

African Americans in Science

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Abstract

This essay focuses on the roles and experiences of African Americans in science. Two major themes are explored: the emergence of African Americans as working scientists and as members of the scientific community; and the evolution of race and racial attitudes and theories in science and in the scientific community, and the ways in which these attitudes and theories have influenced and shaped not only views within science but also views in the larger society. The convergence and interaction of these themes are also explored.

This essay also focuses on the numerous contributions of African Americans to medicine or technology. Inventors and their lives are not included for discussion, except by way of example and only in passing. The history of patents, therefore, falls outside of the purview of this essay. My portrayal of medical science and medical scientists is to be distinguished from the various histories of medical practice and medical practitioners. These topics have traditionally captured the attention of scholars and writers for a much longer period than those writing on African Americans in science per se. Historians of science and other scholars and writers have just begun in the last three decades or so to explore the topic of blacks in science.

Scholarship on blacks in science differs from that on blacks in technology and medicine, largely due to the nature of the contributions in the different fields. Blacks working in technological fields have usually been inventors who developed products that are often patented and reported in technical journals and the popular press as well. These inventions are the subjects of much of the historical discussion of blacks in these fields, as the idea or patent is usually portrayed or associated with an individual African American or a group.

Blacks in the history of medicine are similar in many ways to blacks in the history of technology, except that there is a much stronger tradition of blacks in American medicine, owing to the systematic effort since the middle of the nineteenth century to produce a quota of African American physicians each year. The history of African Americans in medicine is about that group of men and women and their careers as individuals and as a group. As practitioners, in general they have not involved themselves with scholarly tradition or with scholarship and scholarly publication. The influence of these doctors has been recorded in their day-to-day practice of medicine and in their struggles for professional opportunity within an essentially segregated health care system in this country.

The work of black scientists, on the other hand, is usually embedded in a body of scientific work and tradition that produces no tangible product and is often removed from public notice. A few black scientists have achieved the public arena, having made "discoveries," as such, within their fields that are associated with their names. Many African American scientists have, however, made considerable and important contributions to a body of scientific knowledge, working within a scientific tradition and often challenging it as well, that are not to be characterized in summary form for public appreciation. Such portrayals demand sustained and detailed accounts in the form of biography and social and intellectual history. Nonetheless, this essay attempts to convey the rich variety of the work carried on by African American scientists since the founding of this country.

African Americans in the World of Science

The scientific community has, for the most part, been white and male, characterized by the image of a white male working long hours in an isolated laboratory. Yet throughout modern history there have been many African Americans whose life histories and struggles have enlarged the professional ranks of science—individuals who have sought to become part of the larger scientific community. Many have been attracted by the concepts of science itself; few had explicit political or social reasons for pursuing their various careers. Each one's story has moved science toward a more diverse, multicultural enterprise. The world of science mirrors some of the same tensions and forces that have shaped human and civil rights struggles throughout the world.

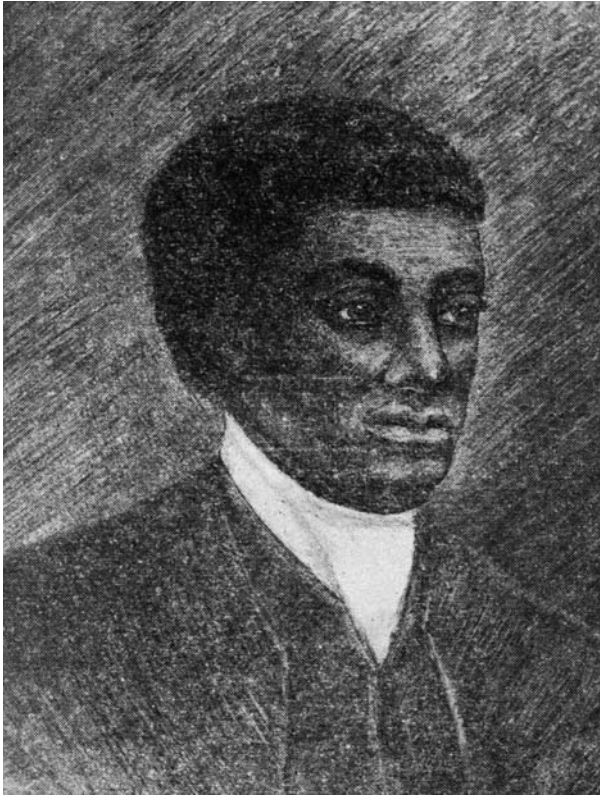
Eighteenth-century Europeans had some experience with blacks pursuing science and other disciplines in their universities. For example, Francis Williams studied mathematics and Latin at Cambridge University in the early eighteenth century. Williams, a free black born in Jamaica in 1702, had been supported by the Duke of Montagu, who had an ongoing interest in the sciences and wanted to show that blacks were endowed with the same intellectual faculties as whites. Other educated blacks in eighteenth-century Europe included Anthony William Arno, a native of Guinea, West Africa, who earned a doctor's degree at the University of Wittenberg around 1730; Job Ben Solomon, a Fula slave and leading Arabic scholar, who worked in London in the early 1730s with the noted English botanist and physician Sir Hans Sloane; and a Monsieur Lislet, who was named a corresponding member of the Académie des Sciences for his skills in meteorological observation.

