

Memorial to Arthur D. Howard

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Arthur David Howard, a Fellow of the Geological Society of America since 1941 and chairman of the Society's Geomorphology Division in 1969–1970, died November 22, 1986, in Morehead City, North Carolina. He is survived by his wife Julia.

Arthur Howard was born in New York City on August 9, 1906, and attended city public schools. Family financial difficulties forced him to leave high school for a year, during which he worked as a stock runner and later as a typist in a Wall street brokerage firm. He entered Washington Square College of New York University in 1925 but still found it necessary to work part time to help out at home. Howard later enjoyed recounting to students some of the odd jobs he had held: newspaper delivery boy, milkman's helper (operating from a horse-drawn wagon), assistant to a fruit and vegetable peddler (operating from a pushcart), pinsetter in a bowling alley, assistant salesman in the music department of a small department store, and later, a part-time musician.



Howard took special delight in telling the story of how he became acquainted with geology. During his first three years in college, his selected major was fine arts, aimed at preparation for a career in commercial art. At the close of the summer of 1928, Howard returned to the university after formal registration had closed. He filled out a late program, selecting chemistry to satisfy the science requirement, and was informed that all chemistry classes were filled. Howard requested that biology be substituted, only to be told that all biology classes were also filled and that, as a matter of fact, the only science available was geology. Neither Howard nor the young man at the window knew exactly what geology was, but after being assured that geology was the only science available, Howard accepted it as a substitute. After only three weeks in the elementary course, Howard knew that he had found his life's work. He returned to the Registrar's office, changed his major to geology, and switched all his arts courses to required courses in the geology program. Although he was able to obtain his Bachelor's degree at the end of his senior year, he was resigned to spending a fifth year in making up deficiencies in his science background.

Howard received his M.S. degree from New York University in 1931. His Master's thesis was a study of the lithology of some of the richly fossiliferous sediments in the collections of the American Museum of Natural History in New York. The study served to emphasize the role of volcanic activity in preserving the record of mammalian evolution. The results were published by the museum. Howard then attended Columbia University from 1931 to 1933 while serving as a graduate assistant in geology at New York University. A five-year study in Yellowstone National Park under the aegis of Douglas Johnson resulted in Geological Society of America Special Paper 6, *History of the Grand Canyon of the Yellowstone*, which earned him his Ph.D. in 1937.

Howard's original interest, even while at New York University, had been petrology. His Master's thesis and a number of early papers were in that field. At Columbia University, however, Howard

came under the influence of Douglas Johnson, who suggested the Yellowstone Canyon study, which required considerable petrologic and stratigraphic study of the park's volcanics. Howard was also inspired by William Morris Davis, who spent a semester at Columbia University in 1931 conducting an advanced seminar for graduate students in geomorphology. The seminar attracted some distinguished visitors. Under the influence of Johnson and Davis, Howard became an ardent disciple of the method of multiple working hypotheses, to which his students will attest.

Howard had the misfortune to finish his protracted schooling during the depths of the Great Depression. Probably because his salary was so small, he was retained on the faculty of New York University as graduate assistant and instructor until early 1941. He then responded to the pre-war draft, refusing to claim exemption, even though he was 35 years old at the time and in the middle of a school year. After 10 months, however, he was released from the army with all others over age 26.

In 1942, Howard joined the U.S. Coast and Geodetic Survey where he assisted in the preparation of aeronautical and submarine charts. Here, he became closely associated with then Commander Paul Smith, who with A. C. Veatch, had published the Geological Society of America Memoir on the Hudson Submarine Canyon. He also consulted with Harold Murray, who prepared the submarine chart of the Gulf of Alaska in which the seamounts of that region were portrayed clearly for the first time.

