

Rock Stars

The Father of Modern Volcanology: Howel Williams (1898–1980)

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Though known to most of his friends as “Willie,” the title Howel Williams cherished most was one given to him by his students on the occasion of his retirement: *The Last of the Ordovices*. I think it appealed to him because it reflected his Welsh background and his role as one of the last members of a passing era.

Williams’ 50-year career spanned a period of dramatic changes in the sciences, especially geology. Through his own contributions and those of his students, he was largely responsible for the emergence of volcanology as a rigorous branch of modern science. Although his work was in a classic style that we seem to have lost, perhaps forever, few have left so pervasive an imprint on their fields. Even fewer have inspired wider admiration or deeper affection.

Born in Liverpool, England, Williams was raised along with his identical twin, David, and six other children in a modest, middle-class household. He spoke only Welsh until the age of six. His scholastic honors in secondary school won him a scholarship to the University of Liverpool where, despite an interruption for military service from 1917 until the armistice in 1918, he received his bachelor’s degree with first-class honors before the age of 20. Though his initial studies were in geography, Williams soon developed a keen interest in archaeology, which in turn, by a singular chain of events, led him to geology.

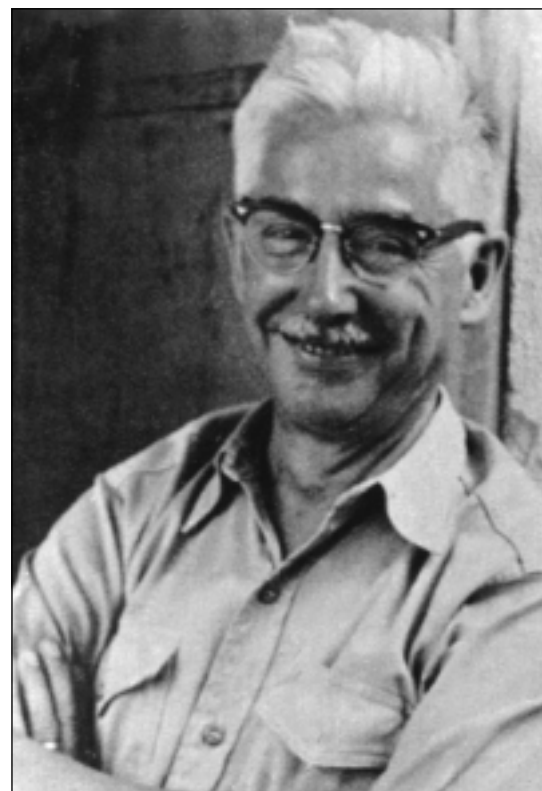
While engaged in excavations of a Roman camp site in northern Wales, Williams observed that the floor of the baths was paved with slabs of slate rich in curious fossils. Anxious to learn where the Romans had quarried the slate, he consulted P.G.H. Boswell of Liverpool’s Department of Geology. It so happened that Boswell was then studying the Silurian rocks of Denbighshire and, from the nature of the distinctive graptolites in the slate, immediately knew its source. Williams was so impressed with this instant solution to his problem that he began to sit in on lectures in geology and in 1924, after receiving his M.A. degree in geography, went on to earn an M.S. in geology.

With his geology degree came another scholarship that enabled Williams to further his studies at Imperial College. There, working chiefly under W.W. Watts, he completed a detailed study of Snowdon in North

Wales. The abundant Ordovician volcanic rocks he encountered there and in the area near Capel Curig aroused his interest in volcanism and led him to the classic volcanic fields of the Eifel district of Germany and the Auvergne in central France. He returned with a firm resolve to make volcanic geology his principal work. Thanks to a fellowship from the Commonwealth Fund, Williams was able to devote the next two years to studies with A.C. Lawson at the University of California at Berkeley. Apart from a single seminar dealing with the geology of California, he took no formal courses while at Berkeley, devoting his time instead to field studies. He concentrated on the ancient volcanoes of the Sutter Buttes in the Sacramento Valley of California and on Lassen Peak, a recently active volcano in the southern part of the Cascade Range. In addition to all this, he found time to visit Hawaii and Tahiti.

