Publisher's Note

Great Lives from History: American Heroes joins the *Great Lives* series, which provides in-depth critical essays on important men and women in all areas of achievement, from around the world and throughout history. Titles in this series include *The Ancient World, The Middle Ages, The Renaissance & Early Modern Era, The 17th Century, The 18th Century, The 19th Century, Notorious Lives, The 20th Century, Inventors & Inventions, African Americans, The Incredibly Wealthy, Jewish Americans, Latinos, Scientists & Science*, *Asian & Pacific Islander Americans, American Women,* and *Great Athletes.* This new installment extends the series to 18 titles, 64 volumes, and more than 8,000 great lives.

Scope of Coverage

Great Lives from History: American Heroes features 297 biographies, some from earlier Great Lives titles and all reviewed and brought up to date. We've added dozens of brand new biographies of heroic men and women. This three-volume set includes artists, business giants, religious and political leaders, scientists, inventors, educators, and social activists. Each essay has been written specifically for this set, for which inclusion criteria includes historical significance, representation of a wide range of fields of endeavor, relevance to classroom curricula, and appeal to high school, undergraduate, and general readers.

Essay Length and Format

Each essay, 1,000 to 2,000 words in length, includes top matter information:

- **Name** by which the subject is best known, with pronunciation guidelines as needed;
- **Description** of each subject's contributions or occupation;
- **Birth, death dates** and **locations,** as available;
- **Alternative identifications**, such as alternative spellings, pseudonyms, and nicknames;
- **Areas of achievement** with which the profiled subject is most closely identified;
- **Synopsis** of the subject's historical or social importance.

The body of each essay is divided into the following three parts:

- **Early Life** provides facts about upbringing and the environment in which the subject was reared. When details are scarce, historical context is provided.
- **Life's Work**, the heart of the essay, consists of a straightforward, generally chronological account of how the subject gained recognition in their chosen field, emphasizing the most significant achievements in their life and career.
- **Significance** provides an overview of the long-range importance of the profiled subject's accomplishments, and why studying them is important.

Each essay includes **Further Reading**, an annotated bibliography that provides a starting point for further research.

Special Features

- **Editor's Introduction:** Offers an informative, detailed look at heroes and how they have been defined throughout history, in a variety of areas, and through numerous lenses.
- **Sidebars**: Highlight significant, high-point events and accomplishments of the profiled subject.
- **Photographs**: Approximately 650 photographs punctuate the volumes.
- **Complete List of Contents**: An alphabetical list of all of the individuals covered in this set appears in each volume.

Back matter includes the following appendixes and indexes of particular interest to those studying American heroes:

- **Chronological List of Entries** is arranged by year of birth;
- **Alphabetical List of Entries** is arranged by last name;
- **Subject Index** includes people, organizations, events, legislation, court cases, cultural movements, works, and concepts.

CONTRIBUTORS

Salem Press would like to extend its appreciation to Editor Dewayne A. Dean for his invaluable guidance and thoughtful introduction, and to all those involved in the development and production of this work. Contributors include scholars of history, humanities, the sciences, and other relevant disciplines. Without these expert contributions, a project of this nature would not be possible. Editor's bio and list of contributors and their affiliations appear at the end of the third volume.

Aeronautics and Spaceflight

The term aeronautics originally meant *navigation* through the *air* (from Greek *nautikos*, "pertaining to sailing," plus *aero-*, "air"). The word was used to describe travel in hot air balloons—navigating through the air in the days before airplanes were invented. Today *aeronautics* refers to the science of flight in all its forms—from balloons to airplanes to rockets—and to the mechanics of flight. *Aviation,* which has to do with the activity of flying aircraft, is here considered a part of aeronautics.

