

QUEST



THE HISTORY OF SPACEFLIGHT
Q U A R T E R L Y



BETTY SKELTON FRANKMAN, "THE FASTEST WOMAN ON EARTH"

**ASTRONAUT SALESMEN:
SELLING SAVINGS BONDS IN THE
AGE OF HEROIC SPACE FLIGHT**

**ALTERNATE PATHS OF PAPERCLIP:
FRITZ PAULI AND
TRANSNATIONAL KNOWLEDGE TRANSFER**

DENTAL CARE IN SPACE

THE LOST FILM OF AV-4

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COULD HAVE BEEN**

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FRONT COVER CAPTION

The cover photograph of the 2 February 1960 *LOOK* Magazine shows Betty Skelton in a Mercury spacesuit standing by a Mercury capsule mockup and asking, "Should a Girl Be First in Space?"

Credit: Bob Sandberg, *LOOK* Magazine, staff photographer, 5 October 1959, and published in the 2 March 1960 issue. The *LOOK* Magazine Photograph Collection was donated in 1971 to the Library of Congress, Prints & Photographs Division.

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THE MOONWALKERS WHO COULD HAVE BEEN

By Douglas W. Oard

In the three-and-a-half years between July 1969 and December 1972, twelve people walked on the Moon. That fact is well known. What is less well known is that there were at least twelve others who could quite possibly have visited the surface of the Moon. Most people know the story of *Apollo 13*, which was sent to the Moon with the intention of landing. But that accounts only for two of the possible moonwalkers. Who were the others, and what basis do we have for saying that they were possible moonwalkers?

People Who Said No to a Moonwalk

Three astronauts could likely have had a moonwalk just by saying yes when asked if they would be interested in being assigned to one of the lunar landing crews as commander or as lunar module pilot (LMP). However, when they were asked, they said no.

Frank Borman: According to Borman, he elected to retire rather than train in seven months for *Apollo 11*.¹ He informed Donald K. “Deke” Slayton, director of Flight Crew Operations, of his intentions before commanding *Apollo 8*, so he was not actually offered the *Apollo 11* mission. Slayton said that he would have considered sending the *Apollo 8* crew on *Apollo 11* if Borman had been willing.² Borman never flew in space again after *Apollo 8*, his second mission.

James McDivitt: According to Slayton, McDivitt was offered the

LMP seat on the prime crew for *Apollo 13*, with Alan Shepard commanding the mission.³ Slayton said that McDivitt declined the offer. McDivitt, in his NASA oral history, said that he could have had command of *Apollo 13* if he had wanted it. Despite the inconsistency regarding which seat was offered, it is clear that McDivitt declined an opportunity for a moonwalk. The *Apollo 13* and *14* crews were swapped prior to their official assignment, so the mission McDivitt turned down is today known as *Apollo 14*. McDivitt never flew in space again after *Apollo 9*, his second mission.

Michael Collins: According to both Slayton⁴ and Collins,⁵ while training as *Apollo 11* Command Module Pilot (CMP) Collins was offered command of the *Apollo 14* backup crew upon his return from the *Apollo 11* mission. This would have been expected to lead to command of *Apollo 17*. He declined that opportunity, and never flew in space again after *Apollo 11*, his second mission.

Others Who Might Have Had a Moonwalk

Seven astronauts lost a good chance at a moonwalk due to some single event that was beyond their control that might reasonably have come out the other way.

James Lovell: Lovell commanded *Apollo 13*, which had been planned as the third lunar landing mission. That mission failed to land due to an oxygen tank explosion. Lovell never flew in space again after *Apollo 13*, his fourth mission.

Fred Haise: Haise was the LMP on *Apollo 13*, planned as the third lunar landing mission, which failed to land due to an oxygen tank explosion. He commanded the *Apollo 16* backup crew, and was in line for command of *Apollo 19* prior to its cancellation due to budget reductions.⁶ Haise subsequently commanded a Shuttle Approach and Landing Test (ALT) crew, but he never flew in space again after *Apollo 13*, his first and only mission.

