

Memorial to William Lee Stokes

1915–1994

M. DANE PICARD
Salt Lake City, Utah

Lee Stokes drifted into the Mesozoic—his exact whereabouts unknown—on December 12, 1994. His battle through nearly two decades against polymyositis, a debilitating auto-immune disease that savages muscles, showed spirit that most of us are not called upon to show. For the many who loved Lee, this journey may seem as if it is no more than a temporary trip to Jurassic Morrison dinosaur strata, a trip from which he will soon return.

He had had a wonderful Thanksgiving with Betty, his wife of 55 years, and with his children and grandchildren. He was gone before Christmas. On the morning of the funeral it was clear and cold, the Salt Lake Valley miraculously free of December fog and smog, and fluffy snow fell lightly, gentle remnants of a storm that had passed.

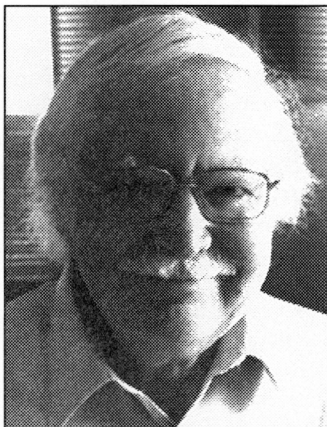
William Lee Stokes was born on March 27, 1915, in the coal-mining camp of Black Hawk, Carbon County, Utah. March is a crueler month in central Utah than April, T. S. Eliot notwithstanding. Snowstorms come unexpectedly and sweep furiously across the wide gray-shale flats. There is little protection anywhere from the cold, the wind, the snow. A clear sunny day may be bitter and windy. No wonder that Lee, 40 years later, took a look at the Ice Age in a notable article published in *Science*.

Before Lee was two years old, his parents moved to Cleveland, 17 miles south of Price in Emery County, Utah. He grew up there in desolate wind-swept space on the Blue Gate Shale—thick, dark, Cretaceous, marine strata. As soon as he could walk, he collected rocks, building pyramids in the yard and around the house. As Lee grew, the pyramids grew. Up at dawn on Saturdays, he collected among shivers of gold in the Mesozoic badlands. Almost 18 years of pyramids finally stood watch, fixed sentinels receiving messages on the wind. Out of the mix within such a crucible—rocks, solitude, the seasons—a geologist or a shepherd is apt to crystallize.

Close to Cleveland, purple, cream, brown-red, and green Morrison Formation layers crop out on the northern San Rafael swell. Lee was fascinated by these rocks. The colorful Morrison badlands are a kaleidoscope compared with the funeral-gray Blue Gate ramparts. The boy and young man, tramping along in the summer and autumn, chose to explore the Morrison. There he found moss agate, jasper, petrified wood, dinosaurs, and a life's work.

Lee was uninterested in cowpunching and shepherding, and his father took a critical view of Lee's limited skill in animal husbandry. At age 18, Lee decided to leave home. With 25 dollars and his parents' blessings, he traveled through the Wasatch Mountains to Provo, location of Brigham Young University. "You should go home, young man," advised the president of the university, who considered Lee's 25 dollars too small a nest egg.

He worked his way through BYU, earning the B.S. in 1937 and the M.S. in 1938. While a laboratory instructor—one of his principal jobs—he met a student who thought he was showing off. Without preamble, in the fashion of students in introductory courses, she said, "Tell me what this is if you're so smart." Replied Stokes, "A rock." "Oh yeah," said Betty A. Curtis, native of Cokeville, western Wyoming, and Lee's future wife.



In the fall of 1938, he began graduate studies at Princeton University. He returned the next summer to the Red Plateau, back to the clay and silt and gravel of the home roads east of Cleveland, Utah. He explored the burial grounds of *Diplodocus*, those slender, whip-tailed, Jurassic sauro-pods, and the giant carnivorous dinosaur, *Allosaurus*, and scores of other reptiles. During that first field season, Lee and his younger brother, Grant, uncovered an area of 45 square meters, revealing an *Allosaurus* that was ultimately put on display in the center of the Princeton Museum. As Hemingway might have said, and as E. B. White did say: "It was a fine thing to be young and in the field when he was young and in the field." With Lee leading the way, and with the close collaboration of James Madsen, the Cleveland-Lloyd Quarry ultimately yielded dinosaur specimens that are on display in more than 40 museums around the world. Lee and his crew unearthed bones representing more than 70 individual animals of 14 different species, the basis for more public exhibits than the specimens collected from any other dinosaur quarry in the world.

