

HISTORY OF SCIENCE

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George K. Greene: An Early Indiana Fossil Collector

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Introduction

George K. Greene (Figure 1) amassed one of the largest fossil collections ever accumulated from Indiana rocks. He spent most of his life in southern Indiana, first in Jeffersonville and then for many years in New Albany, Indiana. He is best known for the tremendous collection of silicified corals that he obtained from the Falls of the Ohio. At the time of his death his collection was estimated to have numbered over 400,000 specimens. He was initially introduced to fossils by Albrecht Koch, a German paleontologist who travelled extensively in the eastern United States during the middle 19th century. Greene worked for several years for the Indiana Geological Survey and later privately published an extensive series of taxonomic papers on corals and some other fossils from the Falls of the Ohio and other localities in southern Indiana. His collections posthumously went to the American Museum of Natural History in New York, where his type specimens still reside. The bulk of the collection was later transferred to the U.S. Natural History Museum in Washington, D.C.

Early Days

George K. Greene was born in 1835 in Columbus, Indiana. His father was George Graham Greene, a merchant of Hancock County, Kentucky. His mother was on a visit to Columbus when he was born, hence he was accidentally born a Hoosier, where he later lived. Greene received a public school education in Kentucky and he says that he also studied Latin and science with private teachers (1). At the age of 16 he met a well-known German paleontologist, Albrecht C. Koch, who was in Kentucky collecting geological specimens for a French nobleman who was to endow a College in his native land (1). Koch excited Greene's interest in rocks and fossils and the boy left home to travel with Koch and to "become a geologist". Greene



FIGURE 1. Photograph of George K. Greene, taken beside his fossil shop in New Albany, Indiana. Date unknown. Copied from photograph in Miss Emma Carleton scrapbook no. 1, page 11 in the New Albany-Floyd County Public Library, 180 West Spring Street, New Albany IN 47150, courtesy of Ruth Ann Kramer.

says that he was with Koch for several years, but the exact duration of this association, where they travelled and what they did, is not recorded.

Koch worked primarily out of St. Louis, where he had established a museum in 1836 (2). He was responsible for excavating and naming an American mastodon from Missouri in 1839. He called the specimen *Missourium* or the Missouri Leviathan. He assembled parts of two skeletons into a single super-mastodon and had it on exhibit. He later shipped the fossils to Europe and sold the specimen to the British Museum, where the anatomist Richard Owen correctly mounted the specimen.

Later, in 1845, Koch excavated an enormous Eocene age archaic whale said to be 119 feet long. Most specimens of these whales are 70 feet or less in length. He called this "sea serpent" *Hydrarchos* even though the whale had earlier been named *Basilosaurus* or *Zeuglodon*, names that are in use generally today. One of his whale skeletons was later sold to the Royal Museum of Berlin.

Presumably Greene returned to Kentucky and remained there until middle age. He married, his wife's name was Elizabeth, and he had at least two sons born in Kentucky, Newton A., later Mayor of New Albany, and William (3). In 1870, at age 35, Greene moved to Jeffersonville, Indiana so that he could be situated closer to the famous fossil beds at the Falls of the Ohio. Eight years later, in 1878, he moved permanently to New Albany. The Devonian limestones at the Falls, which form rapids across the Ohio River between Clarksville, Indiana and Louisville, are

famous for the size, abundance and variety of fossils, especially corals and sponges (stromatoporoids) found in them. The beds were noted by early explorers of the Ohio River and species of fossils were first described from the locality in 1820 by Rafinesque and Clifford (4).

A Collector

Upon moving to Indiana Greene began putting together the large collection of fossils and antiquities that was his principal claim to fame.

Many of the fossils from the Falls of the Ohio occur in limestone and have been replaced by silica. Thus, they weather out of the rock as the limestone dissolves and the more chemically resistant silica remains behind. The fossils commonly accumulate in potholes worn in the limestone in the bed of the river and these potholes, some several feet in diameter, were favorite places for early fossil collectors to obtain fossils. Many of Greene's specimens were undoubtedly obtained in this way. It is quite clear that Greene knew how to help Nature along, as he mentions treating pieces of limestone that contained fossils with muriatic acid (commercial hydrochloric acid). The acid dissolved away the lime rock, thus releasing the fossil (1). Greene must have been one of the earliest paleontologists to employ this technique for studying fossils.

Although corals from the Falls of the Ohio were clearly Greene's speciality, his advertising card states that he also dealt in archaeological specimens, scientific books, coins, medals, badges, U.S. and foreign postage, revenue stamps, Confederate and broker's bank bills, as well as old arms and relics of the late [Civil] war (5). His shop was located at 25 West Market Street in New Albany. In 1911, when he gave an extensive interview with the Louisville Journal newspaper, he lived in two small rooms in the back of this shop.

