

## FROM THE ARCHIVIST'S CORNER

### ROBERT H. DOTT, JR.



## W.H. Twenhofel—Patriarch of Sedimentary Geology



photo: Geology Dept. archive

William H. Twenhofel  
(1875–1957)

Boyhood on a small Kentucky farm was hardly an auspicious beginning for “The foremost authority in the world of sedimentation [who] made the University of Wisconsin the center of sedimentation of the world.” Although the *Wisconsin State Journal* perhaps overstated the case a trifle when William H. Twenhofel retired in 1945, certainly he was one of a handful of founders of the specialty now called sedimentology and our university was one of a very few centers of research and teaching in that specialty.

When Twenhofel joined our faculty in 1916, Wisconsin was famed as a “hard rock” school of Precambrian geology (see *Alumni Newsletter* for 1996, p. 42-44). To be sure, other aspects of geology were being taught and the very first course in sedimentation seems to have been introduced here in 1912 by Twenhofel’s predecessor, Eliot Blackwelder. But it was Twenhofel who, during 29 years on the faculty, developed strong reputations for Wisconsin in both paleontology and sedimentary geology. The rapid expansion of the petroleum industry after 1920 greatly stimulated those “soft rock” specialties. In 1928 paleontologist Robert R. Shrock joined Twenhofel and in 1935 Twen’s student, Stanley A. Tyler, joined the faculty. After Twen’s retirement, Tyler taught sedimentation and Lewis M. Cline came on board in stratigraphy and petroleum geology. As enrollments continued to mushroom, still others were recruited—Robert H. Dott, Jr. in clastic sedimentology (1958), Carl J. Bowser in sedimentary geochemistry (1964), and Lloyd C. Pray in carbonate sedimentology (1968). Cline died prematurely in 1971 and the other three are now retired.

Today the sedimentary program is staffed by Toni Simo in carbonate sedimentology, Alan Carroll in clastic sedimentology, and Nita Sahai in low-temperature geochemistry.

Who was William H. Twenhofel? How did he become a geologist? And how did he come to Wisconsin? Twen, or Twennie, as he was known to students and colleagues alike, was born in 1875 to German immigrant parents near Covington, Kentucky just across the Ohio River from Cincinnati. He attended public country primary schools, but had to attend a private school for secondary education. In 1899, he married his childhood sweetheart, Virgie M. Stephens. Twen had to earn his own living from an early age, but he was infused with frugality, self-discipline, and an incredible capacity for work. From 1896 to 1904, he taught in local schools during the winter and took other jobs in the summers,

for example with the Covington Street Railway Company in 1900. During the summers of 1902-1904, he studied at the National Normal School in Lebanon, Ohio. After receiving the BA in 1904, he took a teaching position at the East Texas Normal College in Commerce, Texas.

Having at last saved enough money and with strong letters of recommendation, he entered Yale

University in 1907 at the age of 32. Twen quickly earned another AB (1908), the MA (1910), and the PhD (1912).

In 1910, he took an assistant professorship at the University of Kansas, and in 1918 became State



photo: Geology Dept. archive

Twenhofel in the field, circa 1940.

Geologist. While at Kansas, he was a co-founder of the geological fraternity, Sigma Gamma Epsilon. Then in 1916, he accepted an invitation from Wisconsin.

Twenhofel told a reporter in 1945 that he had become interested in geology by accident. "I've always been a collector. As far back as I can remember, I picked up arrow heads and fossils and saved them." The incredibly rich Ordovician fossils of the Cincinnati area helped to nurture the careers of a remarkable number of outstanding American geologists, but for Twen it was a delayed reaction. His principal early teaching duties were in mathematics, and he intended to pursue that subject once he got to Yale. But in his last year at East Texas, he had to take over the duties of a recalcitrant geology instructor, and that experience showed him his true calling.

At Yale, Twenhofel was much influenced by Joseph Barrell and Charles Schuchert (the latter, coincidentally, was one of those famous Cincinnati-born paleontologists). Schuchert suggested a dissertation project in eastern Canada to study fossils below and above the Ordovician-Silurian boundary. In 1908-1910, Maritime Canada was remote and wild, so that to work there meant an "expedition, which entails hardship." Twenhofel reminisced with the reporter that "You spend half of your time getting to your destination and half of the remaining time waiting for the rain to quit." On Anticosti Island, the subject of his dissertation, he walked 700 miles around the perimeter of the island while his supplies followed by dory rowed just offshore. He once stayed with a local "Old Man

Hollister, who took care of us the best way he could—dried salmon and bread; no butter, no plates, and only a little molasses in our tea." Twenhofel's Canadian research was to develop into a long-term program, which kept bringing him back to the Maitime region. Indeed, the first half of his career was primarily in paleontology and stratigraphy, but his presidential address to the Paleontological Society in 1931 foreshadowed his sedimentation career by emphasizing the importance of sedimentary environments to paleoecology.

