George Washington Carver

Holistic Scientist for the American South

by Harold S. McNabb, Jr.

In October 1896, after finishing work on a master's of science degree in agriculture at Iowa State College of Agriculture and Mechanic Arts in Ames, Iowa, a slightly built, 32-year-old African American man boarded a train for Tuskegee, Alabama, where he had accepted an offer from Booker T. Washington to join the Tuskegee Institute. Iowa's adopted son, George Washington Carver, was carrying a suitcase, a few amaryllis bulbs, and a wooden box containing a microscope, a gift from those he was leaving behind: the townspeople of Ames and the faculty and students of the college.

Those friends and admirers could not understand why he was leaving this mecca of agricultural teaching, research, and extension. What did the 14-year-old Tuskegee Institute offer this bright, young scholar? Who was this Booker T. Washington, who could entice this popular student and now teacher away from their campus?

Little did they know of the inspirational challenge that a devout, motherly woman had given the 12-year-old boy, called Carver's George, some 20 years earlier. He had to walk eight miles to Neosho, Missouri, to attend Lincoln School, the closest African American school to his original home in Diamond Grove, and so Mariah Watkins and her husband, Andrew, took him in. Born near the end of the Civil War in southwestern Missouri, he had been raised since he was a baby by Susan and Moses Carver, who had owned his mother and her children as slaves. "Aunt" Mariah told the boy that he was now free, and therefore should call himself George Carver. (Later, he acquired the middle initial W. when his mail was confused with another George Carver; and later still, the W. became Washington when he was asked what the letter represented.) At the African American school at Neosho and under the care of African American "parents," as Carver for the first time was immersed in African American culture, he awakened to the needs of his people. Mariah Watkins challenged him always to search for knowledge but to take that knowledge to serve others, especially those of his race who were suffering as an outcome of the Civil War.

Reaching the point where his knowledge matched the teacher's in Neosho, Carver left for Kansas in the late 1870s with a family traveling to Fort Scott. After witnessing a brutal lynching of a member of his race, he immediately left for Olathe. There and later in Minneapolis, Kansas, he finished the equivalent of high school. Although he was admitted into the Presbyterian church in Minneapolis, he was turned away from the small Presbyterian college in Highland. He had been accepted by mail, but when he arrived at the school, the president informed him that they did not admit African Americans.

Discouraged, Carver traveled west, taking over a homestead in western Kansas. But the quest for further learning set him wandering again. Eventually he ended up in Winterset, Iowa, where he found true friends who recognized his artistic abilities. Ever since he was a child in southwestern Missouri he had made nature drawings, and he had learned to paint from a fellow homesteader in western Kansas. A Winterset family, the Milhollands, recognized his talent and encouraged him to enroll in Simpson College in nearby Indianola. His art instructor there, Etta Budd, considered Carver a natural artist, but she questioned whether a black man could make a living in the arts. Since she had also seen evidence of his "way with plants"—he sometimes brought her plants that he had cross-fertilized or grafted—she recommended that he transfer to Iowa State College, where her father was professor of horticulture, to study agriculture.

So, in April 1891, George Washington Carver arrived in Ames. Iowa State College was a leader in agricultural education and research. The college was the first one established as a result of the Morrill Act of 1862.

George Washington Carver devoted his life to Tuskegee Institute. He began his career in scientific agriculture in Iowa.

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Carver's love of nature was reflected in his artistic talents as well as in his scientific research.

And thanks to that act and its successors—the Hatch Act of 1887, which provided funds for agricultural experiment stations, and the Morrill Act of 1890, which expanded land-grant appropriations—the study of agriculture had become a recognized scientific discipline.

From 1891 through 1896, Carver was mentored by some of the agricultural greats of the day: "Tama Jim" Wilson, Henry C. Wallace (both future U.S. secretaries of agriculture), J. L. Budd, and, above all, Louis Pammel, professor of botany, whom Carver termed "his great mentor and friend." As the only African American on campus, life was not easy for Carver. At first, the dining room manager made him eat in the basement, and living arrangements were embarrassing until some faculty offered him a room in an old office. And he had to work at menial tasks to earn money for his expenses. Eventually, however, Carver's wide-ranging abilities and activities and his warm personality won students over, and many made special efforts to include him in their activities. Moreover, his ability to raise, cross-fertilize, and graft plants won him the respect of the faculty. He graduated in 1894 with a thesis titled "Plants as Modified by Man." The faculty then persuaded him to pursue postgraduate work. He received a teaching appointment and was put in charge of the campus greenhouse, freeing him from the menial jobs he had pursued as an undergraduate to make ends meet.

