaching you, “Oh gosh, they are so bright, they are so smart.” That’s when you’re fresh. By the time you’re a senior, you know a lot of that stuff yourself and you begin to think, “Oh I could do that,” especially when occasionally you get up in class and you teach and do stuff. So that’s the personal mission. The next thing is in terms of you’re on a job, knowing what is the requirement of the job. People don’t hire you just to come and sit at a desk. They hire you because there’s a job to be done and you need to understand what that job is. Thirdly, an awareness of the environment in which you work. Being at Bell Labs is different from being at MIT, it’s different from being at the University of California, it’s different from being at the University of North Carolina. They’re all different.

So being able to bring those three things together—my personal mission; the requirement of the job that I am called to do, that I have obligated myself to do, for which I am being paid; and the environment in which I function. An awareness of those things has helped me a great deal.

I would assume then, if you were giving advice, your advice would be very much along those lines.

Yes. A quote I like from James Thurber—and I think as African-Americans it’s very instructive to take it into account—is, “Let us not look back in anger or forward in fear, but around in awareness.” That’s all these things I’ve just mentioned, what I call the area of awareness. Look around you where you are now in awareness of that situation. Don’t spend a lot of energy being angry about the past or being afraid of the future.

Based on your own experience, is there any advice you might offer to other blacks who are entering or planning to enter the MIT environment? What advice would you give a young black scientist coming to MIT?

Again, I would turn to those things. I would first say, “Do your knitting well, but don’t stick to your knitting alone.” Quite often as I talk to young people, there’s the attitude, “I got my degree, I’m good at this, and this is what I want to do and I’ll leave the politics to someone else.” Awareness, as I mentioned previously, that’s politics. Some of that is politics—knowing who the people are around you, knowing whom you can trust, knowing whose judgment you can respect, knowing who it

is that is likely to take your work and use it as their own as opposed to giving you appropriate credit for it. And testing the waters on those things—not being so fearful that, “Gee, I won’t share this with anybody because I know they’ll steal it from me,” but at least try anything once. Give them a chance. You’ll be taken once, maybe, but don’t be taken a second time.

And the other thing is speaking up. There are little things. Let’s say you’re in a work environment like the place where I work, Lincoln Laboratory at MIT. Work environments include working and include meetings. You’re sticking to your knitting and you’re doing your work, and there’s a special meeting called to discuss a different technical topic on the design of a new radar they’re thinking about. “Well, that’s of interest, but I know that stuff. Should I go?” Yes, you should go to some of those meetings, even if they turn out to be a waste of time, for two reasons: number one, you may learn something, you don’t know everything; and number two, your presence is recognized by other people, or your lack of presence can be taken as indicating you are not interested. “I never see Wade here. He must not be interested in this.” Now how do I know that? Not because somebody tells me that, but because of comments people make about other people.

I had a situation where there was a young fellow I had just promoted. He happened to be Caucasian. The next supervisor up had observed this young fellow. “Gee, I thought you guys said he was good. I noticed that he came to a meeting”—there had only been one meeting, now—“and he snuck to the back of the room. If he’s going to be a manager, he shouldn’t be sitting in the back of the room.” Now, he wouldn’t tell that guy that, and nobody would have told me that. That’s the nature of the environment. But I found a way to convey it to this person without saying So-and-So said so. But what you risk, by the way, and this is the thing you have to be cognitive of, is not being defensive. If I go to this person and I start saying, “George, when you go in a room as a manager and you want to be perceived as being a leader, you ought to go up there in the front of the room. It’s to your advantage.” Leave it at that. If I go there and say, “They say you’re sitting in the back of the room.” “Who says so?” and he gets defensive. Well, I’m going to leave him alone and let him rot. And the person will do that to you. It

might be more likely to happen to you as an African-American.

The last thing, you must seek information. Quite often it will not be laid on your desk or at your doorstep. You must ask what's going on. If there are meetings and you're not invited, you ask, "What was that meeting about?" Don't get defensive and talk about, "Why wasn't I invited?" Find out what it was about and how often do they happen and show up the next time. Or ask, "Is there any reason that I shouldn't attend?" Don't ask, "May I attend?" Ask, "Is there any reason that I shouldn't attend?" Those are two different questions.

Another area is to develop some kind of liaison outside of your environment. Your environment can wrap you up a hundred percent of your time—that is, your workplace. You never get to go to any meetings anyway. Everybody else is going to meetings and you are so dedicated to doing your job, you think if you take two days off to go to San Francisco or somewhere to a professional conference that you're wasting time. You're not. The guy next to you down the hall is going to those meetings. You should take the time to do that yourself, develop some liaisons outside. You may decide to change jobs some day. You know some people some place else. You make social contacts. You may have decided that, "Gee, I'm an astronomer. This meeting is interesting, but I know that stuff. Those are old papers." Well, go to the meeting. You don't need to go to all of the sessions. Those things can be critical, but don't overdo it.

