Rock Stars

INTRODUCTION

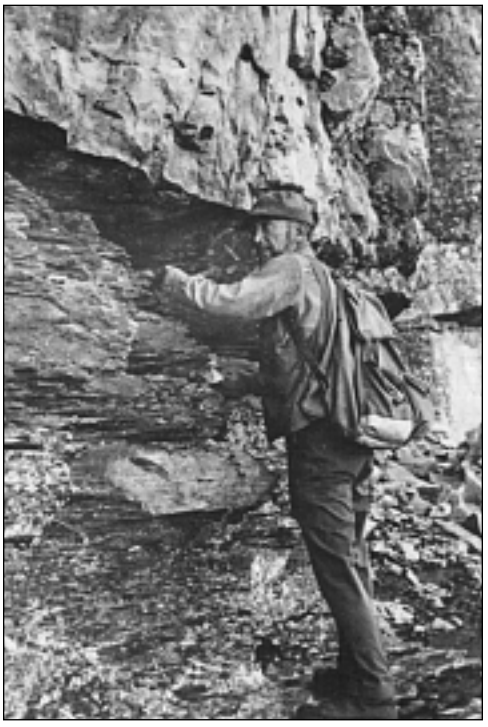
Bernard of Chartres, an 11th-12th century philosopher and teacher, said that we are like dwarfs on the shoulders of giants, so that we can see more than they and for a greater distance, not by any virtue of our own but because we are carried high and raised aloft by their stature.

All of us have our geological heroes, those giants on whose shoulders we stand. To encourage recognition of these luminaries and to provide inspiration for students and young professionals, the GSA History of Geology Division presents Rock Stars, brief profiles of our geological giants. If you have any comments on profiles, please contact Robert N. Ginsburg, University of Miami, RSMAS/MGG, 4600 Rickenbacker Causeway, Miami, FL 33149-1098, E-mail: rginsburg@rsmas.miami.edu.

—Robert N. Ginsburg, History of Geology Division

Preston Cloud: Peripatetic Paleontologist

J. Thomas Dutro, Jr., *U.S. Geological Survey, Washington DC 20560-0137*



In the field, north Bow River slope, Canada, 1968.

Few scientists change the direction and focus of their entire discipline in a lifetime, let alone every few years. Even fewer make the transition from bench scientist to successful science manager and back again. Add a mission, in the waning stages of a career, to alert the public to the dual dangers of burgeoning population and steadily decreasing natural resources, and you have the peripatetic Preston Cloud (1912–1991).

Early Years

Preston Ercelle Cloud, Jr. was born in West Upton, Massachusetts, September 26, 1912; he was the third of seven children in a family headed by an itinerant engineer-draftsman. By the late 1920s, the family was in Waynesboro, Pennsylvania. Preston Cloud loved the outdoors life that led him to hunting and hiking and scouting. He became an Eagle scout, and he graduated from Waynesboro High School in 1929. Cloud escaped the early depression years by enlisting in the Navy in 1930. The feisty young sailor released some of his frustrations through boxing, and he soon became bantamweight champion of the Pacific Fleet Scouting Force. Discharged from the Navy in 1933 in California, he spent that summer hiking and working his way back east.

Cloud in the U.S. Navy, about 1931.

Becoming a Paleontologist

Cloud's resourcefulness, drive, and abilities made him successful in college and graduate school. He took any odd job he could find in 1933, the depth of the Depression, and earned enough money for his first semester at George Washington University.

There, his mentor was Ray Bassler, a part-time professor and curator of paleontology at the National Museum. Bassler, impressed by Cloud's enthusiasm and ability to absorb information rapidly, found work for him at the museum. By his second year, Cloud was working full time as a technician and attending classes at night. He also impressed G. Arthur Cooper, world-famous paleontologist and stratigrapher, and became a preparator in the paleontology laboratory; there he absorbed Cooper's lore and skill in studying fossil brachiopods. Despite full employment at the museum, Cloud completed his B.Sc. and graduated in 1938. In that same year, he published his first paper on brachiopods with Cooper, beginning his career in paleontology.

