Memorial to Leonard D. Harris
1925–1982

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Leonard D. Harris was born in Kansas City, Missouri, on March 10, 1925, and died in the Washington, D.C., area on July 27, 1982. He served with the U.S. Marine Corps in the South Pacific during World War II, participating in amphibious operations against the Japanese. After the war he obtained a bachelor's degree in geology from the University of Missouri in 1949, and in 1950 joined the U.S. Geological Survey.

Leonard was first and foremost an able field geologist. He began his mapping for the U.S. Geological Survey with a short tour in the Ouachita Mountains. In 1952 he moved to the Appalachians to work in the coal fields, where he mapped and compiled coal resource information in Kentucky and studied deep oil and gas tests in West Virginia. He began his studies of the Valley and Ridge shortly thereafter and, with Ralph Miller, published his first geologic quadrangle report “The Geology of the Duffield Quadrangle, Virginia” in 1958. In 1958 Len started a regional project in the southern Appalachians which was designed to test the thin-skinned hypothesis by mapping a block of quadrangles across the Valley and Ridge. This project, which resulted in detailed field mapping of eight 7½-minute quadrangles and in several regional stratigraphic and structural geology studies in the imbricate thrust belt of eastern Tennessee and southwestern Virginia, provided him with the experience essential for his subsequent regional studies and syntheses of Appalachian fold and thrust belt tectonics.

Leonard had many and diverse career interests and a curiosity that was constantly stimulated by his work in the field. He often said that he approached each study using “imagination and geo-logic.” He wrote papers on stratigraphy, facies, and depositional environments; on paleotopography and paleoaquifers; and on Appalachian structure and tectonics. Len was interested in the Knox Group and its mineral resource potential, both as a reservoir for oil and gas and for its Mississippi Valley-type ore deposits. He revised and refined the stratigraphy of the group, described its algal stromatolites, and developed a regional dolomitization model that showed how widespread, thick carbonate sequences could be altered in subtidal environments.

As part of his work for the Branch of Eastern Environmental Geology, Len made an exhaustive environmental study of Knox County, Tennessee. In one map series he (and several associates) compiled and published data on the geology, mineral resources, land slopes, and urbanization, stratigraphy, structure, sinkholes, soils, engineering geology, and flood potential in Knox County.

During the later part of his career, after the oil embargo of 1973 had focused national attention on the need for domestic petroleum resources, Len returned to his interests in regional studies related to Appalachian hydrocarbon potential. Philosophically, he was a converted thick-skinner, and although little data were available to the
public to prove thin-skinned deformation of the Appalachians even in the early 1970s. Len had accepted and endorsed the concept. He obtained a short Vibroseis profile in eastern Tennessee from Geophysical Services, Inc., and with their permission in 1976 published his interpretation, which demonstrated the nature of thin-skinned tectonics in the Tennessee imbricate thrust belt. When the Tennessee Division of Geology, under contract to the U.S. Department of Energy, was conducting regional Vibroseis surveys of the Valley and Ridge in 1977, Len convinced the U.S. Geological Survey to contribute to the project while it was in mid-shoot. This Survey contribution allowed one of the lines to be extended entirely across the Valley and Ridge to the toe of the Blue Ridge, where it became evident that about 23,000 ft of Paleozoic strata were projecting eastward beneath crystalline overthrusts. The success of the Tennessee surveys encouraged Len to pursue this line of research, and the resulting regional seismic profiles by the U.S. Geological Survey in Tennessee and North Carolina, and later in Virginia, are fundamental to our understanding of Appalachian thrust systems. Leonard provided the inspiration, justification, and leadership in the U.S. Geological Survey Branch of Oil and Gas Resources that was necessary to secure appropriate funding for the contract geophysical work and to interpret data once they were obtained.

These studies, and others concerned with regional structural and stratigraphic syntheses and with thermal maturation of Paleozoic strata in the Appalachians, provided basic geologic data essential for exploration in the region. Leonard worked with and instructed many company geologists interested in exploring the Appalachians for oil and gas. He contributed greatly to their understanding of this complex geology. Len was an excellent speaker, conducting numerous seminars, both formal and informal, for company geologists. He was at his best, however, when leading field trips and discussing thin-skinned tectonics with those most important exposures providing the background for understanding Appalachian structural geology.

Leonard was a hard-working and dedicated individual. He gave much more to his associates than he expected in return. His natural ability, intelligence, hard work, dedication to the profession, and unabated curiosity concerning Appalachian geology constantly stimulated and inspired those of us associated with him to vigorously pursue our own, often related studies. When he began working in the Appalachians, the thick-skinned-thin-skinned debate was unresolved. When he finished, regional geologic and geophysical surveys funded by industry and government had provided a great deal of detailed information concerning the framework of the Appalachian basin and the geometry of Appalachian thrust systems, and overthrusting of Valley and Ridge Paleozoic rocks by Blue Ridge and Piedmont crystalline rocks had been clearly demonstrated by extensive seismic profiling—he had played a leading role in the process.

SELECTED BIBLIOGRAPHY OF L. D. HARRIS