If you had to give advice to MIT regarding how to do better relative to people like yourself, what kind of advice would you give in terms of how we can improve on the black presence in the scientific area?

Let me at least do what I think is a diagnostic of what I think the environment is at places like MIT. It may not be unique to MIT, but that's no excuse. If MIT takes the position of it's the best, we seek the brightest, we seek the smartest, and always seek out the best—we do seek out the best—well, seeking out the best sometimes may mean not being conventional. Also a place like MIT, when it comes to minorities, blacks, and so on, they always want to make certain that everything is equal, everybody has a fair chance at the position. But when it comes to some other people, if there's

someone at Berkeley or someone at the University of Texas who is just right for this position, the person is sought out, is pinpointed, is nurtured. He's at Texas, you think he could benefit from a year at Harvard before MIT? Word goes out, he goes there, and you tell me that doesn't happen? I challenge you: It does happen. Eventually, he'll end up at MIT and he's declared to be the best and the smartest.

Those kinds of things seldom happen to blacks, because the interest that I experienced at a place like North Carolina Central and my segregated high school does not exist. That supportive environment does not exist at MIT, I believe. There are few that have your vested interest at heart. It's reflected in terms of those who hire at all levels, who have hired the best and the brightest. But when it comes to African-Americans, there is a tendency to hire people that they are certain will not fail. Select out people who will have a high probability of not failing, a high probability of being successful. I think that's good, but sometimes you have to take a chance on individuals and take a chance that if it doesn't work out, we will fire him or her. There's not enough of that. I think that means setting the tone of expectation from on high. It's not a matter of setting quotas, it's a matter of targeting. If in an area where you do not have people of color, you don't hire two this year or three this year but over a period of a couple of years you're hiring five people, why not? What have you done toward seeking out blacks short of advertising in a trade magazine, advertising in local newspapers? Have you sought people? How many times have people made contacts at conferences and on the spot invited people to come in to give lectures and things of that sort? Setting that kind of tone of expectation among the leadership is very important. Sometimes it's just a matter of asking, "How are you doing?" or "What are you doing in this area?"

There is a reluctance to ask those kinds of questions, at least in the environment in which I work. I would think it's like the environment of MIT. When someone compares how they're doing to how the rest of MIT is doing, that is not a good model. When you ask, "How are you doing in this area?" "Well, I'm doing better than some of the other departments." That's not a good answer. It may mean that neither of you are doing anything.

I think that as we go through our careers, one of the things when I've encountered some blacks who did not make it or who were here and left or were asked to leave and things of that sort, quite often it's a case where all of the signs were missing, were ignored in terms of things that could have been done to turn it around early on. Only after it had reached the pinnacle of someone reaching the decision that this person has performed poorly for four years or five years and we're going to terminate their employment, the person then starts challenging that and saying, "What's wrong with me?" Many of the signs were there early on, in a review—a performance review—which is done throughout the Institute in various forms, sometimes written, sometimes oral. Someone makes a comment and someone comes in and they give you a salary increase, say four percent or three percent or whatever it is at that particular time. You are elated by that increase and the person will say, "You know, you're doing pretty good. Your work is acceptable."

You listen only for the good news. I don't know whether we have a propensity to listen only for good news or not. Maybe that's a human trait. We hear that and we don't hear the undertones, we don't hear the "but" that's not spoken. We won't dare to ask, "Are there areas you think I can improve in?" We won't ask that specifically—putting the manager, you could say, on the spot to give you some specific guidance in areas. "You're doing very well, but you have some communication problems." "What is the communication problem?" "The run-in you had last month with someone down the hall, or your refusal to let someone else take your work and represent it as their own." The time to deal with that is then, not two years later. Two years later it's looked upon as fodder that's being used to try to keep you from being put out of the place.

I think that's one of the things that you have to be very attuned to. You must listen in this environment. You must listen to what's being said—not defensively, not in a "What do you mean?" sense, but in a sense of "I don't understand, can you explain that a little better? Run that past me again since I want to understand." This as opposed to a sense of "I don't believe it," or "You're wrong," because only in the former sense will you get people to open up. Although you know he's lying and he's wrong, if you tell a person they're

lying, they're going to choke up and they'll tell you nothing.

Awareness, again, I think is a great thing. I can remember one of my promotions. Someone wanted to promote me to an assistant something. I said, "Tell the director thank you, but I'm disappointed. I should be an associate." I knew what the difference meant. It wasn't just money. Money had nothing to do with it. It meant influence, respect, and achievement. I knew when I met with the director. I said, "A lot of other people have been promoted over my head. I think I'm just as good as they are. If you want to make me an assistant, what that means is that I'm not appreciated and I should be someplace else." The answer was, "Oh, no, no, no. We want you to be an associate." I could have blown up and said, "You so-and-so! You're lying. If you wanted me to be one, you would have done it in the first place." Again, that was my aspiration. I know what my objective is. My objective is to get the position.

Basically, what you're saying is that you let people know what your expectations are.