

Memorial to William Porter Irwin (1919–2012)

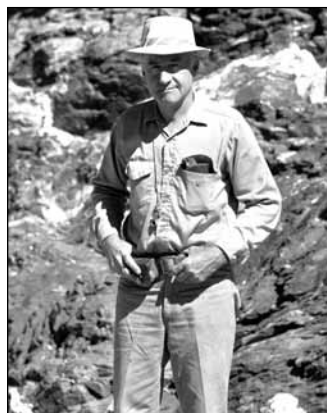
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William Porter Irwin (known to all as “Porter”), U.S. Geological Survey (USGS) Scientist Emeritus and Geological Society of America Fellow, died on 1 February 2012 at his home in Menlo Park, California, at the age of 92. With Porter’s death, the geoscience community lost a quintessential field geologist who made enormous contributions to the geology of the Klamath Mountains and Coast Ranges of California and Oregon. These studies, although commonly regional in scope and focus, provided important insights into the development of accretionary orogens, which characterize many mountain belts on Earth. His friends, colleagues, and family lost a warm-hearted, humorous, creative, and dedicated man who had significant impact on the many people who were fortunate to know him during his long and productive life.



William Porter Irwin was born on 22 September 1919 in Springfield, Illinois. He was the son of Lafayette Lincoln Irwin and Gertrude Ahart Irwin. As a boy, Porter enjoyed camping and fishing and was active in the Boy Scouts. As a teenager, he enjoyed walking the Lincoln Heritage Trail. One of his favorite memories was a trip to the Chicago World’s Fair in 1933. He graduated from Springfield High School in 1937. For about a year after his graduation, Porter pursued a career in music as a clarinetist. However, in 1939, he enrolled at New Mexico School of Mines in Socorro, New Mexico, and graduated with a BS in geological engineering in 1944. In 1942, he served as a geological field assistant to Richard H. “Dick” Jahns (1915–1983) in the Mineral Deposits Branch of the USGS. Their work on pegmatite deposits in New Mexico prepared him for his first assignment as a geologist with the USGS several years later. However, later in 1942, Porter enlisted in the U.S. Army and was subsequently sent to the Air Corps Training Center in Jackson, Tennessee. He was discharged from the army in June 1943 and returned to the Mineral Deposits Branch and continued mapping pegmatite deposits in New Mexico and eventually in the Spruce Pine district, North Carolina, and Keene district, New Hampshire. In 1946, he left the USGS to work as a field geologist for Transcontinental Resources, Ltd., Vancouver, British Columbia, Canada. For over a year he studied gold and silver mines in the Yukon Territory.

In late 1948, Porter decided to continue his education at the graduate-school level and entered the California Institute of Technology (Caltech), where he again worked with Dick

Jahns. Interestingly, his MS thesis was not on pegmatite deposits but focused on the stratigraphy of the Upper Tick Canyon area, Los Angeles County, California. Porter graduated from Caltech with an MS degree in 1950.

In 1951, Porter returned to the Mineral Deposits Branch of the USGS and was stationed in San Francisco. He carried out field studies throughout California and Nevada on various mineral commodities. In 1953, he was designated the project chief of the Trinity River Basin project with Edgar H. "Ed" Bailey (1914–1983) as his immediate supervisor. This project inspired Porter's interest in the geological evolution of the California Coast Ranges and adjacent Klamath Mountains. Irwin's studies in the northern Coast Ranges led to the recognition that the 'Franciscan Group' includes age-equivalent rocks to the well-stratified and fossiliferous Great Valley sequence and eventually, to the discovery that a fundamental regional fault, the Coast Range fault, separates these two structurally dissimilar but age-equivalent units. An important byproduct of Irwin's regional work in northern California was the 1960 publication of the landmark study titled: *Geological Reconnaissance of the Northern Coast Ranges and Klamath Mountains, California* as California Division of Mines Bulletin 179. Accompanying the text of this important bulletin was Plate 1: *Geologic map of northwestern California*, scale 1:500,000.