In this interview (1), at age 76, Greene says that he had sold specimens to the American Museum of Natural History, the British Museum of Natural History, the Museum of Comparative Zoology at Harvard, the Boston Society of Natural History, and to the Massachusetts Institute of Technology. He also states that he had sold a 150 pound coral head to the Borden Institute at Borden (then New Providence) Indiana for \$50 and also sold a fine crinoid to Professor W. W. Borden, founder of that Institute, for \$100. He had found tusks and other fragments of a mammoth at the Falls. In this long interview Greene also expresses some peculiar ideas on the origin of the ice ages, on extinction of large mammals, and on religion.

Shortly after moving to New Albany, Greene spent some time during 1878 in Bloomington, Indiana, where he was employed to catalog and arrange the David Dale and Richard Owen collection of fossils and other geological specimens at Indiana University. These collections were later, in 1883, almost completely destroyed by fire. In the next year, 1879, Greene went to work for the State of Indiana. He was appointed as an Assistant on special duty in the newly formed Department of Statistics and Geology. He undertook the first and only geological survey of the geology of Monroe County. The report was published in 1881 (6).

From 1881 through 1883 Greene was employed in Indianapolis where he continued to work for the State geological survey, renamed the Department of Geology and Natural History. He was responsible for arranging the State geological and paleontological collections in the State Museum. His title was changed from Assistant on special duty to Museum Assistant. He oversaw expansion of the collections from about 40,000 specimens in 1881 to an estimated 100,000 specimens by 1883, with an estimated value of over \$100,000 (7,8). During this time he was paid about \$65 a month in salary as well as expenses for travel to and from New Albany. He did fossil collecting in Shelby, Cass, Carroll and White counties as well as at Waldron,

Hartsville, and Logansport. He ceased work for the State in January, 1883, probably because of budgetary restrictions. In 1885 Greene became one of the founding members of the Indiana Academy of Science (9).

Contribution to Indiana Paleontology

Amateur paleontologists such as Greene have a great desire to see their collections receive notice. Having gone to a great deal of time and expense to collect the fossils, they are especially anxious that any new forms, genera or species, be named and published. They can seek out a professional who is willing to write up their new taxa. Alternatively the collector may decide to take matters into his own hands and publish on the specimens himself. This was the path chosen by Greene and the motivation behind his *Contribution to Indiana Paleontology*, which is basically a description and illustration of parts of Greene's very large fossil collection (10).

Greene began publication of the *Contribution* with part I on Feb. 28, 1898. In the preface he states that he will publish in parts that include three plates each, that he has enough fossils for 60 plates, that each part will be for sale for 25 cents and that 500 copies will be printed. True to his word, six years later on Sept. 20, 1904, he issued part XX, resulting in a total of 60 plates of fossils. After a two year interval he published volume 2 of the *Contribution* in three parts between July and November, 1906. Each of these parts also had three plates (10).

Greene's collection was heavily weighted toward fossil corals, especially those of Devonian age from the Falls of the Ohio and other areas near New Albany where he lived. Thus, as one might expect, the *Contribution* is also preponderately concerned with Devonian corals that Greene believed were new species, and in some cases, new genera. Of a total of 356 species discussed in the *Contribution*, 181, or over one half, are of corals.

The first six parts of the *Contribution* are devoted exclusively to corals. A total of 86 species are described, all but one of which are thought to be new. Each of the subsequent 13 parts invariably begin with some coral descriptions, ranging from two to nine in number, but also including a variety of other fossils. All descriptions other than corals, which Greene did himself, were prepared by R. R. Rowley of Louisiana, Missouri. Finally, in part XX Greene reverted to sole description of 11 more new species of corals. In volume 2, the first two parts include other fossils but the third and final part contains 10 descriptions of new coral species.

Of the 181 species of corals described in the *Contribution* only one was not described by Greene. In part VIII one coral is described by Rowley and named *greenei* for George Greene. Apparently Greene wanted one species named after himself and could not, with proper taxonomic etiquette, do so himself, so he had Rowley do it for him.

Of the 181 species of corals described only 15 were assigned to species previously described by earlier workers. Greene essentially ignored all previous work, which was extensive, on Falls of the Ohio corals. Corals had been described from this famous fossil locality as early as 1820 when Rafinesque and Clifford published on some fossil corals (11). Later paleontologists have emphatically disagreed with Greene concerning the appropriateness of his new species. In a monographic revision of the Falls of the Ohio corals by Stumm in 1964, all but 15 of Greene's 166 new species of corals are placed in synonymy with previously described species (12). Thus, a major part of the *Contribution* is viewed today as a futile exercise in species making.

Rowley was much more conservative in his species making than was Greene. Of 95 crinoid species described, 49 were assigned to earlier named species and 28 of 42 species of blastoids were not new. Today Rowley's work in the *Contribution* has considerably more scientific value than does Greene's.

