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Techniques And Production Complexity Of Mississippian Period Textiles From Spiro, Oklahoma

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TECHNIQUES AND PRODUCTION COMPLEXITY OF MISSISSIPPIAN PERIOD TEXTILES FROM SPIRO, OKLAHOMA

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INTRODUCTION:

The archaeological site of Spiro, which is located in eastern Oklahoma, was a major civic-ceremonial center of the Mississippian cultural period from approximately A.D. 900 to 1400. These prehistoric peoples developed an extensive trade network, a highly developed religious center, and a political system which controlled the region. An exceptionally rich assemblage of artifacts has been recovered from the mounds at Spiro, and Craig Mound has produced the most extensive collection of preserved prehistoric textiles in the southeastern United States (Brown 1976, King & Gardner 1981, Kuttruff 1988).

METHODS:

A purposeful sample of 71 Spiro textile specimens from burial context in Craig Mound was selected from the collections of the National Museum of Natural History, the Oklahoma Museum of Natural History, and the University of Arkansas Museum. The primary criteria for the selection of the sample were maximum variation in textile attributes, observable interworking of elements, and a minimum size of two square centimeters. These textiles were subjected to a systematic study of attribute complexes which included fabric structure, patterning, design, coloration, yarn construction, and fibers. An ordinal scale index of production complexity was developed by the author and used to evaluate the number of decisions and the amount of labor involved in the manufacture of the individual textiles.

RESULTS:

The research reveals textiles from Spiro that are unique in structure and design among reported Mississippian period textiles. Nearly all of the textile fabrication techniques employed could have been produced by finger manipulation and would not require the use of a loom with means of providing both warp tensioning and shedding. There were 116 fabric structures identified in the 71 specimens, and the number of structural variations per textile specimen ranged from 1 to 4. Interworking was done with both 1 and 2 sets of elements and included examples of twining, interlacing, knotting, and wrapping.

Fifty examples of interworking with one set of elements were identified, of which 82 % were interlaced, 12 % were twined, and 6 % were knotted. Sixty-six examples of interworking with two sets of elements were also identified, with 91 % of those twined, 6 % wrapped and 3 % interlaced. Twining attributes varied as to type, direction of twining

elements, direction of twining twist, number of active elements working together, amount of twining twist, number of passive elements, and movement of passive elements. Only two examples of interlacing with two sets of elements were identified, and both were of plain weave (1/1 interlacement pattern). One was balanced, and the other appeared to be warp faced. Forty-one examples of oblique interlacing (interlacing with one set of elements) were identified. These included narrow bands and braids, which were both flat and round, as well as wide textiles. Elements were used singly as well as in groupings, and plain and twill interlacement patterns were identified.

Patterning of the textiles was accomplished through the use of both structural and surface patterning techniques. Structural patterning techniques include twining, interlacing, knotting, wrapping, irregular spacing of elements, combining and/or recombining elements, separating elements, interlinking elements, combining colored elements, tapestry, and twined outlines with an additional element set. Surface patterning techniques include resist-dyeing and the addition of shell beads. Geometric design motifs include bands, stripes, circles, half-circles, squares, rectangles, diamonds, chevrons, and frets; while figural motifs include bird and human forms. Many of the Spiro textiles had been dyed various shades of black, brown, red, and yellow.

Yarn structures include single and combined unspun yarns; single, plied, and replied spun yarns; and complex wrapped core yarns. The number of yarn components ranges from 1 to 6, but 72.5 % are made up of two components. All of the components of 2-ply yarns were spun in the opposite direction from the one in which they were plied, and 82.2 % are plied in the Z direction. Yarn diameters range from 0.03 to 1.0 cm with the finest yarns being spun singles and the heaviest yarns being complex wrapped core yarns. Of the 76 fibers that were classified as to fiber type, 44 are fur or hair, 5 are feather, 1 is a seed hair (cotton), 9 are bast fibers, and 17 are hard plant fibers. Three of the bast fibers had not been separated from the surrounding "woody" plant parts and thus were composed of both bast and hard fibers.

The textile production complexity index (Figure 1) was developed to formalize and make explicit the ranking process used to differentiate the complexity and production costs of preindustrial textiles. This ordinal scale index was designed specifically for the analysis of archaeological textile remains from the southeastern United States and was based upon the production step measure for ceramic manufacture developed by Feinman (1980, 1985). Data from the Spiro textile attribute analysis are used in the textile production complexity index, which is a tally of points assigned for specific attribute dimensions. The minimum production complexity index value for the Spiro textile specimens was 12.5, the maximum value was 32.5 and the mean value was 18.1 (see Table 1).

