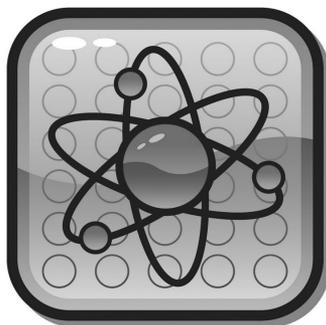


AFRICAN AMERICAN MEN AND WOMEN OF SCIENCE

FEBRUARY 2017



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Introduction

The scientists, doctors, inventors, and educators in this booklet are among the many African Americans who have contributed to scientific learning and advancement. They include the first African Americans to reach academic or scientific milestones, along with brilliant, hardworking people whose scientific breakthroughs moved human understanding many steps forward.

The 29 brief profiles are a sample of innovative and dedicated African Americans who helped their communities and affected the lives of many around them. They include innovators from the early 1800s to today; some are still alive and contributing to new scientific advances.

We hope that this booklet highlights the lives and contributions of some of the models for students of all ages who wish to learn about African Americans' contributions to science, technology, engineering, and mathematics. New generations of thinkers and innovators continue to be trained and stand on the shoulders of giants before them—including those in this booklet.

Alan R. Kroner
Executive Director

Dr. Patricia E. Bath (1942—)*Ophthalmologic Surgeon and Inventor*

Born in New York City's Harlem, Patricia Bath showed aptitude in biology at an early age. At 16, her work in a summer program of the National Science Foundation led her to develop a mathematical equation for predicting cancer cell growth. She finished high school in 2½ years, earned a B.A. from Hunter College in 1964, and received an M.D. at Howard University College of Medicine in 1968.

In the late 1960s, Dr. Bath noted differences in the patient populations of the hospitals she served: blindness among African Americans was nearly double the rate for whites. She concluded that this was largely due to lack of access to ophthalmic care. As a result, she established the new discipline of Community Ophthalmology, now studied and practiced worldwide. In 1976 Dr. Bath co-founded the American Institute for the Prevention of Blindness.

Dr. Bath is a pioneering laser scientist and inventor. Her experience and research on cataracts led to her invention of a new device and method for their removal—the Laserphaco Probe. The tool uses a laser to vaporize cataracts and is used worldwide. It is fast, accurate, and less invasive than earlier surgical methods.

Edward Bouchet (1852-1918)*Pioneering Science Teacher*

Edward Bouchet was born in New Haven, Connecticut. He attended Hopkins Grammar School, a prestigious private school preparing students for Yale College (now Yale University), and graduated in 1870 as its valedictorian. In 1874 he became the first African American to graduate from Yale. In 1876 he earned a Ph.D. in physics from Yale, becoming the first African American to earn a doctorate at an American university.

After graduating, Bouchet taught physics and chemistry for 26 years at the Institute for Colored Youth—one of the few places in Philadelphia where African American students could get an academic high school education. Bouchet was an advocate for improved science education, and gave public lectures on science topics in addition to his regular teaching. After the Institute shifted to industrial education in 1902 (following a then-current trend of directing African American students into vocational training), he spent the rest of his career in other teaching positions in the U.S.

James Bowman (1923-2011)

Biologist, Pathologist, Blood Disease Expert

James Bowman grew up in Washington, D.C. He earned a bachelor's degree in biology and a medical degree from Howard University, and became the first African American resident to train at St. Luke's Hospital in Chicago. He chaired Provident Hospital's pathology department for 3 years before being drafted to become chief of pathology at an army hospital in Denver.

He and his wife later moved to Iran, where he served as chairman of pathology at Nemazee Hospital. While there, he made important discoveries on the genetics of inherited blood diseases and the populations they affect. In 1962 he returned to the U.S. to join the University of Chicago faculty, eventually becoming the first tenured African American professor in its Biological Sciences Division. Along with teaching, he directed the university hospital's blood bank, where he helped detect dangerous abnormalities in donated blood. He directed the university's Comprehensive Sickle Cell Center, and took an active interest in the ethics of mandatory sickle cell screening laws.

