

Memorial to Thomas A. Mutch

1931–1980

F. DONALD ECKELMANN

College of Arts and Sciences, George Mason University, Fairfax, Virginia 22030



Thomas A. Mutch, known by all as “Tim,” died on October 6, 1980, while descending from the 23,410-foot high peak of Mount Nun in the northern Indian State of Kashmir. Tim left behind his wife Madeline and their three daughters, Patricia, Wendelin, and Margaret; his parents Thomas S. and Mildred Mutch; and a sister, Elizabeth Thomas. He also left behind a distinguished career in geology which led him from studies of the Earth, to the Moon, to Mars, and had his life not ended, to still other bodies in the solar system.

Tim was born in Rochester, New York, on August 26, 1931. As a college student he studied history (B.A., Princeton University). His interest in the outdoors, exploration, and the history of the Earth led him into geology, and he received a M.S. degree in geology from Rutgers in 1957. He continued graduate work at Princeton and received his Ph.D. in geology in 1960. His thesis work was on the Flint Creek Mountains of Montana.

In 1960 Tim accepted an appointment as an instructor in geology at Brown University. In the two decades that followed, he compiled a distinguished teaching and research record. In addition to his normal duties, he served as Assistant to the Dean of the college, Associate Dean of the Graduate School, and Chairman of the Department of Geological Sciences. At the time of his death, Tim was on leave from Brown University, serving as Associate Administrator for Space Science for the National Aeronautics and Space Administration, a position entailing responsibility for the nation’s space science and scientific exploration efforts.

Tim’s life was marked by a deep, abiding commitment to exploration. His first trip west at the age of eighteen seems to have set his taste for exploration. “I came over a pass just east of the Tetons and when the road topped off, I found myself looking at the Snake River Valley and across the Tetons. It blew my mind.” Twenty-seven years later, following the successful landing of two Viking spacecraft on Mars in July 1976, Tim spoke in a similar vein as he described to a standing-room-only crowd in Alumni Hall, Brown University, his reaction to seeing the first close-up view of Mars obtained by cameras he helped plan and design. “The impact was so great that I literally felt I was there. I could feel myself walking out on the surface of Mars. I had worried so long about those particular eyes in the spacecraft that they were almost an extrapolation of my own vision.”

During Tim’s lifetime he explored the Earth as a geologist, conducting field stratigraphic studies for his Ph.D. in the rugged Flint Creek Mountains of Montana, and later, upon arriving at Brown, in the central Appalachians. Then his attention turned to the analysis of small extraterrestrial particles in salt deposits of the Earth as a means of estimating rates of terrestrial deposition. This was followed by an active interest in the use of remote-sensing techniques as a tool for elucidating large-scale features and

relationships. In 1967 Tim began work at the Astrogeological Branch of the Geological Survey in Flagstaff, Arizona, working with the newly available Lunar Orbiter photographs to unravel geologic information on the Moon's evolution in preparation for the Apollo missions to the Moon. From this work came his classic book, *The Geology of the Moon, A Stratigraphic View*.

In 1968 Tim was chosen to be a member of the Viking Lander Imaging Team preparing for the Viking mission dedicated to landing on the surface of Mars in 1976. In due course this led to his being called upon to head the team of scientists and engineers responsible for designing and operating the cameras destined to land on the surface of the planet and return the first close-up pictures from the surface of another planet. Using pictures taken during this mission with these cameras, Tim prepared his book, *The Martian Landscape*. Prior to the actual lander mission, he co-authored an encyclopedic book, *The Geology of Mars*, with four other eminent planetary geologists who had all originally been his graduate students.

In May 1979, having returned to Brown University, he was prevailed upon by NASA to go to Washington to serve as the Associate Administrator for Space Science. His concerns now were for the space shuttle; fly-bys of Jupiter and Saturn, and eventually Uranus and Neptune; promoting the Galileo project designed to send a probe into the atmosphere of Jupiter while an orbiter explores the satellites of the planet; and eventually, manned missions to Mars, more trips to the Moon, and space stations.

It is not surprising that this modern-day explorer sought to share his sense and spirit of exploration with students at his "home" institution, Brown University. His many remarks in and out of the classroom illustrate his views on exploration. "I've always been excited about exploration . . . I believe exploration is the single most important educational experience . . . it's really the search that's important . . . what's fundamental is the quest." Such comments express the flavor of his special "Modes of Thought" course offered as part of Brown's new curriculum and simply entitled, "Exploration." He was convinced from personal experience that a person could not really sense exploration without participating in it. "Only by participating in a journey of exploration can you share in the fundamental mode of thought." So he organized an expedition to climb Devistan, a 21,900-foot high peak in the Indian Himalayas in the spring of 1978. "I can't take you all to Mars but I can show you a little of what it means to explore." These plans culminated in a group of thirty-two people (many were former students in his "Exploration" course) successfully climbing the nearly 22,000-foot high Devistan in the central Himalayas.

Another means of sharing with students the exhilaration of discovery was the Viking Undergraduate Internship Program established by Tim. Four groups of fifteen undergraduate students each worked for a period of one month at the Jet Propulsion Laboratory during the summer of 1976. These students worked with the country's leading scientists, and many were on hand when the first close-up pictures of possible landing sights were received and analyzed and when the spacecraft landed on Mars. The program was so successful that it received a special NASA award and since has evolved into a permanent Planetary Geology Intern Program.

