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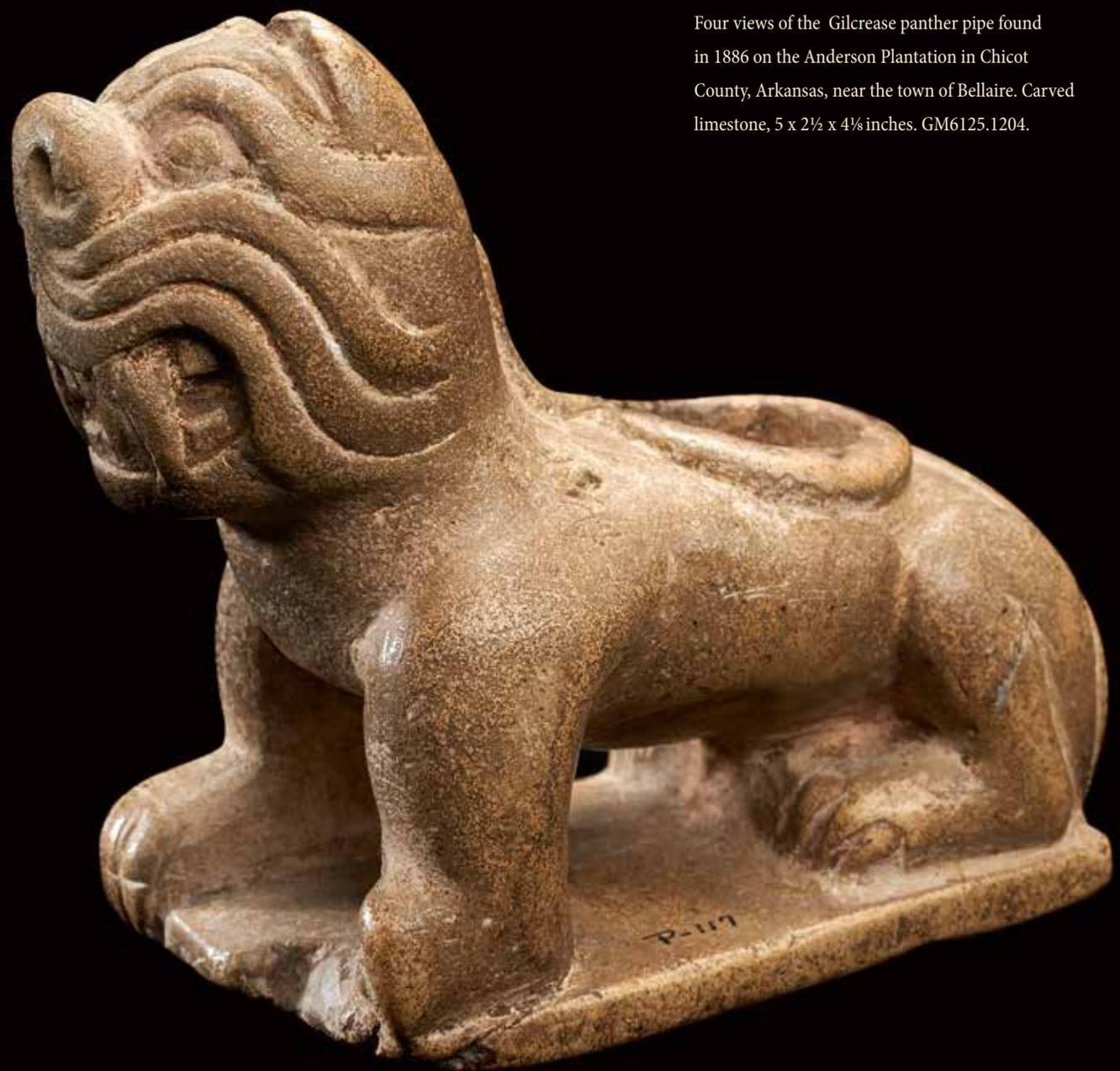
The Mississippian people who lived in the American South during the centuries prior to European contact (ca. AD 1000–1600) produced an extraordinary corpus of art, much of it comprising representations of supernatural beings. Some of these beings took human shape; others took the form of animals—often snakes, cats, birds of prey (raptors), or composite beings that combined the characteristics of all three. Many of these beings are recognizable to us as the principal actors in traditional stories that were told by Indian people throughout the Eastern Woodlands and Great Plains, and are still told by tribal elders today.

