

FOLKLORE OF FOSSILS

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HERE BE
DRAGONS

Introduction

For thousands of years, anyone making even the briefest examination of the rocks beneath their feet would have recognized lines, markings, or objects that resembled something in their world. From these markings, animals both terrible and wonderful could have taken shape in the minds of those Early People, and creatures great and small would have been given life in their stories passed down from generation to generation.



Figure 1. NDGS 1016, a fossil fish (*Knightia eocaena*) from the Eocene Green River Formation of Wyoming. Fossil is approximately 4 inches long (10 cm).

Early interpretations

The Greek naturalist Aristotle (384-322 B.C.) wrote: “A great many fishes live in the earth motionless and are found when excavations are made” (Adams, 1938, p. 12). Aristotle is likely referring to skeletons of fossil fish (fig. 1). The idea of fish living in rock seems ridiculous to modern people, but at the time it may not have been all that far-fetched. At this point in history people had not taken the time to systematically inquire about rocks or nature, and knowledge about the world around them was based only on observations. This was a time when Atlas was believed to be holding Earth on his shoulders, Zeus was responsible for lightning storms, and crops would fail or prosper at the will of the gods. It was a time long before Newton, Darwin, and Einstein, and the scientific discipline of paleontology would not be established for another 2,000 years!

The ancient Greeks almost certainly would have stumbled upon large bones eroding out of the hills and valleys as they were exploring and farming the land. What would they have thought of a large (mammoth) skull found buried in a hillside? The skull would be many times larger than any they knew, and one with a very large hole in the middle of the creature’s face. One could conjecture that they might try to place that skull into their known universe. Elephants (the mammoth’s modern relatives) would have been virtually unknown to the ancient Greeks. It would be

understandable then, to mistake the large skull as being from some giant, unknown creature, and mistake the single hole for an eye socket. What kind of creature would they have imagined this skull to have come from? If we look to Greek Mythology, in Homer’s *Odyssey*, Odysseus is trapped on the island of Cyclopes by the Cyclops Polyphemus. The creatures on Cyclopes are described as a gigantic race of shepherds (Homer, *The Odyssey*), and Polyphemus in particular is described as having one giant eye in the center of his forehead (fig. 2). Could this be the origin of the story of the Cyclops? The idea of ancient Greeks mistaking mammoth skulls for those of Cyclopes is not a new one. The idea was first proposed by the Austrian paleontologist Othenio Abel in 1914, and later resurrected by Adrienne Mayor in her book “*The First Fossil Hunters*,” published in 2000. What would the ancient Greeks have thought of other large bones weathering out of the hillsides? Bones they would have recognized as arm or leg bones. Ancient Greeks believed that all the heroes and heroines were 3 times larger than “normal/average” humans (Mayor, 2000). A femur (upper leg bone) is roughly the same shape between different types of mammals. For example, the femur of a human doesn’t look all that dissimilar from that of a lion or even an elephant. If you have only a rudimentary understanding of anatomy then mistaking an elephant femur for a very large human femur is understandable. We have no proof that these bones are the origins of these tales, but we do know that when the ancients found large bones in the fields they referred them to the myths that they knew (Mayor, 2000).

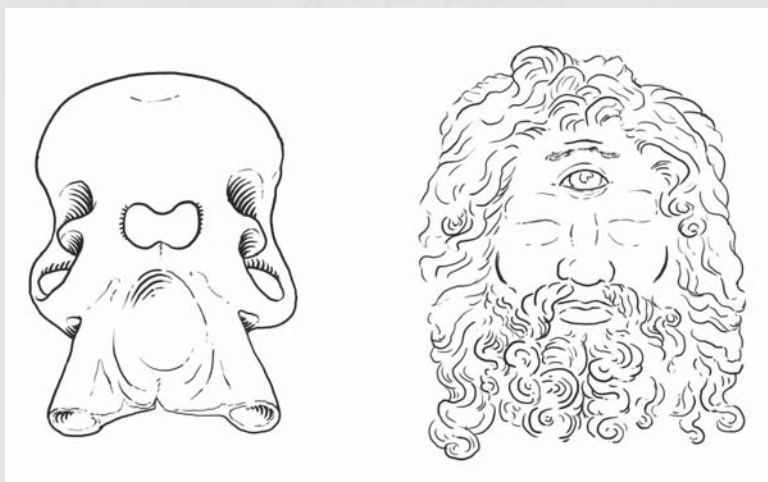


Figure 2. A drawing comparing a mammoth skull with the skull of the mythological Cyclops. Drawing by Becky Barnes.

