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Lithic Morphological Organization: Gahagan Bifaces from Texas and Louisiana

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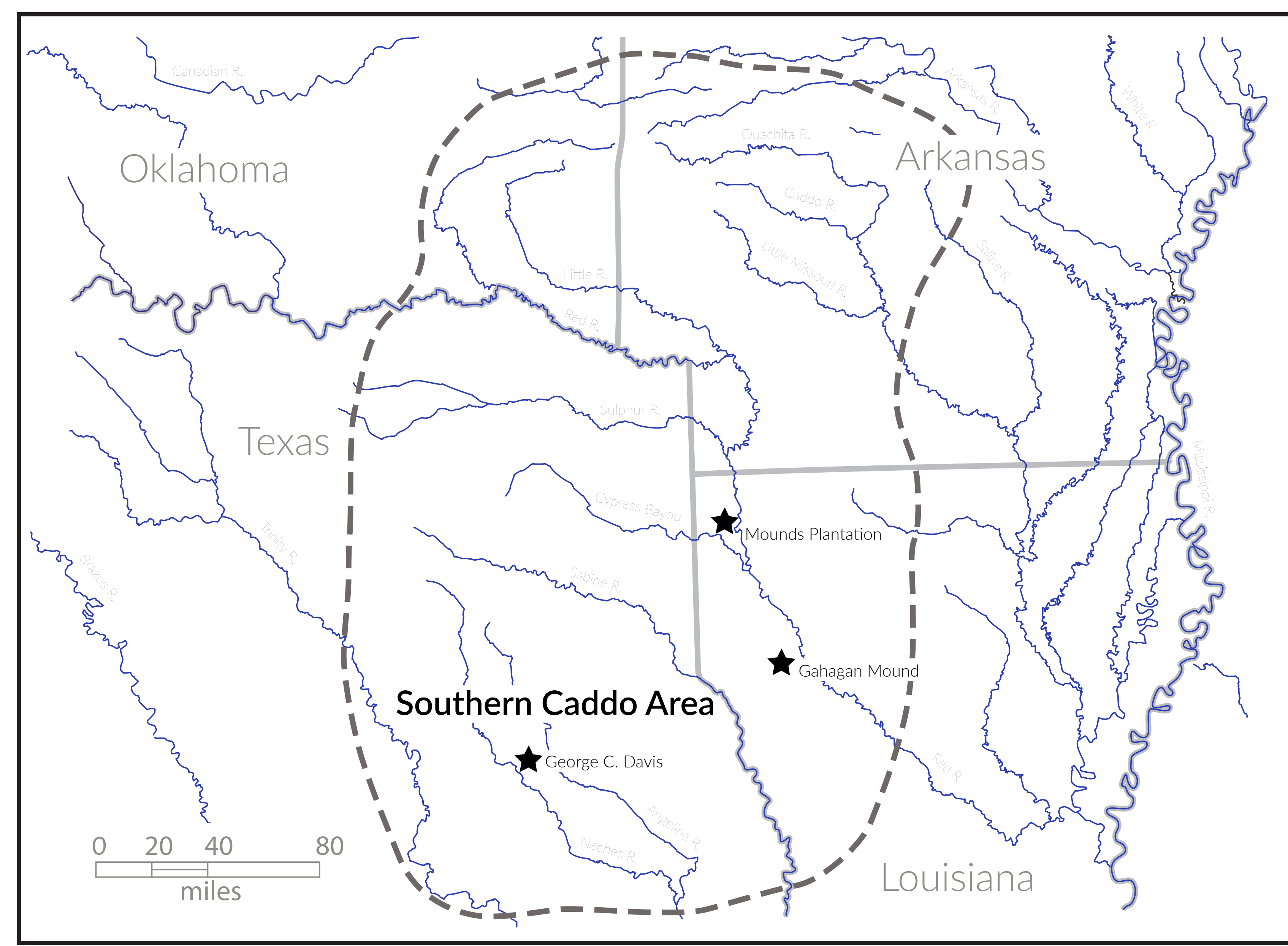