Cooper had called Yale Professor Charles Schuchert's attention to the hard-working, conscientious Cloud and made certain that he was admitted to Yale as a graduate student in geology with adequate financial support. Cloud started graduate work on brachiopods at Yale, supervised by Carl Dunbar, completed his dissertation on the Silurian and Devonian terebratuloid brachiopods in record time, and graduated in 1940 (the Geological Society of America published his dissertation as a monograph in 1942).

After a year of teaching at Missouri School of Mines, Cloud returned to Yale for postdoctoral work, but in 1941 he was recruited by Josiah Bridge of the U.S. Geological Survey. Cloud worked in a field party studying manganese deposits in Maine as part of a wartime mineral exploration program. This appointment began an association with the USGS that lasted until his death half a century later. The next year, Cloud was appointed party chief of the Alabama bauxite project.

In 1943, Cloud accepted an invitation to join Virgil Barnes of the Texas Bureau of Economic Geology in the Ellenburger Project, studying the stratigraphy and sedimentology of this important early Paleozoic carbonate complex. The resulting monograph established Cloud as a carbonate stratigrapher and paleogeographer; these disciplines were added to his paleontologic background and developed later when he was party chief of the USGS work on Saipan during the geological study of the Trust Territories in the late 1940s.

From 1946 to 1948, Cloud was professor of invertebrate paleontology at Harvard, filling the vacancy left by the death

of Percy Raymond. He resumed work on brachiopods and the Ellenberger manuscript, but was discouraged by the lack of support for expanding the teaching and research facilities in Cambridge. He resigned and returned to the USGS in 1949, to become chief of the Branch of Paleontology and Stratigraphy.