Otis Boykin (1920-1982)

Inventor of Pacemaker Regulator

Otis Boykin was born in 1920 in Dallas. After graduating from Fisk College (now University) in Nashville, he moved to Chicago and worked as a lab assistant, testing automatic controls for aircraft. He continued his education at the Illinois Institute of Technology while trying to start a business. Although he did not complete his graduate studies, he worked as an inventor and later founded his own firm, Boykin-Fruth, Inc.

Boykin's inventive work focused on resistors—electronic components that allow a safe amount of electricity to flow through a device. He invented a total of 28 electronic devices. His first patent, in 1959, was for a precision wire resistor that was used in radios and televisions. Two years later he designed an improved resistor that could withstand temperature changes and shock, and was used in guided missiles and computers. Perhaps his best-known invention was a control unit to stimulate heart action and precisely regulate heart pacemakers.

Dr. Benjamin S. Carson (1951—)
Pediatric Neurosurgeon and Politician

Benjamin Carson was born in Detroit. He got a scholarship to Yale University, where he received a bachelor's degree in psychology. He earned a medical degree from the University of Michigan in 1977, and served a residency in neurosurgery at Johns Hopkins Hospital. In 1984 he became the director of pediatric neurosurgery at Johns Hopkins—becoming the youngest person (33) to earn a directorship of a major division at Johns Hopkins.

In 1987 Carson performed the first successful separation of twins conjoined at the back of the head. He did many more conjoined-twin separations, including a 1997 surgery separating Zambian twin boys joined at the top of the head. Carson made the first successful use of an intra-uterine shunt that directed cerebrospinal fluid away from a fetus' brain to save a hydrocephalic twin. He also developed techniques for hemispherectomy in children. He retired from Johns Hopkins Hospital in 2013.

In 2015 Carson announced his candidacy for President. Although considered a major contender early in the campaign, he dropped out of the race in March 2016. President Trump later nominated him to be Secretary of Housing and Urban Development.

George Washington Carver (1860s-1943)
Botanist, Researcher, Educator

George Washington Carver was born into slavery in Missouri in the early 1860s (his year of birth is unknown) to Mary and Giles, a couple owned by Moses Carver. Shortly after his birth he was kidnapped along with his sister and mother by raiders from Arkansas, and was later sold in Kentucky. Moses Carver sent an agent to locate the family, but only George was found. After the Civil War, Moses Carver and his wife, Susan, kept George at their farm, where Susan taught him to read and write. He later went to school in a one-room schoolhouse a few miles away.

Although accepted to a white high school in Kansas, he was refused admission due to his race. In 1888 he got a small educational loan and began studying art and piano at Simpson College in Iowa. A teacher noticed his talent for painting flowers and plants, and encouraged him to study botany at Iowa State Agricultural College in Ames (now Iowa State

University), where the teacher's father headed the horticulture department. Carver was the school's first African American student. He earned a bachelor's degree in 1894, and a master's in 1896.

After his graduation, Booker T. Washington hired Carver to run the Tuskegee Institute's agricultural department. His work there, including research on crop rotation and developing alternative cash crops such as peanuts and sweet potatoes, helped sharecroppers in the South. He also discovered many new uses for peanuts and other crops that he encouraged farmers to grow.

Dr. Rebecca Lee Crumpler (1831-1895)

Pioneering Physician and Author

Dr. Crumpler was born in Delaware but was raised by an aunt in Pennsylvania. In the 1850s she became a nurse in Massachusetts, where her dedication gained notice from her supervisors. She was admitted to the New England Female Medical College in Boston in 1860. In 1864 she became the first African American woman in the U.S. to earn an M.D. She married and began a medical practice in Boston.

After the Civil War, the family moved to Richmond, Virginia. She saw an urgent need for medical care for newly freed slaves in the South. Her reputation for excellent care and hard work spread quickly, and she served that community for several years.