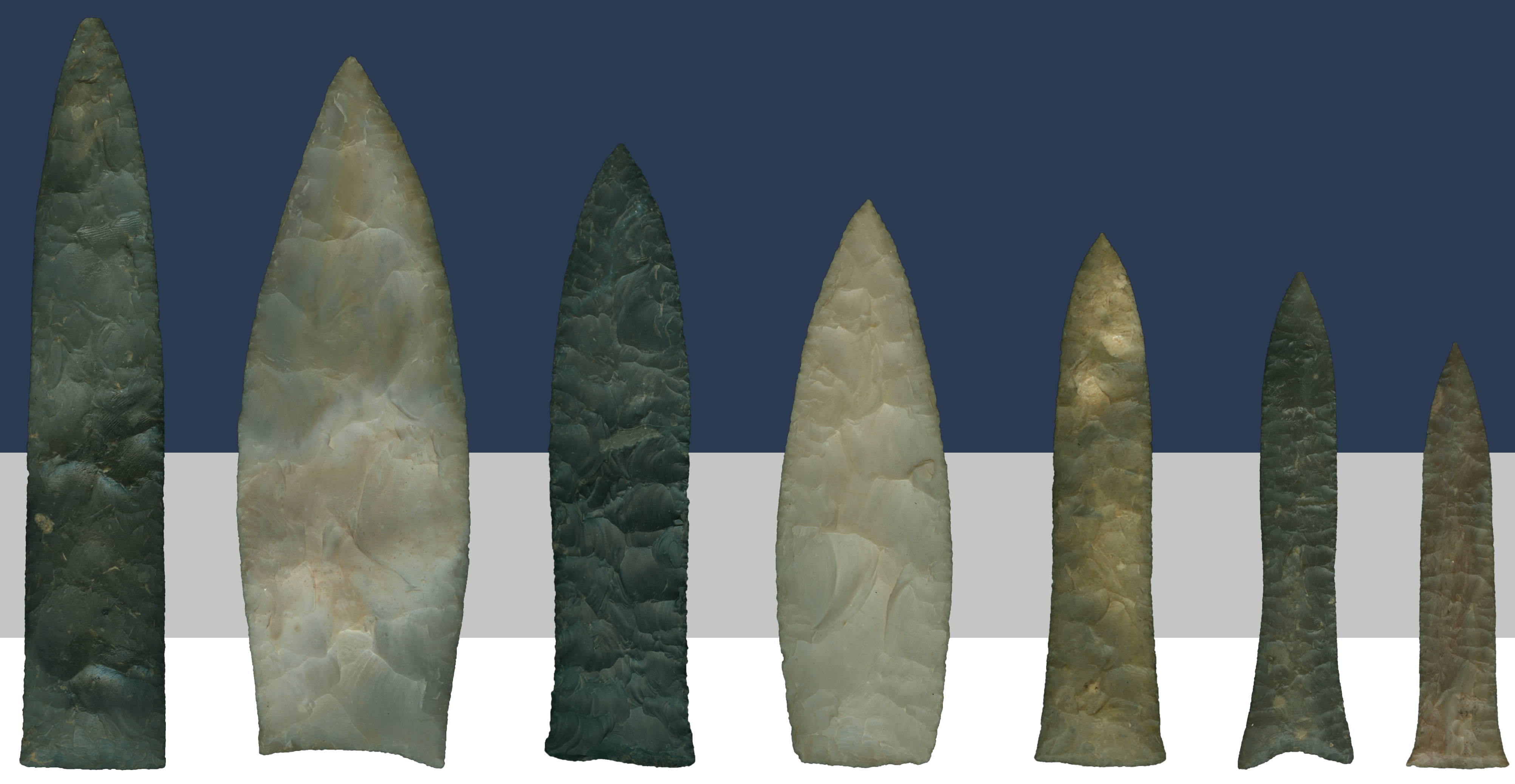
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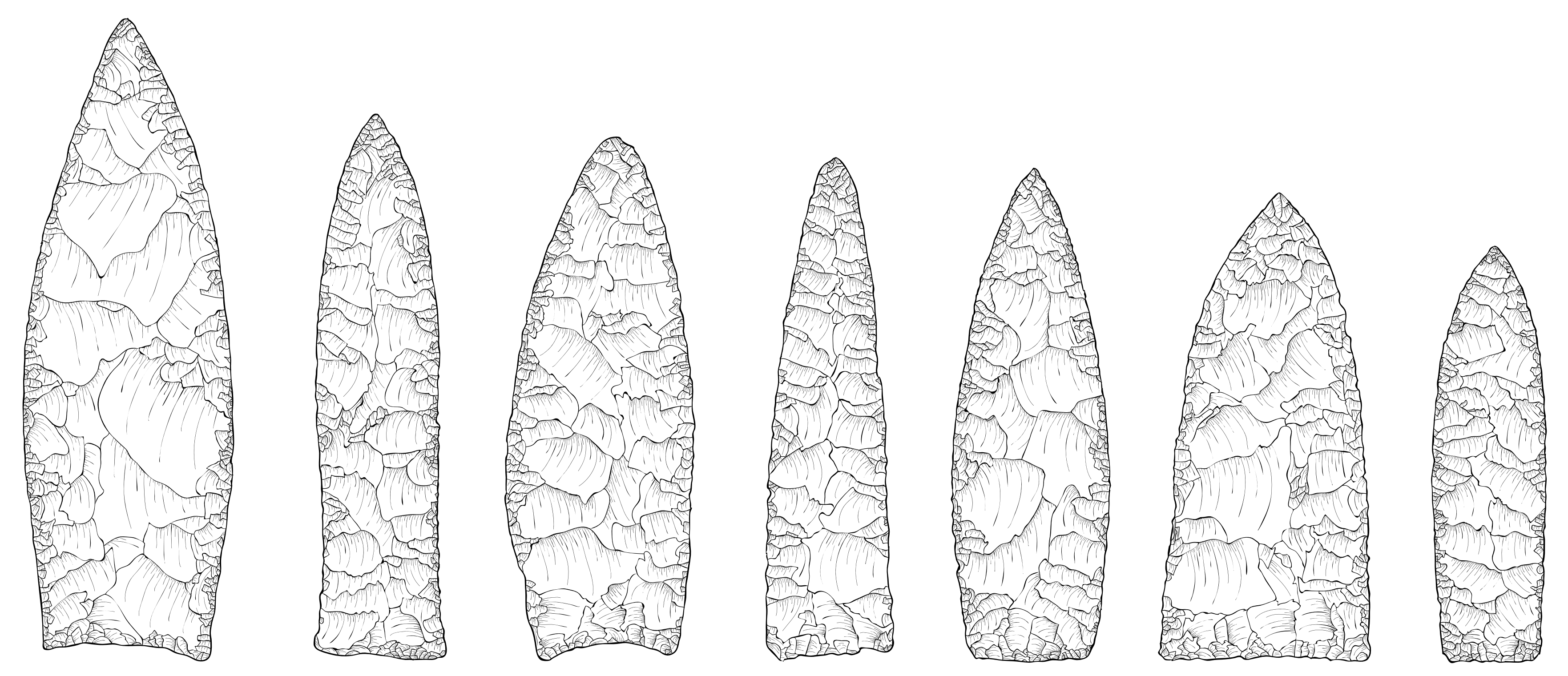
Robert Z. Selden, Jr., John E. Dockall, and Harry J. Shafer

