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Expanding Our Universe:
New Models of Success for the Minority Community

by

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Good evening, ladies and gentlemen. I am delighted at this opportunity to present the 20th Annual W.E.B. DuBois Distinguished Lecture. I especially am honored that I am the first scientist to participate in this lecture series. Given that understanding, and given my specific background as a theoretical physicist, I believe I have selected a topic that fits the occasion. I have entitled my presentation, "Expanding Our Universe: New Models of Success for the Minority Community." I will begin by providing you, by way of context, a brief description of my current position as the Chairman of the Nuclear Regulatory Commission. I then will attempt to answer two questions: (1) How does a scientist—or, for that matter, a high-level government policy maker—contribute to the minority community? and (2) As members of a minority community, how can we continue to "expand our universe"?

I. The Role of the Nuclear Safety Regulator

Let me begin with a brief overview of how the Nuclear Regulatory Commission (NRC) has evolved into its current regulatory role. Back in 1954, when the Congress passed the Atomic Energy Act, the NRC did not exist. The Atomic Energy Commission (AEC), created in 1946, had the dual responsibilities of both promoting the growth of nuclear power and regulating its use.

Over the ensuing years, as nuclear power progressed from an experimental technology to an established source of electricity production, concern grew over the inherent conflict of interest in having promotion and regulation invested in the same agency. In the 1960s and 1970s, the rapid growth in the number of nuclear power plants brought a corresponding increase in concern over nuclear safety, waste disposal, and the role of the regulator. In 1974, the Congress abolished the Atomic Energy Commission and

created two new agencies: the Nuclear Regulatory Commission, led by a 5-member Commission, with an exclusively regulatory mandate; and the Energy Research and Development Agency (ERDA), which later became the Department of Energy (DOE).

Concern over the role of the regulator was not limited to separating promotion from safety oversight. The Congress perceived two additional needs: (1) to eliminate the aura of secrecy associated with the AEC; and (2) to establish clearly how a 5-member Commission should function efficiently. This second issue, related to the NRC organization and management, was still not well understood or resolved at the time of the 1979 accident at Three Mile Island (TMI).

The TMI accident clearly was a watershed event that cut across all aspects of nuclear energy and nuclear regulation. Multiple investigations, both internal and external to the NRC, called for drastic change across a broad spectrum of issues—including the demand for profound improvements in severe accident analysis, and the need for more clearly spelled-out reactor safety objectives. One of the key focus areas for both of the major TMI investigations—the President's Commission on the Accident at Three Mile Island, known as the Kemeny Commission; and the NRC Special Inquiry Group, headed by Mitchell Rogovin—was the lack of clarity in the NRC governance, and the adverse safety impact that could result from confusion and the lack of role definition.

Both the Kemeny Commission and the Rogovin group recommended replacing the 5-member Commission with a single administrator and placing the agency in the Executive Branch, under the President. President Carter rejected both recommendations; however, he took strong action to define how the NRC would function—both during emergencies and in day-to-day operations. This action eventually took the form of legislation, which became known as the Reorganization Plan No. 1 of 1980.

The Reorganization Plan defined the role of the Commission as one involving policy formulation, rulemakings on non-administrative matters, and orders and adjudications. It emphasized the importance of clear communication lines and Commission access to information. Certain responsibilities formerly assigned to the Commission, as a whole, were moved specifically to the Chairman: the role of Principal Executive Officer and official agency spokesperson; the responsibility for day-to-day operation of the agency through the Executive Director for Operations; the ultimate responsibility for all NRC emergency response functions; the development of policy planning and guidance; and rulemaking for administrative matters.

This hybrid arrangement is fairly unique among Federal agencies—an independent agency in which policy matters are formulated by Commission consensus, but with a Chairman leadership role designed to increase efficiency and define responsibility. Within this arrangement, the mission of the NRC remains the adequate protection of public health and safety, the environment, and the common defense and security, in the civilian use of nuclear materials. This mission encompasses the regulatory oversight of not only nuclear power reactors, but also research, test, and training reactors, fuel cycle facilities, low-level and high-level radioactive waste facilities, and the use of radionuclides in medicine, research, and industry.