In 1928, Williams returned to Britain to take his D.Sc. in geology at the University of Liverpool. He then spent two years on the staff of Imperial College before returning to America to join the faculty at Berkeley in 1930. There, he rose to the rank of full professor in only seven years. Between 1945 and 1949, he served as chairman of the Department of Geology, doing much to raise the quality of its faculty, teaching, and research. It was largely his influence during these critical years that set the course of the department and brought it into the ranks of leading American institutions. He was elected to the National Academy of Sciences in 1950.

Williams continued his studies of volcanoes in the western United States, particularly Crater Lake, where his work formed the basis for two of his most important contributions, a monograph on Crater Lake and a general treatise on the origins of calderas. The rapid succession of papers that he produced during this period included



Howel Williams, 1961.



Howel Williams, left, and Alexander McBirney use the hood of a jeep as a place to plot the geology on their map of Honduras.

several that soon became classics of volcanology. He dealt with volcanic domes, the classification of pyroclastic rocks, the Pliocene volcanic centers of the Navajo-Hopi region, and several large volcanic centers of the Cascade Range, including Newberry Caldera and The Three Sisters.

In 1943, when the volcano Paricutin was born in a Mexican cornfield, Williams joined a group of geologists recording its growth and evolution and completed a reconnaissance study of more than a hundred similar cinder cones in the surrounding region. This was the beginning of the work in Latin America that absorbed much of his energy for the remaining years of his career. He found there several opportunities to apply his geological experience to problems in archaeology. While in Mexico he used petrographic techniques to discover the source of stone used in the giant Olmec sculptures of La Venta near the Gulf of Mexico. In 1950, with the support of the Carnegie Institution of Washington, Williams went to Nicaragua to examine the extraordinary ancient human footprints in a hardened volcanic mud-flow near Managua.

I was living in Nicaragua at that time. I had started a coffee farm in a remote part of the country and, while waiting for the trees to mature, took a job with a mining company. Though totally ignorant of geology, I was given the task of exploring an area near the volcanic chain to develop geothermal power for the mine. My boss asked Williams to let me accompany him in the field for a week or so in order that I might learn some rudimentary geology. During the day, we explored the geology of the area, and in the evenings Williams tutored me in volcanology and elementary petrology. His enthusiasm and lucid explanations aroused my interest and ultimately led me to study under him at Berkeley. After I obtained my degree, we worked together until his death in 1980. I was not the only student to be captivated by his enthusiasm for volcanology. In the course of his long career, Williams fostered a succession of students, many of whom went on to become leaders in their fields.

Williams' work in Nicaragua was the beginning of a succession of regional studies which, though less widely known than his work on calderas and domes, were even more remarkable, both for their scope and for the extent of their contribution to the previously little-known geology of Central America. These studies, together with a survey of the Galapagos Archipelago completed in 1969, covered large regions where few, if any, geologists had gone before. The studies allowed us to start from scratch, working out broad structures, regional stratigraphy, and the evolution of an entire volcanic province. Less interested in the eruptive phenomena of active volcanism than in broad structural and lithologic relations, Williams had a masterful ability to decipher the form and past activity of large volcanic complexes.