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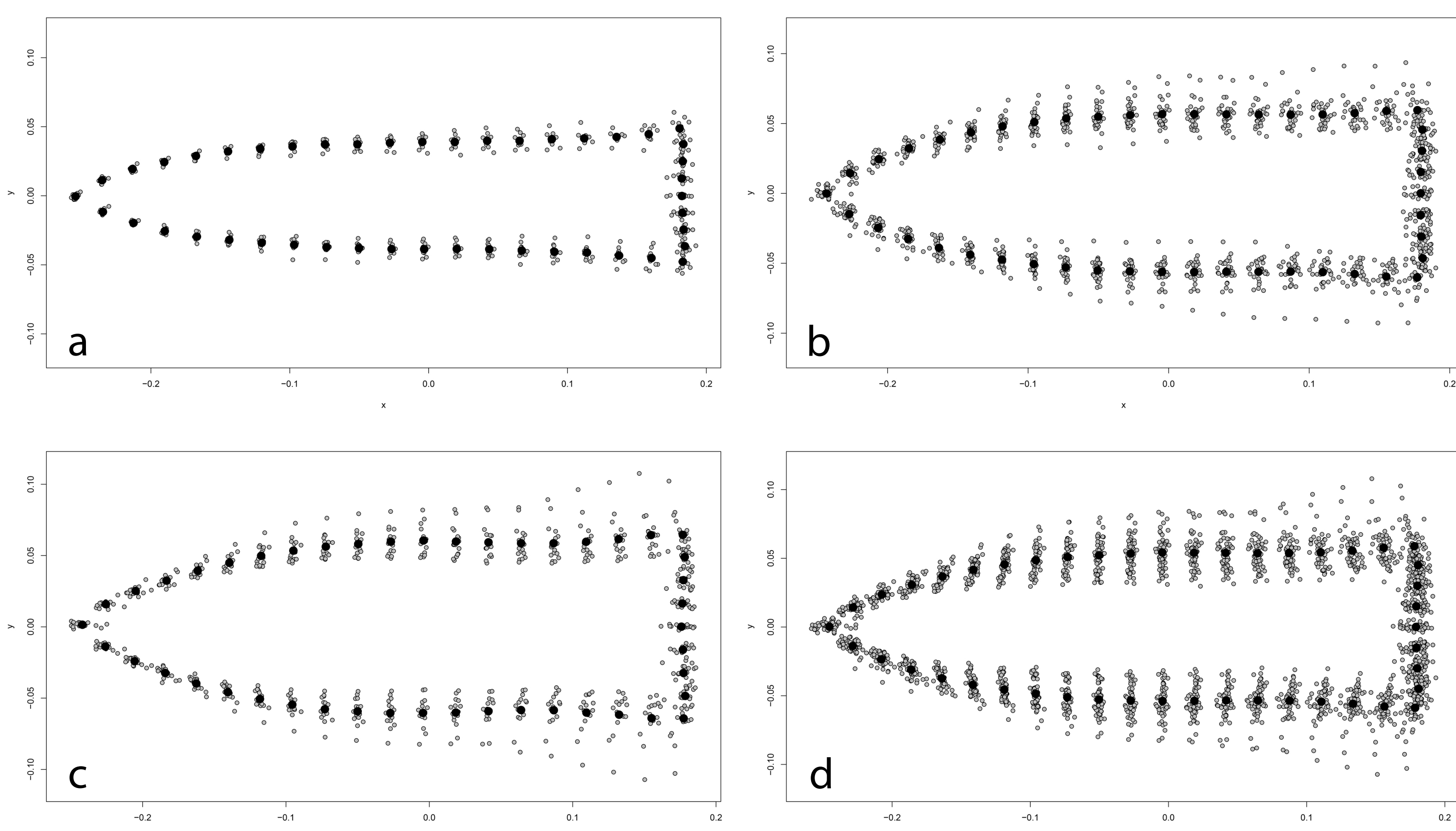