Joseph Barrell had stimulated in Twenhofel an interest in how weathering, erosion, depositional environments, and patterns of subsidence affect sedimentation. This gave the impetus for Twenhofel's more famous second career in sedimentation. A first small contribution came when he joined a 1914 Harvard expedition to the Baltic Sea to compare the lower Paleozoic paleontology and stratigraphy of that region with that of Maritime Canada. One day Twenhofel's small boat grounded in a bay in the eastern Baltic, and when he jumped out to push it free, he sank up to his waist in soupy, black, stinking mud. This prompted a short article, "Notes on black shale in the making" (1915). Together with dolomite and banded iron formation, the origin of black shale was one of those seemingly intractable problems in sedimentary geology, (Twenhofel wrote again about black shales in 1939). World War I began while Twenhofel was investigating the famous Silurian rocks of the Baltic island of Gotland, He was promptly arrested because he was a



photo: Geology Dept. archive

*W.H. Twenhofel (1), Mrs. Twenhofel (2), their son Bill (3), daughters Helen (4) and Lillian (5). A.W. Weeks (6), a younger brother of Lewis G. Weeks, is in the back row. Dances held in the Twenhofels' attic were legendary events. This photo was taken in 1924.*

*The Twenhofel house, built in 1922 near the UW arboretum, is an outstanding example of the Arts and Crafts bungalow style and is a Madison architectural landmark.*

foreigner, but the officer had once been “a Boston cop so I talked my way out of it.” A day or so later, he was arrested again, however, and was shipped back to mainland Sweden.

Twenhofel’s sedimentation career really began with his appointment in 1919 to a National Research Council Committee on Sedimentation. This body brought together a number of investigators to survey the status of the newly emerging specialty. Twen remained on the committee until 1949 and he chaired it from 1923 to 1931. He did most of the writing of *A Treatise of Sedimentation* published by the committee in 1926. Appearance of the *Treatise* and the creation of the Society of Economic Paleontologists and Mineralogists in the same year mark the beginning of modern sedimentology with Twenhofel a key player in both efforts. Moreover, in 1930 he was a co-founder of the *Journal of Sedimentary Petrology*, the first journal in the field, and from 1933 to 1946 he was its editor. Apparently Twenhofel had an unusual talent for directing committee efforts. He was able to get colleagues to do a lot of work and to see it through to completion. He also wrote unusually effective summary reports. After chairing the Sedimentation Committee, he was tapped to direct the NRC’s Division of Geology and Geophysics (1931-1934), and, during this term, he helped to organize a Committee on Stratigraphy. Next he chaired an NRC Committee on Paleocology (1934-1937).

Besides his administrative accomplishments in helping to spawn new fields in sedimentary geology, Twenhofel made many other contributions as well. In 1939 he published *Principles of Sedimentation*, the first textbook in the field, which made the *Treatise* material more accessible. In 1941 he co-authored *Methods of Study of Sediments* with Stanley A. Tyler. The 1920s-1930s was a heavy mineral era in sedimentology because the petroleum industry was desperate for criteria derivable from small drill cuttings for correlation between wells. Variations among the accessory minerals in sandstones seemed especially promising; it was the study of sedimentary mineralogy that prompted the creation of the *Journal of Sedimentary Petrology*. With a strong tradition in mineralogy and petrology, thanks especially to Alexander N. Winchell, Wisconsin was a natural venue for accessory mineral research. Although it is not apparent from his bibliography, Twenhofel was an active participant in this effort by directing at least eight theses on the heavy minerals of several Paleozoic and Precambrian formations in Wisconsin. Most notable was the 1935 PhD dissertation of his student, Stanley A. Tyler, on the heavy minerals of the St. Peter Sandstone. During World War II, Twenhofel himself studied the black sands of Oregon beaches to evaluate their potential as a source of

strategic chromite.

During the 1930s and 1940s, Twenhofel embarked upon another major line of investigation, the sediments of various Wisconsin lakes, which complemented the pioneering research in limnology by University of Wisconsin zoologists. He co-authored papers on the lakes with ten students, including later director of the United States Geological Survey, Vincent E. McElvey. Twenhofel also wrote about a wide variety of other sedimentological topics, including Cambrian glauconitic greensands and their potential as a source of potash fertilizer, marine conglomerates and unconformities, deep sea sediments, and corals and other reefs. Moreover, having “been born with the outdoors in his blood,” he was interested in all of nature, but especially plants and soils. Reflecting his farming roots, Twen wrote and lectured about the geologic origin of soils, how vital they are to humankind, and warned of the dangers of soil erosion.

Twenhofel’s stature as a founder of sedimentology has been recognized in several ways. The Society of Sedimentary Geology, SEPM, which he helped to found in 1926, established the Twenhofel Medal as its highest award. In 1947 he was awarded an honorary doctorate by University of Louvain in Belgium. He served as president of SEPM (1935) and earlier as president of the Paleontological Society (1930), vice president of the Geological Society of America (1930), Distinguished Lecturer (1946), honorary member of the American Association of Petroleum Geologists (1947), and honorary member of the Tulsa Geological Society (1947). [Following the Twenhofel tradition, Badgers Cline, Dott, and Pray were also Presidents of SEPM, Cline was editor of the *Journal of Sedimentary Petrology*, and Pray and Dott have been recent Twenhofel Medalists].

Thousands of students remembered W.H. Twenhofel as an unusually inspiring educator, whose lectures were laced with humor and memorable anecdotes. The depth of appreciation and affection for Twen was exemplified by a present from his introductory geology class in May 1944. The accompanying card stated in part: “Our thanks to you for being the friend of students and youth, as well as the true scholar that you are.” Twenhofel was also popular with the public for outreach activities. Members of the Madison Geology Club presented him with a briefcase and autograph book upon his retirement. All expressed deep gratitude for the generous sharing of his knowledge of the earth through public lectures and field trips. In all of his educational efforts Twenhofel demonstrated a philosophy that an investigator’s “every faculty should be used—the feet to carry [one] across the strand, along the cliff, and over the rocky wastes; the eyes to search out the endless detail of the geological record; and the mind to analyze the significance of those details.” (R.R. Shrock, 1947, p. 839).