

WILLIAM R. DICKINSON

## Plate tectonic pioneer

Bill Dickinson was a passionate student and interpreter of the tectonic history of the North American Cordillera mountain range and the geo-archaeology of the South Pacific. He investigated the links between plate tectonics and sedimentary basins and used the composition of sand temper in pottery shards to reconstruct the prehistoric trade routes of Polynesian seafarers in the western Pacific. He wrote prolifically and communicated extensively through scientific presentations, class lectures and conversations, and became known as a giant thinker in North American geology.

Born in 1931 in Nashville, Tennessee, Bill moved to California as a teenager. He spent his formative years riding horses in the Transverse Ranges north of Santa Barbara, and in south-eastern Utah, where he also rafted white water of the Colorado and San Juan rivers very early in the history of river running. He received a BSc in Petroleum Engineering followed by an MSc and a PhD in Geology from Stanford University, and went on to become an Assistant Professor at Stanford in 1958.

Bill hit his stride during the emerging plate tectonic revolution of the late 1960s and early 1970s, recognizing early on the manifold implications of the plate tectonic concept for geologic phenomena at active plate margins. He was particularly interested in the links between igneous rocks produced at subduction zones and the accumulation of the eroded products of these igneous rocks as sandstones in sedimentary basins. After focusing initially on volcanic-related sedimentation in Fiji, he later devised a petrographic rubric that permitted the reliable discrimination of sandstone composition in different plate tectonic settings globally. He also developed a scheme to classify sedimentary basin types by their locations relative to the nearest plate-tectonic boundary — a scheme that is still in use today. His general concepts about plate tectonics and sedimentation have influenced at least two generations of geologists the world over.



TIMOTHY LAWTON

Another research path led Bill on a lifelong investigation of the geo-archaeology of Oceania. He exploited his understanding of the composition and source of sandstones used in ancient pottery to reconstruct trade routes through the Pacific Islands over the past few thousand years. Together with his wife, Jackie, he visited more than 120 islands in the South Pacific.

In 1979, Bill moved to the University of Arizona, where he established himself as a synthesizer of Cordilleran geology and tectonics. He became department head in 1986, and served in that capacity until he retired in 1991. By the time of his retirement, he had supervised the completion of 42 MSc degrees and 43 PhD degrees. Nevertheless, the story was not over, and his retirement years constituted a period of renewed production and personal scientific renaissance. He helped pioneer the interpretation of the ages of individual zircon grains in sandstones, thereby expanding the scope of his earlier compositional analysis to include the ages of potential sources for sediments. By applying this emerging technology to sandstones from the Colorado Plateau — the part of the North American Cordillera beautifully displayed in the states of Utah,

Arizona, Colorado and New Mexico — Bill helped develop a new field of inquiry that enabled the reconstruction of continent-scale sediment dispersal systems. He was able to show, for example, that in the Jurassic, rivers flowed westwards across the North American continent supplying an enormous volume of sediment to the famous aeolian sand seas exemplified by the Navajo Sandstone of Zion National Park.

Following his retirement from the classroom, Bill became active in scientific policy in the Earth sciences and received numerous honours, including top awards from the Geological Society of America (GSA), the Society for Sedimentology and the Archeological Geology Division of GSA. He received a Distinguished Alumni Award from Stanford University in June 2015, on the eve of his final research trip to Tonga and Fiji.

For all his recognition, Bill possessed a steadfast humility and approachability that helped elevate him to almost legendary status in Cordilleran geology. He listened carefully, and could be relied on to render immediate and insightful analysis of the topic at hand. He possessed an unwavering sense of humour and was a dedicated storyteller, a trait he exercised with folksy eloquence and liberal use of invented terms. With his passing in Tonga on July 21, 2015, the geologic community lost a transcendent scientist with an uncanny ability to plumb the global implications of regional geologic patterns, a patient teacher, and a synthesizer who wove together strands from different disciplines within geology and other fields, to create new avenues of investigation. He was interred in Tonga at Mala'e Sia Cemetery in the village of Nukuleka, Tongatapu, thereby becoming a permanent part of an island legacy he helped to elucidate.

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