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Bossier Revisited Again

Clarence Webb (1948) christened Bossier more than a half century ago. Its namesake was the northwestern Louisiana parish where several Bossier sites were located, but it could just as easily been named after Webster, Claiborne, Harrison, Columbia, or other political subdivisions in northwestern Louisiana, southwestern Arkansas, or eastern Texas where its distinctive pottery was found. This is Caddo country, linguistically and ethnically (Carter 1995; Perttula 1992; Swanton 1942; Webb and Gregory 1978). Bossier is the issue of Caddoan cultural tradition, a culmination of agents, practices, and histories that transpired in the Red River valley and adjoining Pineywoods hills between ca. A.D. 1300 and 1500 (McGimsey and van der Koogh 2001; Webb 1948, 1961, 1983; Webb and Gregory 1978; Webb and Jeane 1977).

Bossier is best known for its pottery (Webb 1948, 1961, 1983). Pottery hoists the load for this examination, but other factors such as presence or absence of mounds and relative geographic location help me contextualize Bossier pottery and contemplate Bossier materiality as the product of human minds and hands. I organize pottery data, new and old, by a simple arithmetic measure, an average index of similarity. I don't see how more robust statistical comparisons could do any better when data come from potsherds picked up from bare spots on the ground but not from underneath the pine straw.[1] Powerful statistics don't create powerful data. They don't create data at all.

I'll not be purveying data from all of Bossier Country, only the Pineywoods between the Red and Ouachita rivers in northern Louisiana (Figure 1). And I'll not be looking at all decorated Bossier pottery variations, only those six styles which Webb found to be most common on late prehistoric components in northwestern Louisiana: banded cross-hatched engraved, paneled brushed-incised, vertical ridged, linear punctated, multiple-line rim incised, and overall brushing (Figure 2). It would be easy enough to label these variations with their type names—Maddox Engraved, Pease Brushed-Incised, Belcher Ridged, Sinner Linear Punctated, Dunkin Incised (late variant), and Bossier Brushed—but such types equate representational material with bounded society (see Lyman et al. 1997), and I am hoping to show that Bossier is merely a name for many politically autonomous families and bands who interacted with each other in varying ways to varying degrees over several generations.

From old data and new analyses rises a new Bossier, more historical, better able to incorporate the materiality produced by neighboring Pineywoods peoples during a centuries-long, multi-generational span. In this sense, the new Bossier is really a history of a tradition and the peoples responsible for it. What can Bossier pottery tell us about these Pineywoods potters, especially their organization?

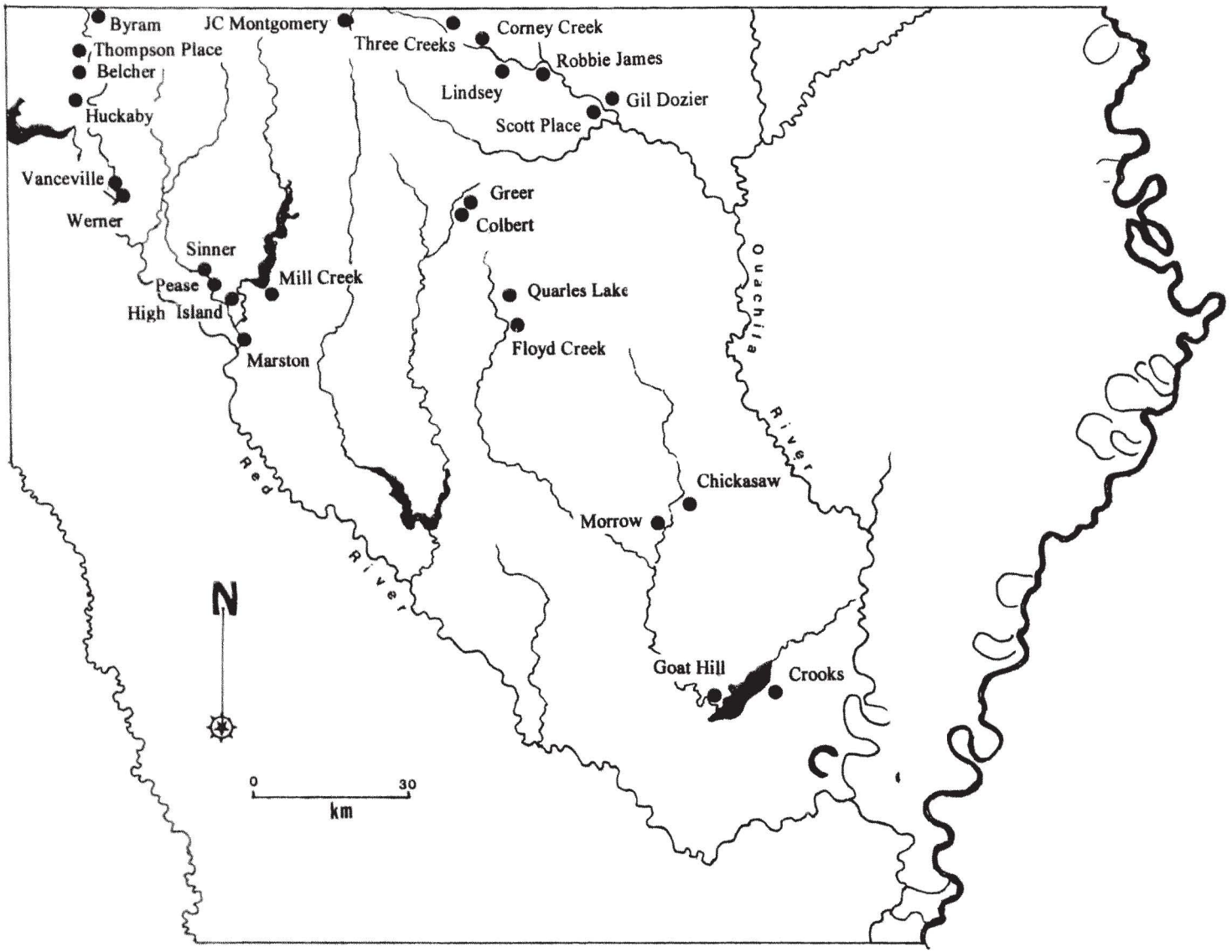

Figure 1. North Louisiana Pineywoods Bossier territory. Locations of sites discussed in text are shown.

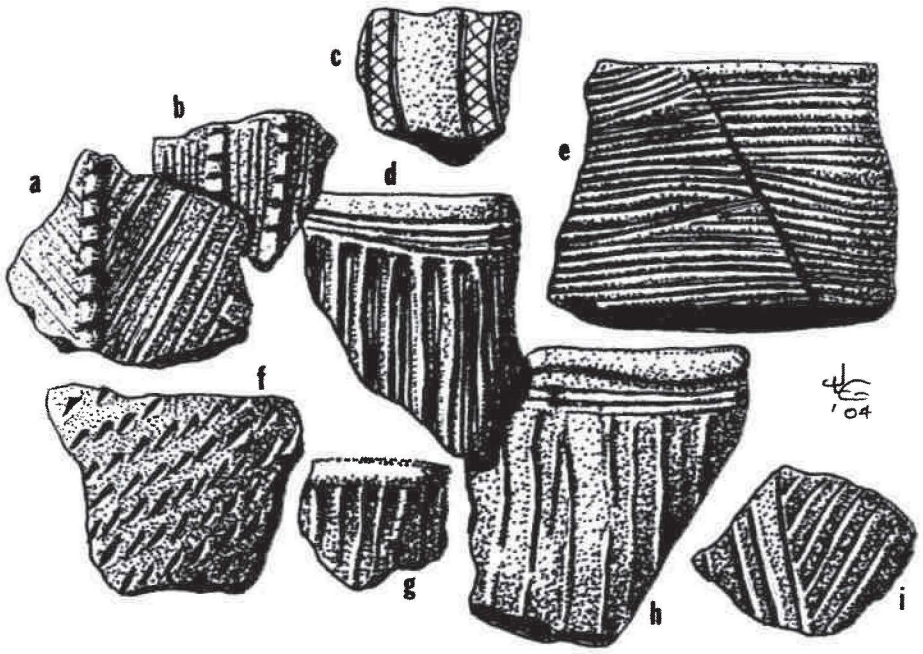

Figure 2. Diagnostic Bossier pottery styles: a-b, d, paneled brushed incised; c, banded cross-hatched engraved; e, overall brushing; f, linear punctated; g-h, vertical ridged; i, multiple-line incised. a-f, i, drawn from Webb 1983:Figure 3r, s, c, u, p, and l respectively; and f drawn from Webb 1983:Figure 2x ; h-i, drawn from Webb 1948:Plate 13, Nos. 2, 4. Pen and ink by Jon L. Gibson.