In 1869 the Crumplers returned to Boston, where she continued practicing medicine. In 1883, to educate the public on health, she wrote a book based on her journals and research. Its two volumes, called *A Book of Medical Discourses*, offered women a reference on providing medical care for themselves and their children.

Marie Maynard Daly (1921-2003)*Chemistry Researcher and Teacher*

Daly was born in Queens, New York to parents who were committed to education. She pursued an early interest in science by getting a bachelor's degree in chemistry from Queens College and a master's from New York University. In 1947, at Columbia University, she became the first African American woman to receive a Ph.D. in chemistry.

Her career was dedicated to research and education. She taught college chemistry and did research on cholesterol, sugars, and proteins. Part of her research addressed causes of heart attacks, and helped lead to the discovery of relationships between high cholesterol and clogged arteries. She also was committed to increasing the enrollment of minority students in medical and graduate science programs. In 1988 she started a scholarship fund for African American science students at Queens College. She died in New York City in 2003.

Mark Dean (1957—)*Computer Scientist; Personal Computer and Supercomputer Developer*

Born in 1957 in Tennessee, Dean was a gifted athlete, earned straight A's in high school, and graduated at the top of his class at the University of Tennessee in 1979. He then worked as a computer scientist for IBM, also earning a master's in electrical engineering from Florida Atlantic University and a Ph.D. in electrical engineering from Stanford University. He was named an IBM fellow—the highest technical honor awarded by that company—and inducted into the National Inventors Hall of Fame and the National Academy of Engineers. He is now a John Fisher Distinguished Professor at the University of Tennessee's College of Engineering.

Dean's work was instrumental in developing the personal computer. He has helped develop all types of computer systems, including supercomputers. He was a member of the team that developed the IBM personal computer (earning three of the nine patents on the original IBM PC) and the color PC monitor. Most notably, Dean and a colleague developed the device that allows add-on devices (such as keyboards, disc drives, or printers) to connect to a computer (the ISA "bus"). He also managed the team that tested the 1-gigahertz processing chip, and formed the team that developed the Blue Gene supercomputer.

Dr. Charles R. Drew (1904-1950)

Blood Bank Inventor, Medical Researcher, Surgeon

Charles Drew was born in 1904 in Washington, D.C. He received a bachelor's degree from Amherst College. He briefly taught college biology before entering medical school at McGill University in Montreal, Canada, where he graduated with doctor of medicine and master of surgery degrees in 1933.

In 1938 he received a fellowship to train at Presbyterian Hospital and study at Columbia University in New York City where he developed a method to process and preserve blood plasma. Drew and a colleague set up the first blood bank at Presbyterian Hospital.

In 1940 he was asked to direct a project to collect and ship plasma to war-time Britain. In 1941 he was chosen as medical director of an American Red Cross blood bank pilot project. Initially, African Americans were not allowed to donate. That policy was soon modified to allow them to donate, but their blood was segregated. Drew criticized these policies as unscientific throughout his career.

In 1941 Drew moved to Howard University to teach and direct its department of surgery. He died in 1950 in an accident on the way to a medical conference.

Lloyd Augustus Hall (1894-1971)

Chemist and Food Preservation Inventor

Hall was born in Elgin, Illinois. His maternal grandmother escaped slavery in Alabama through the Underground Railroad; his paternal grandfather was a founder of the oldest African American church in Chicago. At East Side High School in Aurora, he was captain of the debate team and graduated among the top 10 in his class of 125.

Hall received a scholarship to Northwestern University, where he studied pharmaceutical chemistry. He also earned a graduate degree at the University of Chicago. He worked as a chemist for the Department of Health in Chicago, and for several chemical laboratories.

In 1922 Hall became president and chemical director of Chicago's Chemical Products Corporation, a consulting lab. One of his clients, Griffith

Laboratories, asked him to become its chief chemist. At Griffith Laboratories he worked to improve a salt curing process known as flash-drying. He also invented new methods to prevent food spoilage, including using antioxidants. He retired in 1959, but later consulted for the Food and Agriculture Organization of the United Nations and sat on the American Food for Peace Council.

