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HOWEL WILLIAMS

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A Biographical Memoir by

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IT IS NOT AN EXAGGERATION to say that Howel Williams, through his own work and that of his students, was largely responsible for the emergence of volcanology as a rigorous branch of modern science. Few have left so pervasive an imprint on their fields; even fewer have inspired wider admiration or deeper affection.

Less interested in the eruptive phenomena of active volcanism than in broad structural and petrographic relations, he had a masterful ability to reconstruct the forms and histories of long-extinct volcanic provinces. It was his uncanny eye for landforms and the regional significance of lithologic relations that enabled him to synthesize the evolution of entire provinces from a few seasons of field reconnaissance and petrographic studies.

EDUCATION AND CAREER

Born in Liverpool, England, Howel 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 father recognized young Howel's ability early and encouraged his intellectual ambitions. With the help of a series of awards and scholarships, he began the

career that soon brought him international repute as one of the foremost igneous geologists of his time.

Williams's academic record was an unbroken series of achievements and scholastic honors. The potential he displayed in secondary school won him a scholarship to the University of Liverpool where, despite an interruption for military duty from 1917 to 1918, he received his bachelor's degree with first class honors before the age of twenty. Though his initial studies were in geography, he soon developed a keen interest in archeology, which in turn, by a singular combination of events, led him to geology.

While engaged in excavations of a Roman camp site in northern Wales, he 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 Professor P. G. H. Boswell of Liverpool's Department of Geology. It so happened that Boswell was then studying the Silurian rocks of Denbighshire and immediately recognized the source from the nature of the slate and its distinctive graptolites. Williams was so impressed with this instant solution to his problem that he began to sit in on lectures in geology and, after receiving his M.A. degree in geography, went on to earn an M.S. in geology in 1924.

With his geology degree came another scholarship that enabled him to further his studies at Imperial College. There, working chiefly under Professor 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 he was able to devote the next two years to stud-

ies with Professor 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 to field studies instead. 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.

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

FIELD WORK AND MAJOR PUBLICATIONS

Williams continued his studies of volcanoes in the western United States, particularly at 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 origin of calderas. The rapid succession of papers that resulted from this period included many 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 accounts of several large vol-

canic centers of the Cascade Range, including Newberry Caldera and The Three Sisters.

Following World War II, during which he worked with the U. S. Geological Survey on the quicksilver deposits of Oregon, his attention began to turn from the Cascades toward Mexico and Central America. When the volcano Paricutin was born in a Mexican cornfield, he joined a group of geologists recording its growth and evolution and completed a reconnaissance study of more than a hundred small cinder cones in the surrounding region.

In Latin America he found opportunities to put to good use his early background in archeology. He used petrographic techniques to trace the origin of stone used in the giant Olmec sculptures of La Venta near the Gulf Coast of Mexico, and in 1950, with the support of the Carnegie Institution of Washington, went to Nicaragua to examine ancient, human footprints near Managua.

While in Nicaragua, Williams was able to delve into the geologic effects and historical records of the great eruption of Coseguina in 1835. This was the beginning of a succession of regional studies which, though less widely known than his work on calderas and domes, was more remarkable, both for its scope and for the extent of its contribution to the previously little-known field of Central American geology.

In 1952 Williams published the first survey of the volcanic geology of central Costa Rica. Three years later, together with Helmut Meyer-Abich, he completed an extensive survey of the volcanoes of El Salvador. This was followed, in 1960, by a study of the great volcanic cones of the Guatemalan Highlands and, in 1964, by a reconnaissance of southeastern Guatemala. (This latter work provided my first occasion to work with Williams in the field and was the beginning of a long and fruitful collaboration.)

In 1965 we completed a survey of the volcanic geology of

Nicaragua and, in 1969, a similar one of Honduras. These last two studies, and one of the Galápagos Archipelago (also completed in 1969) were, in terms of the shear scope of work, the most impressive of Williams's career. All three involved large regional studies where few, if any, geologists had gone before; they allowed us to explore the geology of virtually unknown regions and to work out broad structural and stratigraphic relations of a fascinating volcanic province. Those delightful years of working closely with Williams in the field were, by any measure, the most valuable experience of my career.