Beginning in 1953 and continuing throughout his active career as a geologist with the USGS, first with the Mineral Deposits Branch and subsequently with the Pacific Coast Branch, Porter carried out basic geologic mapping in the northern California Coast Ranges and Klamath Mountains. An important tectonic concept that resulted from Irwin's extensive mapping of alpine-type ultramafic rocks in these mountain ranges was his recognition that these ultramafic rocks were commonly tectonically emplaced during orogeny and typically associated with regional thrust faults. As the plate-tectonic paradigm was broadly applied to the interpretation of the geology of California in the early 1970s, Porter became an active participant in the International Union of Geological Sciences (IUGS) ophiolite project, which afforded him the opportunity to travel extensively, studying ophiolites in various orogens outside of North America. In 1976, he participated in an oceanographic cruise on the RV *Dmitri Mendeleev* to dredge oceanic trenches and examine on-land exposures of ophiolite along the western Pacific Rim. Porter applied his knowledge of ophiolitic rocks to earthquake mechanics in his paper with Ivan Barnes (1931–1989) on the causal relationship between the distribution of serpentinite and creeping segments along the San Andreas fault.

However, an even more fundamental contribution to the tectonic evolution of the western North American Cordillera arose from his regional geologic studies in the southern Klamath Mountains. In 1972, Porter recognized that the western Paleozoic and Triassic belt that he had delineated on his 1960 geologic map was composed of "terranes," which he referred to as "... an association of geologic features, such as stratigraphic formations, intrusive rocks, mineral deposits, and tectonic history, some or all of which lend a distinguishing character to a particular tract of rocks and which differ from those of an adjacent terrane." Although it would take a half-dozen or more years for the full impact of the 'terrane concept' to permeate the psyche of many tectonicists studying the geologic evolution of the western North America Cordillera, the recognition of terranes would eventually become a central theme in the interpretation of ancient orogens dominated by accretionary tectonics. An important culmination of his many years of study of the geology of the Klamath Mountains province was the publication of his *Geologic map of the Klamath Mountains, California and Oregon* as U.S. Geological Survey Miscellaneous Investigations Series Map I-2148 in 1994. This important geologic map is a classic synthesis of the evolution of an accreted orogenic belt.

Porter was a clear, crisp writer and a wonderful editor, especially for beginning geologists. Both of us remember the detailed comments in blue pencil that characterized his review of

your abstract, thesis, or manuscript. Porter enjoyed writing, especially when he had a good geological story to tell. Throughout his career, Porter always emphasized and used fundamental, field-based data: geologic maps, regional cross sections, large-scale structural features, fossil assemblages and distributions, geochronology of plutonic belts, and distribution of mineral deposits. His great talent was to carefully and logically compile these basic geologic data into a regional tectonic framework. For his service to the USGS and contributions to science, Porter was awarded the Meritorious Service Award in September 1985.

While living in San Francisco, Porter met Norma Nones, who was an employee at Bank of America. After a brief courtship, they were married in Reno, Nevada, on 12 December 1953. Porter and Norma were married for 54 years until Norma's passing in 2007. Norma and Porter had three sons: Richard Porter Irwin, Jeffrey Lynn Irwin, and Robert Bruce Irwin. During the 1960s and 1970s, Porter and his family spent many summer months in the Klamath Mountains. Commonly field assistants, who Porter trained in the basic methods of geologic field mapping, were part of the 'family.' In the field, Porter was a true teacher. Although he always had an ambitious research plan for his field season, he had the patience and dedication to carefully instruct his assistants in how to understand the complex rocks and structural geology that characterize the Klamath Mountains and northern California Coast Ranges. Commonly, in the evenings after a hard day of fieldwork, Porter enjoyed his favorite hobby as a ham radio operator to chat with friends, especially his USGS colleague Preston E. "Pres" Hotz (1913–2004), or to communicate with other members of the International Amateur Radio Union throughout the world.

Porter formally retired from the USGS at the end of December 1988 at the age of 69. However, he continued his studies of the tectonics of northern and central California as a scientist emeritus, Branch of Engineering Seismology and Geology, and subsequently as a member of the Earthquake Hazards Team, Menlo Park, California, until a few weeks prior to his death. During his "retirement" he developed new skills in computer drafting and spent much of his time compiling many geologic maps that were based on his years of fieldwork. Some of these maps had previously been published as preliminary geologic maps, but now he finalized them and shepherded them through the rigorous review process characteristic of the USGS. Porter's published geologic maps are listed separately in his selected bibliography because he was perhaps most proud of this great legacy that he left the geoscience community.

His three sons, two daughters-in-law, and four grandchildren survive Porter. Also, he left a legacy of many former field assistants, including us, who learned much about being a field geologist from this great teacher, mentor, and friend.

ACKNOWLEDGMENTS

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