Mythological creatures were often depicted on early maps of the world to indicate unexplored or even dangerous regions. The phrase “*hc svnt dracones*” (here are dragons), can be found on

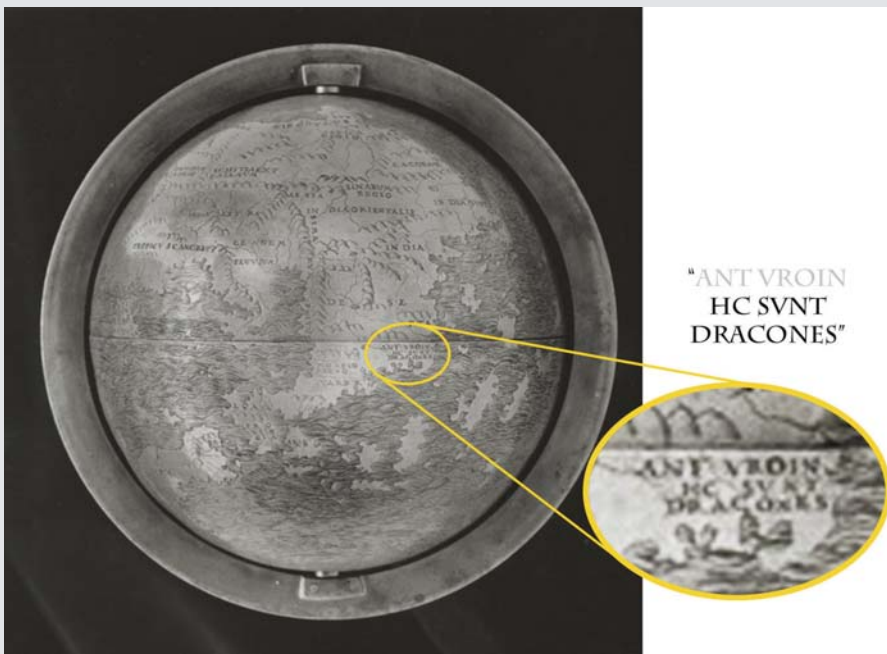


Figure 3. The Lenox Globe, approximately 5 inches (13 cm) in diameter. The highlighted text reads: "HC SVNT DRACONES" or "Here are dragons." This globe is the only known map bearing that famous phrase.

the Lenox Globe, the oldest map from after the time of Columbus, circa 1505 AD (Wikipedia). Other early maps do contain references to mythological creatures, but the Lenox Globe is the only known map with this famous phrase, inscribed near the equator of eastern Asia (fig. 3). It is possible that the phrase is referring to the dragons of Komodo in the Indonesian Islands, as tales of these creatures were known to those living in Asia at the time the map was created.

Early America interpretations:

Similar to ancient Greek beliefs, many of the Native American interpretations of large fossil bones are stories of giant men, so big as to be able to throw large animals (mastodons or bison) over their shoulders like men do with deer. Many of those stories involve a creator or deity destroying these larger creatures to

protect the smaller, modern race of man (Mayor, 2005; Hedeem, 2008). Large bones that were found by Early People were interpreted to be from this giant race of creatures and men. Bones from fossil creatures such as *Bison*, *Mastodon*, *Mammoth*, *Megalonyx*, and any large dinosaurs would have likely been incorporated into these stories. A *Bison latifrons* skull now on display at the North Dakota Heritage Center (fig. 4) was removed from the shoreline of Lake Sakakawea near the setting of a Native American story where giant Bison rose up from the ground (Hoganson, pers. comm.).

The Sioux would refer to the bones they found as belonging to Thunder Beasts (Mayor, 2005). Often after thunderstorms, they would find the fossil remains of large animals washed out on the buttes. In their stories they referred to the lightning as being similar to that seen being made when bison hooves would trample across certain kinds of rocks and create sparks (Mayor, 2005). It is likely that the Sioux were finding and recovering fossils of giant mammals and dinosaurs that modern paleontologists still find

in the same areas today. In the late 1800s, O.C. Marsh, a famous paleontologist and a friend of the Sioux, named the large ten to fifteen-foot-tall, rhino-like mammal *Brontotherium* or "Thunder Beast" and *Brontops robustus* or "Strong Thunder" (fig. 5) in honor of these stories (Mayor, 2005). He also named the very large sauropod dinosaur *Brontosaurus* (now *Apatosaurus*) or "Thunder Lizard" (Mayor, 2005) in deference to these wonderful stories.

Fossils of invertebrate animals such as ammonites were also incorporated into Native American stories. Ammonites are animals related to squid, octopus, and nautili. Their shells are segmented into chambers and when the fossils weather, they break along suture lines and sometimes only single segments are found. These segments can resemble Bison-like shapes (fig.

