A PRE-COLUMBIAN MAP OF THE MISSISSIPPI?

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A unique petroglyph panel in southeastern Missouri appears to be a cartographic depiction of the Mississippi River, a series of Middle Mississippian places, and, perhaps, social or political identities (ca. A.D. 1200–1400). The panel, part of the Commerce Quarry and Petroglyph site, sits adjacent to a millennia-old Mississippi River crossing on a prominent natural feature which also was a likely raw-material source for the production of quartzite chunkey stones. The Commerce map is the oldest known cartographic representation in eastern North America, marking a significant location in regional space and Mississippian cultural history.

Maps are not unique to any period or people in world history, although cartographic inscriptions are rare in many places prior to literate periods. Such seems the case for pre-Columbian eastern North America, where few maps illustrating geographic features are known (see Lafferty 1994; Mallery 1893; Warhus 1997). Our documentation of a periodically submerged rock-art site at Commerce, Missouri, leads us to conclude that such maps existed as early as the Mississippian period (A.D. 1050–1600).

The rock-art panel in question is located at the Commerce Quarry and Petroglyph site (23ST295) in southeast Missouri and likely dates to between A.D. 1200 and 1400. Based on comparisons with other known historic era maps and with other known or suspected rock-art maps in North America and Mesoamerica, we believe that American Indians plotted the locations of particular Mississippian period settlements, if not also political or cultural identities at the Commerce site (Figure 1). Not incidentally, this place was a prominent landmark, a kaolin clay source, and possibly a quartzite quarry site for the production of chunkey stones. In the following discussion, we outline our reasons for arguing that the rock-art panel was a map.

Background: Pre-Columbian Maps?

Premodern American Indian maps, according to Mark Warhus (1997:3), must be understood in broad terms:

> *It is necessary to suspend western preconceptions of what makes a map. Unlike western cartography, where the primary document is the physical map and the conventions of scale, longitude, latitude, direction, and relative location are believed to "scientifically" depict a static landscape, Native American maps are pictures of experience. They are formed in the human interaction with the land and are a record of the events that give it meaning.*

A map, in such terms, is a scaled-down representation of people, places, things, or experiences in geographic or cosmographic space. Given such an open definition, most anything that depicts geographic or cosmographic relationships in microcosm might qualify as a map. For instance, the space inside a domicile, the decorations on a ceramic pot, or the painting on a hide might represent the directionality or associations of the celestial sphere and its supernatural forces (e.g., Bourdieu 1977; Horse Capture et al. 1993; Pauketat and Emerson 1991; Warhus 1997). A particularly good example of this is a well-known nineteenth-century Pawnee painted-hide star chart (Murie 1981). However, many public or sacred spaces, monuments, or the organization of certain places might have projected maplike images of the cosmos (Birmingham and Eisenberg 2000; Hall 1985; see also Eliade 2005; Wheatley 1971).

Thus it is no stretch to suggest that motifs at certain rock-art sites if not also the array of rock-art sites within a region might map out stories or act as mnemonic devices, enabling readers to place social or religious narratives or memories in larger historical and cosmological contexts (e.g., Wagner et al. 2004). In some ways, many pre-Columbian or early colonial drawings or paintings were similar to such spatialized narratives that located people in the world or cosmos. Clearly, there were indigenous maps prior to the arrival of the Europeans. One was presented to the Spaniard Cortés, for instance, by the Aztec ruler Moteuczoma Xocoyotl (Cortés 1986:94). Another was given to Champlain in 1605 (Mallery 1893:341). Some indigenous maps were sometimes merely "notices," warning signs, or signposts marking a location or pointing the way (Mallery 1893:329). They also doubled as storyboards where cartographers used foot prints or lines to show connections between places, if not also to indicate the narrative's flow of action (Figure 2a, b; see Boone 1994; Liebsohn 1994; Mallery 1893; Mundy 1996).

Some such depictions illustrated particular historical moments, especially battles, treaties, or migrations (Mallery 1893). Some of these incorporated the totems of certain people or clans. For example, one eighteenth-century "Ho-Chunk village chief named Waban signed his name on a treaty in Montreal using the picture of an

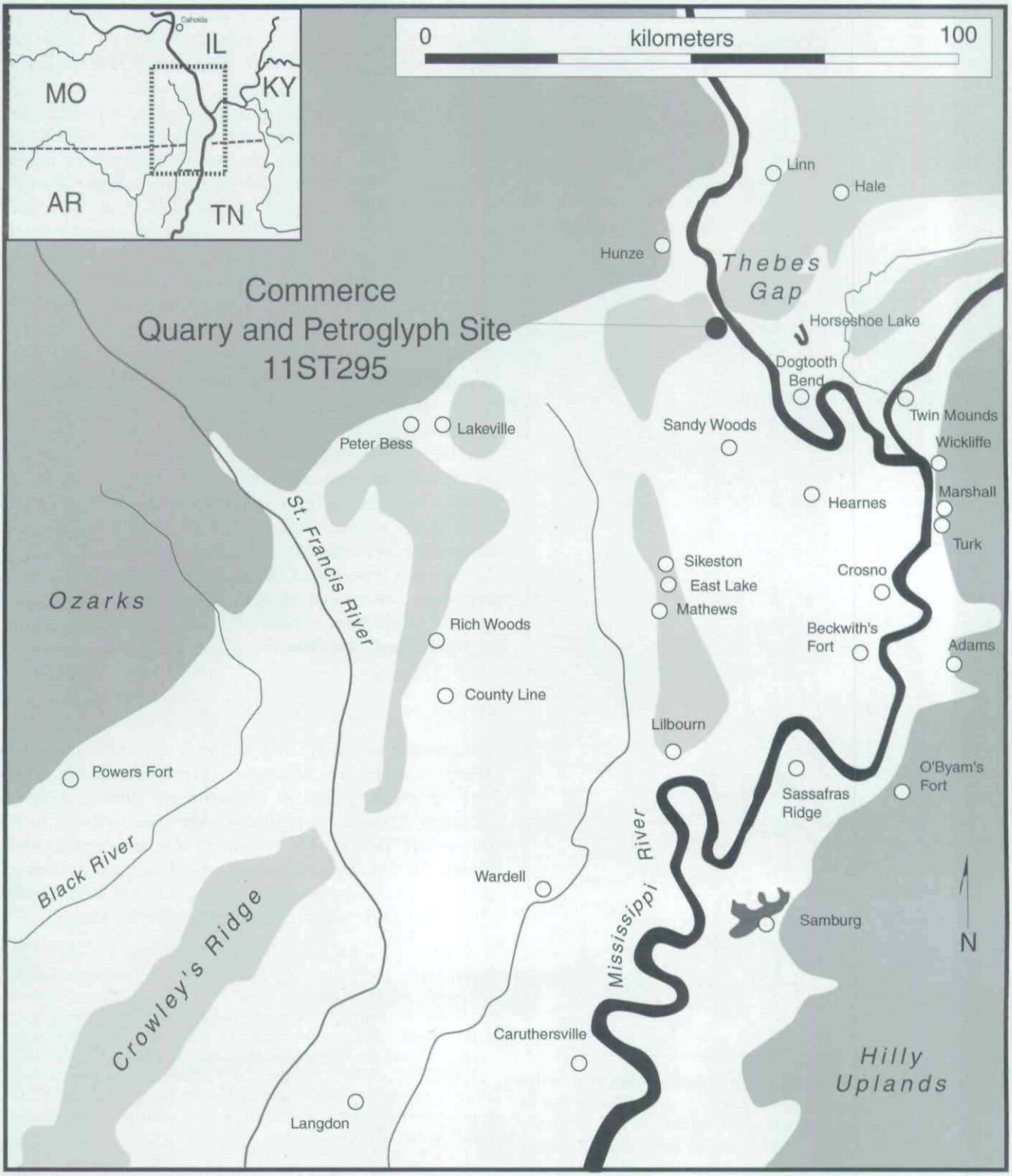

Figure 1. Location of Commerce Quarry and Petroglyph site.

hour-glass-shaped bird" (Salzer and Rajnovich 2000:21). Likewise, one Ojibwa artist used bird, quadruped, fish, and anthropomorph glyphs, connected by lines, to illustrate the route taken by several tribal leaders who journeyed to petition the president of the United States in 1849 (Schoolcraft 1851b).