America holds a privileged place in the history of modern aeronautics. Although balloons were developed in Europe in the eighteenth century, and the technology for gliders was developed in Germany in the nineteenth century, it was primarily in America that machines were first used successfully to assist humans in flight. In the 1890s, Samuel P. Langley, the director of the Smithsonian Institution, tried to add a motorized engine to a flying machine. His steam-powered "aerodrome" was heavy and not very successful in flight, but it paved the way for the work of Orville and Wilbur Wright. On December 17, 1903, the Wright brothers made four brief flights near Kitty Hawk, on the Outer Banks in North Carolina, with the first successful powered aircraft, a plane that they called the Flyer.

In the jet age, American achievements in the field of aeronautics led naturally to achievements in the field of *aerospace*. The Soviet Union during the Cold War devoted enormous resources to winning the "space race" against the United States, and they achieved many of the first milestones in space flight. These include the first human space flight in 1961 (Yuri Gagarin aboard Vostok 1) and the first spacewalk in 1965. Twenty-three days after Gagarin's achievement, Alan Shepard became the first American to reach suborbital space; John Glenn became the first American to orbit the earth nearly a year after Gagarin. Of course, when American astronauts Neil Armstrong and Buzz Aldrin walked on the moon in 1969, America essentially "won" the space race. No other achievement in aerospace, before or since, has been quite as dramatic as that.

Our selection of heroes in aeronautics includes Orville and Wilbur Wright, the duo who flew the first successful airplane, and Chuck Yeager, the first pilot to break the sound barrier. It also includes important women in the field such as Bessie Coleman, the first Native and African American woman to hold a pilot license, and Hazel Ying Lee, a Chinese-American who flew missions for the United States military during World War II. Among the astronauts included here are John Glenn, the first American in space, and Neil Armstrong, who landed on the moon. Also included are Sally Ride, the first American woman in space; Ellen Ochoa, who served on the Discovery and was later the director of the Johnson Space Center; and Shannon Lucid, the woman who once held the record for the longest duration stay in space by an American astronaut.

The space shuttle Discovery *at Kennedy Space Center under a full moon. (NASA)*

Neil Armstrong

Astronaut and aviator

Born: August 5, 1930; Wapakoneta, Ohio
Died: August 25, 2012; Cincinnati, Ohio
Areas of Achievement: Aviation and space exploration, science, invention and technology

Armstrong was the first person to walk on the Moon. He was commander of the Apollo 11 spacecraft, which made the first piloted lunar landing mission in history, and he had an early career as a test pilot.

Neil Armstrong (Wikimedia Commons)

Early Life

Neil Armstrong, the first person to set foot on the Moon, was born on a farm in Auglaize County near Wapakoneta, Ohio. He was the elder son of Stephen Armstrong and Viola Armstrong; his younger brother, Dean Alan, was born in Jefferson, Ohio, and had a long career with the Delco Division of General Motors Corporation at Anderson, Indiana; Neil also had a sister, June Louise. Stephen Armstrong was an auditor for the state of Ohio, and his work took the family across the state to many towns. The Armstrong's moved from Warren to Jefferson, to Ravenna, to St. Mary's, Upper Sandusky, and finally to a more permanent home in Wapakoneta. The Armstrong's were descendants of Scotch-Irish immigrants, while the mother's ancestors were of German background. Neil's father eventually was made the assistant director of mental hygiene and corrections of the state of Ohio.

Armstrong began his formal education in the public schools of Warren, Ohio, where he attended Champion Heights Elementary School. His advanced reading ability (he had read ninety books in the first grade) permitted him to skip the second grade. Known as a shy and modest boy, he played baseball and football with friends and enjoyed school activities.

Influenced by his father, Armstrong had an early interest in aviation. His family attended the National Air Races at the Cleveland airport, and as a six-year-old boy, he accompanied his father in a plane called a Tin Goose (Ford TriMotor) that provided air rides near their home in Warren. During the Great Depression, Armstrong developed a deep interest in building model airplanes, a hobby that soon filled his room with the smell of glue and balsa wood. He quickly advanced from hobby kits to creating bigger and more powerful models of his own, which he tested at the town park. During his high school years, to improve his homemade planes, Armstrong built a seven-foot-long wind tunnel in the basement of his family's house. He was also an enthusiastic fan of science fiction, especially that of H. G. Wells.

