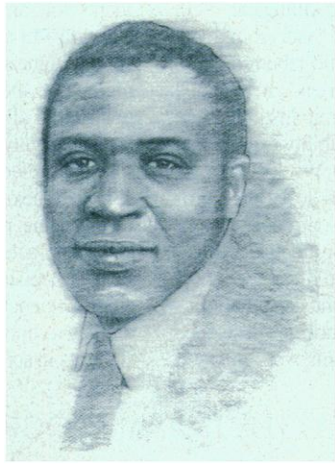
AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

150 YEARS • 1848-1998

# SCIENCE AND OPPORTUNITY



KENNETH R. MANNING *is Thomas Meloy Professor of Rhetoric and of the History of Science at MIT. His biography,* Black Apollo of Science: The Life of Ernest Everett Just *(Oxford University Press, 1983), won the Pfizer Award of the History of Science Society. He is writing a social history of African Americans in medicine.*

In a speech entitled "Science, Education and Democracy," delivered at the 1913 annual meeting of the American Association for the Advancement of Science (AAAS) in Atlanta and published a month later in *Science* magazine,* J. McKeen Cattell, owner and editor of *Science,* declared—while arguing for educational opportunities for blacks—that "There is not a single mulatto who has done creditable scientific work."

This myth was common in the white world of science, which found it easy both to accept and perpetuate the notion that African Americans had never done any worthwhile scientific work. Among those unacknowledged were the 18th-century mathematician and astronomer of African-American descent Benjamin Banneker, who had sent his scientific work to Thomas Jefferson who in turn publicized it in the United States and abroad; Edward Bouchet, one of the first African Americans to receive a doctorate in the United States—in physics from Yale University in 1876; and Charles Henry Turner and Ernest Everett Just, who had been publishing scientific articles in major journals for several years before Cattell delivered his speech.

It was left to black intellectuals such as W. E. B. DuBois to take issue with this myth, especially since no objections came from white scientists, not even from liberal-leaning ones like Jacques Loeb, a friend of Cattell's. DuBois's criticism of Cattell in the pages of *The Crisis*,† the official journal of the National Association for the Advancement of Colored People (NAACP), was one of the factors that led the NAACP a year later to create the Spingarn Medal, an award slated for a male or female of African descent "who had performed the foremost service to his race." The first award, serving as a conspicuous counterexample to Cattell's pronouncement about the lack of achievement by blacks in science, went to the rising biologist Ernest Everett Just.

Cattell's type of sweeping generalization about what a race has or has not done in science is rarely, if ever, heard today. The scientific community has, by and large, moved beyond such crude, unsubstantiated myths. The change of attitude first became evident in the 1920s, when research results of African-American scientists began more often to appear alongside their white counterparts in the various professional journals, as blacks began, in greater numbers, to participate in scientific communities at the Marine Biological Laboratory in Woods Hole, MA, and elsewhere.

World War II brought further opportunities. At Los Alamos and at the universities and research laboratories involved with the Manhattan Project, many white scientists witnessed for the first time black scientists joining their community in closer, more integral ways. Blacks who worked together with whites on the atomic bomb included physicists Edwin R. Russell and George W. Reed, as well as the chemists Moddie D. Taylor and the brothers William J. and Lawrence H. Knox. The eminent white physicist Arthur Holly Compton remarked that the bomb project was unique in bringing together "colored and white, Christian and Jew" for a common purpose.

However, while African Americans were clearly doing creditable scientific work, they were still not full-fledged members of the scientific community. After the war African Americans in science continued their tradition of working at historically black universities, barred as they were from holding faculty positions at most white research and teaching institutions. This pattern continued through the 1950s, well beyond the legal end to segregation in the landmark *Brown v. Board of Education* case. Black scientists attracted young black students into the various scientific fields at black colleges and universities, institutions that had limited resources for scientific research. Herman Russell Branson and Warren Henry of Howard University, S. Milton Nabrit and Henry C. McBay of Morehouse College, and James R. Lawson and Samuel Massie of Fisk University all served as inspiring mentors to students who went on to earn doctorates at white institutions in the late 1950s and 1960s. The scientific community owes this cohort of pioneering mentors of black students a great debt.