In all but the category of the amount of fiber preparation or processing, values in the textile production complexity index are assigned for attributes which can be measured or counted objectively. The amount of fiber preparation or processing was estimated and ranked based upon the type of fibers utilized and other attributes of those fibers which are observable. The index does not include values for procurement costs of fibers and dyes, differences in the original size of the textiles, the amount of skill necessary for the execution of different textile processes, or the labor involved in the manufacture of tools or equipment used in textile production because this information is seldom known and difficult to estimate or objectify for archaeological textile remains. However, based upon the evaluations of knowledgeable individuals in the textile field, the production complexity index is believed to be a valid method of ranking the number of decisions and the relative amount of labor involved in preindustrial textile manufacture.

When the textile attribute data and the production complexity index values from Spiro are compared to data obtained from the analysis of 48 Mississippian period textiles recovered from southern Ozark bluff shelters, some obvious differences become apparent (Kuttruff 1988). Fringes, stitched edges, the color red, other added colors, resist dyeing, design motifs other than warp stripes, cotton, and spun fur fibers were present only among Spiro specimens. The mean average fabric count, or number of elements per square centimeter per specimen, was considerably higher for textiles from Spiro (12.8) than from the Ozarks (4.7). Other textile attribute characteristics, in addition to the ones listed above, are found only in the Spiro sample. These include the presence of round braids, balanced 1/1 interlacing, wrapping, twined tapestry, the grouping of more than two elements, unspun singles yarns, more than three colors in a single textile, the color black in textiles that are not charred, and shell beads incorporated into a fabric. No comparable sets of attribute characteristics were found in only the Ozark sample.

Production complexity values for the textiles analyzed from Spiro and from the Ozarks do overlap (Figure 2), but the lowest values on the complexity scale are from the Ozarks and the highest values are from Spiro. There is less overlap in complexity ratings between the two groups of textiles when textile size is controlled by analyzing narrow bands and braids separately. The mean production complexity values (Table 1) indicate that higher complexity ratings are associated with Spiro textiles than with Ozark textiles.

CONCLUSIONS:

This research on Spiro textile remains is a part of a larger study (Kuttruff 1988), which explored the use of textile attributes and production complexity rankings as indicators of

status differentiation within the Caddoan society of the Mississippian period. The Spiro textiles are an exceptionally significant collection because of the rarity with which textile remains are preserved in open archaeological sites in the eastern United States and the uniqueness of the textiles themselves. The individuals interred in Craig Mound at Spiro were members of the regional elite of the Caddoan society (Brown, Bell & Wyckoff 1978), and many of the textiles associated with these burials are thought to have been used as symbols of the social status of those individuals. Therefore, differences in attribute characteristics and production complexity of the Spiro textiles, when compared with textiles recovered from low status Caddoan burials of the region, may result from status differentiation within the society.

A production complexity index of non-industrial textile manufacture has not been previously applied to the study of prehistoric textiles, and the development of this measure is expected to have many applications in future textile research. Its use, with some revisions or refinements, should be applicable to a wider range of nonindustrial textiles, including ethnographic textiles.

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FIGURE 1
PRODUCTION COMPLEXITY INDEX FOR TEXTILE MANUFACTURE

<u>Scale</u>

average number of elements per cm^2 ____
(1 = 0-4.9, 2 = 5-9.9, 3 = 10-14.9,
4 = 15-19.9, 5 = 20-24.9, 6 = 25-29.9,
7 = 30-34.9, 8 = 35-39.9, etc.)

<u>Patterning</u>

number of structural techniques ____
(1 for each variation)

number of added surface techniques ____
(1 for each variation)

<u>Coloration</u>

number of differentiated colors ____
(1 for each color)

<u>Yarn</u>

number of different yarn types ____
(1 for each yarn type)

average number of yarn components ____
(1 for each yarn component)

average amount of yarn twist ____
(0 = none, 1 = <10 degrees, 2 = 10-25 degrees, 3 = 26-45 degrees, 4 = >45 degrees)

<u>Fiber</u>

number of different fibers used ____
(1 for each fiber)

