

Rock Stars

Grand Vision of Edwin D. McKee

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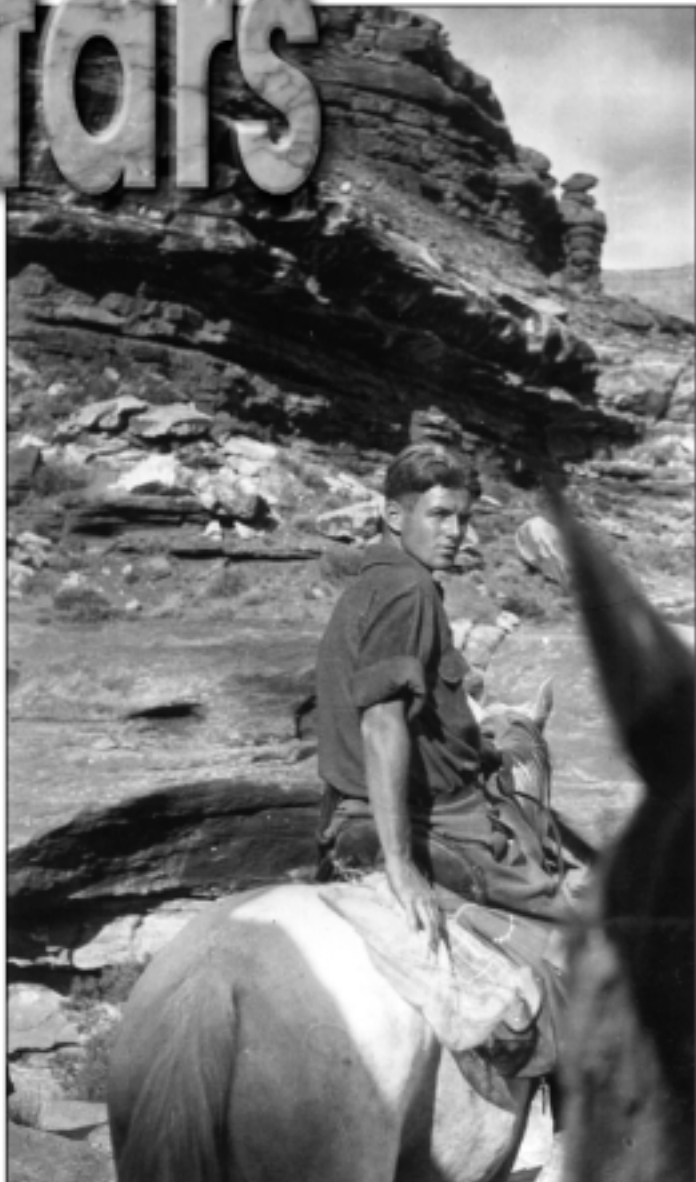
We geologists are all attached to places—our home landscape, the place we did our first field work, a locality where we discovered something—but few of us devote our careers to one place and use it as a prism through which to view the world. Edwin McKee fell in love with the Grand Canyon and did just that.

McKee, born in 1906 just 48 years after the first explorations of the Grand Canyon, was introduced to the canyon in Washington, D.C., where he grew up. He joined Boy Scout Troop 1, whose scoutmaster was François E. Matthes, the eminent topographer, who in 1903, made the first small-scale topographic sheets of the Grand Canyon. Matthes must have told stories of his experiences, the demands of mapping the canyon, of blazing a horse trail up narrow, rocky Bright Angel Creek, of heat that diminished the leveling bubbles in their instruments, and tales of scientific discovery by renowned canyon explorers like John Wesley Powell and Charles D. Walcott—stories that surely meted out adventure, technical know-how, and solid work ethics.

As a young man, McKee entered the U.S. Naval Academy, but again Matthes changed McKee's life. In 1927, Matthes arranged a summer internship for the self-assured McKee with paleontologist and educator John C. Merriam. President of the Carnegie Institution of Washington, Merriam was charged by the National Park Service with developing the first interpretive programs at Grand Canyon National Park. McKee arrived at the canyon on June 16, to assist paleobotanist David White and vertebrate-ichnologist Charles W. Gilmore.

Enthralled by the experience, McKee enrolled in Cornell University to study geology. Winters in Ithaca, New York, alternated with invigorating summers in the Grand Canyon until February 20, 1929, when tragedy changed his life. Park naturalist Glen Sturdevant drowned with ranger Fred Johnson while crossing the Colorado River, and McKee was given Sturdevant's job as park naturalist. When he returned permanently to the canyon, he courted biologist Barbara Hastings, who was working during summers on the canyon's North Rim. McKee frequently hiked the rigorous 21 miles across the mile-deep canyon, and up the trail blazed by Matthes, to visit Barbara. They married on December 31, 1929.

