THE BELLEFONTE SITE

1 JA 300

by
Eugene M. Futato

Research Series No. 2
Office of Archaeological Research
The University of Alabama

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TVA

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PREFACE

The excavations at the Bellefonte site, 1 Ja 300, were sponsored by the Tennessee Valley Authority under contract TV38355A with The University of Alabama, Office of Archaeological Research, June 19, 1973. The administration of TVA's archaeological projects is the responsibility of the Division of Water Management, Mapping Services Branch. The continued support of the Tennessee Valley Authority for archaeological research is gratefully recognized and acknowledged.

Carey B. Oakley, Director of the Office of Archaeological Research, and J.B. Graham, Assistant Director, were Co-principal Investigators. Mr. Graham also served as Field Supervisor. Eugene M. Futato supervised the laboratory work, assisted by Archaeological Aides II, Jim Berryman and Janice Gilliland.

In addition to the consulting specialists who appear as senior authors of reports included in this volume, several other people should be mentioned for their work. Betsy Reitz of the University of Florida, Gainesville, Florida, identified the vertebrate species; and Jimmy Walden of Florence, Alabama, identified the gastropod species on a volunteer basis; Gloria Caddell identified the botanical remains, also as a volunteer; and Betty Gay Barnett edited the manuscript. Dr. Richard A.

Krause, Chairman of the Department of Anthropology, University of Alabama, provided much of the intellectual and theoretical framework of Chapter III. These people and many others contributed to the completion of this project, which saw the first excavations in the lower Guntersville Lake area since WPA.

The vicinity of Site 1 Ja 300 had much to offer its inhabitants. The forest yielded game, particularly deer, but other animals as well; nuts, grapes, persimmons; and wood for fuel and construction. Numerous other plants not represented in the archaeological record were surely used for food, medicine, dye and other purposes. The river provided molluscs, fish, and turtles for food; mammals associated with the river such as otter and beaver were also taken for food or fur, or both. Water was needed for many purposes, and aquatic or marsh plants were probably also used. The geology of the area also provided resources; clay, chert, sandstone, limestone, shale, hematite, and other minerals were used. At one point the availability of soils suitable for horticulture became important.

The site seems to have been, in succession, a temporary campsite, a campsite occupied on a seasonal basis, the location of a small farmstead, agricultural fields, and most recently, the location of the Bellefonte Nuclear Plant. Like all archaeological projects, this one has its areas of relative success and shortcoming. However, it does continue to document man's increasing understanding of the environment and subsequent ability to manipulate it. For better or worse, this has done much to make us what we are, and governs what we choose to become.

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CHAPTER I

THE SITE AND SURROUNDINGS

The completed environmental statement for the Bellefonte Nuclear Plant Units 1 and 2 (TVA n.d.) contains detailed information on the environment immediately surrounding Site 1 Ja 300; there is no need to reproduce the data here. Rather, this chapter is intended as a brief summary of the general nature of the site area and adjacent portions of Jackson County.

The following section of the report on physiography and geology is based largely on the county soil report (Swenson *et al.* 1954), Section 1.2-3 of the environmental statement (TVA n.d.), and *Physical Divisions of Northern Alabama* (Johnston 1930). Physiography was taken from the first, geology from the second, and Johnston was referred to for both. Due to the basic inseparability of the subjects it seemed impractical to burden the reader by frequent and redundant bibliographic references in the text. These are the references where not otherwise stated.

Physiography and Geology

The Bellefonte site, 1 Ja 300, is a small, shallow, shell midden in Jackson County, Alabama, the northeasternmost county in the state. The site is on the western edge of the Tennessee River flood plain at the foot of River Ridge, adjacent to a narrow drain now flooded by Guntersville Lake. Another small site, 1 Ja 36, was located about 200 meters southeast of 1 Ja 300 on the old natural levee of the Tennessee River. This site is now largely under water. In fact, the levees and a few other high spots are the only portion of the flood plain still above water in this area. River Ridge is a line of dissected hills 100 to 200 feet in height corresponding to the outcrop of the Red Mountain Formation and the upper portion of the Chickamauga limestone. This relatively erosion-resistant line of hills and the western escarpment of Sand Mountain have somewhat constrained the course of the Tennessee River. The flood plain here was only about three-fourths mile wide and is now completely flooded.

The soil of the Bellefonte site is the Tellico clay loam, eroded rolling phase. Swenson *et al.* (1954) describe this as a strongly acid but moderately fertile soil, susceptible to erosion. The typical profile is given as loam or clay loam over silty clay grading to unweathered shale. The soil generally is 1 or 2 meters deep but may be deeper on gentle slopes or where colluvium has accumulated. The Tellico clay loam is a member of the Etowah-Jefferson-Monongahela-Talbott association which is found on terraces and smooth uplands of the limestone valleys. The other major soil association in the immediate area of the site, the Fullerton-Clarksville-Greendale association, is found on cherty ridges and corresponds with the outcrop of the Red Mountain formation on River Ridge.

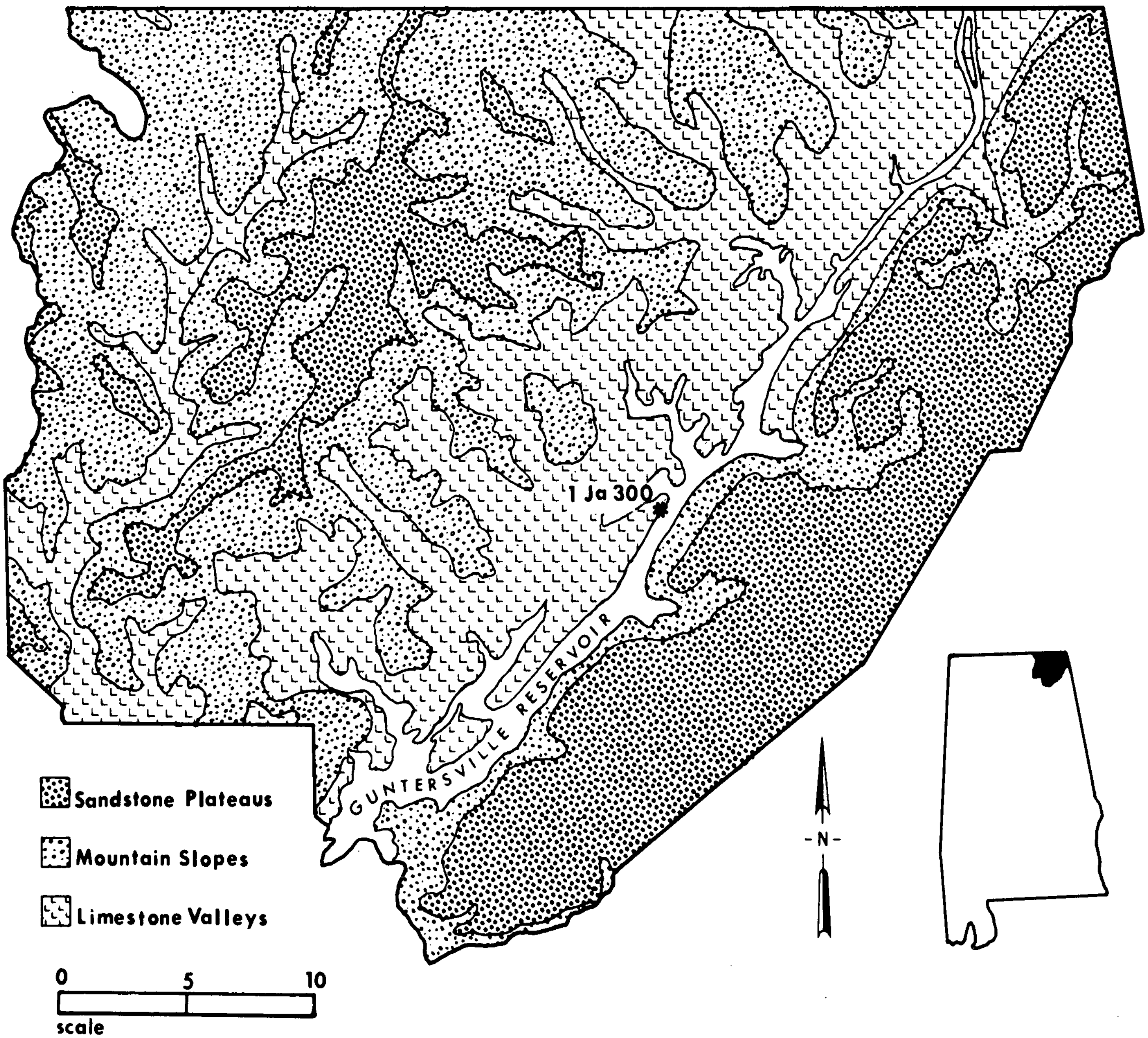
Jackson County, Alabama, lies wholly within the Cumberland plateau section of the Appalachian Plateau Province. The physiography and geology of the county falls into three general types: sandstone plateaus, rough mountain slopes and limestone valleys (Figure 1). The geology of the county is characterized by nearly flat, gently southward sloping sedimentary rocks; sandstone, shale, and limestone. These level sedimentary formations are disrupted by the Sequatchie Valley. The Sequatchie Valley is an eroded anticline which bisects the plateau and serves as the route of the Tennessee River through the county.

That portion of the plateau east of the Sequatchie Valley is called Sand Mountain. Johnston (1930) describes Sand Mountain as a long synclinal plateau, submaturely dissected. The plateau is capped by the Pennsylvanian sandstone and shale of the Pottsville formation. The western escarpment of Sand Mountain is high and steep. In the area immediately across the river from the Bellefonte site it rises 800 feet in a horizontal distance of about one-half mile.

The limestone valleys include the Tennessee River Valley, basically coincident with the Sequatchie Valley, and the valleys of the major tributaries of the Tennessee. This physiographic area consists of eroded limestone valleys based on the Bangor, Knox, and Chickamauga formations. The more erosion-resistant Red Mountain formation and Fort Payne cherty limestone outcrop in the limestone valleys as long narrow ridges, River Ridge and Backbone Ridge, respectively.

Figure 1.

Physiography of Jackson County, Alabama



To the west of the Sequatchie Valley, the sandstone plateau has been dissected considerably more than has Sand Mountain. This area, including the tributary valleys of the limestone valleys was called the Jackson County Mountains by Johnston (1930). The major difference between the Jackson County Mountains and Sand Mountain is the amount of dissection, although Johnston classed both as submaturely dissected. The portion of Sand Mountain in Jackson County is still largely one monolithic structure with the mountain slopes area confined to the escarpment and some drainage cuts. The Jackson County Mountains are more strongly dissected with a relatively narrow mesa having numerous spurs and outliers of sandstone plateaus and rough mountain slopes.

Flora and Fauna

The natural vegetation for virtually all of Jackson County is southern hardwood forest. The most numerous deciduous hardwoods here are a variety of oak, hickory, beech, yellow poplar and maple. Some pines are mixed with the hardwoods, especially in the poorer soils and drier places. Cedars are common on the limestone slopes.

Most of the forested areas remaining have been heavily logged, altering the make-up of the forest. The vegetation survey of the Bellefonte Nuclear Plant Site records the vegetation as oak-hickory of small sawtimber size. Other forest community types near 1 Ja 300 are classified as oak-gum, elm-ash-soft maple, black locust, and mixed conifers and hardwoods (TVA n.d., Appendix B3). In general the oak-gum, oak-hickory, and black locust communities are found in areas of the Etowah-Jefferson-Monongahela-Talbott soil association of limestone valleys. The mixed forest and elm-ash-soft maple communities are more common in areas of the Fullerton-Clarksville-Greendale soils of cherty ridges.

The bulk of the preserved botanical material from Bellefonte is hickory-nut shell with some acorn and walnut also present. This gives evidence of the importance of the oak-hickory forest to the aboriginal inhabitants of the Bellefonte site. Many other greens, roots, and seeds, however, were surely eaten by the Indians, and plant resources must have served a great many uses other than food: construction, basketry, fiber products, medicines, and dyes, to name but a few. Such material is not part of the botanical specimens from the site.

Table 1 is an attempt to account for some of the other plants which may have been used at the Bellefonte site. It is based on a list of plant species which are known to be present in the area or adjacent areas. The list was compiled from the botanical surveys of the Tennessee Valley and the plateau by Roland Harper (1942, 1943, 1944) and recent surveys of the Wheeler National Wildlife Refuge (USDI 1974) and the Bellefonte Nuclear Plant Site (TVA n.d.). This list of plant species was then cross-referenced against *The Indians of the Southeastern United States* (Swanton 1946) and *Food Plants of the North American Indians* (Yanovsky 1936) to determine which of these plants have documentation for aboriginal use.

Table 1 presents a list of those plants which occur or probably occur near the Bellefonte site and are recorded as being used aboriginally. While Table 1 is admittedly incomplete and somewhat speculative, it is presented in hope of providing a better understanding of the botanical resource base potentially available to the aboriginal inhabitants of the site.

The forest and riverine environments supported a variety of animal life utilized by the Indians. The acidity of the soil of the Bellefonte site was neutralized due to the large volume of shell present so that preservation was excellent and a large sample of both bone and shell was obtained by the excavation. Later sections of this report deal with this material in some detail and yield considerable data on the use of animal resources by the site's inhabitants.

TABLE 1. Potential Floral Resources of the Bellefonte Site Area.

Scientific Name	Common Name	Comments
Acer negundo *A. rubrum* *A. saccharinum* *A. saccharum*	Box Elder Red Maple Silver Maple Sugar Maple	Maple bark used for cordage and dye. Wooden spoons from *A. negundo*. All used for making sugar, and bread made from bark of all.
Aesculus glabra	Buckeye	Fish poison.
Allium canadense *A. vineale*	Wild Onion Wild Onion	Food and seasoning.
Amelanchier canadensis	Service Berry	Eaten boiled or in soup. Made into paste and dried for winter.
Arctium minus	Burdock	*A. lappa* was eaten as greens or roots, or dried for winter
Aster pilosus *A. surculosus*	Aster ?	Some species boiled and eaten as greens.
Bohermeria cylindrica	False Nettle	Thread, fish net, fishline.
Bursa bursa-pastoris	Shepherds Purse	Seeds, greens eaten
Corpinus caroliniana	Ironwood	Wood sometimes used for bows.
Carya alba *C. glabra* *C. ovata*	White Hickory Pig-nut Hickory Scaley Bark Hickory	Nuts for food, wood for houses, tools, weapons, fuel. Bark for houses, fuel.
Castanea dentata *C. pumila*	American Chestnut Chinquapin	Nuts from both eaten. Nuts from *C. pumila* used as beads.
Celtis mississippiensis	Hackberry	Fruit and seeds pounded, used for food and flavoring. Wood for baskets.
Cocculus carolinus	Coral Beads	Fish poison.
Cornus florida	Flowering Dogwood	Fruit of many species eaten, wood for bows, arrows, baskets.
Crataegus veridis	Red Haw	Fruit of many species eaten.
Dioscorea villosa	Wild Yam	Food.
Diospyros virginiana	Persimmon	Fruit for food.
Fagus grandifolia	American Beech	Nuts for food, bread, fresh or stored for winter. Buds as food.
Festuca sp.	Fescue	Seeds eaten in Utah, Nevada.
Fraxinus sp.	Ash	Cambium of *F. pennsylvanica* eaten.
Gleditsia tracanthos	Honey Locust	Fruit eaten, sugary pods fermented for beer.
Hedeoma pulegioides	Pennyroyal	Leaves of some species eaten, flowering tops used in beverages.

TABLE 1. Continued

Scientific Name	Common Name	Comments
Ilex decidua *I. opaca*	Deciduous Holly American Holly	Leaves used in drinks, also *I. vomitoria* is ceremonial "black drink."
Juglans nigra	Black Walnut	Nuts used for food, oil and dye.
Juniperus virginiana	Cedar	Berries of many species eaten, beverages from stems and leaves, wood in house and bow construction.
Lactuca scariola	Prickly lettuce	Greens.
Liquidambar styraciflua	Sweet Gum	Dried leaves mixed with tobacco.
Liriodendron tulipifera	Yellow Poplar	Wooden spoons.
Malus angustifolia	Crab Apple	Fruit eaten.
Morus rubra	Red Mulberry	Fruit eaten. Fibers from inner bark of some species used for many purposes. Dye from roots.
Nyssa aquatica *N. sylvatica*	Tupelo Gum Black Gum	Drums, dishes, spoons made from gum wood.
Oenothera biennis	Evening Primrose	Seeds eaten.
Oxydendrum arboreum	Sourwood	Young leaves as salad.
Parthenocissus quinquefolia	Virginia Creeper	Fruit eaten raw, stalks peeled and boiled.
Phytolacca Americana	Pokeberry	Leaves and stalks eaten.
Pinus echinata *P. palustris* *P. taeda* *P. virginiana*	Short-leaf pine Long-leaf pine Loblolly pine Spruce pine	Seeds, sap, bark, cambium of many species used for food; wood for fuel, tinder, construction; bark for house coverings.
Polyganum sp.	Smartweed	Seeds, roots and rhyzomes of some species eaten.
Prunus americana *P. angustifolia* *P. serotina*	Wild Plum Chickasaw Plum Wild Cherry	Fruit eaten fresh, cooked or dried. *P. serotina* twigs used in a beverage.
Quercus alba *Q. borealis maxima* *Q. coccinea* *Q. falcata* *Q. lyrata* *Q. marylandia* *Q. montana*	White Oak Red Oak Scarlet Oak Southern Red Oak Overcup Oak Black-jack Oak Chestnut Oak	Acorns were extensively used as food. Wood for fuel, fish-traps, bows, mortars, framework for wattle and daub construction, and many other things. Bark was used for house covering, dye, tanning.

TABLE 1. Continued

Scientific Name	Common Name	Comments
Q. muhlenbergii	Chinquapin Oak	
Q. nigra	Water Oak	
Q. phellos	Willow Oak	
Q. prinus	Rock Chestnut Oak	
Q. schneckii	Red Oak	
Q. shumardii	Shumard's Oak	
Q. stellata	Post Oak	
Q. velutina	Black Oak	
Rhus copallina	Dwarf Sumac	Drink from fruit and dye from some species of sumacs.
R. glabra	Smooth Sumac	
R. radicans	Poison Ivy	Dye from poison ivy.
Robinia pseudoacacia	Black Locust	Seeds for food, wood for housing, bows.
Rubus argutus	Tall Black-berry	Berries eaten.
R. procerus	Himalaya Black-berry	
R. trivialis	Dewberry	
Salix nigra	Willow	Fire sticks sometimes of willow, and a deer call made by the Alabama.
Sambicus canadensis	American Elder	Berries eaten, tea from blossoms.
Sassafras albidum	Sassafras	Leaves in soup and tea. Wood for housing, bows, fire sticks and dye.
Smilax bona-nox	Bullbrier	Tuberous roots used in soup, bread, jelly.
S. glauca	Sawbrier	
S. rotundifolia	Greenbrier	
Tilia sp.	Basswood	Sap of *T. americana* was eaten. Fiber for rope, thread, bowstrings.
T. heterophylla	Basswood	
Tsuga canadensis	Hemlock	Beverage from leaves.
Typha latifolia	Cat-tail	Young roots, shoots, stems, flowering ends, and seeds eaten. Woven into flags, mats, house and bed coverings.
Ulmus fulva	Slippery Elm	food, cordage, and thread
Vaccinium arboreum	Highbush Blueberry	Berries of many species eaten.
V. corymbosum	Highbush Blueberry	
Viburnum prunifolium	Black Haw	One or both used for arrow shafts.
V. rufidulum	Ruby Haw	
Vitis cordifolia	Frost Grapes	Fruit of many species eaten fresh, dried or made into preserves. Vines at times substituted for cord. Tea from *V. cordifolia*.
V. palmata	Red Grapes	
V. rotundifolia	Scuppernong	

CHAPTER II

THE EXCAVATION

Excavation, Recovery, and Control

Figure 2 is a topographic map of the Bellefonte site and a plan of the excavations. The squares are keyed to maximum depth of excavation. This was done so that people wishing to examine the vertical distribution of artifacts given in tables may adjust for excavated volume. The excavated depth was to sterile subsoil with a single exception. Square 14R4 was only partly excavated to expose features encountered in the adjacent square.

The site was mapped and gridded in June, 1973. The basic unit of horizontal control was a 2-meter square. Rows of squares were numbered by distance along a base line beginning at an arbitrary point 0. Columns were numbered in meters left and right of the base line. The control point for a particular square was the upper left corner of the square relative to the grid. Standardized 10-cm. cuts were the basis of vertical control, and all cuts were oriented so that the floor of the square remained parallel to the plane containing the four corners of the original grid unit. Thus the orientation of each cut remained the same as the generalized surface of the site at that point.

Prior to excavation, a surface collection was made on each square to be excavated. All stone, shell, pottery and

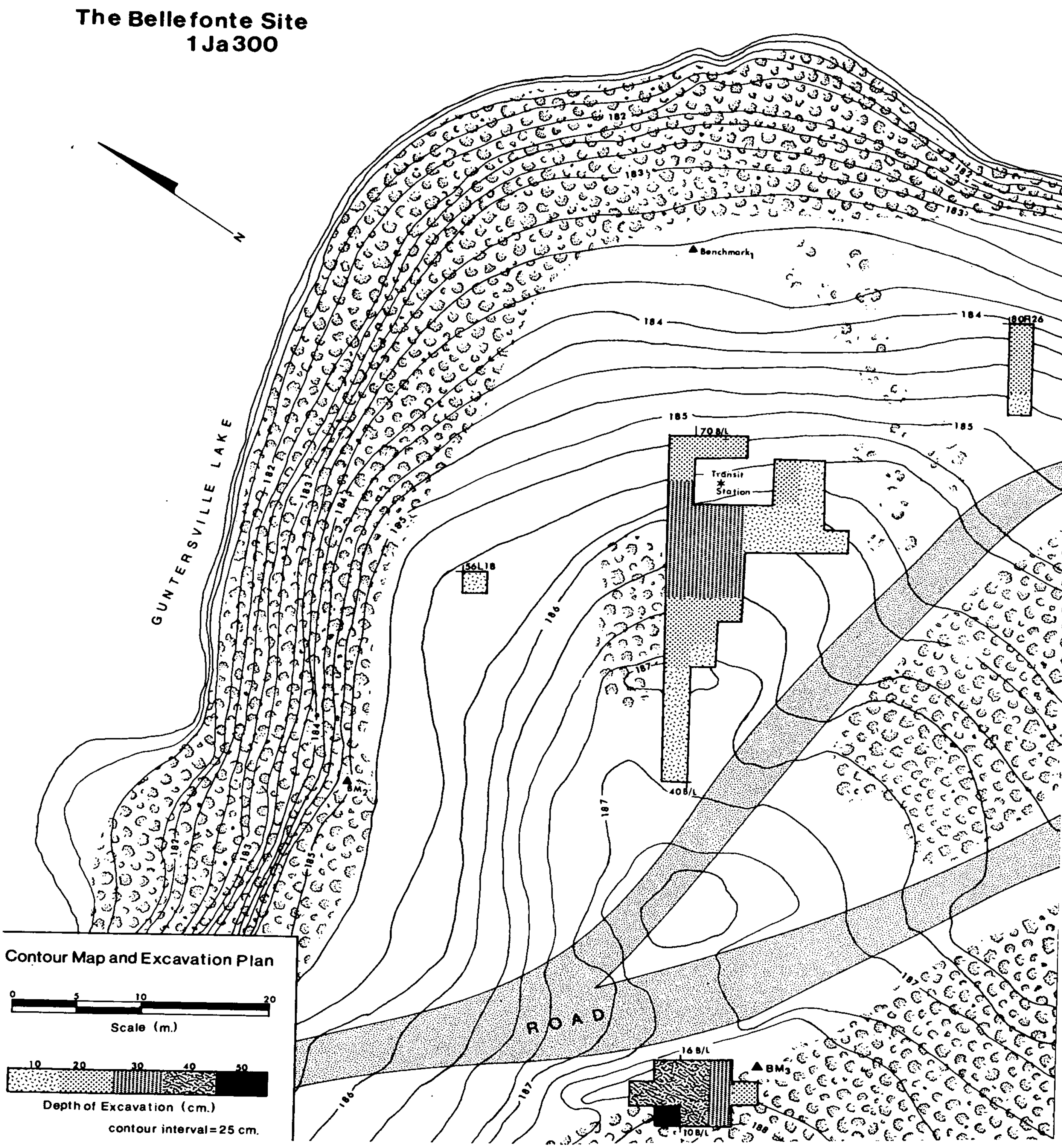

The Bellefonte Site
1Ja300
N
GUNTERSVILLE LAKE
Benchmark1
Transit Station
ROAD
BM2
BM3
70B/L
40B/L
16B/L
10B/L
56L18
180R26
182
183
184
185
186
187
188
Contour Map and Excavation Plan
0 5 10 20
Scale (m.)
10 20 30 40 50
Depth of Excavation (cm.)
contour interval=25 cm.