Greene used a considerable number of illustrators to prepare the plates for the *Contribution*. Even by standards of the time most of the figures were not of very high quality and some are so generalized as to be virtually useless for purposes of identification. John Bridgham of Providence, Rhode Island was the sole artist for the first four parts. He later provided two plates for part V, two for part VII, and one for part VIII in 1901. All of these plates were of corals. Albert Albers of Cincinnati, Ohio sporadically drew a series of plates beginning with part V and ending with part XII, for a total of eight plates.

Beginning with part VII and Rowley's contributions, Rowley also began preparing plates. Those that he did prepare are of especially poor quality and are without exception of fossils that he also described. Beginning with part VIII Fred B. Stichter began to prepare plates for Greene. His drawings were generally of fossils other than corals. He prepared a total of 12 plates for parts VIII through XVII. In latter parts of volume 1 and in volume 2 plates were drawn by P. W. Alles and J. M. Paine. Nothing further is known about these illustrators.

With part XIII Greene began to use photographic illustrations of fossil corals. In each case all specimens comprising figures for a plate were carefully arranged and a single photograph was taken of the entire assemblage. Those photographs are invariably the first of three plates in each part where they appear and are always of fossil corals. The photographic images are of considerably higher quality than the various illustrators' sketches. No credits are given for the photographic plates and they may have been taken by a local New Albany photographer or by Greene himself.

Among the many new species named by Greene quite a few were named for other collectors or paleontologists and these give us some insight into other early fossil collectors in the New Albany area. Species are named for R. R. Rowley, Albert Albers, and John Bridgham, all of whom collaborated with Greene and who were discussed earlier. Local collectors known to Greene who provided specimens that he described and that became part of his collection included W. W. Borden, Thomas J. Lamaster of Speed, IN; Dr. John Lemon of New Albany; John Hammell of Madison, IN; John Sellers and William N. Williams, collectors; Dr. Otto Oppelt, New Albany; George Weber of Louisville, Charles Very of New Albany and Henry Grossback of Sellersburg.

A second group consisted of amateur and professional paleontologists at a distance who may have traded or bought and sold specimens with Greene. These included W. F. E. Gurley of Danville, IL, Rev. H. Currie of Thedford, Ontario (a prime locality for Devonian corals); Dr. Marshman E. Wadsworth, former President of Michigan Mining School; Prof. A. E. Seaman, Professor of Natural History at the same institution; and Prof. Will. H. Sherzer, Prof. of Natural Sciences at the State Normal School, Ypsilanti, Michigan. The emphasis on Michigan folks, none of whom were well-known in paleontological research of the time, may have been due to the richness of Devonian fossil localities in that state, especially corals.

A third category consists of very well known paleontologists with whom Greene probably had little personal contact. These include Amadeus Grabau of Rensselaer Polytechnic Institute; Alexander Agassiz, Harvard University; Wm. H. Niles of M.I.T.; Charles E. Beecher of Yale; R. T. Jackson of Harvard; Frank Springer of New Mexico and Stuart Weller of the University of Chicago. Finally, one species is named *hobbsi* with no indication of who Hobbs might be.

Disposition of the Greene Collection

George K. Greene died in New Albany in 1917 at age 82. In September of that year his son Newton contacted the American Museum of Natural History concerning

sale of his father's collection (13). Newton Greene valued his father's collection at \$7500 and offered to sell it for \$2500 down (cash) and \$1500 per year for three years at 6% interest. He would take a substantial reduction if paid in one lump sum. He also indicated that at one time the Field Museum of Natural History in Chicago had offered his father \$10,000 for the collection but that negotiations had failed.

The American Museum sent Dr. C. A. Reeds to New Albany to inspect the collection and to arrange for its purchase. He wrote that the collection consisted of 1500 boxes, 100 cabinet drawers, 3 show cases, 5 bins, 65 cigar boxes, 1 trunk of Indian relics, 3 cabinets and 20 bushels of fine specimens. These were very dusty and scattered through eight rooms of a "fire trap haunted house". The museum bought the collection for \$5500 and Reed packed the specimens in 5 sugar barrels and 134 wooden boxes, all together weighing 23,000 pounds.

At the same time Reed purchased another Falls of the Ohio coral collection from Wm. J. McConathy of Louisville consisting of over 7000 specimens for \$2300.

The Greene collection was accessioned (AMNH No. 490) but was stored and never curated except for the type specimens. In 1960 the entire collection except for the types was donated to the U.S. National Museum, where it is housed in 21 3-foot range cases (14).

In summary, George K. Greene amassed one of the largest fossil collections ever assembled by a Hoosier. He published a series of papers describing new species, especially Devonian age corals from the Falls of the Ohio, from his collections. Virtually all of these species have since been declared to be junior synonyms of earlier described species. He was an early user of hydrochloric acid to release silicified fossils from limestone matrix and early used photographic plates to illustrate fossils.

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