Among the finest examples of the genre are two effigy pipes in the Gilcrease Museum’s collection, which were obtained in the 1960s from Judge Harry Lemley of Hope, Arkansas. One depicts a raptor holding a human head and the other a crouching feline with its teeth bared. Both are made from limestone, clearly the work of master carvers. And both are examples of the so-called Bellaire style, which is native to the lower Mississippi Valley, and dates ca. AD 1100–1500 (Steponaitis et al. 2009; cf. Brain and Phillips 1996: 384–386). Pipes of this kind were used to smoke tobacco, probably *Nicotiana rustica*, a powerful hallucinogen known to Native peoples throughout the Americas. The rarity of such pipes and their extraordinary workmanship suggest they were not everyday objects. Rather, we believe they were employed in ceremonies by priests or healers, who knew how to elicit their spiritual power.

In line with this issue’s theme of “Meaning in Materials,” here we show how a detailed examination of the pipes’ raw materials yields clues as to where the limestones were obtained, which in turn allows us to reconstruct the directions and distances over which these materials and the finished pipes moved. Each of the Gilcrease pipes tells a different story. The raptor pipe was carved in the lower Mississippi Valley from a local limestone. The panther pipe, on the other hand, was probably carved in the same region but from rock obtained at a distant source. Once finished, both pipes were carried to places far from where they were made. Clearly each of these objects had a complex and distinctive “life history” which can be reconstructed archaeologically, at least in part. But before we explain in more detail how these histories were deduced, we must first provide some background on the artistic tradition to which these pipes belong and the methods we used to determine their geological sources.

AS MORE AND MORE EXAMPLES OF MISSISSIPPIAN ART CAME INTO VIEW in the late nineteenth and early twentieth centuries, archaeologists were struck by the remarkable similarity these objects showed over long distances. For example, decorated copper plates found in eastern Oklahoma were virtually identical to coppers found in Tennessee, Alabama, Georgia, and Florida. At first, archaeologists interpreted these similarities as the manifestation of a unitary art style—the so-called “Southeastern Ceremonial Complex”—that spanned the American South after AD 1000 (Waring

Four views of the Gilcrease panther pipe found in 1886 on the Anderson Plantation in Chicot County, Arkansas, near the town of Bellaire. Carved limestone, 5 x 2½ x 4⅞ inches. GM6125.1204.





The Gilcrease raptor pipe found in 1917 on the Esperanza Plantation in Issaquena County, Mississippi, just south of the community of Glen Allan. Carved limestone, 7 x 3³/₁₆ x 4⁷/₈ inches. GM6125.1206.

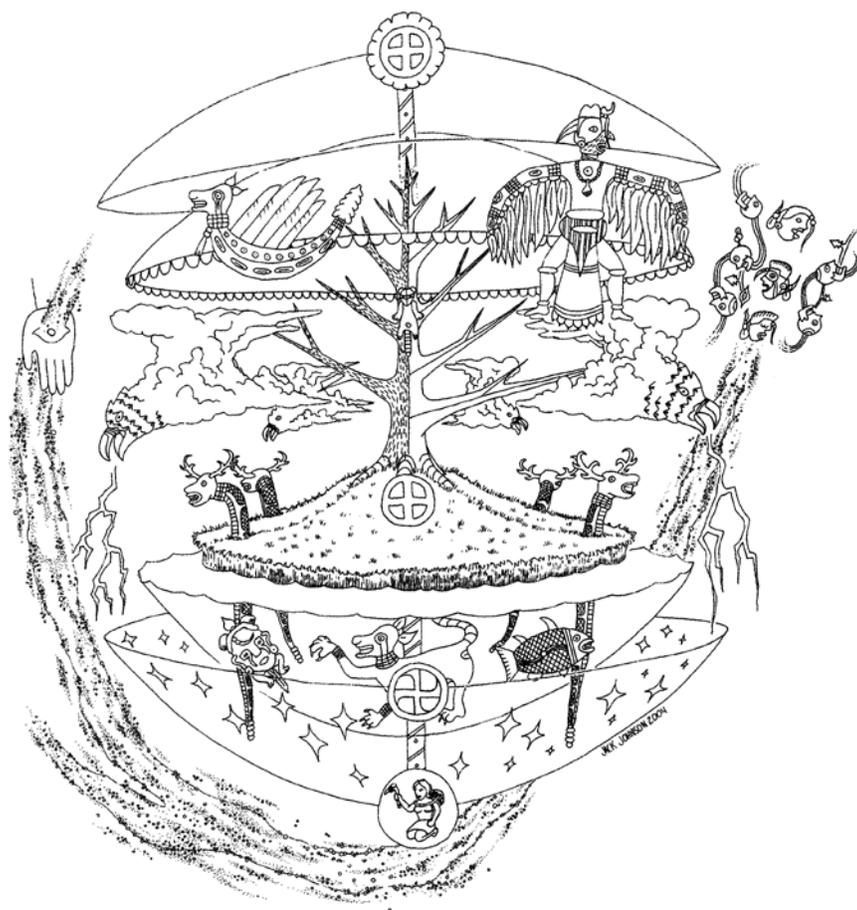
and Holder 1945). Over the past two decades, however, this view has gradually been supplanted by a more complicated picture, one that portrays Mississippian art in terms of many distinct regional styles which interacted and changed over time (Brown 2004; Knight 2006; Lankford et al. 2011). We now know that the appearance of unity was caused by two factors: (1) a widespread substrate of shared beliefs about the cosmos and the supernatural beings who inhabited it; and (2) the movement of religious objects between regions, a result of either trade or religious pilgrimages, or both.

