Memorial to Robert C. Speed 1933–2003

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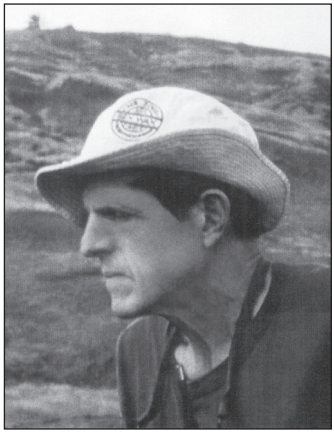
"The closest I've ever been to a real-life Indiana Jones: a tough, rugged field geologist with a talent for eloquent lecture."

"An outstanding field geologist; extremely versatile; physically tough; disciplined; extremely focused and bright; a great teacher."

"He expected the best out of you. Not perfection, but application of your training and intellect to the best of your ability."

"He challenged your observations, your assumptions, and your interpretations, and helped turn you into a critically thinking scientist in the process. If you were lucky, after looking and talking over every detail of an outcrop, he'd say, "Nicely done; lead on."



These testimonials from his past students give some idea of the profound influence Bob Speed had on those around him. His character clearly reflected his values: economy of words, trustworthiness, understatement, and loyalty. He was a leader who quietly but ferociously protected those for whom he had responsibility, with rescue exploits that are legendary among his field companions. Bob's quiet self-confidence, his pursuit of understanding, and his high expectations of himself and others inspired his students and colleagues to push their own physical and intellectual limits. His courses were quantitative, challenging, and thought-provoking, and all of his students remember life-defining experiences on the outcrop, in which Bob's tenacious insistence on accumulating extraordinarily detailed observations led to unexpected "eureka moments" for each of us. To his students and many of his colleagues, he seemed a larger-than-life figure who routinely mastered imposing physical and intellectual challenges.

Robert Clarke Speed was born in Los Angeles in 1933. He grew up in southern California. At age 13, he climbed the Grand Teton and its sister peaks. At age 16, he held the record for the shortest time traversing the John Muir trail between Mount Whitney and the Yosemite Valley. He graduated from the University of Colorado in 1954, received a commission in the Navy, and flew patrol planes over Korea during the Korean War. After three years in the Navy, Bob attended Stanford University, from which he received his Master's and Ph.D. degrees by 1962.

During his final two years of graduate school, Bob became senior research scientist of the Earth and Planetary Science group at Cal Tech's Jet Propulsion Laboratory just as JPL emerged as a major center of space exploration using unmanned aircraft. His thorough understanding of the interplay of chemistry, physics, mineralogy, petrology, and geophysics was critical to the development of planetary geology—a term not even in use at the time.

Bob joined Northwestern University's Department of Geological Sciences in 1966, where he was promoted to associate professor in 1969 and full professor in 1974. He was Department Chair

from 1981 to 1983 and was appointed William Deering Professor (endowed chair) in 1991. While at Northwestern, Bob completed and published a formidable body of research that focused on the structural geology and tectonics of active continental margins. Most of Bob's early field work was undertaken in Nevada, where he continued to work throughout his career; later, he targeted the eastern Caribbean, particularly Barbados.

Bob profoundly influenced our perception of the geology of the western Great Basin. For his dissertation at Stanford University, he identified, mapped, and analyzed the igneous rocks of the Early Jurassic Humboldt lopolith in northwestern Nevada. During his early years at Northwestern University, he and his students evaluated late Paleozoic deformation in the region associated with the Sonoma orogeny. He also identified and differentiated coeval Mesozoic basin and carbonate platform rocks composing the upper and lower plates of the Fencemaker thrust system. His eye for detail and his gift for integrating diverse types of data enabled him to construct a regional tectonic framework that still underlies current views of the region's tectonic history. During the 1970s and 1980s, Bob and his students attacked long-standing stratigraphic and structural problems in west-central Nevada. He focused his attention on the late Paleozoic history of this region just as the terrane concept was coming of age, and concluded that substantial parts of the western Great Basin are allochthonous, possibly far-traveled, arc complexes that collided in the Paleozoic with the long-standing (late Proterozoic–early Paleozoic) passive margin of western North America. The clear, cogent logic of his research papers precipitated debate and stimulated research in the western Great Basin for more than three decades.

Bob's work on the Paleozoic accretionary prism of the Roberts Mountain Allochthon in Nevada stimulated him to investigate the much younger prism on Barbados, West Indies, which hadn't been affected by much subsequent tectonism. From the late 1970s to the 1990s, Bob and his students and colleagues collected and interpreted data from accreted Tertiary turbidites of the Scotland District, structurally overlying forearc-basin rocks, and even the tilted Quaternary reefs that cover most of the island. Results of this work included structural and stratigraphic studies of remarkably detailed scope, wider-ranging tectonic syntheses and speculations, and a geologic map of the entire island (expected posthumous publication).

Bob recognized that folds and faults of the Barbados accretionary prism are oriented at a high angle to the current Caribbean-Atlantic subduction zone boundary, leading him to propose that the Antilles arc collided obliquely with northern South America in the mid-Tertiary and to undertake field studies in Trinidad and Tobago and in Venezuela. His ground-breaking efforts in all these areas triggered much additional work by others, including several DSDP and ODP legs on the Barbados Ridge and ongoing investigations of the Caribbean-South America plate boundary. His Barbados work also is basic reading for anyone studying fossil or modern accretionary prisms anywhere in the world.

In the 1970s, Bob chaired the panel that developed Northwestern's Integrated Science Program (ISP) for high-level undergraduates and was its first director from 1975 to 1978. This program emphasized the interdisciplinary nature of fundamental scientific and mathematical principles and techniques, and the deep-level learning and innovation that could result. The rigorous mathematical basis of the program reflected Bob's conviction that advances in science would be obtained only through mathematics as the medium of communication.

Throughout his career, Bob served the earth science community in a variety of roles besides research and education. For NASA, he was a member of the Scientist Astronaut Selection Board (1966–68) and the Advisory Panel on Lunar Exploration (1967). For the USGS, he was a member of Earthquake Hazards Reduction Program (1975–1978) and a Faculty Associate from 1978. He was associate editor of *Neotectonics* from 1984 to 1990 and of *GSA Bulletin* from 1985 to 1989. Bob was chair of the U.S. Geodynamics Committee's North American Continent-Ocean Transects

Program from 1980 to 1992, and he edited the resulting volume of GSA's Decade of North American Geology, writing several of its sections. He also chaired several panels of the Ocean Drilling Program from 1980 to 1990 and was principal investigator for an ODP-sponsored well drilled on Barbados in 1992.

At the end of 2001, Bob retired from Northwestern University as Professor Emeritus of Geological Sciences. Five days later, in January 2002, he took up residence in the Department of Earth System Science at the University of California, Irvine. Besides teaching introductory geology courses, he began to investigate the western margin of the Santa Ana Mountains of southern California, which he could see from the window of his office at UC Irvine. There, he identified a previously unrecognized right-lateral strike-slip fault zone that implied active deformation and a seismic hazard. He began collaborating with Lisa Grant of UC Irvine and first transcribed his field notes onto paper in August 2003. Bob's final field excursion was a trip to this site in a wheelchair with his maps on his lap three days before he died at home on Balboa Island of melanoma on September 18, 2003.

Bob leaves behind family, friends, and colleagues who treasure and miss his strength, caring, and affection.

> "...vital force...heart...that impulse which drives a man to choose one of the innumerable paths of life, and to care only for that one…"
>
> (Tolstoy, *Anna Karenina*).

Nicely done, Bob; lead on.

Acknowledgments

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