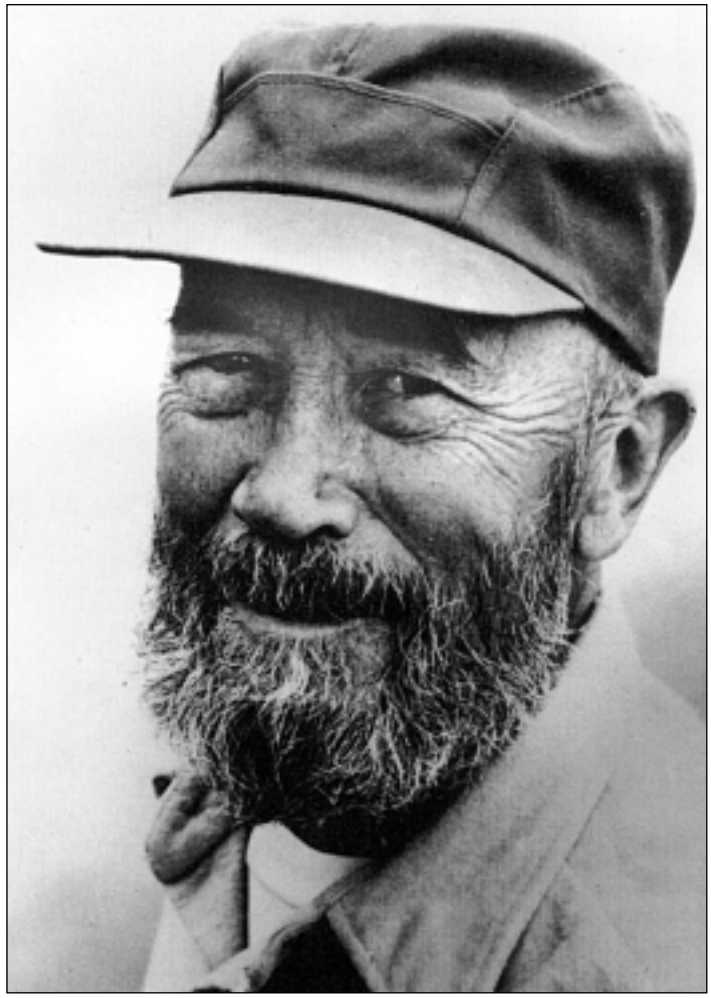
Survey Years

Cloud was the major influence in developing careers of many young paleontologists in the USGS for a quarter-century after World War II. A hard and exacting taskmaster, Cloud organized a paleontology and stratigraphy unit that acted as a ready-response team for inquiries about paleobiological and sedimentological problems. Burgeoning USGS activities, reflecting the increase in minerals exploration after 1949, required, in Cloud's view, an expanded cadre of specialists who could take on any and all challenges. He scoured the rosters of other USGS branches for people who could be useful for his new branch. With the full backing of Chief Geologist Bill Bradley, Cloud had these people transferred and, in some instances, retrained to fit into his organization. At the same time, he recruited more promising young graduates to fill gaps in his plan. With these swashbuckling tactics, he increased the size of the branch from about 15 to more than 60 in six years. Cloud's persistence built an internationally recognized paleontologic research organization that was the pride of the USGS for a quarter-century.

After a decade, Cloud decided to revitalize his research in carbonate rocks, particularly those of biogenic origin, including reefs, and he set to work completing studies, begun in the late 1940s, of Pacific atolls. This interest in marine carbonates led him to initiate and organize the first USGS programs in marine geology. Now, three decades and two reorganizations later, marine geology is a major program. But Cloud missed the USGS decision-making maelstrom of the early 1960s. One morning at coffee in his lab, he suddenly interjected, "I just can't get back to atoll problems; my telephone doesn't ring anymore!" It was clear that he would soon leave the USGS.

Off To Academe

Cloud took an academic post about as far away from the oceans as he could get in North America. From 1961 to 1965, he was at the University of Minnesota as full professor of geology, chairman of the Department of Geology and Geophysics, and head of the School of Earth Sciences. The frigid weather, combined with his restlessness, led to another move—this time to California. After only three years as professor at the University of California, Los Angeles, Cloud finally settled into a permanent position at Santa Barbara. In 1968, as professor of biogeology, he resumed studies on the origin of life and Precambrian physicochemical conditions that made organic evolution possible. By 1974, he had convinced the USGS director, his old friend Vince McKelvey, to build and equip a unique "clean laboratory" at Santa Barbara for the study of early microorganisms, and to rehire Cloud as the head of a project to carry out the research. Together with a long-held and expanding concern over population growth and natural resource conservation, this work filled his very active life until his death, in 1991, of amyotrophic lateral sclerosis ("Lou Gehrig's disease").



Preston Cloud in the late 1980s.

Cloud and the Cosmos

After leaving the USGS in the 1960s, Cloud focused his energy on developing hypotheses about the origin and evolution of life on Earth. Essential to this research were his paleontologic expertise and appreciation of geologic time. His work on carbonates had involved him in the study of the Precambrian, including the geochemistry of early oceans and atmospheres. Much of his work after 1974 centered on the pre-Phanerozoic Earth, and his conclusions are presented in *Cosmos, Earth, and Man* published by Yale University Press in 1978.

Cloud's realization of the vulnerability of life on Earth grew as he reflected on the human impact on the environment. He also knew, from his early work on mineral resources and later studies of energy sources and pollution, that sustainability was a major problem for the future if human tendencies to ravage Earth were not curbed. He made several projections of natural resource needs as related to the exponential population growth over the last decades of the 20th century, summarized in the chapters "Posterity's World" and "Perchance to Dream" in his 1978 book.

Cloud summarized the dilemma as follows: "...the quantities involved have become so large and the doubling times [of population] so short that the lead time for action between general perception of a threatening situation and the onset of crisis or even catastrophe has become dangerously small." The world situation since 1978 has only become more threatening—not less so.

Coda

Preston Cloud's research interests were kaleidoscopic—from invertebrate paleontology and brachiopod systematics to carbonate petrology and coral reef ecology, to marine geology and oceanography, to Precambrian stratigraphy and the origin of life, and finally, to concern for the whole Earth environment and our future relationship to it. He was a brilliant, energetic, and feisty researcher, teacher, leader, and friend.

For Further Reading

Cloud, Preston, 1978, Cosmos, Earth, and man: A short history of the universe: New Haven, Connecticut, Yale University Press, 372 p.

Cloud, Preston, 1988, Oasis in space: Earth history from the beginning: New York, Norton, 508 p.

Crowell, John C., 1995, Preston Cloud, September 26, 1912—January 16, 1991: National Academy Press Biographical Memoirs, v. 67, 22 p. ■