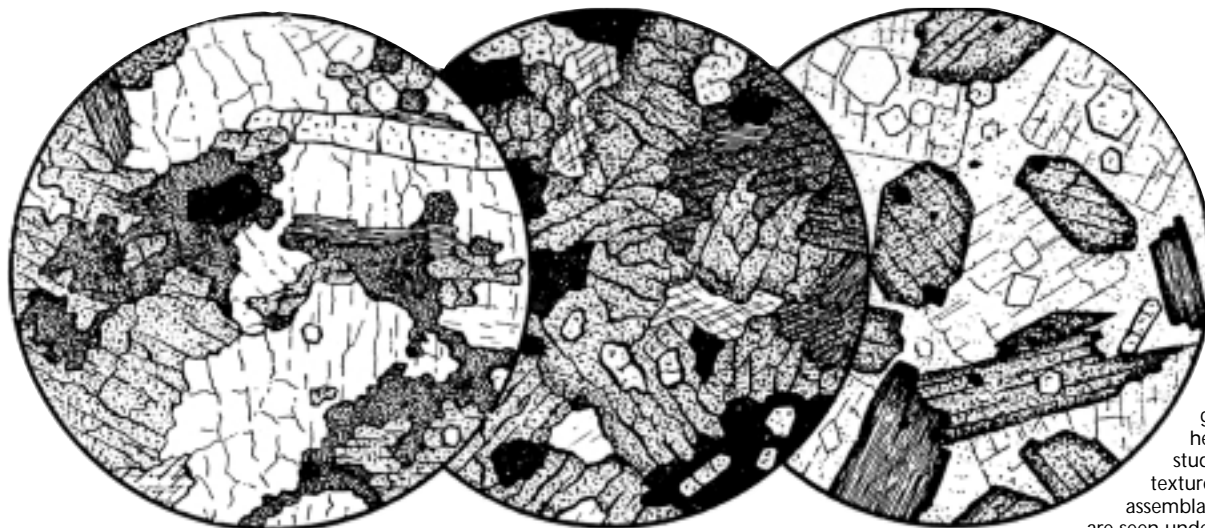
Many have commented on his instinctual ability to find the critical outcrop that resolved a puzzling question. With his uncanny eye for landforms and the regional significance of lithologic variations, he could synthesize the volcanic history of a broad region from a few seasons of field reconnaissance and petrographic analyses.

In addition to regional field studies, Williams produced a widely used textbook on petrography in 1954, and, in 1979, a comprehensive treatise on volcanology. The former was the result of collaboration with Frank Turner and Charles Gilbert at the University of California; the latter a product of the years he spent with me at the University of Oregon after his retirement from Berkeley. Published only two months before his death, *Volcanology* summed up a lifetime's experience and, despite more recent advances, is still regarded as one of the most comprehensive works on the subject.

Williams' most conspicuous personal trait was his sparkling wit and unflinching sense of humor. Until one became acquainted with him, his jokes could be disconcerting. Encountering one of his students crossing the campus he might ask, "Why are you wandering about at this hour wasting valuable time? You should be in your office working!" Or, upon entering a laboratory, he would pretend to check the settings of the instruments and offer a "correction factor" in the form of a complex differential equation incorporating the effects of daily weather conditions on analytical results. But beneath his jovial manner there was a personal reserve that only those who knew him well could fully appreciate. His irreverent wit concealed an uncompromising code of personal conduct.

A natural scientist in the classical tradition, Williams stressed meticulous observations, thorough research, and sound interpretations presented in elegant, lucid prose. With his ability to read geological literature in English, French, German, or Spanish, he could trace the historical development of ideas and synthesize diverse views with simplicity and clarity. The same qualities pervaded his teaching. His courses in petrography and regional geology were enlivened with amusing historical anecdotes and illustrated by artistic hand-drawn diagrams that left an indelible impression on hundreds of students.

In the closing years of his life, Williams saw the classical methods of scholarship give way to complex geochemical investigations and thermodynamic calculations compiled on computers and reported in hastily prepared, multiauthored papers of transient interest. Although he himself contributed to this change and on balance approved of it, he inspired in his students a respect for the traditional standards that make his work stand out, even today, as enduring contributions to volcanology. ■



Howell Williams' hand-drawn illustrations of petrographic thin sections helped thousands of students understand the textures and mineral assemblages of rocks as they are seen under the microscope.