Newell & Krieger (1949: 173-174) originally termed the large thin bifaces from tomb contexts at the George C. Davis site to be similar in form---but not technology---to Copena points from northern Alabama described by Webb & DeJarnette (1942: 301-306). The chronological placement of Gahagan bifaces is Late Prehistoric with a distribution that includes central, east-central, and east Texas with a limited presence in south Texas and Louisiana (Turner et al., 2011: 230). Previous mortuary occurrences of Gahagan bifaces have been reported from Gahagan Mound (Webb & Dodd 1939) and Mounds Plantation (Moore 1912) in northwestern Louisiana. Clarence H. Webb later suggested Gahagan as a typological term to replace Copena at the 1970 Caddo Conference (Shafer 1973: 229); however, it was not until 2006 that a morphological and technological description was advanced (Shafer 2006: 22).

This analysis of Gahagan biface morphology enlists the three largest samples of Gahagan bifaces, to include that of the type site (Gahagan Mound) as well as the Mounds Plantation and George C. Davis sites. Results indicate a significant difference in Gahagan biface morphology at the Mounds Plantation site when compared with Gahagan bifaces from the Gahagan Mound and George C. Davis sites. A test of morphological integration indicates that Gahagan bifaces are significantly integrated, meaning that those traits used to characterize their shape (blade and base) vary in a coordinated manner. Tests for allometry and asymmetry were not significant. Results augment previous inquiries, providing additional evidence for a north-south divide based upon biface morphology used to define two communities of practice. Viewed in concert with morphological shifts in Hickory (Fine) Engraved and Smithport Plain bottles over the same geographic area, results lend support to an increasingly robust argument for two previously unrecognized and morphologically-unique Caddo communities of practice.