Figure 2.

bone were collected. Wood and other vegetable matter were not recovered. In this report the surface collections have been included in tables as a part of Cut 1, 0-10 cm. in depth.

The initial excavation on the site consisted of a column of squares from 42L2 to 70L2, forming a trench across the geographic center of the site. Twenty-one squares were then excavated to the immediate right of this trench in the area of greatest depth of cultural material (Plate 1). Burials, pits and other cultural features were found in this area. One additional test unit, Square 58L18 was excavated to the left of this area.

The 1974 excavations expanded the initial excavations and also excavated a 2- by 8-meter trench to the right of and above (relative to the grid) the initial excavation. All of the excavations thus far are collectively referred to as Area B in this report.

In 1974 one additional unit of 11 contiguous squares was excavated. This excavation was placed across the road and the area disturbed by machinery from Area B. This portion of the site is slightly higher than the rest, and it was hoped that soil washed from the slopes of River Ridge had increased the depth of the culture-bearing deposit, potentially enhancing stratigraphy. This excavation unit is referred to as Area A. Three burials, a structure pattern, and other features were encountered in this area.

The excavations here did indeed recover artifacts to a greater depth than in Area B, as indicated in Figure 2. The site is small, shallow, and has been intermittently occupied for thousands of years. The stratigraphic placement of artifact classes is blurred and overlapping, and tabulating the artifacts from Areas A and B together would only add to the imprecision of the stratigraphy. Thus the reason for distinguishing between the two areas is for increased clarity of data presented in the tables, not because of any fundamental differences in content of the two areas.

Recovery of material from the excavation was accomplished by two methods. Soil from most of each unit of the excavated squares was troweled through and material was picked out by hand. No screening processes were used. For controlled recovery, a 50- by 50-cm. control column was reserved in the upper right corner of each cut of each square (Plate 2). These columns were excavated in 10-cm. cuts as was the remainder of the unit. Soil from the control column was water-screened through two nested screens having square mesh measuring respectively one-fourth inch (.635 cm.) and three-thirty-seconds inch (.238 cm.) on a side (Plates 3, 4). All feature and burial fill was screened in this same manner.

Stratigraphy

All squares were excavated by standard 10-cm. cuts since the site exhibited no discernible natural or human-use-created soil stratigraphy other than differential amount and type of cultural materials. The soil profile of the site excluding shell, rock, increased organic content and other introduced materials was the normal profile of the Tellico clay loam, eroded rolling phase, as summarized in the previous chapter. The soil of the site was a clay loam becoming purer clay with depth. In the lower, culturally sterile portion of the site the clay contained many shale fragments. Post holes associated with Feature 16 intruded into unweathered yellow shale at about 60 to 65 cm. below surface.

Local informants stated that at one time the area of the Bellefonte site had been in cultivation. Although the field personnel made a particular effort to discern a plowzone on the site, none was detected. Pits and undisturbed skeletal material in burials were found as little as 10 cm. below surface, and Feature 1 was detected only 1 cm. below surface. Feature 1 was a large pile of fire-cracked rock; some plow disturbance could have gone unnoticed, although the feature appeared to be one discrete body.

It is possible that the site was plowed at one time. The plow likely would have been drawn by draft animals and the plowzone would have been shallow. The soil of the site is erosion prone, and most of the plowzone could have washed down the slope. It is also possible that the cultivation took place on more level land closer to the old river channel below the site.

Features

The term feature as used in this report is applied to an artifact or set of artifacts whose size or composition normally prohibits removal and preservation for further study. Thus features require interpretation and analysis in the field.

The replication of these procedures requires examination of demonstrably similar, additional instances; pits, and stone and shell piles. Burials and post holes are designated as special subclasses of features and are enumerated and discussed separately. Figures 3 and 4 show the distribution of all classes of features on the site. Figure 5 illustrates the profiles of selected pits.

Feature 1 (Plate 5). Feature 1 was a large pile of fire-cracked rock. The feature was encountered only 1 cm. below surface and was about 140 by 170 cm., maximum and minimum diameter. A small amount of cultural material was found mixed in with the rock. Woodland ceramics were the only diagnostic materials. Bone, shell and charcoal were also present. Cultural affiliation is probably Woodland.

Feature 2. This feature was a roughly circular pit, 120 by 135 cm. The pit had steeply sloping sides and a slightly rounded bottom. The point of detection was 23 cm. below surface. The interior depth of the pit was 45 cm. The pit had been intruded into by Burial 2. The pit contained 41 sherds of Long Branch Fabric Marked, 30 sherds of Mulberry Creek Plain, Smooth pottery, one with a small rim fold. Only four sherds of Mulberry Creek Plain, Rough were recovered. Two sherds of Wright Check Stamped were also found. Fish and squirrels were the most numerous animal remains recovered. Almost no charcoal other than wood was present. The cultural affiliation is Early to Middle Woodland.

Feature 3. This pit was small and round, with a nearly hemispherical cross-section. The pit was detected 17 cm.

1 Ja 300 Area A, Features

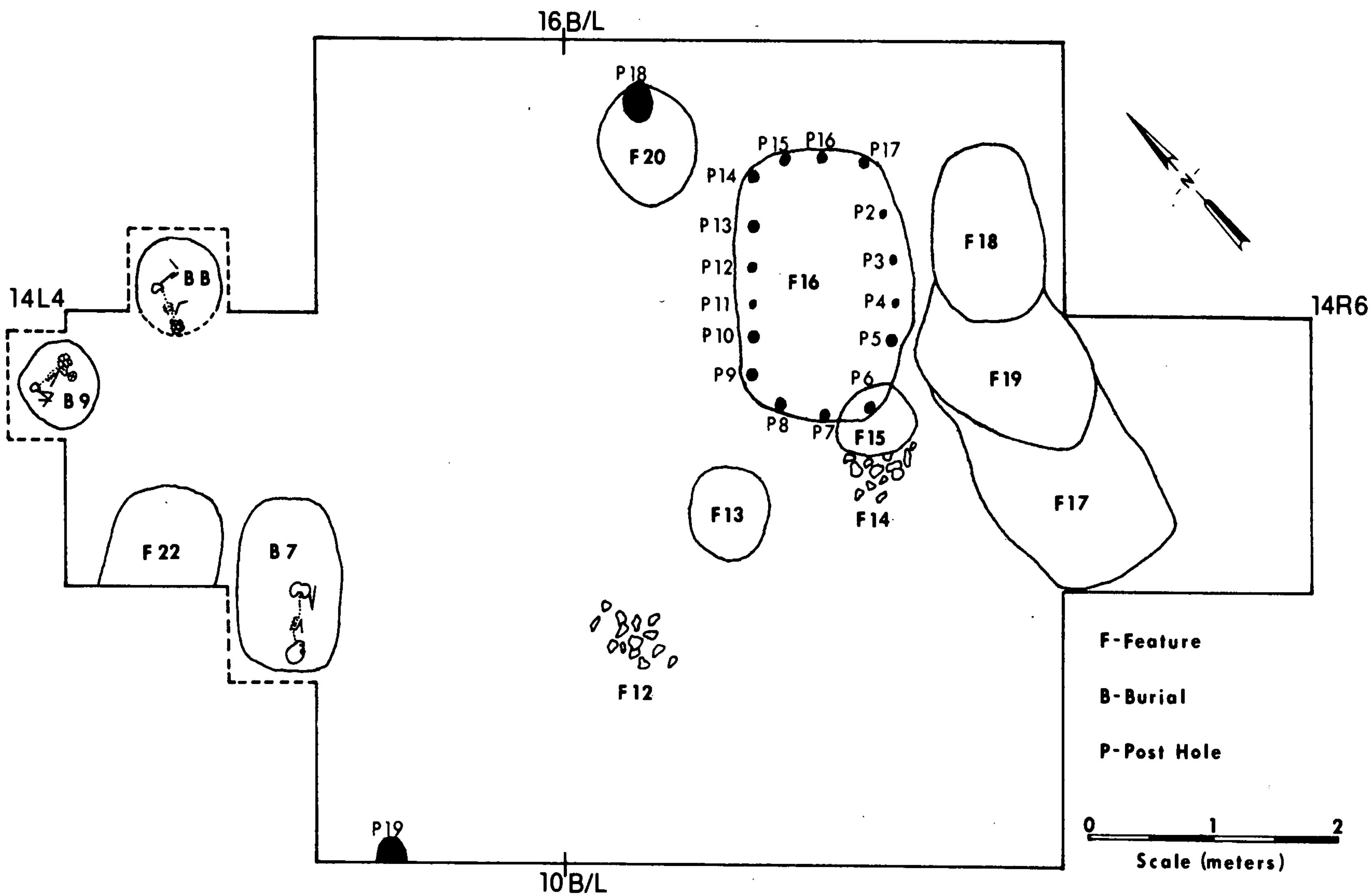


Figure 3.

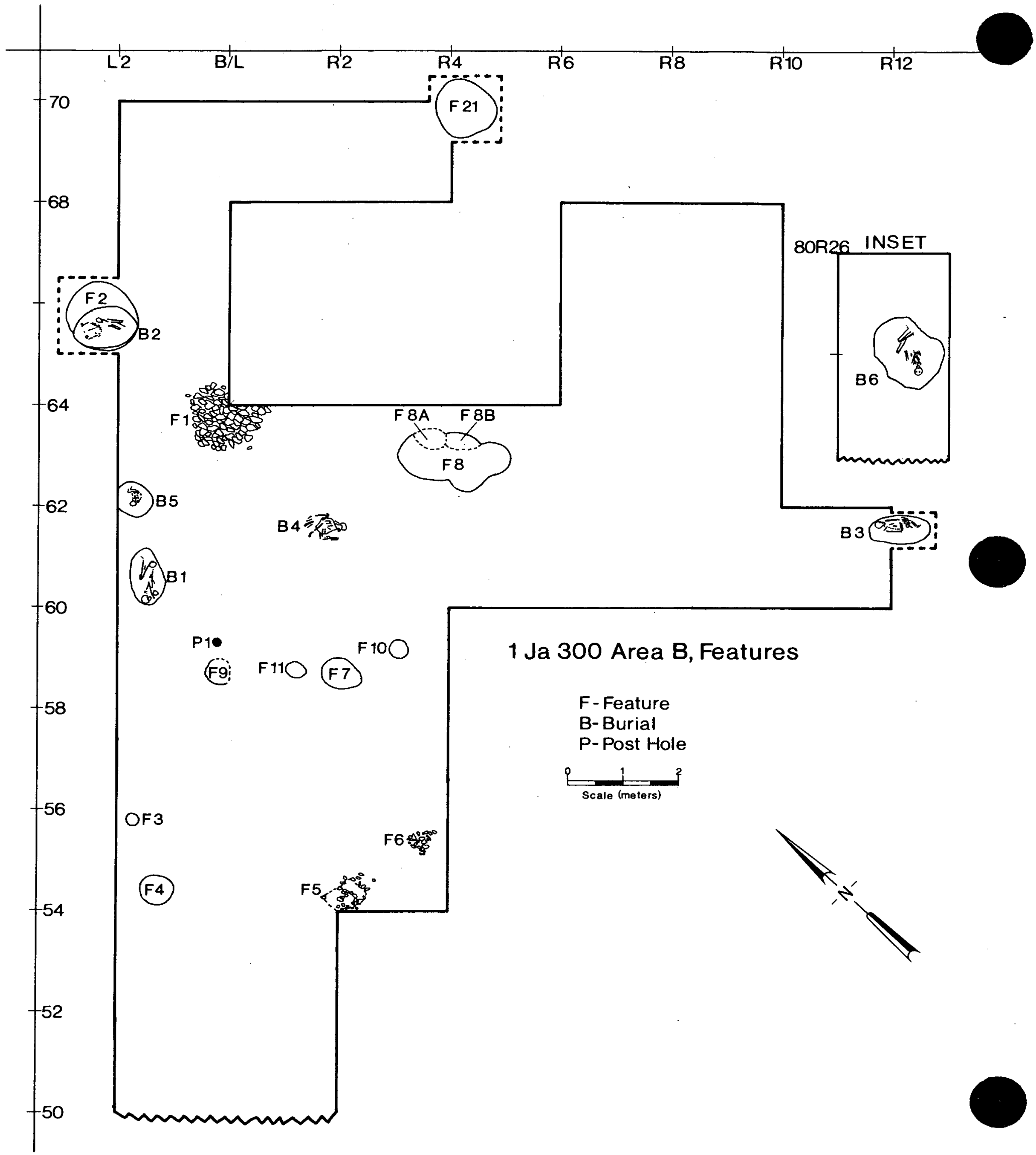

L2
B/L
R2
R4
R6
R8
R10
R12
70
68
64
62
60
58
56
54
52
50
F 21
F 2
B2
F 1
F 8A
F 8B
F 8
80R26
INSET
B6
B5
B4
B3
B1
P1
F9
F 11
F 7
F 10
1 Ja 300 Area B, Features
F - Feature
B - Burial
P - Post Hole
0
1
2
Scale (meters)
F3
F4
F6
F5
N

Figure 4.

Selected Pit Profiles

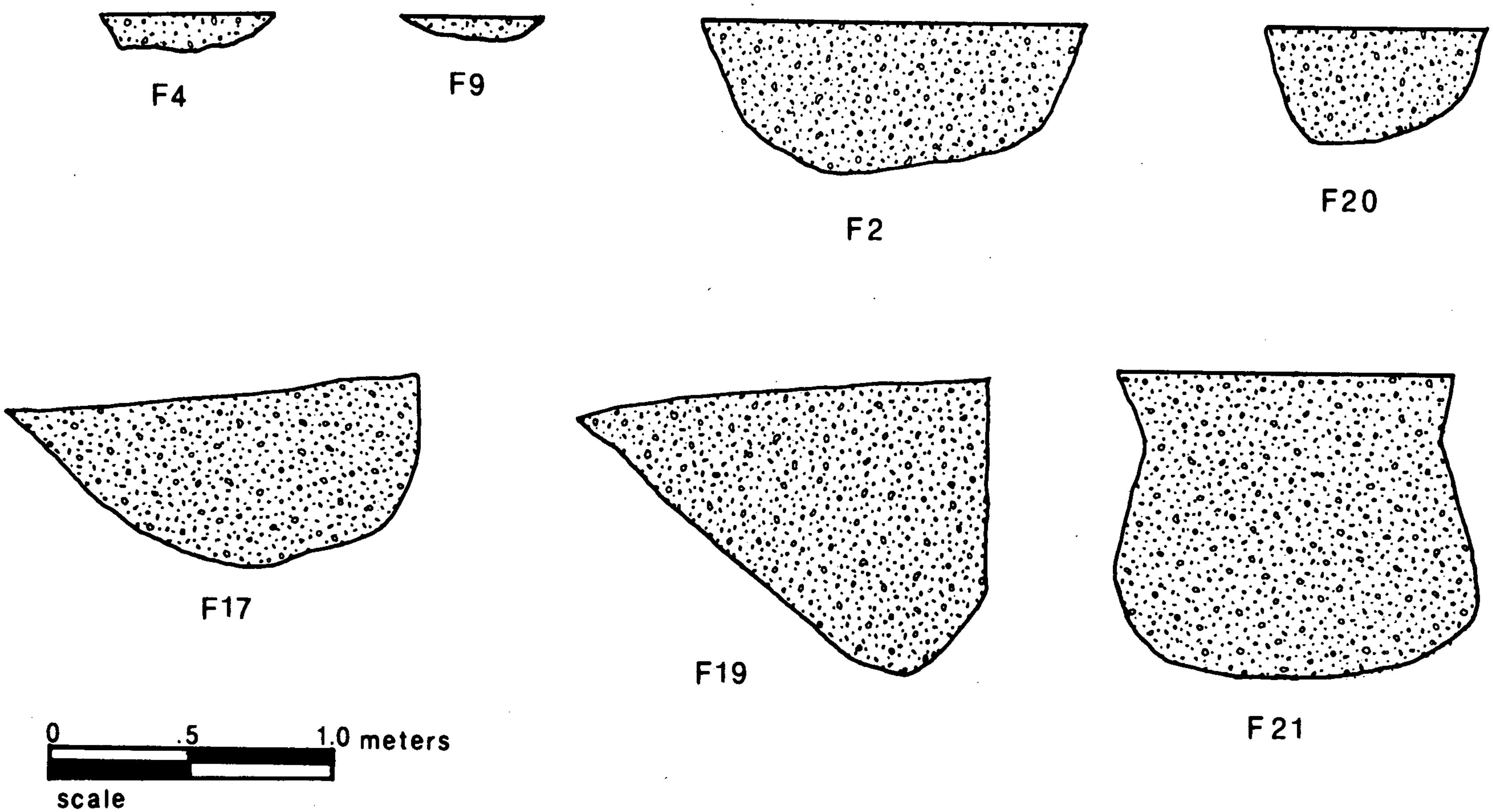


Figure 5.

below the surface. The maximum and minimum diameters were 42 cm. and 39 cm. The pit was 19 cm. deep. The contents of the pit include shell, bone, rock, lithic waste, one stemmed projectile point (Class 114) and pottery. The predominant pottery type was Mulberry Creek Plain, Smooth. The cultural affiliation is apparently Woodland.

Feature 4. Feature 4 was a shallow, circular, basin shaped pit. The diameter varied from 62 to 66 cm., and the pit was 11 cm. deep. The pit contained limestone tempered pottery, debitage, and rock. Mussel and snail shells, bone and charcoal were also found.

Feature 5 (Plate 6). This was a small pile of rock and shell. No cultural material was recovered, but the field form notes the presence of one chert nodule or core among the limestone and sandstone cobbles. The feature was 93 cm. long and 73 cm. wide.

Feature 6. Feature 6 was a small pile of rock encountered in the same excavation unit at Feature 5. Mixed in with the rock were limestone tempered sherds, two drills and one microlith. Bone and charcoal were also present.

Feature 7. This feature was a small oval pit observed 16 cm. below surface. The maximum diameter was 77 cm.; the minimum, 63 cm. The pit was 21 cm. deep. It contained limestone tempered pottery, lithic material, shell, bone, charcoal and rock.

Feature 8. This was a complex of five intrusive pits, mostly oval with sloping sides and rounded bottoms. Only two pits, the last two of the sequence, could be partially isolated.

These were labeled 8A and 8B in the field. Almost no cultural material was contained in the partial pits. Feature 8A contained only one unidentifiable chipped stone fragment and 5.9 grams of debitage, all recovered in the fine screen. Feature 8B contained only four pottery sherds, eighteen pieces of debitage and 2.3 grams of fine screen debitage. This material is all included in the Tables under Feature 8. Most of the diagnostic artifacts from Feature 8 are Woodland. One small sherd of Plain Shell was found in the undifferentiated part of the feature.

Feature 9. Feature 9 was a very shallow basin shaped pit. The maximum and minimum diameters were 53 and 40 cm. respectively. The pit, observed 22 cm. below surface, was only 6 cm. deep. The pit contained a small amount of charcoal, debitage, rock, and bone, and shell. Cultural affiliation is uncertain.

Feature 10. This pit was first detected 23 cm. below surface. The opening measured 33 by 40 cm. The side walls were vertical, and the bottom was rounded with some root disturbance noted on one side. The maximum depth of the pit was 24 cm. The pit contained limestone tempered sherds, debitage, charcoal, and a small amount of bone. The apparent cultural affiliation is Woodland.

Feature 11. Feature 11 was a small oval basin shaped pit detected 23 cm. below surface. The opening of the pit was 35 by 42 cm., and the pit was 16 cm. deep. The sides and bottom were merged into a single smooth curve. The artifacts from the feature include one microlith, debitage, and nine limestone tempered sherds. Botanical remains and a small amount of bone were also present. This is apparently a Woodland feature.

<u>Feature 12</u>. Feature 12 was a pile of fire-cracked sandstone and limestone. One hammerstone, debitage and eight limestone tempered sherds, bone and charcoal were mixed in with the stone. The stone pile was 62 by 90 cm. and was detected 21 cm. below the surface.

<u>Feature 13</u>. This feature was a small round pit with an opening 66 by 72 cm. Side walls and base of the pit were one smooth curve. The pit was first observed 18 cm. below the surface and was 28 cm. deep. The lithic artifacts in the pit included two Class 2 projectile points, two microliths, other chipped stone and debitage. The ceramics were limestone tempered including 24 sherds of Mulberry Creek Plain, Smooth, 24 sherds of Mulberry Creek Plain, Rough and nine sherds of Flint River Brushed. The majority of the identified faunal material was fish. A large quantity of hickory nuts was found along with other botanical specimens.

<u>Feature 14</u>. This feature was a small pile of stone containing little cultural material. The rocks were spread over an area roughly 64 by 70 cm. The concentration was detected 14 cm. below surface. The artifacts from the area include debitage and eroded limestone tempered sherds. A few bone fragments and a small amount of charred botanical material were also found.

<u>Feature 15</u>. Feature 15 was a small, round pit with nearly vertical side walls. The opening of the pit measured

47 by 51 cm. The point of detection was 23 cm. below surface, and the pit was 22 cm. deep. The pit contained many intact bivalve shells. Artifacts were sparse, and a small amount of bone was found. The botanical material consisted mainly of hickory nut shell. Feature 15 may be assigned a Mississippian provenience because it is intrusive into the Mississippian Feature 16.

Feature 16 (Plate 7). Feature 16 was the remains of a small semi-subterranean Mississippian structure. The pit for the structure was 143 cm. wide, 200 cm. long, and 36 cm. deep. It was detected 12 cm. below the surface. A small test pit from the survey intruded into the center of the feature, and Feature 15 was intrusive into one edge. The pit shape was a rounded rectangle rather like a wide bathtub. Sixteen post holes 5 to 10 cm. in diameter were observed at the base of the pit. The depth of the post holes ranged from 15 to 25 cm. below the bottom of the pit. The last several centimeters of some of the post holes were pecked into the bedrock, a soft yellow shale. The mean diameter of the post holes was 8.2 cm., and 21.4 cm. was the mean depth.

A variety of cultural material and bone, shell, limestone, and charcoal was found in the fill of Feature 16. Thirty-six of the pottery sherds were shell tempered, indicating a Mississippian culture association for the feature. The preliminary analysis of the botanical material noted 57 corn cupules and 33 kernel fragments in the sample. All but one of the post holes contained only small amounts of debitage. The exception was Post Hole 16 which contained 15 limestone tempered sherds.

Features 17, 18, 19. These features were three overlapping ovoid pits adjacent to Feature 16. The approximate dimensions of each feature are: Feature 17, 123 cm. wide, 197 cm. long, 61 cm. deep; Feature 18, 91 cm. wide, 139 cm. long, 52 cm. deep; Feature 19, 141 cm. wide, 144 cm. long, 95 cm. deep. A large quantity and variety of material was excavated from each of these pits. Each contained Mississippian pottery. Fire-cracked rock was a large component of the fill of each of these pits.

Feature 20. Feature 20 was a round pit with slightly sloping walls and a nearly flat bottom. The opening of the pit was 61 cm. by 80 cm. The pit was 37 cm. deep and was detected 20 cm. below surface. The artifacts from the pit included limestone tempered pottery, one Class 41 projectile point and one Class 9 projectile point. Bone, shell, and charcoal were also recovered. The cultural affiliation is apparently Middle Woodland.

Feature 21 (Plate 8). Feature 21 was a large bell shaped pit. Observed only 1.5 cm. below surface, the opening of the pit was 110 cm. long and 102 cm. wide. The pit was 91 cm. deep. The variety and quantity of material excavated from the pit is considerable. Two radiocarbon samples were collected from the large amount of charcoal and pockets of ash present in the fill. One of these was submitted to Dicar Radioisotopes Laboratory for dating. The date for the sample was calculated to be A.D. 420 ± 60 (DIC-536).

The ceramics from the feature, predominantly Mulberry Creek Plain, Smooth, also include Wright Check Stamped, Bluff

Creek Simple Stamped, and Pickwick Complicated Stamped pottery. These pottery types and the radiocarbon date indicate a Middle Woodland, Copena culture, association for the feature. A broken limestone celt with an ovoid cross section and two fragments of polished greenstone were also found in the pit. While these artifacts are too non-diagnostic to use as evidence of a Copena association, they are not inconsistent with such an association.

