

James W. Gidley: Expert in Cenozoic Mammals

James Williams Gidley (1866-1931) was a vertebrate paleontologist at the United States National Museum (USNM – which became the National Museum of Natural History during later reorganizations), specializing in Cenozoic mammals.



From left to right, Oliver P. Hay, Charles W. Gilmore, James W. Gidley

A native of Springwater, Iowa, Gidley had a life-long interest in paleontology. He gained a position as Assistant in Vertebrate Paleontology at the American Museum of Natural History (AMNH) in 1892, but took a leave of absence two years later in order to pursue more formal training at Princeton University, where he was awarded both bachelor's and master's degrees. Gidley returned to the AMNH in 1901, where his skills as a fossil preparator and researcher were highly praised. He was hired by the USNM as a preparator in 1905, named Custodian of Fossil Mammals in 1908, and promoted to Assistant Curator in 1912. While with the USNM, he gained his PhD from George Washington University in 1922 and remained in the service of the USNM until his death in 1931.

Dr. Gidley was both a skilled preparator and an active researcher. While with the USNM, he led or co-led approximately 20 field expeditions to locations as far flung as Maryland, Montana, Indiana, Nebraska, Arizona, Oklahoma, and Florida. He was particularly noted for his work in four important areas: his collection, preparation and study of a wealth of small Paleocene mammals from Montana; his collection and study of Pleistocene mammals from Cumberland, Maryland; his study of geology, stratigraphy, and paleontology at Pleistocene sites which bear on when humans may have arrived in Florida; and his recognition of the extreme importance of a small number of important localities for fossil horses in Idaho. All provide insights into his career and expertise.

Paleocene Mammals from the Fort Union Formation, Montana

Paleocene mammal fossils had first been discovered in the Fort Union Formation east of the Crazy Mountains in central Montana in 1901 by Earl Douglass. The fossils found were extremely fragmentary and not much more was done until 1908, when Dr. T. W. Stanton of the United States Geological Survey (USGS) commissioned a local rancher, Albert C. Silberling, to collect Fort Union fossils for the USGS and the USNM. The fossils Silberling collected were sent on to the USNM, and Gidley travelled to Montana in 1909 to join Silberling in prospecting the area. Between 1909 and 1911, Gidley and Silberling together returned more than 1,000 mammal fossils to the USNM. Although Gidley did not return to the area after 1911, Silberling continued to collect sporadically until 1935. Overall, much of what was collected was fragmentary, but the total take was at the time one of the largest collections of Paleocene mammals ever assembled from one location.

Of course, collection is only the first step in the paleontological study process. The fossils still had to be prepared, that is, removed from the surrounding rock, cleaned, and stabilized. Most of the fossils found were upper and lower jaws, teeth, and foot and limb bones, and were both small and fragile, which meant that almost all of the work had to be done slowly and carefully using a binocular microscope. Gidley drew on his background as a preparator and did most of the work himself, although it ended up taking him roughly 12 years of effort to finish. Although he had done some short papers regarding the fossils during that time, in 1923 he was ready to begin more comprehensive studies. He had amassed an extremely valuable collection, noting at the time that it contained “at least 40 species, most of them new to science, distributed among not less than 15 families, and 6 or possibly 7 orders...”¹. Unfortunately, after Gidley finished a significant monograph on Paleocene primates in 1923, other duties took more and more of his time, and he was never able to complete the overall review of the mammals of Fort Union he so greatly desired before his death in September, 1931.



Typical Fort Union fossil -- Left dentary with teeth of a small mammal, *Spanoxyodon*, USNM 9287

Actual length approximately 1.4 inch

Collected by J. W. Gidley, 1909, Fort Union Formation, Montana

However, Gidley left behind an exceptional collection of prepared and catalogued study-ready fossils, as well as some 27 pages of notes and preliminary observations. Shortly after Gidley's death, Charles W. Gilmore (Curator in the Division of Paleontology at USNM) and Dr. Alexander Wetmore (Assistant Secretary, later Secretary of the Smithsonian Institution) asked noted vertebrate paleontologist Dr. George