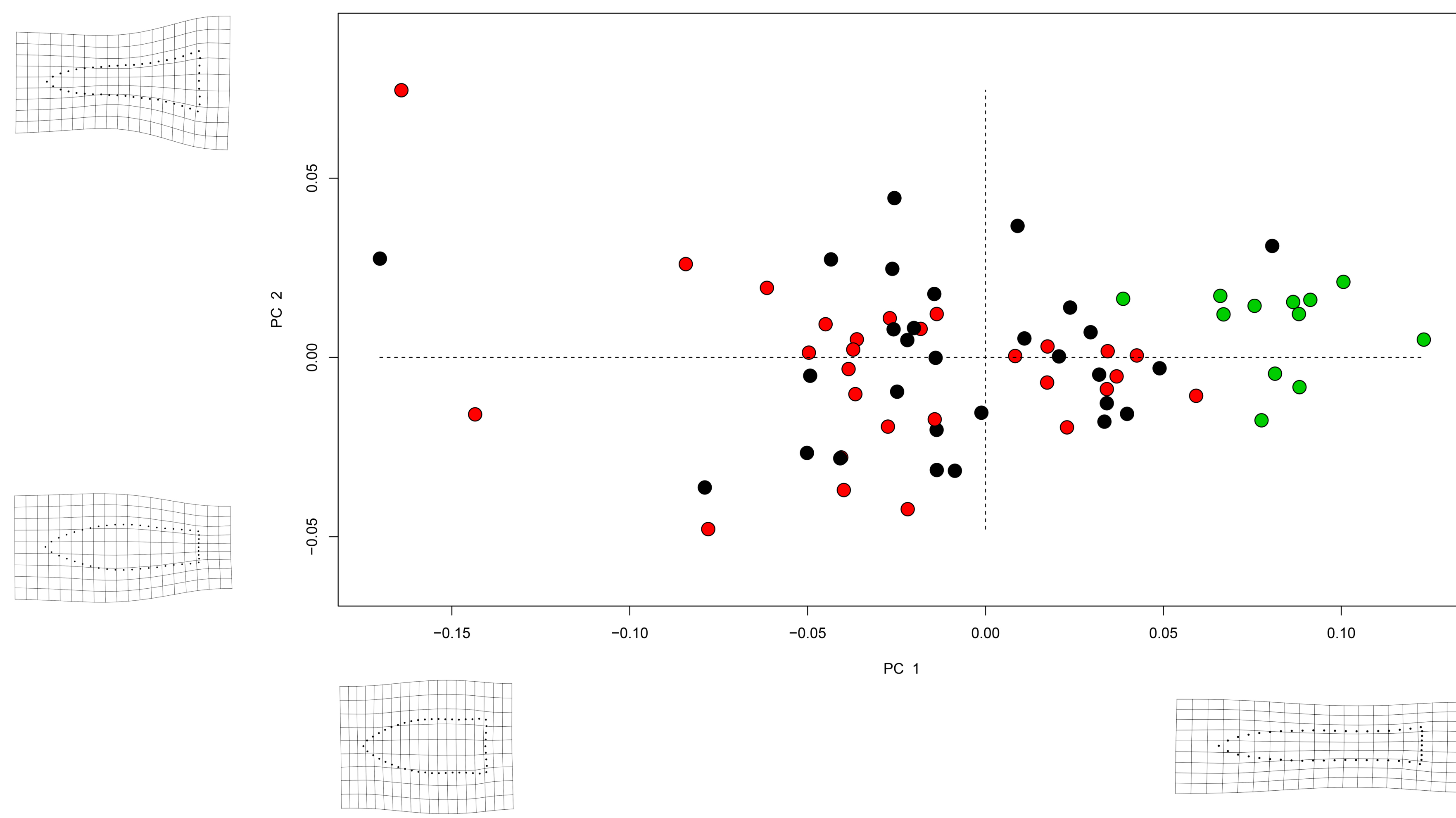


Illustrations of Gahagan bifaces from the Gahagan Mound site that demonstrate the range of variability in shape at the type site (above). Principal components analysis (PCA) for Gahagan biface shape of specimens from Gahagan Mound (red), George C. Davis (black), and Mounds Plantation (green) (below).



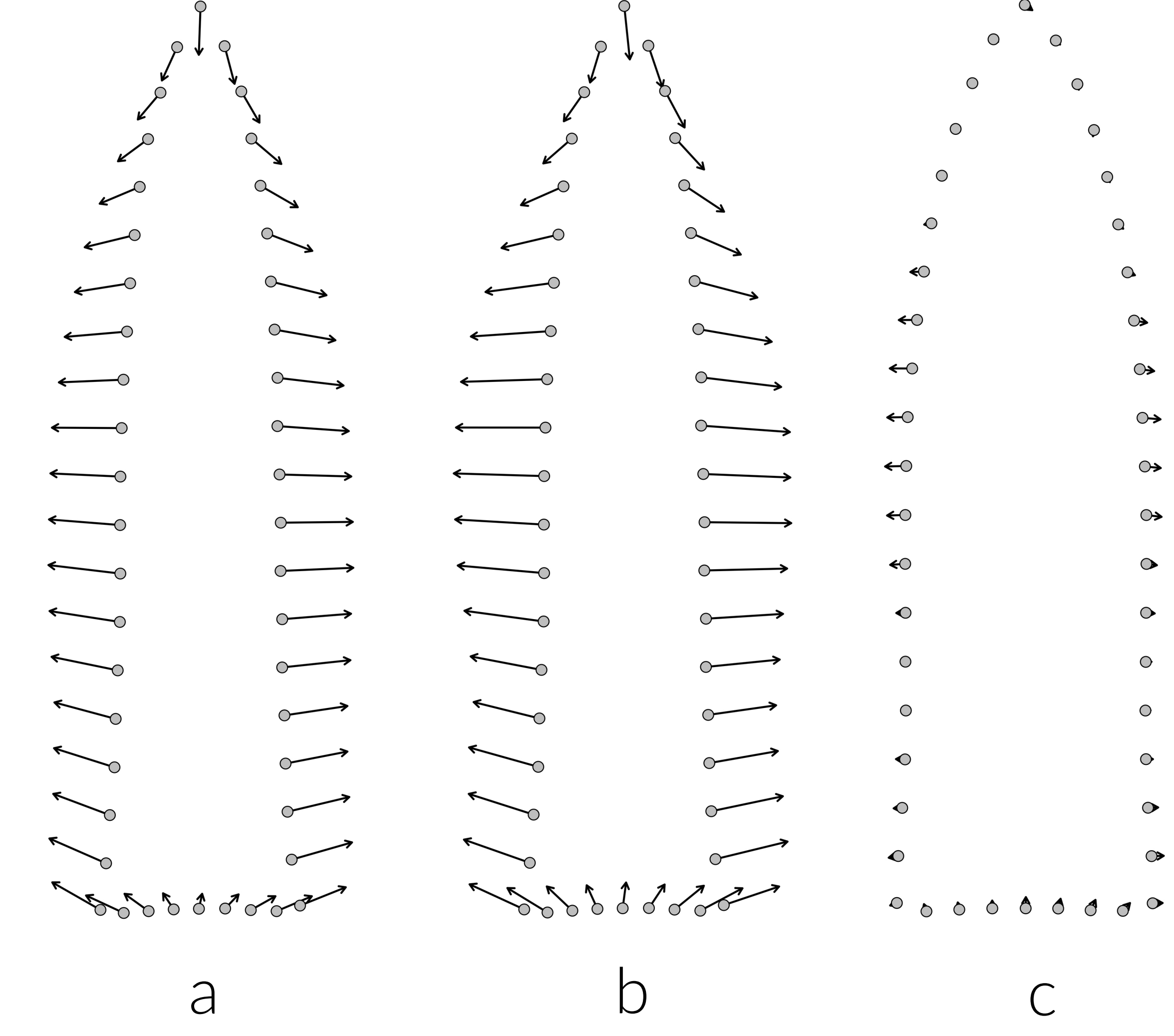
Mean consensus configuration (black) with Procrustes residuals (gray) superimposed by generalized Procrustes analysis for a, Mounds Plantation; b, Gahagan Mound; c, George C. Davis; and d, all specimens.