Lee extended his dinosaur studies to an investigation of the Morrison Formation depositional history—its streams, swamps, floodplains, and lakes—which became his dissertation, completed in 1941 and published in 1944. His extensive knowledge of the Morrison and of the Colorado Plateau led to a job with the U.S. Geological Survey. From 1942 to 1947, he mapped and evaluated vanadium and uranium deposits in the West. Although the vanadium was in low-grade deposits, its discovery and mining were essential—German U-boats were sinking ore ships from Peru. Vanadium was a vital war commodity. "Later on," Lee once said laconically, "the uranium became important." He participated in the exploration project that produced fissionable material used in the first atomic bombs. During the war years and afterward, he visited uranium mines throughout the Rocky Mountains. "I've probably been in more uranium mines than anyone alive," he said.

Although he began teaching at the University of Utah in 1947, Lee continued to study uranium deposits in the field. During the testing in Nevada, he camped out in San Juan County, southeast Utah, a region that received considerable fallout from the nuclear explosions—"Nancy," "Harry," those innocent-sounding names. Lee published on uranium geology for almost another decade after he began teaching, a dozen papers in all. The book *Uranium, the World's Expanding Frontier* (with four coauthors) was published in 1955, a productive year for Lee professionally. He also became Head of the Department of Geology, a position he held for 13 years.

From the start, Lee was a familiar campus figure. Like a volcano, he erupted with facts and streams of ideas under the pressure of questions from students and colleagues. His prematurely white hair was a cloud (*cumulus congestus*). He was interested in all of natural history, a visionary striver. His course Geology and Scenery of Utah was particularly popular. In 1980, the year he retired, the College of Mines and Earth Sciences belatedly awarded Lee its Faculty Teaching Award. The Utah Board of Education gave him its Outstanding Service to Education Award in May 1989.

For much of his 33 years of teaching, Lee taught a heavy load. He wanted it that way and he taught well under it. Few geologists at the University of Utah have ever supervised as many graduate students as Lee Stokes. He guided 40 novices through their graduate studies. Eleven earned Ph.Ds.

Lee contributed enormously to geological education and to public understanding of geology through the four editions of *Essentials of Earth History* and his *Introduction to Geology—Physical and Historical* (with Sheldon Judson and M. D. Picard). Over many years, Stokes's *Essentials* was the text most often used for such courses in the United States. Eventually, it was adopted in all 50 states. The book has sold more than 150,000 copies. In its several editions, Lee was quick to incorporate and keep abreast of new ideas about plate tectonics, which he recog-

nized as an important and unifying and research-provoking concept. He also recognized that geology would never be the same again. In its historical implications, the hypothesis of plate tectonics rivaled Darwinian evolution, said Lee.

Lee Stokes continued to write until almost the end, sitting in his chair in the sun room, consulting his books and folders and notes, thinking. In his lifetime, he published about 125 articles, 20 annual reviews in *Encyclopedia Americana*, 31 abstracts, and 14 books. He was director of the program to compile the first geologic map of Utah, a major accomplishment that he shared with Lehi F. Hintze and James Madsen. Lee covered the eastern half of the state, Lehi the western half. Lee's book *Geology of Utah*, after his prodigious effort to raise funds for it, met with instant success. In June 1994, Utah's Governor Mike Leavitt honored Lee with the Governor's Medal for Science and Technology.

Lee Stokes was an observational geologist, not an armchair or laboratory scientist, but he plugged on, doing interesting and important work although he slept little, had diabetes along with assorted other health problems associated with the polymyositis, could not walk, and in the end could hardly move. He came to believe that his popular writing was the most important work he had done or that any geologist could do, a lonely position for an academic to hold. He was a wonderfully creative writer, teacher, and geologist to his death. His door was always open; he was generous and warm to everyone. It has been a great pleasure to work alongside Lee in Utah and in the Mesozoic, to have walked the mountain spines and draws he walked, and to have had such a friend for 42 years.

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