In Mesoamerica, such paintings or drawings with maplike qualities presented "historical events such as

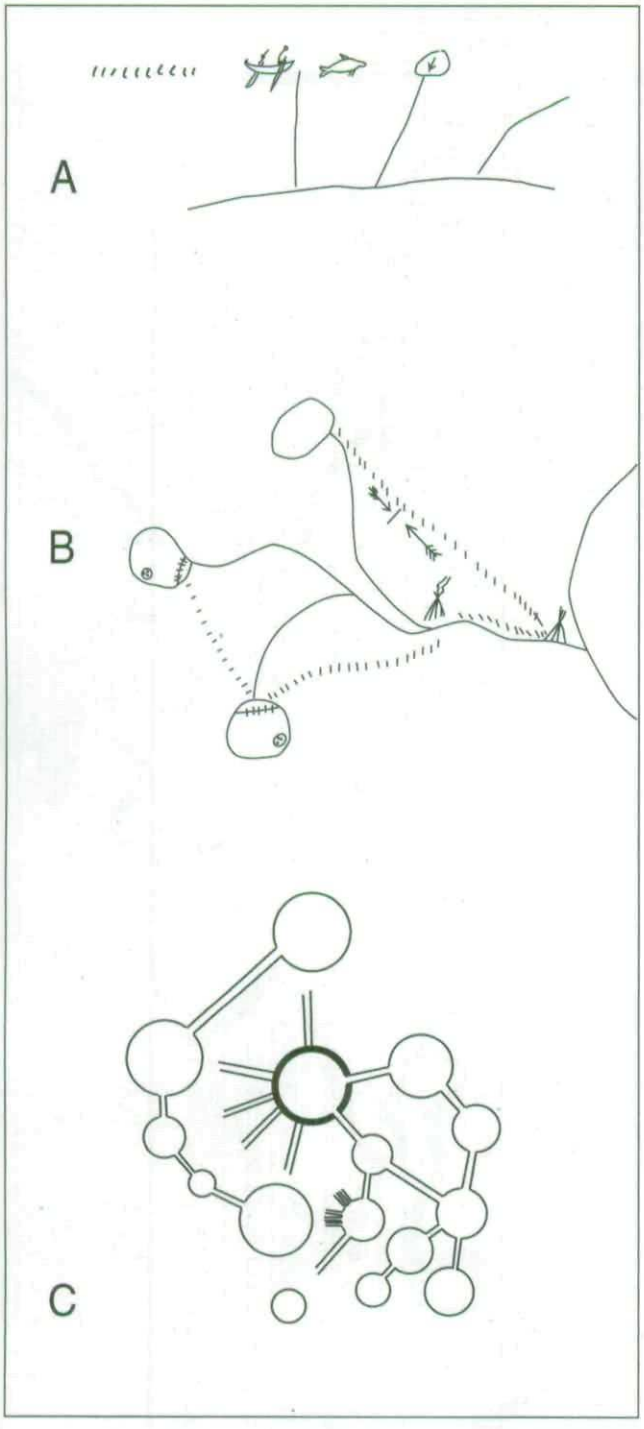

Figure 2. Historic American Indian maps: (a) Micmac notice posted on tree that ten enemy warriors were "observed in canoes on the lake going toward the outlet . . . and probably down the river"; (b) Penobscot birch-bark map showing camps, ponds, streams, beaver dams, trails (dashed lines) and an encounter (arrows and line); (c) French copy of Chickasaw deerskin map of circa 1723 showing nations [circles] and relationships [lines] (adapted from Mallery 1893:338–339, 341; Waselkov 1989:Figure 5).

conquest or the foundation of a ruling lineage" or illustrated how "the community populace . . . organized both themselves and the space[s] they inhabit-[ed]" (Mundy 1996:106–107). In essence, "picture writing" was used in all of these cases to depict events, people, or mythic characters with respect to certain places, pathways, thoroughfares, migrations, or trajectories (see Boone 1994). In addition, various Eastern Woodland Indians used circles and lines to show places and pathways, with arrows sometimes highlighting key points or directions through space or story (Mallery 1893; Warhus 1997; Waselkov 1989).

The best known native maps in the eastern Woodlands, drawn by early-eighteenth-century Catawba, Chickasaw, and Alabama cartographers, used circles connected by lines of varying lengths to indicate the locations and relative distances of discrete regional populations (Figure 2c). A similar dot-and-line decoration on a Mississippian period pot has been interpreted as a graphic representation of ancient societies (Lafferty 1994). These transregional depictions of peoples or polities are characteristically ethnocentric, placing the mapmaker's group at the chart's center (Waselkov 1989). However, other North American maps are not, especially those that appear to depict the features of specific localities similar to the earlier mentioned signposts and storyboards.

Other Rock Art Maps

Among the other likely maps from pre-Columbian North America are a number of rock-art inscriptions. One of these is found in southern Illinois a short distance from the Commerce site (see below). Most others are petroglyph panels in the western United States. Of the western examples, all appear to depict discrete localities and resources. Dockal and Smith (2005:413–414) summarize a few of these cases:

> *The best examples for well-documented maps as part of a prehistoric rock-art tradition are the late prehistoric to early historic period Plateau style of the Columbia–Fraser River plateau in British Columbia (Wellman 1979:45). In these petroglyphs, outlines of lakeshores, the courses of rivers and streams, and the silhouettes of mountains are depicted (Corner 1968:29). . . . Gortner (1988, 1989) describes a petroglyph in the north-central Sierra Nevada Mountains of California that maps the petroglyph site and connecting trails along the north fork of the American River.*

Dockal and Smith (2005) continue by noting southwestern examples, including Schroeder's (1952:44) report of some "linear drawings" along the lower Colorado River, "one being a perfect representation of the bends of the Colorado River from Toprock south to Mojave Rock" (Dockal and Smith 2005:414). They also report a similar map that details the bends and canyon topography of Granite Creek, crosscut by an ancient

trail south of modern-day Prescott, Arizona. Elsewhere in Arizona is a map of a Hohokam settlement's pithouse locations and a depiction of a large topographic ridge, trails, and lithic quarries (Wallace and Holmlund 1986:147; Institute for American Research 1986:2).