One neighbor, Jacob Zint, owned a powerful telescope and often invited youngsters to look at the Moon, stars, and planets. Armstrong remembered these stargazing experiences as awe inspiring and began more study of the universe. He loved to learn; his schoolbooks, which his parents saved, reflect his thorough study and wide reading in the fields of science and mathematics. With his collection of the popular *Air Trails* magazine, he kept pace with aviation advancements. As a high school student, at the age of fifteen, he worked in stores to earn enough money to take flying lessons. On his sixteenth birthday, even before he had a driver's license, he was granted a student pilot's license. He later said that he had decided to become an aircraft designer and thought that a good designer needed to know how to fly.

Armstrong rode his bicycle day after day in 1946 to the Auglaize Flying Field at Wapakoneta, where flight instructor Aubrey Knudegard trained him to fly in an Aeronca 7AC Champion, built in Middletown, Ohio. The Aeronca Airplane Company had been a pioneer in the

production of light, single-wing aircraft for private flying, and Armstrong learned to fly the plane with skill. Since the initial flights in 1903 of the Wright brothers at Kitty Hawk, North Carolina, the growth of aerospace research had been concentrated at the Wright-Patterson Air Force Base in Dayton, Ohio, and the Miami Valley had become a center of postwar aviation development and testing. Armstrong was flying from a local airfield not far from this national air base. He also became an Eagle Scout in the Boy Scouts of America.

In the fall of 1947, following his graduation from Wapakoneta High School, Armstrong entered Purdue University at Lafayette, Indiana, on a United States Navy scholarship. Enrolled in the College of Engineering, he had completed about two years of study when the navy ordered him to report to Pensacola, Florida, for special flight training. After the outbreak of the Korean War in July, 1950, Armstrong was the youngest member of his unit, Fighter Squadron 51, when it was sent overseas for active duty. He flew seventy-eight combat missions from the flight deck of the aircraft carrier the USS *Essex*. One mission nearly cost him his life: His Panther jet, damaged by antiaircraft fire, nicked a cable stretched across a North Korean valley; with grim determination and skill, he guided the plane back into South Korea before parachuting to safety. Armstrong won three Air Medals for his combat duty. (Author James Michener modeled his classic 1953 novel *The Bridges of Toko-Ri* after Armstrong and some other fliers in the squadron.)

On completion of his navy service in 1952, Armstrong returned to Purdue to finish his bachelor of science degree in aeronautical engineering and was graduated in 1955. On campus, he met Janet Shearon of Evanston, Illinois, who shared his love for flying; their college courtship led to marriage on January 28, 1956. Three children were born to the Armstrong's: Eric, born in 1957, Karen, born in 1959 (she died near the age of three), and Mark, born in 1963.

> *"Mystery creates wonder and wonder is the basis of man's desire to understand."*

Armstrong had by then matured into a handsome aviator with a strong physical stature, standing nearly six feet tall. Reserved in speech but quite able to express himself, Armstrong had keen blue eyes that reflected the intensity of concentration and the good judgment of his mind. Always a good listener, he had absorbed a remarkable amount of information about airborne flight and often drew vital information from that reservoir.

Engineering the Possible

Intensely private and unassuming, Neil Armstrong avoided public appearances after his days as an astronaut, but on July 20, 1999, the thirtieth anniversary of the first lunar landing, he gave a lighthearted speech before the National Press Club in Washington, D.C., on behalf of the National Academy of Engineering. Describing the mission as one of humanity's greatest engineering achievements, he observed that while "science is about what is, engineering is about what can be."

LIFE'S WORK

Armstrong went to work at the Lewis Flight Propulsion Laboratory in Cleveland, serving as a research pilot. After six months at Lewis, he transferred to the High Speed Flight Station at Edwards Air Force Base in California, where he served as an aeronautical research pilot testing many pioneering aircraft, including the X-15 rocket airplane (he took it to more than 200,000 feet above Earth's surface and flew at speeds of nearly four thousand miles per hour), the X-1, F-100, F-101, F-102, F-104, F5D, B-47, and the paraglider. In all, he flew more than two hundred different kinds of aircraft. While in California, he began his master of science degree in aerospace engineering at the University of Southern California, completing it in 1969.

