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INTRODUCTION

Marsh Monsters of Big Bone Lick

We are indebted to the Indian for finding and collecting the first fossil bones that received scientific study.

—*Edward M. Kindle, 1935*

Indians certainly found and occasionally collected fossil bones . . . but these discoveries are no real part of paleontological history.

—*George Gaylord Simpson, 1943*

OHIO RIVER, SUMMER 1739

TOWARD dusk, the Indian hunting party returned with game to feed the army of French Canadians and Indians camped along the Ohio River in what is now Kentucky. But tonight the hunters' canoes are laden with more than fresh venison. Curious soldiers gather to watch the Indians unload a strange cargo—an enormous, fossilized femur nearly as tall as a man, several huge teeth, and great ivory tusks darkened by time.

The expedition of 442 men (123 French soldiers and 319 Native American warriors) from Quebec was commanded by Charles Le Moyne, Baron de Longueuil. Traveling by waterway, the fleet of war canoes left Montreal in July 1739, paddling down the St. Lawrence River, Lakes Ontario and Erie, and the Allegheny and Ohio rivers, heading for the Mississippi River (see map 1 on page 35). Their destination was the French port of New Orleans. It was the height of the great colonial wars for empire, as the English and

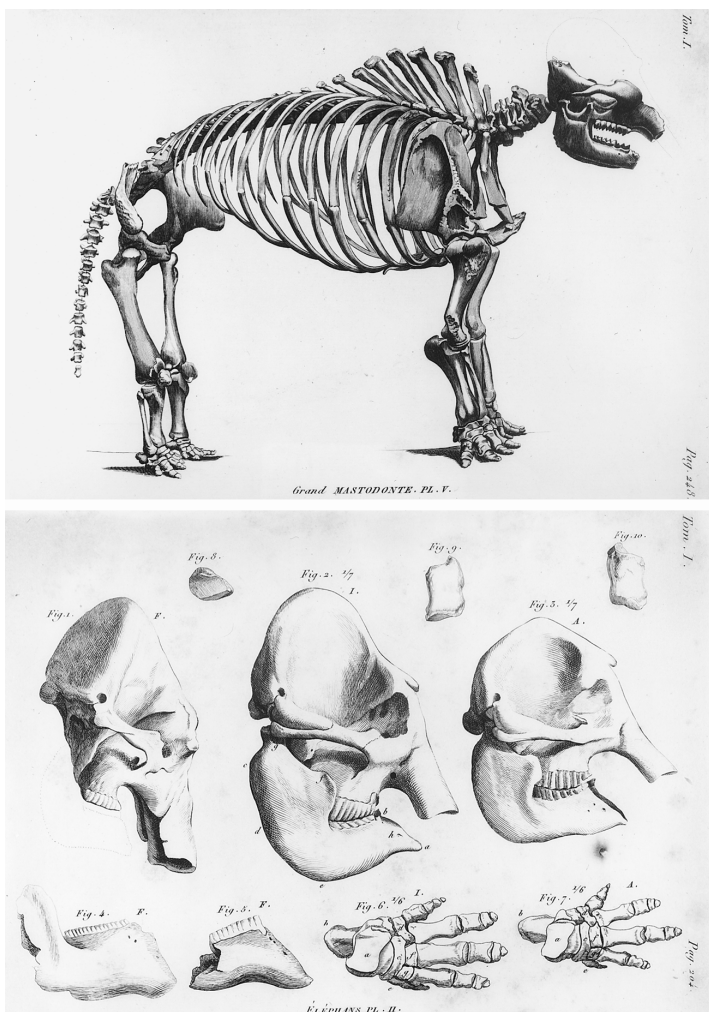
French and their Indian allies battled for control of North America (the French and Indian Wars, 1689–1763). In 1739, Longueuil’s mission was to help repel the pro-English Chickasaw Indians who were besieging New Orleans and blockading the Mississippi.

Longueuil’s expedition was a military failure. The Chickasaws defeated the French and Indian armies, and the French ultimately surrendered to the English in 1763. But the big bones collected by the unnamed Indian hunters in Longueuil’s army made scientific history.

After the perilous river journey down the Mississippi, the fossils arrived unscathed in New Orleans. From there, they sailed with Longueuil to France. Reaching Paris in late 1740, the fossils were placed in Louis XV’s cabinet of curiosities, under the direction of the famous naturalist Count Buffon. A few years later, those bones and teeth from the Ohio River became the first American fossils ever studied by scientists.

In 1762, Louis Daubenton read his scientific paper on the Ohio fossils to the French Royal Academy (scientific drawings of the fossils had been made six years earlier). Crediting the anonymous Indians (“les Sauvages”) with the finds, Daubenton sketched the circumstances of their discovery and established for the first time a comparative procedure for identifying vertebrate fossils. The method was far from perfect. Daubenton concluded that the remains belonged to two separate living species. The femur and tusks he recognized as elephantine, but he thought the molars must belong to a species of carnivorous hippopotamus (the reasons for this mistake are discussed below). He imagined that both animals were to be found alive in the swamps of America. As more fossils from the New World were studied and compared over the next century, however, it eventually became clear to scientists that the Indian hunters had actually found the remains of a single species: the extinct American mastodon, *Mammuth americanum* (fig. 1).¹

The discovery in 1739 that led to Daubenton’s paper is hailed in the annals of scientific history as the birth of American paleontology. In 1821, the great French naturalist Georges Cuvier credited the Indian hunters in Longueuil’s army with discovering the first specimens of the “mammouth d’Amérique” to be studied in Eu-



1. Cuvier's *mastodonte* skeleton, above; mammoth/elephant skulls below. Mastodons and mammoths are often confused, especially since Cuvier named the American mastodon *Mammot americanum*, while *Mammuthus* refers to the mammoth genus. Both are ancestors of elephants and survived till the end of the Pleistocene, but mastodons have pointed molars, while mammoths and living elephants have flat “grinders.” Engravings from Cuvier, *Recherches sur les ossements fossiles* (Paris, 1821–24).

rope. From the beginning, Daubenton, Cuvier, and other French scientists included “les Sauvages” as partners in the discovery. And partners they were. Even though their approach to understanding giant bones was quite different from the comparative method inaugurated by Daubenton and the paleontological theories later established by Cuvier and other scientists, the Native Americans knew where to find large vertebrate fossils of animals that no longer lived. They collected specimens for their own uses, and they had their own ideas about the bones’ meaning—at a time when European scientists were struggling to understand the petrified remains of large, unknown creatures.

The 1739 episode at what came to be called Big Bone Lick has often been recounted from the point of view of the European scientists, but never from the perspective of the Indian fossil finders. In his authoritative history of American paleontology (1942), George Gaylord Simpson wrote that “although Indians were probably involved in the real discovery” of Big Bone Lick, “they cannot fairly be called the discoverers.” Just as “Columbus discovered America in 1492,” he asserted, “Longueuil discovered American fossil vertebrates in 1739.” According to Simpson, “Longueuil’s claim as the true discoverer of North American fossil vertebrates depends more on the results than its absolute priority.”