Given this context, you may understand better my feelings when, in 1995, President

Clinton asked me to consider nomination to the Nuclear Regulatory Commission and to become the Chairman of the Nuclear Regulatory Commission. My reaction was not, as some might assume, an immediate and unqualified “yes.” At that time, I was a Professor of Physics at Rutgers University, and for over 15 years before my tenure at Rutgers, I had conducted research at AT&T Bell Laboratories and other facilities, working in theoretical physics, solid state and quantum physics, and optical physics. Becoming a high-level presidential appointee, even if it meant heading up a highly technical independent agency like the NRC, was not exactly part of my pre-calculated career plan. In addition, there were other considerations. How would this change affect my family? How would it restrict my involvement in industry boards of directors, advisory boards, or various scientific councils? What contributions could I bring to the civilian nuclear industry through the avenue of nuclear safety regulation?

Finally, there was the question I would like to focus on today—a question I had asked and answered before, when choosing a career in physics: “As a scientist—or in this case, as a nuclear safety regulator, or as a high-level government policy maker—how will I be making a contribution to my own community?”

II. Making a Contribution to the Minority Community

To understand this question properly requires, first, that we reflect briefly on the all-too-familiar barriers that many minorities have faced in choosing career fields that are non-traditional for individuals of a particular gender or ethnic background. Sometimes those barriers can take the form of direct discrimination, or confrontational reminders of demeaning stereotypes. Let me give you a personal experience: in 1965, as a freshman at the Massachusetts Institute of Technology, still deliberating on what my major would be, I was approached by an MIT professor with a piece of career advice. “Colored girls,” he told me, “should learn a trade.”

Consider, if you will, that I was newly separated from the support system of my family and my community back in Washington, DC. Consider that I was one of two African-American women in an MIT freshmen class of 900. How does a young woman, eager for success but also desirous of support and respect, respond to so denigrating a suggestion, to so clear a depiction of the limitations associated with racial and gender stereotypes? I will tell you. I chose a “trade.” I chose physics! Four years later, my friend, Dr. Jennifer Rudd, and I became the first African-American women to graduate from MIT. She went on to become a physician. I remained at MIT as a graduate student, and received my Ph.D. in theoretical elementary particle physics in 1973, the first African-American woman to receive a doctorate from that institution.

An experience of that sort, a direct and forceful encounter with what we sometimes call a “glass ceiling,” can have a traumatic effect on a young person—on her view of the world, and on her view of the opportunities available. However, most of the challenges I faced, relevant to my pursuit of a scientific career, were more subtle. In fact, some of the challenges came to me from within my own community—not from people who wished to be denigrating or discriminatory, but from individuals who, in all other ways, I counted on for support. These challenges, sometimes direct but more often indirect, could be summarized as follows: “You are a bright, talented young woman. With all that brainpower, with all that energy, where is your sense of responsibility? You have the potential to succeed in any field you choose—why, then, are you not choosing a career

that will make a direct contribution back to your own community? How will your career in physics be of benefit to African-Americans?”

I do not mean to imply that challenges of this sort are frivolous. However, just as discrimination and injustice sometimes take more subtle forms, so too I believe that we must take a more expanded, and, if you will, a more sophisticated, view of what constitutes a contribution to the African-American community or other minority communities. Contributions can take many forms—some direct, some less direct. For example, where imminent social issues need to be addressed, a community must have attorneys capable of bringing and defending cases, competent in drafting and promulgating needed legislation, as a way to redress social inequities. For that reason, the law has been a natural pathway for motivated African-American achievers. Career fields such as medicine, religion, and education also have been frequent choices—again, because of their direct contribution to the communities of their practitioners.

When an extraordinary degree of success is achieved in one of these fields—as in the life and career of Supreme Court Justice Thurgood Marshall—the direct benefits to the African-American community are considerable and obvious, and justifiably receive high recognition. When we think of Justice Marshall, we think immediately of his role as “the little man’s lawyer,” his support of the NAACP, and his overall stature as a champion of civil rights. However, I believe it also is important to understand his indirect contribution to the African-American community—his renown as a successful litigator, his national recognition as an authority on constitutional law, and his appointment by President Johnson as the first African-American Associate Justice of the Supreme Court. Those personal achievements were of less direct benefit to the African-American community, but they were of profound significance in “breaking the darkened glass ceiling”—forcibly raising the standard of achievement as an inspiration to those who would follow. What do I mean by “the darkened glass ceiling?” Seeing through a glass darkly does not always allow one to know what is on the other side. But one wants to “go there” to know—to find out what is there, and what one can do “on the other side.”

