

**5****The Space Race II: A Walk on the Moon**

On February 20, 1962, less than a year after Gagarin's flight, astronaut John H. Glenn, Jr., became the first American to orbit the earth. Glenn's craft, *Friendship 7*, made three orbits in a five-hour period. Seven years later, after much testing and more Earth-orbits by U.S. astronauts, the U.S. space program managed to meet President Kennedy's deadline with months to spare. On July 20, 1969, the Apollo 11 mission placed two U.S. astronauts on the moon. They were Neil A. Armstrong and Colonel Edwin E. (Buzz) Aldrin, Jr. A third astronaut, Lieutenant Colonel Michael Collins, remained in orbit around the moon in the spaceship *Columbia* while Armstrong and Aldrin descended in a lunar module (or LM) named *Eagle*. The dramatic moment when Armstrong first set foot on the moon was telecast live in the United States and 42 other nations. The United States thus showed its ability to meet and surpass the Soviet lead in space technology.

This document is from a book by Aldrin. The excerpt begins with the descent of the lunar module, which was out of radio contact with mission control in Houston while it swung behind the moon.

The moon rolled by silently outside my window. The craters were slowly becoming more distinct as we descended. There wasn't much to do except monitor the instruments and wait for AOS (acquisition of signal). As we got closer, the moon's color changed from beige to bleached gray. The hissing crackle of Houston's signal returned to our earphones. "*Eagle*, Houston," Charlie Duke called through the static. "If you read, you're go for powered descent. Over."

Neil nodded, his tired eyes warm with anticipation. I was grinning like a kid. We were going to land on the moon. . . .

We were just 700 feet above the surface when Charlie gave us the final "go." . . .

Neil . . . wasn't satisfied with the terrain. . . . We scooted across the boulders. At 200 feet our hover slid toward a faster descent rate. . . .

The low-fuel light blinked. . . .

Thirty feet below the LM's gangly legs, dust that had lain undisturbed for a billion years blasted sideways in the plume of our engine.

"Thirty seconds," Charlie announced solemnly. . . .

I stared out at the rocks and shadows of the moon. It was as stark as I'd ever imagined it. A mile away, the horizon curved into blackness.

"Houston," Neil called, "Tranquility Base here. The *Eagle* has landed." . . .

I reached across and shook Neil's hand, hard. We had pulled it off. Five months and ten days before the end of the decade, two Americans had landed on the moon. . . .

Suiting up for the moon walk took us several hours. Our PLSS [portable life-support system] backpacks looked simple, but they were hard to put on and tricky to operate. They were truly our life-support systems, with enough oxygen, cooling water, electrical power, and radio equipment to keep us alive on the moon and in constant contact with Houston (via a relay in the LM) for four hours. On Earth, the PLSS and spacesuit combination weighed 190 pounds, but here it was only 30. Combined with my own body weight, that brought me to a total lunar-gravity weight of around 60 pounds.

Seven hours after we touched down on the moon, we depressurized the LM, and Neil opened the hatch. My job was to guide him as he backed out on his hands and knees onto the small porch. He worked slowly, trying not to jam his backpack on the hatch frame. When he reached the ladder attached to the forward landing leg, he moved down carefully. . . .

The surface was a very fine-grain powder. "I'm going to step off the LM now." . . .

From my window I watched Neil move his blue lunar overshoe from the metal dish of the footpad to the powdery gray surface.

"That's one small step for . . . man, one giant leap for mankind." . . .

One of the first things Neil did on the surface was take a sample of the lunar soil in case we had to terminate our moon walk early.

Now he started working with his scoop and collection box while I set up the metal foil “window shade” of the solar wind collector. The moon was like a giant sponge that absorbed the constant “wind” of charged particles streaming outward from the sun. Scientists back on Earth would examine the collector to learn more about this phenomenon and, through it, the history of the solar system. . . .

Of all the jobs I had to do on the moon, the one I wanted to go the smoothest was the flag raising. Bruce [McCandless in Houston] had told us we were being watched by the largest television audience in history. . . . Just beneath the powdery surface, the subsoil was very dense. We succeeded in pushing the flagpole in only a couple of inches. It didn’t look very sturdy. But I did snap off a crisp West Point salute once we got the banner upright. . . .

Bruce told us that President Richard Nixon wanted to speak to us. . . . The president said, “For one priceless moment, in the whole history of man, all the people on this Earth are truly one.” . . .

Time was moving in spasms. We still had many tasks to accomplish. Some seemed quite easy and others dragged on. It took me a long time to erect the passive seismometer (the “moonquake” detector). . . .

Our liftoff was powerful. Nothing we’d done in the simulators had prepared us for this amazing swoop upward in the weak lunar gravity. Within seconds we had pitched forward a sharp 45 degrees and were soaring above the crater fields.

“Very smooth,” I called, “very quiet ride.” It wasn’t at all like flying through Earth’s atmosphere. Climbing fast, we finally spotted the landmark craters we’d missed during the descent. Two minutes into the ascent, we were batting along at half a mile per second.

*Columbia* was above and behind us. Our radar and the computers on the two spacecraft searched for each other and then locked on and communicated in a soundless digital exchange.

Four hours after Neil and I lifted off from the Sea of Tranquility, we heard the capture latches clang shut above our heads. . . . Soon Mike [Collins] would unseal the tunnel so that Neil and I could pass the moon rocks through and then join Mike in *Columbia* for the long ride back.

## Review Questions

1. Identify:
  - a. *Columbia*
  - b. *Eagle*
2. How many years elapsed between Yuri Gagarin's space flight and the first landing of human beings on the surface of the moon?
3. a. How much did astronaut Edwin Aldrin weigh on the moon with all his space equipment?  
b. Why did Aldrin weigh less on the moon than he did on Earth?
4. Explain the meaning of the following statements in the document:
  - a. "That's one small step for . . . man, one giant leap for mankind."
  - b. "For one priceless moment, in the whole history of man, all the people on this Earth are truly one."
5. How would you describe the difference between Gagarin's space trip in 1961 and the U.S. moon flight in 1969?
6. How was the space race just one area of competition between the United States and the Soviet Union?