



Norman D. Newell

1909–2005

BIOGRAPHICAL

Memoirs

*A Biographical Memoir by
Donald W. Boyd*

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NATIONAL ACADEMY OF SCIENCES

NORMAN D. NEWELL

January 27, 1909–April 18, 2005

Elected to the NAS, 1979

Norman Newell's life ended in his ninety-sixth year, shortly after the appearance of his one hundred eighty-eighth publication. In the course of a long and highly productive scientific career, he achieved worldwide recognition in several sub-disciplines of Earth science: paleontology, stratigraphy, paleoecology, and carbonate sedimentology. His research in each of these subjects reflected an imaginative mind and an ability to foresee benefits in deviating from conventional practice of the time. His work commonly involved cross-disciplinary thinking, and his publications stimulated colleagues to change their research from a narrow, descriptive approach to one with broader interest and implications. This mindset inspired many of the graduate students he mentored to achieve greatness in their own careers. As a scientist with strong humanistic instincts, Newell recognized the problems posed by scientific illiteracy in America and the need for better communication between scientists and the general public. He was an activist in calling attention to the threat to science education posed by the "anti-evolution" movement.



Norman D. Newell

By Donald W. Boyd

Newell was born in Chicago on January 27, 1909. Soon after, his dentist father moved the family to the small town of Stafford, Kansas, where Newell spent his boyhood. Although he did not live to see Newell enter college, the father's interest in natural history clearly influenced his son's career choice. Newell remembered his excitement as a six-year-old when his father explained the significance of a mammoth tooth that had been plowed up from a wheat field.

By the time he moved to Lawrence to enroll as a freshman at the University of Kansas, Newell had decided to major in geology. Already an accomplished clarinetist, he helped pay his college expenses by playing in local dance bands. During his undergraduate years he had close contact with Geology Department head and state geologist Raymond

Moore. Moore, whom Newell later referred to as his “foster father,” had a forceful personality and single-minded determination to excel that left an impression long after Newell had received his bachelor of science degree (1929) and master of arts degree (1931) at the University of Kansas.

Recommended by Moore for a graduate fellowship at Yale, Newell was awarded his doctorate (1933) after two years at New Haven. His doctoral research was supervised by the renowned invertebrate paleontologist and stratigrapher Carl Dunbar, but the retired Charles Schuchert, an eminent earth historian, was still active and was also a source of friendly advice to Newell. In fact, Schuchert helped make Newell’s New Haven days financially feasible by employing Newell’s wife Valerie to catalog specimens. An older graduate student, J. Brookes Knight, had impressed Newell with his intense interest in fossil mollusks; it was at Knight’s suggestion that Newell chose bivalve mollusks, which were then termed “pelecypods” by American paleontologists, as his field of specialization. During a postdoctoral year at Yale, subsidized by a Sterling Fellowship, Newell accomplished most of the research embodied in the first of his influential paleontological monographs.

Newell’s professional employment began during his work for a master’s degree when state geologist Moore employed him as a geologist with the Kansas Geological Survey. Under Moore’s tutelage, interrupted by the three years at New Haven, Newell gained practical field experience in detailed classification and correlation of strata. In 1934, he was appointed to the University of Kansas geology faculty. Three years later, Moore provided another career boost by appointing Newell to take his place as an official delegate to the International Geological Congress in the Soviet Union. At this venue, the twenty-eight-year-old Newell became acquainted with many foreign paleontologists and stratigraphers.



At the American Museum of Natural History, undated.

He recognized the importance of being part of an international network of scientists with kindred interests, and he actively maintained such contacts throughout his career.

Newell left his home state in 1937 for an associate professorship at the University of Wisconsin. He taught there until 1942, when the State Department recommended him to the Peruvian government to participate in that country's survey of petroleum resources. During that three-year assignment, he was involved in reconnaissance mapping and geological field work both in the tropical rain forest and in the Andes, where he worked at an altitude of four kilometers.



Fieldwork in Djebel Tebaga, Tunisia, 1975.



Working with Jacob's Staff, Tunisia, 1975.

In 1945 Newell joined the staffs of Columbia University as professor of geology and the American Museum of Natural History as curator. This situation provided him with stimulation from world-renowned colleagues who had talent and ambition similar to his own, and he thrived in the environment that combined excellent research support at the museum with teaching and supervision of graduate students at the university. Newell's dual responsibilities continued until his formal retirement in 1977, when he was awarded emeritus status in both positions. If anything, retirement only whetted his appetite for research. The last of his annual field seasons involved work in Utah, Nevada,

and Idaho when he was eighty-one years old. At age ninety he was still working many hours each week at the museum.

As an invertebrate paleontologist, Newell will be remembered not only as the leading authority of his time on late Paleozoic bivalve mollusks, but also for his leadership in integrating biological and paleontological approaches and concepts. In 1937, his seminal monograph, *Late Paleozoic Pelecypods: Pectinacea*, demonstrated the importance of utilizing zoological information (e.g., muscle anatomy) and concepts (e.g., population variability) when interpreting morphology and relationships of fossil shells. This paper, together with a 1942 monograph on *Mytilacea*, served as a model for young invertebrate paleontologists engaged in changing the scope and image of their discipline.