One of the most subtle and covert forms of discrimination and racial stereotyping is the false and demeaning notion—not always articulated aloud—that minority group members do not have what it takes to succeed in certain fields. This way of thinking, in my view, has created what I refer to as a “restricted universe” for young people in minority communities—a limited range of career options. When social pressure is placed on a talented young person of minority background to choose a career that is “clearly relevant to the needs of the minority community,” that pressure, in its own way, can self-perpetuate this “restricted universe,” by limiting the range of what those young people will view as valid models of success. In so doing, pressure from within the minority community can in fact reinforce external stereotypes regarding fields of low minority representation.

Consider another example. One early African-American practitioner of science who was intimately acquainted with the confines of this “restricted universe” was Benjamin Banneker—a name that should be familiar to many of you, given that he lived and worked here in Baltimore County in the 18th Century. Among his other interests, Banneker was an avid mathematician and astronomer who successfully predicted the solar eclipse on April 14, 1789 (to the discomfiture of other prominent astronomers of the day). In August of 1791, Banneker enclosed a copy of his latest almanac with a

letter to Thomas Jefferson, who was then the U.S. Secretary of State. In his letter, Banneker argued passionately and forcefully that the Jeffersonian credo of “life, liberty, and the pursuit of happiness,” as inalienable human rights, could only find its logical result by bringing an end to slavery.

Once again, when considering these achievements of Benjamin Banneker, one could argue that his efforts as an early civil rights advocate made a more direct contribution to the African-American community than his other pursuits. In this case, however, I can testify, from personal experience, regarding the benefits to me of his scientific interests and accomplishments. As a child, I found Banneker fascinating because, like me, he had an intense curiosity, he liked math and science, and he had helped to design my home town of Washington, DC. While my parents were extremely supportive of my early interest in science, there were few African-American scientists with whom I could identify as role models. Banneker was an exception, an African-American who had put “a crack in the darkened glass ceiling.” To put it another way, Benjamin Banneker helped to expand my universe by serving as an unusual model of success. [I should say, for the record, that at that time I did not focus on the fact that Banneker also was the first African-American to receive a presidential appointment, when George Washington appointed him to a three-man team of surveyors to design the District of Columbia.]

So let me ask a slightly different question: Should every member of a minority group feel bound to choose a profession of direct and obvious benefit to that group? The answer, I believe, hinges directly on this subtle differentiation between direct and indirect contributions. I would argue that it is of profound value to our minority communities, as well as to the nation as a whole, that we have Native American, Hispanic, and African-American mathematicians, scientists, and engineers of renown. Every African-American or Hispanic or Native American man or woman who succeeds as an astrophysicist or geologist, as a microbiologist or computer scientist or chemist, is contributing to the well-being of his or her community, even if the specific work performed does not have an immediately observable impact on the social problems of the ghetto, the barrio, or the reservation.

When, in the 1920s and 1930s, Dr. Ernest Everett Just overcame less than optimal circumstances to establish a reputation as a leading expert on cell biology and human metabolism, he also was creating a new model of success for others to follow. When, in September 1992, astronaut Mae Jemison became the first African-American woman in space, she expanded the universe of the African-American community a little more. Sooner or later, every such message of individual achievement makes a community impact, as a source of pride to the elders, as a source of hope and opportunity to the young, as an education to the larger society. The young, in particular, need to feel that there is no field foreclosed to them, no glass ceiling intact. They must be afforded the chance to dream, and must feel that striving to make their dreams reality is worth the effort.

Every success sends a message to society as a whole, helping to break down the prejudices, spoken and unspoken, that imply either a lack of capability or a lack of contribution from certain minorities in certain professions. When we contribute to disproving those prejudices, we benefit not only ourselves, not only the groups to which we belong, but our nation itself. To illustrate, within my present field of focus—civilian

applications of nuclear materials and nuclear energy—I would note such contributors as the African-American Roscoe Koontz, one of the first formally trained Health Physicists, who made significant advances in radiation detection instrumentation, environmental sampling equipment, and survey techniques, to protect humans from the dangers of ionizing radiation; and Dr. J. Ernest Wilkins, Jr., also a physicist and mathematician, who conducted seminal research in radiation absorption and radiation shielding, as well as helping to design and develop nuclear reactors for electrical power generation (Dr. Wilkins currently is distinguished professor at Clark Atlanta University, and adjunct professor at the Georgia Institute of Technology—Georgia Tech).