Associations and Similarities

I begin this comparison by selecting 16 Bossier components with decent-sized collections and representation in at least any four of the six "diagnostic" decorative categories (Table 1; Tables 1-4 are found at the end of this article; Gibson 1966; Gregory et al. 1989, 1990; Harty 1997; Johnson 1984; Webb 1948, 1983). Decent size is not a matter of magic numbers or hard-fast selection criteria. Greer, for example, has a decent-sized collection with only 31 pottery sherds, so is Werner Mound with 3,148 sherds. Here, ubiquity is as important as numbers. The selected sample includes sites from several major drainages across North Louisiana's interior hill country—some falling into Red River, others into Ouachita River (see Figure 1). Sample sites include: Chickasaw (16LA58), Colbert (16BI2), Corney Lake (16CL25), Floyd Creek (16WN218), Greer (16BI1), High Island (16BO16), Lindsey (16UN8), Marston (16RR2), Mill Creek (16BI9), J. C. Montgomery I (16WE32), Morrow's Pear Field (16LA65), Pease (16BO2), Quarles Lake (16JA21), Sinner (16BO3), Vanceville (16BO7), and Werner (16BO11).

My objective was to spot similar collections and explain how they got to be that way. I exhaustively compared the 16 sites by figuring out how much each site's collection deviated from cumulative, area-wide Bossier averages. First, I calculated percentages of each represented style for each site (see Table 1) and then figured cumulative averages for each of the six diagnostic styles by dividing by 16, the total number of sites in the sample (see Table 1). Next, percentages of each style at each site were subtracted from cumulative averages (Table 2), creating a profile for each site. Then, I compared profiles by pairing each site with every other site in the sample, subtracting their percentage deviations from area-wide cumulative averages, and totaling the differences (Table 3). The sums provide quantitative measures of similarities between each pair of sites, or numerical indices of similarity (Table 4). Because indices were generated from area-wide averages, they furnish a yardstick of site-to-site variability across North Louisiana's Pineywoods hills.

Take the index of 20, for example, the value derived by comparing Chickasaw with Morrow's Pear Field, two nearby sites located in the Castor Creek drainage on the southeastern edge of Bossier country (see Tables 3-4). This low value means that Chickasaw and Morrow's Pear Field are twice as similar as Morrow's Pear Field and Marston (index=42) and three times as similar as Morrow's Pear Field and Floyd Creek (index=60). Similarity between collections increases the closer an index comes to zero and decreases as indices get larger. An index of zero is a perfect fit, whereas one of 156, such as J. C. Montgomery versus Quarles Lake, is about as different as you can get and still have both assemblages warrant the Bossier name.

A further word of explanation is needed here. All these quantitative measures do is quantify differences and similarities; they point out patterns in the pottery. They do not say anything about what is responsible for the differences. I throw in a few more variables to see if I can pin down responsible agents and conditions more closely.

Comparisons reveal four statistically significant associations—groups of two or more relatively similar sites (see Table 4). One association involves the Pease, Sinner, and High Island sites (chi square=7.8, df=8); another, the Colbert and Greer sites (chi square=0.1, df=3); a third, the Morrow's Pear Field and Chickasaw sites (chi square=0.9, df=2), and the last, the Lindsey, Vanceville, and Werner sites (chi square=8.4, df=4). In the Pease-Sinner-High Island association, multiple-line horizontal rim incising prevails followed by a fair amount of paneled brushing-incising and horizontal ridging, and lesser amounts of brushing, curvilinear linear punctating, and banded cross-hatched engraving. Multiple-line horizontal rim incising also prevails in the Colbert-Greer association where it makes up three sherds out of five; brushing is next, followed by vertical ridging, curvilinear linear punctating, banded cross-hatched engraving, and lastly by paneled brushing-incising. In the Morrow's Pear Field-Chickasaw association, brushing predominates, followed by sizeable amounts of multiple-line horizontal rim incising and paneled brushing-incising. Other decorations are rare or missing altogether. Paneled brushing-incised predominates in the Lindsey-Vanceville-Werner association, closely followed by brushing. All other styles are minor.

In addition, several other comparisons produce fairly small indices. On the chance that they too comprised statistically significant associations, I ran contingency tests on them, but, alas, they all lacked statistical coherence. These comparisons include J. C. Montgomery I and Marston (chi square=174.4, df=5); Quarles Lake and Floyd Creek (chi square=64.4, df=4); Quarles Lake, Greer, and Colbert (chi square=34.5, df=6); and Corney Lake and Lindsey (chi square=26.0, df=3). Interestingly, Werner and Vanceville, which together with Lindsey constitute one of the four associations, do not produce a statistically significant association between themselves (chi square=36.2, df=3).

And then, there is Mill Creek. It stands off by itself, the most dissimilar site in the sample.

Locational Patterns

The findings—both the associations and the lack of them—are based strictly on statistical similarity (see Tables 3-4, also see chi square values embedded above). Location is not factored in, but when it is, interesting patterns emerge. The three coherent associations all involve nearby sites in the same drainage—Pease, Sinner, and High Island on lower Red Chute Bayou; Colbert and Greer on upper Black Lake Bayou; and Chickasaw and Morrow's Pear Field on middle Castor Creek. Only one association, Werner, Vanceville, and Lindsey, involves sites from separate stream basins. Still, I hasten to add that neither proximity nor being on the same or interconnected streams is a foolproof determinant of how similar their potteries are. Take Werner and

Vanceville, for example (Webb 1983). They are only a few kilometers apart on upper Willow Chute, yet their pottery assemblages—though generally similar—are statistically distinctive. Werner has more brushing and less multiple-line horizontal rim incising than Vanceville (Webb 1983: Tables 7 and 10), Yet, when Lindsey, a mound site on Corney Creek—a separate drainage—is brought into the comparison, the three sites together form a statistically significant association. Additionally, Quarles Lake and Floyd Creek, which are both located on Bayou Dugdemona, are not alike. Quarles Lake has more paneled-brushing-incising, linear punctating, and multiple-line horizontal rim incising than Floyd Creek (Gregory et al. 1989: Table 1; Gregory et al. 1990: Table 3). J. C. Montgomery I and Marston are on Bayou Dorcheat, and they have distinctive potteries. Marston has more vertical ridging, multiple-line horizontal rim incising, and less brushing than J. C. Montgomery I (Webb 1948:Table 2; Webb 1983:Table 3). Corney Lake and Lindsey are both on Corney Creek but are ceramically different. Corney Lake has more banded cross-hatched engraving, linear punctating, and multiple-line rim incising and less paneled brushing-incising and brushing than Lindsey (Harty 1997:136; James Harty, 2004 personal communication; Johnson 1984).

Nearly all inter-drainage comparisons, even between sites that are not that far apart as the crow flies, produce dissimilar assemblages (see Tables 3-4). For instance, Quarles Lake on Bayou Dugdemona is unlike Greer and Colbert on Black Lake Bayou. Quarles is also different from Chickasaw and Morrow's Pear Field on Castor Creek. Lindsey on Corney Creek does not resemble the Castor sites either, but intriguingly, it closely resembles Werner and Vanceville on Willow Chute, perhaps inculcating hidden history. If relative location is not fully responsible for Bossier ceramic variability, what is?

Time as Agent of Change

Could it have been time? Maybe for two nearby sites, one dating to the onset of Caddo III times, the other to its end, time might be an indirect factor. Consider Werner Mound and Vanceville. If Werner dates ca. cal. A.D. 1440 (two sigma range, A.D. 1300-1490), as the latest of its four radiocarbon dates indicates (Webb 1983: Table 11), and if Vanceville dates to cal. A.D. 1280 (two sigma range, A.D. 1185-1395), as the earliest of the five dates indicates (Girard 1992, 1996, 1997), then we can envision pottery styles gaining or losing popularity over the century and a half that possibly intervened.[2] But we cannot reconcile potential time differences by choosing dates we like and ignoring those we do not. Radiocarbon's standard errors do not support that kind of thinking.

J. C. Montgomery I is another dated site in our sample (Webb 1983:183-240; Webb and Jeane 1977:3-6). Its potteries are not closely associated with any other assemblage; ergo, its radiocarbon dates, which are either all too early or too late, cannot help us either (Webb 1983:Table 11). Scott Place Mounds (16UN8) has produced a date of cal. A.D. 1040-1300 (McGimsey and van der Koogh 2001), which is very close to the moment when distinctively Bossier tradition coalesced on Corney Creek, maybe even slightly before, but we don't have a collection to check out Scott's relationship with other Corney sites.

Regardless of what effect the passing years may have had on ceramic changes at individual sites, we can dispense with time as a primary factor associated with change because Bossier represents the gist of all pottery assemblages viewed over the long term. The social aggregation that was Bossier simply is more than the lifetime of one person or the duration of a single village. Wish as wish might, radiocarbon estimates simply will not allow us to work out a year-by-year or even decade-by-decade chronology for Bossier. The period is just too short, and radiocarbon dating too, well, too statistical.

