Fred B Phleger, Oceanography: San Diego

1909-1993
Professor Emeritus

Fred B Phleger was professor of oceanography at Scripps Institution of Oceanography, UC San Diego, from 1951-1977. He died peacefully on December 14, 1993, after an extended period of disability that he had endured with characteristic courage.

Phleger was a pioneer in the ecology and paleoecology of foraminiferan protists (both planktonic and benthic) and helped establish, in his thirty-five years at Scripps, the now thriving field of paleoceanography. His interests were broad, ranging from the deep-sea environment to shelf and lagoonal processes as reflected in foraminiferal distributions. Regarding pre-Recent studies, he was among the first to show that Ice Age climatic fluctuations can be read from deep-sea sediments. Contributions of central importance are in a monograph on North Atlantic foraminifera (1953), with Frances Parker and Jean Peirson, reporting work on cores raised by the Swedish Deep-Sea Expedition, and in several studies on Gulf of Mexico foraminifera (in part with Frances Parker). His book on the subject of foraminiferal ecology (published in 1960) opened new avenues of research.

Fred B Phleger was born in Kansas City, July 31, 1909, as the only child of Norabelle and Fred Phleger. His parents soon after moved to California. He entered USC (Los Angeles) majoring in drama (a background he used later when teaching his students to give professional presentations). He obtained a master's degree from CalTech in 1932, for a study of Ordovician fossils, and in 1936, earned his Ph.D. in geology at Harvard University with a dissertation on trilobites.

While at Harvard, Phleger studied foraminifera with Joseph A. Cushman (partly for financial reasons, one may assume). He quickly realized the potential of foraminifera as environmental indicators. Also,

he met Frances Parker, already an expert in foraminifera, who had been working with Cushman for some time. From then on studies on foraminiferal ecology increasingly became the focus of his work, and collaboration with Frances Parker was to distinguish the most productive period of his career.

He joined the faculty of Amherst College as an instructor in paleontology shortly after obtaining his degree. While there, one of his duties (as part of the war effort) was to teach oceanography to future navy officers, at Amherst and Woods Hole. Thus, he acquired a broad knowledge of the field of oceanography. At the same time, he continued his studies on foraminifera, and soon published (with F.L. Parker) a Memoir of the Geological Society of America on foraminiferal distributions in the northwest Gulf of Mexico. During summertime he worked at Woods Hole Oceanographic Institution (with Henry Stetson), studying foraminiferal distributions in cores from the continental slope off the East Coast.

When the Swedish Deep-Sea Expedition set out, under the leadership of Hans Pettersson, to make a systematic survey of late Quaternary deep-sea sediments, Fred was asked to work up the foraminifera. He came on board for a short portion of the cruise, and soon after published (in 1948) a brief paper on a core from the Caribbean. It already hints at the usefulness of foraminifera as indicators of Pleistocene climatic fluctuations and represents a first step toward the study of the Ice Age wiggles that has dominated marine Quaternary research since.

In 1949 Phleger came to SIO as a visiting associate professor, and permanently joined the SIO faculty in 1951. Frances Parker soon joined the research staff at Scripps, and the collaboration between her and Phleger continued within the newly founded Marine Foraminifera Laboratory. In 1953 they published, with Jean Peirson, the monograph on the Swedish cores that was to become an all-time classic on the use of foraminifera in paleoclimate and paleoceanography.
In the meantime, the petroleum industry had realized the importance of correct environmental reconstruction in bettering the odds of finding oil. The American Petroleum Institute, in its Project 51 (1951-1958), made research funds available for the study of modern environments of deposition in the Gulf of Mexico. In this project, Phleger worked with F.P. Shepard and Tj. H. van Andel (and others) to produce another classic of sedimentology-paleoceanography: *Recent Sediments, Northwest Gulf of Mexico*.

After the end of Project 51, Phleger summarized what was then known about the ecology of foraminifera, drawing extensively on his own intimate experience with deep-sea sediments and shallow marine processes, as well as on the research of Frances Parker and on the studies by his early students W.R. Walton, T. Uchio, and J.S. Bradshaw. The various themes developed in his book *Ecology and Distribution of Foraminifera* have remained central to foraminiferal ecology. With this book Phleger set a milestone and outlined the essence of a new subdiscipline of geology and oceanography: foraminiferal paleoceanography. His later students, in particular A. Gaelic, A. Blackman, and W.H. Berger, were to build on this foundation.

In the years that followed, Phleger turned his main interest toward processes in lagoons and marshes and their effects on foraminiferal distributions. These studies led to much field work in various parts of the world, which Phleger carried out with zest, his wife performing the role of assistant. Much of this type of work was done in Mexico, in collaboration with Augustin Ayala Castanares. Another focus of Phleger's interests were his children's books (in part written with his wife Marjorie), which were quite successful, and introduced thousands of children to the ocean and to ecology.

Phleger's "reign" at the Marine Foraminiferal Laboratory at Scripps was characterized by a friendly, comfortable atmosphere. Chats during coffee hours in the morning (a must) were his way to keep track of progress in the work of the students. Regarding science, his philosophy was to keep it simple: "If you cannot explain it to an intelligent 13-year-old, you really don't know what you are talking about." He took pleasure in pretending to be that mythical 13-year-old on occasion, forcing his students to concentrate on the essence of an argument.

Phleger retired in 1977, but kept coming to the office for many more years. The death of his wife (in 1986) affected him deeply. However, even as his health deteriorated, he never lost interest in the various projects going on at “his” laboratory.

Phleger was well recognized for his accomplishments. A fellow of the Cushman Foundation for Foraminiferal Research, he was a director, and twice its president. In 1980 he received the Joseph A. Cushman award from the Cushman Foundation of Foraminiferal Research. In 1993 he was made an honorary member by the North American Micropaleontology Section of the SEPM.

Fred Phleger was greatly appreciated by those who knew him. A rather private person, he was unfailingly polite and considerate. However, he could be very firm in his opinions; he had high standards for scientific achievement and personal conduct, and had a special dislike for bluster and puffery. He lived a full life, as a scientist, a teacher, a family man, and a friend to his students and coworkers.

Wolfgang H. Berger Joseph R. Curay Timothy D. Herbert

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