More elaborate than these is a petroglyph panel depicting a pre-Hispanic canal irrigation system and nearby Hohokam settlements in the Valley of Sonora of northern Mexico and southern Arizona. Known since the early 1950s, William Doolittle (1988:46) sees in this example a depiction of a local agricultural landscape, not unlike "glyphs found in various parts of the world (Raisz 1948:1–7; Lugli 1967; Thrower 1972:8–14; Wilford 1981:8–11; Blakemore 1981), including the New World (Heizer 1958; Grant 1965, Plate 3)." Doolittle's (1988:46–47) Sonoran example was

> *carved on the flat side of a large boulder . . . [and] found on the edge of the floodplain. . . . The glyph appears cluttered and is composed of "abstract" or "meandering rectilinear" designs (Heizer and Baumhoff 1962:83; Grant 1967:27). Nevertheless, it does bear a strikingly similar likeness to the portion of the valley immediately surrounding the location of the glyph as seen from above. . . . Especially evident are the accurate locations of the main river channel, the* acequia madre *or principal irrigation ditch, fields, and the adjacent permanent habitation sites. The actual locations of fields are indicated on the glyph by the dots within circles. This particular iconographic motif has been interpreted as maize, beans, or squash plants in another part of Mexico (Mountjoy 1982:119). Settlements are depicted by the concentric circles, a motif commonly used by many cultures to represent areas of habitation (for example, Munn 1973:119).*

Another western rock-art panel provides additional information on the localized prominence and purposes of such maps. Situated next to the Snake River near a likely river crossing in present-day Idaho, this "Map Rock" features a long squiggly line remarkably similar to contemporary depictions of the Snake and Salmon Rivers (Warhus 1997:21). A series of circles and "representations of buffalo, deer, mountain sheep, elk, antelope, and human figures" might have simultaneously depicted locational information easily "seen as one traveled the river" even as it also conveyed the "spiritual relationship between the land, its resources, and the people who depended upon them" (Warhus 1997:21). That is, Idaho's Map Rock was a piece of a larger cultural landscape that served to contextualize the human experience of that landscape.

One final rock-art site suggests that contextualizing the experience of landscape was key. This possible map is part of the "Whetstone Shelter" at Fountain Bluff in southern Illinois, 50 km north of the Commerce site (Wagner et al. 1990; M. Wagner, personal communication, 2006). In 1937, Bruce Merwin described the panel:

> *About half way up the west side of Fountain bluff and overlooking the Mississippi is a very interesting and extensive series of carvings. . . . Most of these are on the vertical wall of a rock shelter and include the usual items of footprints, hand prints, a seat, concentric circles, eye or turtle designs, a sort of dagger or, probably a dragon fly or tadpole, and finally, a series of lines one inch wide connecting small cavities, each about three inches in diameter.* This last design might be a map of the nearby area and indicated streams and village sites. . . . *In this shelter the carvings extend over an area nearly fifty feet long (Merwin 1937:181; emphasis added).*

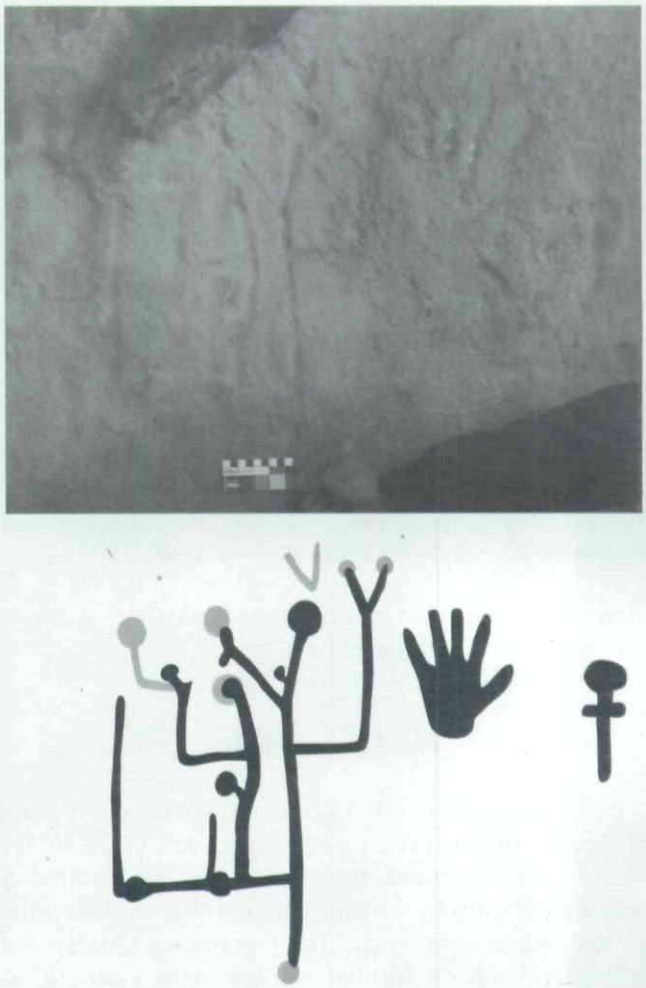

Figure 3. The Whetstone Shelter rock-art diagram. Top: photograph (March 2007); bottom: drawing based on 2007 photograph, Brian Butler's sketch map (outlined in black), and Erwin's 1937 photograph (additional features not seen later outlined in gray).

Comparing Merwin's (1937) photo of the design with our own photograph and an earlier sketch map (made by Brian Butler) reveals that the Whetstone Shelter diagram consists of a series of large pecked dots connected by lines (Figure 3). This series of dots and lines, in turn, are part of a larger panel within the remote site, as documented in Mark Wagner's extensive survey of the rock art of Fountain Bluff (Wagner 1996; Wagner et al. 1990). The larger panel, which consists of various circle, hand, and mace (not dragon fly or tadpole) motifs, is situated adjacent to a large natural crevasse at the rear of the rockshelter, perhaps

Figure 4. View of the Commerce Quarry and Petroglyph site, September 2005 (rock-art panel in foreground).

indicating that the diagram was part of a larger storyboard-like arrangement of motifs.

The Commerce Site

In its basics, Missouri's Commerce petroglyph panel is similar to several suspected rock-art maps in the western United States, beginning with the Commerce rock's proximity to a major riverine thoroughfare and an age-old river crossing. The Commerce Quarry and Petroglyph site is located on the west bank of an entrenched, 6.5 km (4 mile) segment of the Mississippi River historically known as "Thebes Gap" and less than 1 km north of Commerce, Missouri (210 km south of metropolitan St. Louis, Missouri). By river, the site is about 65 km above the confluence of the Ohio and Mississippi Rivers.

The most obvious physical features observable on the site are hundreds of large quartzite (actually "silicified sandstone" or "orthoquartzite") boulders, some estimated to weigh in excess of 10 metric tons each, a formerly prominent bed of white kaolin clay and, apparently, a more restricted deposit of reddish clay (Figure 4). Geologically, the boulder field and clays derive from a larger, Cretaceous period deltaic deposit called the "McNairy" formation that outcrops on both sides of Thebes Gap in present-day Missouri and Illinois (Koldehoff and Wagner 2002; Willman et al. 1975:204–205).