Domestic or Political Economic Differences as Agents of Change: Mound Building and Public Gathering

If we cannot blame time, then what about domestic economic or political economic differences? What I am driving at is the possibility that field parties used different potteries than village people and that village people used different potteries than town people. Or the possibility that mound-top serving dishes differed from household cooking pots, that burial wares differed from domestic wares, or that china for the caddi differed from pots for the plebians? Jeffery Girard's (2002:56) discovery of distinctive sets of pottery at Three Creeks (16CL4)—engraved and red painted bowls and bottles on the slope of Mound B and brushed pots in the living area east of the mound-encircled plaza—opens up such possibilities.

A string of mound sites along Corney Creek might provide a good test case (see Figure 1). At the moment, ceramic data are inadequate, but it is interesting that the only two Corney collections compared so far, those from Corney Lake, a village without mounds, and Lindsey, a small mound center, are different—a finding compatible with the notion that activities relating to high ceremonialism and social inequality affected ceramic content. However, the Corney bottom sites are special in the Pineywoods world. Here, along a 50–km stretch are at least five mound sites, including one major mound complex (Girard 2000:65-76, 2003; Harty 1997:129-130). Robbie James (16UN87) and Gil Dozier (16UN37) have single platform mounds (Jones et al. 1992:36; Saunders 1992:15-16, 1993:35). Lindsey has two fairly large platforms, about 30 m square and 4 m high, set on an east-west line about 220 m apart (Harty 1997:125-142). Scott Place Mounds has five mounds, one large. flat-topped platform about 3.3 m high and 35 m square, and four small domes, all less than 1.3 m high and 23 m in diameter (Moore 1913:78-79; Saunders 1992, 1993).

The crown jewel on the Corney is Three Creeks, the northernmost of the known mound sites (Girard 2000:65-76, 2002:51-57, 2003). Its five mounds are set in a semi-elliptical arrangement overlooking the steep bank of Corney Creek (Figure 3; Girard 2000:Figure 24). The principal mound (Mound A) is the northernmost, a steep-sided flat-topped platform with a large summit plateau. It stands 4 m high and measures 60 m along its long axis (northwest by southeast) and 40 m along the short one. Coring disclosed its bulk was separated by four thin organic strata (Girard 2000:66 and Table 19), which could represent older, littered mound surfaces, loaded village midden fill, or, less likely, natural weathering of long-exposed mound tops. Proceeding clockwise around the ellipse, we encounter Mound B, a 2.25 m high flat-topped platform. Its base measures 30 by 40 m. It is not as steep-sided as Mound A, so its summit is correspondingly smaller. It lies only 26-28 m from Mound A, with its short side facing the sharp southeastern corner of Mound A. Coring reveals it was built in a single stage (Girard 2000:67 and Table 20). Next is Mound E, a 2.65 m high, 36 m square platform. Its summit plateau is smaller than Mound B's. An elongated apron extends off the southwestern corner suggesting, if it's not a natural or modern man-made feature, an artificial ramp leading toward Mound D. Like Mound E, Mound D is also 2.65 m high but its base is bigger, 45 by 50 m. The eastern, southern, and western sides are steep, but its northern side is gentler and actually bulges into the plaza, affording a wide ascent slope. Its flat top is bigger than Mound E's, but the sloping side distorts the shape of the summit, leaving it triangular instead of rectangular. The last mound in the ring is Mound C. It is the smallest of the five mounds, only 1.7 m high when viewed from the plaza side, but its western side coincides with the high bluff bank of Corney Creek, which makes it appear to tower over the cliff rim. It has been described as conical, but mapping shows that it is shaped more like an elongated triangle with its apex near the midpoint of its short bulging side. I do not see how erosion could have altered a dome into this curious shape and suspect that Mound C was built this way on purpose.

The plaza at Three Creeks is large, defined by the steep bluff bank of Corney Creek on the west and the encircling mounds everywhere else. It covers 7 hectares. Its level surface slopes gently, falling about 2 m from its higher end near Mound D to its lower end at Mound A.

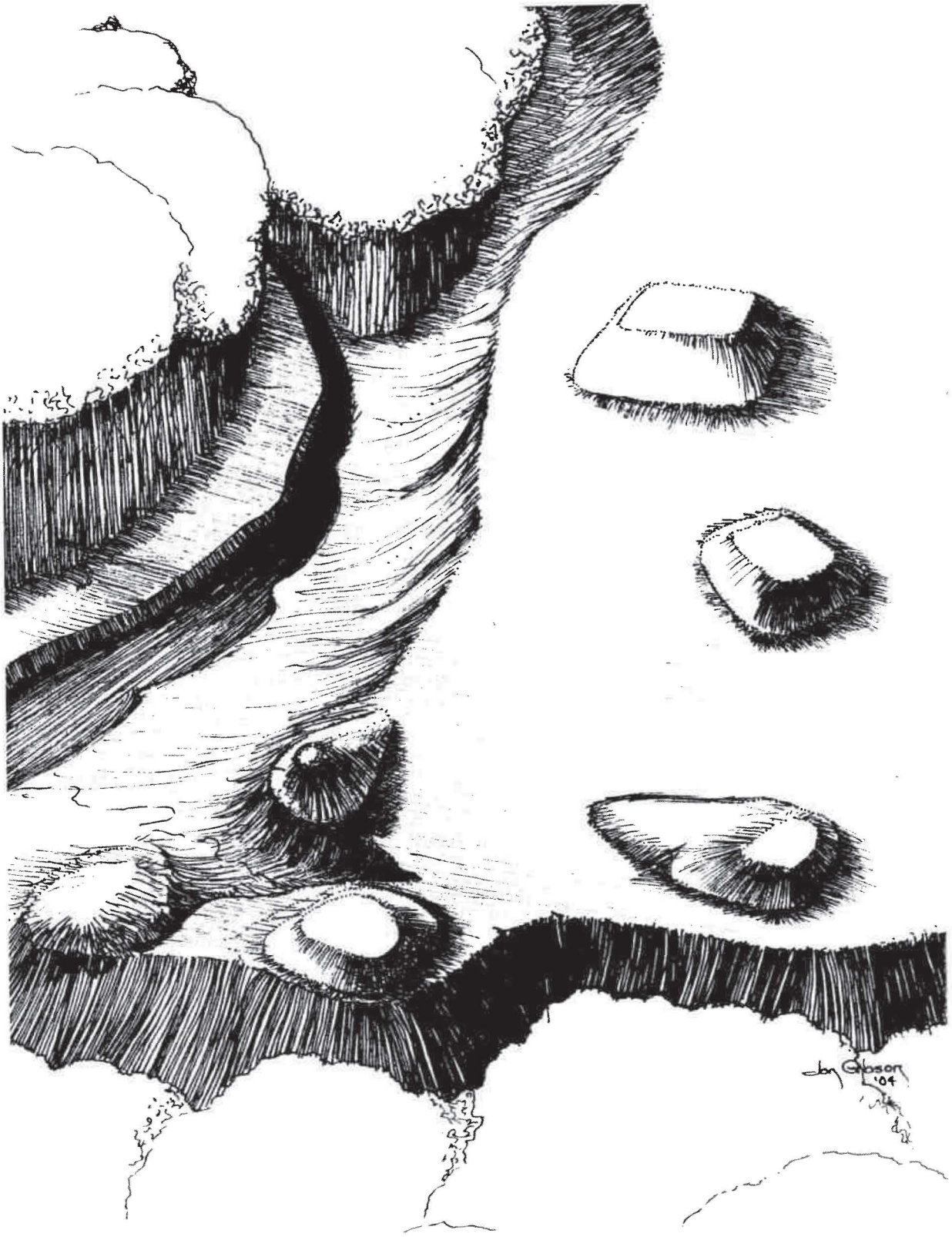

Figure 3. Bird's eye view of mound layout at Three Creeks (16CL4). Based on total station contour map engineered by Jeffrey Girard (2000:Figure 24). Pen and ink by Jon L. Gibson.

At first glance, it looks like the Corney mound sites and the Willow Chute sites of Vanceville and Werner Mound were the only places where Bossier folks built mounds, but Jeffery Girard (2004 personal communication) suspects that Bossier mound building was more extensive. He lists other possible Bossier mounds: i.e., Swan Lake Mound (16BO11), also on Willow Chute, and Thompson's Place Mound (16CD32) on Red River (Moore 1912:525), both with solitary mounds, as well as the Byram Ferry (16BO17) (Girard 2003:15-30; Moore 1912:525) and Huckaby (16CD31) sites on Red River, with two mounds each. He even pointed out that the early stage of Belcher Mound (16CD13) dated before A.D. 1500 and primarily contained Bossier pottery, not Haley materials (cf. Webb 1959). All these mounds, if indeed they are Bossier constructions, were not in the Pineywoods but down in the Red River floodplain, which was thought to be uninhabitable at the time because of flooding (Webb and Gregory 1978). Obviously, the Great Raft left a few sanctuaries here and there. But I gloss over mound sites in Red River Valley for two reasons—first, they are floodplain sites, and my story is about hill country sites, and, second, we do not know much about them.