The mean consensus configuration (black) and Procrustes residuals (gray) were calculated for each site by means of a Generalized Procrustes Analysis (GPA). This initial view of the dataset demonstrates the degree of variation that occurs at each site and in the combined sample. As an exploratory measure, GM methods---to include GPA---aid in clarifying shape differences associated with each population and in the production of novel *a posteriori* hypotheses.



Principal components analysis (PCA) was conducted on scaled, translated, and rotated landmarks, and demonstrate that the first two PCs account for 76 (PC1) and nine (PC2) percent of the variation in Gahagan biface shape. Together, PC1 and PC2 account for over 86 percent of shape variation for Gahagan bifaces, with all remaining PCs representing less than five percent of the variation. This plot indicates that shape changes associated with PC1 articulate most readily with biface length. Those shape changes associated with PC2 are dominated by differences in biface blade and base width.

Comparison of Mean Shapes



Comparison of mean consensus configurations for Gahagan biface shape by site at: a, Mounds Plantation (gray) and Gahagan Mound; b, Mounds Plantation (gray) and George C. Davis; c, Gahagan Mound (gray) and George C. Davis.

Results indicate a significant difference in Gahagan biface shapes produced at Mounds Plantation when compared with those from Gahagan Mound and George C. Davis. The test of morphological disparity revealed that Gahagan bifaces from the Gahagan Mound site include a significantly greater range of shapes than the Mounds Plantation sample (standardization?). The test of morphological integration indicates that the base and blade shapes of the Gahagan bifaces vary in a coordinated manner. Lastly, the comparisons of mean consensus configurations highlight that Gahagan bifaces from the Gahagan Mound site generally exhibit a lower degree of blade recurvature and a less convex base than those from the George C. Davis site.

Archaeologists working in the region have a long history of exploring and developing novel analytical applications to further expound upon the local cultural landscape. This analysis of Gahagan bifaces augments an ongoing research program aimed at delimiting the vagaries associated with the many bottle shapes used by Caddo potters. Thus, this study serves as an example of how different categories of material culture might be used to identify dynamic shifts in morphology used by makers through time and space. The recent discovery of variability in Hickory (Fine) Engraved and Smithport Plain bottle shapes over the same geographic area articulate with those of the Gahagan bifaces, demonstrating an allopatric relationship for two previously unidentified and morphologically-distinct Caddo ceramic/lithic communities of practice.

Communities of Practice

