

**MEMORIAL RESOLUTION**  
**TJEERD HENDRIK VAN ANDEL**  
**(1923 - 2010)**

Tjeerd ("Jerry") van Anandel died on September 17, 2010, at age 87 in Cambridge, England. He was one of the most influential and accomplished Earth scientists of the past half-century and a pioneering international leader in marine geology, oceanography and geoarchaeology. Tjeerd joined the Stanford faculty as Professor of Oceanography in 1976 and spent the following eleven years vigorously pursuing an international research agenda encompassing the global ocean to ancient human history. He retired from Stanford in 1987 and moved to Cambridge University. At the time of his death he was Honorary Professor of Earth History, Quaternary Science and Geo-Archaeology at Cambridge—a title clearly reflecting the remarkable breadth of his many contributions.

Tjeerd was born in Rotterdam, Netherlands, but spent his earliest years in the Dutch East Indies where trips with his family to ancient temples in the Indonesian jungle sparked an interest in archaeology. After the family's return to Holland he entered Groningen University in 1940 to study archaeology, a path interrupted by the World War II occupation of the country and closing of the university. The end of the war saw Tjeerd change his major to geology resulting in a fortuitous association with Phillip Kuenen, a renowned marine sedimentologist. Shortly after his receipt of the Ph.D. in 1950 and work with the Shell Oil Company, he was asked to take on the leadership of one of the first comprehensive marine geological studies of a modern continental shelf area off the coast of Venezuela. Subsequent publication of these studies in 1954 with H. Postma brought international recognition and in 1956 he accepted a post at Scripps Institution of Oceanography and leadership of major marine geologic and oceanographic studies of the Gulf of California and the Gulf of Mexico. Tjeerd's publications stemming from these latter expeditions are now considered classics in their field and continue to be much referenced.

The 1960's saw Tjeerd's interests expand from marine sedimentology to marine geophysics as emerging technologies provided revealing new images of the deep-sea floor and the Earth's crust. His research now included study of the Mid-Atlantic Ridge. This research thrust occurred at just the moment when a convergence of marine geophysical and geological investigations led to the revolutionary concept of plate tectonics and recognition that new ocean crust was in fact forming along the mid-ocean ridge system. Testing and confirmation of plate tectonics required a new kind of ship capable of drilling through the ocean floor and a level of international organization and funding unprecedented for the marine sciences. The Deep-Sea Drilling Project (DSDP) was launched in 1966 with Tjeerd a key member of the planning committee. Initial drilling commenced in 1968 with subsequent drilling sites in all of the world's ocean basins yielding a revolutionary new view of Earth history. Tjeerd's participation in DSDP included stints as Co-Chief Scientist at sea and membership on Advisory Panels overseeing scientific

goals and methods. This major international effort continues today as the Integrated Ocean Drilling Program with the participation and support of more than 20 nations.

Tjeerd early recognized the potential of deep-sea sediments as a rich archive of ocean and climate history, a resource unlocked *via* deep-sea drilling. He took full advantage of this record during his tenure as Professor of Oceanography and Head of Marine Geosciences at the newly formed School of Oceanography at Oregon State University beginning in 1968. Of the many research projects he initiated at Oregon, one stands apart. Together with colleagues Ross Heath and Ted Moore, he synthesized data garnered from a number of drilling sites in the Pacific region to reconstruct the history of the calcium carbonate compensation depth (the CCD) over the past 50 million years, a dynamic feature of fundamental importance to ocean chemistry reflecting major variations in ocean circulation, biologic productivity and climate change. Working with the National Science Foundation during this same period, Tjeerd's geopolitical skills were central to the organization and success of the International Decade of Ocean Exploration (1971 - 1980) including initiation of the CLIMAP project, a research effort subsequently responsible for documenting and confirming the orbital forcing of glacial-interglacial climate cycles. His participation in the French-American Mid-Ocean Undersea Study (FAMOUS) in the early 1970s was highlighted by the first use of a deep research submersible to map portions of the Mid-Atlantic Ridge. This latter use of the submersible *Alvin* led to what Tjeerd considered the peak experience of his career. On February 17, 1977, while looking through the porthole of *Alvin* at a depth of 3 km and observing the Galapagos Ridge in the eastern Pacific, he was the first to sight the now famous deep-sea hot springs and exotic deep-sea biota associated with these hydrothermal vents. It was a startling and completely unexpected discovery of a marine biota entirely sustained by chemosynthetic bacteria, a diverse life system completely independent of sunlight and photosynthesis.