Gaylord Simpson at the AMNH if he would consider finishing Gidley's work. Simpson, who already had access to the significant collection of Fort Union mammal fossils at the AMNH, would also be provided all of the specimens Gidley had prepared at the USNM. Simpson agreed to the arrangement, and the USNM agreed to fund additional field work by both Simpson and Silberling as well. After 5 additional years of collecting and studying, Simpson produced a massive and influential monograph in 1937, detailing the local geology of the Fort Union Group and classifying and describing the fossil mammals found there. Speaking of the specimens collected by Gidley and Silberling, Simpson said: "The collection represented, potentially, the greatest single contribution to knowledge of early mammals that had ever been made."²

Cumberland Cave, Maryland

In 1912, the Western Maryland Railroad Company was expanding their line west and workers were cutting through the side of Wills Mountain near Cumberland, Maryland, when they exposed a small cave system in the limestone rock. A local resident and amateur collector, Raymond Armbruster, noticed fossil bones being removed from the cave by workmen as curiosities, and sent a small sample to the USNM for its possible interest. While caves are relatively common, caves containing fossils are not, and Dr. Gidley planned a trip to the site in October 1912. This initial trip resulted in the collection of more than 100 specimens, mostly jaws and jaw fragments from at least 29 different species, most of which are now



Railroad tracks at
Cumberland Cave, 1913.
(Photo by R. Armbruster)



J. W. Gidley at the entrance to Cumberland Cave, 1913.
(Photo by R. Armbruster)

extinct. This success was encouraging enough that Gidley and Armbruster collected sporadically at the site for another three years.

Although the limestone of Wills Mountain is of Devonian age, all the specimens collected from the cave and identified by Gidley are of Pleistocene age, suggesting that, roughly 200,000 years ago, the cave system was connected to the surface for a time by a sinkhole. Based on the probable topography, the sinkhole was approximately 100 feet deep, making it likely that anything that fell in would remain there. The fossils found are a mixture of animals that may have lived in the caves (such as bats, owls, and

invertebrates), and some that may have fallen in, including terrestrial vertebrates (such as wolverines, bears, and peccaries), and numerous plants, all encased in sediments washed in over the years. Of the 41 genera listed from Cumberland Cave, eight are now extinct, and of 46 species, about 28 are extinct.

Between 1913 and 1920, Gidley authored seven publications documenting his finds from Cumberland. Like his work on the Fort Union mammals, the cave represented an opportunity to examine a particular area in detail over time. Unfortunately, once again, his untimely death in 1931 prevented him from finishing the overall analysis he had planned. His successor, Dr. C. Lewis Gazin, assistant curator of vertebrate paleontology at the USNM, re-examined all the material from Cumberland Cave and co-authored with Gidley two additional papers in 1933 and 1938 detailing the geology and likely environment of the cave and the fauna it contained. Together, this material has given us a unique look into Maryland's biota during the Pleistocene.

Ancient Man in Florida

In 1916, Dr. E. H. Sellards, at the time the State Geologist of Florida, announced the discovery of human remains apparently closely associated with fossils of late Pleistocene vertebrate fauna near Vero Beach, Florida. Sellards concluded that this find indicated humans had reached Florida in Pleistocene times, much earlier than previously thought. Considerable controversy ensued over both the apparent association and the possible age of the sediments in which they lay. A symposium examining the evidence was held in 1917, with well-known geologists, paleontologists, and anthropologists coming down on both sides of the fence and with no firm conclusion reached. Things simmered for a while, and not much more was done until 1922, when artifacts were discovered by a local amateur named C. P. Singleton near the bones of a Columbian mammoth near Melbourne, Florida, under conditions very similar to those found at Vero Beach.

Singleton reported the finds to the USNM, and in late 1923, paleontologist Frederick B. Loomis of Amherst College went to investigate. Examining the artifacts, fossils, and sedimentology of the site, Loomis published his conclusion that men and mammoths were contemporaneous in Florida during the Pleistocene. The USNM assigned Gidley to investigate further, and in mid-1925, Loomis, Singleton, and Gidley met in Melbourne and spent six weeks carefully excavating three local sites in which human artifacts or bones and animal fossils had been found in close proximity. The stratigraphy proved to be almost identical to that found at Vero Beach, and many of the fossils were of animals typically found during the Pleistocene. Gidley concluded that the human artifacts and animal remains were contemporaneous, although he was unwilling to definitively link them to the Pleistocene.