American scientists of the time were, by contrast, far less advanced than their European counterparts. Nonetheless, some Americans were members of the Royal Society of London and in general part of the European scientific community as foreign or corresponding affiliates. The eighteenth-century American statesman of science Thomas Jefferson found himself in the position of having to defend his countrymen and women against the accusations of the Comte du Buffon and other Europeans, who charged that nothing of cultural or biological worth existed in the New World.¹ In his *Notes on the*

State of Virginia, Jefferson praised the mathematical and astronomical work of Benjamin Banneker as worthy of serious attention.² Banneker, a free black living in Maryland, did not attend or have an affiliation with a university, but he was widely recognized, within national borders, as a leading American scientist of his day.

During the 1790s, Banneker pursued scientific research, published almanacs, and calculated astronomical predictions.³ He had already, in 1791, served as part of the team of surveyors and engineers who contributed to the layout of the city of Washington. Alongside his publications on science, he spoke out on the issue of the equality of blacks. He told Jefferson that his own accomplishment was proof that blacks did not possess inferior minds and that his work should pave the way for emancipation of the slaves. Banneker's case is an example not only of the early participation of American blacks in science but also of an early American scientist who assumed a moral voice in science. Jefferson is thought to have sent a letter to the Marquis de Condorcet in Paris in the hope that Banneker's work would be brought to the attention of the Académie des Sciences.

Free blacks constituted the only group of blacks in America who had any chance for exposure to general education and the scientific literature. Mostly concerned with maintaining their own personal freedom, they could merely dream of engaging in scientific work. Indeed, free blacks who pursued higher education did so at New England colleges and tended to concentrate on the traditional disciplines of law, theology, and letters—disciplines that were of immediate practical use in the social and political agenda that consumed much of their attention. Amherst College, Bowdoin College, Dartmouth College, and Oberlin College led the way in accepting black students between 1820 and the Civil War. A few black students pursued qualifications in medicine at places such as Rush Medical College and the Harvard Medical School, but almost no blacks took up science. Thus, by the start of the Civil War no blacks had engaged in pure science, as such, since the time of Banneker at the end of the previous century. African Americans were active in the field of invention, however, as shown by the careers of Thomas L. Jennings, Henry Blair, George Peake, James Forten, Norbert Rillieux, and others who acquired patents.