Feature 22. This pit was rectangular with rounded corners. The sides were nearly vertical and the bottom almost flat. A portion of the pit extended beyond the limits of excavation. The excavated part of the pit was 93 cm. wide and 73 cm. long. Detected 10 cm. below the surface, the pit was 56 cm. deep and contained limestone tempered ceramics. A high percentage of Mulberry Creek Plain, Rough and Flint River Brushed indicates a Late Woodland provenience.

Burials

Nine burials were recovered in the Bellefonte site excavations, all of which were primary burials in a flexed or semi-flexed position. Eight were in round to oval pits. The pits were usually just large enough to contain the body. Some of the pits were very shallow. One burial seemed to be placed in a shallow depression, but no pit outline was detectable. Assignment of some of the burials to a particular component was difficult. Both Mississippian and Woodland burials were present.

Five of the burials are adult, and four are children or infants. Burial goods were found in association with all the children and infants. No burial goods were found with adults. Three of the child burials contained only *Anculosa* shell beads. In two of these instances the beads may have been scattered in the fill. Burial 5 had a concentration of these beads at each elbow. Burial 9, in addition to *Anculosa* beads in the fill, contained an engraved whelk shell gorget and necklace of large columella beads worn by the infant at the time of interment.

A detailed report of the osteology of these burials is presented in a later chapter of this report. Below is a brief archaeological description of each. The term "Burial N" refers to both the grave and the contained skeletal materials. Tables giving the artifact distribution for the site give the pit contents for each burial. No pit was detected for Burial 4, and the tabulated material is from the soil immediately around the burial.

Burial 1 (Plate 9). The body of a male 40 to 60 years old had been interred in the flesh in a fully flexed position on its left side. The right arm was folded across the chest, and the knees were drawn up near the right elbow. The left arm was apparently extended along the body and under the left leg. The pit was 106 cm. long and 57 cm. wide. It was detected 10 cm. below surface and was only 20 cm. deep. The profile of the pit was a shallow basin.

Burial 2. This burial of a male aged 40 to 60 years was intrusive into Feature 2, and the pit in that area was indistinct. The pit was oval, 80 cm. wide, and an estimated 120 cm. long. The pit was detected 11 cm. below surface and was 23 cm. deep. The body had been buried in the flesh. The position was semiflexed with the hands near the pelvis. The heels were against the sacrum, and the knees pointed almost 90 degrees away from the torso. The head and hands were disturbed; most of these bones are missing. Orientation was east-west, with the head to the east.

Burial 3. This burial was placed in a shallow oval pit 56 cm. wide and 113 cm. long. The point of detection was 10 cm. below surface, and the pit was only 11 cm. deep. The skeletal remains are those of a female in the age range of 18 to 30 years. The body was buried in the flesh, partially flexed, in the same position as Burial 1. It was on the left back with the knees drawn up and the heels against the pelvis. The right arm was folded across the body and the left arm was extended under the legs. Bone from this burial was dated at 460±85 B.C. by Dicar Radioisotopes Laboratory (DIC 538). The report of the lab states that due to rootlets in the bone, the date should be considered a minimum age.

Burial 4 (Plate 10). No pit was detected for this burial although it seemed to have been placed in a slight depression. The body was on its back and fully flexed. A large rock was placed over the burial. The orientation of the burial was southeast-northwest with the head to the southeast. The skeletal remains are those of a female age 35-40 years.

Burial 5. This was the burial of a child about 1 to 2 years of age. The pit was almost round, 62 by 74 cm. The pit was detected 30 cm. below surface and was 35 cm. deep.

The body was placed on its back, knees drawn up to the left side. The arms were extended along the sides. Gastropod beads were clustered around the distal portion of each humerus. The orientation was northeast-southwest, head to the southwest.

Burial 6 (Plate 11). Burial 6 was in an irregular oval pit 115 by 146 cm. at the point of detection, 10 cm. below surface. The sides of the pit sloped so that at the base, the pit was about 75 by 105 cm. The pit was 50 cm. deep. The body was placed on the back and semi-flexed. The arms were flexed in front of the chest; the hands near the skull. The knees were tightly flexed, with the heels against the pelvis. Charcoal from the pit fill was dated at A.D. 700± 165 years (DIC 537). The skeletal material indicates that the burial was that of a female, aged 40 to 60 years.

Burial 7 (Plate 12). Burial 7 was that of a child aged 4 to 6 years. The body was placed on the right front with the knees and hands brought together in front of the chest. The pit was oval and was about 125 cm. long and 85 cm. wide at the point of detection, 10 cm. below surface. The pit was stepped at one end at a depth of about 15 cm. so that the portion of the pit containing the burial was 85 cm. by 85 cm. Orientation was northeast-southwest, head to the southwest. The total depth of this part of the pit was 41 cm. Gastropod beads were recovered while screening the pit fill. Skeletal material was dated at A.D. 1160±60 years (DIC 539).

Burial 8. This was a burial of a child 3 to 5 years old. Part of the pit wall was indistinguishable due to disturbance, but the pit may have been nearly round with a diameter of about 70 cm. The point of detection was 10 cm. below surface, and the pit was 29 cm. deep. The body was on its left side and partially flexed. The arms were across the chest, and the femurs were perpendicular to the orientation of the rest of the body. Screening of the pit fill recovered gastropod shell beads. The burial was oriented northeast-southwest, the head to the southwest.

Burial 9. This was a Mississippian burial of an infant aged 6 months to one year. The pit was almost round, 67 by 62 cm. The side walls were almost vertical, and the pit was 28 cm. deep. The point of detection was 12 cm. below surface. The burial was oriented east-west, with the head to the east. The body was on the left side with the arms extended along the sides. The knees were flexed with the feet near the pelvis and the legs perpendicular to the rest of the body. At the time of interment the infant was wearing a necklace of columella beads and a gorget with an incised cross design. Gastropod beads were recovered while screening the pit fill.

Post Holes

Post holes are a particular type of feature. They may be characterized as small pits relatively deep in proportion to width. Nineteen post holes were found on the site. Three were isolated instances. Post holes 2-17 are part of Feature 16. In no case was any indication of a post mold observed within a post hole. Only a small amount of cultural material was found in the post holes.

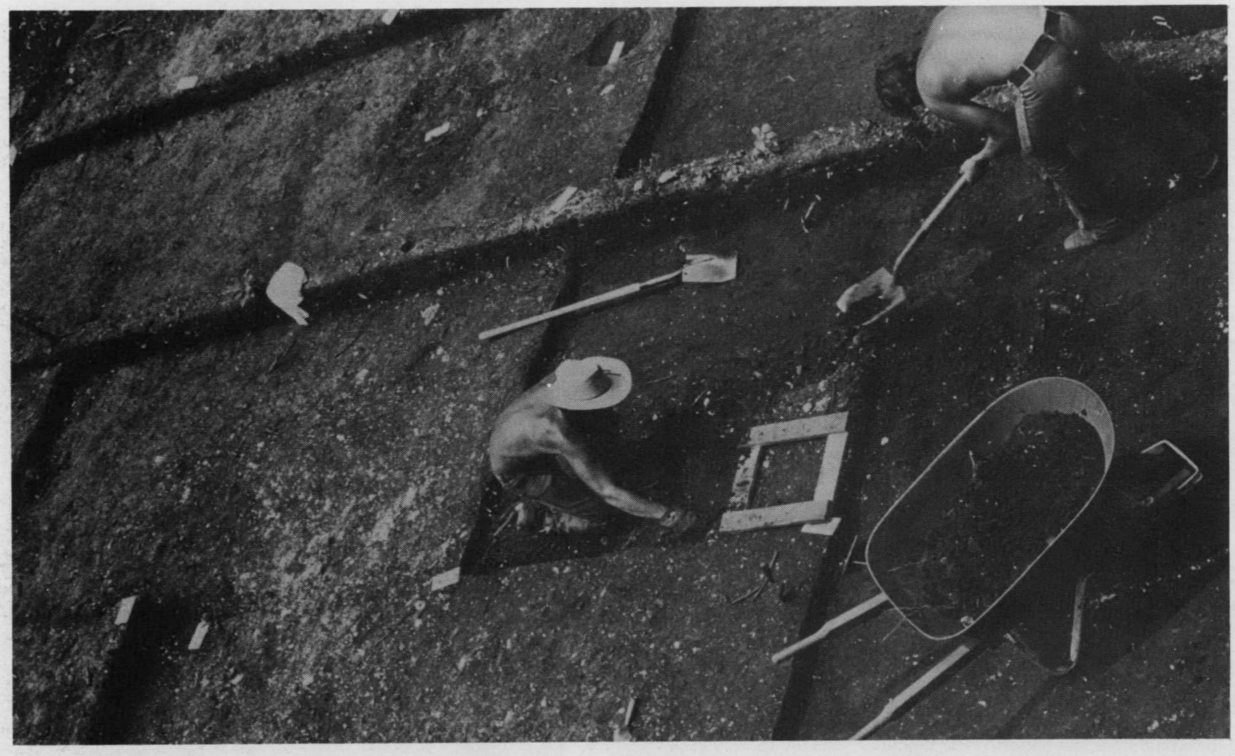


Plate 1. General View of Excavation in Area B, Facing West.

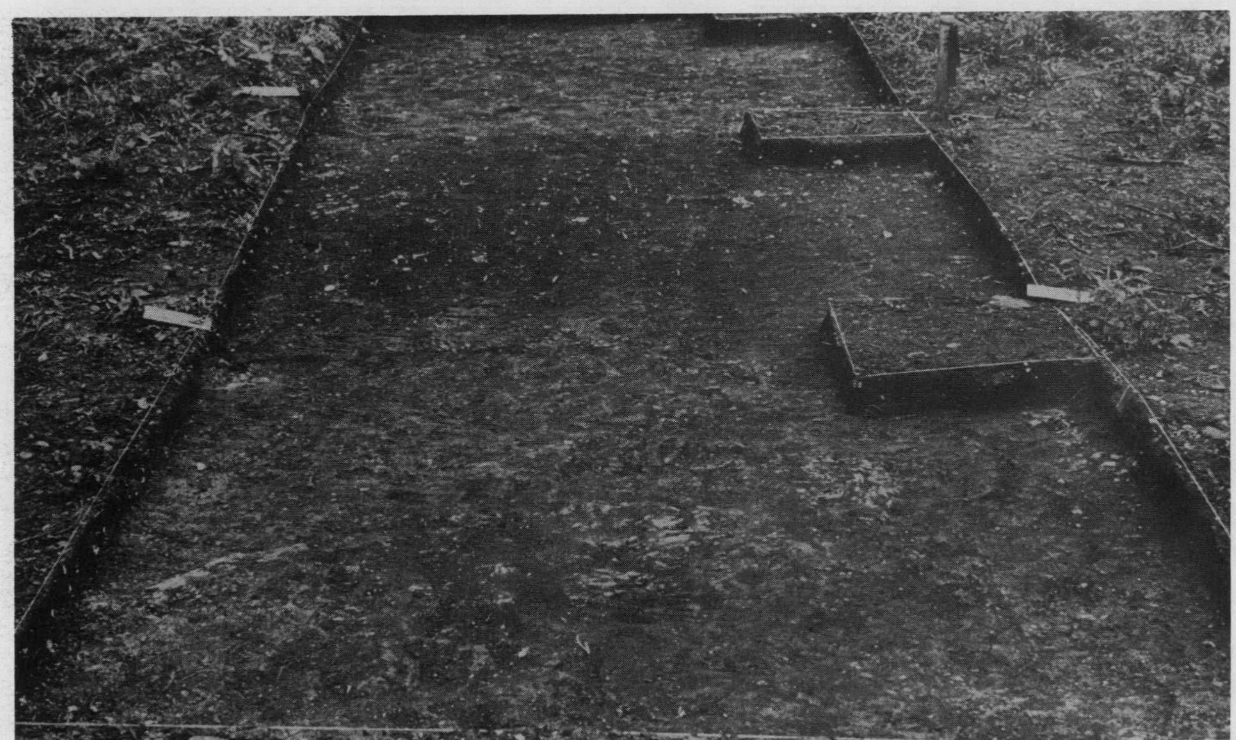


Plate 2. General Excavation Units and Control Columns.

Plate 3. Waterscreening.

Plate 4. Waterscreening.

Plate 5. Feature 1, Portion in Control Column.

Plate 6. Feature 5.

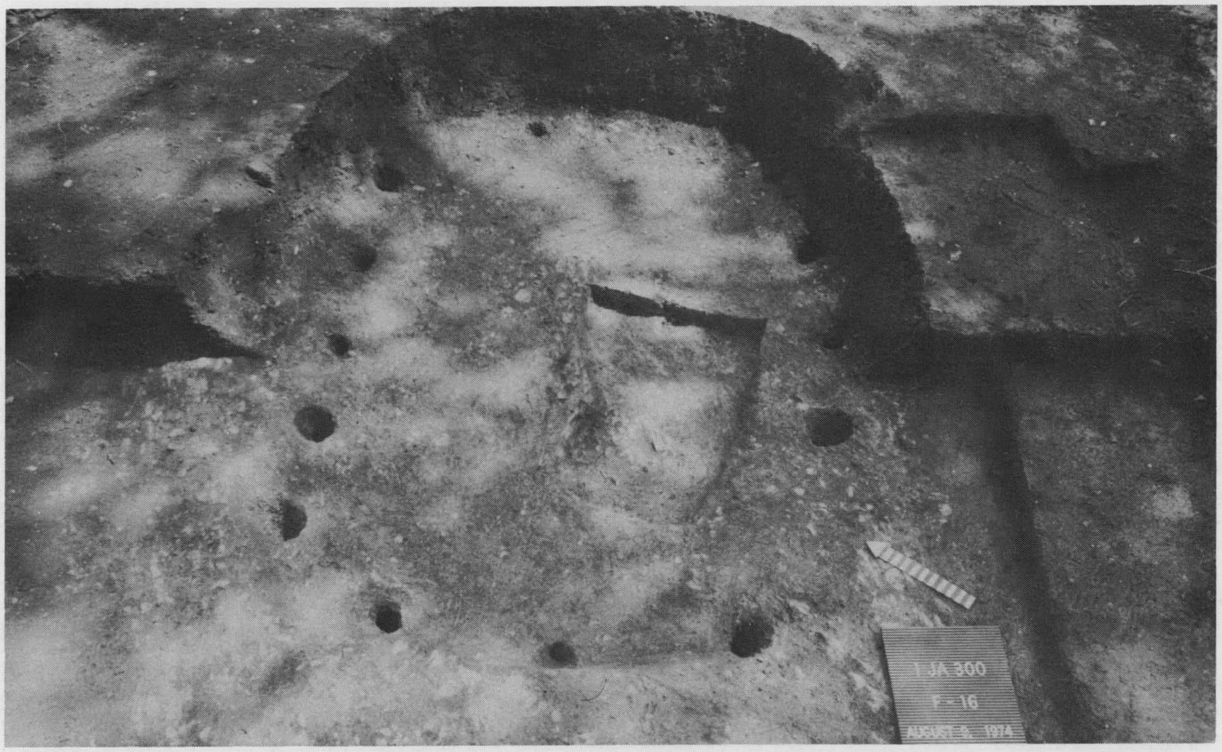


Plate 7. Feature 16.

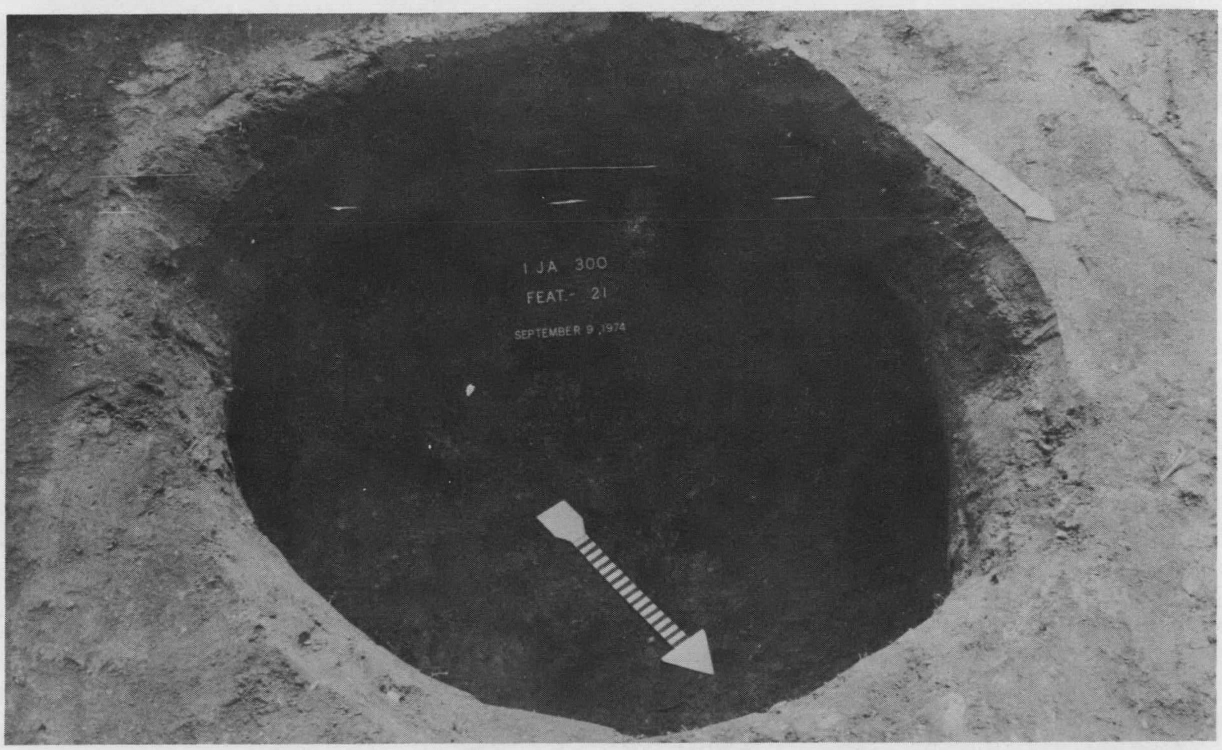


Plate 8. Feature 21.

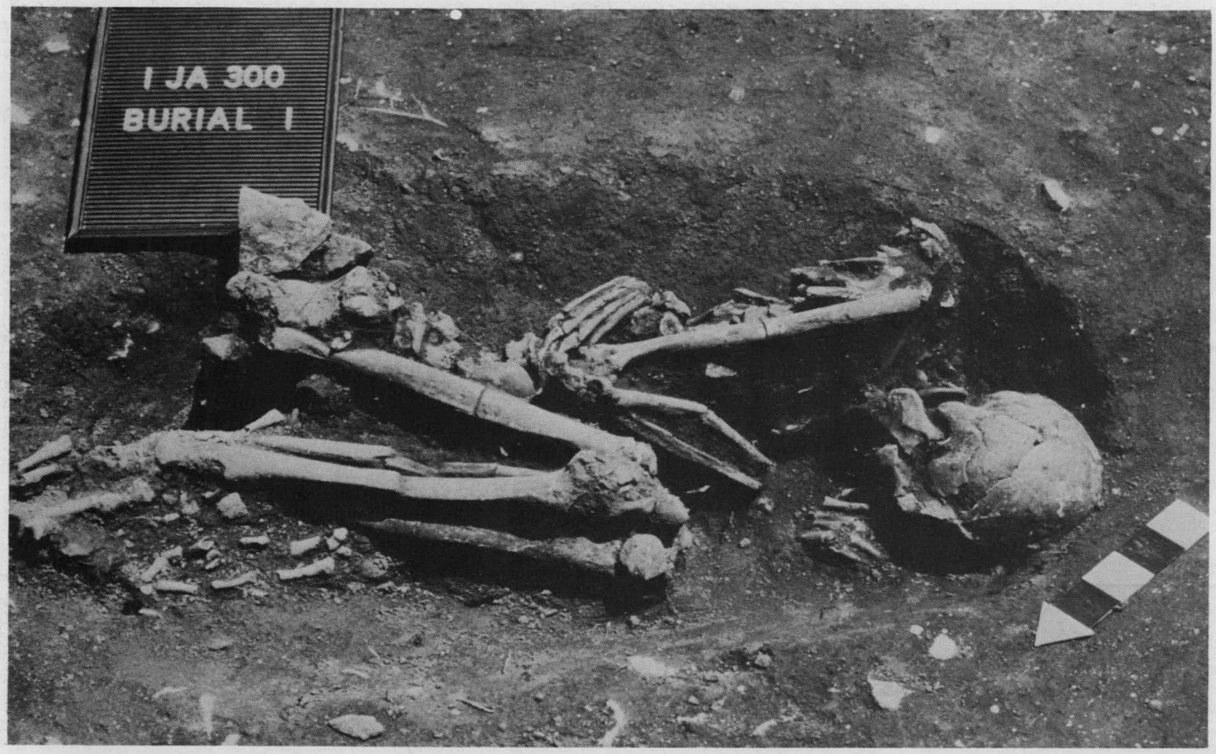


Plate 9.   Burial 1.

Plate 10. Burial 4.

Plate 11. Burial 6.

Plate 12. Burial 7.

CHAPTER III

TOWARD A FORMAL ACCOUNT OF PROJECTILE POINT MORPHOLOGY

Formal accounts consist of units and rules such that when the rules are applied to the units a reasonable model of the subject phenomenon is produced. In this particular study the units are introduced by definition. The rules are those used to create and combine the units. Interpretations of these units may then be used to model projectile point shapes.

The terms and expressions used in this study are introduced by nominal definition. The rules for nominal definition have been explained by Hemple (1952). Briefly stated, a nominal definition introduces a term, the definiendum, by stating its synonomy with another term or expression, the definiens, having a previously determined meaning. This previously determined meaning may consist of prior nominally defined terms or primitives. Primitives are the basic starting points for a system of definitions and are introduced at the outset. However, this should not be taken to mean that the meanings assigned to the primitives are arbitrary. They should be stated as explicitly as possible and should contain a maximum of empirical relevance. Since the definiens of a nominally defined term may contain only primitives or prior nominally defined terms, it follows that any nominally defined term must ultimately be reducible to, or replaceable by, a unique expression of primitives. This is Hemple's "Requirement of univocal eliminability of defined expressions" (p. 17).

The point may arise that since all nominally defined terms may be replaced by primitives, why use the nominally defined terms at all? The answers are multiple in nature, the first being purely practical. A single nominally defined term may reduce several lines of primitives to one word, and a definition containing several of these would be virtually unintelligible if expanded to a long passage of primitives. As an example, the fairly simple *basal plane* expanded to primitives is a formula which requires 97 primitives plus quantifiers grouped in 54 brackets (marking set addition) nested to the eighth order. Twenty-four operations of including or being proper subsets are also needed. It is obvious that "The most proximal transverse plane tangent to the base" is much more understandable. This example implies an additional set of rules which were used in combining the terms, but this will be discussed later.

The second benefit of a system of nominally defined terms is that the meaning of the term becomes precise and consistent. The term *base* is currently used with three distinct meanings. In a hypothetical discussion of the proximal portion of a broken Clovis point, we may see the artifact referred to as the *base* of the point. Clovis in general may be described as a ground *base* point, and one that has an incurvate *base*. Thus the term *base* may mean respectively:

1. An undetermined proximal portion,

2. The edges of an undetermined proximal portion,

3. A specific edge across the proximal end.

As defined below, the term *base* will have only one interpretation.

Another benefit of using a system of nominal definitions is that the definitions must be built in an orderly manner without circularity, contradiction, or inconsistency. This forces one to look at the subject material in new ways and often reveals relationships not apparent in other ways. Finally, nominal definitions may be used to define classes, rather than to describe groups. Classes are the necessary and sufficient criteria for class membership and are invariant. The characteristics of a group as a whole are not invariant, as they may change with the addition or deletion of successive members.

Domain Specifier

The first step is to specify the domain, or that area of study, to which the system is to be applied. It is of course preferable for this to be by definition, but in this case it is not. The following characterization will have to suffice for now:

> *Projectile Point*=Any chipped stone artifact presumed to have been used, or usable, as the piercing end of an arrow, spear, dart, or similar composite tool.

This study assumes a basic symmetry of the artifacts which is not always present in reality. However, once the system is understood, its application to broken or asymmetrical specimens entails little interpretive difficulty. Basically, unpaired points on one margin are projected onto the other margin on the same transverse plane.

Primitives

The more thoroughly a definition system is nested within an extant theoretical system, the greater the likelihood of generality. Thus in a system of definitions dealing with shape, it is not surprising that most of the primitives needed are used in mathematics, particularly geometry. The term tip is included to present one starting place on the projectile point.

Property Terms

Point=A dimensionless geometric object having no property but location.

:: Synonymous with projectile point in another context.

Straight Line=The shortest distance between two points.

Curve=A line that deviates from straightness in a smooth continuous fashion.

Vertex=A point at the intersection of two lines.