To sidestep what he acknowledged was the Indians’ absolute priority, Simpson argued at length that full credit should go to Longueuil alone, “the star . . . of the paleontological drama.” Rejecting Daubenton’s clear statement that the Indian hunters were the only ones actually to observe the fossils *in situ*, and that they were solely responsible for their collection, Simpson insisted—on no evidence—that Longueuil himself surely observed the fossil site, too. Simpson claimed that the marsh must have been less than an hour’s “walk” from camp, and that Longueuil personally ordered that the remains be gathered up. Simpson was a fine paleontologist, but his eagerness to put the European “star” at center stage led him to construct a historical fantasy. He even stated that the French defeated the Chickasaws, when in fact the Chickasaws were victorious.²

Simpson's scenario has become entrenched in paleontological and popular history. A recent example appears in the chapter on the discovery of Big Bone Lick in Paul Semonin's comprehensive study of mastodon fossils in colonial America, *American Monster* (2000). Semonin elaborates on Simpson's imaginary version, writing that "Longueuil's Indian guides led the French soldiers several miles up a buffalo path from the Ohio River to the large muddy pond" where they saw "a multitude of enormous bones."³

In April 2001, I visited Big Bone Lick State Park in Kentucky. The heaps of mastodon and other large skeletons that used to loom out of the brackish backwaters along the Ohio River here are long gone, though the occasional big bone sometimes comes to light. The official museum texts state that the original discovery of the fossils was made "by a French soldier . . . Longueil [*sic*] . . . and his troops. They discovered a marshy area scattered with large bones and teeth they believed came from an elephant. They gathered . . . a tusk, a femur, and molars" that were later sent to France. There is no hint that Indian hunters actually discovered the fossils and brought them back to Longueuil in camp. Indeed, the illustrated markers at the site depict a group of French soldiers in tricornered hats standing next to the big bones. Here, too, at the "Birthplace of Vertebrate Paleontology," Simpson's ahistorical vision—Baron de Longueuil strolling along a path to view the site of the Native fossil find—holds sway.⁴

Clearly it was the Indians' decision to collect extraordinary bones that day in 1739 that initiated paleontological inquiries by Europeans in the New World. For me, learning of the hunters' action opened up an unexplored world of early Native American encounters with fossils. How much of their story could I recover? Could I identify the unknown Indians who made the discovery? Why would hunters looking for game go to the trouble of collecting the heavy bones of bizarre creatures? All I had to go on were two facts: the physical evidence of the fossils themselves and the French historical record that it was "les Sauvages" supplying meat for Longueuil's army who discovered the fossils in 1739. By working with these facts and filling in their context, I think we can recon-

struct a plausible story to counter Simpson's fabricated version of this historic milestone.⁵

My first step was to try to determine the tribal affiliation of the fossil hunters. Although the French sources credited the Indians with the discovery of the fossils in 1739, they did not name the tribe, and no modern historian has ever attempted to identify the Indians. Historical and cultural detective work allows us to figure out who they were. The Natives in Longueuil's army came from New France, eastern Canada, home of Algonquian and Iroquoian cultures. In the seventeenth century, French Jesuits had established missions among the Algonquian-speaking Abenakis and the Iroquoian-speaking Iroquois and Hurons (Wyandots) of New France. Longueuil's father, a founder of Montreal, had come to New France in 1641 as an interpreter for the Hurons and Iroquois. As early as 1681–82, a group of Abenakis had accompanied the French explorer La Salle on his historic voyage down the Mississippi to the Gulf of Mexico. By 1700, many Abenaki and Iroquois Indians spoke French and had some European education, and some were literate in French and Latin. But by that time, the Iroquois had become very hostile toward the French missionaries and their converts, the "praying Indians." Meanwhile, Abenaki men regularly joined the French military campaigns, and, as historian Richard White points out, the Chickasaw Wars increased the French need for Algonquian warriors.⁶

In 1739, Longueuil recruited Indian men for his army in southern Quebec, with the help of the Jesuit missionaries. At that time and place, the Christianized Abenakis were the most powerful and loyal allies of the French, while the pagan Iroquois and Hurons were their enemies (and in the Ohio Valley, the Shawnees and Delawares leaned toward the English and opposed the French). Since the 319 Indians in Longueuil's army were persuaded to enlist by the Jesuit priests, we can safely assume that they were almost all Abenakis, with perhaps a few "praying" Iroquois living at the missions. In all likelihood, then, the hunters who found the fossils on the Ohio River were Abenaki.⁷

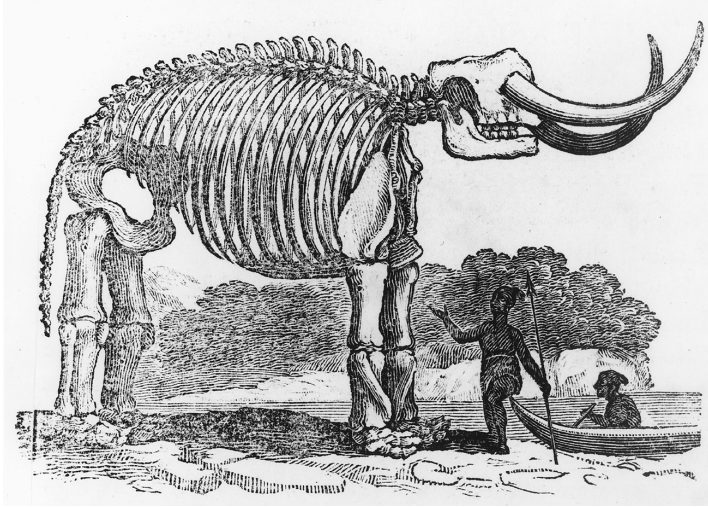
To fill in cultural details about these men, I talked with Gerard Tsanakwa, an Abenaki historian-storyteller. Tsanakwa also happens

to be an amateur paleontologist, so he was intrigued by the idea that his ancestors may have been involved in the famous discovery. He confirmed that a great many Abenaki warriors in Quebec joined French military expeditions at that time. By consulting historical records, and drawing on Tsonakwa's knowledge, I set about reconstructing the circumstances of the discovery along the Ohio.⁸

A large war canoe of that era carried ten men. With supplies and the traveling armory, Tsonakwa estimated that Longueuil's fleet probably consisted of more than a hundred large birch-bark canoes. "To avoid scaring away game and attracting the attention of hostile enemies—or water monsters," said Tsonakwa, "Abenaki war parties followed a strict protocol on the water. Silence was the rule—no splashing, no shouting or cursing, and nothing was thrown overboard."

How many Indians would have been in the deer-hunting party that found the skeletons? Tsonakwa estimated that meat for the army of nearly 450 men could have been provided by a small hunting group of about six Indians. But contrary to Simpson's notion, it seems unlikely that the hunters simply walked "less than an hour away" from the camp. To carry back enough dressed venison, the men probably set off in three canoes, going a good distance away from the noisy encampment. Armed with flintlock muskets and bows and arrows, they would then beach their canoes and stalk deer on foot, paying special attention to salt licks, which attracted game. After gutting the carcasses, they would drag the venison back to the canoes.