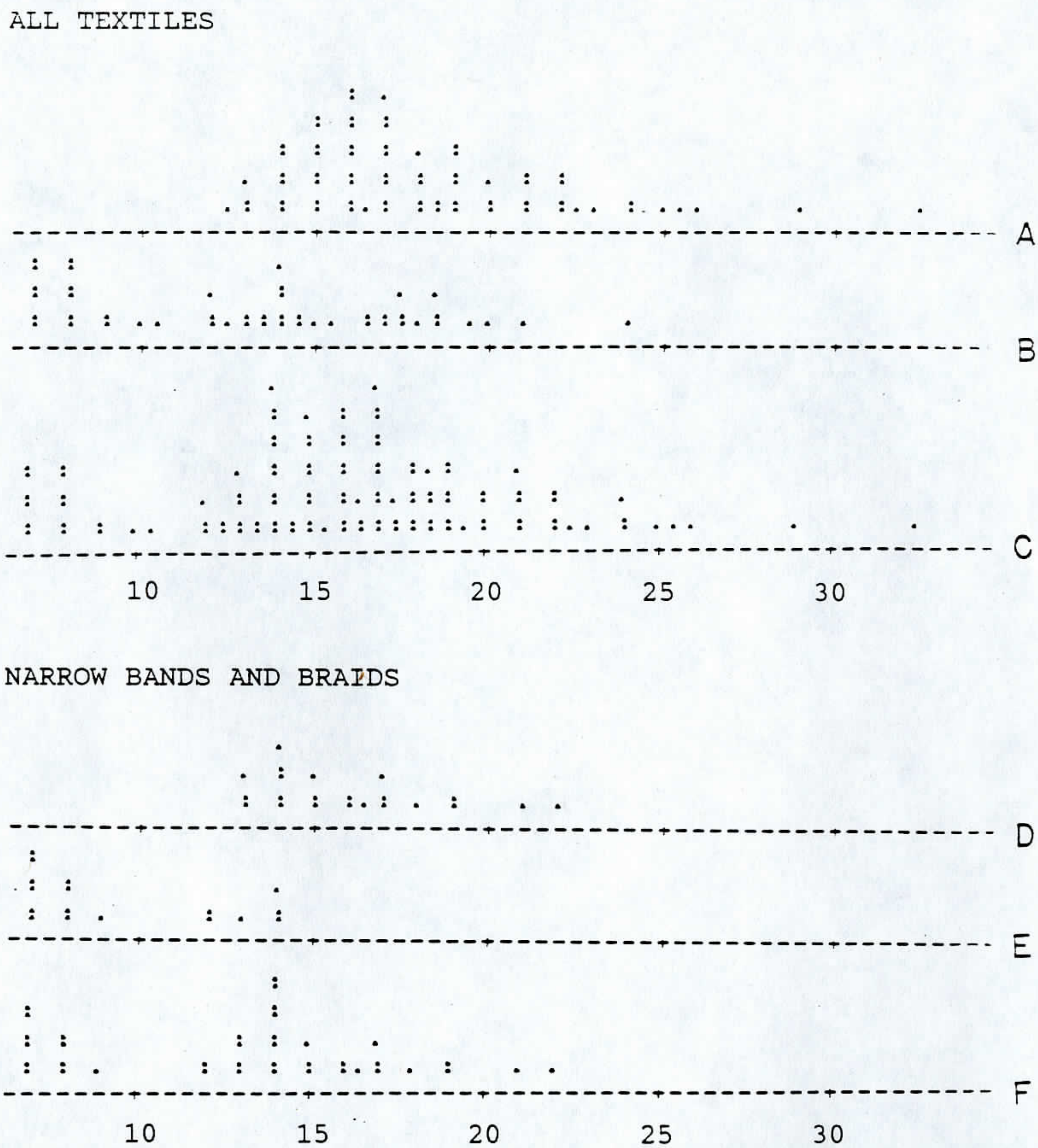
average amount of fiber preparation or processing ____
(1 = minimum, 2 = moderate,
3 = extensive, 4 = very extensive)

TOTAL PCI VALUE ____

TABLE 1
PRODUCTION COMPLEXITY INDEX VALUES

	Number	Minimum	Maximum	Mean
All textiles				
Spiro	71	12.5	32.5	18.1
Ozark	48	7.0	24.1	13.2
Total	119	7.0	32.5	16.2
Narrow bands and braids				
Spiro	22	13.0	22.0	16.0
Ozark	17	7.0	14.0	9.5
Total	39	7.0	22.0	13.2

FIGURE 2
FREQUENCY PLOTS OF PRODUCTION COMPLEXITY VALUES



Plots represent the following groups of textiles: (A) Spiro sample, (B) Ozark sample, (C) Total sample, (D) Spiro narrow bands and braids, (E) Ozark narrow bands and braids, (F) Total narrow bands and braids.