Mary Jackson (1921-2005)

Mathematician and Aeronautical Engineer

Born in Hampton, Virginia, Mary Jackson graduated from high school with highest honors, and earned dual Bachelor of Science degrees in math and physical science from Hampton Institute. After working at several jobs, in 1951 she was hired by the National Advisory Committee for Aeronautics (the predecessor of NASA) in Langley, Virginia.

She began work there as a research mathematician—or what was then called a “human computer.” After 2 years in the computing pool, she got an offer to work on wind tunnel experiments with engineer Kazimierz Czarnecki, who encouraged her to take engineering classes. She was promoted to engineer in 1958, and developed expertise in wind tunnel research and analyzing data on aircraft flight experiments.

However, promotions slowed and she was frustrated by inability to reach a management level. In 1979 she left engineering to become Langley’s Federal Woman’s Program Manager. There she helped hire the next generation of female mathematicians and scientists. Her story was part of the basis of the recent feature film *Hidden Figures*. She died in 2005.

Dr. Mae Jemison (1956—)

Doctor and Astronaut

Mae Jemison was born in Alabama, but grew up in Chicago after age 3. She had early interests in astronomy and biomedicine. After graduating from high school at age 16, she earned degrees from Stanford University in chemical engineering and African American studies. In 1981 she earned a medical degree from Cornell University. She joined the Peace Corps as a medical officer in West Africa and, among other things, did research to develop a hepatitis B vaccine.

After returning to the U.S., she applied and was selected to be a NASA astronaut. She completed training in 1988, and for the next 4 years provided launch support at the Kennedy Space Center. She was the first African American woman in space, participating in the week-long September 1992 mission of the shuttle *Endeavour*. She performed experiments in space motion sickness and bone loss during space flight. She later left NASA, taught at Dartmouth College, and formed a company that researches advanced technologies.

Katherine Johnson (1918—)

NASA Mathematician

Katherine Johnson was born in White Sulphur Springs, West Virginia. Her hometown had no high school, so she attended a laboratory high school on the campus of historically black West Virginia State College. She enrolled in the college itself at age 18 and graduated with highest honors with degrees in French and mathematics. She began teaching at a public school, but then became one of the first three African American students at West Virginia University. After starting a family and returning to teaching, she was hired in 1952 by the National Advisory Committee for Aeronautics (predecessor to NASA) to perform quick calculations.

Johnson was instrumental in developing systems to track spacecraft. She helped design the systems for tracking NASA's first manned space missions and its lunar missions—including the process of syncing the Apollo Lunar Lander with its Command and Service Module. (Astronaut John Glenn reportedly insisted on having her confirm the computer's calculations before taking off in Friendship 7 in 1962.) She was the first woman credited as the author of a NASA research report, and eventually authored or co-authored 26 reports. In 2015 she was awarded the Presidential Medal of Freedom. In 2016 NASA named a new computational research facility after her. Her story was part of the basis of the recent feature film *Hidden Figures*.

Percy Lavon Julian (1899-1975)*Chemist, Medical Researcher, Chemical Synthesis Pioneer*

Percy Lavon Julian was born in Montgomery, Alabama. Although a good student, he could not formally attend high school because no high schools in his area were open to African American students. He entered DePauw University in 1916, and graduated first in his class with a bachelor's degree in chemistry. In 1923 he got a scholarship to finish his master's degree at Harvard University, but Harvard did not allow him to earn a Ph.D. He received a Ph.D. from the University of Vienna in Austria in 1931.

In 1935, while working as a research fellow at DePauw, Julian and a colleague synthesized physostigmine, a plant compound from Calabar beans, which led to a drug for glaucoma. After leaving DePauw in 1936 he began work at the Glidden Company, where he found new uses for substances in soybeans—including a protein used to create a foam fire extinguisher used in World War II. He also synthesized the female and male hormones progesterone and testosterone, and the stress hormone cortisone.