Tip=The most anterior point of a projectile point, considered a vertex.

Plane=Any two-dimensional locus of points.

Boundary=A border or limit.

Distance=The length of a line segment joining two points.

Beginning=The point at which something starts or is originated.

End=The point at which something ceases or is completed.

It is recognized that *beginning* and *end* are imprecise terms in that each must be relative to the other or some other reference point. However, definitions using these terms will contain instructions to the analyst which will remove any ambiguity.

Relation Terms

Perpendicular=Intersecting at or forming right angles.

Parallel=Being at an equal distance at every point.

Tangent=Touching but not intersecting.

Isomorphic=Identical in form.

Maximum=The greatest possible quantity, degree, or number.

Minimum=The least possible quantity, degree or number.

Greater=A larger quantity, degree, or number.

Lesser=A smaller quantity, degree, or number.

Compound=Consisting of two or more parts.

Paired=Consisting of two corresponding parts.

Nominal Definitions

The nominal definitions are produced by combining the prior terms in certain ways. The operations are: set addition; inclusion as a proper subset; being a proper subset of; and exclusion. The quantifiers which may be used have indexical intent, *i.e.*, have a single denotatum: a, one, the, etc.; or they are universal, having infinite denotata. Universal quantifiers may be positive: any, all, etc.; or negative: no, none. Real numbers may also be used. These rules, plus the general rules for the formulation of nominal definitions previously summarized, are the basis for the nominal definitions which follow.

The following is a list of nominally defined terms to be used in the analysis of projectile point shape. Where further clarification or interpretation would be helpful it is presented verbally and/or by graphic examples, but such analogies and examples are not themselves part of the definition. It is interesting to note that most of the terms below are taken from the current jargon, usually with a meaning very similar to the current meaning. This indicates that the jargon does contain a fair amount of empirical meaning but lacks precision and systematization.

The definitions are all in the form:

Definiendum=df. Definiens.

The symbol *=df.* is read as "equal by definition." Material following the symbol :: is any additional nondefinitional explication. The first set of nominally defined terms deals with reference points on, and the parts of projectile points.

Margin=df. The maximum boundary of a projectile point.

Edge=df. Any portion of the margin.

Coronal=df. The plane which includes the margin.

Longitudinal=df. The plane perpendicular to the coronal which is the boundary of isomorphic parts of the projectile point.

Midline=df. The intersection of coronal and longitudinal planes.

Transverse=df. Any plane perpendicular to the midline at only one point.

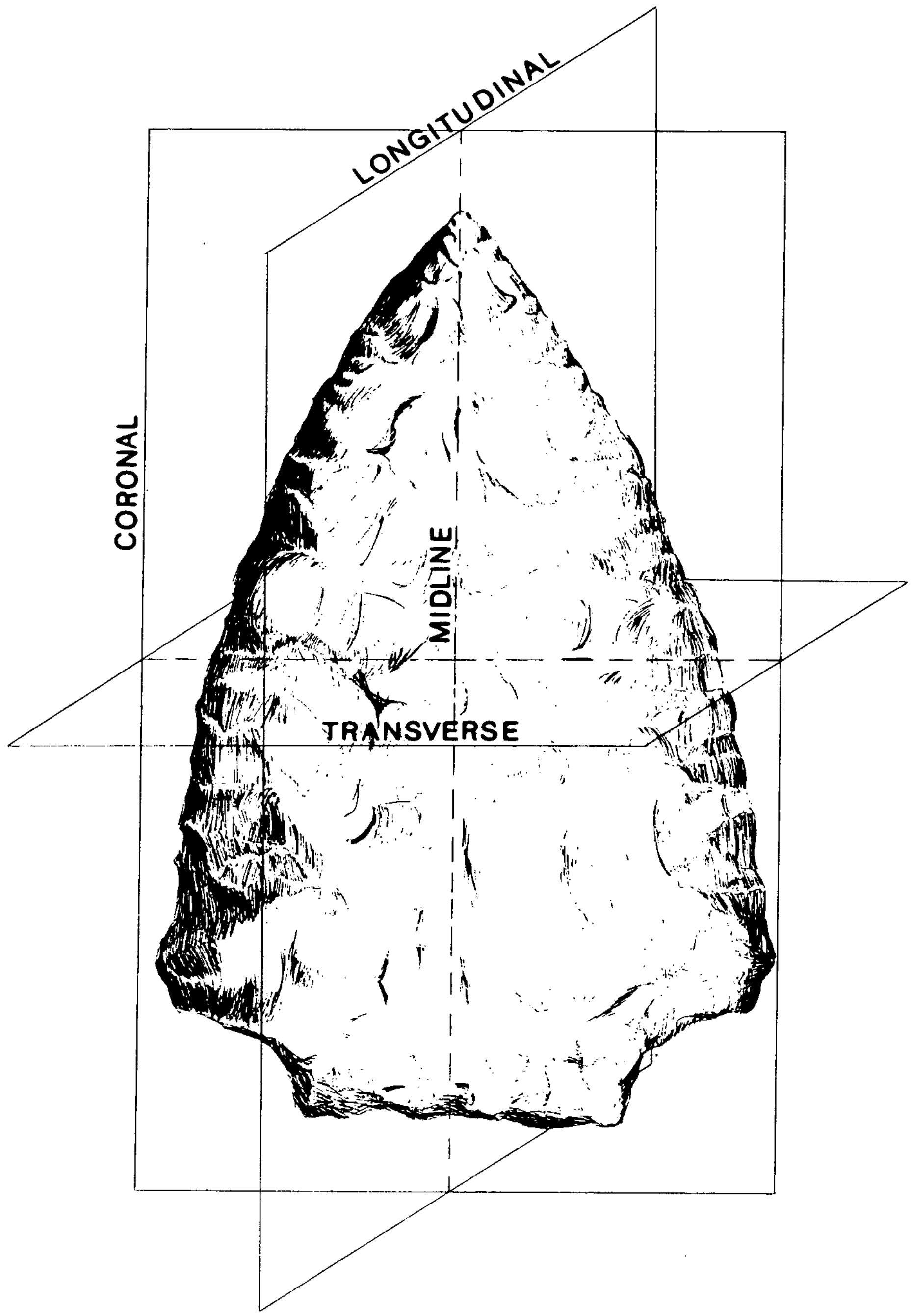


Figure 6. Reference Planes.

Side=df. Either of two portions of the projectile point bounded by the longitudinal plane.

Face=df. Either of the two portions of the projectile point bounded by the coronal plane.

Proximal=df. At a greater distance from the tip along the midline.

Distal=df. At a lesser distance from the tip along the midline.

Medial=df. At a lesser distance from the midline.

Lateral=df. At a greater distance from the midline.

:: Note that Proximal and Distal are relative to the tip along the midline, not around the margin.

Midbase=df. The proximal intersection of midline and margin.

Base=df. Any edge beginning at the midbase and ending at the most lateral paired points on the margin not beyond the first vertex in either direction

Basal=df. The most proximal transverse plane tangent to the base.

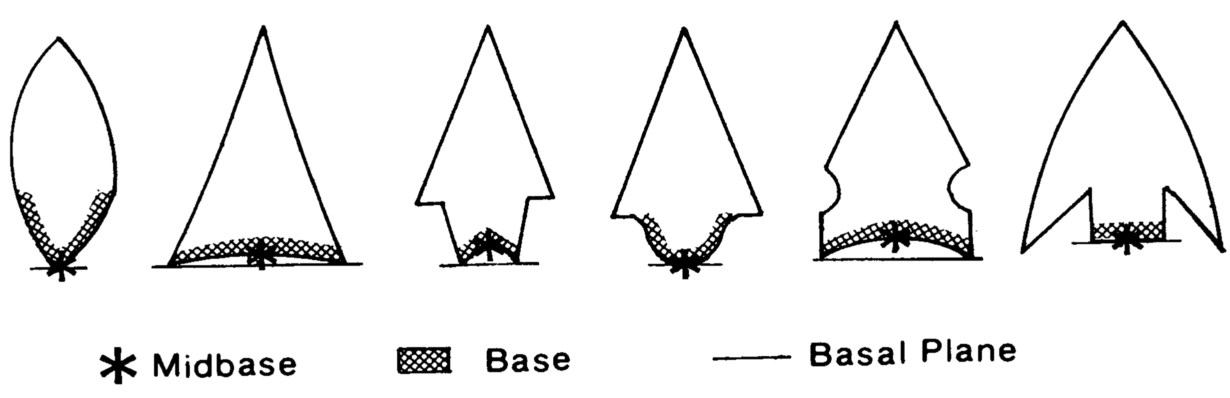


Figure 7. Midbase, Base, and Basal Plane.

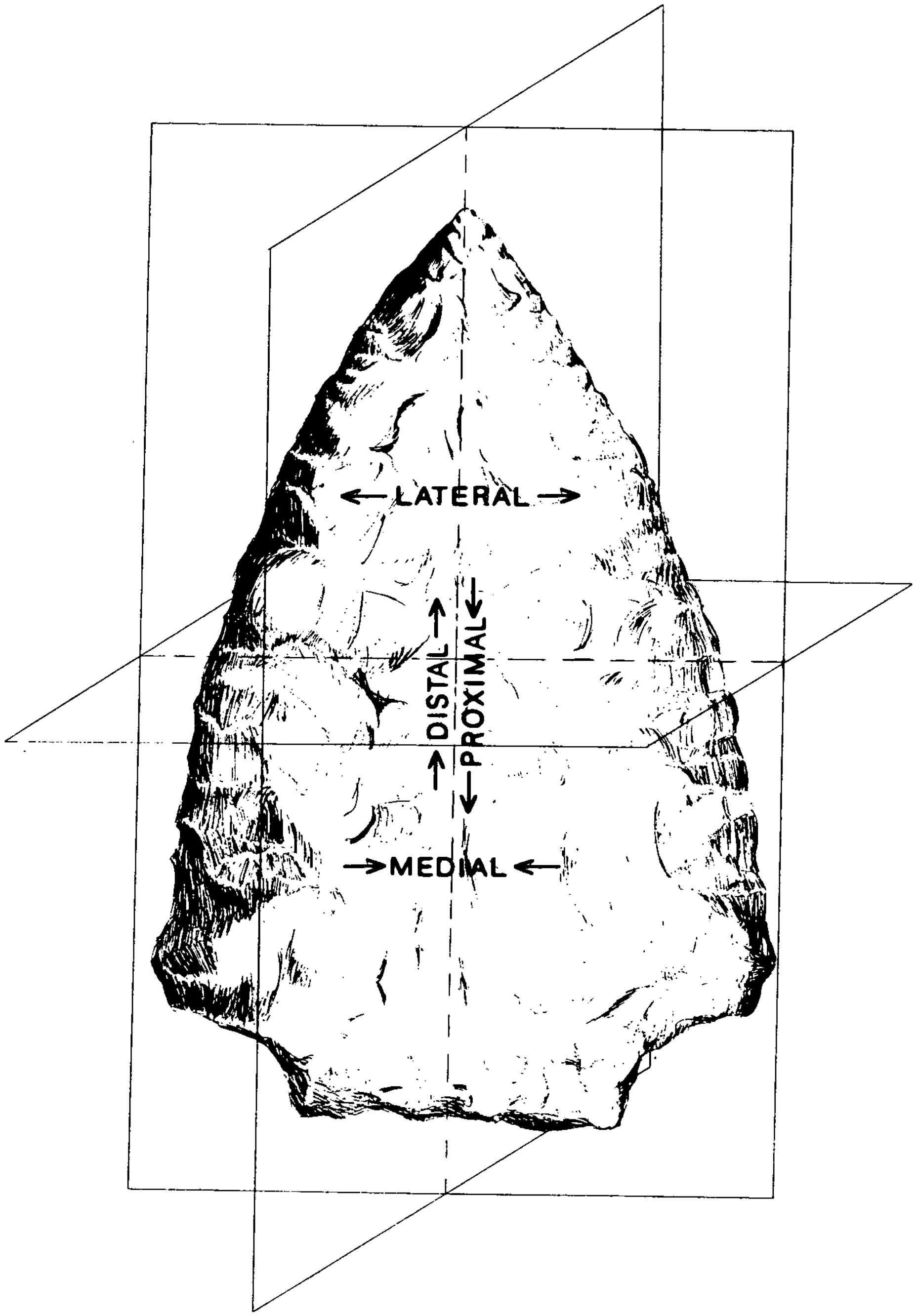


Figure 8. Directional References.

Junctures=df. The paired most distal points on the edge beginning at the most medial paired vertices not on the basal plane and ending at the next vertex on the margin moving initially toward the proximal end of the midline.

Haft Element=df. Any portion of the projectile point proximal to a straight line, beginning at one juncture and ending at the other.

Blade Element=df. All non-haft portions of the projectile point.

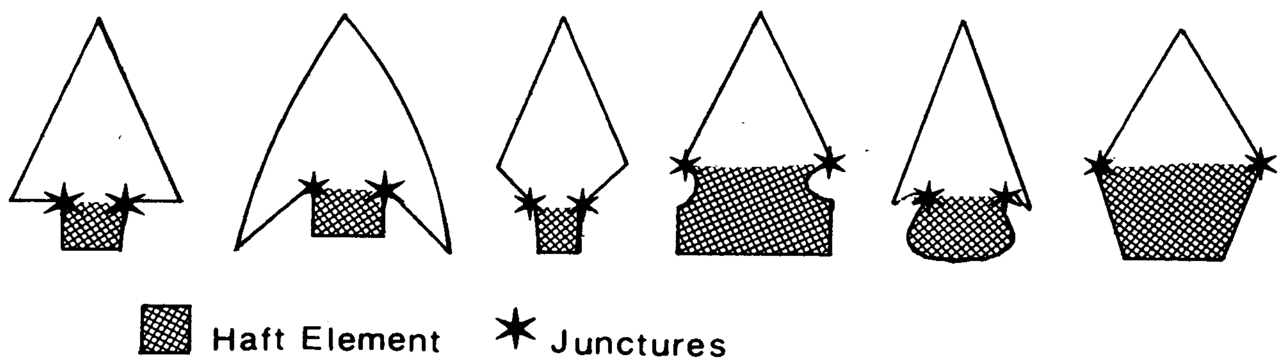


Figure 9. Junctures, Haft Element, and Blade Element.

Blade Edge=df. The margin beginning at the tip and ending at the first encountered of: the most proximal and lateral vertex on the blade element other than the juncture; the juncture; or the base.

Shoulder=df. Any non-base margin extending medially from the proximal end of the blade edge and not ending proximally on the basal point.

Lateral Haft Element Edge=df. Any non-base, non-shoulder, margin on the haft element.

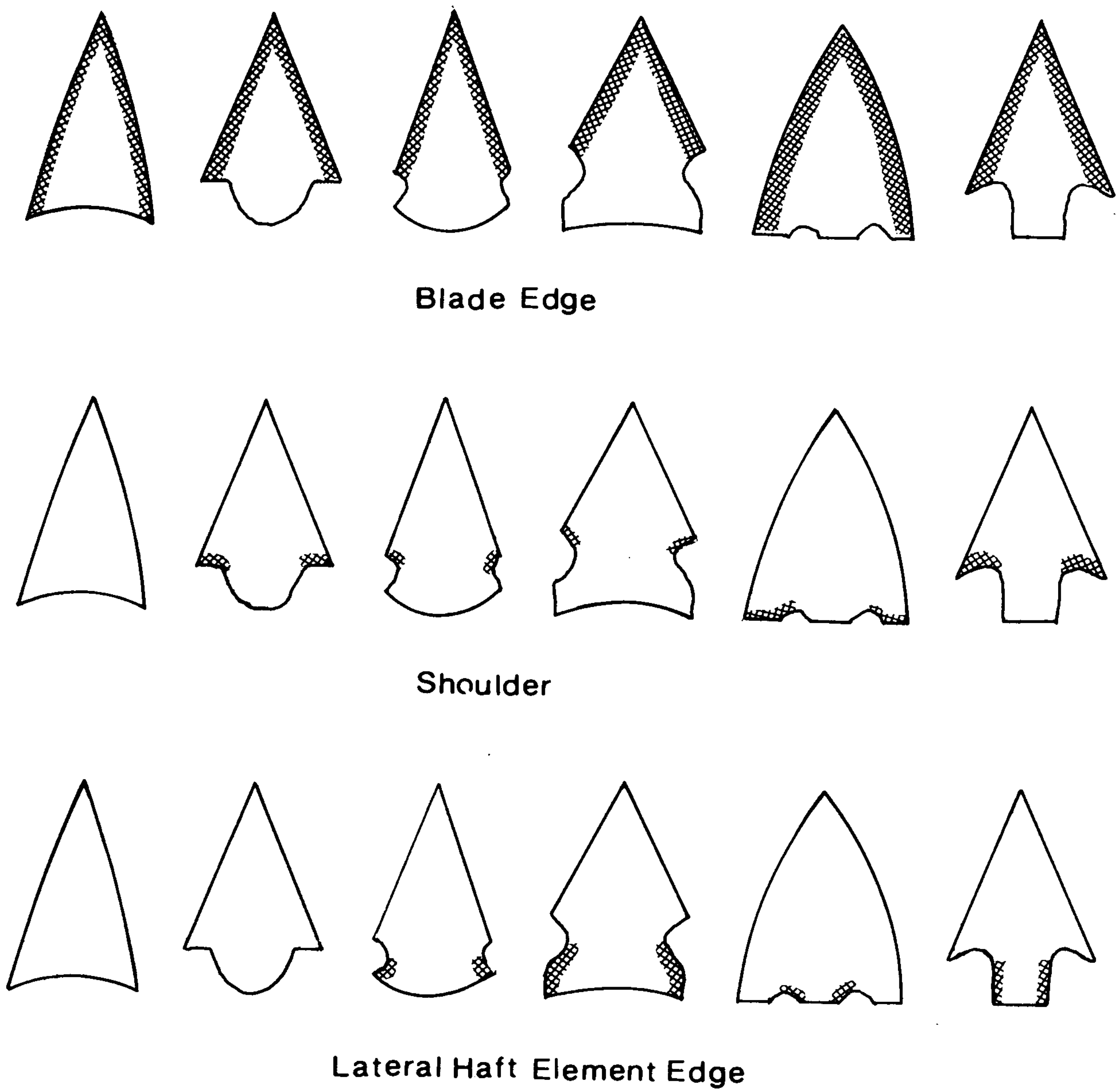


Figure 10. Other Edges.

The nominal definitions thus far have dealt with various reference points on, and the edges and elements of, a projectile point. The definitions to follow are for terms dealing with shapes and orientation of various edges. These two concepts of shape and orientation are taken here to be separate, though interrelated. Shape is used in reference to the configuration of an edge; orientation is the way one edge is positioned with respect to some other edge or edges. Currently, such things as type of stem and type of shoulder are at times dependent on the shape of the edges involved and at times on the orientation of the edges. Herein these concepts are dealt with separately.

Excurvate=df. Any edge which is the boundary of a greater area on the coronal plane than is a straight line between the same two points.

Incurvate=df. Any edge which is the boundary of a lesser area on the coronal plane than is a straight line between the same two points.

Recurvate=df. Any edge which is a compound of at least one excurvate edge and one incurvate edge.

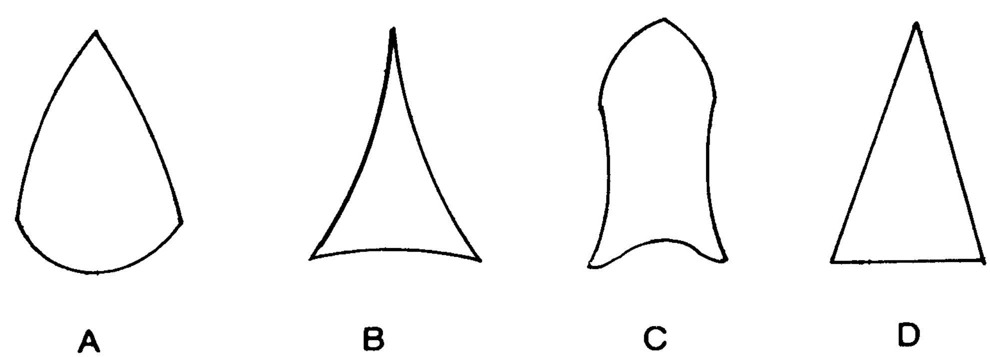


Figure 11. Edge Shapes: A, Three Excurvate Edges; B, Three Incurvate Edges; C, Three Recurvate Edges; D, Three Straight (Line) Edges.

Angular=df. Any compound edge including at least one vertex.

Internal=df. Any angular edge which is the boundary of a lesser area on the coronal plane than is a straight line between the same two points.

External=df. Any angular edge which is the boundary of a greater area on the coronal plane than is a straight line between the same two points.

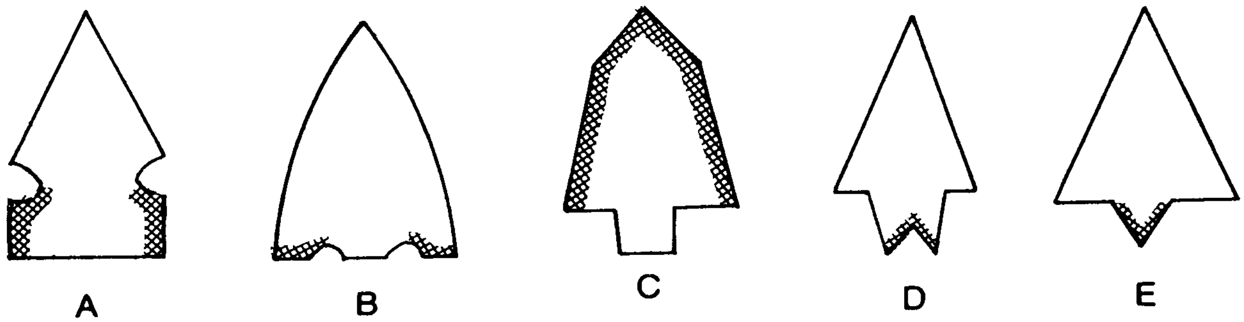


Figure 12. Angular Edges: A, Angular Lateral Haft Element Edge; B, Angular Shoulder; C, Angular Blade Edge; D, Angular Base Internal; E, Angular Base External.

Horizontal=df. Any shoulder having both ends on the same transverse plane.

Tapered=df. Any shoulder having the lateral end distal to the medial end.

Barbed=df. Any shoulder having the lateral end proximal to the medial end.

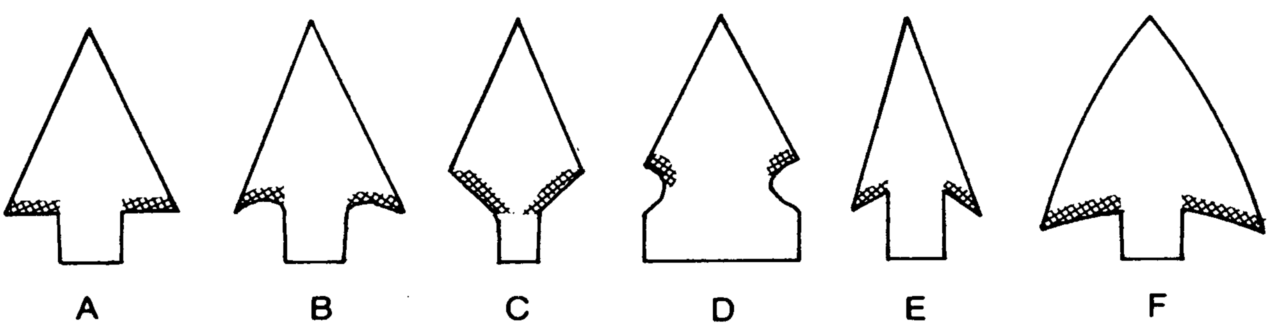


Figure 13. Shoulder Orientation: A-B, Horizontal; C-D, Tapered; E-F, Barbed.

Expanding=df. Any lateral haft element edges, the distance between paired points becoming greater proximally.

Contracting=df. Any lateral haft element edges, the distance between paired points becoming lesser proximally.

Concave=df. Lateral haft element edges, the distance between paired points becoming lesser, then greater, proximally.

Convex=df. Lateral haft element edges, the distance between paired points becoming greater, then lesser, proximally.