In the early to mid-1960s additional opportunities began to open up in science. These were the consequence, in part, of the social and political upheavals in the United States—the sit-ins and demonstrations in the South by young black college students, the March on Washington, and the passage of federal civil rights legislation. While universities began to admit more African Americans as undergraduates, some of whom entered scientific fields, the scientific community was mostly a passive beneficiary of these developments. Little, if any, progressive action to integrate blacks into higher education or to bring them into the mainstream of the scientific enterprise emanated from the professional ranks of science. That is not to say that some individual white scientists did not join blacks on the freedom rides in Mississippi, Alabama, and other parts of the Deep South. During the last half of the 1960s, political activists on college campuses throughout the country questioned not so much science itself as its uses and abuses. African Americans, some of them pursuing science as a career, were part of this group. As aspiring scientists, they worked to balance their political commitments and their career goals. It was sometimes difficult for them to explore Banach spaces in mathematics classes or repeat Arrhenius's experiments on the

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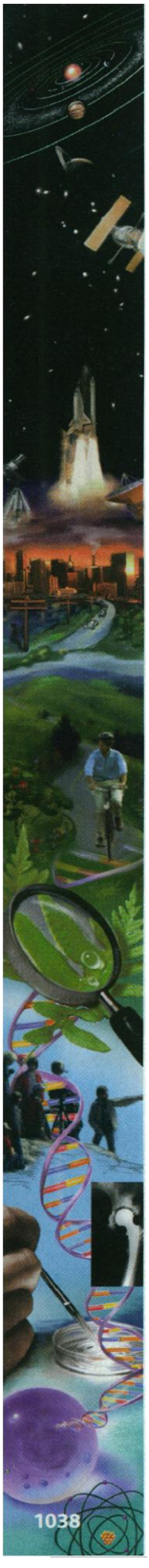
*Science **39**, (no. 996), 154 (1914). †*The Crisis* **9**, 81 (1914). ‡*Science* **258**, 1177 (1992). *Ibid*, pp. 1057–1276.

ILLUSTRATION: ALLAN M. BURCH



conductivity of electrolytic solutions in the chemistry lab while demonstrations against Dow Chemical Co., the Vietnam War, and the killing of black students at Jackson State proceeded apace.

There were university-wide strikes during two spring terms of my four college years—strikes protesting the Reserve Officers' Training Corps (ROTC) and police brutality on campus in 1969, and the invasion of Cambodia and the Kent State killings in 1970. Many young scientists became part of the strike leadership, leaving the protected sanctity of their classrooms and laboratories to organize, march, and fight for justice. This experience heightened their awareness of the role of science and academic institutions in perpetuating past inequities, and of their responsibility to stimulate transition to a fairer and more equitable society. While some potential scientists from this group were ultimately lost to the profession through disillusionment and other reasons, others were able to balance politics and career, pursuing productive change within their fields on matters of race, access, and diversity.

Beginning in the early 1970s, American scientists and administrators attempted to increase the number of minorities in science and engineering fields, and intervention programs were initiated to further this mission. These national, regional, and local programs, many of which have survived into the 1990s, have sought to open the door for more African Americans, Hispanics, and Native Americans to share in the scientific endeavor. Individually conceived and implemented, each program has a story that needs to be told.

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In 1992 Walter Massey, the second African-American director of the National Science Foundation (NSF), declared that "a host of programs have been conceptualized, touted, and funded—and largely, they have not made much of a difference."‡ He, and especially his colleague Luther Williams, asserted that these programs had failed. Their characterization, perhaps correct as it relates to increasing the number of blacks in science, seems not to speak to a qualitative assessment of the intervention programs—how they related, for example, to the experiences of individual participants. To determine this, educators and policy makers need first to know exactly what happened, when, and to whom. Fortunately, because a number of these programs still exist and are ongoing, we are able to capture both their past and current status, and shape their future.