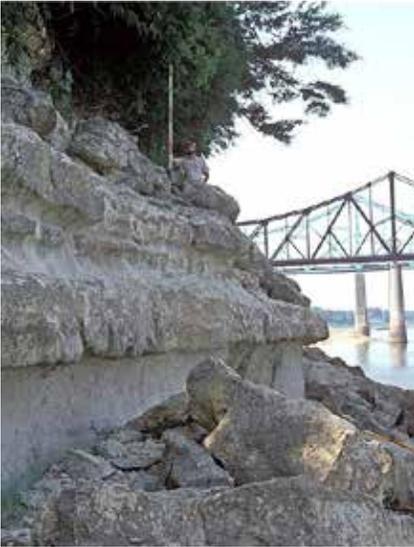
Mississippian people, together with Indian people throughout the Americas, saw the cosmos as consisting of three layers (Lankford 2004, 2007a; Reilly 2004). The Middle World, the one that humans inhabited, was often described as a disk of earth floating on water. Below this layer was the Beneath World, a watery realm entered through caves, rivers, and pools, which was inhabited by powerful supernaturals. These beings had the attributes of cats and snakes, often in combination. We call the feline version of this creature the Underwater Panther, and the ophidian version the Great Serpent (Lankford 2007b). These were not separate beings, but rather the two different manifestations of the same supernatural power—in much the same way as a single species of bird may have different plumages or morphs. And finally, over the Middle World was a third layer called the Above World. This layer comprised the celestial vault, which was realm of supernatural birds called Thunderers. As their name implies, Thunderers were associated with weather events, such as lightning, storms, and winds. They were seen as mortal enemies of the Underwater Panther or Great Serpent, and many stories were told about battles that took place between them.

This common substrate of belief accounts for many of the thematic similarities in Mississippian art, by which we mean the similarities in subject matter (Knight 2012). That is why Mississippian artists so often depicted beings that looked like snakes, cats, and birds—albeit in different regional styles.

In addition to thematic similarities, we also often see stylistic similarities in the way a given theme is depicted at widely separated sites across the South. We now know that such stylistic similarities resulted from the long-distance movement of individual objects—in other words, objects made in a particular style local to one region were transported, sometimes over great distances, to other parts of the Mississippian World. In some cases, this movement may have been the result of gift-giving or barter. In others, particularly with powerful spiritual objects that were kept in bundles, the mechanisms of

A modern representation of the Mississippian cosmos, showing the three layers and the beings that inhabit them (after Reilly 2004: Figure 2). Drawing by Jack Johnson, courtesy of F. Kent Reilly III.





Glendon limestone outcrops near Vicksburg, Mississippi. Top: Left bank of the Mississippi River, upstream from the I-20 bridge. Bottom: Ravine in Vicksburg National Military Park.

movement would have been different. Such movements may have involved pilgrimages to distant towns, where the travelers apprenticed themselves to noted religious practitioners and eventually returned with both the bundled objects and the knowledge needed to use them properly (Steponaitis et al. 2011).