Julian established his own laboratory in 1953 and sold it in 1961, making him among the first African American millionaires. He died in 1975.

Ernest Everett Just (1883-1941)*Biologist and Science Writer*

Born in South Carolina, Just lost his father at age 4. His mother worked as a teacher to support the family. After finishing public school, he attended Kimball Academy in New Hampshire (graduating with honors) and Dartmouth College—the only African American student in his class. He became interested in science and took every biology course there, graduating with highest honors.

He taught English and rhetoric at Howard University before starting graduate study in science. He earned a doctorate in zoology for his work at the Marine Biological Laboratory in Woods Hole, Massachusetts, and researched marine biology there for over 20 years. He became an expert on the egg development of sea life, writing two books and at least 50 papers on cell biology from 1912 to 1937.

Lewis Howard Latimer (1848-1928)

Engineer and Inventor with Edison and Bell

Born in Massachusetts to parents who had escaped slavery in Virginia 6 years before, Latimer showed an early aptitude for drawing. He overstated his age to enlist in the Navy at age 16 in the Civil War. After an honorable discharge, he returned to the Boston area and became an office boy at a patent law firm.

He learned mechanical drawing and drafting by reading books and observing the work of draftsmen at the firm. His employers learned that he had become a skilled draftsman and promoted him to a drafting position, raising his pay from \$3 per week to \$20 per week. While there, he met Alexander Graham Bell, who hired him to draw plans and draft a patent application for an invention called the telephone. He was later invited to work for Thomas Edison, and played a critical role in filing his patent applications. He also testified as an expert witness against persons infringing Edison's patents.

Latimer continued as an inventor and patent consultant until failing eyesight forced his retirement.

Elijah McCoy (1843-1929)

Versatile Inventor

McCoy's parents were former slaves who took the Underground Railroad to Canada, where he was born. His parents sent him to college in Scotland to be trained as an engineer. Few African Americans were hired for professional jobs, so he got work as a railroad fireman/oilman. His job was walking beside a train and oiling its axles, bearings, and other moving parts. Seeing that this could be mechanized, he invented a lubricating cup that automatically oiled moving parts. This device, which he patented in 1872, allowed trains to travel without stopping for oiling.

McCoy received a total of 52 patents, mostly for improvements to steam engines. He also patented a folding ironing board and a self-propelled lawn sprinkler. In 1916 he patented a graphite lubricator and started a company to make it.

Garrett Augustus Morgan (1877-1963)*Entrepreneur and Inventor of Safety Devices*

Born in Kentucky, Morgan received only an elementary education but showed an early aptitude for business. He went to Cleveland at age 18 and found work at sewing machine factories. He received a patent for an improved sewing machine, opening his own sewing machine sales and repair shop. He later opened a tailoring shop, where he accidentally created a hair straightening formula that provided funding for other inventions.

Morgan is best known for two inventions. In 1914 he received a patent for a breathing device (a gas mask) that would be used by firemen and by soldiers in World War I. After he used it to rescue workers trapped by a tunnel collapse, orders poured in—but he had to employ white salesmen, because many orders were cancelled when buyers learned his race. In 1923 he received a patent for another device that has saved countless lives: the traffic signal. Traffic rules for intersections were not well established, and his invention revolutionized traffic control. He later sold rights to it to General Electric.

Valerie Thomas (1943—)*Astronomer and Inventor*

Thomas was born in Maryland and showed an interest in math and science at an early age. Although she was not encouraged to study science, she majored in physics at Morgan State University.

After graduation, Thomas was hired by NASA as a data analyst. In the 1970s she managed the Landsat project—an image processing system that allows satellites to transmit images from space. In 1980 she received a patent for the “illusion transmitter”—a device that uses two concave mirrors to create images that appear three-dimensional. She also helped develop computer program designs supporting research on Halley’s Comet and the ozone layer. She retired from NASA in 1995.