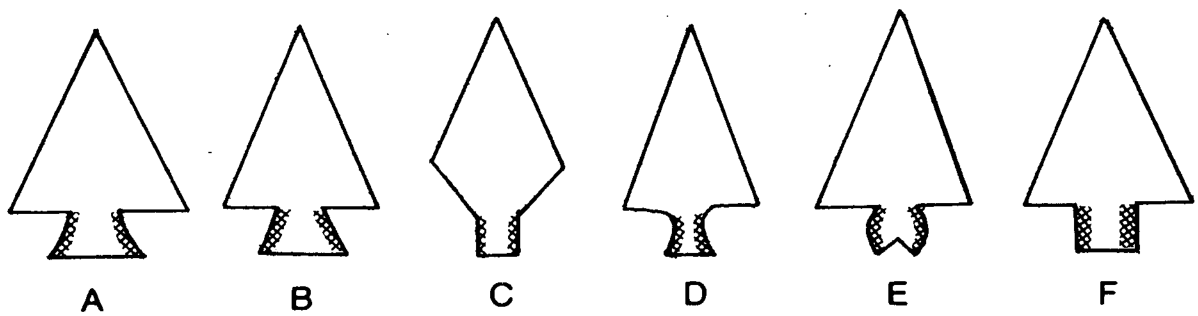


Figure 14. Lateral Haft Element Edge Orientation: A-B, Expanding; C, Contracting; D, Concave; E, Convex; F, Parallel.

The next set of definitions is for the classification of haft element modifications. That portion of the projectile point dealt with is quite variable as is the nature of the modification. The haft element modification may or may not include the shoulder; it may or may not include all or part of the base, depending on the type of modification involved and the exact form of a given specimen.

Haft Modification=df. Any edge between points on margin lying on a plane perpendicular to the coronal and tangent to the projectile point at the lateral end of one shoulder and the haft element, not including the midbase; or tangent to the projectile point at the lateral end of both shoulders.

Laterally Modified Haft=df. Any projectile point having the ends of the haft modification on two planes either not tangent to the base or tangent to the base but not intersecting proximal to the junctures.

Basally Modified Haft=df. Any projectile point having the ends of haft modification on a plane tangent to the projectile point of the lateral end of the shoulders.

Diagonally Modified Haft=df. Any shouldered projectile point not laterally or basally modified.

Unmodified Haft=df. Any projectile point having a haft element and no shoulder.

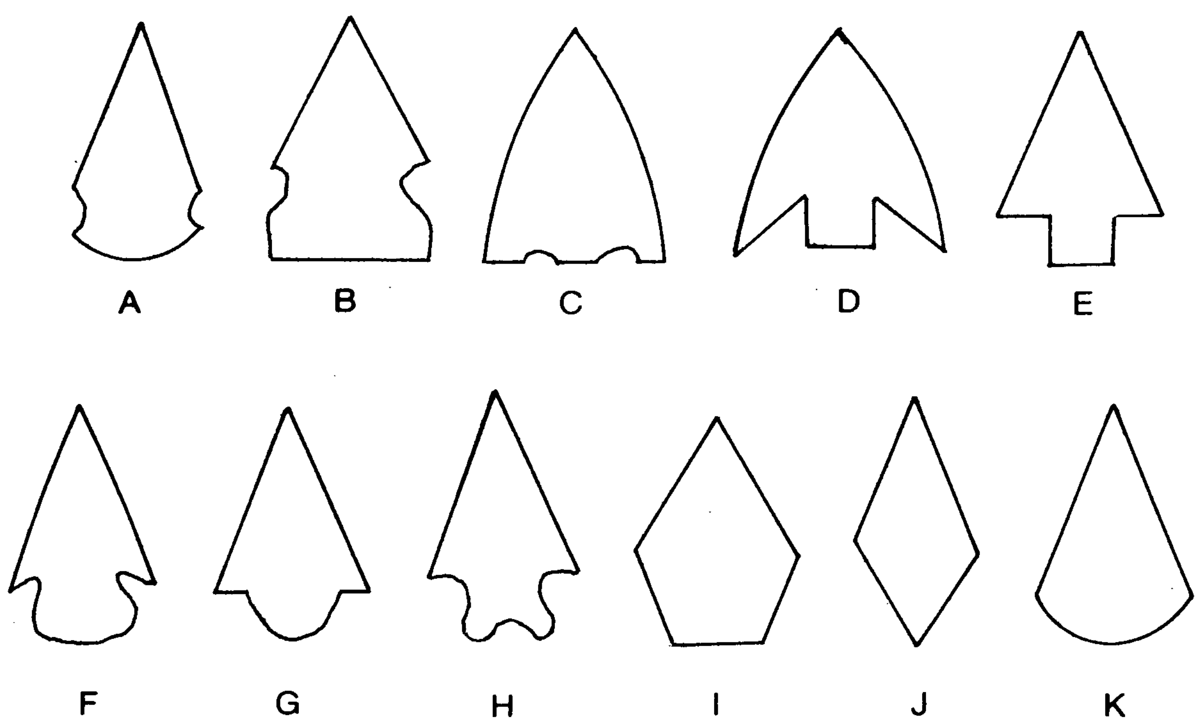


Figure 15. Haft Modifications: A-B, Laterally Modified; C-D, Basally Modified; E-H, Diagonally Modified, I-K, Unmodified.

Rules of Projectile Point Shape

The following rules are offered with respect to projectile point shape. In actuality the first two are extensions of geometric rules.

> *Rule 1.* The number of vertices and the number of edge segments on a projectile point must be equal.

This is an interpretation of a theorem of geometry which states that a polygon of N sides will have N angles.

> *Rule 2.* Projectile point shapes are determined by the number of position of vertices and the shape of the edge segments between vertices.

Rule 2 is a logical extension of Rule 1. However, it may be interpreted to mean that the shape of a projectile point is made up of constituent parts and that by defining the number, shape and interrelation of the parts, we may define the shape of the whole.

The next rule requires a little more explanation than the others. Assuming, as this study does, an artifact symmetry, it is a logical conclusion that vertices on each side of the projectile point must occur in pairs. When the tip is added an odd number of vertices must be the result. Logic, and a little experimentation if desired, will show that the only way to have an even sum will be to match the vertex at the tip with one at the midbase.

> *Rule 3.* Any projectile point having an even number of vertices must have a vertex at the midbase.

Referring back to the nominal definitions this becomes an angular base, either internal or external. An angular base external is considered a special case of an excurvate base, and an angular base internal is considered a special case of an incurvate base. In each example the two edge segments of the angular base are generalized to a single curve. This leads us to Rule 4.

Rule 4. Any projectile point with an even number of vertices N may be considered a specialization of a corresponding form having the odd number of vertices N-1.

The final nominal definition may now be introduced. It provides for a primary separation of projectile points by an interpretation of the number of vertices, largely based on Rules 1 and 4. Since the number of vertices and edges on a projectile point are equal, this interpreted vertex count is a general indicator of relative complexity of shape. It is the sum of those points which are generally the boundary of major edge segments.

Vertex Class=df. The number of vertices on the margin excluding any vertex wholly on a single blade edge or at the midbase; plus the junctures, if not vertices.

Classification of Projectile Point Shapes

The definitions and rules previously presented may be used to define the number, type, shape, and orientation of parts of a projectile point. These definitions may be used in two distinct ways, classificatory or analytical. The first is application to a specific specimen to define the shape of that specimen. This is the assignment of that specimen to a shape, and is the method used in classifying a group of individual projectile points.

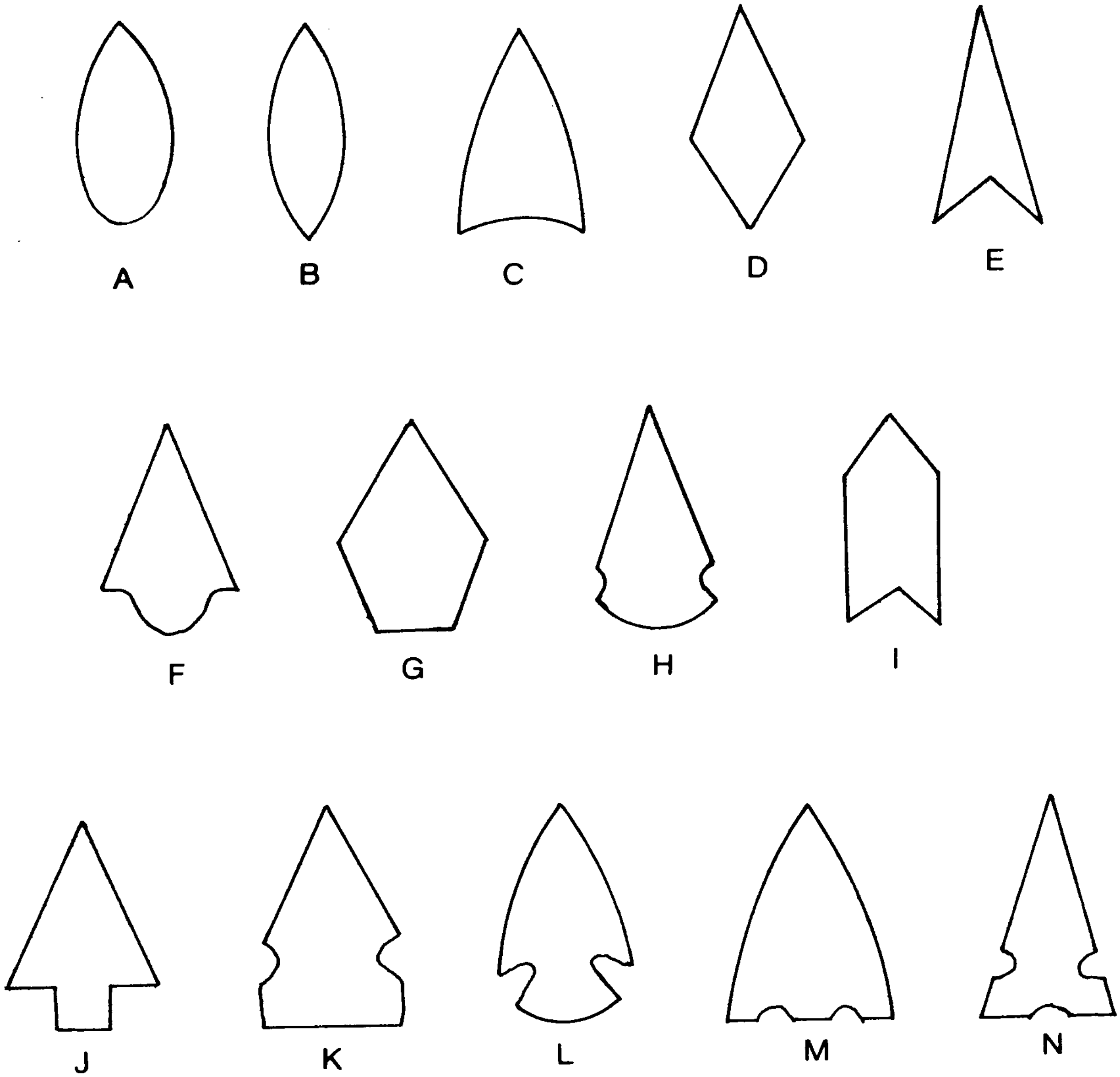


Figure 16. Vertex Class: A-B, Class 1; C-E, Class 3; F-I, Class 5; J-L, Class 7; M-N, Class 9.

The second use of the definitions is in the creation of a desired type, regardless of whether or not there are any specimens. In the examination of any shape-related projectile point research problem, such as functional or temporal variation, a desired type may be created from the definitions and applied to the study material. For example if one wanted to make a study of blade shape variability of a group of Plevna points, a type or set of types could be created which would define the shape of the artifacts in all variables but one, blade shape. Thus the variance of blade shape would in each case be examined against a background of constants. This is a primary benefit of this analytical classification system. It permits any desired projectile point attribute(s) to be defined as a constant or set of constants against which the variability of other attributes may be measured. How can one examine the variability of blade shape within a point type, if several other attributes are also variable? Then there is no standard of what is a variable, and with respect to what else. The establishment of a constant research universe is fundamental to any study of variability or co-variability of attributes.

The classification of projectile points shape uses nine classes of data with several possible alternate choices under each. The nine classes are the vertex class, haft element, and shape and orientation of various edge segments. All of the terms used are nominally defined terms or primitives. Thus the definition of a particular shape is a list of the attributes of shape which make up the point, an application of Rule 2. If the definition of each type seems excessively long, it should be noted that each can be reduced to an alpha-numeric code. For example: Vertex class - five; Haft element- laterally modified; Blade edge - straight; Base - straight, non-angular; Shoulder - incurvate, tapered; Lateral haft element edge - incurvate, expanding, may be written 5-L-S-S-N-I-T-I-Ep.

Figure 17 is a key to the system of classification and also shows a set of abbreviations for the terms. Some examples of classification are shown in Figure 18.

This classification system produces a precise statement of the form of a type and facilitates the comparison of any two forms. The knowledge that some specimen is a Provisional Type 9, while another is a Kirk Corner Notched may be moderately intellectually satisfying and of some historical significance, but it reveals little about the nature of the morphological relationships of the two specimens. Typology by the system presented here, however, would specify the form of each specimen, facilitating any comparison.

Metric Attributes

The foregoing definition of projectile point shapes has dealt with the number, form, and orientation of the component parts of a projectile point. It has not considered size and proportion of parts. In the illustration shown as Figure 19 the shape of each example is the same: Vertex class - Seven; Haft element - Diagonally modified; Blade edge - Straight; Base - Straight, Non-angular; Shoulder - Straight, Horizontal; Lateral haft element edge - Straight, Parallel. The difference in shape is the relative size of the parts, and differentiation among these shapes will call for a metrical interpretation of some of the terms. This may be done with certain nominally defined terms for measurements which will permit the differentiation of shapes by size and proportion. The given examples are, of course, but a few of an infinite set of possibilities.

VERTEX CLASS
1
3
5
7
9

HAFT ELEMENT	
None	-X
Unmodified	-U
Laterally Modified	-L
Basally Modified	-Bs
Diagonally Modified	-D

SHAPE BLADE EDGE	
Excurvate	-Ex
Straight	-S
Incurvate	-I
Recurvate	-R
Angular	-A

SHAPE BASE	
Excurvate	-Ex
Straight	-S
Incurvate	-I
Recurvate	-R

ORIENTATION BASE	
Non-Angular	-N
External	-Et
Internal	-It

SHAPE SHOULDER	
None	-X
Excurvate	-Ex
Straight	-S
Incurvate	-I
Recurvate	-R
Angular	-A

ORIENTATION SHOULDER	
None	-X
Tapered	-T
Horizontal	-H
Barbed	-B

SHAPE LATERAL HAFT ELEMENT EDGE	
None	-X
Excurvate	-Ex
Straight	-S
Incurvate	-I
Recurvate	-R
Angular	-A

ORIENTATION LATERAL HAFT ELEMENT EDGE	
None	-X
Parallel	-P
Expanding	-Ep
Contracting	-Ct
Concave	-Cc
Convex	-Cv

Figure 17. Key to Classification

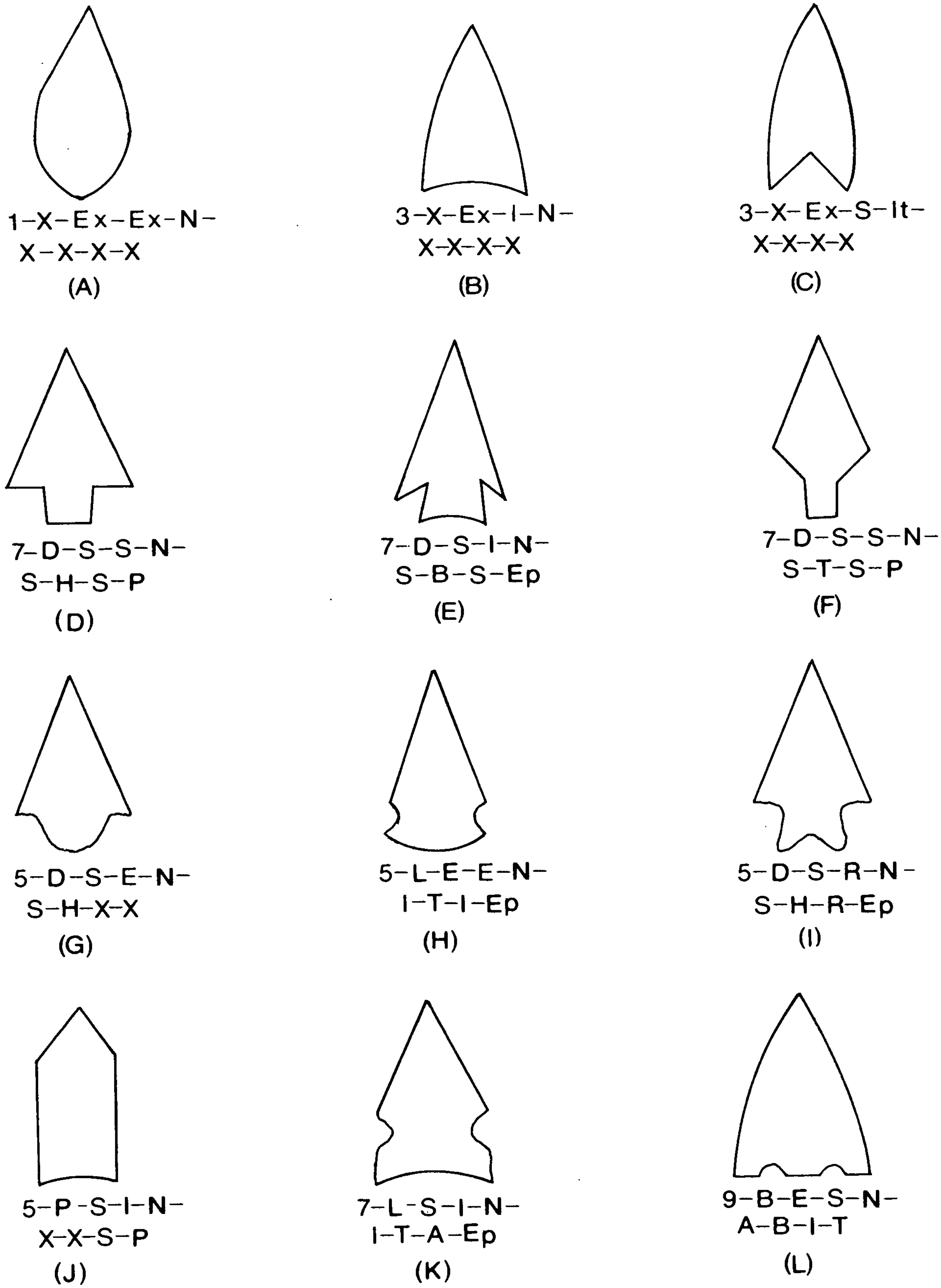


Figure 18. Examples of Shape Classification

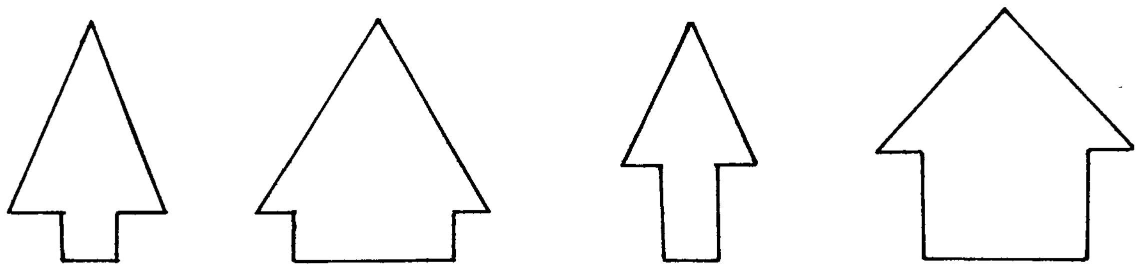


Figure 19. Examples of Shape 7-D-S-S-N-S-H-S-P.

Maximum Length=df. Maximum perpendicular distance between transverse planes tangent to the projectile point.

Maximum Width=df. Maximum perpendicular distance between planes parallel to the longitudinal and tangent to paired points on the projectile point.

Maximum Thickness=df. Maximum perpendicular distance between planes parallel to the coronal and tangent to paired points on the projectile point.

Basal Width=df. Distance on the coronal plane between ends of the base.

Shoulder Width=df. Distance on the coronal plane between lateral ends of shoulders.

Juncture Width=df. Distance on the coronal plane between junctures.

Haft Element Length=df. Perpendicular distance between the transverse plane which includes the junctures and the basal plane.

Haft Modification Width=df. Distance on the plane defining the haft modification between the two points of tangency.

Haft Modification Depth=df. Maximum perpendicular distance between the plane defining the haft modification and the margin.

These terms are for linear measurements, but the capacity for defining specific proportional relationships between measurements is implicit. Ratios may be introduced by nominal definition and exact proportion stated by this. Alternately, proportion classes may be formed by the real number specification of an allowable range.

The index of incurvature or excurvature of an edge may be defined as the straight line distance between the ends of the edge divided into the maximum perpendicular distance between that straight line and the edge. This ratio may then be subdivided as desired by a statement that each class contains ratios between two specified numbers. To permit a continuum of values from very incurvate to a very excurvate, incurvate values could be negative, being less in enclosed area than a straight line. Excurvate edges would then have positive values. This would permit the quantification of terms such as "nearly straight." The index value for a straight edge would be 0, and a plus or minus factor could be specified as being considered straight.

In fact, virtually any defined term in the system can be metricised, largely due to the orderly nature of nominal definition systems. As another example, precise haft modification classes could be formulated using the angle formed by the plane which defines the modification and the longitudinal plane, and specifying the metric degree of permissible variability.

Summary

The title of this chapter is "Toward a Formal Account of Projectile Point Morphology" since this is by no means intended to be a final word on the subject. In the first place it has dealt only with certain gross aspects of morphology such as shape and size, and incompletely with these. Certain aspects of shape are not considered, such as cross-sections, and the metric attributes defined out of infinite choices are only those pertinent to the analysis contained elsewhere in this report. Other important aspects of morphology such as flaking, fluting, or secondary edge modification by serration, beveling or grinding are not considered.

Many unconsidered morphological aspects are ready extensions of the extant system. For instance, serration could be readily defined as multiple vertices on a blade edge. Terms for describing the shape of the serrations are available, and quantification of size, number, position and density of serrations is no trouble. Beveling could possibly be defined in relation to transverse sections. On the other hand, definition of flaking styles probably requires an entire new branch of the system with a largely new set of primitives, and would be a major undertaking.

The problem of asymmetrical specimens also was not considered other than by the briefest mention. As far as the derivation of nominally defined terms is concerned, asymmetry is of no great consequence. Most of the definitions are expressed in unilateral terms, and those which are not could be, with wording changes. Asymmetry is more of a problem in classification, a unilateral process as performed herein. Some specification should be made as to side selection if this unilateral mode of classification is followed. If called for by need of the research, the artifact could be divided by the longitudinal plane and each half treated separately. In a detailed morphological analysis this would probably be the best method.

There are certain positive aspects of the study thus far. A basic core of primitives and nominally defined terms is forwarded which, if nothing else, standardizes these terms. It should be re-emphasized at this point that the definitions and the classifications are distinct. The set of nominal definitions is a system of specifically defined attributes of projectile point morphology. The classification system in this report represents a single potential use of these definitions. The methodology by which other needed terms of shape or even entire new branches of the system may be generated is introduced, if fleetingly. New primitives may be added if necessary, and the rules for combining terms to form definitions are stated. (In fact a completely different set of units and rules could be formulated which leads to a totally different set of definitions.) Thus this account does present a set of basic building blocks which can be combined, or if needed, increased, in ways tailored to the needs of a particular research problem.

As stated in the first paragraph a formal account consists of units and rules with a model building capacity. Indeed as a model consists of a representation of parts and their articulation, any formal account is a conceptual model of the studied phenomenon. In those admittedly rather general aspects of projectile point morphology to which this chapter is addressed, there is a model building capacity which may claim some modest initial success. Hopefully, continued expansion and refinement will increase the utility of the system as an analytical tool.

CHAPTER IV

LITHIC ARTIFACTS

Chipped Stone

The Tennessee River Valley and most immediately adjacent areas in Alabama are rich in chert well suited to the manufacture of chipped stone artifacts. A number of limestone formations predominate the geology of the region, and each of these contains usable chert. The relative abundance and quality of the chert vary somewhat from area to area, but the physical accessibility of suitable raw material should not have been a major problem for the aboriginal inhabitants.

Individuals familiar with chipped stone artifacts and debitage from the Middle Tennessee River Valley recognize gross differences in the dominant chert types in various sub-areas, but no systematic inventory of the available or utilized chert types has been undertaken. Malmberg and Downing (1957) summarize the geologic formations in Madison County, Alabama, including a number of descriptions of geologic profiles observed in the field. These include references to the chert present but are of a geologic rather than archaeological emphasis. This, coupled with the overall similarity of some of the cherts, and the possible variation of chert within a single formation over a distance of 25 to 30 miles, minimizes the use of such published descriptions in the sorting of the Bellefonte site lithic material by source. However, lacking any present knowledge of the exact chert sources or of procurement and distribution methods utilized by the Bellefonte site inhabitants, we may reasonably speculate that good quality chert was obtainable with the expenditure of modest effort.

