

Memorial to Wendell Phillips Woodring 1891–1983

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Wendell Phillips Woodring, son of James Daniel Woodring and Margaret Kurtz Hurst, was born in Reading, Pennsylvania, June 13, 1891, and died in Santa Barbara, California, January 29, 1983. His father, a minister of the United Evangelical Church (Methodist), was president of Albright College, then in Myerstown and now in Reading, Pennsylvania.

Woodring himself attended Albright College and earned an A.B. degree in 1910; in 1912 he entered Johns Hopkins University and received his doctorate in 1916. While at Johns Hopkins, in 1913, he joined the U.S. Geological Survey as a summer field assistant and held that position until 1916, working in Colorado, Wyoming, and Montana. In 1917, he was employed as a geologist with Sinclair Central American Oil Corporation working in Costa Rica and Panama. After a short period of service in the Corps of Engineers, as a Second Lieutenant in France during World War I, he rejoined the Geological Survey. At the war's end, and as part of treaty terms imposed on the Haitian government, he was designated geologist-in-charge of the Haitian Geological Survey, where he worked until 1923, when he became a paleontologist for one year with the Tropical Oil Company in Colombia. With the exception of the years 1927–30, when he was professor of invertebrate paleontology at California Institute of Technology, he again worked for the Geological Survey, from 1924 until his retirement in 1961. At that time he was appointed research associate of the Smithsonian Institution, where he worked actively until 1979, when he moved to Santa Barbara, California. In 1982, at the age of 90, he was appointed research associate in the Department of Geological Sciences of the University of California at Santa Barbara, an appointment that he especially treasured.

Woodring's doctoral dissertation dealt with Miocene marine pelecypods and scaphopods from Jamaica. Under an informal agreement between the U.S. Geological Survey and the Carnegie Institution of Washington, this work was later expanded to include the gastropods. Published as a two-volume set, it is modestly titled *Miocene Mollusks from Bowden, Jamaica*. Not content to only describe species and discuss their stratigraphic significance, Woodring devoted a significant portion of the second volume to the origin and ecology of the fauna, setting a precedent in depth of inquiry for others to follow.

During the 1930s and 1940s, Woodring focused on the marine Tertiary of southern California, and in so doing he provided the foundation for all subsequent studies of west coast Tertiary molluscan faunas, paleoecology, facies, and stratigraphy.

His first major paper on southern California dealt with early Pliocene strata in the Los Angeles basin. In this paper, Woodring expressed concern that previous correlations between the Los Angeles and Ventura basins might have been made on the basis of similar faunal facies and not on correlation of chronologic successions of faunas. His description of depth-controlled biofacies in the Pliocene of the Los Angeles basin

followed the thorough analysis of molluscan faunas he began in Jamaica and is a splendid example of his ability to gather and interpret objectively geologic data and to relate these data to the habitats of fossil mollusks. His careful mapping in the Kettleman Hills defined the principles for stratigraphic classification and the nomenclature of the California marine Tertiary; it contributed significantly to later interpretation of the Cenozoic geologic history of the Coast Ranges and the crustal deformation related to the San Andreas fault. Among the most valuable results of this paper were the descriptions of the distribution and correlation of outcropping Tertiary formations from Coalinga to Taft and how these formations relate to subsurface units, particularly to those informally named by drillers. A subsequent paper on the Palos Verdes Hills placed emphasis on data that might aid in the study of the subsurface of the Los Angeles basin and in the discovery of oil. To the concern of paleontologists and stratigraphers, the Palos Verdes Hills report went out of print prematurely because it was in great demand by engineering geologists working to save structures threatened by the serious landslides around the seaward slopes of the peninsula. Woodring was amused and dubbed the report a "best-seller." He considered the Palos Verdes Hills the most interesting area geologically of all he studied because so many aspects of geology were involved.

The last of his southern California professional papers dealt with the geology and paleontology of the Santa Maria district and was coauthored by M. N. Bramlette, a long-time, highly esteemed friend. In this paper, as in two others in the group on southern California, the systematic paleontology was presented in a narrative rather than formal style because the primary emphasis was on the geology and the relationship of the molluscan and foraminiferal faunas to the stratigraphy. This series of papers today remains the standard reference on paleontology, geologic names, and lithostratigraphy for geologists who work in the Santa Maria, San Joaquin, and Los Angeles basins, both onshore and offshore.

In the late 1940s, Woodring again directed his attention to tropical America and began his monumental work on the geology and fossil mollusks of the Canal Zone and adjoining parts of Panama, something he had wanted to do since his student days. He began fieldwork in the Republic of Panama in 1947 and made his tenth and last visit there in 1977. The first chapter of the Professional Paper based on this work was published in 1957 and the sixth and last chapter in 1982. During the 1960s and into the 1970s, he devoted most of his time to this project, knowing it would be his last contribution to Tertiary molluscan paleontology. He called this olympian work old-fashioned paleontology because it described and recorded 964 species and subspecies of mollusks, in 9 marine formations ranging in age from Eocene to Pliocene. He planned the formal systematic paleontology to be a basic foundation for all subsequent work in tropical America, as indeed it is and will be for many years to come. Of particular interest to him were the zoogeographic relations of the Panamanian faunas that showed a strait had extended across Central America during most of Tertiary time. He concluded that the mammalian fauna interchange between North and South America began near the boundary between the Pliocene and Pleistocene and was at its height during the early Pleistocene. When he spoke of animals crossing this land bridge for the first time, his voice would change to express awe, and his eyes would light up with the wonderment of the scene.