These long-distance movements not only created the illusion of widespread stylistic uniformity, but also spawned an archaeological puzzle which we nowadays try to untangle. Typically, the corpus of art one finds in a specific site or region is a mixture of items that were made locally and others that were made in distant locales and imported. To complicate matters further, some of the things crafted locally might also have been made of raw materials from distant sources. Sorting out these possibilities requires not only being able to recognize the hallmarks of various regional styles, but also being able to “fingerprint” the raw materials in order to determine their geological sources.

Often, this fingerprinting is done by looking at the chemical or mineralogical composition of the object so it can be traced to specific geological outcrops. But this type of analysis sometimes requires cutting or drilling into the object to obtain an appropriate sample—not ideal for unique works of art. For such objects, nondestructive methods of analysis are always preferable.

In recent years, the two of us have teamed up to study Mississippian effigy pipes with the goal of sourcing the ones made of limestone. One of us (Steponaitis) is an archaeologist who knows the pipes and their styles, and the other (Dockery) is a geologist who knows the rocks. Our method is simple and completely nondestructive: the limestones from which the pipes were made contain fossils, which can readily be seen in the pipe’s surface. These fossils allow us to narrow down the possible sources from which the rock was obtained, and sometimes to identify a particular geological formation as the place of origin.

We applied this technique to a sample of eighteen limestone effigy pipes, mostly of the Bellaire style, from archaeological sites in Arkansas, Louisiana, Mississippi, and Alabama (Steponaitis and Dockery 2011). Based on the visible fossils, all but one of these pipes turned out to be made of the same material: the Glendon limestone, a formation that outcrops most visibly near Vicksburg, Mississippi. Massive outcrops of this rock occur at the base of the bluffs on which this city is built. They can be found just above the water line where the Mississippi River cuts into the bluffs, and in secluded ravines along the bluff edge, where ledges of this rock create sparkling waterfalls. We further noted that the geographical distribution of the Bellaire pipes was centered near Vicksburg, and that the decorations that sometimes appeared on these pipes mirrored those on the local pottery. Together, these lines of evidence strongly support the conclusion that Bellaire-style pipes were made in the lower Mississippi Valley, probably near Vicksburg, and from there were distributed more widely.

The two Bellaire-style pipes at the Gilcrease were not included in our original study. So when this museum’s staff invited us to visit Tulsa and look at their collections, we jumped at the chance. The question on our minds was simple: Of what rock were these two pipes made? Based on prior experience, we expected the answer to be Glendon limestone. But until we actually examined the pipes, we couldn’t be sure. Let us now describe each pipe in turn and discuss what we learned.



The geographical distribution of limestone pipes carved in the Bellaire style. The vast majority are made of Glendon limestone, which outcrops near Vicksburg, Mississippi. Locations where the Gilcrease pipes were found are shown in red.

A comparison of raptor pipes carved in different styles. The top pipe belongs to the Bellaire style; note that the beak is open and the flight feathers are notched, ridged, and horizontal. The bottom pipe is carved in a different style, characteristic of the Caddo area west of the Mississippi; note the closed beak and the flight feathers made of simple, oblique incisions. Top, the Gilcrease raptor pipe; bottom, a pipe from Spiro Mounds, Le Flore County, Oklahoma, GM6125.18912.

THE RAPTOR PIPE was found in 1917 on the Esperanza Plantation in Issaquena County, Mississippi, about thirty miles south of the city of Greenville.¹ It depicts a raptor clutching a forward-facing human head in its talons. The upper part of the beak appears to have broken and been repaired in antiquity by re-shaping and smoothing the remaining portion; hence its unusually short length. Certain details of the carving clearly link it to other Bellaire pipes: the open beak with protruding tongue, the forked eye surround, the tufted head, and—most distinctively—the notched flight feathers with incised decoration. Many other pipes depicting a similar “bird over man” theme are known from sites in western Arkansas and eastern Oklahoma, but the beak is not open and the feathers are rendered in a very different way, indicating a different regional style (for examples see Brown 1996:2: 513, Fig. 2.93b-c).