In physics research overall I would note the work of Dr. Chien-Shiung Wu, a pioneering physicist who changed our accepted view of the structure of the universe by proving, through experimentation, that parity was not conserved in sub-atomic interactions, and the work of theoretical physicist Walter Eugene Massey, who, in addition to seminal research dealing with many-body problems, quantum liquids, and quantum solids, served as the Director (and later as the Vice President for Research) of Argonne National Laboratory, and the Vice President of the University of California system (he is now President of Morehouse College, in Atlanta, Georgia. Only the most myopic perspective would view the contributions of these individuals to the body of science as something other than of significant benefit to their own minority communities as well.

III. Continuing To Expand Our Universe

As members of the minority community, how do we continue to expand our universe? I believe the answer lies, as the title of this lecture would suggest, in establishing more diverse models of success. I have stated before that, in order for minorities to realize their full potential in professional fields of endeavor, three essential conditions must coexist and be sustained: (1) within each individual must be a catalyst--a driving force that compels the individual to take on challenges and to excel despite obstacles; (2) the opportunities must exist, within these fields of study, to put training and education to practical use in careers worth pursuing; and (3) societal values must support the professional growth and development of all the human resources available within the society. The creation of new models of success relates directly to this last objective.

The process of establishing these models occurs in a series of steps. First of all, as a community, we must be aware of our own demographics, and we must understand the value of increased participation in those fields in which our community is under-represented. In most cases, there have been or there will be individual “trailblazers,” the precedent-setters who achieve career “firsts” by ignoring or overcoming the ethnic and gender stereotypes and other obstacles. We cannot expect of these individuals that they will always be the best in their respective fields of endeavor. On the other hand, for those of us who have achieved a measure of success and recognition, with that recognition comes the responsibility as leaders to set an example of vision, hard work, and ethical integrity. In addition, we have the responsibility, wherever possible, to cultivate and serve as mentors to “the second-generation pioneers” coming along behind us.

These nurturing and mentoring activities hopefully will lead to communication networks, small circles of support and identification. These intimate networks, in turn, give birth to larger foundations and support programs that work actively to publicize successes, to

educate young people as well as the larger community, and to eradicate limiting stereotypes. It is only part of human nature that we feel more comfortable in entering those segments of society where we see others like us, and these networking and support activities can help to remove any associated barriers for individuals of minority background entering non-traditional fields.

By way of encouragement, I believe we are closer to achieving this objective—the establishment of new models of success—than we have ever been. Many studies, discussions, and actions have concentrated on formal organizational support and assistance to encourage more women and individuals of minority background to participate directly in science-based careers. This formal organizational approach has been an essential contributor to progress in certain fields over the last decade, and it will play a continuing, vital role in the future. I also would suggest that we are experiencing a change in employer perceptions toward diversity. Most business and governmental organizations increasingly are recognizing that, if they are to compete successfully in a global political and economic setting, they must make use of all of the best human resources available.

Fundamentally, the present and foreseeable challenges facing this nation simply are too great for society to ignore or to undervalue the capabilities of entire population segments. If we are to have an environment and a society worth passing on to our children, we must be sure that we engender an appreciation for one another as human beings with individual qualities, rather than peering through blinders of prejudice, inherited from the past. For those of you who have chosen or are considering a career in science or engineering, I would urge you not to be dissuaded or disheartened by any who would tell you that such a career is irrelevant to the broader social concerns of your communities. Such advice is off the mark. The inner city, the barrio, the reservation, and yes, the suburbs do need teachers, doctors, lawyers, and social workers, to be sure; but the contributions of scientists, mathematicians, and engineers, on a global scale, in the long run, are just as vital. Many environmental, medical, and social problems cannot be resolved without strong scientific and technological input. Our communities must appreciate these needs, and must support those who choose the path of science and related fields.

In conclusion, I am reminded of an old Swahili proverb, which says, “The prayer of the chicken hawk does not get him the chicken.” So let me leave you with a challenge: How will you contribute to this complex formula for success in a diverse society? Will you let others define your models of success? Or will you work to expand our universe, to create a future of productivity and mutually beneficial opportunities?

As I stated earlier, one of the basic elements required for minority communities to reach their full potential involves individuals who are motivated from within, who can tap into an inner source of strength—comprised of passionate interest, personal ambition, staying power, and multicultural awareness. Our vision must be clear enough to understand the challenges of a restricted universe, strong enough to produce the hard work needed to push back its edges by creating new models of success, and enduring enough to produce stability and continued progress once that success has been achieved.

Remember: “The Prayer of the Chicken Hawk does not get him the chicken.”

Thank you for your attention.