In Illinois, the McNairy formation has limited exposure and the associated sedimentary quartzite is synonymous with the "Kornthal quartzite" in Illinois (Koldehoff 2002:138). In Missouri, this formation rests below Pleistocene-age loess, comprising the upper layers of the Commerce or "Scott" Hills that, along with the Sikeston Ridge to the south, at one time separated the northwesterly flow of the ancient Mississippi (through the Morehouse Lowlands) from the southeasterly ancient Ohio (in the Cairo Lowlands). One or more massive Pleistocene era flood events cut off this ancient meander at present-day Thebes, Illinois, creating Thebes Gap.

Composed of loosely bedded sands, clays, limonites, and sandstones reaching thicknesses of 76 m (250 ft), the lower portion of the McNairy formation consists of "light yellow to orange, medium- to coarse-grained" sandstone (Grohskopf and Howe 1961:124). "The upper part of this sandstone is usually silicified and is locally named the 'Commerce quartzite'" (Grohskopf and Howe 1961:124). Actually, the topmost portions of this upper sedimentary quartzite have been de-silicified, as readily visible on the boulders at the Commerce site and on individual chunks of the raw material scattered about the site surface. Just below this de-silicified matrix, the McNairy quartzite (or orthoquartzite) is stained red, a function of water-borne iron precipitating out as it met the less permeable light yellow matrix. Recently, Ray (2007) has provided comprehensive descriptions of all Missouri quartzites and orthoquartzites. He characterizes the Commerce or McNairy material this way:

> *It is not easy to distinguish McNairy quartzite from other local quartzites macroscopically; however, distinguishing attributes are apparent under microscopic examination. In general, McNairy quartzite exhibits a more uniform and lighter color than Roubidoux, Jefferson City, Yankeetown, and Lafayette quartzites. The most important differences, however, are in the composition, shape, and size of the sand grains. McNairy quartzite contains fewer inclusions, such as chert particles, and the sand grains are more tightly packed and more angular than those in Roubidoux, Jefferson City, and Lafayette quartzites. . . . Light-colored (white) deposits of Hixton quartzite from Wisconsin also bear a strong macroscopic resemblance to McNairy quartzite. Microscopic examination, however, reveals that the sand grains in Hixton quartzite are generally smaller and more rounded, and the Hixton quartzite contains more silica cement than McNairy quartzite (Ray 2007:305).*

As seen in the late eighteenth and early nineteenth centuries A.D., the McNairy formation boulders exposed in Thebes Gap were part of a partially submerged geological feature that stretched along both sides and across the Mississippi River. This boulder field was recorded by early French cartographer Nicolas de Finiels in 1797 as a "double chaîne de rochers" (Figure 5; see Finiels 1989). Others called it the "Little Chain of Rocks" (Schoolcraft 1851a:27). Whatever it was called, the Commerce boulders and the associated clay deposits were probably impossible for most travelers on the Mississippi to miss, comprising a memorable landmark situated at the northern edge of an expanse of Mississippi River floodplain known in the late eighteenth century as the Tywappity (or "Tyewapety") Bottom (Schoolcraft 1851a:27). A small Spanish American trading post and settlement known as Zewapeta was established on the northern edge of this bottom in 1788.

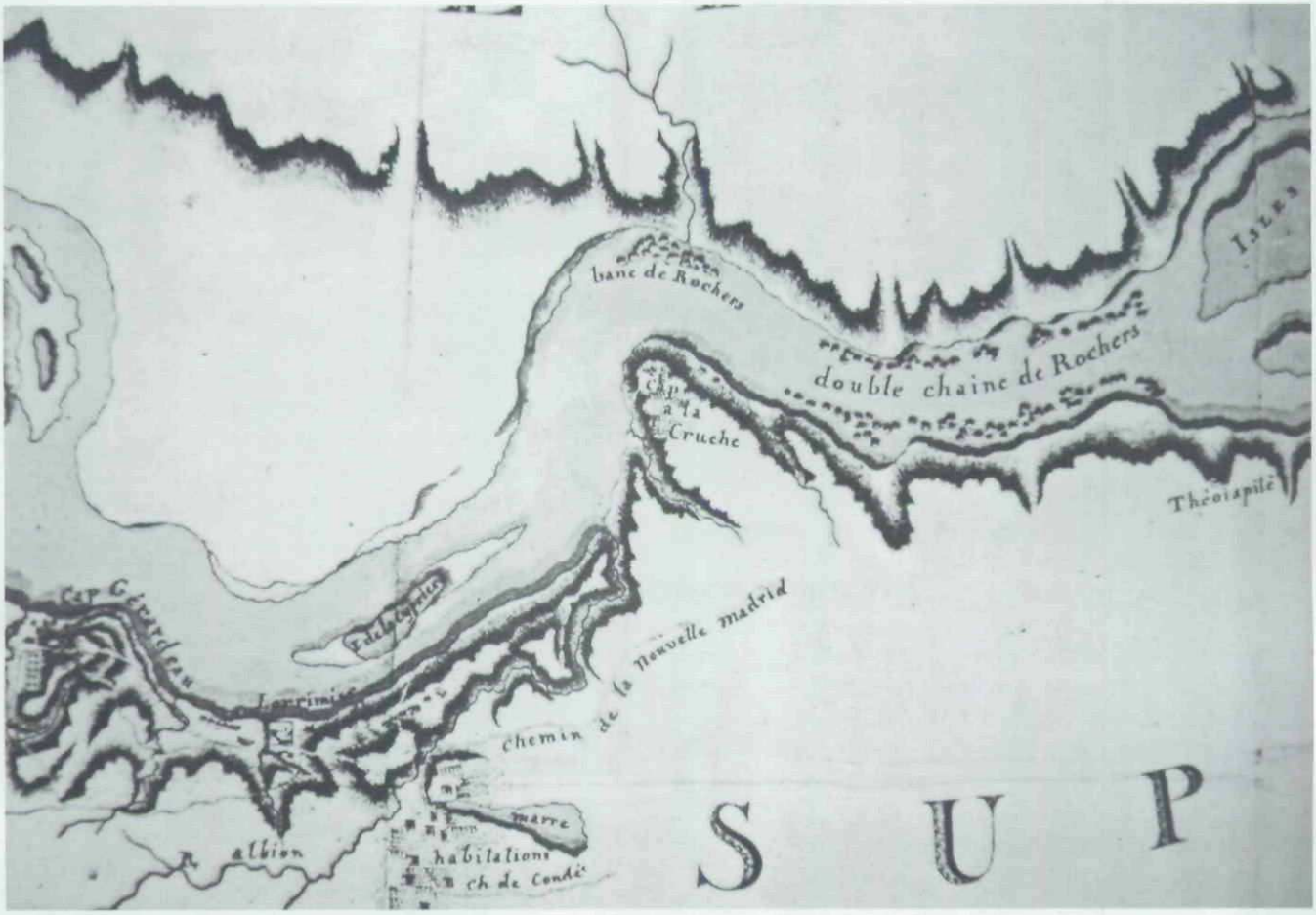

Figure 5. Section of De Finiels map showing "double chaînes de rochers."