According to early French maps indicating the "place where elephant bones were found" in 1739, the Indians went hunting on the southern side of the lower Ohio River. They were in the vicinity of the rapids some miles east of modern-day Louisville, Kentucky, and not far from Big Bone Lick, which would later become the most famous fossil site on the Ohio River. The impressive bones of Pleistocene mastodons and other very large mammals, extinct for about ten thousand years, were abundant in the salty, sulfurous back-channel bogs. The deer hunters from Quebec came upon the skeletons of three immense creatures at the edge of a swamp reeking of sulfur (fig. 2).⁹



2. This wood engraving of 1804 shows two Indians in a canoe, discovering a fossil mastodon skeleton along a river. Engraving by Alexander Anderson, for Thomas Bewick's *A General History of Quadrupeds* (1804). Photo: Graphic Arts Collection, Department of Rare Books and Special Collections, Princeton University Library.

Ivory and Monsters

Seeking to understand why the hunters decided to carry away heavy tusks, teeth, and bones, I asked Tsonakwa to imagine his ancestors' reactions. First, he pointed out, even though they were unfamiliar with elephants, Abenakis would have immediately recognized ivory tusks as a precious commodity. The Abenakis prized the ivory teeth of whales that they hunted in the Atlantic, and they also acquired pieces of fossil mammoth ivory through trade with Arctic people. Historical records show that Abenakis and other Natives encountered European explorers and traders in Canada looking for sources of ivory to compete with the Russian trade in Siberian fossil mammoth ivory—these traders routinely asked about ivory “horns” and teeth. Since isolated mastodon fossils and tusks are found in eastern

Canada, New England, and around the Great Lakes, the Indians in Longueuil's army might also have observed or heard about similar remains closer to home.¹⁰

Historical evidence indicates that Algonquians, including the Abenakis, were actively collecting and trading fossil ivory at a very early date, and there were stories to explain the remains of huge animals in the Northeast. The Algonquians, for example, referred to the "bones found under the earth" as ancient monsters killed by their culture hero Manabozho. In the seventeenth century, a French missionary in Canada reported a "strange legend" circulating among the Hurons. They told of a monster with a "horn" that could pierce anything, even rock. "Anyone possessing a piece of it was supposed to have very good fortune. The Hurons did not know where the creature was to be found, but [they] said that the Algonquians were in the habit of selling them small pieces of the magic horn." These talismans were probably chunks of fossil ivory, gathered by Abenakis and other Algonquians.

In a similar practice, the Creek Indians of the Southeast fashioned amulets of pieces of "horn" that they sawed off from monsters found lurking in water holes—most likely the tusks of fossilized Columbian mammoths preserved in bogs, like the mastodons of the Northeast. Archaeologists at the paleo-Indian Hiscock Site in western New York (occupied in the Ice Age) have found numerous mastodon fossils and tusks along with tools made from mastodon bone. The mounds built by paleo-Indians in Ohio also contain pieces of fossilized ivory tusks collected more than two thousand years ago.¹¹

So Abenaki huntsmen would have taken tusks and teeth back to show Longueuil because they themselves valued ivory and because they knew that the Europeans were eager to obtain such things. Indeed, within a few years of Longueuil's expedition, the competition had become fierce among French and English tusk collectors in the Ohio Valley (dominated at that time by the French and their Indian allies). The dangerous rivalry was vividly described in explorers' journals. For example, Colonel Christopher Gist, of the British Ohio Company, purchased several great molars and tusks from another English trader. The trader told Gist that earlier, in

1744, he had buried a prize five-foot-long “horn” in a secret cache “lest the French Indians should carry it away.” The French-allied Indians were known to acquire ivory for French traders. Gist also met four friendly Shawnee men canoeing upriver who warned him that sixty French Indians were encamped nearby. Gist abandoned his fossil-hunting expedition after he heard the French Indians firing their muskets.¹²

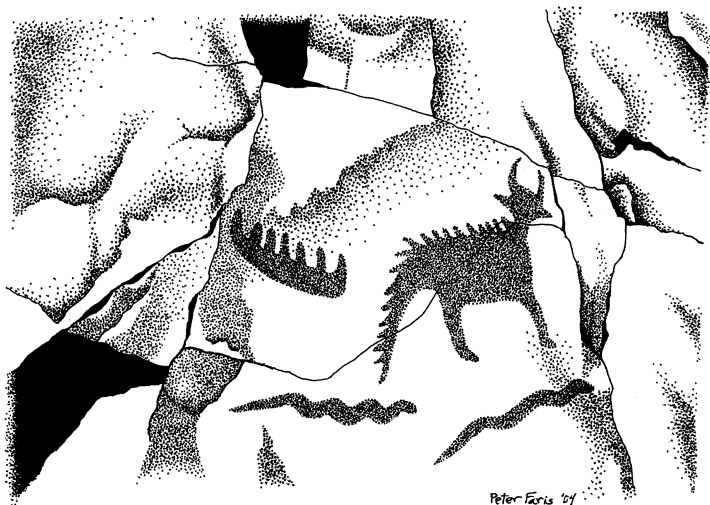
By 1766, only four years after Daubenton’s landmark paper made the Ohio fossils so famous in Europe, a “considerable quantity of elephants’ teeth from the banks of the Ohio” was already stored in the Tower of London, in the royal cabinet of curiosities. Some of these may have been shipped to England by the Indian trader George Croghan (1720–82), an adventurous Irishman who collected mastodon tusks despite the perils. Croghan, who had arrived in America in 1741, learned Shawnee and Iroquois languages and became an important diplomat and Indian agent for the British. He knew of the bone beds in the 1740s, years before he began deliberately collecting specimens in the 1760s. In his letters, Croghan stated that local Indians guided him to the “extraordinary Bones of Elephants” at the place they called the Great Buffaloes’ Lick. And he made the important point that even the “oldest Indians had no traditional Trace” of seeing these beasts alive (the local knowledge of the Shawnees and other tribes in the Ohio Valley and eastern United States is discussed in chapter 1).

In 1765, Croghan, with an escort of Shawnee men, began gathering Ohio fossils intended for the English king’s collection and for others, such as Benjamin Franklin in Philadelphia. The Shawnee guides were never named; however, searching old records for possible candidates, I found that a few years earlier, in 1759, Croghan had negotiated with five Shawnee chiefs and sixty-four warriors at Fort Pitt (now Pittsburgh) on the Ohio River some miles above the big bone deposits. He listed the chiefs’ names in his notes: they were Misquepalothé, Waconathechea, Othoaway, Weseloutha, and Woppepalathe. There is no way of knowing for sure, but it is quite possible that some of these chiefs or their men joined Croghan’s fossil-collecting expeditions.