He also earned the admiration of another future U.S. secretary of agriculture: "little Hank" (Henry A.) Wallace, who was just eight years old when Carver left Ames. Hank's father, Henry C., was the dairy professor on campus. Carver and the boy, Henry, hiked the bogs and fields around Ames together, collecting plant disease fungi (one of Carver's research specialties) and plant specimens. In the greenhouse, Carver taught young Henry how to breed plants. Although, with the Wallace family background, Henry was destined to become an agricultural pioneer, Carver's mentoring was certainly a catalyst for the boy's future.

The Iowa State period in Carver's life shaped his future. His studies exposed him to the organization found in the natural and physical sciences, and to the "hands-on" method of teaching students and farmers, and awakened him to the potential he possessed for serving his fellow humans. Above all, he reaffirmed the holistic approach to problem solving that he had been developing since his boyhood days exploring the fields and stream banks in southwestern Missouri. Thus, when he had a chance to serve humankind, and especially his race in "Black Belt Alabama" at a school led by a person who had the same philosophy and goals as his, he decided to bring the new "scientific agriculture" to Tuskegee.

Plant breeding and mycology (the study of plant fungi and disease) were undeveloped, experimental branches of the relatively new discipline of the scientific study of agriculture in the 1890s. Carver's studies at Iowa State, complemented by his own innate abilities and interests, prepared him well to engage in the kind of scientific experimentation in these embryonic fields that characterized scientific agriculture. In the Tuskegee Institute's laboratories and in the fields of its experiment station, he conducted countless demonstrations and experiments that would enable him to make significant contributions to this new field of study. But his education and life experience at a white institution of higher education in Iowa did little to prepare him for the real-life challenges he would face at an ill-funded African American institution of higher learning in the midst of Alabama's Black Belt.

He never conceived how poor the conditions would be in that vicinity. After his first trip into the countryside around Tuskegee, he came back to Booker T. Washington and described what he had seen and heard as the "lowlands of sorrow." He began to think that the

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Soil worn out from cotton and farmers worn out by economic servitude disheartened Carver when he came to Alabama. In simple, nontechnical words, he taught farmers how to apply scientific ideas, so "the man fartherest down can get hold of it."

challenges that Mariah Watkins had given him 22 years earlier might be too hard to meet. But he did meet them. Over the next four decades, he led the revolution in southern agriculture from the "lowlands of sorrow" to the highlands of pride and joy.

George Washington Carver's work during those years is often reduced to accommodate his identification throughout the world as the "peanut man." But there is much, much more to this great scientist and humanitarian than his work with the peanut: his faith, his mysticism, his service to others, his love of plants, his love of the natural world, his lack of materialism, his belief that there is "no such thing as waste," and his non-violent attitude. In fact, his holistic integration of science, mystical love of nature, religion, and humanitarianism are what make it worth the effort to understand him.

What Carver saw in the "lowlands of sorrow" was an agricultural way of life that depended on one non-food crop, cotton; a very non-sustainable agricultural land system; terrible human nutrition; and a serf-like economic system—all of these robbing people of pride and hope. The results of the Civil War had produced another form of slavery, economic slavery. Therefore, both Carver's teaching at the institute and his outreach to farms around Tuskegee had to bring the new scientific agricultural principles that were being employed at agricultural experiment stations at Tuskegee and across the country into a holistic approach to farm life.

The southern rural social structure was built around the church. This Carver understood and used as he began to work with farmers around Tuskegee. He began attending church with them, going to their homes after church to expound his scientific agriculture ideas, such as crop rotation (using plants that returned nitrogen to the soil instead of cotton that "wore out" the land). Instead of buying fertilizer in town, farmers, he urged, should use compost from the farm. He believed that waste did not exist in nature.

Carver suggested that families could grow some of their own food in kitchen gardens around the home instead of buying all their food in town using their meager profits from cotton. He showed them how to preserve foods for use during winter months. He produced recipes for both old and new field and garden crops. These actions brought a balanced diet to the rural poor.

At the same time, his students were developing experimental plots that showed yield increases with crop

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Working with native clays, Carver developed low-cost house paints for rural southerners. Calling himself a "trailblazer" but not a "finisher," he worked on hundreds of agricultural ideas. To Carver the mystic, they were all connected.

rotation, new crops, and genetically improved crop varieties. Carver continued the field days at Tuskegee that Booker T. Washington had started, exhibiting the results of his students' experiments. By introducing peanuts, cowpeas, soybeans, and sweet potatoes (previously thought to be fit only for hogs) as possible additional field crops, and tomatoes (previously thought to be poisonous) and other vegetables for the kitchen garden, Carver promoted diversification. But with new crops, new markets had to be developed. Carver not only developed new food products from peanuts and sweet potatoes, but began his research in chemurgy, the industrial use of agricultural crops. Carver gained international recognition as the father of chemurgy by developing more than 300 products from peanuts and more than 100 from sweet potatoes. But this was only part of his holistic approach to the dismal condition of southern agriculture.