Bringing some jacketed fossils out, Melbourne, Fla., 1925



Some of the take, Melbourne, Fla., 1925

Gidley returned to Florida in 1928, 1929, and 1930, attempting to clarify the issue. (He also went to Florida in 1927 on an expedition to find a mammoth suitable for display in the USNM, but funding constraints did not allow him to return to either the Melbourne or Vero Beach areas during that trip.) Gidley finally concluded in 1931 that the artifacts and fossils were probably Pleistocene in age, although he would not rule out a date slightly post-Pleistocene. Unfortunately, he did not live to attend a symposium hosted by the Academy of Natural Sciences in 1937 that reexamined the entire “Early Man” issue. While the weight of geological and paleontological opinion seemed to have shifted to support the contemporaneity of man and mammoth during the Pleistocene in Florida, many anthropologists continued to disagree.

The Hagerman Horses

In 1928, a cattle rancher named Elmer Cook discovered fossil bones near Hagerman, Idaho. He passed the bones to Dr. H. T. Sterns of the USGS, who in turn passed them, and others he had recently collected, to Dr. Gidley. Gidley immediately identified some of the bones collected as those of a previously unidentified fossil horse, and, greatly interested, arranged for an expedition to the Hagerman area early the following year. Gidley and Cook collected in the area in both 1929 and 1930, with three tons of specimens returned to the museum in 1929 alone.

Gidley’s earliest work as a paleontologist with the AMNH concerned fossil horses, and he was considered something of an expert. Gidley identified the horse fossils found at Hagerman as a new species, *Plesippus shoshonensis*. Nowadays the fossils are referred to *Equus simplicidens*, which is the earliest known species of *Equus* in North America and is considered similar to zebras. Gidley later noted that in the 1929-1930 collecting seasons, his parties obtained more than 40 more or less complete skulls and sufficient bones to restore at least three or four composite horse skeletons.

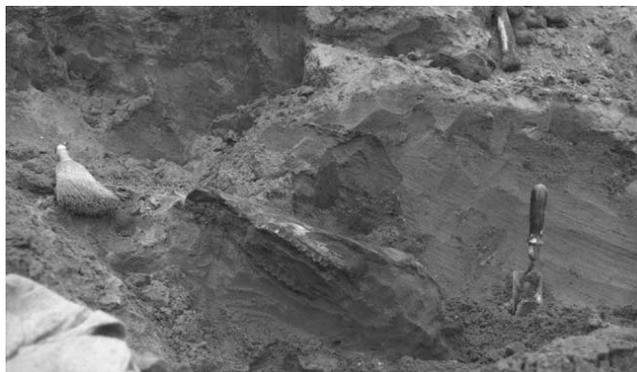


Jacketed fossils at the Hagerman Quarry, 1930



The Hagerman Quarry, 1930

This take represented the greatest accumulation of horse remains ever discovered in one location, and in 1930 the locality was by no means exhausted. Unfortunately, deteriorating health prevented Gidley from returning to the area in 1931. Norman Boss (Chief Preparator in the USNM Department of Geology) led the expedition to Hagerman that year, and C. Lewis Gazin followed with an expedition in 1934. All together, the expeditions yielded more than 130 skulls, numerous associated jaws, and enough bones for 10 complete skeletons of *Equus simplicidens*.



Typical *Equus* skull, Hagerman Quarry, 1930

Other vertebrate remains found in the area include those of fish, frogs, turtles, snakes, birds, and a fair variety of both large and small mammals, suggesting that the site may have been a small pond or watering hole. The sediments and the types of fossils found suggest the assemblage is of late Pliocene age, roughly 3.5 million years old.

In yielding so many well-preserved bones of so many individuals of all ages and both sexes, the Hagerman locality provided an extraordinary view into the development of the modern horse. Although his deteriorating health prevented him from continuing his field-work at the site, Dr. Gidley's contribution to the recognition of Hagerman's importance cannot be overstated. The Hagerman Fossil Beds National Monument was designated in 1975 to protect the site, which continues to yield a wealth of vertebrate fossils to the present day. Known as the Hagerman Horse, *Equus simplicidens* is now the state fossil of Idaho.



Mural of *Equus simplicidens* (center, drinking) and environs at the Hagerman locality 3.5 million years ago, painted by Jay Matternes.