At Big Bone Lick, Croghan and the Shawnees loaded a flatboat with fossils, including a magnificent tusk seven feet long. But the precious cargo was lost when eighty French Indians (in this case, Mascoutins and Kickapoos from the Great Lakes) attacked the party. Several of the Shawnees were killed, and Croghan survived a bloody hatchet blow to the skull and was captured. But by summer of 1766, Croghan had escaped and set out to gather more fossil ivory tusks on the Ohio, as will be described later.¹³

Besides ivory, however, there was another compelling reason for Abenaki hunters' interest in the strange remains in the marsh, hinted at in the early Huron legend of collecting "magic horns" from monsters. Stories about dreadful monsters would have influenced the men's reaction to the eerie sight of many gigantic skeletons emerging from the foul-smelling mire. Around the time of Longueuil's expedition, Father de Charlevoix, a French missionary in eastern Canada, recorded a fascinating Abenaki legend about the Great Elk, a beast that despite its name sounds decidedly elephantine. (Notably, the Iroquois knew this creature as Big Elk; see chapter 1.) This animal's bulk made other animals seem like ants; it had an extremely tough hide and could stride through eight-foot snowdrifts. And the Great Elk had a peculiar, prehensile "extra arm" extending from its upper body. Did some of Longueuil's marksmen associate the mastodon skeletons they discovered in the Ohio marsh with the legendary Great Elk?

Some scholars have suggested that the mythology of the Abenakis and other tribes may actually preserve ancient memories of living mastodons and mammoths hunted by distant ancestors in the Ice Age. Humans and Pleistocene megafaunas did coexist for many centuries, until the large mammals died out between eight and ten thousand years ago. It has been demonstrated that oral narratives about datable geological events can extend back at least seven thousand years, and perhaps further. The notion that ancestral memories of Pleistocene-Holocene creatures persisted in folklore is a possibility, but it is difficult to prove. On the other hand, stories of such creatures could also have arisen from observations or reports of well-preserved woolly mammoth remains in Arctic ice or in New England bogs. Water monsters with horns constitute a



3. Horned Water Monster and a war canoe; note two large serpents below. Algonquian rock art, Great Lakes. After Conway 1993. Drawing by Peter Faris 2004.

pervasive motif across North American Indian cultures where pre-historic elephant remains occur. The image of a horned water monster may have been a way of explaining mysterious tusked skeletons eroding out of marshes and riverbanks.¹⁴

Abenaki tradition also featured a terrible water monster known as *Meskag-kwedemos* (“swamp creature”). These monsters were said to lie in lakes, rivers, and marshes, posing great danger to canoes (fig. 3). According to Abenaki historical records (beaded mnemonic devices known as *wapapi*), in the early seventeenth century Abenaki guides warned French captains in Quebec to be “respectful” of *Meskag-kwedemos*. Men in canoes “should not make loud noises or fire their muskets without good reason.” War canoes were especially at risk, because “in the bloody days of the wars, the monsters are numerous; there is much to eat.” When fighting the Mohawks, for example, the Abenakis would “take hold of the enemy’s canoes to capsize them . . . so the *Meskag-kwedemos* will rise from the depths to eat them.”¹⁵

When hunters from Quebec encountered the unusual, oversize animal bones and tusks in the Ohio marsh, they may have associated them with water monsters. That would parallel the reports of early French explorers in the Great Lakes region who learned that when Natives discovered massive mastodon bones and tusks in swamps and streambeds, they also identified them as underwater horned monsters. Perhaps the Abenaki hunters believed that the bones and teeth from the swamp carcasses would convince the French that the fearsome Meskag-kwedemos really existed.

Is it possible that an Abenaki narrative about water monsters actually accompanied the fossils to Paris? It's an intriguing thought. Consider how Daubenton came to know the facts of the 1739 discovery. As we have seen, Daubenton stated that the discovery was made by "les Sauvages," and that they were the only ones to see the fossils *in situ*. The description of their discovery came either from Longueuil himself before his death in 1755 or from other Frenchmen on the Chickasaw campaign of 1739—or perhaps (as George Gaylord Simpson suggested) from written notations about the Indian discovery that accompanied the specimens when they were placed in the Cabinet du Roi in 1740. In any of these cases, an oral or written account may well have mentioned an interpretation of the remains offered by original finders. Keep in mind that the Indians spoke some French and Longueuil and his men knew some Algonquian, so they could have conversed about the hunters' remarkable discovery in the salt marsh.

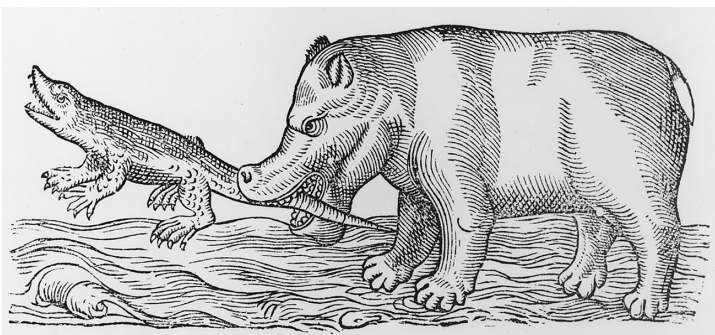
French explorers and scientific thinkers of Daubenton's era (and earlier) were very interested in recording what Native Americans thought about large vertebrate fossils. In 1748, for example, Count Buffon, Daubenton's colleague in Paris, received a letter from a French officer named Fabri who had accompanied Longueuil to New Orleans. Fabri recounted a Louisiana tribe's tradition about monsters based on mastodon fossils. He also told Buffon that similar fossils were known to Natives in Canada, and Fabri remarked that some Indians referred to mastodons as "the grandfather of the buffalo." We know that Fabri (and another Frenchman named du Hamel) also detailed for Daubenton the circumstances of the 1739 discovery on the Ohio. Little is known about Fabri except that he

participated in the campaign from Montreal down the Ohio and on to New Orleans, and he obviously maintained an active interest in Indian fossil lore.¹⁶

If Daubenton knew of Canadian Indian traditions about carnivorous water monsters that suddenly emerged to attack canoes, it would help explain his erroneous conclusion that the giant molars belonged to a *living* species of gigantic carnivorous hippopotamus. He was unfamiliar with mastodon molars, which—unlike flat elephant molars—have sharp points, and in his day, pointed teeth were taken to indicate a carnivore. Mastodon teeth do resemble hippopotamus teeth, so it was logical for the French naturalist to visualize a New World version of the terrible African water monster feared for its attacks on boats.¹⁷

Indeed, in Europe, knowledge of the hippopotamus was “wonderfully vague” until the end of the eighteenth century (the first live hippo was not displayed in Europe until 1850). In Daubenton’s day, the mid-1700s, information about the hippopotamus came primarily from the Bible and from classical Greek sources, which described the animal as a monstrous water beast that overturned boats and killed men, something like the Meskag-kwedemos. In about 1760, a French explorer in the Congo sent a letter to Paris describing an enormous water beast, apparently a hippopotamus, that suddenly surged up to smash boats, and Daubenton would have known Konrad Gesner’s illustration (1563) of a hippo as an aquatic, carnivorous monster attacking a crocodile, and other seventeenth-century engravings of savage Hippo-Behemoths (fig. 4). As late as 1711, Siberian mammoths were confused with the biblical Behemoth, identified by theologians as the hippopotamus.¹⁸

And, since the early 1600s, we know that the Abenakis had warned French captains about very similar water monsters. Such tales filtered back to France, through traders, explorers, and soldiers like Fabri. All these facts suggest that Daubenton may well have been influenced by American Indian lore about dangerous water monsters when he postulated that the great molars belonged to a giant hippopotamus living in the Ohio River. Unfortunately, any written notes once attached to the fossils about the hunters’ discovery have been lost. All we can say for sure is that the hunters decided



4. Hippopotamus attacking a crocodile, woodcut by Konrad Gesner, 1563. Until the mid-nineteenth century, Europeans imagined the hippopotamus as a carnivorous “water monster.” Dover Pictorial Archives.

it was worth the extra work and weight to collect specimens from the three monstrous creatures. They took a tooth from each jawbone and dragged some tusks and one immense thighbone from the bog and loaded them into their canoes.

