Rock Stars

Here is the second Rock Star profile (the first appeared in the November 1995 issue of *GSA Today*). Readers are encouraged to comment on this profile to History of Geology Division Chair William Brice, Department of Geology and Planetary Science, University of Pittsburgh, Johnstown, Johnstown, PA 15904, bbrice@upj.pitt.edu. To be more involved with the history of geology, join GSA's active History of Geology Division.

—Robert N. Ginsburg, for the GSA History of Geology Division

From Farmer-Laborer to Famous Leader: Charles D. Walcott (1850–1927)

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In today's vernacular, Charles D. Walcott was probably a high school dropout. Without formal scientific training, and Horatio Alger–like, he became an outstanding scientist, member and president of the National Academy of Science, director of the Geological Survey, and secretary of the Smithsonian Institution.

Walcott became interested in collecting local fossils before he was a teenager; it seemed to be the thing boys did in Utica, New York. His father died when he was two. The whole family was in the cotton milling business, and there is no indication that Walcott received any guidance into science from any of his relatives. Fortunately he met a retired curator from the New York State Museum who had moved to Utica, and it was Colonel Jewett who first gave him a notion of what fossils meant. It was equally fortunate that at age twelve, Walcott started spending summers at nearby Trenton Falls, New York, helping out on a farm during the Civil War. To the paleontologist interested in the Middle Ordovician, Trenton Falls is another name for heaven, for the rocks are crowded with fossils. Every rock in the farm fields was fossiliferous.

Walcott's schooling at the Utica Free Academy, where there were only two or three teachers, ended when he was 18, and he may not have graduated; the records of this period are lost. He tried working in a hardware store for a year, and hated it. At age 20 he went to live with William Rust, sometimes paying board and sometimes helping with the farming, which included spreading manure from the cows. Rust, a farmer who also was interested in the local fossils, showed Walcott where and how to collect and prepare. As collectors, Walcott and Rust were so good that in 1873 they sold one collection to Louis Agassiz, the preeminent naturalist of the day, for what would be $70,000 in 1995 dollars. In 1879, Alexander Agassiz, Louis's son, paid them the modern equivalent of $80,000 for another collection.

A young Charles Doolittle Walcott. The back of this picture, copied from his daily pocket diary, bears the date 1873. At this time Walcott was living on the Rust farm, east of Trenton Falls, New York, and collecting fossils commercially with William Rust. Photographs of Walcott are easy to date relatively, because a few years after 1873, he grew a mustache. Subsequently, the amount of hair on both the top and bottom of his head was less in each succeeding photograph.

Walcott spent a week at the Museum of Comparative Zoology at Harvard in September 1873, unpacking and arranging the fossils he sold. This was his total involvement with college, but Professor Agassiz impressed Walcott with the importance of learning about the appendages of trilobites. Later, in the course of collecting at a quarry a few hundred yards from the farm house, Walcott noticed fragments that might have been of trilobite legs and hit on the notion of studying them by cutting thin sections. Cutting the rock and then grinding it down was all hand labor, but Walcott persisted through several hundred sections. No trilobite legs were known up to that time; in 1876 Walcott proved conclusively from the presence of jointed appendages that trilobites were arthropods.

Late in 1876, Walcott became a special assistant to James Hall, the state paleontologist of New York, and the second most prolific paleontologist in the world. Hall had known Walcott for years and kept stating that he would buy Walcott's collection. R. P. Whitfield had left, and Hall was in need of an assistant, especially to run operations during 1877 when he went to Europe. Another volume of the *Palaeontology of New York* had to be seen through the press, and the collections and exhibits in the New York State Museum were in terrible shape. Hall was autocratic and operated generally by terrorizing his assistants; Walcott is the only one who did not coauthor with Hall and who continued to publish under his own name.

Walcott was employed for little more than a year, but he remained in Albany, where he learned a great deal from studying Hall's collections and library; he also learned practical politics from lobbying for Hall in the state legislature. By good fortune, he was hired in July 1879, as one of the original members of the new United States Geological Survey. Hall had written a letter of support for Walcott, but it was R. P. Whitfield who obtained the position for him.

Walcott's first year was as a temporary geological assistant at $50 per month. He worked on the Colorado Plateau and found the position of the Paleozoic-Mesozoic boundary in the course of measuring a section from the Cenozoic-Mesozoic boundary in southern Utah down to the Devonian at Kanab Creek in the Grand

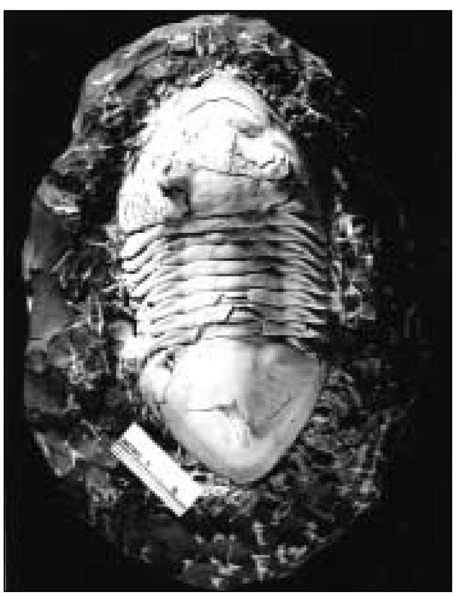
A trio at Rust farm, Trenton Falls, New York. The center figure with the black beard and black hat is the young C. D. Walcott. The dandy on the right side of the picture is questionably identified as A. C. Peale, a geologist with the Hayden Survey and, later, the U.S. Geological Survey. The bearded older man is unknown, but he could be one of the elder members of the Rust family. Smithsonian Institution Archives, Record Unit 95, Box 24, No. SA 187.