Display Mounts

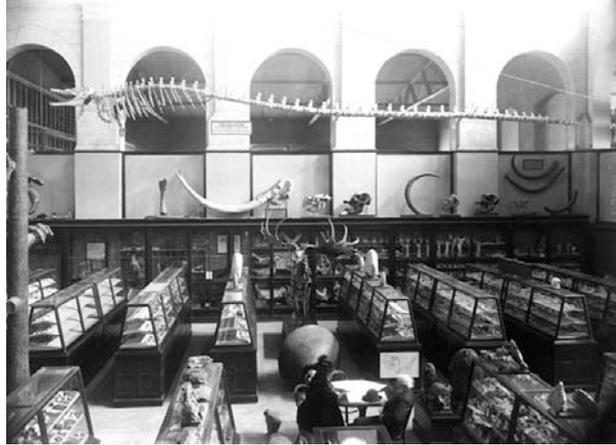
In addition to the above activities, as Assistant Curator responsible for fossil mammals, Dr. Gidley also was responsible for providing scientific oversight and supervising the mounting of a number of the USNM's large display fossils, in particular those of the *Basilosaurus*, Indiana Mastodon, and *Megacerops*.

Basilosaurus

Basilosaurus (sometimes called by its junior synonym *Zeuglodon*) is a genus of Eocene archaeocete whales, and was one of the first named fossil whales in the world. The USNM's specimen of *Basilosaurus cetoides* (USNM 4675) is a composite of skull and skeletal elements of three individuals collected by Charles Schuchert (Assistant Curator of Invertebrate Paleontology in the USNM) in Alabama in 1894 and 1896.

Shortly after collection, many of the bones were partially prepared, restored, and displayed, although no attempt had been made to reassemble them into a life-like pose and only pieces of the vertebrae were laid out in a display case. In 1901, Frederic Lucas (then Curator in the Division of Comparative Anatomy in the USNM) published a partial description of the whale's anatomy and it became possible to consider creating a true restoration. Dr. Gidley was

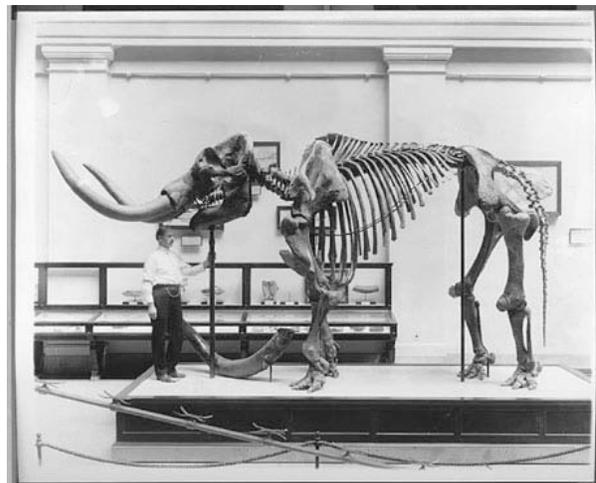
responsible for directing the creation of the mounted specimen, which was completed in 1912, with a total length of approximately 55 feet. This was the first scientific mount of a skeleton of *Basilosaurus* ever done, and it was given a prime spot in the main paleontology hall. The mount survived essentially "as is" until 1989, when it was given some anatomical corrections and repairs, and moved into the "Life in the Ancient Seas" hall. It remained there until 2008, when the mount's hind limbs were replaced and it was moved to the Sant Ocean Hall, where it can be seen today. It remains the only real mounted specimen of *Basilosaurus* on display in the world.



Basilosaurus (top center) as originally mounted and displayed

Indiana Mastodon

Most of the mastodons found in this country are fragmentary, and complete (or relatively complete) skulls and skeletons are rare. One of those rare finds was reported to the USNM in 1914 by Captain H. H. Pattison and Mr. W. D. Pattison of Winamac, Indiana, when workmen unearthed it while digging a drainage canal on the Pattison farm. The Pattisons announced that they would donate whatever was found to the USNM, and Gidley made two trips in 1915 to excavate and remove the specimen. The almost complete mastodon skeleton was in unusually good condition, and only limited