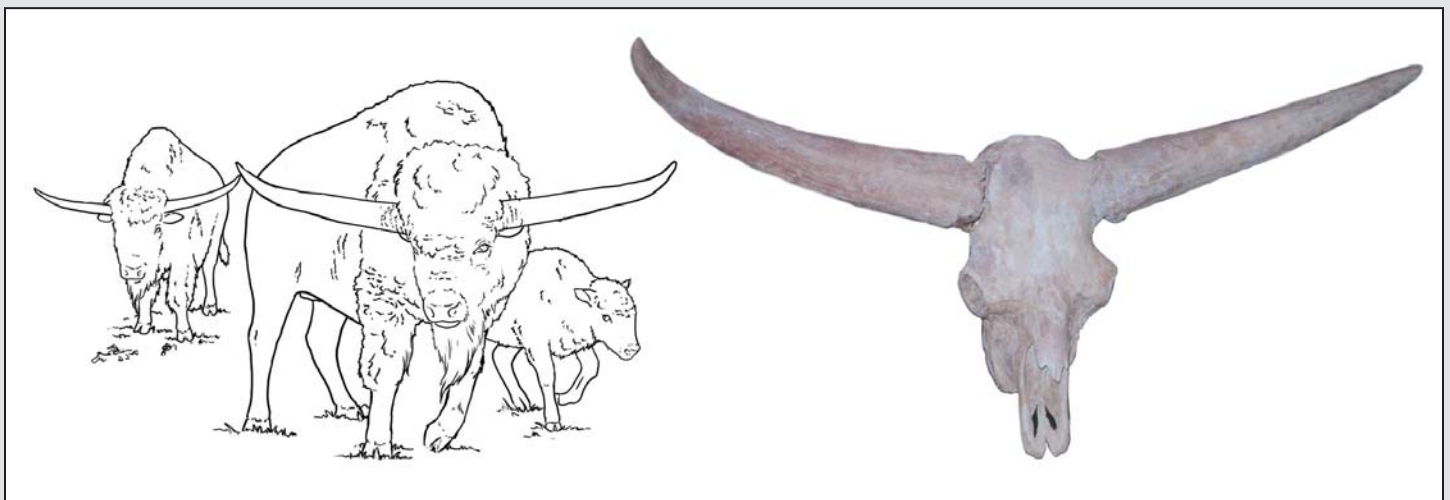


Figure 4. NDGS 216, *Bison latifrons* from the Pleistocene of North Dakota, approximately 6 feet (2 meters) from horn tip to horn tip. This skull was found on the shore of Lake Sakakawea and is currently on exhibit at the North Dakota Heritage Center in Bismarck. Drawing by Becky Barnes.

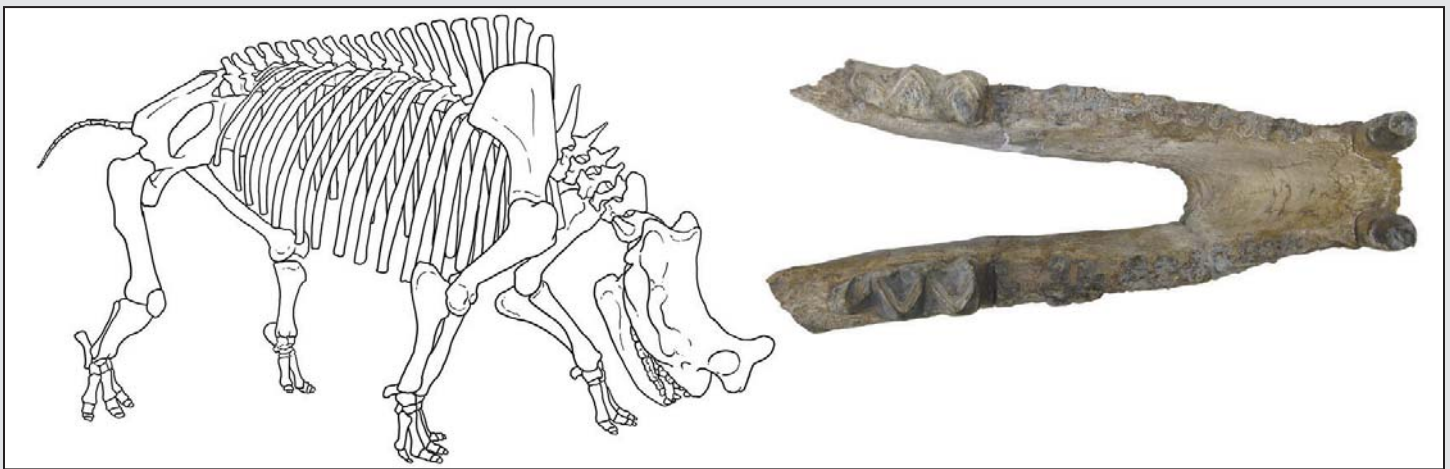


Figure 5. A large rhino-like mammal jaw (*Brontops* sp.) from the Oligocene Brule Formation of North Dakota. The jaw is approximately 16 inches (41 cm) in length. Drawing by Becky Barnes.