Joseph Engle: According to Slayton, he had nominated Engle as *Apollo 17* LMP but that choice was turned down by NASA Headquarters in order to provide an LMP slot for Harrison “Jack” Schmitt.⁷ This would not have been necessary if Schmitt, who was the *Apollo 15* backup crew LMP, had replaced James Irwin to fly as LMP on the *Apollo 15* crew. That option that had been considered (but rejected) at the time as a way of getting Schmitt to the Moon, for which there was considerable political pressure.⁸ Engle eventually commanded two Shuttle missions.

Richard Gordon: Gordon commanded the *Apollo 15* backup crew, and he was in line for command of *Apollo 18* prior to its cancellation due to budget reductions. According to *Apollo 17* commander Eugene Cernan, Slayton also threatened to assign Gordon’s entire *Apollo 15* backup crew to *Apollo 17* if Cernan would not accept Schmitt as his LMP,⁹ an outcome that Slayton said had at least one advocate. Gordon never flew in space again after serv-

ing as CMP on *Apollo 12*, his second mission.

Jerry Carr: According to Slayton, Carr was internally selected as LMP for *Apollo 16* backup crew, which would have put him in line for LMP on *Apollo 19*.¹⁰ Carr was moved to the Skylab program upon cancellation of *Apollo 19*, which occurred prior to the announcement of the *Apollo 16* backup crew. Carr later commanded *Skylab 4*, his only mission.

William Anders: Anders could have landed on the Moon if Borman's crew had been assigned to *Apollo 11* upon their return from the *Apollo 8* mission, since he was the LMP on that crew. Anders did serve as the backup CMP for *Apollo 11*, and according to his oral history interview he was slated for the CMP position on *Apollo 13*, but he chose to take a non-flying job rather than fly as a CMP because he felt it unlikely that there would be enough future missions for him to fly *Apollo 13* and then to train for a landing mission after that.¹¹

Rusty Schweickart: According to Slayton, Schweickart would have been considered as backup LMP for *Apollo 12*,¹² which would have put him in line to fly as LMP on *Apollo 15*. Because of a serious incident of motion sickness during *Apollo 9*, this did not seem to Slayton to be a viable option. Little was known about Space Adaptation Syndrome at that time; it is now known that about one third of all astronauts will experience similar effects during their first few days in space. Schweickart later trained for Skylab missions, but he never flew in space again.

People Who Could Have Walked on the Moon Had They Lived

There were two astronauts who, at the time of their death, were in line for a good chance at a moonwalk.

Virgil "Gus" Grissom: Grissom commanded *Apollo 1*, and according to Slayton he would have been an excellent candidate for command of the first lunar landing mission.¹³ He died in the *Apollo 1* fire after flying two missions, *Mercury-Redstone 4* and *Gemini 3*.

C.C. Williams: Williams was the backup LMP on *Apollo 9*, and was in line to fly as LMP on *Apollo 12*, as Alan Bean actually did after Bean replaced Williams on the *Apollo 9* backup crew. Williams died in a T-38 crash before *Apollo 9* flew, and he never flew in space.

Some Others

Beyond those twelve, there were also at least six other astronauts who might reasonably have been considered for a moonwalk had things worked out differently, but for whom specific plans that would have led to a moonwalk were not actually made:

Thomas Stafford: According to multiple sources, some consideration was given to assigning the first lunar landing to *Apollo 10*, which Stafford commanded.¹⁴ This would have required having the *Apollo 10* crew wait until the *Apollo 11* Lunar Module (which was the first one light enough to land) was ready. It was ultimately decided that flying *Apollo 10* without landing would achieve important objectives and the mission was flown as planned. Stafford later flew again as commander of the *Apollo-Soyuz Test Project*, his fourth mission.

Gordon Cooper: According to Slayton, at the time of Cooper's selection to command the backup crew for *Apollo 10* he had an "outside chance" of being selected to command *Apollo 13*, but that he had not done well in that position.¹⁵ According to Cooper, he was instead offered command of the *Apollo 13* backup crew, which he declined.

Charles Bassett: According to Slayton, had Bassett not died he would have been CMP on *Apollo 8*.¹⁶ This was the slot actually filled by Lovell, who later flew as commander on *Apollo 13* as a result of the normal rotation of CMPs from early Apollo missions to a later landing mission as Commander. Bassett died in a T-38 crash in 1966 while assigned to the *Gemini 9* crew and never flew in space.