The Ohio Fossils in Paris

As I delved deeper into this story, I became ever more curious to know what finally happened to those historic fossils. In 1943, George Gaylord Simpson had also wondered whether Longueuil’s specimens might still be in the museum in Paris, but the German occupation of France during World War II made it impossible for him to confirm their whereabouts. In December 2000, more than 250 years after the Ohio fossils were found by Native American hunters, I arrived in Paris hoping to learn the fate of the relics. Would they still be in the old Museum of Natural History?

Walking in the cold rain along the Seine, I turn onto the rue Cuvier and enter the gate of the Jardin des Plantes, the royal botanical gardens founded in 1635. Passing by Cuvier’s house, the site of his study and anatomy laboratory, I remind myself of the arduous odyssey of the specimens. After traveling down the Ohio and Mis-

Mississippi rivers in 1739, and withstanding attacks by the Chickasaws, the fossils arrived in New Orleans, were loaded on a French ship, crossed the Atlantic, and were finally placed in the Cabinet du Roi, in the Jardin des Plantes. Between 1740 and 1861, the fossils had been stored in at least three different buildings. I knew that the femur and two of the three teeth (but not the ivory tusks) had somehow survived the upheavals of the French Revolution (1789), because Cuvier had mentioned their existence in 1834. But after that the fossils seem to have dropped out of sight.

Paleontologists had advised me that the Paris museum's dust-laden collections were disorganized, last cataloged in 1861. To find a particular specimen would require luck; it would also require the help of some individual in the laboratory who happened to have studied that particular fossil and might remember its location in the museum's vast holdings. I had arranged to meet Pascal Tassy, curator of vertebrate fossils in the Museum of Natural History, at his office on the rue Buffon. The lanky paleontologist hears my request with delighted surprise. By an amazing coincidence, he says that he himself unearthed the two Longueuil specimens from deep in the museum that very week. Tassy was comparing the teeth with other mastodon teeth from America, in an attempt to find the lost third tooth from Longueuil's expedition. *Voilà!*—there are the two big molars on his old oaken desk, amid a jumble of other American mastodon teeth, including one sent to Cuvier by Benjamin Franklin (fig. 5).

Tassy places one of the molars in my hands. I turn the heavy, burnished tooth over in my palms and read Daubenton's inscription in faded black ink: *b. de Longueuil 1739*. We marvel over the fact that we are holding the very same molars wrested from the stony jaws of marsh monsters so long ago in America. "What a story these relics must hold," Tassy reflects. He confides that he hopes someday to visit Big Bone Lick in Kentucky, "the place where American paleontology *and* bourbon were invented." Then he confides another secret. The huge femur that was discovered by the Indians is prominently displayed here in the museum. But few people know it, says Tassy, because the label is wrong.



5. Pascal Tassy, curator of vertebrate paleontology, National Museum of Natural History, Paris, holding one of the mastodon molars discovered by the Indian hunters in Longueuil's army near Big Bone Lick on the Ohio River, 1739. Photo: Adrienne Mayor.

Sure enough, at the top of the curving wrought-iron staircase, two great mastodon femurs from the New World have guarded the entrance to the Paleontological Gallery since about 1865. Held upright by iron bands, the South American bone on the left is labeled as a gift to Cuvier from the great naturalist Baron Alexander von Humboldt. The North American mastodon femur on the right is labeled "Gift of Thomas Jefferson" (fig. 6).

Going through the museum archives, however, Tassy was surprised to find that Thomas Jefferson had never shipped a mastodon



6. The fossil mastodon femur discovered in 1739 by Indian hunters on the Ohio River, now at the entrance to the National Museum of Natural History, Paris. Courtesy of Pascal Tassy, *Geodiversitas* 24 (2002).

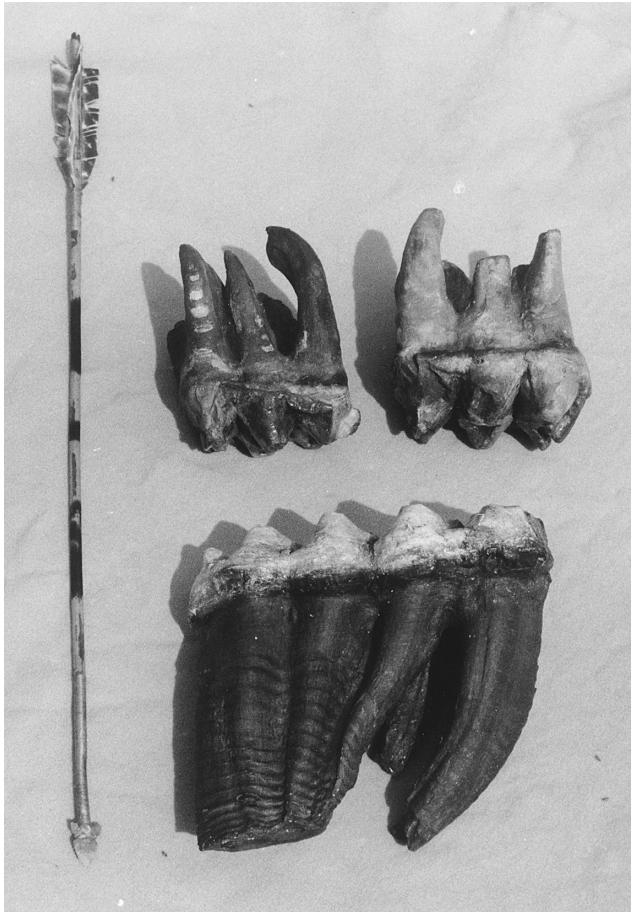
femur to Paris. Jefferson, America's third president and a paleontological scholar, did collect many fossils from Ohio, Kentucky, and Virginia, and he sent several important specimens to Cuvier in Paris. But that was half a century *after* Longueuil's expedition, after Big Bone Lick had become famous.