To promote comparison with mound sites in the Pineywoods, I delve a bit deeper into two bottomland mound sites on Willow Chute. Vanceville Mound and Werner Mound are close enough to have seen the smoke from each other's fires on the horizon, yet they too are ceramically dissimilar (Webb 1983:Table 10). Both have been radiocarbon dated (Webb 1983:Table 11), but age estimates overlap, raising the bar for social influences on pottery composition. Vanceville is unusual simply because it has a mound, and a sizeable one at that, a rarity in Red River Bossierdom. Webb (1983:227) said the mound was surmounted by a building—a fire temple or a caddi's house?—which makes it like temple mounds elsewhere in the Southeast. But Werner Mound is more than unusual. Werner Mound was a big dirt pile raised over the remains of a burned or dismantled wooden building (Figure 4). There was no surrounding village, no burials in the mound, and mound fill was devoid of material remains (Webb 1983:217). Webb (1983:221) was assuredly right in claiming the mound was a memorial to the meaning of the place and the actions expended there. Werner Mound stood apart, all the more imposing in its solitude.

Yet, the mound was only an external covering for Werner's deepest secret. Underneath were remains of one of the biggest wooden buildings ever constructed by Bossier people, a great house (see Figure 4). Its outer wall formed a perfect circle, 25 m in diameter, except near the entrance, where it bulged out another 3 m. Inside was a thick center post surrounded by a second circle of posts, 14.4 m in diameter, which supported a heavy thatched roof. The entrance was narrow, just wide enough for a man's shoulders, and stuck out three arm spans past the eastern wall. Inside were several, small, walled-in cubby holes, one attached to the northern wall of the big room, a second fixed to the eastern side of the circle of roof supports and, after enlargement of the walls connected to the entranceway, a third, free-standing circular crib next to the door into the big room.

The floor was hard packed red clay. There were no interior furnishings except for two ash beds.

Materials from the floor vouch for the special nature of the building and the activities it housed. There were ony a handful of stone artifacts (Webb 1983:Table 8) but a substantial quantity of broken pottery, nearly two-thirds of which was decorated, mainly with brushing (Pease and Bossier types) (Webb 1983:Table 7). Webb claimed these were serving vessels—food was not prepared inside the great house but brought to those gathered there. Yet, the predominance of brushed pottery suggests that food was carried inside in the same pots it was cooked in, likely because they were bigger and there were many hungry mouths awaiting. The food wasn't bad, either—choice cuts of venison being the entree. Leftovers from eating were responsible for most of the trash inside; bone orts and smashed vessels littered the floor. Shell carving was the other main indoor trash-making activity. Scores of small, cut-and-drilled pieces of shell—rejects from making shiny ornaments—were scattered around the ash bed closest to the door.

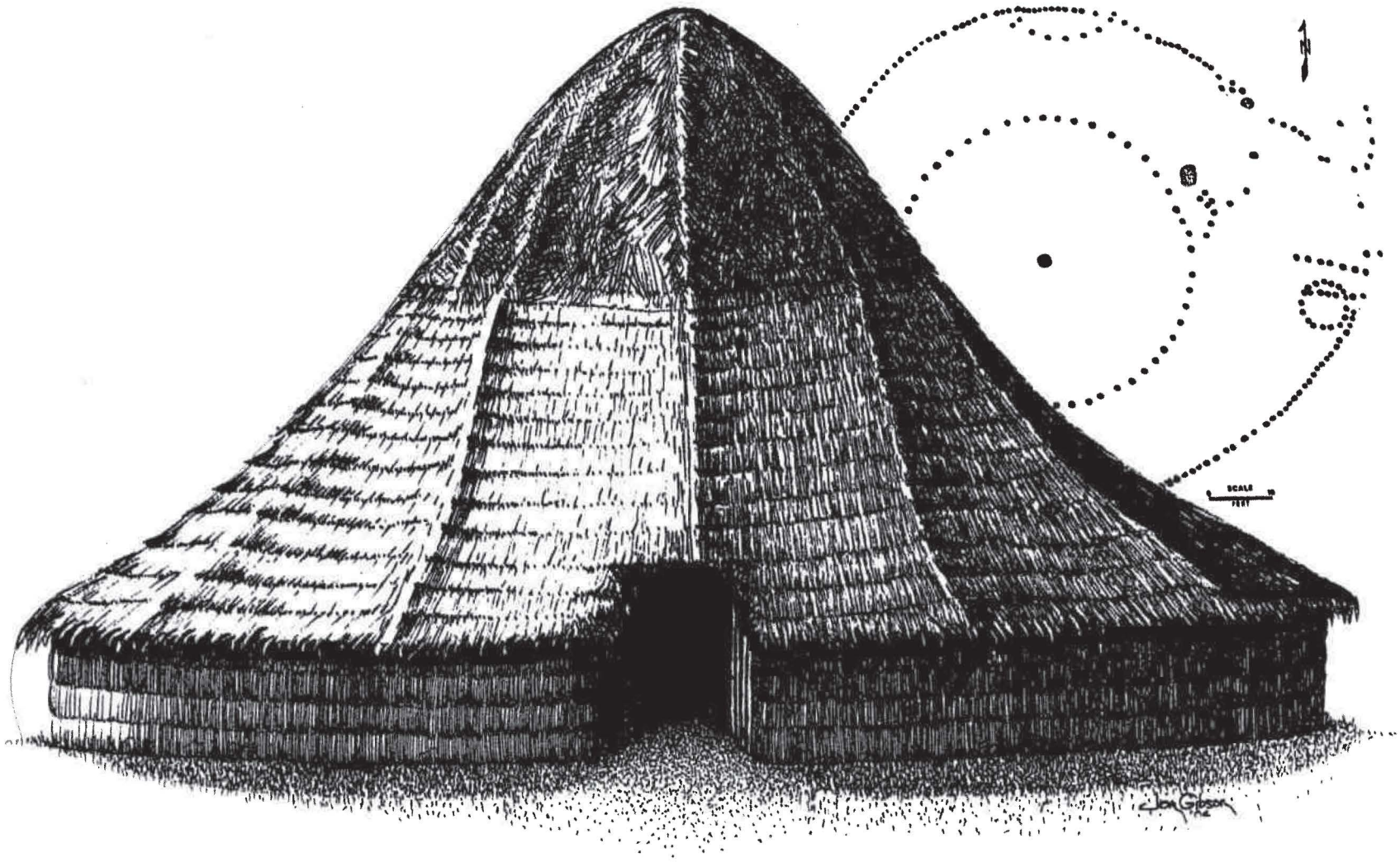

Figure 4. Werner great house. Reconstruction based on house plan (Webb 1983:Figure 10). Pen and ink by Jon L. Gibson.

Webb (1983:226) opined that the building was a ceremonial lodge, the residence of a caddi or a public council house (see Figure 4), presided over by a caddi, where food was catered to personages sitting there in the semi-darkness fathoming the great mysteries or meting out justice. I wonder if it might not have been the capitol house for the entire Red River Bossier nation, maybe a holy sanctuary for the Gran Xinesi himself (Griffith 1954), or an assembly house for warriors (Swanton 1942:149, 184), whose blood-curdling threats to do bodily harm to their enemies must have raised the rafters—perhaps, one of the reasons the lodge was out of earshot of wives and daughters.

Three Creeks is also unique in Bossierdom but in a completely different way than Werner. Three Creeks is a town zoned for residence and public service. Other Bossier sites, including those with one or two mounds or cemeteries, are villages or temporary campsites. Three Creek's five large mounds enclose a public plaza and are themselves encircled by residential zones of incompletely determined extent (Girard 2002). So, here there are public and sacred platforms surrounded by private and profane living areas, the traditional design for leveraging and displaying social inequalities all across the Southeast—raised stages for personages busied with ritual matters while on village grounds below ordinary folks carried on daily routine; the lower plane more befitting of their social station and birthright. The verticalness of the mounds expresses differences in rank and privilege. Narrow spaces on mound summits are accessible only to the special few, leaving the less-privileged masses with perpetual cricks in their necks and constant reminders in their psyches of just how important those few people really were who moved freely about on the mound tops. Yet, the enclosed central plaza, which is on the same plane as the village area, is of and for the public, a place where ordinary folk mix with those of high station during social gatherings—dances, feasts, ballgames, and other mixers. What inequalities mounds wrought, plazas overcome, at least for fleeting moments.