Almost all of the chert utilized at 1 Ja 300 is the white-to-black, mostly grey, chert available in the Fort Payne formation and Bangor limestone. Some small black chert nodules have been reported for the Red Mountain formation (Malmberg and Downing 1957), but the extent of these is not known. The color of the Bellefonte chert is either homogeneous, mottled, banded or streaked. The most likely source for the smooth black chert on the Bellefonte site is the Bangor limestone; the banded grey chert is probably from the Fort Payne formation. The texture is fairly even with inclusions rare, the major exception being small pockets or layers of cortical-like material, particularly along old fracture lines within the stone.

The form of the chert may be small nodules or angular pieces defined by fracture planes in the parent stone, either larger nodules or lenses of chert. The availability of chert cobbles in any nearby gravel deposits is not known, but only one waterworn chert cobble core was found on the site.

The examples of other stone types used at the site include: limestone, fossiliferous chert, quartzite, some reddish banded chert, and a few other miscellaneous types. Also noted were some chert flakes of a blue-green or green-grey color and very even texture. Similar material is more common downstream near Decatur, Alabama. Overall, however, it seems likely that most or all of these miscellaneous types of stone are available near 1 Ja 300. In any case, non-locally available raw material is inconspicuous in the total chipped stone assemblage.

The aboriginal occupants of the Bellefonte site used a number of flint knapping techniques to produce both core and flake tools. The flake tools from the site have a working edge retouched along some portion of their margin. This retouch is most often unifacial but may be bifacial. The length of the retouch flakes is usually short, but they may extend across any or all of the dorsal surface of the flake tool.

Biface tools were produced following a number of different processes. One common method was a successive reduction from raw material to preform to finished artifacts. If the size and shape of the raw material permitted, it was treated as a natural preform and flaked directly into a tool. In other instances, flakes served as the preform. Some biface tools are modifications of existing tools which were broken or considered worn out or expendable. A few biface tools are working edges on otherwise unmodified pieces of stone.

The chipped stone artifacts from the Bellefonte site were sorted into groups based on the subjective application of certain criteria including form, flaking, shape and position of working edge, and techniques of manufacture. Individual groups may draw more heavily on certain types of criteria than others. As an example, the preforms are characterized largely by form and flaking; the perforators by shape and position of working end.

Some broad classifications of artifacts are more finely divided than others, for example stemmed projectile points versus cores. A number of subgroups are described under cores, but all are tabulated together, while the stemmed projectile points are divided into a number of specific classes. The bases for such decisions are the assumed significance of the attribute(s) on which the separation is to be based, and/or the potential significance of the resultant separation. Due to the mixed, multi-component nature of the lithic assemblage both of the above criteria are applicable to the more formal artifact classes. The distribution of chipped stone is given in Tables 4-10.

Projectile Points

The classification of the projectile points from the Bellefonte site has been accomplished by an application of the method presented in the previous chapter. The types are unilateral shape classifications as shown in Figure 17. There was some difficulty in using this unilateral method since many of the projectile points have asymmetrical edges, particularly shoulders. In dealing with asymmetrical specimens, the side chosen for classification was that which was; first, unbroken and showing no evidence of reworking; and second, most well-formed.

The triangular projectile points, Classes 2-16, have one additional factor used in their classification: mass. It was desirable to separate the small triangular points, of fairly late provenience from those of a similar shape but larger size and earlier time. Weight was the most convenient and consistent way to do so. Thus in the classification of triangular projectile points, "small" refers to artifacts less than or equal to 3 grams in weight. "Large" refers to artifacts heavier than 3 grams.

A second division of the large triangular points into wide and narrow classes was considered after viewing the material. Since most of the specimens are transversely broken, proportional measurements could be made only on a very small sample and were of little use. Graphs were made of the basal widths, available on 14 of the proposed "narrow" group and 36 of the "wide." Graphed separately, the two distributions overlapped and were skewed toward the narrow in the case of the wide, and vice versa (Figure 20). Graphed together, a unimodal curve resulted. Thus working with basal widths alone did not support the separation, though a larger sample of complete artifacts allowing a closer examination of true proportion might have done so. Figure 21 shows that the intact specimens tend to differ in both length and width, offering support for the separation, but it did not seem justified at this time. Small sample size, percentage of indeterminate specimens and poor temporal control eliminate any potential benefit of such a separation of the Bellefonte material; proportion was therefore not considered in the final

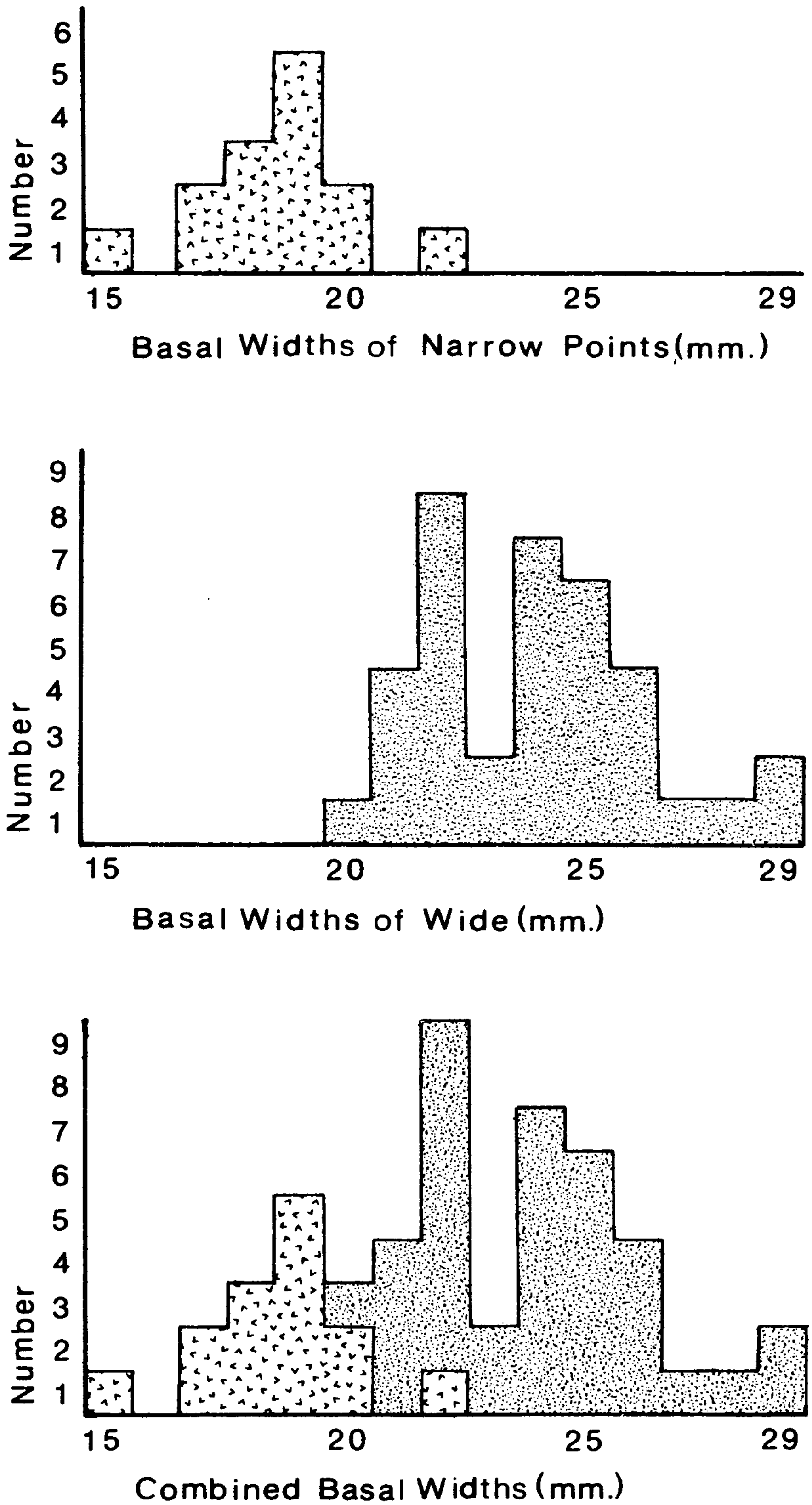


Figure 20. Basal Widths of Selected Large Triangular Projectile Points.

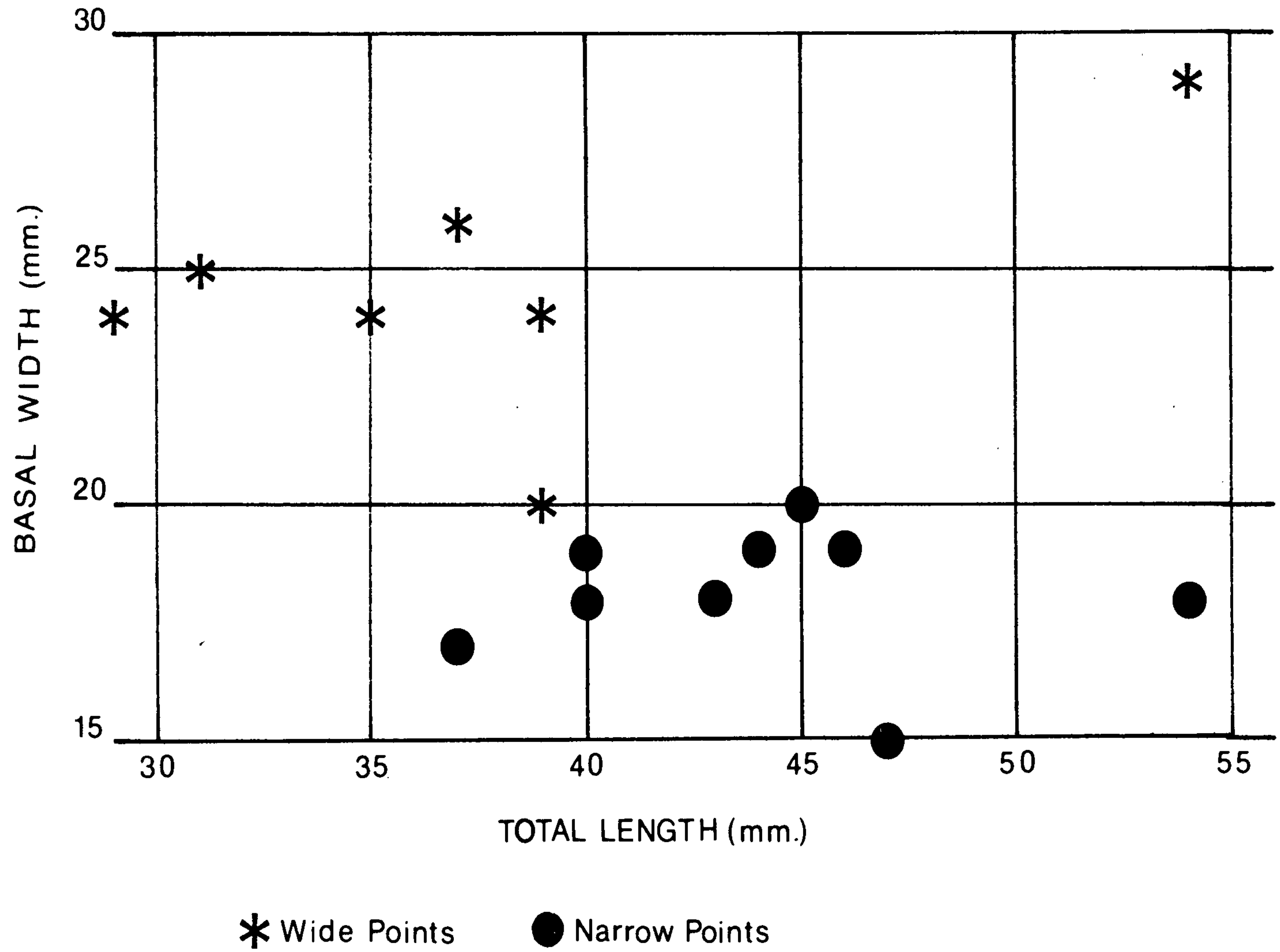


Figure 21. Length and Basal Width of Selected Large Triangular Projectile Points.

classification.

There are a few groups of miscellaneous projectile points included which were formed outside the classification. These are largely residual categories of projectile points untyped due to breakage, incomplete manufacture, or other factors. Many are proximal fragments, more complete than those typed as proximal fragments, but retaining too little of the blade to permit classification of blade shape. They are given class numbers and are listed where it is most helpful to organization.

Using the nine classification criteria and the several alternative choices for each results in a very high number of potential classes of shape. As a result, the large majority of classes of stemmed and notched points from Bellefonte have only a single specimen and one class may have several other classes within one attribute of variance. Thus while the shape class and metric data are given for descriptive purposes, the system is cumbersome for historical discussion purposes. For purposes of discussion, largely historical or comparative in scope, one or more of the classes may be related to a previously established type or types such as those presented by Cambron and Hulse (1964), or to a cluster of projectile point types such as those used in the Normandy Reservoir by Faulkner and McCollough (1973, 1974). For clarity, the term "class" will be used for the morphological classes defined here, while "type" will be used for established types. Unless otherwise stated established types are as described by Cambron and Hulse (1964). Terms for wear patterns are as given by Ahler (1970). For simplicity, the rubric "projectile point" or simply "point" is used despite recognition of the multiple and various uses of these artifacts.

The measurements given for the projectile points are defined in the previous chapter. Appropriate and determinable measurements are given in Table 2 for each member of each class. The distribution of projectile points is given in Tables 3, 4, and 5.

Class 1 (Plate 13). Small, vertex class 1, no haft element, excurvate blade, excurvate base, no shoulder, no lateral haft element edge. 4 members.

These are simple ovate to tear-drop shaped points. One is very thick and shows numerous step fractures from attempts at thinning. The others are relatively thin.

Class 2 (Plate 13). Small, vertex class 3, no haft element, incurvate blade, incurvate base, no shoulder, no lateral haft element edge. 20 members.

These projectile points are similar to the Hamilton points as originally described by Lewis and Kneberg (1946) and more recently by Cambron and Hulse (1964). The flaking of these specimens varies from the very delicate workmanship noted by Lewis and Kneberg to thick, more crudely flaked examples. Serrations, noted as frequent by Lewis and Kneberg, and rare by Cambron and Hulse, are rare among the Bellefonte sample.

Class 3 (Plate 13). Small, vertex class 3, no haft element, straight blade, incurvate base, no shoulder, no lateral haft element edge. 15 members.

This class of points conforms to Class 2 in all respects except straight versus incurvate blade edges. In all likelihood, this class represents another form of the Hamilton projectile point and is included in that cluster.

Class 4 (Plate 13). Small, vertex class 3, no haft element, recurvate blade, incurvate base, no shoulder, no lateral haft element edge. 1 member.

This small well-made projectile point has been related to the Hamilton cluster as being a small, incurvate base, triangular artifact but this is rather tenuous.

Class 5 (Plate 13). Small, vertex class 3, no haft element, excurvate blade, incurvate base, no shoulder, no lateral haft element edge. 1 member.

This artifact is a fairly broad, thin point with an excurvate base and incurvate blade. The point was found in Cut 1 of Square 16R2. It is probably related to the Guntersville point as described by Cambron and Hulse (1964), but it bears little actual resemblance to the specific description, being broader and having an incurvate base.

Class 6 (Plate 13). Small, vertex class 3, no haft element, straight base, straight blade, no shoulder, no lateral haft element edge. 7 members.

This class is metrically variable, ranging from narrow to almost equilateral forms. Temporal association is either Late Woodland or Mississippian.

Class 7 (Plate 13). Small, vertex class 3, no haft element, straight base, excurvate blade, no shoulder, no lateral haft element edge. 4 members.

This class resembles the Greeneville type as described by

Cambron and Hulse (1964), but the examples are smaller. On the other hand, they may be rather broad examples of the Guntersville type, so the association is uncertain.

Class 8 (Plate 13). Small, vertex class 3, no haft element, excurvate blade, excurvate base, no shoulder, no lateral haft element edge. 1 member.

Obviously, the literal application of the definitions in the previous chapter means that any triangular point with an excurvate base has a haft element, *i.e.*, that part of the artifact is encompassed by the base. However, any such haft element would be very rudimentary in this class and has not been considered for purposes of this analysis.

Class 9 (Plate 13). Large, vertex class 3, no haft element, straight blade, incurvate base, no shoulder, no lateral haft element edge. 13 members.

This class is the first of several classes which include the numerous medium-sized triangular projectile points of Early to Middle Woodland provenience. This particular class most closely resembles the Copena Triangular type. One example was found in Cut 4 of Square 14L4 along with a Class 15 (Copena) point. The greatest width on most but not all of these specimens is at the base. One specimen has highly smoothed and rounded blade edges which indicates use as a knife.

Class 10 (Plate 14). Large, vertex class 3, no haft element, incurvate base, excurvate blade, no shoulder, no lateral haft element edge. 9 members.

These points are largely comparable to Class 9 except for blade shape. Most of the specimens also resemble the

Copena Triangular type, and one was found in Feature 21. Some of them are shorter than the Class 9 points would be if intact, but the widths and thicknesses are comparable. Again, the maximum width is usually, but not always, at the base.

Some of the Class 10 points have edge wear suggesting use as a knife. Two have been retouched producing a shallow beveling of the left hand margin of each face. The beveling begins 3 to 5 mm. above the base and extends about 7 mm. across the artifact.

Class 11 (Plate 14). Large, vertex class 3, no haft element, straight blade, straight base, no shoulder, no lateral haft element edge. 13 members.

These specimens are narrower in proportion than Classes 9 and 10, the basal widths of some overlapping the small classes. The individual specimens resemble the Camp Creek and Greeneville types first described by Kneberg (1956, 1957) from the Camp Creek site (Lewis and Kneberg 1957). The major difference between those types and the Class 11 points is that Class 11 has a straight base while both of the above named types have incurvate bases.

There is less evidence of use as knives within Class 11. However, one specimen has been retouched from 6 mm. above the base. Several of these points have one straight and one distinctly excurvate edge so that the tip is offset from the base. One untabulated specimen comes from the overburden.

Class 12 (Plate 14). Large, vertex class 3, no haft element, excurvate blade, straight base, no shoulder, no lateral haft element edge. 10 members.

A few of these points are rather narrow and resemble Class 11, but most are fairly broad and are proportionally more like Classes 9 and 10. One of the specimens is beveled on the left margin of each face and one on the right side of each face. A third is beveled on the left side of one face. The distal two-thirds of both blade edges of one specimen are heavily ground and rounded. Several of these artifacts may have been used as knives.

Class 13 (Plate 14). Large, vertex class 3, no haft element, straight blade, excurvate base, no shoulder, no lateral haft element edge. 3 members.

The three members of this class include two rather broad and one long, narrow specimen, all broken. The blade edges of the narrow specimen exhibit rounding and crushing indicative of use as a knife.

Class 14 (Plate 14). Large, vertex class 3, no haft element, excurvate blade, excurvate base, no shoulder, no lateral haft element edge. 2 members.

These artifacts are similar to the above classes of triangular projectile points.

Class 15 (Plate 15). Large, vertex class 3, no haft element, recurvate blade, incurvate base, no shoulder, no lateral haft element edge. 3 members.

These three artifacts are examples of the Copena point type. The two more distally complete specimens have their maximum width on the blade above the constricted part of the blade. A distally directed burin fracture has removed the proximal end of one blade partially obscuring the recurvature, which is less pronounced on this specimen.

Class 16 (Plate 15). Large, vertex class 3, no haft element, recurvate blade, straight base, no shoulder, no lateral haft element edge. 2 members.

One of these specimens fits into the type Nolichucky (Kneberg 1957), another common type at the Camp Creek site (Lewis and Kneberg 1957). The other is thick, poorly flaked, and resembles no particular type.

Class 17 (Plate 15). Undifferentiated, thick crude, small triangular projectile points. 5 members.

These artifacts appear to be unfinished or rejected small triangular points. Some of these are similar in form to the artifacts described by Munson and Munson (1972) as hump-backed knives. Two of the Class 17 artifacts do show wear. One has crushing and smoothing on the blade edges except for a small section near the base. Another exhibits smoothing on the blade edges except for a small section near the base. Another exhibits smoothing on about the distal one-third of both blade edges. This is in contrast to a large sample of similar artifacts from a McKelvey occupation site in the southwest portion of the Middle Tennessee River Valley which show no pronounced edge wear (Oakley and Futato 1975).

It is of some interest to note that one drill is flaked on what would be a Class 17 point. If the Class 17 artifacts do indeed represent results of unsuccessful projectile point manufacture, perhaps the drill and hump-backed knives represent an effort to salvage some good from the attempt. It is likely, however, that considering the abundance of chert at the Bellefonte site, any such effort was rather casual.

Class 18. Miscellaneous, small, triangular, 4 members.

These projectile points could not be classified due to missing bases or uncertain orientation.

Class 19 (Plate 15). Vertex class 5, unmodified haft element, straight blade, incurvate base, no shoulder, straight contracting lateral haft element edge. 1 member.

Class 20 (Plate 15). Vertex class 5, unmodified haft element, straight blade, incurvate base, no shoulder, straight expanding lateral haft element edge. 1 member.

Classes 19 and 20 contain two points of the type generally called pentagonal. The pentagonal group could probably be divided into two broad categories. One would consist of the "true pentagonal" usually rather long and narrow with a rather long, contracting haft element. These would include the Jacks Reef Pentagonal as described by Cambron and Hulse (1964) and Type 50 in the provisional typology of Faulkner and McCollough (1973). The second group would include those pentagonal artifacts which are blade edge variants of triangular types. The two Bellefonte examples seem to fit the latter group.

Class 21 (Plate 15). Vertex class 5, unmodified haft element, straight blade, straight base, no shoulder, straight contracting lateral haft element edge. 1 member.

This type corresponds to the Bradley Spike. Cortex is present on the base. The lateral haft element edges are lightly ground.

Class 22 (Plate 15). Vertex class 5, unmodified haft element, straight blade, straight base, no shoulder, incurvate contracting lateral haft element edge. 2 members.

These points are similar to the Bradley Spike and New Market types. One has cortex on the base and ground lateral haft element edges.

Class 23. Undifferentiated spike. 1 member.

This artifact is very similar to the one in Class 21, but the blade edges are of indeterminate shape.

Class 24 (Plate 15). Vertex class 3, unmodified haft element, incurvate blade, excurvate base, no shoulder, no lateral haft element edge. 2 members.

The members of this class would be included in the New Market type associated with Bradley Spike in surface collections by Cambron and Hulse (1964).

Class 25 (Plate 15). Vertex class 7, laterally modified haft element, excurvate blade, incurvate base, incurvate tapered shoulders, angular convex lateral haft element edge. 3 members.

The artifacts in this class are like those called Knight Island by Cambron and Hulse (1964) and Upper Valley side notched by Kneberg (1956). The given association for the former is thought to be Late Woodland and Early Woodland for the latter. One of the three exhibits an impact fracture which has been partially retouched along the distal portion of one blade edge.

Class 26 (Plate 15). Vertex class 5, laterally modified haft element, straight blade, incurvate base, incurvate tapered shoulders, excurvate expanding lateral haft element edges. 1 member.

The straight blade and slight lateral haft element edge differences are all that separate Classes 25 and 26. This specimen would be included in the same two established types as the above.

Class 27 (Plate 15). Vertex class 7, laterally modified haft element, excurvate blade, incurvate base, incurvate tapered shoulder, angular expanding lateral haft element edge. 1 member.

The single member of this class resembles the Big Sandy type, but no grinding is present on the haft element. The only difference between Class 25 and Class 27 is the orientation of the lateral haft element edge, and this is probably a Woodland artifact.

Class 28 (Plate 16). Vertex class 5, laterally modified haft element, incurvate blade, straight base, incurvate tapered shoulders, excurvate concave lateral haft element edges. 1 member.

The specimen in this class seems to be another slight variation of Classes 25 - 27. All of the members in these four classes could be called Upper Valley Side Notched or Knight Island.

Class 29 (Plate 16). Vertex class 5, laterally modified haft element, excurvate blade, straight base, incurvate tapered shoulders, incurvate expanding lateral haft element edges. 1 member.

The representative of Class 29 corresponds to the type Sublett Ferry which seems to be closely related to the Knight Island type. Its rather broad, shallow haft modification extending to the base separates this artifact from those in the above four classes. The Bellefonte specimen has an impact feature; the haft modification is ground.