Mystified, Tassy dug further and learned that an American scholar studying Jefferson's papers in Paris, Howard Rice, had uncovered the mistake in 1951. By comparing the meticulous records kept by Jefferson of the specimens he sent and Cuvier's record of fossils received, he established that the great thighbone long thought to have been donated by Jefferson exactly matches

Daubenton's detailed drawing of the femur brought to Paris by Longueuil in 1740. It was a natural mistake for later curators to assume that the venerable pair of American fossils must have been donated by the two most celebrated scientific friends of Cuvier, Baron von Humboldt and President Jefferson. There is no doubt, however, that this femur is the very same one found by Abenaki hunters in the marsh in 1739. In 2001, the labels were corrected.¹⁹

In summer of 2002, a bulky package from Paris was delivered to me in Bozeman, Montana. Inside were realistically painted casts of the two great molars discovered by the hunters, the specimens that Tassy had shown me. But there was a third colossal molar, twice the size of the others (fig. 7). It turned out that Tassy had solved the case of the missing third tooth, lost for two centuries in the bowels of the Paris museum. By comparing the original 1756 drawing of the three molars with all the other mastodon teeth from America that I had seen spread out across his desk that day in 2000, Tassy was able to identify the lost molar. The third molar had been mislabeled sometime after Cuvier's statement of 1834, identified as a gift to Buffon from the British naturalist Peter Collinson, an avid collector of American mastodon fossils. At last, all of the relics collected by the Abenaki huntsmen have been accounted for, except for the ivory tusks, which were probably looted during the French Revolution.²⁰

"The Indian hunters knew that these bones and teeth were strange and important," remarked Tassy that day in Paris. "Accordingly, all the early French scientists who studied these fossils credited the American Indians with the discovery." How many other Indians had observed mastodon or dinosaur fossils in America, mused Tassy, and what stories did they tell? It was a paleontologist's question that only a folklorist could answer. Tassy's curiosity spurred me to search for evidence that the remarkable mastodon remains of the Ohio Valley had captured the attention of other Native American groups who traveled in the area. The earliest oral legend told by northern tribes about the Ohio fossils was written down twenty-seven years after the Abenaki discovery of 1739, by a trader named George Morgan.



7. The three mastodon molars discovered by the Indians who accompanied Longueuil down the Ohio River in 1739, now in Paris. Arrow = twenty-four inches long. Casts created by the Laboratoire de Paleontologie, Muséum National d'Histoire Naturelle, Paris. Photo: Adrienne Mayor.

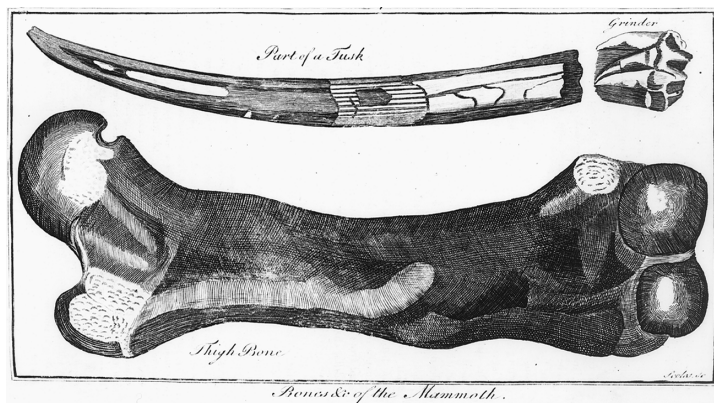
IROQUOIS AND WYANDOT KNOWLEDGE OF BIG BONE LICK

In 1766, George Morgan accompanied the indomitable Irish trader George Croghan on his return to the salt licks on the Ohio, a year after the boatload of fossils and ivory had been sunk during the Indian attack described above. Morgan, age twenty-three, was the junior partner of a trading company in Philadelphia. (Later, during the Revolutionary War era, Morgan won the trust of the Indians by his passionate defense of their territorial claims, as George Washington's Indian agent for the Continental Congress, and helped to instill the Founding Fathers' admiration of Indian democracies.)

In 1766, Croghan's party discovered the remains of at least thirty mastodon skeletons at the edge of a swamp. Morgan personally packed a large box full of mud-encrusted bones, including a femur, a very large tusk, and huge jawbones with molars (fig. 8). But Morgan also collected one of the oldest recorded Indian traditions about the Ohio fossils. By this time, George Croghan had become a celebrity whose exploits were narrated in the newspapers along with reports about Big Bone Lick, and Morgan was equally famous. Remarkably, however, modern historians of Big Bone Lick are unaware of Morgan's account—which was published in London and New York in 1795–96 by William Winterbotham, cited in 1803 by Rembrandt Peale, and reprinted in America by Henry Mercer in 1885.²¹

Morgan recalled his trip to Big Bone Lick in correspondence to a Mr. Morse (probably Jedidiah Morse, the “father of American geography,” a scholar sympathetic to Indian causes). Morgan remarked that he and other traders in the Colonies had already seen many large molars from the Ohio Valley, which had been collected by various Indian war parties. When Croghan and Morgan arrived at the salt licks in 1766, they traded with several Iroquois war parties who were on their way “to fight the southern Indians.”

From earliest times, the Iroquois of the area around Lake Ontario and New York State routinely traveled down the Ohio River on their way to make war in the deep South. The powerful Six Nations of the Iroquois Confederacy (Seneca, Cayuga, Mohawk,



8. Mastodon tusk, tooth, and femur, collected by George Morgan in 1766, at the time of his conversation with the Iroquois-Wyandot chief at Big Bone Lick. Engraving published in Winterbotham 1795.

Oneida, Onondaga, and, after the early 1700s, Tuscarora) had controlled the Ohio Valley for centuries—even before Columbus, according to Iroquois historians. The Iroquois had turned against their Huron neighbors in Canada in the early 1500s, and in the 1600s they had nearly wiped them out. By about 1700, the Huron survivors left Canada for Ohio, where they became known as Wyandots. Subsequently, the Iroquois made peace with the Wyandots and included their “little brothers” in raids against southern enemies, such as the Cherokees and Chickasaws.²²

At Big Bone Lick, Morgan and Croghan met a large party of Iroquois and Wyandot warriors traveling south to fight the Chickasaws. The head chief was a very old man of about eighty-four, wrote Morgan. “I fixed on this venerable chief as a person from whom some knowledge might be obtained.” After presenting him with tobacco, paint, and ammunition, Morgan, with careful courtesy, asked the old man what his people knew of the immense skeletons in the marsh. Croghan, who spoke Iroquois, may have translated, as Morgan wrote down the story. “Whilst I was yet a boy,” began the old chief, “I passed this road several times, to war against the Catawbias.”

Morgan failed to record the old chief's name or tribe. The Iroquois and Catawbas of South Carolina had engaged in fierce warfare between 1650 and 1760, and the Huron-Wyandots fought Catawbas until a treaty was made in 1729. So the chief may have been a Wyandot who had fought Catawbas as a boy, or he may have been an Iroquois. In treaty archives and the diaries of Croghan, Gist, and George Washington, I found the names of several Iroquois chiefs who conversed with British colonists in the period 1740–60. For example, the Onondaga orator Canassatego attended a council in Philadelphia in 1742, and the Seneca chief Canagaat came from his “castle” on the Allegheny to deliver speeches at Fort Pitt in 1759 and 1761. The Iroquois chiefs Iononerissa and Cosswertenicea had dealt with Croghan in the Ohio Valley in 1749, as did Tanacharisson and Monacatoocha, who also met with George Washington on the Ohio River in 1754 (Washington himself collected fossils at Big Bone Lick). One of these men may have been the old chief who spoke with Morgan in 1766. Monacatoocha would be a good candidate: in 1754 Washington had recorded his speech castigating white intruders and “Disturbers in this Land [which] is our Land, and not yours, [given to us] by the Great Being Above.”²³ Similar sentiments are prominent in the old chief's fossil story of 1766, which continued as follows:

The wise old chiefs, among whom was my grandfather, then gave me the tradition, handed down to us, respecting these bones. After the Great Spirit first formed the world, he made the birds and beasts which now inhabit it. He also made man, but having formed him very white, and imperfect, and ill-tempered, he placed him on one side of it [the world], where he now inhabits, and from whence he has lately found a passage across the great water, to be a plague to us.