Fossils wrapped for shipping to the AMNH, Utah, 1978.



Fieldwork in Nevada, 1987.

Newell's proclivity for bridging the gap between paleontology and zoology continued throughout his life. His work attracted the interest of biologists, and by midcareer he had served as president of both the Society for Study of Evolution and the Society of Systematic Zoology. Although Newell continued to publish significant papers on fossil bivalves to the end of his life, it can be argued that his most influential taxonomic work occurred in the 1960s. In that decade he published his comprehensive classification of the Bivalvia and played a major role, both as editor and contributor, in producing

volumes one and two of the Bivalvia section of the *Treatise on Invertebrate Paleontology*.

While engaged in unglamorous work on the *Treatise*, Newell found time to produce prescient papers that emphasize the episodic nature of the fossil record and the major turning points that he termed revolutions in the history of life. The Paleozoic-Mesozoic transition held a special interest for him, both for the practical problem of determining criteria for defining the erathem boundary in the stratigraphic record, and for the search for a plausible explanation for the sweeping extinctions at the close of the Permian. He was an active participant in both debates, taking part in international conferences concerned with choosing a locality where an agreed-upon boundary could serve as a world standard, and arguing for eustatic drop in sea level as a causal factor in this and other times of mass extinctions.

In the early 1950s, Newell's Permian interests turned to reefs of that age exposed in western Texas. He orchestrated a multi-year research project in which he and his graduate students interpreted these well-known rocks from the fresh perspective of the emerging sub-disciplines of paleoecology and carbonate sedimentology. Recognizing the importance of modern depositional environments and organism communities as a basis for interpreting ancient ones, he and his research group began field work in the Bahamas while the Texas project was under way. The former activity produced a series of widely cited publications on Bahamian sediments and marine ecology while the latter work resulted in the co-authored book *The Permian Reef Complex of the Guadalupe Mountains Region, Texas and New Mexico*. This classic work served as a model for many subsequent workers on other fossil reefs.



Fieldwork in Idaho, 1982.



Return in 1991 to Pine Springs, Texas, place of much fieldwork in the 1940's and 1950's.

In a quite different pioneering effort, Newell recognized as early as 1973 that growing scientific illiteracy in America was providing a willing audience for anti-evolutionists. Through a series of articles, he tried to arouse the scientific community to this threat to science education, and he authored the 1982 book *Creation and Evolution: Myth or Reality?* for nonscientists seeking enlightenment on the controversy.

Newell's success as a teacher came not through the classroom, but in the way he served as a model for his students. The

professional training program he supervised during the decades of his joint appointment with Columbia and the American Museum of Natural History produced some forty advanced degrees, many of them awarded to exceptional individuals who became distinguished professors and museum paleontologists. These individuals typically eulogized him for the manner in which he had influenced their lives. They were lastingly impressed by the characteristics observable in his day-to-day professional activity: a dedication to his science, a sharply focused pursuit of his current research program, and the ability to recognize and transcend weaknesses in conventional paleontological practices.

A long list of medals and awards attests to the high esteem in which Newell was held by his peers:

Mary Clark Thompson Medal (National Academy of Sciences, 1960); Distinguished Service Alumni Award (University of Kansas, 1961); Medal of the University of Hiroshima (1964); Hayden Award in Geology and Paleontology (Philadelphia Academy of Sciences, 1965); Verrill Medal (Yale Peabody Museum, 1966); Gold Medal for Achievement in Science (American Museum of Natural History, 1978); Paleontological Society Medal (1979); Raymond C. Moore Medal (Society of Economic Paleontologists and Mineralogists, 1980); Scientific Freedom and Responsibility Award (American Association for the Advancement of Science, 1987); Penrose Medal (Geological Society of America, 1990); Special Award (American Association of Petroleum Geologists, 1996); Geological Society of Peru Medal (1997); and Legendary Geoscientist Award (American

Geological Institute, 2004). Newell was elected to the National Academy of Sciences in 1979.

When accepting awards, Newell emphasized the importance of the support and encouragement provided by others along the way. Of special significance were his first wife Valerie and his second wife Gillian, whom he married in 1973 following Valerie's death. For the rest of his life, Norman and Gillian were inseparable. She participated enthusiastically in all phases of his scientific work, and she sustained him during his final years of declining health.



Collecting fossils in Montana, 1989.

ACKNOWLEDGEMENT

A complete bibliography of Newell's publications is included in the finding aid to the Norman Newell papers, which are held in the library archives at the American Museum of Natural History in New York City.

The Newell papers in the American Museum of Natural History Archive can be accessed digitally at the web link:

http://images.library.amnh.org/hiddencollections/wp-content/uploads/2012/02/MSS-.N495_Newell_findaid.pdf.

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The selected publications in the following list represent the scope of his work.

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