Edwin and Barbara McKee's similar interests are displayed throughout the park museum's study collections, which are filled with ethnographic artifacts and natural history specimens. Butterfly collecting was among Edwin's avocations (McKee, 1927). The McKees ran a bird-banding station (McKee, 1934) and studied the distributions of birds in the canyon. They befriended the Havasupai Indians of the canyon; their published collection of Havasupai basketry (McKee et al., 1975) records a critical period of changing Havasupai culture. Barbara stopped writing when they began their family, but she accompanied Edwin into the field as often as possible. Once, in Mexico, she satisfactorily explained to quizzical Yaqui Indian helpers on the Colorado



E. D. McKee on the trail from Supai, Havasupai Indian Reservation, Arizona, ca. 1939. Photo NAU.PH.95.48.141, McKee Collection, Cline Library, Northern Arizona University. Used with permission.

River delta that her husband did such “strange things” as filling bags with sediment because “he gets paid to do that!”

McKee helped create the Grand Canyon Association, which continues to assist interpretive programs in the park. His popular ranger talks covered regional geology, paleontology, ornithology, mammalogy, herpetology, entomology, botany, ethnology, archaeology, and history. In 1931 he published *Ancient Landscapes of the Grand Canyon Region* which remained in print during his entire life, in 30 revised printings until 1985. He compiled the first checklists of the Grand Canyon's mammals, amphibians, reptiles, and birds. He discovered the salmon-colored Grand Canyon rattlesnake, *Crotalus viridis abyssus*, indigenous to the canyon (McKee, 1930, 1976). But it was sedimentary cross-beds, found in many of the canyon's formations but most dramatically shown in the eolian, Permian Coconino Sandstone, that particularly piqued his curiosity. He organized the Grand Canyon Cross-Bedding Club, “a group of energetic residents who liked to hike and who had some background in geology.” After he taught them precise field techniques, each Sunday they hiked into the canyon

to measure cross-beds. His first significant geological paper, on the Coconino, was published in 1933.

McKee's ability to relate the minutiae of sediments and fossils to broad geography led him to be the first to apply practical methods of tracing key beds from one area to another. In his 1938 monograph on the Permian Kaibab and Toroweap formations, he used these techniques in the study of sedimentary facies. These principles were masterfully applied in a 1945 monograph, with paleontologist Charles E. Resser, on the Cambrian Tonto Group. They are his most profound interpretations of geologic processes. Sediments and fossils in these strata show that rates of transgression and regression of the sea varied and periodically reversed, making problems for stratigraphic interpretation. Such well-exposed intertonguing of sequential formations led economic geologists to better understand subsurface stratigraphy. McKee's diagrams continue to be reprinted, and the principles of his work are core materials in classes on sedimentology and stratigraphy.

The National Park Service did not allow a ranger to remain more than ten years at one place. In 1938, rather than move to Yosemite National Park, Edwin quit and became assistant director for research at the Museum of Northern Arizona. His three children were in their early school years, and a decrease in his publications reflects the attention to family affairs and administration. Still he managed to study modern sediments as analogs of paleosediments, and he devised a classification of bedding structures. Later he went to the Department of Geology at the University of Arizona, Tucson, where he became department chair. In the late 1950s, he was a research geologist for the U.S. Geological Survey, in Denver, where he operated a sedimentology laboratory even after his retirement. This is a remarkable ascendancy for someone with just a bachelor's degree. In 1957, Northern Arizona University awarded him an honorary doctorate.

Thereafter, McKee studied modern and fossil sediments on every continent but Antarctica. He considered sedimentary and biologic deposits of low-gradient streams and river deltas; dune structures of the great sand seas of Africa, Asia, and Australia; structures of arid-climate pediments; and carbonate sedimentary processes of Pacific atolls. He carried out flume-sediment experiments, and he had interests in theoretical aspects of paleoclimate analysis. McKee also embraced remote sensing technology and visual reports from Skylab to study surface processes of the world's sand seas.

The Supai Group of Grand Canyon is quintessential McKee, a model of 50 years of field work and analytical methods (McKee, 1983). Chapters by McKee and by others on these four largely fluvio-deltaic, Pennsylvanian-Permian formations are topically and

technologically diverse. A color photo of a Havasupai basket from the McKee collection respectfully acknowledges the Havasupai craftswomen and friends whose family names are given to geographic features and rock formations of the Supai Group.

In the field McKee was indefatigable. His sparks of industry and creativity inspired others. No McKee bibliography exists, but a partial listing (in Spamer, 1990) contains hundreds of titles in many fields. His geological work spanned the world, but Arizona's Grand Canyon was first and never forgotten.

In 1984, McKee's ashes were buried at Grand Canyon Cemetery, beside paleobotanist David White, and John H. Maxson, a geologist who traveled with McKee on the Colorado River in 1937. Barbara McKee joined him in 1998. Despite remarkably broad interests, the man who published hundreds of articles and monographs on many subjects, who was an accomplished collector of butterflies, stamps, and Havasupai crafts, has just a simple marker of water-sculpted Tapeats Sandstone from the Grand Canyon Cambrian. A small plaque gives his occupation not as geologist, but "Teacher." His exemplary legacy and the inspiration to be gained from his accomplishments are, indeed, grand lessons.

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McKee coating trilobites with ambroid, Grand Canyon, 1936. Photo NAU.PH.95.48.1107, McKee Collection, Cline Library, Northern Arizona University. Used with permission.