6). Native people would keep them as effigies, using them ritualistically to call or hunt Bison (Hoganson & Murphy, 2003; Mayor, 2005).

Petrified wood also featured in Native American stories. According to some legends in the southwestern United States, petrified logs are the remains of large shafts of arrows shot by Shinarump, the Wolf-Thunder god (Mayor, 2005). In North Dakota, small chunks of petrified wood are common, but it is rare to find entire petrified tree trunks. However, one large petrified tree trunk collected along the shore of Lake Sakakawea exists on the capitol grounds in Bismarck (fig. 7). It is nearly 80 feet long!

In 1796-1797, Thomas Jefferson was sent bones from a cave in Virginia that he attributed to a lion, because of their size (Jefferson, 1797). He named this animal *Megalonyx* because of its large claw

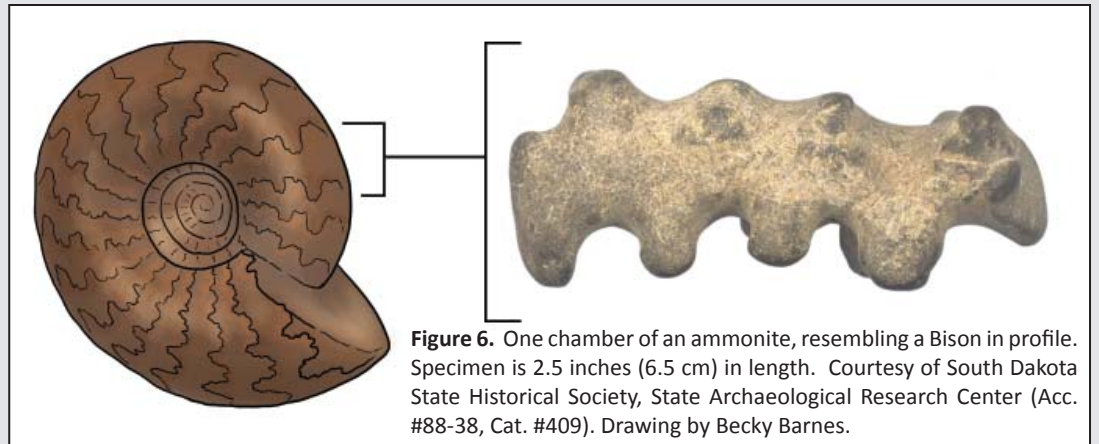


Figure 6. One chamber of an ammonite, resembling a Bison in profile. Specimen is 2.5 inches (6.5 cm) in length. Courtesy of South Dakota State Historical Society, State Archaeological Research Center (Acc. #88-38, Cat. #409). Drawing by Becky Barnes.

(*Megalonyx* is literally translated as “large claw”), and imagined it, along with mammoths, to still survive somewhere within the interior of the continent of North America (Jefferson, 1797). He was hoping to hear of fantastic animals still living, in the largely unexplored interior of the country, from Lewis and Clark as they traveled west. A short while after announcing his discovery he was told of the similarity of his *Megalonyx* bones to those of ground sloths from Paraguay (Jefferson, 1797; Hoganson and



Figure 7. Image of a large petrified log. This NDGS specimen is located on the capitol grounds in Bismarck and is approximately 80 feet (244 meters) in length.



Figure 8. NDGS 217, a claw from the large ground sloth *Megalonyx jeffersonii*, from the Pleistocene of North Dakota, approximately 6.5 inches (16.5 cm) in length. This claw is on exhibit at the North Dakota Heritage Center in Bismarck. Drawing by Becky Barnes.

Murphy, 2003), confirmed later by the French naturalist Cuvier. A claw of this species of ground sloth (*Megalonyx jeffersonii*) was found south of Bismarck (fig. 8) and is on display at the North Dakota Heritage Center (Hoganson and McDonald, 2007).

So what does it all mean? There are many examples of fossils being used as a basis for storytelling and many stories of fossils being misidentified, with that misidentification spurring the emotions and imaginations of many who hear those tales. Fossils have existed on Earth for nearly as long as life on Earth has. They were eroding out of hillsides when dinosaurs ruled the plains and will continue to erode long after you and I are gone. Human curiosity and interpretation of fossils has ranged from mythological and supernatural interpretations to the scientific interpretations of today. Whatever your beliefs may be, the stories told about curious rocks and bones weathering out of hillsides evoke a primal sense of wonder matched by little else.

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