Vivien Thomas (1910-1985)

Surgical Innovator

Vivien Thomas was born in New Iberia, Louisiana and wanted to be a surgeon, but lost his savings due to the 1929 stock market crash. Forced to postpone college, he took a job as a laboratory technician for Dr. Alfred Blalock at Vanderbilt University. Blalock trained him as a surgical assistant, and they conducted experiments on pulmonary hypertension and traumatic shock. Their discoveries about shock and how it is linked to loss of fluid and blood volume saved lives in World War II.

In 1941 Dr. Blalock became chief of surgery at Johns Hopkins Hospital and took Thomas with him. At Johns Hopkins, they and Dr. Helen Taussig developed a procedure to correct a congenital heart defect (tetralogy of Fallot) known as “blue-baby syndrome.” Thomas tested the procedure on animals, and was in the operating room advising the doctors when it was first used on a human in 1944.

Thomas became head of Johns Hopkins’ surgical research laboratory. In 1976 he was appointed an instructor in surgery at Johns Hopkins’ School of Medicine.

Charles Henry Turner (1867-1923)

Educator, Zoologist, Animal Researcher

Born in Ohio soon after the Civil War, Turner developed a keen interest in nature. After graduating as his high school class valedictorian, he enrolled in the University of Cincinnati, where he earned B.S. and M.S. degrees in biology. In 1907 he earned a Ph.D. in zoology with honors from the University of Chicago. He settled in St. Louis in 1908 as a science teacher at Sumner High School, remaining there until his retirement.

He published over 70 research papers based on his pioneering studies in comparative psychology and insect behavior. A number of his experiments were done during his time at Sumner, without benefit of research assistants or dedicated laboratory space. He was the first to prove that insects have the ability to hear. Two of his most famous research projects showed that honeybees can see in color and recognize patterns. He also showed that insects can modify their behavior based on experience.

Neil deGrasse Tyson (1958—)

Astrophysicist, Author, Science TV Host, Teacher

Neil deGrasse Tyson was born in New York City, where he still lives. He graduated from the Bronx High School of Science and earned a bachelor's degree in physics from Harvard University and a Ph.D. in astrophysics from Columbia University. He has studied star formation, exploding stars, dwarf galaxies, and the structure of the Milky Way galaxy.

To help the public appreciate physics, Tyson hosted *NOVA ScienceNOW* on PBS; helped start a radio program and television series called *StarTalk*; and hosted a television series called *Cosmos: A SpaceTime Odyssey*. *Cosmos* won four Emmy Awards and dozens of other recognitions. He received NASA's Distinguished Public Service Medal; has served on two Presidential space exploration commissions; is an advisor to NASA; and has written 10 books and numerous articles. He now heads the Hayden Planetarium in New York City, and is an astrophysics research associate at the American Museum of Natural History.

Dorothy Vaughan (1910-2008)

Mathematician and NASA Programmer

Dorothy Vaughan was born in Kansas City; her family moved to West Virginia when she was 7. She studied math at Wilberforce University in Ohio, then spent 11 years as a homemaker and math teacher at a Virginia high school. After being hired by the National Advisory Committee for Aeronautics (predecessor to NASA), she distinguished herself as a mathematician, computer programmer, and leader.

Vaughan began at NACA in the “West Area Computing” unit—a group of all-black female mathematicians (or “human computers”) who provided mathematical calculations for engineers experimenting with wind tunnels. The group distinguished itself within NACA. After a promotion, she became NACA's first African American supervisor and one of its few female supervisors. She led and advocated for West Computing, and for women in all areas, for nearly 10 years. At NASA she joined a racially- and gender-integrated division and became an expert in the FORTRAN programming language. She worked there on the SCOUT Launch Vehicle Program—one of NASA's most successful launch vehicles. Her legacy and story are the basis of the recent feature film *Hidden Figures*.

James West (1931—)

Inventor

West was born in Virginia and studied physics at Temple University in Philadelphia. He was an intern at Bell Laboratories' acoustics research department during the summers, and was hired there in 1957.