Randolph Widmer (2004) makes a strong argument for mounds being lineage monuments, built by or for lineages to validate their genealogy and memorialize their founders. As I contemplate Three Creeks, I find Widmer's elegant proposal compelling, but like most things in archeology, proving the case requires history that we simply do not have. Since I think the lineage and its inherent capacity for expanding family ties by creating collateral kin lies at the root of Bossier structure everywhere, not just at Three Creeks, I conclude this exercise by looking at what effects lineages would have had on Bossier ceramic similarities and differences. Before I get into that, let me give my conclusions first in case you are not convinced by the data and interpretations: Lineage structure is the primary shaper of Bossier materiality, territoriality, and sociality.

Bossier Tribal Sociality

Lineages mean tribes, and tribes are flexible means for organizing kin-based groups who live in a territory primarily defined by commonalities in identity, custom, language, ideology, cosmology, and, to varying degrees, history (Anderson 2002, 2004; O'Shea and Milner 2002:200; Fowles 2002:15). Tribes do not have strong central authority or control nor do they inculcate generationally persistent inequalities, other than those based on age, gender, and ability. Tribal coherence is provided by inter-group social interaction, participation in inter-group ceremonies and events, and, importantly, inter-marriage with other local groups, which creates collateral relatives and further broadens and strengthens ties among them (Fowles 2002:18). This intercourse serves to transfer information, which we archeologists pick up as similar pottery styles.

What makes me think Bossier sociality was tribal?

First, Bossier had a well-defined territory all of its own—the Pineywoods hills lying between the Red and Ouachita rivers. Just how much farther north and west Bossier territory extended, I do not know exactly, but this I know: Bossier lands did not cross the Ouachita to the east. They came close enough for scouts to have seen gar slapping their tails in the green waters below but not one foot farther (Gibson 1983:325-331; Gibson et al.1992; Kidder 1988, 1990). Throughout this 20,000 km^2 expanse, the only sites and materials from the time period are Bossier (Gibson et al. 1992). At least one Bossier site, Goat Hill (16LA26) (Gibson 1966:219-220), teeters on the banks of lower Little River, the gateway into lower Mississippi lands; its inhabitants may have even watched Plaquemine fishers going and coming on the river below their village. And a few brave but lost Bossier souls escaped high water atop Crooks Mound (16LA3), across Catahoula Lake from the mouth of Little River (Ford and Willey 1940).

As for common identity, we need look no further than the distribution of Bossier ceramics across this expanse. No matter whether north, south, east, west, or in the middle, Bossier pottery is Bossier pottery. There is no mistaking Bossier assemblages for those of any other cultural formation, at least, not in terms of the long-duration co-occurrence of its major diagnostic pottery styles. There seems to be some bleeding between Bossier and Plaquemine styles on the southern margins of Bossier lands (Ford 1951; Webb 1961), but that is simply a fact of life among small, not fully settled groups who lived fairly close to each other near the common border of their respective territories. It is not that their traditions were breaking down as much as it is miscegenation in the borderlands. Our typology makes it seem more blatantly political than the social dynamic of information exchange ever was.

North Louisiana hill country was practically devoid of natives when the first European explorers came looking for guides and translators (Perttula 1992; Swanton 1942), so we really do not know what language Pineywoods Bossier folks used, but materiality and sociality strongly depend on language—easily understood information transfers. So much so, in fact, that I am still agape by the goodness of fit I recently discovered between distinctive Plaquemine pottery clusters and language groupings in the lower Mississippi Valley (Gibson 2003). Since Red River Bossier people assuredly spoke a Caddoan dialect and were participants in the long Caddoan tradition (Webb and Gregory 1978; Webb 1948), I have no reason to doubt that Pineywoods Bossier groups were linguistically and ethnically Caddoan too.

Thus, it appears that territory, identity, and language—the primary defining factors of tribalism—were all coextensive, attesting to Pineywoods Bossier's tribal foundation.

I cannot stress enough that local communities, which participated in Bossier tribalism, drew on a common legacy in dealings with each other, especially communities living beyond daily face-to-face truck (O'Shea and Milner 2002:201). Yet, in the absence of an overriding central authority, local groups kept their autonomy—they set homeland boundaries, mapped onto familiar resources, and carved out their own unique identities within the broader, ever-changing tribal structure. Against this backdrop, variability in material culture prevails, especially in the details. For pottery, we are talking about distinctive attributes, not broad themes of decoration and technology (O'Shea and Milner 2002:213), which are carried far and wide and through the generations by traditionally established, long-lasting interaction rates. It is the breadth of territory and centuries-long duration of Bossier that best exemplifies Bossier tribalism.

Generally similar but locally distinctive patterning is precisely what my analysis detects in Bossier ceramics on the broad scale. Too bad we do not have ample attributes in hand to analyze assemblages on a more detailed level; until we do we are going to have to be content using proportional assemblage profiles as interim surrogates.

Letting Your Babies Grow Up to Be Bossierites

What makes tribalism inherently expansive but organizationally and structurally fragile is baby making (Widmer 2004), and many things go into making babies. Kinship is one. Kinship among the ethnic Caddo of the seventeenth century and later was lineage/clan-based (Parsons 1941; Swanton 1942). Lineages assuredly did not start with the coming of the White Man but had been around for a while, certainly long enough to have been a main organizing principle for Bossier communities at least a couple of centuries before. Caddo peoples used the same terms of reference for certain collateral and blood relatives of the same generation, which indicates that they viewed these terminologically merged relatives as holding similar and familiar positions—positions warranted only when both sets of relatives live in the same village (Widmer 2004). Widmer makes the case that it requires a consistently high birth rate—mothers need to let four of their babies grow up to be Bossierites and make babies of their own—for lineage-based systems to maintain and reproduce themselves. Otherwise, lineages will revert to clans, or if their demographic and economic support is yanked out from under them, their members even may forego co-residence and wind up emphasizing nuclear family relationships. The bottom line: It takes a goodly number of people and favorable economic conditions to make lineage-based kinship work for long.

But what does tribal structure—the lineage in particular—have to do with Bossier materiality, especially the sharing of pottery styles and composition of assemblages across the Pineywoods? Simply this: incest taboos ensure that marriages in small autonomous groups must, at some point, take place between men and women from separate groups, a compact that brings together two formerly separate families to form a new corporate arrangement. This is the only way for small autonomous groups to produce collateral kin, and between-group marriage ensures steady movement of people between communities, spreading Bossier gospel like the wind in the pines.

Proximity and local history are the primary factors behind the geographic extent of Bossier marriages. We can fully expect more marriages between friendly neighboring groups than between disliked neighbors or strangers, at least at first. Yet, in face of a stable or declining population, marriages would become progressively more distant. In a growing population, they would continue to be localized. What effects would these marriages have had on pottery distribution? That, too, seems relatively straight forward: There would be look-alike assemblages on the local level with similarities (associations) becoming more attenuated with increasing distance. Thus, associations, tight or attenuated, and their relative locations ought to give us the geography of Bossier interaction, the shape of Bossier history.

The Ceramic Shape of Pineywood Bossier History

I discovered four highly-associated ceramic associations, or clusters: the middle Castor Creek cluster, the lower Red Chute cluster, the upper Black Lake Bayou cluster, and the Willow Chute-Corney Creek cluster. The Castor Creek cluster from the southeastern corner of Bossier country, close to hard-line Plaquemine territory, is not really very closely associated with the other clusters or even nearby components. Its closest associations are with Corney Lake on Corney Creek and Floyd Creek on Bayou Dugdemona, and its most attenuated are with the lower Red Chute cluster, Mill Creek near Lake Bistineau, and Quarles Lake next door on Bayou Dugdemona (see Table 3). Interestingly, the negative relationship with Quarles Lake in the neighboring Dugdemona drainage is quantitatively higher than any of the others.

The lower Red Chute cluster is most similar to the upper Black Lake Bayou cluster and to Marston on Loggy Bayou, the issue of Lake Bistineau, and Corney Lake (see Table 3). Similarity with Marston is anticipated because Marston and the lower Red Chute sites are not that far apart on interconnected streams. Additionally, the

lower Red Chute and upper Black Lake Bayou clusters, while located in different but adjoining and paralleling drainages, are more similar to each other than either is to the middle Castor cluster (see Table 3). The similarity with Corney Lake, however, is unexpected because Red Chute ultimately discharges into the Red River, while Corney Creek, a major tributary of Bayou D'Arbonne, drains into the Ouachita River. These sites are on opposite sides of the Red-Ouachita drainage divide. The lower Red Chute cluster is most unlike the Willow Chute sites of Werner and Vanceville, even though Willow Chute runs into Red Chute some 35 km north of Sinner, the northernmost component of the lower Red Chute cluster (see Table 3). The lower Red Chute cluster is also distinctive from nearby Mill Creek and distant Chickasaw, but not as much as from Werner and Vanceville (see Table 3). Mill Creek figures as one of the most distinctive components compared to all four clusters.