Since the 1970s, scientific organizations, universities, and learned societies have opened their membership to include more minorities. The AAAS, for example, established the program "Opportunities in Science" in 1972 to tackle the problem of minority underrepresentation. Still, the representation of African Americans in scientific careers hovers around 2 percent, which leaves much to be desired. We now realize that there is no quick fix. The systematic and comprehensive development of a scientific legacy for African Americans will require time and a concerted effort all along the educational pipeline, from preschool through graduate school. Unfortunately, counselors and teachers—not all white—sometimes steer young black students away from the rigorous scientific and mathematical courses required for future training in science. When these students do survive elementary and high school and find themselves at prestigious white institutions, some are confronted with professors with lower expectations for their performance than for that of white students. Such paternalism is detrimental not only to African Americans, but to whites as well.

Universities have a special role to play in bringing blacks into scientific fields, since these institutions serve as filters for entry into the professional world of science. At the undergraduate level, college admissions are carried out by administrators who, guided by institutional goals of producing a diverse student body, have had some success in increasing the potential pool of African-American students for careers in science. At the graduate level, however, admissions are handled by faculty in the academic science departments who are not necessarily motivated by the same institutional commitment and who produce less impressive recruitment results. At the highest professional level, as faculty, the recruitment, appointment, and promotion of African Americans is the most disappointing of all. The reasons are complex and varied, ranging from lack of faculty expertise in performing the necessary recruitment tasks to a reluctance by some to change the complexion of science at the most exalted level. This juncture is a focal point along the career pipeline, perhaps the only remaining place where total and absolute self-selection into a bastion is still practiced.

The decisions of science faculty are therefore critical in diversifying science and engineering fields. In order to invigorate initiatives to build and sustain a critical mass of African-American students in science at both the undergraduate and graduate levels, more African-American science and engineering faculty need to be recruited. Since recruitment efforts for such faculty are often driven by central-office administrators with less than enthusiastic support from faculty, these efforts are frequently doomed from the start because they create tensions between faculty prerogatives and administrative goals. Because appointment, promotion, and tenure are faculty matters, an increased presence of African Americans and other minorities in academic departments depends principally on decisions made by majority faculty. Science faculty members must, therefore, be convinced of the appropriateness and rich advantages of bringing into their fields members who are not necessarily reflections of themselves.

When Dr. Massey was guest speaker at the MIT commencement ceremony in June 1991, 3 years after he had served as president of AAAS, I eagerly awaited his views on the subject of race and science. But he said nothing in this speech about opportunities—or the lack thereof—for African Americans in science. As the second African-American director of the NSF addressing a captive audience of scientists, students, and parents, he missed a unique opportunity. Silence on the topic left the impression that all was well in the world of science.

A year later a special issue of *Science* magazine entitled "Minorities in Science: The Pipeline Problem"§ was published. Devoted to the subject of increasing the pool of African-American scientists, it featured the success story of Massey and others who had benefitted from special mentors in their early education. Here Massey wrote forcefully and eloquently on the subject of blacks and their ongoing struggle for opportunities in science.

The efforts of individual scientists, universities, and professionals are essential if we are to approach the 21st century with any hope of creating a diverse scientific community. Despite the current political atmosphere and the arguments against interventive efforts emanating from recent works such as Richard J. Herrnstein and Charles A. Murray's *The Bell Curve* (1994), and Stephan and Abigail Thernstrom's *America in Black and White* (1997), we must continue the struggle to diversify the world of science and to encourage and enable all who wish to enter it. Increasing diversity will require time and commitment beyond lip service, and courage in the face of political detractors.

ILLUSTRATION: TERESE WINSLOW