Fifteen years later, Captain Meriwether Lewis briefly visited this settlement prior to making his famous journey up the Missouri River. While exploring the floodplain immediately upstream, Lewis observed and recorded the presence of the unique chain of rocks and the Commerce site's concentration of large stones. Lewis's journal entry of November 22, 1803 states that

> *from the water's edge to the top of the first rise or level of the bottom wass* [sic] *pretty well covered with large rock of many tons weight lying in a loose manner on the serface* [sic] *or but partially bedded in the earth. ...The land is of an inferior quality on these hills being a stiff white clay soil.—observed a very fine quarry of white freestone on the eastern bank of a small run which made into the river (Lewis, in Moulton 1986:102–103).*

Fifteen years later, in 1818, Henry Schoolcraft traveled up the Mississippi river, and stopped at this same spot: "We went forward the next day to a point which is called the Little Chain of Rocks. . . . I noticed beneath the first elevated point of it, near the river's edge, a locality of white compact earth . . . or nearly pure clay. Large masses of pudding-stone, disrupted from their original position, were seen lying along the shore in this locality" (Schoolcraft 1851a:27).

Eight years after Schoolcraft, in 1826, the celebrated French naturalist Charles Lesueur painted this unique floodplain boulder concentration (see Vail 1938). As he painted, some of the largest of the boulders on the Missouri shore were perched on a prominent ledge well above the river bank and overlooking the river just north of the Tywappity Bottom. The petroglyph rock probably rested just north of this ledge.

Unfortunately, the ledge, the boulder field, and the related archaeological site today exist in a heavily modified form. In the twentieth century, many of the largest boulders in the Mississippi River channel were dynamited, reduced, or removed to facilitate unimpeded river traffic (Wilkey 1965). At the same time, the lateral (westward) migration of the Mississippi River channel during the mid-nineteenth century resulted in the site being heavily deflated. The Commerce Quarry and Petroglyph site today rests on an eroded riverbank slope literally at the water's edge. Significant portions of the site, including the petroglyph rock itself, are now inundated by the Mississippi River throughout much of the year.

While Euro-American knowledge of the petroglyph boulder might date to the eighteenth century, its modern "discovery" occurred during the mid-1960s.

Figure 6. Possible quartzite blanks from 23ST295.

At that time, Mr. Frank Magre, an avocational archaeologist and local historian, recorded several of the individual petroglyphs present at this site as part of his independent study of the Native American iconography of the region. However, as the petroglyph rock was usually at least partially submerged, Magre appears to have recognized only its most prominent markings. Likewise, Diaz-Granados and Duncan (2000:183, Plate 4, Figure 5.21) note the presence of the raptor and eye or ogee motifs and other "circular pecked and ground depressions, cupules, or cup marks" at the "Commerce Eagle" site (11ST255).

Evidence of Quartzite Quarrying

The McNairy quartzite lithic debitage and the larger site, however, went unrecognized until the senior author visited the site in May 2005 and again with the junior author in September 2005. During these times, the scattered boulders, smaller rocks, lithic debitage, and the single flat petroglyph rock was fully exposed during the low water. The quartzite debitage at the Commerce Quarry and Petroglyph site consists almost entirely of large flakes and apparent chipped quartzite blanks (Figure 6). A single badly damaged fragment of an igneous maul or celt was recovered from among this debris (Figure 7).

Some quartzite flakes lack pronounced bulbs of percussion or secondary chipping marks and may be natural byproducts of flotsam impacts on the quartzite boulders when the latter were inundated by the Mississippi River. However, other flakes and a number of apparent bifacially reworked blanks appear to be human products. The latter include roughly circular pieces up to 25 cm in diameter that may be rejected preforms for Mississippian period chunkey stones.

Silicified sandstone or sedimentary quartzite is the raw material of choice for Cahokia-style chunkey stones. Brad Koldehoff (personal communication, 2002) has

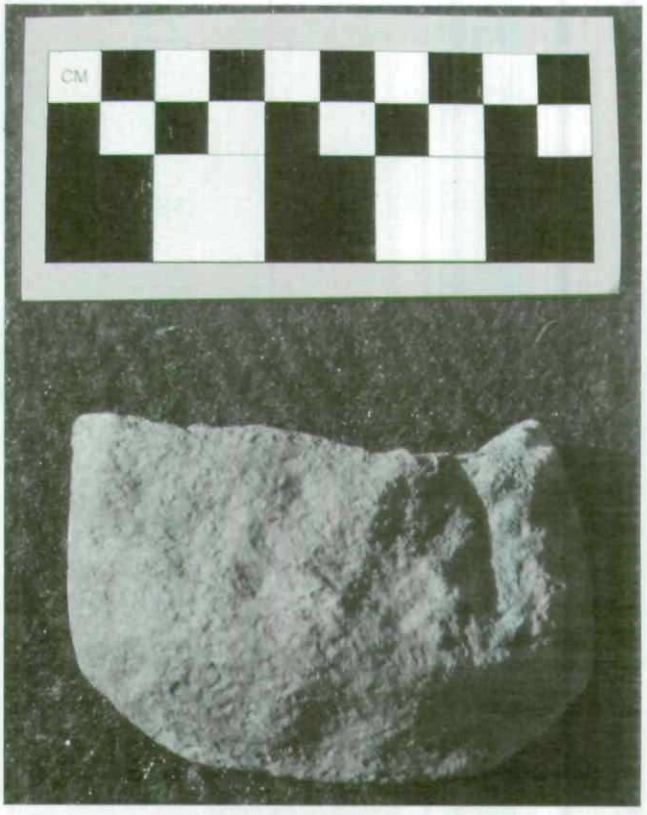

Figure 7. Basalt groundstone hammerstone from 23ST295.

previously suggested that both Yankeetown and McNairy (a.k.a. Commerce or Kornthal) quartzites were probably used in the manufacture of chunkey stones (Pauketat 2004:180n17). Unfortunately, a comprehensive sourcing study of Cahokia-style stones has yet to be undertaken; only preliminary comparisons by the authors of individual specimens from the Mound 72 cache at Cahokia and from Richland Complex sites nearby suggest that the McNairy rock may well be among the raw materials used (see Fowler et al. 1999:Figure 10.1; Pauketat 2004). Additional candidates for Commerce quartzite chunkey stones are known and, as the Commerce site is the largest and most readily accessible source for this raw material in the Mississippi Valley, future sourcing studies must examine the variability of all Missouri and Illinois sources to isolate the sources used for this purpose (see Ray 2007). Not incidentally, possible pre-Columbian quarry pits exist in the steep hillside behind the river bank exposure of the Commerce Quarry and Petroglyph site.

The Petroglyph Panel

Dipping at the same angle as the shoreline, the actual petroglyph rock in the middle of the Commerce site is a single large quartzite slab, approximately 3 m by 3 m wide, with a flat upper surface. Remarkably, although scoured by river water and scraped by river ice for many years, a host of individual petroglyphs and

Figure 8. The Commerce rock-art panel.

suggestive pecked lines and dots have survived. Unfortunately, lower portions of the slab may be missing, presumably lost to the river at some point in the past (Figure 8). In addition, the lower and middle portions of the rock surface appear to have been rubbed repeatedly by river ice which might have erased faintly pecked lines, dots, or small motifs in this area. We presume that such generalized river-edge erosional processes are also responsible for the reduced visibility of the petroglyphs, which are difficult to see when the sun is at high angles or the rock is dry.[1]

The petroglyph panel consists of a single prominent meandering line around which are arrayed a series of discrete dots, dot clusters, geometric patterns, and at least seven formal motifs (Figure 9). Except for two eroded areas, there are no breaks in the meandering line, which was pecked fairly deeply into the rock surface, apparently with the aid of a hammerstone. It begins in the lower left-hand corner of the rock, as viewed from the present-day river's edge and, over the course of 15 bends winds upward and to the right before angling to the rock's lower right side. One meander is larger than the rest, situated near an eye or ogee motif, and marks a major bend in the line toward the lower right (Figure 10).