Spurred by the Soviet Union's successful launching of the first Earth-orbiting satellite, Sputnik 1, on October 4, 1957, the United States in 1958 established the National Aeronautics and Space Administration (NASA) to coordinate all space research projects sponsored by the federal government. Soon the United States was sending its satellites skyward, and NASA began training spacecraft pilots called "astronauts" for orbital flights. Explorer 1 became the first successful American data-gathering space satellite, launched in January, 1958. It was Soviet cosmonaut Yuri Gagarin, however, who became the first human in space orbit, in April, 1961, aboard the Vostok 1; the United States sent its first piloted capsule into suborbital flight in May, 1961, with Alan B. Shepard, Jr., flying in

Freedom 7. That month, President John F. Kennedy, in an address to Congress, called for the nation to land the first person on the Moon by the end of the decade, a goal that was achieved.

While still working at NASA's facility at Edwards Air Force Base (consolidated into NASA), Armstrong applied to be one of the United States' astronauts. The requirements favored men from military units, but Armstrong was accepted in 1962; he was the first civilian admitted to the astronaut program by NASA. The Armstrongs moved to El Lago, Texas, and Armstrong joined the nation's second recruit class of astronauts in training at the new NASA Manned Spacecraft Center in Houston for a two-year intensive program of classroom study and training for space travel.

NASA developed three space programs while Armstrong worked as an astronaut. The first, designated Project Mercury, was to develop the technology and experience to send a person into Earth orbit. On February 20, 1962, the first piloted orbital flight launched by the United States carried John Glenn as pilot of a three-orbit space trip. The Gemini program, created in 1962, launched a series of two-person spacecraft in Earth orbit during 1965 and 1966, including two unpiloted and ten piloted ventures. Project Apollo, created in 1960, was redirected in 1962 to land on the Moon by 1970, using a three-person crew. Nine crewed Apollo missions of lunar orbit or landings were made by the end of that program in 1972.

Armstrong was assigned as a command pilot for the Gemini 8 mission launched on March 16, 1966. He successfully performed the first docking of two vehicles (one piloted, the other unpiloted) in space. He and David R. Scott found the two crafts pitching and spinning out of control; Armstrong detached their Gemini capsule, and then, as it began to roll even faster, brought it back under control and made an emergency landing in the Pacific Ocean. He also served as commander of the backup crew for Gemini 11 and late in 1966, at the request of President Lyndon B. Johnson, went on a twenty-four-day goodwill tour of South America with other astronauts.

It was as spacecraft commander of Apollo 11, the first piloted lunar landing mission in history, that Armstrong gained the distinction of being the first to land a craft on the Moon and the first to step on its surface, an event that was achieved on July 20, 1969, four days after the craft's launch. Michael Collins served as command module pilot of the *Columbia*, which orbited the Moon while Armstrong and Colonel Edwin E. Aldrin, Jr., aboard the four-legged lunar module called the *Eagle*, landed near the Sea of Tranquillity (at about 4:18 p.m., eastern daylight time) and explored the surface before the rendezvous with the *Columbia* for the return trip.

The next day, *The New York Times* ran the headline, "Men Walk on Moon: Astronauts Land on Plain; Collect Rocks, Plant Flag." Relating one of humanity's most historic moments, a journalist recounted,

> About six and a half hours [following the lunar landing], Mr. Armstrong opened the landing craft's hatch, stepped slowly down the ladder and declared as he planted the first human footprint on the lunar crust: "That's one small step for man, one giant leap for mankind."

His first step on the moon came at 10:56:20 p.m., as a television camera outside the craft transmitted his every move to an awed and excited audience of hundreds of millions of people on Earth.