Thematically, the raptor in this pipe may be a Thunderer, or it may be a version of the Great Eagle who, in Seminole and Alabama stories, served in judgement on human souls along the celestial path taken by the dead (Lankford 2011). The meaning of the human head is not clear. A reasonable guess is this pipe and its thematic cousins to the west allude to a story—widely known in ancient times but nowadays lost (or at least unknown to anthropologists)—that involved a celestial raptor and a human or human-like being. Beyond that little

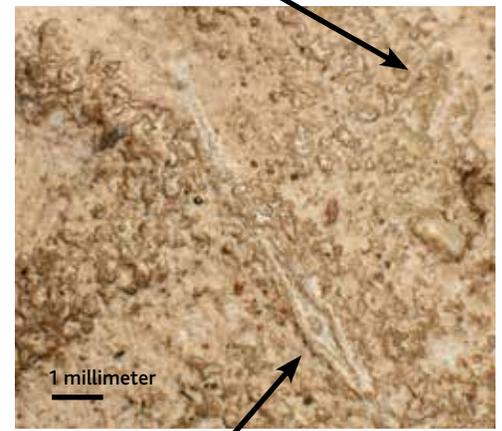
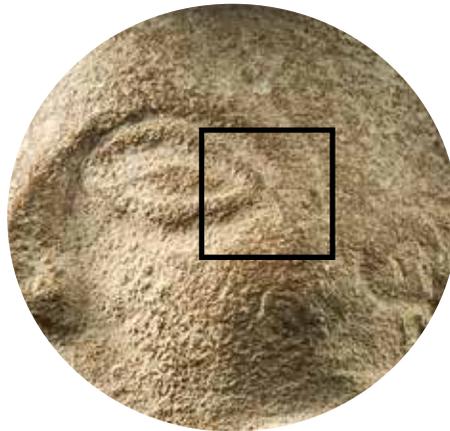




A young sand dollar, *Clypeaster rogersi*, visible among the feathers of the Gilcrease raptor pipe.



Fossils in the eye area of the human head of the Gilcrease raptor pipe.



Clypeaster rogersi, a sand dollar.

Lepidocyclina supera, a Foraminifera species distinctive of the Glendon limestone.

more can be said. A detailed examination of the pipe's surface reveals two distinctive fossils: *Lepidocyclina supera* and *Clypeaster rogersi*. The former is a large Foraminifera, a one-celled amoeba-like creature with a calcareous shell that lived in an ancient sea. The latter species is a sand dollar, a member of the phylum Echinodermata. Both of these creatures date to the Lower Oligocene Epoch, around 30 million years ago. Their fossils are common in the Vicksburg Group of the Gulf Coastal Plain, but *Lepidocyclina supera* is restricted to the Glendon limestone and overlying Byram Formation. The latter formation contains no rocks like that in the pipe, so the Glendon limestone is the only possible source.

In sum, the Gilcrease raptor fit our expectations. Both the style of the pipe and its raw material were local to the lower Mississippi Valley. It was found some fifty miles north of the Glendon outcrops, several days' travel upriver by canoe.

THE PANTHER PIPE was found in 1886 on the Anderson Plantation in Chicot County, Arkansas, near the town of Bellaire, about twenty miles northwest of Greenville, and forty miles northwest of where the raptor pipe turned up (Lemley and Dickinson 1937). Indeed, it was this pipe that gave the Bellaire style its name, long before anyone knew where the pipes were made. The creature shown is a crouching feline with an exceptionally long tail that wraps around the pipe's stem hole, goes up over the back, wraps around the bowl, and ends at the back of the head. The head is erect, the mouth is snarling, and the canines are prominently displayed. Equally prominent are the creature's claws, which are carefully carved on the feet. There can be little doubt that this is an Underwater Panther depicted in the classic Bellaire style—with realistic features, somewhat exaggerated head and claws, a furrowed face, and legs shown in the round.

Even though the pipe's raw material looks superficially like Glendon limestone, its fossils tell a different story. The most obvious fossil, which looks like a jagged birthmark on the panther's left haunch, is the crown of a conodont "element" or tooth, which belongs to the form genus *Hindeodella*.² Conodonts themselves are enigmatic creatures; they were primitive, eel-like vertebrates who lived in the sea. Their elements have the same mineralogy as vertebrate teeth, but exactly how they fit and functioned in the animal's mouth is unclear, as very few fossilized conodont bodies have been found with the elements in place. Conodont elements are usually only 0.2 to 2 millimeters in length, with an upper limit between 10 and 20 millimeters. So the element in the Bellaire panther, some 12 millimeters long, is unusually large. Conodonts are generally associated with the Paleozoic Era (540 to 250 million years ago), but extend into the Triassic Period of the Mesozoic Era, becoming extinct some 200 million years ago. It is most likely that the conodont in the Bellaire panther is from Ordovician, Silurian, Devonian, or Carboniferous limestones (485 to 300 million years ago). A limestone this

A side view of the Gilcrease panther pipe shows an unusually large conodont fossil clearly visible in the hindquarters. Below, the pipe, a closeup of the conodont in the panther's left haunch, and a detail of the conodont. This fossil is a large element of the form genus *Hindeodella*, which is widely distributed in limestones of the Paleozoic Era.