Pecked in like fashion into the Commerce rock are the seven other formal motifs. These include the eye or ogee motif, the well-known eagle or falcon glyph, one or two arrows, a possible moccasin print, two deer or elk footprints, and a small square. Interestingly, both the eye or ogee and the bird glyphs are similar in size and shape, suggesting a relationship. The eye/ogee is 47 cm long and 21 cm wide at its ovoid midsection, similar to the 45 cm length and 29 cm width of the ovoid bird motif.

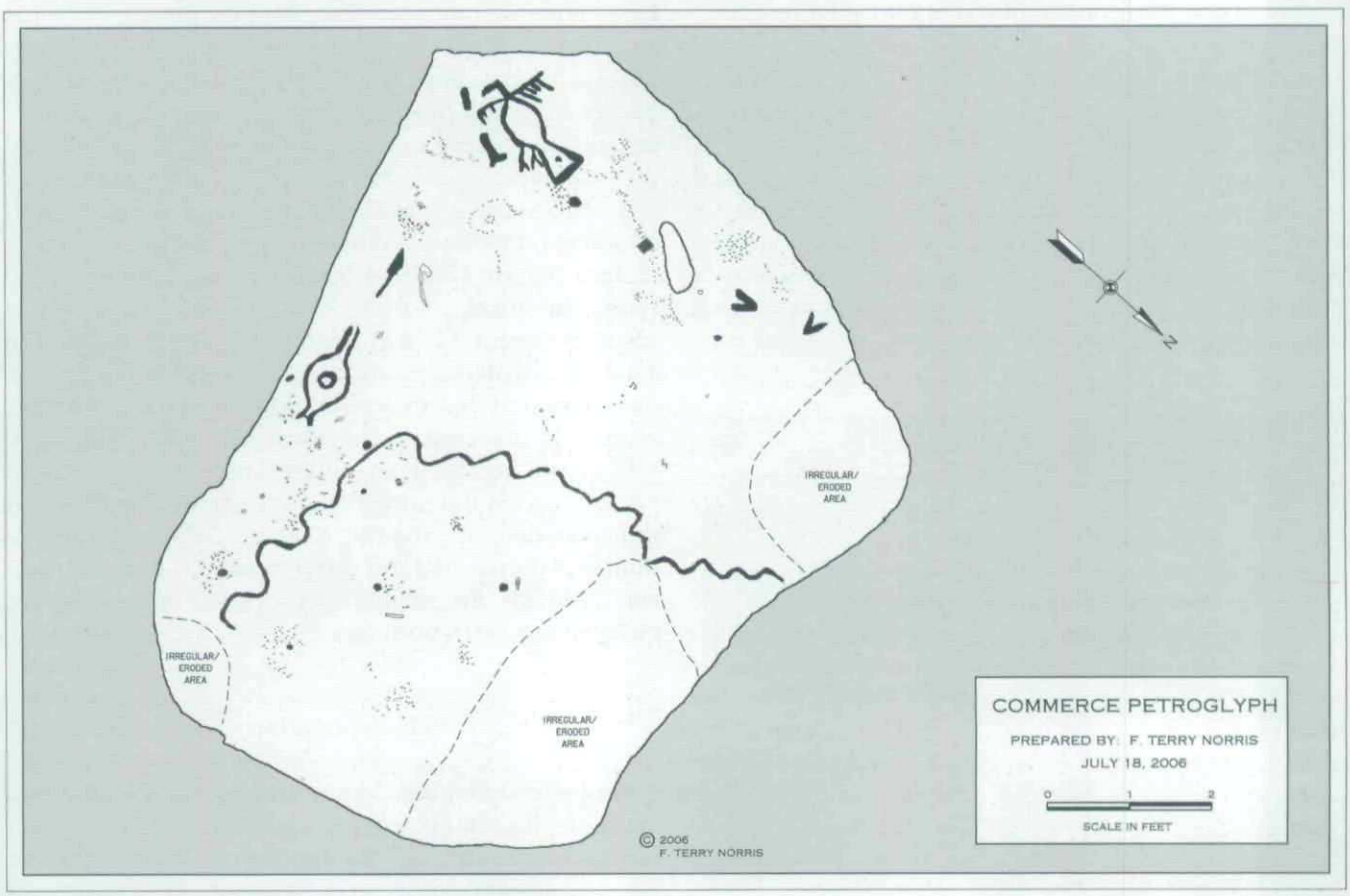

Figure 9. Plan map of the Commerce rock-art panel.

Figure 10. Oblique view of a portion of the meandering line motif.

Figure 12. Close-up oblique view of a punched-dot cluster.

The former has a central circular element, lending to it the eye-like appearance, and one U-shaped end, possibly a feminine vulviform reference (see Diaz-Granados and Duncan 2000; Hall 1997:126–129; Wagner et al. 2000). The latter has a simple head, a prominent tail, a deeply pecked outstretched wing, a second barely visible wing, and two talons extended on one side of the body. A now-obliterated eighth motif might have existed at one time to the left of the bird (Figure 11).

One and possibly two simple arrow motifs are located between these two glyphs that seem to direct one's attention from the eye or ogee toward the bird. Then, to the lower right of the bird are four other formal icons: the possible moccasin, the small pecked square, and the two apparent ungulate foot prints. Of these, the moccasin print is merely a pecked outline made in the shape and, at 26 cm long, the size of a small human footprint. Next to it is the square and, below them the deer or elk footprints.

Figure 11. Oblique view of the bird glyph.

Importantly, these seven formal motifs are not the only markings on the rock. Indeed, there are other pecked lines, dots, and dot clusters all over the panel, some more evident and certain than others. Some of these pecked lines might have been associated with the formal glyphs and, in the case of the largest dots, may have been made using a simple hammerstone. However, in the case of the small dots and lines, a different tool—possibly an antler or copper punch of some sort—appears to have been used to produce deep dotlike impressions. The difference between ordinary pecked lines and punched dots seems significant, either because they were made at separate times or because they conveyed a different sort of information.

There are more than 10 dot clusters on the rock, with additional dots scattered in indiscernible patterns across its face (Figure 12). In at least four and possibly more cases, the small punched dots cluster around single larger pecked dots. In at least three other locations, the small-dot clusters are not associated with larger pecked dots, although they may be associated with linear arrays of dots. In one case, to the immediate lower left of the bird glyph, a series of small dots are arrayed in an oval pattern around a small central circular pattern of punched dots. In another case, a 32 cm long line of punched dots runs from a dot cluster near the bird to and through the small square motif alongside the possible moccasin print (see Figures 13 and 14).

Interpretation

We believe that the Commerce rock-art panel was a map of discrete places of cultural if not political significance to pre-Columbian people traveling along the Mississippi River and stopping or crossing at Commerce. Reasons to suspect that certain markings

Figure 13. Oblique view of dot clusters, dot line, and associated square motif.