The upper Black Lake Bayou cluster is not only similar to the lower Red Chute cluster but is actually more similar to the Dugdemona sites of Quarles Lake and Floyd Creek, as well as distant Corney Lake (see Table 3). That is strange, too, because the two Dugdemona sites, Quarles Lake and Floyd Creek, are not at all alike. The upper Black Lake Bayou cluster is most unlike Werner, then Vanceville, followed by J. C. Montgomery I on Bayou Dorcheat, one drainage farther west, and then the odd-ball again, Mill Creek (see Table 3). Actually, as the crow flies, the headwaters of Black Lake Bayou are not far from the headwaters of Bayou Dugdemona, but Corney Creek is on the other side of the Red-Ouachita drainage divide.

The Werner-Vanceville-Lindsey association is not really similar to any other cluster. Its closest similarities, though very faint, are with components scattered across different watersheds—Marston on Loggy Bayou, Montgomery on Bayou Dorcheat, and Morrow's Pear Field on lower Bayou Castor—seemingly serendipitous resemblances (see Table 3). The Werner-Vanceville-Lindsey association is most unlike Greer on upper Black Lake Bayou and Quarles Lake on Bayou Dugdemona (see Table 3).

These four clusters are the only statistically viable associations among the 16 sample sites, but I provide the associative strengths among all the sites (see Tables 3-4). Table 4 harbors the broad picture of Bossier ceramic relations. Just one technical note: the table provides a quantitative measure of the overall affinity of each site for all others, and the bigger the value, the more distinctive the site—a scale of measured similarity or, if you prefer, of contrariety (see Table 4). Quarles Lake is the kingpin, the site most unlike all the rest; Floyd Creek is on the opposite end of the scale, the site most like others. Strange indeed considering Quarles Lake and Floyd Creek are both on Bayou Dugdemona!

The measured strengths of similarities and differences in Bossier pottery assemblages inculcate Bossier tribalism and its lineage structure. I could not have asked for a better demonstration. The most highly correlated clusters typically are confined to small localities within the same drainage, and these statistical groupings most likely correspond to largely autonomous tribal segments, loose, local multi-village networks, which provide the spousal pool necessary for lineage creation, maintenance, and reproduction. Mid-level similarities closely parallel increased distances between sites indicating more distant marriages and less intensive or more sporadic interactions—feasts, ballgames, and other occasions. Yet, even at these greater distances of 35 to 50 km or more, Bossier potteries retain recognizably traditional styles. It is assemblage proportions that differ, which reverberates once more with local freedom and autonomy—tribal segments sitting proudly on their little own piece of land, doing things when and how they want, the way they want within general conventions of identity and good taste. Even the most dissimilar components are just more of the same, except that they are farther apart and less likely to have had direct interactions.

It is likely that Bossier population fell on the cusp of demographic requirements for creating and sustaining a viable lineage organization (Widmer 2004), sometimes numbers were adequate, sometimes not. Where

population dipped too low to grow lineages, it is reasonable to assume that those people got pulled into the expanding lineages of neighboring groups. Such absorption could explain the apparent "vacant lands," as well as the varying degrees of correlation among ceramics. Confinement of highly correlated clusters to single drainage basins is a fact of life among pedestrian tribal peoples living in a hilly terrain dissected by unconnected streams, most of which were too snaggy and blocked by fallen timber to have floated canoes anyway. It is also a pedestrian fact that sites from the most distant or hardest-to-get-to corners of Bossier country tend to have the most loosely associated pottery assemblages, but there are exceptions.

Bossier tribalism is not upturned by the presence of mounds in the Red River floodplain. They can be seen as ceremonial centers servicing one or more nearby communities; the best warrant for mutual ceremonial participation being the office of Xinesi, a sacred position held by a widely respected and feared demigod. Village-less mounds, as well as one- and, more particularly, two-mound villages further advocate multi-community engagement in ceremonial affairs, but joint ceremonialism does not detract from elemental tribalism. If anything, it provides social glue, especially in a locality where population was rather sparse, scattered, and probably declining.

Corney Creek, on the other hand, supports a community of a different stripe. Five mound villages within a 50 km stretch might, at first glance, seem no different than along Red River, but two of those villages, Three Creeks and Scott Place Mounds, have five mounds each, and Three Creeks is a super center, its imposing earthworks incorporating more moved dirt and hard work than the rest of the Corney Creek sites put together. The fact that the two biggest centers are on opposite ends of the Corney bottom leads me to suspect that they were rival centers, which vied for supporters among out-of-town neighbors—each becoming a loose, open-ended network of folks bound together by marriages, collateral kin ties, and collective participation in mound building and other center rituals. If, five lineages vied for dominance in these towns, then socio-political organization is fundamentally different from the happy ceremonial collective on Red River. It looks like Three Creeks and its chief competitor, Scott Place Mounds, managed to engender a centralized grip on some aspects of their respective community organizations, likely through aggrandizing actions of certain well-positioned and charismatic lineage heads. Held together by lineages but constantly tugged at by competitive struggles to rise to the top of their social and political world, Corney peoples organized their lives around their politics, while the rest of the Bossier world marched to a less politicized cadence. There is rich history on the Corney, including a long tradition of mound building that reaches back before Hedgepeth and Watson Brake, but the Corney story awaits telling another day.

Notes

1. Jeffrey Girard performed a multiple dimension scaling analysis of the data presented in Table 4 in order to see graphically how well the sites clustered. He writes, "fits your discussion well" (Jeffery Girard, 2004 personal communication).

2. Girard believes time is the primary factor behind ceramic differences. He has generously shared his advance thinking on this matter, which results largely from his on-going work with new collections from Vanceville and more than three dozen other sites on Willow Chute. I should let Jeff give the details but the crucible of his thinking is that sites like Colbert and Greer are early Bossier components; Sinner, Pease, and High Island are Middle Bossier, and Mill Creek (and perhaps Marston) is Late Bossier. He does not buy the idea that proportional differences in stylistic categories represent different social groups—which is my underlying assumption—and instead proposes that subtle differences in design elements carry greater weight; he opines:

"My thinking has been that quantitative approaches...are better for looking at continuous temporal change; and qualitative approaches will yield better information about social variation" (Jeffrey Girard, 2004 personal communication). What I failed to make clear was that my analysis was first qualitative before it turned to number crunching. I purposely eliminated all "earlier" Coles Creek and "later" engraved styles from represented collections—the very elements Jeff cites as time-sensitive. Why? I wanted to concentrate on those widespread styles that form Bossier's ceramic core, the representational heart of Bossier tradition, the markers of Bossier identity. My belief is that a broad-brush qualitative-quantitative analysis like the one herein is more likely to expose broad-scale social differences, such as tribal identity and its formational history, while a refined attribute analysis is likely to expose small-scale differences, such as those related to individual potters, individual families, or small co-resident collectivities within tribes.

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Table 1. Sherd frequencies of diagnostic pottery styles from 16 Bossier components in North Louisiana. Frequencies, straight-up; percentages in parentheses.

SITES	X-hatch engraved	Brushed-incised	Ridged	Linear punctated	Rim incised	Brushed	TOTAL
Chickasaw	0	6 (13)	1 (2)	0	13 (29)	25 (56)	45
Colbert	6 (6)	4 (4)	8 (8)	7 (7)	59 (61)	13 (13)	97
Corney L.	7 (9)	8 (10)	0	7 (9)	32 (40)	27 (33)	81
Floyd C.	1 (1)	21 (17)	10 (8)	3 (2)	63 (50)	28 (22)	126
Greer	1 (3)	1 (3)	3 (10)	2 (6)	20 (65)	4 (13)	31
High Is.	3 (3)	18 (20)	18 (20)	2 (2)	37 (42)	10 (11)	88
Lindsey	4 (8)	21 (40)	0	0	6 (12)	21 (40)	52
Marston	26 (2)	246 (23)	295(28)	18 (2)	125(12)	352 (33)	1062
Mill Creek	8 (3)	36 (11)	160 (51)	7 (2)	38 (12)	66 (21)	315
Montgo I	10 (1)	275 (25)	216 (20)	78 (7)	14 (1)	508 (46)	1101
Morrow	1 (2)	9 (20)	0	0	13 (30)	21 (48)	44
Pease	7 (2)	72 (23)	58 (18)	17 (5)	138 (43)	31 (10)	323
Quarles	8 (3)	31 (10)	9 (3)	14 (5)	237 (77)	7 (2)	306
Sinner	6 (2)	62 (22)	40 (14)	28 (10)	125 (44)	23 (8)	284
Vanceville	6 (3)	84 (47)	5 (3)	1 (1)	18 (10)	65 (36)	179
Werner	223 (7)	1399(44)	34 (1)	88 (3)	28 (1)	1376(44)	3148
TOTAL AVG*	317 (4)	2293 (31)	186 (12)	6 (4)	530 (13)	424 (35)	7282 (99)

*Column totals divided by 16, the total number of sites in sample, gives area-wide average for each style

Table 2. Deviations of individual sites from area-wide averages. Numbers represent cell averages of styles at individual sites subtracted from area-wide averages. All averages taken from Table 1.