As the Great Spirit was not pleased with his work, he took of black clay and made what *you* call a negro, with a woolly head. This black man was much better than the white man, but still he did not answer the wish of the Great Spirit. . . . At last, the Great Spirit having procured a piece of pure, fine red clay, formed from it the Red Man, perfectly to his mind, and he was well pleased with him, that he

placed him on this great island, separate from the white and black man, and gave his rules for conduct, promising happiness in proportion as they should be observed.

At last the old man turned to the fossils. The red man “was perfectly happy for ages, but foolish young people, at length forgetting his rules, became exceedingly ill-tempered and wicked.” Therefore, “the Great Spirit created the Great Buffalo, the bones of which you now see before us. These made war upon the human species alone, and destroyed all but a few, who repented and promised the Great Spirit to live according to his laws if he would restrain the devouring enemy. Whereupon he sent lightning and thunder, and destroyed the whole race [of giant bison] in this spot.” But a pair of these great bison, male and female, “he shut up in yonder mountain, ready to let loose again should the occasion require.”

The Creator relented and destroyed the giant bison before they completely wiped out the Indians. With the aid of scholar Barbara Mann’s insights about Iroquois beliefs, we can imagine that the *original* Iroquois and Wyandot tale was a story of restoring harmony and balance in nature. Instead of totally destroying dangerous earth-water monsters, sky spirits “neutralized” them with lightning and buried them in the earth, where they remain “dormant.”²⁴

The introductory part of the chief’s story about the geographic distribution of three human races was obviously recent oratory, intended for European ears. The chronology of creation progressing from imperfect white men to black men and culminating in morally advanced red men veers from older, traditional Iroquois belief that Natives were created before Europeans. References to race were common in Indians’ speeches to whites at this time, and the chief’s criticism of Europeans was meant to support Native claims to the god-given lands being stolen by the encroaching settlers. The chief viewed the ancient bones as markers of territorial rights, as physical memorials of the sky spirit’s intention to make the land safe for Indian ancestors. The concept that fossil legends could serve as historical “deeds” to land to contest Euro-American appropriations was suggested to me by Paul Apodaca, a Navajo-Mixtec scholar of Native American mythology. It is a theme that recurs as we travel

across the New World, and it also figures in modern disputes over fossil ownership.²⁵

The rest of the chief's tale, about the giant buffalo, had probably circulated for at least three generations. If the chief in his eighties had heard the story as a boy from his grandfather, that means the story explaining the great bones was already being told by about 1690—a generation before Longueuil's expedition. The Iroquois, and later the Wyandots, on the warpath against the Cherokees and Catawbas followed the old Iroquois Trail south (the same route taken by the Canadian Indians who canoed with Longueuil down the Allegheny and Ohio rivers in 1739). As Iroquois and Wyandot warriors of the Northeast traveled back and forth to raid in the South, they became aware of the masses of oversize animal skeletons submerged along the Ohio.

The obvious antiquity of the tradition recorded by Morgan led me to search for further evidence to indicate just how long ago the Iroquois and Wyandots from the North had first discovered the big bones in the Ohio marshes.

Giant Bison and Witch Buffalo

It was thanks to the long-standing French fascination with Native American fossil lore that I began to recover the evidence I was seeking. During my visit with Pascal Tassy and other paleontologists in the Paris Museum of Natural History, Madame Françoise Ozanne, the elderly librarian of the French Geological Society, took an interest in my project. She showed me “Les Légendes des Iroquois,” an article penned in an ornate style in 1885 by the Marquis de Nadaillac. He included a French translation of a curious tale about pygmies killing gigantic buffalo at a salt lick, a tale that had been translated from Iroquois into English only a few years earlier. I would eventually discover that this story was a real fossil legend, probably dating to the 1500s.

Back in the United States, I consulted the original report to the U.S. Bureau of Ethnography cited by Nadaillac. There I read the story, “The Warrior Saved by Pigmies,” told by an unnamed Iro-

quois storyteller in his or her native tongue to Mrs. Erminnie Smith, an ethnologist-linguist born in 1836. Smith lived many years with the Iroquois, spoke their language, and was adopted into the Tuscarora nation. But neither Erminnie Smith nor the Marquis de Nadaillac had any idea that they were translating an account of an early Iroquois encounter with the Ohio fossils. Nadaillac noted elsewhere that the Iroquois credited thunder spirits with the destruction of giants, and suggested that chance discoveries of huge bones and teeth of pachyderms of Tertiary and Quaternary times must have confirmed such legends for the Iroquois, but in this case somehow he failed to connect the striking story about enormous bison remains to fossils. In 1914, the British mythologist Lewis Spence retold the same tale—his version was illustrated with a romantic painting of the pygmies—but he too missed the story's paleontological meaning. Like Nadaillac and Smith before him, Spence focused on the supernatural pygmies in the story. But for a folklorist searching for fossil legends, the story's geographic and historical significance stands out. It remained to discern how old the tale really was.²⁶

The tale begins, "It was customary for the Iroquois tribes to make raids upon the Cherokees while the latter inhabited the swamps of Florida." That was an important clue—I asked Barbara Mann what time period was signified by this phrase. The storyteller had used the old Spanish designation "La Florida," which meant the entire Southeast, from Carolina to Florida to the Mississippi River. This indicated that the story had been told during the Spanish colonial era. Other clues to the tale's age lay in the enmity between Cherokees and Iroquois. According to Mann, the Iroquois had driven the Cherokees south from the Ohio Valley in about A.D. 500, and according to the Iroquois historian David Cusick (writing in 1825), the Iroquois were already battling the Cherokees in the Southeast by the time of Columbus, although many modern historians conservatively date the hostilities to the late 1500s. Notably, the English colonist John Smith met an Iroquois war party in Virginia in 1608.²⁷

The Iroquois were adventurous long-distance explorers, bringing back reports of strange sights and exotic folklore, including

fossil lore. For the Iroquois, a journey from upstate New York to the southern Alleghenies “was regarded as a mere excursion or scouting trip,” and journeys of thousands of miles were ordinary for them. They routinely brought back captives from distant locales, Shawnees and Cherokees, who were adopted into the Iroquois nations. Some captives became storytellers, integrating their own traditions with those of their new tribe. In this way, the Iroquois probably heard Shawnee ideas about Big Bone Lick and perhaps learned that the Cherokees called the Ohio Valley “the Land of Horned Water Monsters,” or *Ukténa*, who were the enemies of the Thunder Birds (*Tlanuhwa*) of the Tennessee River.²⁸