Canyon, more than two miles of rock. His work was so satisfactory that he was given a permanent position as assistant geologist and a 100% raise, to $100 a month. Although Walcott made contributions to paleobiology, throughout his career with the USGS his efforts were directed to biostratigraphy—advising field geologists on the age of sedimentary rocks by studying fossils.

If there was ever a geologist who deserves to be better known in America, and incidentally one who had the most inappropriate middle name, it is Charles Doolittle Walcott. In 15 years, he wrote a major monograph on Paleozoic fossils of the est, resolved the fundamental stratigraphic problems of the position of the "Taconic" system, confirmed the sequence of trilobite zones in the Cambrian, and summarized the stratigraphy of the Cambrian System of North America.

In 1894, Walcott became the third director of the U.S. Geological Survey; he served for 13 years in this post. Toward the end of his directorship, John Wesley Powell had gotten crosswise with Congress. The Congress slashed the budget of the Geological Survey and then, when that did not work, they slashed the salary of Powell. When Walcott took over, it was at a lower salary than Powell had received and it was to head a nearly broken organization. In just a couple of years, Walcott had the agency back on track. The USGS then expanded into work on water resources, more topographic mapping, and study of the national forests. While Walcott was administering all these different activities, he was still an active scientist. He wrote on Cambrian jellyfish and Cambrian trilobites from China, and he made significant advances in the understanding of Precambrian life. During this interval, Walcott also did most of the preliminary study for U.S. Geological Survey Monograph 51, *Cambrian Brachiopoda,* for which the volume of plates is as thick as the volume of text. Also during this time, Walcott essentially ran the Carnegie Institution of Washington (1902–1905) and deserves full credit for establishing the Carnegie Institution of Washington Geophysical Laboratory.

Charles Doolittle Walcott, in 1913, posing with a pry bar in the fossil quarry he opened to collect from the Middle Cambrian Burgess Shale. In five seasons, he obtained more than 50,000 specimens from this locality, by splitting slabs day after day. In 1907, Walcott began a systematic study of the Precambrian and lower Paleozoic rocks of western Canada. His discovery of spectacular fossils in 1909 distracted him for some years from his basic program, but he was able to study the Cambrian rocks and fossils of the region and made a start on the Early Ordovician. His last field season was in 1925.



Isotelus gigas (DeKay) from the Rust farm. The matrix is late Middle Ordovician limestone of the Trenton Group. This beautifully preserved trilobite is representative of the quality of the fossils that Walcott and Rust sold to Louis Agassiz. On the matrix are tool marks, an indication of some of the careful preparation done; in later years, William Rust worked for the U.S. Geological Survey as both a collector and preparator. Walcott's Rust farm trilobites, which had the appendages preserved, were more significant biologically than this specimen, but they were studied by cutting thin sections and are not photogenic.

In 1907, Walcott became the fourth secretary of the Smithsonian Institution. He immediately began a program of field investigations, mainly in Alberta and British Columbia, and he was in the field every year until 1926. His research program was essentially the same as when he was at the USGS: to make known the stratigraphy and paleontology of the pre-Trenton rocks.

Walcott worked long and hard on the stratigraphy and paleontology adjacent to Banff, Alberta, though he had two significant distractions from his field program. First, he was the first geologist to attempt geologic investigations around Mount Robson, the highest part of the Canadian Rockies. Second, he found the Middle Cambrian Burgess Shale and its incredible biota. Walcott collected for five seasons to bring this treasure trove back to civilization. He described the fossils, both animal and plant, of the incredible deposit, and then continued on with the stratigraphy and paleontology of the overlying beds.

Walcott had at his disposal the Smithsonian Miscellaneous Collections and was never one to waste an opportunity. He filled five entire volumes of that series. James Hall was the most prolific writer on American fossils, but if Walcott was not second, I cannot imagine who deserves that place.

Besides doing research part-time while running the Smithsonian Institution, Walcott had other duties. After 10 years as vice-president of the National Academy of Sciences, he became president (1916–1922). Before the start of World War I, G. E. Hale, the astronomer, and Walcott had formed the National Research Council, and they applied science to warfare, setting a pattern for the years of World War II, 1941–1945.

Quite apart from all this, Walcott decided that research on aviation was lagging in America. He steered the National Advisory Committee for Aeronautics through Congress and was its chairman for years. NACA is no more, but it laid the foundation for the National Aeronautics and Space Agency. If there is a great-grandfather of the space age, it is the paleontologist Charles Doolittle Walcott. ■

For more on Walcott:

Yochelson, E. L., 1967, Charles Doolittle Walcott, 1850–1927: National Academy of Sciences Biographical Memoirs, v. 39, p. 471–540.