of both science and life. Although he entered physics because of "lucky hazards," he took the ball and created a wonderful legacy.

Ole G. Mouritsen
University of Southern Denmark
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Richard Pierre Von Herzen

Richard Pierre Von Herzen, a pioneer in geophysical instrumentation, died of vascular disease in Portola Valley, California, on 28 January 2016. Dick was a remarkably creative and influential scientist, a considerate colleague, and a thoughtful mentor. He helped establish the disciplines of deep-sea geothermics and marine hydrogeology and published seminal studies on those and related topics.

Born in Hollywood, California, on 21 May 1930, Dick completed a BS in geophysics at Caltech in 1952. After serving in the US Army, he earned an MA in geology from Harvard University in 1956 and a PhD in marine geophysics from the

Richard Pierre Von Herzen

Scripps Institution of Oceanography in 1960, with Russell Raitt as his adviser. Dick spent most of his professional career at the Woods Hole Oceanographic Institution (WHOI), where he made numerous contributions, particularly in instrument development. Dick sailed on about 45 oceanographic expeditions, 15 as chief or co–chief scientist. Among other recognitions, he was awarded the Maurice Ewing Medal by the American Geophysical Union in 1998 and the Hans Pettersson Medal from the Royal Swedish Academy of Sciences in 1999.

Dick is perhaps best known for developing and applying tools, including multipenetration probes, to measure the flow of heat through the seafloor and laboratory instruments to determine the thermal conductivity of sediments and rocks. Dick led the development of microelectronic systems for those tools and pushed the limits of available technology. In addition, he freely shared instruments and ideas with a broad community, including many young researchers and students, and he encouraged others to build on his achievements.

Dick's work was at the center of ideas that developed into the modern theory of plate tectonics, which explains many aspects of Earth's history, properties, and processes. His seafloor heat-flux measurements showed elevated values close to seafloor ridges, which are often near the center of ocean basins; the ridges were interpreted to be "spreading centers" where new lithosphere is created. Those

heat-flux data also showed high spatial variability, which was subsequently determined to result from massive flows of cold seawater into the crust and the circulation and discharge of heated, highly altered hydrothermal fluids.

With colleagues, Dick profiled the temperatures of ocean-bottom water across the Galapagos Rise and generated some of the first direct evidence for hydrothermal plumes. He later returned on an expedition with a submersible; he was among the first to see the discharge of hot, shimmering water and the exotic biological communities that were sustained by that process. Dick was also a co–chief scientist on Deep Sea Drilling Project Leg 3, which validated the hypothesis of seafloor spreading by dating basal sediments across the southern Atlantic Ocean.

Dick developed tools to measure the electrical properties of the ocean crust, determine the rate of fluid flow from seafloor hydrothermal vents, and quantify geothermal heat flux with a submersible. Many of his tools and methods are still widely used today. He studied the heat flux associated with seamounts and their (hypothesized) mantle hotspot plumes, and he conducted surveys showing hydrothermal circulation that occurs in some of the oldest present-day seafloor. Dick served on many technical and scientific advisory committees, where he spoke carefully and quietly, but with authority. His colleagues valued his insights and opinions.

Dick remained active after becoming emeritus at WHOI in 1995. He was a visiting researcher at the University of California, Santa Cruz (UCSC) during 2001–11 and generally spent five to six months each year in residence. There he engaged with a new generation of students learning and applying geothermal methods, conducted collaborative studies, and served as an informal adviser and mentor.

The campus is on the edge of Ben Lomond Mountain, which sits high above the surrounding town, and most people who work or study at UCSC do not use a bicycle as their primary mode of transportation. But Dick was a lifelong athlete and a dedicated cyclist who rarely drove his car in town. Well into his late seventies, he was frequently seen pedaling vigorously up the hill to UCSC, even during winter rainstorms: He would arrive wet, flushed, and bright-eyed after an invigorating ride.

An avid photographer, Dick frequently carried a camera to social gatherings and took pictures throughout the events. A few days later, participants would receive copies of the photos, often with a kind note.

We and many others were fortunate to work with Dick during his five decades of research. We benefited from his ideas, were encouraged to explore, and enjoyed his friendship. He was a gentleman and a brilliant scientist. We mourn his loss and treasure his legacy.

Andrew Fisher
University of California, Santa Cruz
Keir Becker
University of Miami
Miami, Florida
John G. Sclater
Scripps Institution of Oceanography
University of California, San Diego PT

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