In addition to regional field studies, Williams's postwar work produced, in 1954, a popular textbook on petrography 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 following 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 widely regarded as the most comprehensive work on the subject.

IN CONCLUSION

All of Williams's published work is characterized by elegant simplicity and clarity, and the same qualities also pervaded his teaching. His courses in petrography and regional geology were illustrated by artistic, hand-drawn diagrams and lucid, colorful, descriptions that left an indelible impression on hundreds of students. His work tended to be more qualitative than quantitative; it emphasized sound descriptions and insightful, deductive reasoning based on observed field relations.

He was at his best pioneering little-known regions, de-

ducing basic geological relations and characterizing petrographic provinces. He was never happier than when travelling by jeep through back regions of Central America, eating tortillas and beans in tiny native villages, joking in Spanish with Indians, and all the while piecing together a new chapter of regional geology.

Though known to most of his friends as "Willie," the title he cherished most was given him by students on the occasion of his retirement: "The Last of the Ordovices" reflected the Welsh background that had dominated Williams's formative years and the undercurrent of classicism that colored his charming joviality and irreverent wit. All who worked with him recognized his penetrating judgment and ability to see through pretense, but few realized that his genial informality masked a deep personal reserve and uncompromising principles of conduct.

Williams's fifty-year career spanned an era of dramatic changes in geology. The classical methods of scholarship, meticulous observations, and elegantly written monographs in which he was trained gave way to complex geochemical and thermodynamic calculations compiled by computers and reported in hastily prepared, multi-authored papers of transient interest. Although he himself contributed to this change and on balance approved of it, Williams was never really part of it. To the end, he was a natural scientist in the classic mode. In that respect, his death was more than a personal loss, for it was also the passing of a style that will never be seen again.

SELECTED BIBLIOGRAPHY

1922

Excavations of bronze-age tumulus near Gorsedd, Flintshire, North Wales. *Archaeol. Cambrensis*, 7th ser., vol. 2:265–89.

Igneous rocks of the Capel Curig district, North Wales. *Proc. Liverpool Geol. Soc.* 13:166–202.

1923

Romano-British site at Rhostryfan, Carnarvonshire, North Wales. *Archaeol. Cambrensis*, 7th ser., vol. 3:335–45.

1926

Notes on the characters and classification of pyroclastic rocks. *Proc. Liverpool Geol. Soc.* 17:223–48.

1927

Geology of Snowdon, North Wales. *Q. J. Geol. Soc. London* 83: 346-431.

1928

A recent volcanic eruption near Lassen Peak, California. *Bull. Dept. Geol. Sci. Univ. Calif.* 17:241–63.

1929

Volcanic domes of Lassen Peak and vicinity, California. *Am. J. Sci.* 18:313–30.

Geology of the Marysville Buttes, California. *Bull. Dept. Geol. Sci. Univ. Calif.* 18:103–220.

1930

With E. Greenly. *Methods of Geological Surveying*. London: Thos. Murby & Company. 420 pp.

Notes on the later geological history of Tahiti. *Bull. Dept. Geol. Sci Univ. Calif.* 19:119–35.

The Snowdon district. *Proc. Geol. Assoc. London* 41:190–205.

1931

Dacites of Lassen Peak and vicinity and their basic inclusions. *Am. J. Sci.* 20:313–30.

Geology of the Dolwyddelen syncline, North Wales. *Q. J. Geol. Soc. London* 87:425–58.

1932

Mount Shasta, California. *J. Geol.* 40:417–29.

Geology of Lassen Volcanic National Park, California. *Bull. Dept. Geol. Sci. Univ. Calif.* 21:195–385.

The history and character of volcanic domes. *Bull. Dept. Geol. Sci. Univ. Calif.* 21:51–146.

With C. K. Wentworth. Classification and terminology of the pyroclastic rocks. *Bull. Nat. Res. Coun.* 89:19–53.

1933

Geology of Tahiti, Moorea, and Maiao. *B. P. Bishop Museum Bull.* 105. 89 pp.

Mount Thielsen, a dissected cascade volcano. *Bull. Dept. Geol. Sci. Univ. Calif.* 23:195–214.

1934

Mount Shasta, California. *Z. Vulk.* 15:225–53.