Figure 14. Close-up oblique view of small square-and-dot line.

on the Commerce rock were cartographic include its two most anomalous characteristics: the unusual meandering line and the interconnected dotted lines and dot clusters. Of these, the meandering line appears to be a representation of a waterway and a specific locality in the same way that other rock-art maps in the western United States depict streams, rivers, or creeks along with other nearby resources, trails, fields, or houses.

Of course, there are circular "dots" and serpentine motifs on various Midwestern rock-art panels. The former Diaz-Granados and Duncan (2000:233) identify as possible chunkey-stone motifs. The latter are most often thought to represent mythical serpents (and the Commerce panel's meandering line might also symbolize such a snake, even if it doubles as a depiction of the Mississippi river). However, the Commerce panel's meandering line bends in unusual ways across the entire rock and, unlike a simple serpent motif, lacks clear end points. Likewise, the dots are concentrated in locations around this meandering riverine line and, in at least one clear instance, are connected by dotted lines, reminiscent of the Whetstone Shelter diagram and various historic era indigenous maps of connected or allied locations (see also Pohl 1994).

In the case of the Commerce panel (if not also the Whetstone diagram), it is conceivable that the dots, individually or in clusters, represent human populations, perhaps even pre-Columbian towns and their surrounding settlements. If correct, then the motifs may have been meaningful relative to these places. The eye or ogee is near the meandering line and a series of dot clusters, while the bird glyph is situated near two or three dot clusters. A line from one of these, right of the bird, to the small square motif might indicate a trail from one place or people to a specific place conceived as having four sides. We suspect that other dotted line segments on the Commerce map also marked trails or relationships between places, peoples, or things since eroded and reduced by river-induced erosion of the rock face. The ogee, bird, and prints might have denoted cultural identities or referenced associations with general directions or specific locations.

Any final interpretation of the stone, of course, requires some understanding of who carved the rock, when, and why. Significant clues regarding the age and cultural affiliation of the petroglyphs are found in the style of the falcon or eagle at the top of the overall composition. General comparisons of the eye or ogee and bird motifs with the larger corpus of rock art supports the inference that at least one subset of the petroglyphs were carved at the same time during the Mississippian period (A.D. 1050–1600; see Diaz-Granados and Duncan 2000; Wagner et al. 2004). The punch used in creating the dots and dotted lines also points to a single individual or tool, possibly not the same one or time as the broader pecked lines of the motifs. That is, as noted earlier, the possibility exists that the Commerce slab is a palimpsest, with two or more episodes of inscription represented by the two discrete pecking modes. However, if the meandering pecked line was established first, as seems likely, then the map's plan would have been established immediately and the later punched dot additions might be seen as amendments or annotations to the original.

Much more than this concerning the identity or identities of the Commerce panel artists is difficult to know. Then again, specific comparisons of the Commerce bird's wing style with that seen on a recently discovered sandstone tablet from the Schaefer site, in

the southern American Bottom 150 km north of Commerce, argues for a cultural and perhaps temporal association between the two (see Koldehoff and Kassly 2001). Most such sandstone tablets, it should be noted, have been recovered from thirteenth-century archaeological contexts at or near the Cahokia site, located 180 km (112 miles) north of Thebes Gap (Koldehoff and Kassly 2001:5; Pauketat 1994:96). In addition, Diaz-Granados (2005:142–143) has observed that petroglyphs depicting "avian forms at sites in nine eastern Missouri counties form a concentration radiated out from the Cahokia area." Perhaps such similarities and spatial proximities also argue for associating the Commerce petroglyph with Cahokia or Cahokian descendants during the thirteenth or fourteenth centuries (O'Brien 1994).

Arguably, we should expect to see glyphs denoting places and peoples during periods when landscapes were politically and ethnically divided (Liebsohn 1994). Such conditions would have presented travelers with uncertainties and dangers that could have been mitigated, at least in part, by maps (not unlike the circumstances surrounding the use of the southern, historic era deerskin maps). The middle portion of the Mississippian period, of course, was one such time. Between A.D. 1200 and 1400, especially following Cahokia's demise, indigenous populations and political divisions reached a maximum in the central Mississippi Valley south of Thebes Gap (Anderson 1997; Lewis 1991; Morse and Morse 1983; O'Brien and Wood 1998).

Of course, a petroglyph map might have functioned very differently from paper, fabric, or hide maps that could have been rolled up and carried off. Patricia O'Brien (1994) has argued that other rock-art panels some 150 to 200 km from Cahokia were actual signposts that marked the outer boundaries of the Cahokian polity. "Any two sovereign people living beside each other will mark their common boundary by features of 'cultural geography,' . . . buildings, defensive structures, or signs" (O'Brien 1994:31). Individual motifs, in such cases, might have been the totems or signifiers of a people, nation, or leading kin group, as noted earlier. They might also have been place glyphs.

When the Iroquois went to war, they drew the totem or totems "of their tribe with a hatchet in his dexter paw... on a tree from which they remove the bark" (Coy 2004:7, citing O'Callaghan 1849). The Natchez posted their "hieroglyphic sign" on a bark marker "near one of their villages" (Du Pratz 1975:373–374). Glyphs, that is, had more than cosmological meanings in certain times and places. Here, as in Mesoamerica, they were signposts, warnings, memorials, and markers of place, person, and identity that "structured historical memory and geography" (Liebsohn 1994:161; see also Mallery 1893).

Such a possibility seems bolstered by the fact that "silent reading is a relatively recent phenomenon—found in Western civilization only since medieval times" (Hassig 1992:209 n94). A nonportable rock-art map might have been similar to any number of premodern texts or inscriptions, which were read "aloud by a formal reader on significant occasions" (Hassig 1992, citing Chaytor 1941–42; Clanchy 1979; Leclearcq 1982). Reading the Commerce map, for instance, might have been done less to facilitate movement through a terrain and more to officially recognize or publicly name political territories, to remember some event or passage, or to pay homage to certain places, people, or events (cf. Basso 1996).

Regardless of its precise purpose, assuming that the map referenced some cultural, political, or natural landscape should lead us to expect that the Commerce map might possess some degree of accuracy, or conformity between real and ideal. Furthermore, we might expect that an ancient Mississippian map of significant cultural places or political divisions would bear some resemblance to present-day cartographic depictions of Mississippian places and possible divisions. Of course, depending on the scale of the map, it would be difficult to say for certain what was represented by the dots, lines, and glyphs of the Commerce panel. Perhaps, for instance, the Commerce panel was carved when Cahokians yet exerted strong influences on the peoples along the central Mississippi Valley (Pauketat 2004). The bird glyph, in this case, might represent the people of Cahokia, warning north-bound travelers of the powers-that-be north of Thebes Gap. Just such an argument has been made by O'Brien (1994). Perhaps the bird represented a Cahokian identity or memory in a post-Cahokian world, one now transplanted southward. Or possibly the bird, the eye or ogee, and any number of the dots and lines depict otherworldly places and forces, perhaps even being a map of the night sky.

However, if the Commerce panel was a map of a post-Cahokian Mississippian world, then we should focus on the high-density, politically complex landscape south of Thebes Gap. Doing that, we see a degree of correspondence between the Commerce panel's meandering line, dots, and dot clusters and a present-day map of Mississippian town-site locations from Thebes Gap south to or beyond the confluence of the Ohio River (Figure 15). The correspondences include the orientation of the Mississippi River channel and locations of major Mississippian sites.