Woodring's impact on the U.S. Geological Survey was unique. Refusing to accept administrative duties, he served as counselor to many administrators. He was an active participant in and contributor to some of the basic ruling guides of the geologic profession: the early stratigraphic code and the international zoologic code. Serving as a

role model for a host of younger paleontologists, his influence through the structure of his papers had a profound effect on others who strove to emulate him. In addition to being scholarly, his papers are of high literary quality. His advice to one young author was: "Though nobody reads paleontologic papers for delectation or amusement, the reading should be as painless as possible."

Woodring was no ivory-tower systematist, but instead a man with a burning desire to know the truth and a strong awareness that any inaccuracy in his observations, or those of others, might lead to a false conclusion. He was a gifted and extraordinarily perceptive field geologist who walked almost every foot of every area he studied. Moreover, he was not reluctant to get his hands dirty or to work hard to dig out a fresh exposure; he was seemingly tireless in the field even when he was more than 60 years old. With outstanding attention to precision and detail, he wrote descriptions of strata and localities that anyone can find and recognize today based on his careful observations and clarity of mind and expression. His detailed maps were masterfully precise. Moreover, wherever he went in the field he also learned the local history, origin of place names, and the names of the local plants and birds. He truly appreciated the beauty of Nature. He loved to travel by train, as a relaxing way to see the countryside and the geology, and at the age of 89, he prepared for a fellow traveler from memory a detailed log of the geology in railroad cuts in the Casmalia Hills, California, which he had mapped half a century earlier, in the 1930s.

A most meticulously organized man, he wrote all his manuscripts in longhand on pads of lined paper, skipping every other line, yet rarely needing to add or change a single word before final typing. At the close of the day, he cleared his desk, and wooden halfrays of fossils were neatly stacked and covered.

Woodring had a courtly manner and an austere presence, and he often was held in awe by peers and subordinates alike who, seeing only the tradition, never knew that beneath his dignity was a deeply caring man with a delightful sense of humor. He himself was awed by his own predecessor, William Healey Dall, and would wait until Dall had left for the day before using his shared library. And he loved to tell stories about his shortcomings as a young summer field assistant. His favorite related to the time he inadvertently pushed his party chief, who was already not too pleased with him, adrift in a rowboat on a rushing stream, with the oars aboard but without the oarlocks in place. The gentleman recommended that Wendell not be given a permanent position with the Geological Survey; fortunately for the organization, others more kindly disposed toward the young assistant gave him a second chance.

Although always objective in his science, Woodring was not always objective in his relationships with others. He had no patience with ineptitude and was intolerant of imprecision—his own or that of any other person. On numerous occasions he stated firmly that he had neither the time nor the inclination to groom a successor; nevertheless, he often painstakingly taught and helped those younger than himself with great sympathetic understanding. He demanded proper acknowledgment and thanks for the time he took from his disciplined day to help someone else, and if this courtesy was not extended, he would sometimes terminate a personal relationship. He set high scholarly goals and loved to argue with admired colleagues who had the fortitude to disagree with him. He disliked obsequiousness and those who accepted his ideas without challenge, merely because he was *the* authority.

A modest man, too, Wendell maintained that his honors were not necessarily deserved but rather related to his having friends on medal-selection committees. Yet modesty did not prevent him from proudly willing those medals to his grandson. Upon

receipt of the Penrose Medal, Wendell suspected that it was not heavy enough to have as much gold in it as purported and asked a colleague to check it for him. The results satisfied his scientific curiosity but showed that his suspicion was incorrect. Mostly, he just greatly enjoyed having perpetrated such a shenanigan.

When Wendell Woodring resigned from his position with the Smithsonian Institution, he donated his library of over 2,000 volumes and some 80 boxes of reprints to the Escuela Centroamericana de la Universidad de Costa Rica in order to show his admiration for the people and as it was his desire that it remain an entity and be placed where it filled the greatest need.

He was a fellow or member of the American Philosophical Society, National Academy of Sciences, American Association for the Advancement of Science, Geological Society of America (president, 1953), Paleontological Society (president, 1948), American Association of Petroleum Geologists, Geological Society of Washington (president, 1947), and American Geological Institute. He received the Penrose Medal from the Geological Society of America in 1949, the Distinguished Service Medal from the U.S. Department of the Interior in 1959, the Mary Clark Thomson Medal from the National Academy of Sciences in 1967, and the Paleontological Society Medal in 1977. He received an honorary Sc.D. from Albright College in 1952.

In 1918, he married Josephine Jamison, who died in 1964. In 1965 he married Merle Crisler Foshag, who died in 1977. His daughter Jane died in 1954 and he is survived by his daughter, Judy Armagast, three grandchildren—David Woodring Armagast, Marilyn Armagast Martorano, and Susan Jane Armagast—and two sisters, Margaret Brillhart and Mary Hagen.

For this memorial, I relied heavily upon meticulous records kept by Wendell and on personal data from his daughter, Judy.

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