1935

Newberry Volcano of central Oregon. *Bull. Geol. Soc. Am.* 46: 253–304.

With R. D. Evans. Radium content of lavas from Lassen Volcanic National Park. *Am. J. Sci.* 29:441–52.

1936

Pliocene volcanoes of the Navajo-Hopi country. *Bull. Geol. Soc. Am.* 47:111–72.

1940

With L. S. Cressman. Early man in south-central Oregon. *Univ. Oregon Monogr., Studies in Anthropology* 3:53–78.

1941

Crater Lake, the story of its origin. Berkeley: University of California Press. 97 pp.

Volcanology, 1888–1938. *50th Anniv. Vol., Geol. Soc. Am.*, pp. 367–90.

Calderas and their origin. *Bull. Dept. Geol. Sci. Univ. Calif.* 25: 239–346.

1942

Geology of Crater Lake National Park, Oregon. Carnegie Inst. Washington, pub. no. 540. 162 pp.

1944

Volcanoes of the Three Sisters Region, Oregon Cascades. *Bull. Dept. Geol. Sci. Univ. Calif.* 27:37–84.

1948

Ancient volcanoes of Oregon. Condon Lecture, Oregon State System Higher Education. 55 pp.

1949

Geology of the Macdoel Quadrangle. *Calif. State Div. Mines Bull.* 151:8–78.

1950

Volcanoes of the Parícutin region, Mexico. *U.S. Geol. Surv. Bull.* 965-B:165–279.

1951

With A. C. Waters. Quicksilver deposits of the Horse Heaven Mining District, Oregon. *U.S. Geol. Surv. Bull.* 969-E:105–49.

Volcanoes. *Sci. Am.* Nov.:3–11.

1952

Volcanic history of the Meseta Central Occidental, Costa Rica. *Bull. Dept. Geol. Sci. Univ. Calif.* 29:145–80.

The Great Eruption of Coseguina in Nicaragua in 1835. *Bull. Dept. Geol. Sci. Univ. Calif.* 29:21–46.

Geological observations on the ancient human footprints near

Managua, Nicaragua. Carnegie Inst. Washington, pub. no. 596. 31 pp.

1953

With R. R. Compton. Quicksilver deposits of Steens and Pueblo Mountains, southeast Oregon. *U.S. Geol. Surv. Bull.* 995-B: 19–77.

1954

Problems and progress in volcanology. *Q. J. Geol. Soc. London* 109:311–332.

With F. J. Turner and C. M. Gilbert. *Petrography*. San Francisco: W. H. Freeman & Co. 406 pp.

1955

With H. Meyer-Abich. Volcanism in the southern part of El Salvador. *Univ. Calif. Pub. Geol. Sci.* 32:1–64.

1957

Geologic maps of the Bend Quadrangle and of the central portion of the High Cascade Mountains. *Oregon Dept. Geol. Min. Ind.*

Glowing avalanche deposits of the Sudbury Basin. *Ontario Dept. Mines* 65:57–89.

1960

Volcanic history of the Guatemalan Highlands. *Univ. Calif. Pub. Geol. Sci.* 38:1–86.

1961

The floor of Crater Lake. *Am. J. Sci.* 259:81–83.

1963

With R. F. Heizer. Geologic notes on the Idolo de Coatlichan. *Am. Antiq.* 29:95–98.

1964

With A. R. McBirney and G. Dengo. Geologic reconnaissance of southeastern Guatemala. *Univ. Calif. Pub. Geol. Sci.* 50:1–56.

1965

With A. R. McBirney. Volcanic history of Nicaragua. *Univ. Calif. Pub. Geol. Sci.* 55:1–73.

1969

With A. R. McBirney. Volcanic history of Honduras. *Univ. Calif. Pub. Geol. Sci.* 85:1–101.

With A. R. McBirney. Geology and petrology of the Galápagos Islands. *Geol. Soc. Am. Mem.* 118. 197 pp.

1977

With G. H. Curtis. The Sutter Buttes of California: a study of Pio-Pleistocene volcanism. *Univ. Calif. Pub. Geol. Sci.* 116:1–56.

1979

With A. R. McBirney. *Volcanology*. San Francisco: Freeman & Cooper. 397 pp.