Tim, the explorer, was also an exceptional teacher. President Howard R. Swearer of Brown University said at a memorial service for Tim in Providence, Rhode Island, "If one were to create a composite of the ideal faculty member, all parts could be drawn from the attributes of Tim Mutch."

Early in 1981, in a completely unprecedented event, Dr. Robert Frosch, the Administrator of NASA, dedicated the Viking spacecraft on the surface of Mars as the

“Thomas A. Mutch Memorial Station.” Dr. Frosch unveiled an 8-by-10-inch stainless steel plaque which reads as follows:

Thomas A. Mutch Memorial Station

“Dedicated to the memory of Tim Mutch, whose imagination, verve, and resolve contributed greatly to the exploration of the Solar System.”

Dr. Frosch said, “I am today charging a future administration of NASA with the responsibility of assuring that this plaque is subsequently placed on the lander craft.” He added that the plaque will be passed on until there is an appropriate Mars mission for it to fly on. It will be affixed to the side of the Viking 1 lander spacecraft in Chryse Planitia on Mars when we return to that planet. Thus, the Tim Mutch Station stands both as a memorial to Tim and as a challenge for future exploration.

Tim’s professional affiliations were many and varied. He was a Fellow of the Geological Society of America, a Fellow of the American Astronautical Society, a member of the Society of the Sigma Xi, a member of the American Association for the Advancement of Science, a member of the Explorers Club, and a member of the Board of Directors of the American Alpine Club. He served on the Lunar Science Review Board and was chairman of two NASA committees charged with planning the future exploration of Mars. He received the NASA Medal for Exceptional Scientific Achievement in 1977, and he was the recipient of four NASA Group Achievement Awards for Lunar and Martian scientific endeavors and for the NASA Headquarters Voyager Management Program. Tim was the recipient of the Cleveland-Newcomb Award of the American Association for the Advancement of Science for the best paper in *Science* in 1977, an award shared by other Viking scientists.

Tim’s unexpected and premature death is a deep loss felt by family members, former students, colleagues, and many other acquaintances among his wide family of friends. He will be remembered as a husband, father, son, brother, teacher, researcher, and co-worker, and by all whom his life touched for his warm, genuine, unpretentious relationships.

Acknowledgments

In preparing this memorial, acknowledgment and appreciation are due those persons whose earlier commentaries on Tim Mutch have been liberally used here without citation. I am particularly indebted to Tim’s close friend and colleague, James W. Head, for his assistance.

SELECTED BIBLIOGRAPHY OF T. A. MUTCH

- 1961 Geologic map of northeast flank of Flint Creek Range, western Montana: Special Publication 22, Montana Bureau of Mines and Geology.
- 1964 Extraterrestrial particles in Paleozoic salts: *Annals of the New York Academy of Science*, v. 119, p. 166–185.
- 1965 (and Gwinn, V. E.) Intertongued upper Cretaceous volcanic and nonvolcanic rocks, central western Montana: *Geologic Society of America Bulletin*, v. 76, p. 1125–1144.
- 1967 (and Garrison, R. E.) Determination of sedimentation rates by magnetic spherule abundances: *Journal of Sedimentary Petrology*, v. 37, p. 1139–1146.
- 1968 Pennsylvanian nonmarine sediments of the Narragansett Basin, Massachusetts, Rhode Island: *Geological Society of America Special Paper* 106, p. 177–209.
- 1970 *Geology of the Moon—A stratigraphic view*: Princeton University Press, 324 p.
- 1972 (and Binder, A., Huck, F., Levinthal, E., Morris, E., Sagan, C., and Young, A.) Imaging experiment: The Viking Lander: *Icarus*, v. 16, p. 92–110.
- 1973 (and Saunders, R. S.) Geologic map of the Hommel Region of the Moon: United States Geological Survey Miscellaneous Geologic Investigations Map I-702.
- 1976 (Arvidson, R., Jones, K. L., Head, J. W., and Saunders, R. S.) *Geology of Mars*: Princeton University Press, 400 p.
- 1965 (and Gwinn, V. E.) Intertongued Upper Cretaceous volcanic and nonvolcanic rocks, central western Montana: *Geological Society of America Bulletin*, v. 76, Princeton University Press, 400 p.
- (and others) The surface of Mars: The view from Viking 1 lander: *Science*, v. 193, p. 791–801.
- (and others) The surface of Mars: The view from the Viking 2 lander: *Science*, v. 194, p. 1277–1283.
- 1977 (with Head, J. W., and Wood, C. A.) Geologic evolution of the terrestrial planets: *American Scientist*, v. 65, p. 21–29.
- (and Arvidson, R. E., Binder, A. B., Guinness, E. A., and Morris, E. C.) The geology of the Viking lander 2 site: *Journal of Geophysical Research*, v. 82, p. 4452.
- 1978 *The Martian landscape*: National Aeronautics and Space Administration Special Publication, 425 p.
- 1979 *Planetary surfaces*: International Union of Geology and Geophysics Quadrennial Report, *Reviews of Geophysics and Space Physics*, v. 17, p. 1694–1722.