Still tracking the date of the tale of the pygmies and giant bison, I searched out other tales of early Iroquois explorers. In Native cultures, scouts and explorers were trusted reporters and often became storytellers, or repositories of oral traditions. According to David Cusick, his tribe’s oral histories stated that some centuries before Columbus the Iroquois had sent an expedition party of fifteen men and two chiefs to explore west of the Mississippi River. Just before reaching the Rocky Mountains, however, they encountered “a giant” and turned back. After many years, the explorers returned home with amazing tales of the strange people and animals of the West. Around the same time, wrote Cusick, the first Iroquois war party crossed the Ohio River and camped on the bank on the Kentucky side, where a monstrous “furious Lizard” killed all the warriors except for one, who killed the monster and survived to tell the tale. Although there is no mention of unusual skeletal remains in these two ancient accounts in Iroquois oral history, it’s tempting to speculate that the giant and the monster lizard might have reflected attempts to describe some extraordinary fossils in the Badlands and the Ohio Valley, respectively. At least, I was beginning to fill in the cultural and chronological background of Erminnie Smith’s story of pygmies and giant bison.²⁹

According to that tale, after more than two years of fighting Cherokees in the “Southern country,” a party of Iroquois warriors was returning home. When one of the men fell deathly ill, the group abandoned him on a river south of the Allegheny Mountains, the Ohio. On their arrival back in their village, the men claimed

that their companion had died in battle. But the warrior eventually recovered and made his way home, where he told this story: One night, near death and lying by the river, the warrior had a vision in which three pygmies or Little People arrived by canoe. The Little People told him that they were on their way to a nearby salt lick where there were “many strange animals.” They planned to ambush these giant beasts as they emerged from the earth. The sick warrior watched as a huge male and two female animals “arose out of the lick” and the Little People killed them with arrows.

The Little People cared for the warrior until he was well, and escorted him back to his village. After he told his tale, the men who had abandoned him were punished. But the warrior’s compelling description of gigantic “buffalo” rising from the murky salt marsh caused the Iroquois to develop a “strong desire to see the lick.” Accordingly, a large party of Iroquois was organized—not for war, but to rediscover the bone bed. The Iroquois “searched for it and found it surrounded with the bones of various large animals killed by the pygmies.”

The hallucinatory vision of giant buffalo emerging from the swamp could be interpreted as the delirious warrior’s efforts to make sense of the sight of large, ghostly animal skeletons partly submerged in a swamp of the Ohio River. His feverish condition, brought on by illness, was like a vision quest, in which dreams of the past or future are sought through fasting. The idea of special, sacred animals hidden in the ground is a widespread Amerindian motif, and the theme of a warrior abandoned by companions frames many other vision-quest stories; for example, a Wyandot story about a warrior’s discovery of the Thunder Beings begins with a similar abandonment. To his observation of the real but mystifying natural phenomenon of remarkable bones, the warrior added some familiar elements from Iroquoian mythology. The Little People (translated by Smith as “pygmies”) were small folk of supernatural strength, legendary protectors of isolated people and hunters, and they had helped the early Iroquois by slaying monsters, serpents, and other dangerous, primeval creatures.

The Wyandots also had a legend about Big Bone Lick, collected by an ethnologist in 1850–90. In the Wyandot story, the bones

were identified as those of Witch Buffaloes, immense female bison as high as trees with horns extending straight out from their foreheads as long as a man is tall. Long ago, these Witch Buffaloes ruled the “great and ancient spring” of pure water at Big Bone Lick, and so dominated the spring that other, smaller game animals were forced out. The Wyandots could no longer hunt or gather salt there, until the Little People wiped out the Witch Buffaloes, leaving the vast heaps of big bones at the spring. Then, as the pure spring shrank in size over the ages, it came to be called *Oh-tseh-yooh-mah*, “Spring of Bitter Water.”

The Wyandot tale accounts for both the salty water and the masses of bones at Big Bone Lick. Notably, among the Pleistocene fossil remains of the Ohio River are the skulls of extinct, giant bison with straight horns that span six feet, and these were apparently recognized by Wyandots, Iroquois, and other early Indian observers as much larger relatives of living buffalo.

A crucial aspect of the Iroquois fossil legend preserved by Erminie Smith is that the warrior’s discovery of strange remains in a faraway land inspired his tribe to organize an expedition to investigate the big bone site. According to Barbara Mann, bones and parts of animals, including fossils, were considered powerful “earth medicine.” Noting that the Iroquois often went on “pilgrimages to such spiritual spots and bone heaps,” Mann suggests that the Iroquois in the tale intended to gather some of the bones of the giant game from the deep past to use as hunting medicine. And, indeed, among the Wyandots, too, there are old traditions about going out to collect the “calcified bones of destroyed monsters” to make hunting amulets, described by a Wyandot elder in 1912.³⁰

The story of the Iroquois warrior at Big Bone Lick is the first of many examples described in this book of active verification of paleontological finds undertaken by various Native nations. These widespread examples counter George Gaylord Simpson’s assertion that Indian discoveries were always accidental, never purposeful, that they were casual finds without sequel, and that they never resulted in “permanent record or continuous development.”³¹ The reports and investigations by the Iroquois and others were not scientific in the modern sense, of course, but there is something akin

to scientific inquiry in these activities. Scouts and explorers were expected to bring back accurate, verifiable reports of their observations. Deliberate efforts were made to authenticate empirical evidence: witnesses seeking reproducible results traveled to view the firsthand reports of big bone sites. The authentication led to narrative theories explaining the giant bones, which were recognized not only as organic remains but also as related to smaller, living species. These explanations were then integrated into oral histories and maintained over centuries in an oral culture, satisfying Simpson's requirement of "permanent record and continuous development."

Some significant details of the original Iroquois and Wyandot stories were almost certainly lost or mangled in translations, and Morgan's translated tale of 1766 has strong biblical overtones. One longs to know the chief's exact words without the eighteenth-century European filter. As many Native American scholars have pointed out in conversations with me about the fossil legends gathered here, European concepts such as "Great Spirit" or "Creator" ring false in original Indian cosmology. The traditional view of the cosmos was based on the maintenance of a precarious balance among earth, water, and sky powers, so that no one force "runs amok," explains Barbara Mann. Sky, earth, and water powers (often represented by large birds, giant buffalo, and various land and water monsters) were in eternal and sometimes violent tension but could never totally destroy each other.

Applying Mann's insights, one realizes that many fossil tales concerned restoring natural harmony and balance. Rather than eliminating all of the earth-water monsters, sky spirits struck them with lightning and buried them in the earth, where they continue to exist in a kind of mystical suspended animation.³²

In many oral fossil legends recorded by Europeans, distortions and misinterpretations can make it difficult to untangle what the Native speakers really intended to say. Yet it seems well worth the effort to try to understand these extremely rare written records of ancient oral traditions. The Iroquois account of the giant bison bones in the Ohio Valley probably dates back to the 1500s, the era when most historians believe that the Iroquois-Cherokee conflicts began, calling into question Simpson's argument that most Indian

(continued...)

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