Colonel Aldrin soon joined Armstrong and, in a two-and-a-half-hour stay outside the *Eagle*, the two set up a camera for live television transmission, conducted seismographic and laser experiments, planted a United States flag, and collected samples of Moon soil and rocks. After

The crewmen of the Apollo 11 lunar landing mission leave the Kennedy Space Center's (KSC) Manned Spacecraft Operations Building (MSOB) during the pre-launch countdown. (Wikimedia Commons)

twenty-two hours, they blasted off to rejoin the *Columbia*, climbed back into the command module, jettisoned the lunar *Eagle*, and returned to earth to splash down southeast of Hawaii and were personally welcomed by President Richard M. Nixon aboard the USS *Hornet*. Nixon said: "You have taught man how to reach for the stars."

For eighteen days after the splashdown, the three lunar astronauts were kept in isolation to avoid any contamination from the Moon's environment. New York City welcomed them with the greatest ticker-tape parade since Charles A. Lindbergh's solo flight to Paris in 1927. At the White House, they received the nation's highest civilian honor: The Medal of Freedom was given to each of them. In the next months, they visited twenty-two nations and were awarded medals and citations from governments and scientific organizations around the world.

Ticker tape parade for the Apollo 11 astronauts. Location is Manhattan, New York City on the section of Broadway known as the "Canyon of Heroes". Pictured in the lead car, from the right, are astronauts Neil A. Armstrong, Michael Collins and Edwin E. Aldrin, Jr. (Wikimedia Commons)

Armstrong was reassigned to the position of deputy associate administrator for aeronautics, Office of Advanced Research and Technology, NASA Headquarters, Washington, D.C. He was responsible for the coordination and management of NASA research and technology work related to aeronautics. Warned in his correspondence with Charles A. Lindbergh of the dangers of fame, he resolutely shunned the limelight and evaded reporters and photographers. From then on his name was among the best known on the planet, but he could travel anywhere without being recognized.

In the fall of 1971, at the urging of his friend, Paul Herget, astronomer and professor of space science, whose work in the field of minor planets and in satellite orbits had won world recognition, Armstrong accepted an appointment as professor of engineering at the University of Cincinnati, an interdisciplinary post he retained until 1980. After their return to Ohio, the Armstrong's lived on a farm near Lebanon, Warren County, where their sons were graduated from high school.

Between 1979 and 1981, Armstrong worked part-time for the Chrysler Corporation and appeared in a national advertising campaign for the Detroit car manufacturer. For a short time, he and his brother Dean owned and operated the Cardwell International Corporation, a producer and exporter of oil field equipment. He later headed CTA, an aviation company based in Charlottesville, Virginia. Sought by many major corporations, Armstrong accepted positions on the board of directors of several companies, including Gates Learjet and United Airlines. In the 1980's, although carefully guarding his schedule, he became a popular speaker at national conventions and trade associations as well as a commencement speaker for many universities, some of which awarded him honorary degrees. He turned down offers from both major political parties to run for office.

Following the explosion of the *Challenger* space shuttle on January 28, 1986, in which seven astronauts lost their lives, President Ronald Reagan named William Rogers chair and Neil Armstrong vice chair of a presidential commission to investigate the causes of the *Challenger*'s failure. For the next six months, Armstrong served as an active member of that commission, appearing on television and before Congress with the chair to report on the findings of the body. After the Rogers Commission disbanded, Armstrong served on the board of directors of Thiokol, the corporation that had manufactured the rocket booster that caused the disaster.

In 1989 he was divorced from Janet. During a golf tournament in 1992, Armstrong met Carol Held Knight; they married two years later. In addition to creating difficulties in his first marriage, his fame sometimes caused him embarrassment and problems. He stopped signing autographs in 1994 after learning that the autographed items were being sold for thousands of dollars on such

venues as the Internet company eBay, and he twice initiated lawsuits against those who used his name, words, or in one case hair without his permission or knowledge. He donated the settlements to charities.

