

# Memorial to Jarvis Bardwell Hadley 1909-1974

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Jerry Hadley's professional life spanned the evolution of the modern science of metamorphic stratigraphy. When he began his work, the Blue Ridge, the Piedmont, and large parts of New England were regarded by many geologists as primordial crust. Jerry played a major part in unraveling the complex stratigraphy of the crystalline Appalachians, first as a student at Harvard University and for many years afterwards as a member of the U.S. Geological Survey. He not only carried out important research in the field himself but directed and strongly influenced the work of others.

Jerry was born in 1909 in Kingston, Rhode Island. He lived in New England most of his boyhood and attended high school in Shelburne Falls, Massachusetts. As a youth, he did a great deal of traveling. He once took a hiking trip through Norway with his mother and sister, and he liked to recount his adventures with a large group of boys on a bicycle trip from New England to Florida, ending with a visit to Cuba. For a time, he went to school in Germany.

Jerry attended Antioch College in Yellow Springs, Ohio, where for two years he was an assistant to Professor Alan Swinnerton. This led to his attending the Harvard Summer School of Geology at Fort Ticonderoga, New York, where Swinnerton was a teacher. His graduate work in geology was at Harvard, where he received a doctorate in 1936.

His graduate studies at Harvard came at a time when new ideas were being applied to the study of metamorphic rocks in the field, and Jerry was one of the first of a group of enthusiasts who, under Marland Billings' tutelage, were destined to bring order out of the chaotic state of understanding of the rocks of New Hampshire and Vermont. After Harvard, Jerry became instructor in geology and mineralogy at Tufts College; then in 1941 he joined the U.S. Geological Survey at the beginning of its rapid wartime expansion. During most of World War II, his assignments were in the West, where he investigated various metalliferous deposits. In 1944 he returned to Massachusetts, where he mapped the bedrock and glacial geology of the Mount Grace quadrangle.

In 1946 he began his long and fruitful involvement in the southern Appalachians where the USGS set up the first of a series of projects, under the general supervision of P. B. King, to discover structural and stratigraphic order in the thick sequence of metamorphic rocks of the region. Jerry was a key member of the group, and he not only took a tough assignment in mapping the remote and rugged eastern part of the Great Smoky Mountains but also shared the administrative load shouldered by King.

The experience was a happy one, lasting more than eight years. The Hadleys found a comfortable place to live in Gatlinburg, and their home became a sort of open house for the younger men on the project and their wives. Jerry had at least six assistants for longer or shorter periods, several of whom have become important Geological Survey figures. He had a strong interest in the southern Appalachians and in the folk music—

the songs indigenous to the region and those imported from England. When working in the isolated Cataloochee valley, Jerry boarded with one of the old mountain families. In the evenings, the head of the family would bring out a dulcimer and entertain. Jerry enjoyed this immensely.

On completion of the Great Smokies project in 1956, he transferred to Denver to work in the Gravelly and Madison Ranges, Montana, as chief of a large project in that area. In 1960 he returned to Washington as Chief of the Branch of Regional Geology in Eastern States. When this administrative assignment was completed in 1965, he returned to the southern Appalachians, where he was in charge of mapping the Knoxville 2° quadrangle at 1:250,000 scale. Mapping the complex stratigraphy of metamorphic terrane at this small scale was a new kind of undertaking, which proved very successful.

Not many places exist where one can confidently trace folded and faulted rock units for considerable distances, observing the changes in sedimentary facies and at the same time noting the progression from unmetamorphosed to highly metamorphosed rocks. This situation exists in the Smokies, and Jerry Hadley's delight was to follow these changes and document them. His demonstration of the difference in the source areas of sediments making up the Snowbird Group (the lower group of the Ocoee Series) from those of the overlying Great Smoky Group is an important contribution to our understanding of the paleogeography and tectonic history of the Blue Ridge and Piedmont provinces in middle and late Precambrian time. Mineralogic studies are under way, taking advantage of the metamorphic-stratigraphic background presented by Jerry. One applicable in mineral resources concerns the occurrence of rutile in rocks of a particular stratigraphic unit at different metamorphic grades.

Jerry's analysis in 1963 of existing radiometric age determinations in the Appalachians and his interpretation of their significance provided a timely statement of tectonic and plutonic events in the Appalachian region, which later workers in the field are refining by use of rapidly accumulating data. Jerry's background led to his participation as an editor of the Northern and Maritime volume of *Studies of Appalachian Geology*, published in 1968, and as a contributor to the Central and Southern volume, published in 1970. It also led to his collaboration with J. F. Devine of the National Oceanic and Atmospheric Administration and the USGS on a map relating patterns of known seismicity to major structural features in the Appalachians. This map is an important tool for evaluating hazards in the siting of major engineering structures, such as nuclear reactors. Jerry's contributions to applied geology include his clear and lucid description and analysis of the geologic conditions leading to the Madison Canyon landslide at the time of the Hebgen Lake, Montana, earthquake in 1959. In this analysis, he provided highly useful information, not only on the effects of such slides but on the combinations of rock structure, rock weathering, and slope that may lead to failure of surficial materials under the shock of an earthquake.

Jerry's productivity never slackened. In 1973 he published an account of the Oxford area in the Carolina slate belt, and at the time of his death he had begun a study of part of the Blue Ridge anticlinorium in Maryland. The professional staff of the Geologic Division owes him a great debt for the time-consuming task of supervising the very successful designs and installation of modular furniture in the new USGS National Center at Reston, Virginia.

Jerry was an outstanding regional geologist whose professional work was both meticulous and imaginative. He was a master of the art of mapping complexly deformed rocks, as well as of the microscopic techniques necessary for working out their relationships. His scientific contributions are of a sort that will have lasting value because the

objectivity and high quality of his geologic maps and papers make them just as useful to those who may disagree with his interpretations as to those who agree.

Jerry will be remembered by his many colleagues and friends, perhaps most of all for his great warmth and friendliness, his enthusiasm, his unassuming nature, and his unselfishness in all his dealings with others.

Jerry Hadley died on November 14, 1974, of a heart attack, apparently while resting after a traverse up Catoctin Mountain near Frederick, Maryland. He was not found until November 17. He is survived by his wife, Charme Shippen Hadley; a daughter, Abigail; and a grandson, Aaron Hadley Schmidt.

*We wish to thank our colleagues who have helped us in preparing this memorial, particularly Philip B. King and Walter S. White.*

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