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Portrait of Benjamin Banneker, scientist, astronomer, and publisher, dated 1791. Born on November 9, 1731 in Maryland, Banneker was a free black who owned a farm near Baltimore. He received a rudimentary education from his grandmother and a Quaker schoolmaster; he learned about astronomy by watching the stars and reading borrowed textbooks. An accomplished inventor, he made a wooden clock in 1761 that kept precise time for more than forty years. The surveyor Joseph Ellicott encouraged his studies, and in 1789 Banneker accurately predicted a solar eclipse. Between 1791 and 1802 he published his astronomical calculations in the *Pennsylvania, Delaware, Maryland, and Virginia Almanac and Ephemeris*. President George Washington was so impressed with his ability that he appointed Banneker to the commission to survey the District of Columbia. When the architect Pierre L'Enfant returned to France with the plans for the city, Banneker was able to accurately reproduce them by memory. Banneker also wrote several essays and pamphlets opposing slavery. He corresponded with Secretary of State Thomas Jefferson in 1791, sending him a copy of his almanac and asking the Founding Father for his aid in improving conditions for African Americans. Jefferson responded politely and shared Banneker's work with European scientists. Banneker died on October 25, 1806, in Baltimore.

African American Scientists after Emancipation

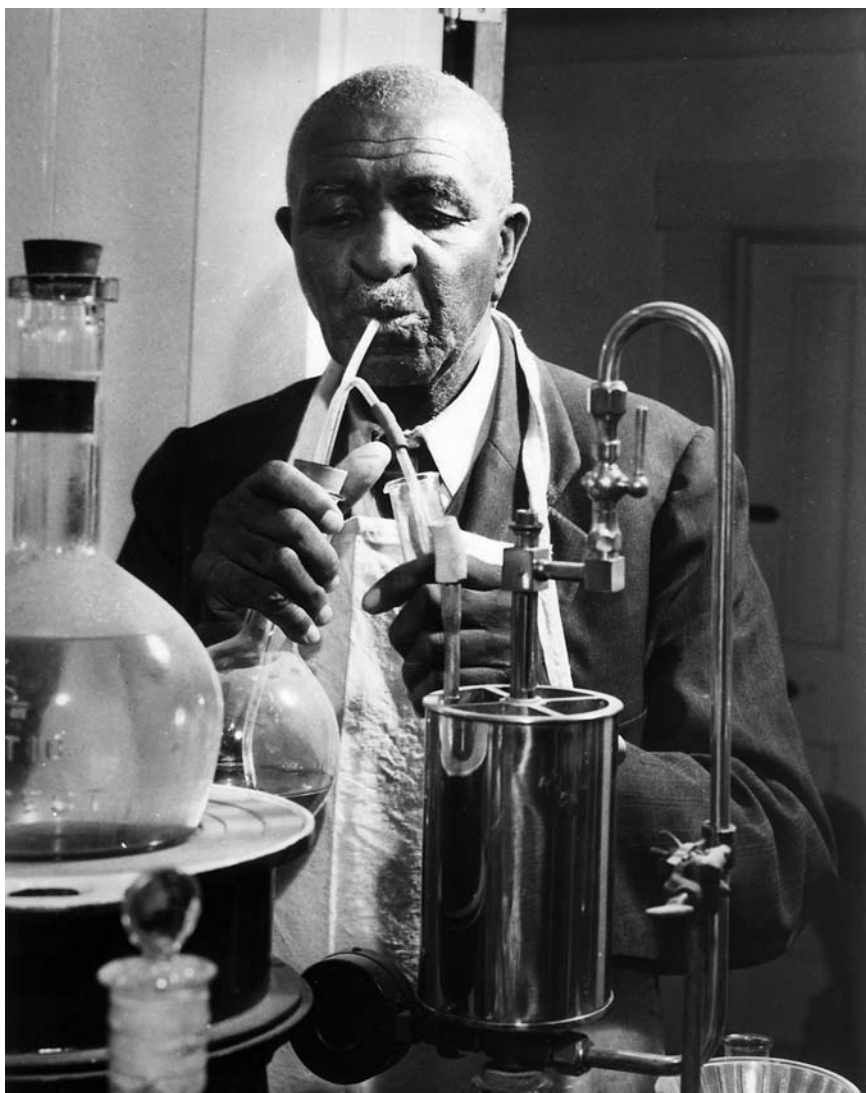
With the Emancipation Proclamation of 1863 came some participation of blacks in the social, cultural, educational, and scientific institutions of the country. The Freedmen's Bureau was set up in 1865 to provide opportunities for former slaves and poor white men and women. It was one of the first formal mechanisms by which blacks as a group benefited educationally and professionally—the only way for most blacks to even begin to participate in scientific activity. Meanwhile, universities such as Howard University (founded in 1866) were taking steps to educate African Americans in the “liberal arts and sciences.” For the first several decades after the Civil War, however, the sciences remained a relatively low priority in the curricula of black colleges and universities. For the most part, the largely white administrations and faculty envisioned blacks primarily as teachers and preachers among their own people. These white educators concluded that the market for black scientists or black science teachers was almost nonexistent; some doubted that blacks could either reason rigorously or exercise adequate conceptual or quantitative skills. Nevertheless, science was a part of the curriculum of black colleges almost from the start. Courses in toxicology, chemistry, physiology, hygiene, and other subjects served as an essential foundation for emerging programs in medicine, dentistry, pharmacy, and other fields. By 1912, almost fifty years after the end of the Civil War, over sixty black colleges and universities had been set up, providing blacks with an essential start in their pursuit of advanced degrees in the humanities and the sciences.