Armstrong retired from business on May 7, 2002, resigning as chair of the board of EDO Corporation, an advanced technology firm serving defense, intelligence, and commercial markets in New York. He had become chair in 2000.

In 2005 a long-standing controversy was revived over what exactly Armstrong had said when he first stepped onto the Moon's surface. He always maintained that he had said "That's one small step for a man, one giant leap for mankind"; however, the "a" went unheard and the resulting statement, seemingly a mere redundancy, was sometimes ridiculed. A computer programmer in Australia, Peter Shann Ford, reprocessed the audio recording with advanced computer equipment and discovered that Armstrong was correct; an "a," only 35 milliseconds long, emerged from the reprocessing. Hidden in the static of the original transmission, the correct version reflected Armstrong's modest attempt to deflect attention from himself and include all humanity in the event.

Honors came early to Armstrong for his moon landing and continued throughout his life. The Boy Scouts gave him the Distinguished Eagle Scout Award and Silver Buffalo Award. He also received the Congressional Space Medal of Honor, Robert H. Goddard Memorial Trophy, and the National Aeronautics Association's Collier Trophy. Many places have been named after him, including a moon crater near his landing site, schools, streets, and, in 2004, the new engineering building at his alma mater.

Significance

When the three astronauts of Apollo 11 addressed a joint session of the United States Congress on September 16, 1969, Armstrong recalled how they had left a bronze plaque on the *Eagle*'s remnants. It declared: "Here men from the planet Earth first set foot upon the Moon. July 1969, a.d. We came in peace for all mankind." Such sentiments reflect the noble convictions of Armstrong: He saw his individual role in the gigantic space exploration mission as that of only one member of the nation's great team; his accomplishment as a victory for the whole of human endeavor: "a giant leap for mankind," "in peace for all mankind." Hence, he was able to return quietly to university and business activities after becoming the world's greatest explorer of all time.

Governor James A. Rhodes led a drive for the erection of a globelike museum honoring Armstrong on the edge of his hometown at Wapakoneta, which houses a vast collection of the awards, citations, gifts, and honors given the Ohio native. As a new American hero, a skillful and courageous commander in the tradition of Christopher Columbus, Ferdinand Magellan, and others, Armstrong confidently walked on the Moon first and confidently returned to work among his fellows. Through it all he remained unassuming about his achievement. He said in 2005, "I was elated, ecstatic and extremely surprised that we were successful."

Paul F. Erwin

Further Reading

Brinkley, Douglas. "The Man and the Moon." *American History* 39 (August, 2004): 26-78. A substantial, enjoyable article that discusses Armstrong's famous reticence and shyness, reluctant participation in the Johnson Space Center Oral History Project, ferocious ability to concentrate on whatever he is doing, and role in U.S. aerospace programs.

Crouch, Tom D. *The Giant Leap: A Chronology of Ohio Aerospace Events and Personalities, 1815-1969.* Columbus: Ohio Historical Society, 1971. A graphic story of human flight from the time of early balloons, aircraft, and dirigibles through to Apollo 11's splashdown in 1969.

Hansen, James R. *First Man: The Life of Neil A. Armstrong*. New York: Simon & Schuster, 2005. Highly acclaimed biography that recounts Armstrong's career in flying, portraying him as a great but reluctant hero.

Mallon, Thomas. "Moon Walker." *The New Yorker*, October 3, 2005. A shrewd, provocative review of Armstrong's career and examination of his character that came out, in part, as a review of James R. Hansen's biography.

Wagener, Leon. *One Giant Leap: Neil Armstrong's Stellar American Journey*. New York: Forge, 2004. A well-researched, balanced, and updated biography of Armstrong.

Westman, Paul. *Neil Armstrong: Space Pioneer*. Minneapolis, Minn.: Lerner, 1980. A preliminary biography of Armstrong in conversational style packed into sixty-four pages with fine black-and-white photographs largely supplied by NASA. Contains an appendix of all United States piloted space flights from Mercury 3 through Project Apollo.