In 1944, "to be nearer the war effort," Howard transferred to the Office of Strategic Services. After a brief period in the Washington office, he was sent as a technical representative to head the Research and Analysis Branch in Kunming, China. This was preceded by a month of briefing in New Delhi, India. From Kunming, Howard made two additional round trips over the "hump" back to India to carry reports for printing to the 653rd U.S. Engineer Battalion stationed at Dehra Dun. After 10 months in Kunming, he was sent to Hsi-an in Shensi Province and, after the formal surrender of Japan, to Peking. This phase of Howard's wartime experience proved particularly interesting inasmuch as he was one of only a handful of Americans isolated in an area still held by the Japanese North China Army, which had not yet officially surrendered. He was later an invited guest at the surrender ceremony in the Forbidden City on October 10, 1945. For his China efforts, Howard was awarded the Emblem for Meritorious Civilian Service.

On his return to the United States in early 1946, Howard joined the U.S. Geological Survey. During his two years on permanent status, he pursued his 5-year project on the Cenozoic history of northeastern Montana and northwestern North Dakota (Professional Paper 326). He also served as Survey Geologist on Operation Deepfreeze (the fourth Byrd expedition) to Antarctica during the Antarctic summer of 1946-1947.

Howard joined the staff of the School of Earth Sciences at Stanford University as associate professor in 1948 and was promoted to full professor in 1951. He continued to work with the U.S. Geological Survey on a part-time basis until the completion of Professional Paper 326. He served a 3-year term as chairman of the Department of Geology at Stanford.

In 1952-1954, Howard spent a sabbatical in Delft, the Netherlands, where he was awarded a certificate of proficiency in photogrammetry from the International Center for Aerial Survey. He then spent a month as guest photogeologist at the Shell Oil Company facility in The Hague. Howard spent 3 months during the summer of 1960 as a consultant in photogeology to the Chinese Geological Survey on Taiwan. He spent two years (1960-1962) as visiting professor in the geological training center administered by the Brazilian Petroleum Corporation (Petrobras) in Bahia, Brazil. He subsequently made three additional trips to Brazil: one as consultant to the Brazilian government on Project Radam (Radar Mapping of the Amazon Basin), and two as consultant to an American company.

After retiring in 1971 at age 65, Howard continued to teach part-time at Stanford until 1977 when he moved to North Carolina. He was visiting professor at North Carolina State University in Raleigh from 1978 to 1980. In 1980, the Howards moved to Morehead City to be nearer to family.

Howard's varied research interests are indicated in his bibliography, which contains more than

100 works, six of book size. His interests included shoreline modifications, coastal terraces, the origin of pediments, continental and alpine glaciation, submarine canyons, regional geomorphic evolution, drainage patterns and their significance, interpretation of aerial photographs, remote sensing, environmental geology, and the origin of lunar rilles. Two of his later book-size publications were *Geology in Environmental Planning* (with Irwin Remson, 1978) and *Geologic History of Middle California* (1979).

Howard was awarded numerous honors during his long career. These included the A. Cressey Morrison Prize by the New York Academy of Sciences in 1935; the Emblem for Meritorious Civilian Service, 1945; Distinguished Lecturer, American Association of Petroleum Geologists, 1950; International Cooperation Administration consultant to the Chinese Geological Survey, Taiwan, 1960; consultant to the Department of Mineral Exploration of Brazil in the mapping of the Amazon Basin; the naming of an Antarctic glacier, Howard Glacier, by the National Academy of Sciences and U.S. Board on Geographic Names, 1961; and the Congressional Antarctic Medal, 1970.

Howard served as corresponding member of several international committees on erosion surfaces; he was chairman of the Corilleran Section Meeting of the Geological Society of America at Stanford University in 1950, chairman of the Technical Sessions Committee of the GSA Annual Meeting in San Francisco in 1966, and chairman of the GSA Geomorphology Division, 1969–1970.

Howard is listed in *Who's Who, American Men of Science, International Year Book, Statesmen's Who's Who*, and *Men of Achievement*. He was a Fellow of the Geological Society of America and a member of the Arctic Institute of North America, the American Polar Society, and American Geological Institute, the American Quaternary Association, the International Quaternary Association, and Sigma Xi. He was also a long-time member of the American Association for the Advancement of Science, the American Association of Petroleum Geologists, and the American Society of Photogrammetry.

The authors of this memorial were two of Arthur Howard's first Ph.D. students at Stanford. He inspired us and his other students to strive for critical, logical thinking and clear, concise presentation of information.

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