SITES	X-hatched engraved	Brushed-Incised	Ridged	Linear Punctated	Rim Incised	Brushed
Chickasaw	-4	-18	-10	-4	+16	+21
Colbert	+2	-27	-4	+3	+48	-22
Corney Lake	+5	-21	-12	+5	+27	-2
Floyd Creek	-3	-14	-4	-2	+37	-13
Greer	-1	-28	-2	+2	+52	-22
High Island	-1	-11	+8	-2	+29	-24
Lindsey	+4	+9	-12	-4	-1	+5
Marston	-2	-8	+16	-2	-1	-2
Mill Creek	-1	-20	+39	-2	-1	-14
Montgomery	-3	-6	+8	+3	-12	+11
Morrow	-2	-11	-12	-4	+17	+13
Pease	-2	-8	+6	+1	+30	-25
Quarles	-1	-21	-9	+1	+64	-33
Sinner	-2	-9	+2	+6	+31	-27
Vanceville	-1	+16	-9	-3	-3	+1
Werner	+3	+13	-11	-1	-12	+9

Table 3. Exhaustive comparison of style average differences from North Louisiana Bossier sites. Every site is compared with every other site in the sample.* Values are taken from Table 2.

SITE	Compare	XHat	BruIn	Rid	LinPu	Inc	Bru	Index
Chickasaw		-4	-18	-10	-4	+16	+21	
	Colbert	+2	-27	-4	+3	+48	-27	
		6	9	6	7	32	43	103
	Corney	+5	-21	-12	+5	+27	-2	
		9	3	2	9	11	23	57
	Floyd	-3	-14	-4	-2	+37	-13	
		1	4	6	2	21	34	68
	Greer	-1	-28	-2	+2	+52	-22	
		3	10	8	6	36	43	106
	High Island	-1	-11	+8	-2	+29	-24	
		3	7	18	2	13	45	88
	Lindsey	+4	+9	-12	-4	-1	+5	
		8	27	2	0	17	16	70
	Marston	-2	-8	+16	-2	-1	-2	
		2	10	26	2	17	23	80
	Mill Creek	-1	-20	+39	-2	-1	-14	
		3	2	49	2	17	35	108
	Montgomery	-3	-6	+8	+3	-12	+11	
		1	12	18	7	28	10	76
	Morrow	-2	-11	-12	-4	+17	+13	
		2	7	2	0	1	8	20
	Pease	-2	-8	+6	+1	+30	-25	
		2	10	16	5	14	46	93
	Quarles Lake	-1	-21	-9	+1	+64	-33	
		3	3	1	5	48	54	115
	Sinner	-2	-9	+2	+6	+31	-27	
		2	9	12	10	15	48	96
	Vanceville	-1	+16	-9	-3	-3	+1	
		3	34	1	1	19	20	78
	Werner	+3	+13	-11	-1	-12	+9	
		7	31	1	3	28	12	82

*Negative numbers are avoided by simply dropping the minus signs after subtracting each site's signed values from Chickasaw's signed values. Chickasaw's values are only given once at the top of the table, and all other sites' values are subtracted from Chickasaw's. The sum of the differences are given in the column on the far right providing a quantitative measure of similarity between the paired sites.

Key to abbreviations: XHat, Cross-Hatched Engraved; BruIn, Brushed-Incised; Rid, Ridged; LinPu, Linear Punctated; Inc, Rim Incised; Bru, Brushed.

Table 3. *(Continued)*

SITE	Compare	XHat	BruIn	Rid	LinPu	Inc	Bru	Index
Colbert		+2	-27	-4	+3	+48	-22	
	Corney	+5	-21	-12	+5	+27	-2	
		3	6	8	2	21	20	60
	Floyd	-3	-14	-4	-2	+37	-13	
		5	13	0	5	11	9	43
	Greer	-1	-28	-2	+2	+52	-22	
		3	1	2	1	4	0	11
	High Island	-1	-11	+8	-2	+29	-24	
		3	16	12	5	19	2	57
	Lindsey	+4	+9	-12	-4	-1	+5	
		2	36	8	7	49	27	129
	Marston	-2	-8	+16	-2	-1	-2	
		4	19	20	5	49	20	117
	Mill Creek	-1	-20	+39	-2	-1	-14	
		3	7	43	5	49	8	115
	Montgomery	-3	-6	+8	+3	-12	-11	
		5	21	12	0	60	11	109
	Morrow	-2	-11	-12	-4	+17	+13	
		4	16	8	7	31	35	101
	Pease	-2	-8	+6	+1	+30	-25	
		4	19	10	2	18	3	56
	Quarles Lake	-1	-21	-9	+1	+64	-33	
		3	6	5	2	16	11	43
	Sinner	-2	-9	+2	+6	+31	-27	
		4	18	6	3	17	5	53
	Vanceville	-1	+16	-9	-3	-3	+1	
		3	43	5	6	51	23	131
	Werner	+3	+13	-11	-1	-12	+9	
		1	40	7	4	60	31	143
Corney		+5	-21	-12	+5	+27	-2	
	Floyd	-3	-14	-4	-2	+37	-13	
		8	7	8	7	10	11	51
	Greer	-1	-28	-2	+2	+52	-22	
		6	7	10	3	25	20	71
	High Island	-1	-11	+8	-2	+29	-24	
		6	10	20	7	2	22	67
	Lindsey	+4	+9	-12	+4	-1	+5	
		1	30	0	1	28	7	67
	Marston	-2	-8	+16	-2	-1	-2	
		7	13	28	7	28	0	83
	Mill Creek	-1	-20	+39	-2	-1	-14	
		6	1	51	7	28	12	105
	Montgomery	-3	-6	+8	+3	-12	-11	

Table 3. *(Continued)*

SITE	Compare	XHat	BruIn	Rid	LinPu	Inc	Bru	Index
		8	15	20	2	39	9	93
	Morrow	-2	-11	-12	-4	+17	+13	
		7	10	0	9	10	15	51
	Pease	-2	-8	+6	+1	+30	-25	
		7	13	18	4	3	23	68
	Quarles Lake	-1	-21	-9	+1	+64	-33	
		6	0	3	4	37	31	81
	Sinner	-2	-9	+2	+6	=31	-25	
		7	12	14	1	4	25	63
	Vanceville	-1	+16	-9	+3	-3	+1	
		6	37	3	2	30	3	81
	Werner	+3	+13	-11	-1	-12	+9	
		2	34	1	6	39	11	93
Floyd		-3	-14	-4	-2	+37	-13	
	Greer	-1	-28	-2	+2	+52	-22	
		2	14	2	4	15	9	46
	High Island	-1	-11	+8	-2	+29	-24	
		2	3	12	0	8	11	36
	Lindsey	+4	+9	-12	-4	-1	+5	
		7	23	8	2	38	18	96
	Marston	-2	-8	+16	-2	-1	-2	
		1	6	20	0	38	11	76
	Mill Creek	-1	-20	+39	-2	-1	-14	
		2	6	43	0	38	1	90
	Montgomery	-3	-6	+8	+3	-12	+11	
		0	8	12	5	49	24	98
	Morrow	-2	-11	-12	-4	+17	+13	
		1	3	8	2	20	26	60

Table 3. *(Continued)*

	Pease	-2	-8	+6	+1	+30	-25	
		1	6	10	3	7	12	39
	Quarles Lake	-1	-21	-9	+1	+64	-33	
		2	7	5	3	27	20	64
	Sinner	-2	-9	+2	+6	+31	-27	
		1	5	6	8	6	14	40
	Vanceville	-1	+16	-9	-3	-3	+1	
		2	30	5	1	40	14	92
	Werner	+3	+13	-11	-1	-12	+9	
		6	27	7	1	49	22	112
Greer		-1	-28	-2	+2	+52	-22	
	High Island	-1	-11	+8	-2	+29	-24	
		0	17	10	4	23	2	56
	Lindsey	+4	+9	-12	-4	-1	+5	
		5	37	10	6	53	27	138
	Marston	-2	-8	+16	-2	-1	-2	
		1	20	18	4	53	20	116
	Mill Creek	-1	-20	+39	-2	-1	-14	
		0	8	41	4	53	8	114
	Montgomery	-3	-6	+8	+3	-12	+11	
		2	22	10	1	64	33	132
	Morrow	-2	-11	-12	-4	+17	+13	
		1	17	10	6	35	35	104
	Pease	-2	-8	+6	+1	+30	-25	
		1	20	8	1	22	3	55
	Quarles Lake	-1	-21	-9	+1	+64	-33	
		0	7	7	1	12	11	38
	Sinner	-2	-9	+2	+6	+31	-27	
		1	19	4	4	21	5	54
	Vanceville	-1	+16	-9	-3	-3	+1	
		0	44	7	5	55	23	134
	Werner	+3	+13	-11	-1	-12	+9	
		4	41	9	3	64	31	152