Most importantly, the Mississippi River today twists and turns in a direction and with major bends that correspond to the meandering line on the rock, when viewed with respect to magnetic north. This fact, that the image parallels fairly well the actual river, perhaps

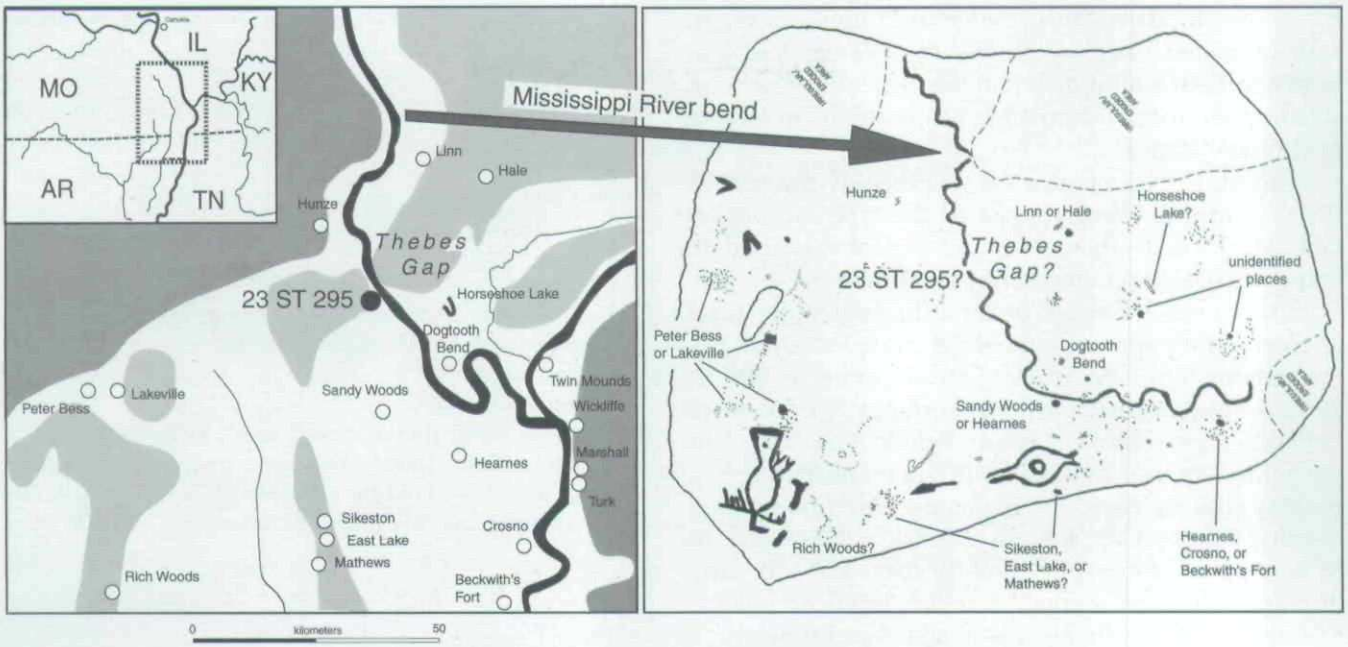

Figure 15. Comparison of the Commerce rock-art panel, oriented to the cardinal directions, with a modern-day map of the principal Middle Mississippian sites between Thebes Gap and Cairo, Illinois.

should be expected. North of Thebes Gap, the river's meander belt is narrow, inhibiting much movement. Moreover, while the rock itself has been undercut, and now dips downward toward the river at a 45-degree angle, its horizontal orientation probably would not have changed significantly from Mississippian times. Thus while the Commerce Quarry and Petroglyph site has been deflated generally, and the rock specifically, the petroglyph rock would not have spun around in place, but would have settled in place as rocks and gravel were washed from under it.

Equally intriguing, though not definitive, several large and well-known thirteenth- and fourteenth-century Mississippian towns might be depicted by the large dots or dot clusters on the rock-art panel. Possibly, these places or their cultural identities are even identified by one of the adjacent glyphs: the eye or ogee, bird, and moccasin motifs. The archaeological places possibly depicted include the Peter Bess, Lakeville, Sandy Woods, Hearnes, Crosno, Sikeston, East Lake, Mathews, and Towasahgy (i.e., Beckwith's Fort) sites in Missouri, and the Dogtooth Bend and Hale sites in Illinois. Also possible are several other correspondences: a gap in the meandering line, possibly also caused by erosional damage to the rock surface, might match to the location of the Commerce river crossing itself; the supposed moccasin print might be a representation of an actual geomorphological feature, an upland isolate next to the Lakeville site; and a short line segment on the Illinois side of the map might correspond to an old abandoned river channel today called Horseshoe Lake (see Koldehoff and Wagner 2002). Missing seems to be any indication of the Ohio River, although the rock is heavily eroded in this area.

Conclusion

An inference that the Commerce rock-art panel was a map is warranted by the specific elements and configuration of the panel itself, as well as by a series of locational associations. Of greatest importance is the meandering line, the dots, dot clusters, and dotted lines pecked onto the rock. Compared to many known Midwestern rock-art sites, these are anomalous. While not entirely comparable to known historic period indigenous cartographic conventions, the presence of multiple dot clusters and dotted lines at least hints at convention, a repeated means to represent locations and pathways, sometimes in association with possible place glyphs. In addition, the arrows, moccasin print, and deer tracks might connote directionality or travel along some pathway, similar to the indigenous maps of Mexico and North America.

Finally, the panel's location cannot be ignored. The Commerce panel is located on the west side of a low-water crossing point of the largest river in eastern North America. Huge quartzite boulders and a white-clay bank were prominently positioned along the river. Any wayfarer would have been certain to see them. Certainly, historic era Euroamerican travelers and traders stopped here, at Commerce, finding the location worthy of note. Additionally, Mississippian people appear to have extracted chunks of quartzite

from the location, this being the most obvious, abundant, and easily accessible spot in the Midwest to obtain both kaolin clay and the McNairy-formation silicified sediment for possible use in the manufacture of chunkey stones.

In short, the Commerce site is precisely the sort of place—and the petroglyph panel the type of nonportable storyboard—that we might expect was used to map Mississippian territories (O'Brien 1994). The Commerce site is situated on a most prominent natural feature jutting out into the river traveled by many throughout time. Moreover, the Commerce site is located between the narrower northern floodplain of the once-great Cahokian realm, before A.D. 1200, and the wide expanse of floodplain south of Tywappity Bottom with its post-1200 towns and high population density. Thebes Gap was, in a sense, a bottleneck in Mississippian geography and history and, for any number of reasons, a good place for American Indians to stop and locate themselves in space and time.

Notes

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[1] Wetting the rock and observing the lines, dots, and glyphs under low-angle light increases the contrast on the petroglyph-covered flat surface and was used by us to enhance our photo documentation efforts. After identifying those lines, dots, and petroglyphs of indisputably human origin, the images were mapped by overlaying a large sheet of clear acetate over the panel's flat surface and tracing the outline of the petroglyphs. Other possible pecked dots, dot patterns, and lines exist on the rock surface but are of uncertain origin.

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