Class 30 (Plate 16). Vertex class 5, diagonally modified haft element, excurvate blade, incurvate base, incurvate tapered shoulders, excurvate expanding lateral haft element edges. 1 member.

This specimen is also similar to those in the immediately preceding classes. However, the orientation of the haft element modification is diagonal. All haft element edges are ground.

Class 31 (Plate 16). Vertex class 7, diagonally modified haft element, excurvate blade, excurvate base, incurvate horizontal shoulder, incurvate expanding lateral haft element edge. 3 members.

Except for small corner notches instead of side notches, and the excurvate base, these artifacts are similar to several of the above classes. These artifacts resemble Type 75 in Faulkner and McCollough's Normandy Reservoir typology (Faulkner and McCollough 1973). One exhibits both an impact feature and blade edge crushing and smoothing.

Class 32 (Plate 16). Vertex class 7, diagonally modified haft element, excurvate blade, excurvate base, straight horizontal shoulder, incurvate expanding lateral haft element edge. 1 member.

The specimen in this class is almost identical to those in Class 31.

Class 33 (Plate 16). Vertex class 7, diagonally modified haft element, excurvate blade, excurvate base, incurvate barbed shoulders, recurvate expanding lateral haft element edges. 1 member.

Minor haft modification differences and a broader blade separate this specimen from those in the previous two classes.

Class 34 (Plate 16). Vertex class 7, diagonally modified haft element, excurvate base, straight blade, incurvate barbed shoulders, recurvate expanding lateral haft element edges. 1 member.

This artifact is similar to those in Classes 31 - 33.

Class 35 (Plate 16). Vertex class 7, diagonally modified haft element, incurvate base, straight horizontal shoulders, straight parallel lateral haft element edges. 1 member.

The specimen in this class shares an overall similarity with those in many of the preceding 10 classes. However, it is straight stemmed rather than notched. The base is ground.

Class 36 (Plate 16). Vertex class 7, diagonally modified haft element, straight blade, straight base, straight tapered shoulders, straight parallel lateral haft element edges. 1 member.

This Class 36 artifact is another straight stemmed point similar to many of the above specimens.

Class 37 (Plate 16). Vertex class 7, excurvate blade, straight base, straight tapered shoulder, straight contracting lateral haft element edges. 1 member.

This class contains one point similar to that in Class 36 but with a contracting stem.

Class 38 (Plate 16). Undifferentiated lanceolate, notched and stemmed. 8 members.

This class contains broken or otherwise undifferentiated proximal portions of artifacts similar to those in Classes 25-37.

Class 39 (Plate 16). Vertex class 7, diagonally modified haft element, excurvate blade, excurvate base, incurvate tapered shoulders, incurvate expanding lateral haft element edges. 2 members.

These artifacts are lanceolate points with small haft modifications like those in the above several classes. One has a missing shoulder and has been beveled along the lateral haft element edge on that side. The blade edge on that same side is also steeply beveled by a few broad shallow flakes. It is not clear whether or not this is a reworked artifact.

Class 40 (Plate 16). Vertex class 5, laterally modified haft element, excurvate blade, excurvate base, no shoulder, straight expanding lateral haft element edge. 1 member.

This projectile point is basically a triangular artifact which has been slightly modified by the removal of small, regular flakes to produce a long, shallow lateral haft modification. The artifact corresponds to the type Bakers Creek.

Class 41 (Plate 16). Vertex class 7, laterally modified haft, excurvate angular blade, straight base, straight tapered shoulder, recurvate expanding lateral haft element edge. 1 member.

This is a small, thin projectile point which fits the type Jacks Reef Corner Notched. The more intact blade edge of the specimen exhibits light smoothing and rounding, the proximal segment more so than the distal. The haft modification, but not the base, is lightly ground.

Class 42 (Plate 17). Vertex class 5, diagonally modified haft element, excurvate blade, excurvate base, straight horizontal shoulder, no lateral haft element edge. 2 members.

The projectile points in this class are two nearly identical points of the type Adena Narrow Stemmed. They were found together in Cut 4 of Square 14L4. Both have the entire base ground.

Class 43 (Plate 17). Vertex class 5, diagonally modified haft element, excurvate blade, excurvate base, incurvate tapered shoulder, incurvate expanding lateral haft element edge. 2 members.

The two specimens in this class are very similar. Both were made on asymmetrical ovate preforms with one edge more strongly excurvate than the other. The haft modification consists of asymmetrical rounded notches, both artifacts having a rather shallow notch on the same side as the less excurvate blade edge and a deeper notch on the side of the more excurvate blade edge. The base is beveled on the same face of each artifact; *i.e.*, the upper face when oriented so that the largest notch is to the right. One of the artifacts is broken by a hinge fracture apparently caused by impact.

Class 44 (Plate 17). Vertex class 9, diagonally modified haft element, excurvate blade, straight base, incurvate tapered shoulder, angular convex lateral haft element edge. 1 member.

This class contains one artifact corresponding to the type Flint Creek. The specimen has cortex on the base.

The specimens in Classes 44-46 share one interesting trait; the proximal segment of the angular lateral haft element is aligned with the plane which defines the haft modification. This seems to indicate that the artifacts may originally have been flaked to a generally pentagonal shape. Then the notches to form the haft modification were placed just proximal to the end of the blade edge of the pentagonal form, removing the distal portion of the pentagon's lateral haft element edge. This method of manufacture would account for the observed alignment of the remaining edge with the plane defining the haft modification.

Class 45 (Plate 17). Vertex class 9, diagonally modified haft element, excurvate blade, straight base, straight tapered shoulder, angular convex lateral haft element edge. 1 member.

The angular, convex lateral haft element edges and retouch flaking of the blade edges would place this artifact into the type Flint Creek. The base is not retouched nor is the haft modification, except for the proximal portion of the lateral haft element edge.

This artifact offers additional support for the method of manufacture suggested above. The haft modification on one side was placed so that parts of the original edge remain both above and below the notch. It is clear, at least in this one instance, that the artifact is a notched pentagonal form.

Class 46 (Plate 17). Vertex class 9, diagonally modified haft element, excurvate blade, incurvate base, incurvate horizontal shoulder, angular convex lateral haft element edge. 1 member.

The artifact in this class would be another example of the type Flint Creek. One blade edge shows the characteristic retouch flaking and is serrated. The other, more excurvate, blade edge is not serrated and is rounded and smoothed. However, it does have the same long, fairly narrow, parallel flake scars extending away from the edge.

Class 47 (Plate 17). Vertex class 7, diagonally modified haft element, excurvate blade, incurvate base, straight horizontal shoulder, recurvate expanding lateral haft element edge. 1 member.

This class contains one projectile point of the type Flint Creek. The major difference in shape between this class and the above three is the lack of an additional pair of vertices on the lateral haft element edges. The blade edges are serrated. The artifact is fairly thick with the maximum thickness near the distal end which is heavily battered.

Class 48 (Plate 17). Vertex class 7, diagonally modified haft element, excurvate blade, straight base, incurvate tapered shoulder, straight expanding lateral haft element edge. 1 member.

The artifact in this class shows rounding, smoothing, and some crushing of both blade edges. The lateral haft element edges are lightly ground. The base is unfinished and was apparently broken off by a single blow. The base shows crushing on one face which may have been done to even the base by removing a thin prominent ridge caused by a hinge fracture when the base was broken.

Class 49 (Plate 17). Vertex class 7, diagonally modified haft element, excurvate blade, straight base, straight tapered shoulder, straight expanding lateral haft element edge. 1 member.

This class contains one artifact similar to the one in Class 48. One blade edge shows crushing and some rounding.

Class 50 (Plate 17). Vertex class 7, excurvate blade, straight base, incurvate tapered shoulder, incurvate concave lateral haft element edge. 1 member.

The artifact in this class has a very shallow haft modification so that the shoulders are very short. A large impact fracture extends all the way down onto the haft element.

Class 51 (Plate 17). Vertex class 7, excurvate blade, excurvate base, straight tapered shoulder, straight expanding lateral haft element edge. 1 member.

The specimen in Class 51 is similar to that in Class 50. Both have long rather parallel sided blades, and nearly rectangular haft elements almost as wide as the blade.

Class 52 (Plate 17). Vertex class 5, unmodified haft element, excurvate blade, straight base, no shoulder, straight contracting lateral haft element edge.

This class contains one artifact basically similar in form to those in the above two classes, but having an unmodified tapered haft element and a strongly serrated blade.

Class 53 (Plate 18). Vertex class 9, diagonally modified haft element, excurvate blade, incurvate base, angular barbed shoulder, straight expanding lateral haft element edge. 1 member.

The artifact in this class is an example of the type Wade. The blade has been chipped to a reamer-like form, but it shows no wear patterns indicative of use as such.

Class 54 (Plate 18). Vertex class 9, diagonally modified haft element, straight blade, straight base, angular barbed shoulder, straight expanding lateral haft element edge. 1 member.

This class also contains one Wade point. The artifact has an unfinished base and ground lateral haft element edges.

Class 55 (Plate 18). Vertex class 9, diagonally modified haft element, incurvate blade, straight base, angular barbed shoulder, incurvate concave lateral haft element edge. 1 member.

The artifact in this class would be typed as Wade. The blade is mostly missing, but the remaining portions of the blade edges are incurvate and strongly serrated. They are also beveled on both faces of each side. The base and proximal portion of the lateral haft element edges are lightly ground.

Class 56 (Plate 18). Vertex class 9, diagonally modified haft element, excurvate blade, excurvate base, angular barbed shoulder, incurvate concave lateral haft element edge. 1 member.

This class contains one more example of the type Wade.

Class 57 (Plate 18). Undifferentiated angular barbed shoulder. 1 member.

This class contains one broken specimen generally similar to the artifacts in Classes 53 - 56 but with an unidentifiable blade shape. A burin fracture has removed the blade edge from most of the remaining portion of the artifact. The fracture begins on the barb and ends in a hinge fracture approximately 14.5 mm. up the blade edge from the shoulder.

Class 58 (Plate 18). Vertex class 7, diagonally modified haft element, straight blade, excurvate base, straight tapered shoulder, straight contracting lateral haft element edge. 3 members.

The three artifacts in this class are basically similar in form. Two have bases beveled on one face, and would probably be called Elora points. The other has a thin retouched base.

Class 59 (Plate 18). Vertex class 7, diagonally modified haft element, excurvate blade, excurvate base, incurvate tapered shoulder, straight expanding lateral haft element edge. 3 members.

This class contains a varied group of specimens and could have been subdivided by metric criteria. One specimen (F.S. 199-1) is long and narrow with an expanded stem. It would probably be typed as a Flint Creek. The others have broad triangular blades. Specimen number 4-8 has been broken transversely by a low angle hinge fracture and may have subsequently been used as an end scraper. The proximal portion of the lateral haft element edges are ground and the base is ground and crushed. The base is also beveled on one face. The final specimen is also broken transversely and has part of one shoulder missing. Like number 4-8 it has a ground base beveled on one face.

Class 60 (Plate 18). Vertex class 7, diagonally modified haft element, excurvate blade, excurvate base, straight barbed shoulder, straight expanding lateral haft element edge. 1 member.

The single specimen in this class would be typed as Cotaco Creek. The lateral haft element edges and base are heavily ground. The blade edges are all moderately to heavily rounded and smoothed. Blunting is minimal, and step fractures are not apparent. This artifact was probably used as a knife for cutting soft materials.

Class 61 (Plate 18). Vertex class 7, diagonally modified haft element, excurvate blade, excurvate base, incurvate barbed shoulders, straight contracting lateral haft element edge. 1 member.

This class contains a single artifact which would probably be typed as a Wade point. The lateral haft element edges are rounded and smoothed. The blade edges show slight to pronounced rounding, smoothing, and crushing.

Class 62 (Plate 18). Vertex class 7, diagonally modified haft element, excurvate blade, excurvate base, incurvate horizontal shoulders, straight contracting lateral haft element edge. 1 member.

The artifact in this class is similar to that in Class 61, the only difference being a horizontal shoulder orientation producing less pronounced barbs.

Class 63 (Plate 18). Vertex class 7, diagonally modified haft element, excurvate blade, excurvate base, straight tapered shoulder, straight contracting lateral haft element edge. 3 members.

This class contains three dissimilar artifacts. One is like those in Classes 61 and 62. It has ground lateral haft element edges. The blade edges show some rounding, smoothing and attrition by numerous small step fractures. The second is larger and broader. One blade edge has been retouched to a high angle. This artifact may be a combination knife/scraper. The third member of Class 63 is a small lanceolate artifact.

Class 64 (Plate 19). Vertex class 5, unmodified haft element, excurvate blade, straight base, no shoulder, incurvate contracting lateral haft element edge. 1 member.

This class contains one artifact with cortex on the base corresponding to the type Ebenezer. Cambron and Hulse relate the Ebenezer type to the type "Rudimentary Stemmed" from the Camp Creek site. The specimen in Class 64 from the Bellefonte site is close in form and size to the illustrated examples of Bradley Spike from the Camp Creek site (Lewis and Kneberg 1956, Figure 16,C). These are considerably wider than most artifacts now referred to as spikes.

Class 65 (Plate 19). Vertex class 5, diagonally modified haft element, excurvate blade, straight base, straight tapered shoulder, excurvate contracting lateral haft element edge. 1 member.

The single member of this class has a broken base which may or may not be intentional. It differs from the specimen in Class 64 on two attributes but probably would also be called an Ebenezer.

Class 66 (Plate 19). Vertex class 5, laterally modified haft element, excurvate blade, excurvate base, incurvate tapered shoulder, incurvate expanding lateral haft element edge. 1 member.

This class contains one small side notched lanceolate point somewhat like Swan Lake. The base appears intentionally broken; the blade is serrated.

Class 67 (Plate 19). Vertex class 7, diagonally modified haft element, excurvate blade, incurvate base, straight tapered shoulders, incurvate expanding lateral haft element edge. 1 member.

Class 67 contains a specimen similar to the type Mud Creek. The right side of one face of the blade shows the fracture plane surface of the raw material piece chosen for flaking. This plane forms an angle of about 45 degrees with the coronal plane. No unmodified surface remains on the other side of that same face, but the slope is similar. It is possible that the preform for this artifact was a flake struck along the corner of the angular piece of chert. Due to the acuteness of the angle and the resultant medial thickness on the flake, repeated attempts to thin the middle of this face of the artifact were unsuccessful.

Class 68 (Plate 19). Vertex class 7, laterally modified haft element, straight blade, excurvate base, incurvate tapered shoulder, incurvate expanding lateral haft element edge. 1 member.

This class contains one small corner notched projectile point of uncertain association.

Class 69 (Plate 19). Vertex class 7, diagonally modified haft element, excurvate blade, excurvate base, straight barbed shoulder, incurvate concave lateral haft element edge. 1 member.

The single specimen in this class is a small corner notched projectile point. The artifact has a serrated blade and ground haft element edges.

<u>Class 70</u> (Plate 19). Vertex class 7, diagonally modified haft element, incurvate blade, straight base, straight tapered shoulder, straight contracting lateral haft element edge. 5 members.

The five artifacts in this class would all be typed as Pickwick. The expanded shoulder of the Pickwick type here is a result of the incurvature of the blade edge which is at its greatest near the proximal end of the blade edge. Three of the specimens have ground haft element edges; a fourth has ground haft element edges and shoulders. The small example is not ground. Edge wear is not particularly pronounced and consists of minor rounding and blunting.

<u>Class 71</u> (Plate 19). Vertex class 7, diagonally modified haft element, straight blade, excurvate base, incurvate tapered shoulders, straight contracting lateral haft element edge. 1 member.

The artifact in Class 71 is generally like those in Class 70. It differs in having a straight blade and slightly excurvate base. Blade and haft element edge show slight rounding and blunting.

<u>Class 72</u> (Plate 19). Vertex class 7, diagonally modified haft element, incurvate blade, straight base, straight horizontal shoulder, straight contracting lateral haft element edge. 1 member.

The only class criteria difference between this class and Class 70 is the shoulder orientation, straight versus tapered. Blade edge wear of the specimen in Class 72 consists of slight blunting except on the most proximal couple of millimeters, which are moderately rounded and smoothed. The haft element edges show light to moderate rounding and blunting.

Class 73 (Plate 19). Vertex class 7, diagonally modified haft element, incurvate blade, excurvate base, straight tapered shoulder, straight contracting lateral haft element edge. 1 member.

The artifact in this class has a narrower blade than those in the above three classes, but the haft element is similar. One side of the point appears to have been reworked, and that shoulder is missing. This accounts for some of the difference in width. The projectile point has ground haft element edges.

Class 74 (Plate 19). Vertex class 7, diagonally modified haft element, excurvate blade, excurvate base, straight tapered shoulders, straight contracting lateral haft element edge. 1 member.

The artifact in this class would probably be typed as a Little Bear Creek point due to its relatively long tapered stem. The blade edges show moderate rounding and moderate to pronounced blunting. The lateral haft element edges show slight blunting.

Class 75 (Plate 19). Vertex class 7, diagonally modified haft element, incurvate blade, straight base, incurvate tapered shoulder, straight contracting lateral haft element edge. 1 member.

Class 75 contains another long tapered stemmed artifact which would be typed as Little Bear Creek. The blade edges are angular, and the artifact has what Cambron and Hulse illustrate as an apiculate distal end (1964, Fig. 31). The base is unfinished and exhibits cortex. The only wear evident on the blade edges is very slight rounding with some blunting of small protrusions. One shoulder is broken.

Class 76 (Plate 19). Vertex class 7, diagonally modified haft element, excurvate blade, excurvate base, excurvate tapered shoulder, straight expanding lateral haft element edge. 1 member.

The artifact in this class has a slightly expanded stem and may or may not have been typed as Little Bear Creek. One blade edge shows pronounced rounding and smoothing; the other moderate. There is cortex on the base of the artifact.

Class 77 (Plate 19). Vertex class 7, diagonally modified haft element, excurvate blade, straight base, straight barbed shoulder, straight parallel lateral haft element edge. 1 member.

Class 77 contains one straight stemmed projectile point with a triangular blade and short barbs.

Class 78 (Plate 19). Vertex class 9, diagonally modified haft element, excurvate blade, excurvate base, angular barbed shoulder, straight parallel lateral haft element edge. 1 member.

The blade edges of the artifact in Class 78 have been beveled on both edges of one face. One edge is straight, the other excurvate. The shoulder is broken on the side with the straight blade edges. Slight blunting and rounding are evident on all edges of the point.

Class 79 (Plate 20). Vertex class 7, diagonally modified haft element, excurvate blade, recurvate base, excurvate tapered shoulder, incurvate concave lateral haft element edge. 1 member.

The artifact in this class has a short expanding stem. One blade edge shows slight blunting as the only wear; the other is broken and shattered from repeated blows. The lateral portion of the haft element is missing on that same side.

Class 80 (Plate 20). Vertex class 7, diagonally modified haft element, excurvate blade, excurvate base, straight tapered shoulder, incurvate expanding lateral haft element edges. 1 member.

The point in this class has blade edges beveled on both sides of one face. The blade edges show slight rounding and smoothing. The haft element edges are ground. One shoulder is broken.

Class 81 (Plate 20). Vertex class 7, diagonally modified haft element, excurvate blade, straight base, incurvate barbed shoulder, incurvate contracting lateral haft element edge. 1 member.

This class contains one broken expanding stemmed artifact with an unfinished base. Blunting is present on the shoulder and lateral haft element edge.

Class 82 (Plate 20). Vertex class 7, diagonally modified haft element, straight blade, incurvate base, straight tapered shoulder, straight expanding lateral haft element edge. 1 member.

Class 82 contains one thin, expanding stemmed projectile point with pronounced serrations. The edges of the haft element are ground. The blade edges show some blunting on the serration tips and between.

Class 83 (Plate 20). Vertex class 7, diagonally modified haft element, straight blade, excurvate base, incurvate barbed shoulder, incurvate expanding lateral haft element edge. 1 member.

This class contains one expanding stemmed specimen with slight barbs. Small portions of both shoulders are broken. The blade edges show only very slight rounding. The lateral haft element edges show rounding and blunting.

Class 84 (Plate 20). Vertex class 7, diagonally modified haft element, excurvate blade, excurvate base, incurvate barbed shoulder, incurvate concave lateral haft element edge. 1 member.

The single specimen in Class 84 has a broad excurvate blade with small corner notches producing short barbs. It is similar in appearance to the specimen in Type 83 of the Normandy Reservoir typology (Faulkner and McCollough 1973:110-111, Plate XLI). The Bellefonte specimen shows only very light edge wear on the blade, but the proximal end of one blade edge and the adjacent shoulder are broken. The base is heavily battered.

Class 85 (Plate 20). Vertex class 7, diagonally modified haft element, straight blade, recurvate base, straight tapered shoulder, excurvate expanding lateral haft element edge. 1 member.

The specimen in this class fits the description of the type Limestone. The base of this artifact has been thinned on one face by a single long flake extending the length of the haft element and onto the blade. Slight blunting and rounding are present on the blade edges, and part of one edge is borken. The base also shows slight blunting.

Class 86 (Plate 20). Vertex class 7, diagonally modified haft element, excurvate blade, recurvate base, straight tapered shoulder, excurvate expanding lateral haft element edge. 1 member.

This class differs from Class 85 only in blade shape. It contains another artifact which would be called a Limestone. Like the specimen in Class 85, it has a base thinned on one face by a flake extending all the way onto the blade. The blade edges are beveled on the right edge of each face and exhibit only very slight rounding.

Class 87 (Plate 20). Undifferentiated expanding thinned haft element. 1 member.

One fragmentary artifact corresponds closely with Classes 85 and 86 but has indeterminate blade shape.

Class 88 (Plate 20). Vertex class 7, diagonally modified haft element, straight blade, incurvate base, incurvate tapered shoulder, incurvate expanding lateral haft element edge. 3 members.

The three artifacts in this class are broad with wide short expanding stems produced by rounded notches. One has been retouched along one haft modification producing one straight shoulder and lateral haft element edge. It resembles a Benton Stemmed projectile point and has an impact fracture. The others, both broken, have not been retouched along the haft modification and have incurvate edges on both sides of the haft element. One has a ground base.

Class 89 (Plate 20). Vertex class 7, diagonally modified haft element, incurvate blade, incurvate base, incurvate tapered shoulder, incurvate expanding lateral haft element edge. 1 member.

This class differs from the preceding class only in blade shape. The blade of the specimen in Class 89 is incurvate and asymmetrical, one side more strongly incurvate than the other. The haft element has ground edges.

Class 90 (Plate 20). Vertex class 7, diagonally modified haft element, incurvate blade, straight base, incurvate tapered shoulder, incurvate expanding lateral haft element edge. 1 member.

This class differs from Class 89 in base shape only. However, the haft modification of the specimen in Class 90 is shallower, so the stem is less expanding. The lateral haft element edges of the projectile point are lightly ground.

Class 91 (Plate 20). Vertex class 7, diagonally modified haft element, incurvate blade, excurvate base, incurvate expanding lateral haft element edge. 1 member.

This class contains one artifact with a short expanding stem. One blade edge is rounded and smoothed; the other is broken and irregular. The edges of the haft element are ground.

Class 92 (Plate 20). Vertex class 7, diagonally modified haft element, excurvate blade, straight base, incurvate barbed shoulder, incurvate contracting lateral haft element edges. 1 member.

The broad triangular shape and short broad stem of the artifact in this class relate it to the type White Springs. However, barbs are not generally noted for that type. The Bellefonte specimen has short barbs resulting from the rounded, nearly basally oriented haft modification.

Class 93 (Plate 21). Vertex class 7, diagonally modified haft element, excurvate blade, straight base, incurvate horizontal shoulder, straight contracting lateral haft element edge. 1 member.

The specimen in this class is similar to the one in Class 92. The only differences are the result of the slightly different haft modification shape.

Class 94 (Plate 21). Vertex class 7, diagonally modified haft element, excurvate blade, excurvate base, incurvate horizontal shoulders, incurvate contracting lateral haft element edge. 1 member.

This class contains another artifact which would probably be called White Springs. The blade edges are asymmetrical and finely serrated.

Class 95 (Plate 21). Vertex class 7, diagonally modified haft element, excurvate blade, straight base, incurvate horizontal shoulders, incurvate contracting lateral haft element edges. 1 member.

The two artifacts in this class are narrower than the usual White Springs point, but would probably be so typed.

The distal half of the blade edges of one specimen have been resharpened by a short, steep beveling of the left edge of each face. Both artifacts have unfinished bases.

Class 96 (Plate 21). Vertex class 7, diagonally modified haft element, excurvate blade, excurvate base, excurvate barbed shoulder, incurvate concave lateral haft element edge. 1 member.