Tjeerd's arrival at Stanford University in 1976 occurred while he was still involved with project FAMOUS. However, he was soon engaged with a full plate of university activities and teaching which curtailed his ability to participate in extended sea-going expeditions. In particular, Tjeerd relished his newly organized undergraduate course in Earth history that he claimed allowed him to become a generalist. His highly praised book *New Views of an Old Planet* reflects this larger perspective as well as his gift for presenting the scientific enterprise in an uncommonly approachable and witty style. The book is in its third edition and five translations. Tjeerd's multifaceted research and teaching activities led to his co-appointments as Professor of Geophysics and Professor of Human Biology.

Tjeerd's scholarly path took a sharp turn in 1978 thanks to an invitation from the late Michael Jameson, Professor of Classics, who invited him to join a Stanford archaeological survey of the Southern Argolid, Greece. As described by Tjeerd, his past experiences with archaeology, Quaternary geology, sedimentology, and study of sea-level change re-emerged and became critical to his research approach melding techniques and concepts of geology and archaeology. His work in Greece expanded and soon involved his graduate students. Professor Curtis Runnels of Boston University noted in a 1997 review of Tjeerd's geoarchaeological work, that his most important contributions concern changes in sea level and their effects on human settlement together with his approach to the study

of co-evolution of humans and their physical environment. Runnels also noted that Tjeerd's work has influenced an entire generation of archaeologists and that he had a major role in shaping the discipline.

Tjeerd's international stature across three major fields in the Earth sciences was recognized and honored by Stanford in 1984 when he was appointed Wayne Loel Professor of Earth Sciences. The scope of his teaching now encompassed the full spectrum of his interests from aspects of marine geophysics to climate change and his research in the Mediterranean region accelerated. He also served the larger university as Chairman of the Committee on Undergraduate Admissions and Financial Aid (1980-1984) and the Committee on Graduate Studies (1980-1985). In 1987 Tjeerd embarked on yet another academic journey when he took retirement from Stanford in his 65th year and moved to the Department of Earth Sciences at Cambridge University.

Far from retiring, Tjeerd spent the following 20 years pursuing geoarchaeological research and study of Quaternary climate, organizing major conferences on these topics, and interacting on a frequent basis with faculty, students and staff in the Department of Earth Sciences at Cambridge. Among his many activities, he was a founding member the Oxygen Isotope Stage 3 project to model European Neanderthal environments and chairman of the management board of the Godwin Institute of Quaternary Research. His publications continued unabated and his high enthusiasm for interdisciplinary research was exemplified by his own collaborative research style.

His colleagues repeatedly recognized Tjeerd's contributions over the years. He received the Francis P. Shepard Medal in Marine Geology in 1978, the Van Waterschoot van der Gracht Medal from the Royal Netherlands Geological Society in 1984, and the Rapp Geological Archaeology Award of the Geological Society of America in 1997. He was elected to fellowship in the American Geophysical Union, the American Association for the Advancement of Science, the California Academy of Sciences, and the Royal Netherlands Academy of Sciences.

Tjeerd van Andel was a consummate scholar of the Earth who experienced an exceptional life filled with important discoveries that he shared equally with his professional colleagues and the world at large and which continue to enrich our understanding of how our planet works. He was able to place his detailed studies of complex ocean processes within a global context and use this view to stimulate international research efforts to address some of the most important questions surrounding ocean and climate history. His later research concerned with the impact of climate and environmental change on human evolution and culture benefited greatly from his exceptional understanding of geological, geophysical and marine processes and history.

Tjeerd's personal life was also rich. He was a wonderful cook, a gifted artist and thoroughly enjoyed writing. He is survived by his wife, Dr. Kate Pretty of Cambridge University; daughters Charlotte Bialek, of Princeton, New Jersey; Barbara Caselli, of Ashland, Oregon; and Carolyn Miller, of College Station, Texas, from his first marriage to

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Elsa Dekking; his sons Chris of Menlo Park and Jeff of Sunnyvale, California from his second marriage to Marjorie Rojahn, and eight grandchildren.

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