As Carver saw rural conditions slowly improve, he also saw the need for more joy and pride among rural people. Therefore, he suggested that they add color to their lives by planting flower beds around their homes and painting their homes bright colors with colorful paints that he developed from the Alabama clays and had produced locally.

Although Carver's work on the peanut represented only a small part of his contribution to southern rural life, it is an important symbol of the developments in scientific agriculture at the time. Carver took full advantage of his successes in his research on the uses of the peanut. His name became a byword after his famous testimony before the U.S. House of Representatives Ways and Means Committee in 1921, where he was an advocate for a protective tariff on peanut imports. At the end of his testimony, after he had pulled countless samples of products made from peanuts from his "Pandora's Box" and wittily exhibited their uses, this usually staid audience burst into applause. Texas Representative John N. Garner later recalled the presentation as "one of the most interesting talks I had ever heard before the committee and one of the most effective." Carver's creative testimony humanized scientific agriculture and thus is one of the best examples of the practical role of a scientist in our society. In other words, it is an excellent example of the land-grant university tradition, a tradition Carver experienced both at Iowa State College, founded in response to the original Land-Grant Act in 1862, and at Tuskegee Institute, which began receiving federal funds after the 1890 Morrill Act expanded funding for agricultural research and teaching in predominately African American institutions.

Carver became the spokesperson for the peanut industry, exhibiting products and speaking about the nutritional values embodied in peanuts and sweet potatoes. He also continued to speak before gatherings of young people of the YMCA and the Commission on Interracial Cooperation (CIC). (During his period in Ames, he had participated in YMCA activities, often leading the group.) During the last decade of his life, much of his time was spent traveling and lecturing throughout the eastern and southern states. Carver had a high-pitched, raspy voice, probably from an early bout with whooping cough when he was a baby. Still, he was considered an excellent and personable speaker who used word pictures and "hands-on" examples to mesmerize his audience. He was also a gifted, inspiring teacher and mentor. His YMCA and CIC presentations to young people in the 1930s began to bring racial understanding to youth in a troubled southern society. One former student wrote to him: "You have shown me the one race, the human race. Color of skin, or form of hair

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Iowa State botany professor Louis H. Pammel (in hat) was Carver's friend and mentor long after Carver left Iowa. Carver (right) and Tuskegee president Robert Russa Moton pose here with Pammel and his wife, Augusta, on a visit to Tuskegee in 1928.

mean nothing to me now, but length, and width and breadth of soul and loving kindness mean everything."

One cannot understand Carver fully without understanding his faith in God. From boyhood, he heard God speaking to him through nature. During most of his life, he spent early mornings in the woods and fields listening to God's words. Because he affirmed that God directed all of his research, many have described him as a mystic. Some have wondered how a scientist could attribute his research to guidance by God. In any case, Carver never separated religion and science as many scientists did then and do now. He is often quoted as saying, "How my very soul goes out to people who have not found the first principle of true happiness and Divine love, which must rule the world."

The era in which George Washington Carver lived and worked was a period of great change. Science was changing from being descriptive to experimental. Teaching was becoming hands-on, as laboratories and field trips supplemented lectures. Extension programs were developing for rural areas. Science and religion grew apart as scientific discoveries greatly improved daily life. Carver actively participated in all of these changes except the separation of science and religion, which he fervently endeavored to hold together.

That holistic approach to the rural agricultural crisis in the South of his day was, I believe, his greatest accomplishment. But a footnote should be added to that claim. Carver often said, "I am no great person. I am no great scientist. I have only been able to point the way in a few things. After me will come those who read and interpret the signs, the great of the world. I am only the trailblazer." Carver directly mentored Henry A. Wallace, who helped found the company that started the hybrid corn revolution. He mentored many more students at the Tuskegee Institute. Indirectly, he has mentored countless others who, like me, have been inspired by the way he integrated his teaching, his research, his faith, and his commitment to service. And many of those, like me, have sought to mentor yet others who will exemplify the true meaning of Carver's most famous quotation: "It is simply service that measures success." ❖

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From the author:
As I was first preparing this tribute to George Washington Carver in July of 2002, a plane crash over southern Germany took the lives of 45 gifted students from the city of Ufa, in the Russian republic of Bashkortostan. Among the students was 15-year-old Lenara Khismatullin, a true lover of plants, the world's primary source of food. As a mentor and teacher of young people for all my professional years, I was devastated by the news, yet touched by the act of her father, who took plants that she had planted at their Russian home and planted them at the crash site in southern Germany. I dedicate this essay to the memory of Lenara and her fellow students.

—Harold S. McNabb, Jr.

NOTE ON SOURCES

Much has been written on Carver and his accomplishments, especially in books for children. The two most accurate and useful sources are Gary R. Kremer, ed., *George Washington Carver: In His Own Words* (Columbia: University of Missouri Press, 1987); and Linda O. McMurry, *George Washington Carver: Scientist and Symbol* (New York: Oxford University Press, 1981).

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