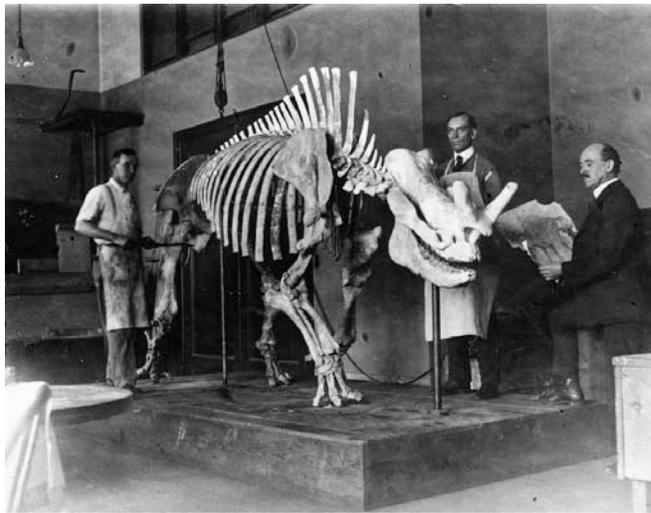


J. W. Gidley and the "Indiana Mastodon", USNM 8204

restoration (done under Gidley's direction) was required in the mount preparation process. Later designated USNM 8204, it was put on display in 1916, and could still be seen as late as last year in the "Ice Age: Emergence of Man" exhibit before it was closed as part of the reconstruction effort for the new Deep Time exhibit scheduled to open in 2019.

Megacerops coloradensis

Dr. Gidley also supervised the creation of the mounted skeleton of *Megacerops coloradensis* (USNM 4262) first displayed in 1919-1920. (This fossil was excavated by John Bell Hatcher in 1887 and had previously been identified as *Brontotherium hatcheri*.) The photo below, dated 1919, shows Gidley posed at the head of the mount with a sketch of it in his hands. Two men in work aprons, presumably preparator Thomas Horne, who is known to have built the mount, and a helper, believed to be junior scientific aide John Barrett, stand to either side of the skeleton. The Museum's Annual Report from 1920 states: "This imposing addition [to the exhibits] ... is the first and only mount of the genus to be exhibited."



The *Megacerops* (USNM 4262) being prepared for display.

Publications

Dr. Gidley's professional bibliography comprises 87 publications, all but nine of which were done while he worked at the USNM. In addition, C. Lewis Gazin included Gidley posthumously as co-author on two additional publications that drew on, and added to, Gidley's Cumberland Cave research conducted in the last few years before he died. Taken together, Gidley's production reveals the career of a man with a love of paleontology and a deep expertise in the development of modern mammals, particularly horses. Despite increasing illness, he continued to work and publish until 1931, the year of his death.

Expeditions Led or Co-led by James W. Gidley

- 1909 Fort Union, Montana. Co-led with A. C. Silberling
- 1912 Cumberland Cave, Maryland. Assisted by Raymond Armbruster.
- 1913 Cumberland Cave, Maryland
- 1914 Cumberland Cave, Maryland
- 1915 Cumberland Cave, Maryland
- 1915 Winamac, Indiana.
- 1921 San Pedro Valley, incl. Curtis Ranch and Benson, Arizona. Co-led with Kirk Bryan.
- 1921 Agate, Nebraska
- 1925 Melbourne, Florida. Co-led with F. B. Loomis and assisted by C. P. Singleton
(Two trips, one in Jan. and one in Jun.)
- 1925 Adel, Iowa. Assisted by James Lee
- 1925 Long Horn Spring, Oklahoma
- 1926 Venice, Florida
- 1926 Melbourne, Florida. Assisted by C. P. Singleton.
- 1927 Sarasota, Zolfo Springs, Florida. Assisted by J. E. Moore
- 1927 Curtis, Oklahoma. Assisted by B. C. Baxter
- 1928 Melbourne, Vero, Okeechobee, New Smyrna, Florida. Assisted by C. P. Singleton.
- 1929 Melbourne, Florida, assisted by C. P. Singleton.
- 1929 Hagerman Lake beds, American Falls beds, and “*Plesippus* Quarry”, Idaho.
Assisted by H. T. Sterns, C. P. Singleton, Elmer Cook, and F. V. Conklin.
- 1930 Hagerman Lake beds and “*Plesippus* Quarry”, Idaho. Assisted by C. P. Singleton,
S. P. Welles, Elmer Cook, Frank Gamier, and Y. Young Rogers.
1930. Melbourne, Florida, assisted by C. P. Singleton.

REFERENCES

¹ Gidley, James W., 1923. “Paleocene primates of the Fort Union, with discussion of the relationships of Eocene Primates”. Proceedings of the United States National Museum Vol 63, Art. 1

² Simpson, George Gaylord, 1937. “The Fort Union of the Crazy Mountain Field, Montana and its mammalian faunas”. United States National Museum Bulletin 169