NOTES

1 Accession records say the pipe was found on Esperanza Plantation “located on Lake Washington, Mississippi on the Mississippi River, several miles out from Glen Allen, Miss., and not a great distance from the Chicot County, Arkansas line.” Princella Nowell was instrumental in helping us determine the location of the former Esperanza Plantation as being in northern Issaquena County, just south of Lake Washington and the Washington County line.

2 We are grateful to James Miller of Missouri State University for initially recognizing this fossil as a conodont, and to H. Richard Lane of the National Science Foundation for identifying its genus and likely chronological range.

A panther pipe made of Glendon limestone, believed to be carved by the same hand as the Gilcrease panther. This pipe was found at Moundville near Tuscaloosa, Alabama, in the late nineteenth century (Moore 1905).

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old could only have come from Paleozoic bedrock outside of the Gulf Coastal Plain. Such limestones extend in an arc from Texas and Oklahoma northeast into northern Arkansas, Missouri, Tennessee, and southeast to Alabama.

This discovery raises a question: Was the pipe made where the stone originated, outside the lower Mississippi Valley, or was it carved in the Bellaire style’s homeland using an imported raw material? We believe the latter is far more likely, for two reasons. First, the style of the pipe is so true to Bellaire norms that it is difficult to imagine it could have been produced by anyone not well versed in the style, that is, anyone outside the region where the style was

common. Second, another panther pipe exists (from Harvard’s Peabody Museum, image above left) that is so similar to the Gilcrease specimen that it was probably carved by the same person (Figure 12; Moore 1905: Figs. 1-3; Brain and Phillips 1996: 386). This other pipe is made of Glendon limestone, which provides yet another strong link between the carver and the Bellaire style’s homeland (Steponaitis and Dockery 2011: Table 1).

All in all, the preponderance of the evidence suggests that the Gilcrease panther was made in the lower Mississippi Valley with a raw material brought in from elsewhere. But the exact location of the source is still unknown and will require further investigation.

OUR EXAMINATION OF THESE TWO PIPES has added a new wrinkle to the results of our previous study. The Gilcrease raptor fit perfectly with our expectations—a Bellaire-style pipe made of Glendon limestone, consistent in both style and material with an origin in the lower Mississippi Valley. The Gilcrease panther, on the other hand, surprised us. This pipe was made by a carver working in a lower Mississippi Valley style, but using a material that came from a distant source, far outside the style’s homeland.

So how do we explain this result? Let us propose a working hypothesis that is consistent with the current evidence. As stated at the outset, we believe the pipes were made by master carvers and used by religious practitioners and healers. In other words, they were not made by the same people who used them. Rather, just as in historical Indian tribes, a religious practitioner who needed a pipe would commission one from a well-known carver. In some cases, the practitioner would also supply the material to be used—a rock that had spiritual power, perhaps obtained as a result of a vision or in a place that had otherworldly connections. Indeed, outcrops of Glendon limestone may well have had such connections (Steponaitis and Dockery 2011: 354). The secluded ravines with pools of water where this rock could be found were exactly the kinds of places the Underwater Panther was known to inhabit. And not far downstream from the

Glendon outcrops along the Mississippi River was a giant, standing whirlpool that the French described in the eighteenth century; such whirlpools and any kind of turbulent water were considered hallmarks of this supernatural being. Perhaps the Paleozoic limestone in the Gilcrease panther came from a similar, but much more distant place.

Studies of Mississippian art, and art in general, often benefit from a multidisciplinary approach, in which art-historical methods that focus on representation are combined with scientific methods that focus on the materials themselves. This combination can lead to a level of understanding that surpasses what can be learned using either set of methods alone. In this case, the recognition and identification of minute fossils embedded in limestones, combined with stylistic evidence, have yielded insights on where the Gilcrease pipes were manufactured and the distances over which the raw materials were moved. These magnificent pipes have added two more pieces to the puzzle as archaeologists strive to understand the patterns of trade and interaction in the ancient Mississippian world.

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