In 1876, the first black to obtain a Ph.D. from an American university, Edward Bouchet, received his degree in physics at Yale University. He was one of the first recipients of any color to earn a Ph.D., the first in America having been awarded just ten years earlier. Bouchet's career did not include research in the sciences; instead, he became and remained a high school teacher of science at the Institute for Colored Youth, started by free blacks in Philadelphia in 1837. Professional opportunities in science were not open to him, though he had worked beside some of America's top scientists, including the eminent physicist Josiah Willard Gibbs at Yale.⁴

It was not until the turn of the twentieth century that a few blacks began to enter the scientific fields. In 1903, three black scientists, all born in 1883,

were about to embark on productive careers in science. William Augustus Hinton, a native of Chicago, went into bacteriology; Elmer Imes, born in Knoxville, Tennessee, became a physicist; and Ernest Everett Just, a native of Charleston, South Carolina, went into embryology.⁵ Each of these scientists sought to enter the mainstream of a white-dominated profession practiced, for the most part, within white research centers and white institutions of higher learning. A little earlier Charles Henry Turner, George Washington Carver, and St. Elmo Brady, and a little later Julian Lewis, Percy Julian, and Charles Drew, embarked on scientific careers.⁶ These men represented the first group of black scientists who received Ph.D.s from major white universities, pursued science at the research level, and published in the leading scientific journals of the day. Prior to the Second World War, their professional lives were almost exclusively tied to black colleges and universities.

Since the early nineteenth century, free blacks had begun moving into the medical profession in greater numbers as an outlet for their scientific interests. Medicine offered a career in which the educational requirements were not as extensive or as demanding as those necessary for a career in research science. Medicine fulfilled, in a direct way, a notion of community service, as expressed in the educational philosophy of Booker T. Washington. Moreover, a medical career for a black was almost invariably carried out in the black community—to clinically treat blacks, to help cure blacks, to protect whites from diseases in the black community. The National Medical Association, founded in 1895, was the black counterpart of the American Medical Association, which until the 1950s effectively barred most blacks from becoming members. Black scientists who emerged in the early twentieth century did not, however, organize as a group. By and large, they pursued their careers as individuals. Science did not fulfill, in any direct way, a notion of community service comparable to medicine. Instead, science epitomized individual academic achievement, as represented by the “talented tenth” of the black race, a notion expressed and espoused by W. E. B. Du Bois.⁷ Nonetheless, the black community recognized science by awarding the scientist E. E. Just its highest honor—the Spingarn Medal—given for the first time in 1915 by the National Association for the Advancement of Colored People (NAACP). The bacteriologist William Augustus refused the award



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African American botanist George Washington Carver (c. 1864–1943) in his laboratory in 1925. He created a crop-rotation system in the Southern states and devoted much of his research to develop uses for the peanut, soybean, sweet potato, and other crops. (He developed more than 300 derivative products from peanuts and 118 from sweet potatoes.) He taught for many years at the Tuskegee Normal and Industrial Institute (now Tuskegee University) under the direction of Booker T. Washington; the Carver Research Foundation was founded with his bequest after he died. He won the Spingarn Medal, an annual NAACP award to honor black achievement, in 1923.