Edward White: White was assigned as CMP on *Apollo 1*, but there were no specific plans at the time of the fire for a follow-on mission for him. He was a member of the 1962 astronaut class, for which four of the seven members who survived walked on the Moon (and the other three who survived were all possible moonwalkers). It therefore seems unlikely that White would not have been offered a moonwalk at some point. He died in the *Apollo 1* fire after only a single Gemini mission.

John Bull: According to Slayton, Bull would have been one of his early picks from the 1966 astronaut class as an LMP.¹⁷ Bull was trained as an LM specialist, but he was medically disqualified prior to assignment to a backup crew and never flew in space.

Ken Mattingly: Mattingly was originally assigned as CMP on *Apollo 13*, making him the first CMP from his

1966 astronaut class to be assigned to a mission. He would also have been the first astronaut without prior rendezvous experience to have flown solo on an Apollo mission if *Apollo 13* been flown as planned. Normal rotation would have then made him eligible to command the *Apollo 16* backup crew (which Fred Haise from *Apollo 13* actually did), which would have put Mattingly in line for command of *Apollo 19* (had it not been cancelled for budget reasons). This set of possibilities unraveled early when Mattingly was removed from the *Apollo 13* mission because he had no documented immunity to measles, to which he might have been exposed shortly before the launch of *Apollo 13*. He flew as CMP on *Apollo 16* and commanded two Shuttle missions.

Chance and Choice

No list of possible moonwalkers would attract universal agreement for the simple reason that what we are listing are things that did not happen, and there's no limit to what didn't happen. Other names might be mentioned, among them Roger Chaffee (who died in the *Apollo 1* fire), Walter Cunningham (who was trained as an LMP, but who did not fly again after *Apollo 7*), and Theodore Freeman (who was killed in a T-38 crash before being assigned to a crew). Indeed, almost anyone trained as an astronaut might have eventually flown on Apollo had the program continued long enough. But the mere act of asking what might have happened serves to illustrate that what actually did happen was not foreordained. Rather, the outcomes we see are the process of a chain of events, a few changes to which might equally well have resulted in us remember-

ing the first lunar landing by Grissom and Chaffee, or the last lunar landing by Collins and Bull.

About the Author

Douglas W. Oard is a professor in the College of Information Studies and the Institute for Advanced Computer Studies at the University of Maryland, College Park.

Acknowledgments

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Notes

- 1 Frank Borman with Robert J. Serling, *Countdown* (New York: Silver Arrow Books, 1988), 222.
- 2 Donald K. Slayton with Michael Cassutt, *Deke!—U.S. Manned Space: From Mercury to the Shuttle* (New York: Tom Doherty Associates, 1994) 191, 223.
- 3 Slayton, 236; James A. McDivitt, Oral history interview with Doug Ward, NASA Johnson Space Center Oral History Project, 29 June 1999, 71.
- 4 Slayton, 238.
- 5 Michael Collins, *Carrying the Fire: An*

Astronaut's Journeys, (New York: Farrar, Straus and Giroux, 1974), 343.

- 6 Slayton, 262.
- 7 Slayton, 271.
- 8 Slayton, 273.
- 9 Eugene Cernan and Don Davis, *The Last Man on the Moon* (New York: St. Martin's Press, 1999), 274.
- 10 Slayton, 262.
- 11 William A. Anders, Oral history interview with Paul Rollins, NASA Johnson Space Center Oral History Project, 8 October 1997, 8.
- 12 Slayton, 230.
- 13 Slayton, 223.
- 14 A.C. Merritt, "Review of Apollo Test Objectives Remaining after Mission D," Bellcomm Memorandum NASA-CR-103929, 19 February 1969, 1; Slayton, 223; Arthur L. Slotkin, *Doing the Impossible: George E. Mueller and the Management of NASA's Human Spaceflight Program*, (New York: Springer-Praxis, 2012), 230.
- 15 Slayton, 236; Gordon Cooper with Bruce Henderson, *Leap of Faith: An Astronaut's Journey into the Unknown* (New York: Harper Collins, 2000), 178.
- 16 Slayton, 167.
- 17 Slayton, 212.



Charles Bassett (left), CC Williams (above)
Credit: NASA

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