At Bell Laboratories, West collaborated with Gerhard Sessler to create the electret microphone (also called the foil-electret transducer). Their invention was highly sensitive and inexpensive to make. It was patented in the early 1960s and is in about 90% of current microphones, such as those in telephones, baby monitors, and children's toys.

West has 60 U.S. and 200 foreign patents, and has authored many scientific research papers. In 1999 he was inducted into the National Inventors Hall of Fame. He is now a research professor at Johns Hopkins University's Whiting School of Engineering, where he researches ways to improve teleconferencing technology.

Jesse Ernest Wilkins, Jr. (1923-2011)

Mathematician, Nuclear Physicist, Engineer

Wilkins was born in Chicago to an educated family. He entered the University of Chicago at 13, getting a master's degree at 17 and a Ph.D. at 19. After more study at Princeton and teaching at the Tuskegee Institute, he returned to the University of Chicago in 1944 to work in the Manhattan Project. He later worked as a mathematician in various industries; started a Ph.D. program at Howard University; was a Distinguished Fellow at Argonne National Laboratory; and taught at Clark Atlanta University.

Dr. Wilkins published over 80 papers, and wrote over 20 reports for the Atomic Energy Commission. In the Manhattan Project he was a discoverer or co-discoverer of several physics phenomena, including the Wilkins effect and the Wigner-Wilkins spectrum. He helped develop shielding against gamma radiation by creating mathematical models for how much gamma radiation a given material will absorb. He also nurtured future African American mathematicians while at Howard and Clark Atlanta universities. He died in 2011.

Dr. Daniel Hale Williams (1856-1931)*Surgeon and Hospital Founder*

Williams was born in Pennsylvania. His father died when he was young, and he went to live with a family friend in Baltimore. At 17 he rejoined his family, by then in Illinois. There he became an apprentice to Dr. Henry Palmer, a surgeon, and later studied medicine at Chicago Medical School and Northwestern University.

Williams opened a medical practice, and in 1891 founded Provident Hospital—the nation’s first hospital with a nursing and intern program that had a racially integrated staff. In 1893 he performed one of the first open-heart surgeries, on a man with a severe stab wound. The man recovered fully.

Dr. Jane Cooke Wright (1919-2013)*Physician, Scientist, Chemotherapy Pioneer*

Born in New York City, Jane Cooke Wright was a daughter of Dr. Louis T. Wright, one of the first African American graduates of Harvard Medical School. She attended Smith College and New York Medical College, earning a medical degree with honors in 1945.

Dr. Wright began her career as a researcher with her father at a cancer center he established at Harlem Hospital in New York. Together they studied the effects of various drugs on tumors, experimented with chemotherapeutic agents on leukemia in mice, and treated patients with new anticancer drugs. She was among the first to document the correlation between chemotherapy responses in patients and in tissue cultures from biopsied samples from the same patients. These findings showed that such techniques could be used to select chemotherapy agents for a specific patient’s tumor.

President Johnson in 1964 named Dr. Wright to the President’s Commission on Heart Disease, Cancer, and Stroke. The Commission’s recommendations resulted in a national network of cancer treatment centers.

Roger Arliner Young (1899-1964)

Zoology Researcher and Teacher

Young was born in Virginia and grew up in Pennsylvania. She entered Howard University in 1916, but took her first science course in 1921. Her teacher was Ernest Everett Just, a prominent biologist and head of the zoology department (see entry in this booklet). Her grades were poor at first, but Just mentored her and she earned a bachelor's degree in 1923. In 1926 she received a master's degree from the University of Chicago and published an article in the journal *Science*.

Just invited Young to work at the Marine Biological Laboratory in Massachusetts, where they studied the fertilization process in marine organisms. She also taught at Howard University. She returned to the University of Chicago to enter a Ph.D. program, but failed the qualifying exams. She had been caring for a sick mother, and had very little money. But she entered a Ph.D. program at the University of Pennsylvania in 1937, and became the first African American woman to earn a doctorate in zoology. She later held various teaching positions.

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