Table 3. *(Continued)*

SITE	Compare	XHat	BruIn	Rid	LinPu	Inc	Bru	Index
High Island		-1	-11	+8	-2	+29	-24	
	Lindsey	+4	+9	-12	-4	-1	+5	
		5	20	20	2	30	29	106
	Marston	-2	-8	+16	=2	-1	-2	
		1	3	8	0	30	22	64
	Mill Creek	-1	-20	+39	-2	-1	-14	
		0	0	31	0	30	10	80
	Montgomery	-3	-6	+8	+3	-12	+11	
		2	5	0	5	41	35	88
	Morrow	-2	-11	-12	-4	+17	+13	
		1	0	20	2	12	37	72
	Pease	-2	-8	+6	+1	+30	-25	
		1	3	2	3	1	1	11
	Quarles Lake	-1	-21	-9	+1	+64	-33	
		0	10	17	3	35	9	74
	Sinner	-2	-9	+2	+6	+31	-27	
		1	2	6	8	2	3	22
	Vanceville	-1	+16	-9	-3	-3	+1	
		0	27	17	1	32	25	102
	Werner	+3	+13	-11	-1	-12	+9	
		4	24	19	1	41	33	122

SITE	Compare	XHat	BruIn	Rid	LinPu	Inc	Bru	Index
Lindsey		+4	+9	-12	-4	-1	-5	
	Marston	-2	-8	+16	-2	-1	-2	
		6	17	28	2	0	3	56
	Mill Creek	-1	-20	+39	-2	-1	-14	
		5	29	52	2	0	9	97
	Montgomery	-3	-6	+8	+3	-12	+11	
		7	15	20	7	11	16	76
	Morrow	+2	-11	-12	-4	+17	+13	
		2	20	0	0	18	18	56
	Pease	-2	-8	+6	+1	+30	-25	
		6	1	18	5	31	20	81
	Quarles Lake	-1	-21	-9	+1	+64	-33	
		5	30	3	5	65	28	136

Table 3. *(Continued)*

SITE	Compare	XHat	BruIn	Rid	LinPu	Inc	Bru	Index
	Sinner	-2	-9	+2	+6	+31	-27	
		6	18	10	10	32	22	136
	Vanceville	-1	+16	-9	-3	-3	+1	
		5	7	3	1	2	6	24
	Werner	+3	+13	-11	-1	-12	+9	
		1	4	1	3	11	14	34
Marston		-2	-8	+16	-2	-1	-2	
	Mill Creek	-1	-20	+39	-2	-1	-14	
		1	12	23	0	0	12	48
	Montgomery	-3	-6	+8	+3	-12	+11	
		1	2	8	5	11	13	40
	Morrow	-2	-11	-12	-4	+17	+13	
		0	3	4	2	18	15	42
	Pease	-2	-8	+6	+1	+30	-25	
		0	0	10	3	31	23	67
	Quarles Lake	-1	-21	-9	+1	+64	-33	
		1	13	25	3	65	31	138
	Sinner	-2	-9	+2	+6	+31	-27	
		0	1	14	8	32	25	80
	Vanceville	-1	+16	-9	-3	-3	+1	
		1	24	25	1	2	3	56
	Werner	+3	+13	-11	-1	-12	+9	
		5	21	27	1	11	11	76
SITE	Compare	XHat	BruIn	Rid	LinPu	Inc	Bru	Index
Mill Creek		-1	-20	+39	-2	-1	-14	
	Montgomery	-3	-6	+8	+3	-12	+11	
		2	14	31	5	11	25	88
	Morrow	-2	-11	-12	-4	+17	+13	
		1	9	51	2	18	27	108
	Pease	-2	-8	+6	+1	+30	-25	
		1	12	33	3	31	11	91
	Quarles Lake	-1	-21	-9	+1	+64	-33	
		0	0	48	3	65	19	135
	Sinner	-2	-9	+2	+6	+31	-27	
		1	11	37	8	32	13	102
	Vanceville	-1	+16	-9	-3	-3	+1	
		0	36	48	1	2	15	102
	Werner	+3	+13	-11	-1	-12	+9	
		4	33	50	1	11	23	122

Table 3. *(Continued)*

SITE	Compare	XHat	BruIn	Rid	LinPu	Inc	Bru	Index
Montgomery		-3	-6	+8	+3	-12	+11	
	Morrow	-2	-11	-12	-4	+17	+13	
		1	5	20	7	29	2	64
	Pease	-2	-8	+6	+1	+30	-25	
		1	2	2	2	42	36	85
	Quarles Lake	-1	-21	-9	+1	+64	-33	
		2	15	17	2	76	44	156
	Sinner	-2	-9	+2	+6	+31	-27	
		1	3	6	3	43	38	94
	Vanceville	-1	+16	-9	-3	-3	+1	
		2	22	17	6	9	10	66
	Werner	+3	+13	-11	-1	-12	+9	
		6	19	19	4	0	2	50
Morrow		-2	-11	-12	-4	+17	+13	
	Pease	-2	-8	+6	+1	+30	-25	
		0	3	18	5	13	38	77
	Quarles Lake	-1	-21	-9	+1	+64	-33	
		1	10	3	5	47	46	112
	Sinner	-2	-9	+2	+6	+31	-27	
		0	2	14	10	14	40	80
	Vanceville	-1	+16	-9	-3	-3	+1	
		1	27	3	1	20	12	64
	Werner	+3	+13	-11	-1	-12	+9	
		5	24	1	3	29	4	66
Pease		-2	-8	+6	+1	+30	-25	
	Quarles Lake	-1	-21	-9	+1	+64	-33	
		1	13	15	0	34	8	71
	Sinner	-2	-9	+2	+6	+31	-27	
		0	1	4	5	1	2	13
	Vanceville	-1	+16	-9	-3	-3	+1	
		1	24	15	4	33	26	103
	Werner	+3	+13	-11	-1	-12	+9	
		5	21	17	2	42	34	121
Quarles Lake		-1	-21	-9	+1	+64	-33	
	Sinner	-2	-9	+2	+6	+31	-27	
		1	12	11	5	33	6	68
	Vanceville	-1	+16	-9	-3	-3	+1	
		0	37	0	4	67	34	142
	Werner	+3	+13	-11	-1	-12	+9	
		4	34	2	2	76	42	160

Table 3. *(Continued)*

Sinner		-2	-9	+2	+6	+31	-27	
	Vanceville	-1	+16	-9	-3	-3	+1	
		1	25	11	9	34	28	108
	Werner	+3	+13	-11	-1	-12	+9	
		5	22	13	7	42	36	125
Vanceville		-1	+16	-9	-3	-3	+1	
	Werner	+3	+13	-11	-1	-12	+9	
		4	3	2	2	9	8	28

Table 4. A glance at associational strengths among Pineywoods Bossier sites*

	Chi	Col	Cor	Flo	Gre	HI	Lin	Mar	MC	Mon	Mor	Pea	QL	Sin	Van	Wer
Chi		103	57	68	106	88	70	80	108	76	20	93	115	06	78	82
Col	103		60	43	11	57	129	117	115	109	101	56	43	53	131	143
Cor	55	60		51	71	67	67	83	105	93	51	68	81	63	81	93
Flo	68	43	51		46	36	96	76	90	98	60	39	64	40	92	112
Gre	106	11	71	46		56	138	116	114	132	104	55	38	54	134	152
HI	88	57	67	36	56		106	64	80	88	72	11	74	22	102	122
Lin	70	129	67	96	138	106		56	97	76	56	81	136	98	24	34
Mar	80	117	83	76	116	64	56		48	40	42	67	138	80	56	76
MC	108	115	105	90	114	80	97	48		88	108	91	135	102	102	122
Mon	76	109	93	98	132	88	76	40	88		64	85	156	94	66	50
Mor	20	101	51	60	104	72	56	42	108	64		77	112	80	64	66
Pea	93	56	68	39	55	11	81	67	91	85	77		71	13	103	121
QL	115	43	81	64	38	74	136	138	135	156	112	71		68	142	160
Sin	96	53	63	40	54	22	98	80	102	94	80	13	68		108	125
Van	78	131	81	92	134	102	24	56	102	66	64	103	142	108		28
Wer	82	143	93	112	152	122	34	76	122	50	66	121	160	125	28	

*Site Abbreviations. Chi, Chickasaw; Col, Colbert; Cor, Corney; Flo, Floyd; Gre, Greer; HI, High Island; Lin, Lindsey; Mar, Marston; MC, Mill Creek; Mon, Montgomery; Mor, Morrow; Pea, Pease; QL, Quarles Lake, Sin, Sinner (repent); Van, Vanceville; Wer, Werner