Except for the presence of small barbs, this artifact resembles the Sykes type (Lewis and Lewis 1961). A burin fracture has removed most of the base.

Class 97 (Plate 21). Vertex class 7, diagonally modified haft element, excurvate blade, incurvate base, incurvate barbed shoulder, straight expanding lateral haft element edge. 1 member.

The single projectile point in this class may or may not fit into the Sykes type. The original definition of the type specifically excludes barbs (Lewis and Lewis 1961, p. 40, 43). Similar artifacts were found in association with Benton and Sykes projectile points at the Champion site in northwest Alabama (Oakley and Futato 1975).

Class 98 (Plate 21). Undifferentiated short broad stem. 3 members.

This class includes three fragmentary specimens similar to the White Springs - Sykes types. Two have ground bases, not noted for the other classes in this group (92-97).

Class 99 (Plate 21). Vertex class 7, diagonally modified haft element, excurvate blade, excurvate base, straight horizontal shoulder, straight parallel lateral haft element edges. 3 members.

These three straight stemmed projectile points have excurvate blades and bases.

<u>Class 100</u> (Plate 21). Vertex class 5, diagonally modified haft element, exucrvate base, straight barbed shoulder, no lateral haft element edge. 1 member.

This class contains a single example of the type Morrow Mountain. The small barbs produced by the haft element modification cause the artifact to resemble an Eva point. However, due to the small size of the notches and short broad rounded haft element, it is more like Morrow Mountain.

<u>Class 101</u> (Plate 21). Vertex class 5, incurvate blade, excurvate straight tapered shoulder, no lateral haft element edge. 1 member.

Class 101 contains a second Morrow Mountain point.

<u>Class 102</u> (Plate 21). Undifferentiated excurvate base. 1 member.

This class contains one proximal fragment of a Morrow Mountain projectile point. The blade shape is indeterminate.

<u>Class 103</u> (Plate 21). Vertex class 5, diagonally modified haft element, excurvate blade, excurvate base, straight barbed shoulder, no lateral haft element edge. 1 member.

The artifact in this class resembles those in the above three classes in that it has an excurvate base, short shoulders, and no lateral haft element edge.

<u>Class 104</u> (Plate 21). Vertex class 3, unmodified haft element, excurvate blade, excurvate base, no shoulder, no lateral haft element edge. 1 member.

The artifact in this class might be called a pseudo-

Morrow Mountain. It is the distal end of a larger artifact reworked by a few flakes removed from the base to thin it.

Class 105 (Plate 21). Vertex class 7, excurvate blade, excurvate base, straight horizontal shoulder, straight contracting lateral haft element edge. 1 member.

This class contains one artifact with a short broad stem produced by removing small corners of an ovoid biface. One shoulder is broken.

Class 106 (Plate 22). Vertex class 7, diagonally modified haft element, excurvate blade, excurvate base, incurvate barbed shoulders, incurvate expanding lateral haft element edges. 3 members.

This class contains two varied categories of artifacts. One is basally notched and contains two Eva points. The other category contains one large corner notched artifact. The groups could be separated by creating more specific haft modification classes, or by metricization of that trait.

The smaller of the Eva points is distinct in that it is made on a flake and is uniface.

Class 107 (Plate 21). Vertex class 7, diagonally modified haft element, straight blade, excurvate base, straight barbed shoulder, incurvate concave lateral haft element edge. 1 member.

This class contains one serrated, expanding stemmed specimen of the type Crawford Creek.

Class 108 (Plate 22). Vertex class 5, diagonally modified haft element, straight blade, straight base, incurvate tapered shoulder, incurvate expanding lateral haft element edge. 1 member.

The artifact in this class corresponds to the type Pine Tree. The blade is serrated and beveled on the left side of each face. The lateral haft element edge is ground.

<u>Class 109</u> (Plate 22). Vertex class 7, diagonally modified haft element, incurvate blade, excurvate base, incurvate barbed shoulder, straight expanding lateral haft element edge. 1 member.

This class contains one member corresponding to the type Pine Tree Corner Notched. The blade is serrated and beveled on both edges of each face. The base shows slight grinding. The proximal end of one barb is rounded and smoothed.

<u>Class 110</u> (Plate 22). Vertex class 7, diagonally modified haft element, incurvate blade, excurvate base, excurvate barbed shoulder, straight expanding lateral haft element edge. 1 member.

Shoulder shape is the only distinction between Classes 109 and 110, and the artifact in this class is also an example of the type Pine Tree Corner Notched. The blade is beveled on the left side of each face and the base is ground.

<u>Class 111</u> (Plate 22). Vertex class 7, diagonally modified haft element, incurvate blade, excurvate base, incurvate horizontal shoulder, incurvate expanding lateral haft element edge. 1 member.

This class contains a small corner notched projectile point with short barbs.

<u>Class 112</u> (Plate 22). Vertex class 5, diagonally modified haft element, straight blade, excurvate base, incurvate barbed shoulder, excurvate expanding lateral haft element edge. 1 member.

The artifact in this class is a corner notched specimen with a rounded haft element. The point is thin, and the two faces are parallel. The blade is beveled on the right side of each face.

Class 113 (Plate 17). Vertex class 5, diagonally modified haft element, straight blade, recurvate base, incurvate barbed shoulder, excurvate expanding lateral haft element edge. 1 member.

This is the only bifurcate base point found in the Bellefonte excavation. The base is heavily ground, and the bifurcation is shallow and wide. The blade is short and triangular. Its edges are beveled on both sides of each face and serrated.

Class 114. Miscellaneous stemmed points, 39 members.

This class contains broken, reworked, unfinished or otherwise undifferentiated stemmed points.

Class 115. Proximal fragments. 73 members.

This class contains artifacts identifiable only as the proximal portion of projectile points. It may contain some fragments of other hafted tool categories such as drills.

Class 116. Medial fragments. 142 members.

This class contains projectile point fragments lacking both proximal and distal portions.

Class 117. Distal fragments. 127 members.

This class contains projectile point fragments lacking proximal portions.

Other Biface Tools

Preforms (Plate 23). The preforms from the Bellefonte site are relatively thick percussion shaped bifaces, generally ovoid or triangular in shape. Many of these artifacts have natural or prepared striking platforms along the margin for use in the final flaking of the artifact. The blank types identifiable among the preforms are large flakes and chert pieces of a suitable natural shape. Other preforms have been flaked to such an extent that the nature of the blank is no longer discernible. Some of these preforms are broken, possibly during flint knapping, and others have natural flaws which prevented further reduction of the piece.

Biface Knives (Plate 24A). These artifacts may be characterized as trianguloid to lanceolate bifaces with secondary flaking on most edges and surfaces. The biface knives are proportionally thinner than the preforms, and have few remnants of unflaked surfaces or remaining striking platforms. Some exceptions to these latter characteristics are due either to flaws in the stone which prohibited thinning or to breakage during manufacture. There are within the chipped stone artifacts from the Bellefonte site, however, a number of backed cutting and scraping tools. Thus some artifacts with only one retouched cutting edge may be backed biface knives. Virtually all of the biface knives from the Bellefonte site are broken; thus no measurements are presented for this category.

Wedges (Plate 24B). The wedges from the Bellefonte site are tools having a crushed working edge opposed to a striking platform. These artifacts usually have roughly triangular cross sections. In most instances the base of the triangle consists of a cortical surface and is opposed by a bifacially flaked edge. Most often, the cortical surface is the striking platform, and the bifacial edge is the working edge. However, some wedges have two perpendicular working axes, and in one instance the working axis is parallel to the cortical surface.

The term *pièces esquillées* has not been applied to these artifacts since the form and flaking of these wedges indicates that at least some of these are prepared artifacts. They are not directly comparable in form to the *pièces esquillées* described by MacDonald (1968) and Goodyear (1974) as angular, blocky, fragments or thick flakes of chert produced by bipolar flaking. Their form is a result of their use, and they are not prepared artifacts. However, the wear patterns and presumed function of the Bellefonte site wedges is the same as that noted for *pièces esquillées* in the more restricted use of the term.

It is necessary at this point to discuss the possible relationship between these artifacts and the bipolar flaking lithic industry. Many of these artifacts could be classed as ridge-area or ridge-ridge cores as described by Binford and Quimby (1963) in their initial description of bipolar flaked materials from North America. The mechanics of manufacture in bipolar flaking, and of use in wedges or *pièces esquillées* are similar, so it is often difficult to separate bipolar cores from *pièces esquillées*.

The wedges from the Bellefonte site are probably not cores in the sense of being a deliberate source of flakes. The small size of the wedges and the removed flakes; the broad, thin, expanding nature of the last flakes removed in most cases; and the frequent occurrence of a bifacially flaked prepared edge, all argue against the Bellefonte artifacts being bipolar cores.

Digging Implements (Plate 25). These artifacts are tabular pieces or slabs of limestone chipped and/or ground along the edges to an ovoid to rectanguloid shape. No definite examples of notching were observed, and these artifacts were probably hand-held. The great majority of these artifacts were found in Cut 1 in Area B and may be related to the digging of the numerous Woodland pits in this area. Similar digging tools were found in a Woodland context at Russell Cave (J. Griffin 1974) and the Westmoreland Barber site (Faulkner and Graham 1966a).

Drills (Plate 24C). These are chipped stone artifacts with a long, narrow and proportionally thick blade, the orientation of the blade and haft elements being such as to permit use in a rotary motion. One of the drills from 1 Ja 300 has a small straight stem. The others have expanded or round bases. Two are reworked triangular projectile points, one Class 12 and one Class 17.

Perforator on Biface (Plate 24D). The artifacts in this category have been separated from the drills primarily by the form of the working portion or bit of the tool. The bits of the perforators are shorter and often thinner and more fragile than those of the drills. Also the orientation of the bit to the body of the tool may be such as to preclude use in a rotary, hafted fashion. Some of the perforators are suitable for the drilling of hard materials such as bone, wood, or ceramics, while others may have been used in a piercing, awl-like manner in the working of hides, or soft plant materials such as split cane or reeds.

The form of the perforators is variable. Three are reworked projectile point/knives, three are round based, and the others are distal fragments.

Scraper on Biface (Plate 26A-B). This category includes biface artifacts having a steeply retouched working edge. All four of these artifacts from the Bellefonte site appear to be worked on the proximal portion of projectile point/knives, two stemmed and two excurvate base. The retouch is bifacial on one of the stemmed artifacts and unifacial on the other stemmed and the excurvate base examples. The working edge is on the lateral edge of one excurvate base artifact (side scraper) and transverse on the others (end scrapers).

Graver Spur on Biface (Plate 25C). This artifact is a triangular, spurred tool similar in form to the scrapers generally referred to as thumb scrapers. However, thumb scrapers are flake tools, and this graver is on a thick, bifacially flaked tool, possibly a fragment of a large biface knife or projectile point.

Uniface Tools

Scrapers (Plate 26D-F). The most numerous uniface tool category in the Bellefonte site sample is the scraper. This category may be divided into three groups based on the orientation of the working edge with respect to the axis of percussion of the flake. The majority of the scrapers are side scrapers (25), followed by end scrapers (7) and combination side/end scrapers (5). The majority are on expanding flakes, but some are on irregular, apparently randomly selected debitage. End-struck flakes are the usual type, with side-struck flakes being uncommon. The well made expanding trapezoidal or thumb scrapers are represented by only one fragment of side/end scraper, and one of an end scraper.

The sorting criterion for the scrapers was the presence of a steeply retouched working edge, the retouching of a size and regularity not accredited to utilization.

Flake Knife (Plate 27A-B). The flake knives are artifacts exhibiting a low edge angle with wear patterns, if any, showing use as a knife rather than as a scraper. The thirteen flake knives are divided between those which are backed and those which are not. Backed knives are those which have a dull edge opposed to the cutting edge. Presumably this is to allow greater finger pressure against the tool to increase the cutting force. The backed knives from Bellefonte have been made in a number of ways. On three of the six backed knives the back is a broken surface. In one instance a resulting reverse hinge fracture was subsequently crushed and ground to smooth the back. Two of the knives have backs which have been modified by the removal of a single flake dulling the back by burin fracture. In the final instance the back was dulled by small steep re-touch flaking. There is some question whether this artifact should be called a backed flake knife or a side scraper.

Three of the flake knives which are not backed are made on large expanding flakes, not noted among the backed knives. Two of these, along with one additional unbacked knife, have been flaked over their entire dorsal surface, another trait not noted for the backed knives.

Spokeshave (Plate 26G). These tools are flakes with small concave scraping edges. Only five were found at this site.

Notched Flake (Plate 26I). One broken flake was found which had at least four heavily battered and crushed notches along one edge. The use of this tool is not known.

Reamer on Flake (Plate 26H). One of these artifacts is worked on a blade-like decortication flake 54.8 mm. long and 20.0 mm. wide. The working edge is heavily worn for approximately 6.5 mm. The second is a small angular piece of chert which broke to form a needle-like point. Minute flaking is present on about 6.5 mm. of this projection.

Perforator on Flake (Plate 28A). Six examples of flakes retouched to form a perforator end were recovered. The working ends were thin, flat, and rounded. The lengths and widths of three intact specimens are: 31.9 by 17.3 mm.; 29.4 by 13.8 mm.; and 16.6 by 11.9 mm.

Serrated Flake (Plate 26J). Two small flakes have fine regular serrations flaked on one edge. Presumably these were used for some light cutting task.

Microliths (Plate 28B-D). It is difficult to make many definite statements about the microlithic assemblage from the site. Most of the microliths appear to have been made on blades, but some are retouched flakes. Most of the measurable platform angles of the blades are about 80 to 85 degrees, but the sample is very small.

No definite blade cores were recognized at Bellefonte, but possibly only a very few blades were removed from a single core.

The microliths may be separated into three intergrading groups. The first, and largest group (26 specimens) consists of blunt pointed, parallel-sided or slightly tapering tools (Plate 28C). Most are rectangular in cross section. The second group (7 specimens) is similar to the first except more acute (Plate 28B). The third group (4 specimens) is comprised of cylindrical rod-like forms (Plate 28D). One of these shows rounding and polish on about 1.5 mm. of the tip. This was the only clear example of a wear pattern observed.

Two major microblade industries have been described for the Southeastern United States: Jaketown - Poverty Point (Ford *et al.* 1955, Haag and Webb 1953) and Cahokia (Mason and Perino 1961, Morse 1975). Which, if either, of these temporal associations is correct for the Bellefonte material is not known. Nor is it known if the Bellefonte microlithic assemblage is associated with only one or several of the Bellefonte occupations. Two microliths were found in an apparent Late Woodland context in Features 11 and 13, and microliths have been reported from Late Woodland context just upriver from Bellefonte (Graham 1964, Faulkner and Graham 1966a).

Other Chipped Stone

Debitage. The debitage from the unscreened general excavations and the one-fourth inch screen recovery material was separated into several categories. Flakes were separated by whether or not they possessed cortex on either the dorsal surface or striking platform. These two groups were further subdivided on the presence or absence of utilization. Bifacial retouch flakes are those having a striking platform consisting of some portion of the edge of a biface artifact. They are produced during final manufacturing stages and by the re-sharpening or reworking of artifacts. The chunks include angular, broken pieces of chert, block fracture flakes, angular shatter and other irregular pieces of chert.

The debitage recovered in the fine screen was neither counted nor separated into any of the above groups. Lithic material identifiable as artifacts or artifact fragments was removed and the remainder weighed. The largest sample of this debitage, 211.3 grams from Feature 21, was counted to permit estimation of counts from the weight. The count was 8,348 for an average of 39.5 pieces/gram.

Cores (Plate 27C). The artifacts from the Bellefonte site classified as cores are pieces of chert from which flakes have been detached in a non-random manner, the piece not conforming to any recognized tool classification. The primary roles of these cores are in the production of flakes or as the initial step in the manufacture of a core tool. These are quite dissimilar functions - one a means, the other an end - but in a great many cases the intent of the flint knapper is not discernible.

Angular pieces of chert nodules and rectilinear or tabular chunks of chert were utilized as cores. Many of these had one or more naturally flat surfaces, and these surfaces were generally, but not exclusively, utilized as the striking platform.

Lacking specific preparation, the shape of a core is determined by the shape of the original piece of chert, until enough flakes have been removed to alter it signficantly. Thus the cores in an early state of development at the Bellefonte site reflect the forms of the selected raw material as have been noted above. Two otherwise unmodified pieces of chert show unifacially directed crushing and small flaking along one edge. These artifacts were included in the cores since other cores show this same small flaking and crushing after the removal of at least one series of flakes from a face. Although this flaking is interpreted as platform regularization on the core, some of these artifacts may have been used as scraper planes.

Those cores having had successively more flakes removed tend to become ovoid, pyramidal or wedge shaped, depending on the number and orientation of striking platforms used. The small, exhausted cores from the site are roughly spheroidal, or steep-sided pyramidal polygons in form.

Miscellaneous. One flake found in Cut 2 of Area A was from a chipped stone artifact which had been very highly polished. The surface also shows fine parallel scratches. This artifact may be a hoe chip.

Unidentifiable Chipped Stone Fragment. This category is largely self-explanatory. It contains fragments of chipped stone artifacts not otherwise classifiable.

Pecked and Ground Stone

As in the case of the chipped stone, the great majority of pecked and ground stone artifacts were made from locally available raw materials; sandstone and quartzite cobbles, limestone, hematite, siltstone, and Chattanooga shale. However, there are some readily observable exceptions, particularly artifacts of steatite and greenstone. Both of these minerals are available in the Piedmont or crystaline area of east-central Alabama (R. Griffin 1951; McMurray and Bowles 1941), but as discussed below there is evidence that at least some of the Bellefonte site steatite came from an alternate source. Table 10 gives the distribution of pecked and ground stone artifacts from the site.

Hammerstones (Plate 29A). The recognition of hammerstones among the thousands of whole and broken cobbles from 1 Ja 300 is a difficult task, and the tabulated figure in all likelihood represents only a small portion of the number present. Natural surface disintegration on much of the sandstone was a major factor in the difficulty of identifying battered cobbles among the material. The only sandstone cobbles that could be recognized as hammerstones with some certainty were those showing intentional pitting or shaping, or those which showed pronounced differences and sharp delineation between battered and unbattered areas.

One chert hammerstone and fragments of two others were found. The complete example is a small, unmodified nodule. The others are angular pieces of chert which may have had a few preparatory flakes removed, but are otherwise unmodified. The more diagnostic nature of the wear pattern and lack of natural decomposition of the raw material facilitated the recognition of the chert hammerstones as opposed to those of sandstone.

Anvilstones (Plate 29B). Two flat sandstone cobbles, each having an irregular battered pit on either side were classified as anvilstones.

Mullers (Plate 29C). Those sandstone cobbles with flat grinding surfaces were classified as mullers. Two intact specimens, including the illustrated example, had rounded depressions roughly in the center of each side and may also have served as anvilstones or nutting stones. The third was broken so that the presence of similar pits was not observable.

Steatite Sherds (Plate 29D). The steatite sherds from the Bellefonte site include two rimsherds with thinned, rounded lips. The other sherds are body sherds ranging in thickness from 8.9 to 20.7 mm. All sherds are from vessels with smoothed interiors, the chisel marks completely gone in some cases. Two sherds were smoothed on the outside as well.

Extensive research at the University of Virginia has been directed at the tracing of steatite sources and trade routes by the use of neutron activation analysis of trace elements. The methodology of this study has been described elsewhere (Luckenbach 1974; Luckenbach *et al.* 1974a, 1974b). Three steatite sherds from the Bellefonte site were included in a number of artifact and quarry samples submitted for study from Alabama. One sherd from Bellefonte was unique, matching no sample as yet tested. The other two sherds were similar in make-up, and they closely match the steatite from Soapstone Ridge in southern DeKalb County, Georgia. A third match for Soapstone Ridge in the submitted samples came from 1 Pi 13, Pickens County, Alabama, and the analysis reported that a fourth had been previously submitted from Russell County, Alabama (Luckenbach *et al.* 1975).

The body of empirical data on this subject is still small, and it is not yet possible to state absolutely that all (or any) of these sherds came from Soapstone Ridge. However, the similarity of the four sherds does indicate that they may have come from a single source, and until such time as repetitive trace element content is noted for separate sources, Soapstone Ridge remains the leading candidate for that source. The explanation of how and why material from Soapstone Ridge became so widely distributed over Alabama, in view of more readily accessible sources, must await further study.

Grooved Steatite Sherd (Plate 28E). This artifact appears to be a modified steatite vessel sherd. The edges of this sherd have been roughly ground, and a groove encircles the sherd around the edge. This perhaps implies use as some sort of weight or sinker.

Celts (Plate 29E). Portions of five polished stone celts were found in excavations. Three of the celts are made of a soft claystone or siltstone. Two of these are biconvex in cross section and have sharp excurvate bits. The other is more rectangular in cross section and has a flat bit. It may lack final shaping and grinding. All three were found in Cut 3 of the general excavations. The fourth celt from general excavations is a midsection of a greenstone celt from Cut 1 of Area B. The cross section is a flattened oval about 60 mm. wide and 20 mm. thick.

The final example is a heavily battered (distal?) end of a polished limestone celt from Feature 21. This artifact is ovoid in cross section, measuring approximately 45 by 35 mm. The presence of three of these celts in Cut 3 and a fourth in Feature 21 suggests an Early to Middle Woodland provenience for these artifacts.

Gorgets (Plate 28H). Four gorget fragments and one apparent example of an unfinished gorget were excavated from the Bellefonte site. Three gorgets were from Cut 2 of Area B, and the other included in the pit fill of Burial 5. Two of the gorgets are rectangular and are made of Chattanooga shale. A third is ovoid and made of siltstone. The most complete example is made of steatite in a "bowtie" shape. The edges of this artifact are notched, and some incising is present on one face. The maximum and minumum widths are 35.9 mm. and 28.9 mm., respectively. The gorget is 12.2 mm. thick.

The possible unfinished gorget is a broken, fairly regular rectangular piece of limestone. A small pit is present approximately where one would expect a hole to be drilled if indeed this specimen is an unfinished two-hole gorget. The stone is eroded so that the presence of surface grinding or drilling marks may not be observed in order to exclude a natural origin and coincidental shape for the piece.

Steatite Pendant (Plate 28F). This pendant was found while excavating a 50-cm.-square extension of Square 80R26 to expose a possible pit. The vertical provenience is thus unknown, but the maximum depth of the deposit in this area is 20 cm. The other cultural material from this extension was not retained. The pendant has a large hole drilled near one end, the other end is bifurcate. The edges of the pendant are crossed by fine engraved lines except in the basal notch. The maximum measurements of the artifact are: length, 55.0 mm.; width, 29,0 mm.; thickness, 10.9 mm.

Crinoid Beads (Plate 28G). These two beads are made from sections of fossilized crinoid stems. The smaller, from Feature 8, is 7.2 mm. in diameter and 3.4 mm. long. No modification is apparent; it may have been utilized in its natural condition. The larger bead, from the fill of Burial 2, has been ground to a regular, cylindrical shape 14.1 mm. in diameter and 11.4 mm. long.

Polished Stone Bar (Plate 30F). This artifact is an expanded-center object with a plano-convex cross section. The maximum width and thickness are 18.4 mm. and 10.3 mm., respectively. The estimated length is 75 mm., assuming symmetry. The artifact is made of a dark green-gray stone with short veins of lighter material running irregularly throughout. Striations produced by grinding are visible on all surfaces of the artifact.

Limestone Plummet (Plate 30E). This artifact, found in Cut 1 of Area B, is a rough limestone cylinder, tapered and grooved on one end. It is 66.7 mm. long and 30.1 mm. in maximum diameter. A similar artifact has been reported for Layer C at Russell Cave (J. Griffin 1974) and appears to date from a Middle to Late Woodland period. In Nickajack Reservoir, just upriver from Guntersville Lake, medially grooved limestone cylinders and balls are found in a Late Woodland context (Faulkner and Graham 1965, 1966a, 1966b). Though grossly analogous, these artifacts are dissimilar to the grooved plummets from the Bellefonte site and Russell Cave. The plummets most similar to the ones from Bellefonte and Russell Cave are the rounded, ovoid or tear-drop shaped plummets associated with cultures on the time level of Jaketown-Poverty Point as illustrated by Ford, Phillips and Haag (1955); C. Webb (1968); and Gagliano and Webb (1970).

Discoidal (Plate 29F). A single rough sandstone discoidal was found in Cut 1 of Area B. The edges are pecked and ground, and depressions are pecked into each side; but little or no polishing is present. The maximum diameter is 79.4 mm. and the greatest thickness is 45.3 mm.

Hematite Dome (Plate 30C). This artifact is a flat based cone with excurvate sides. The height (or thickness) is 28.8 mm. The base is close to a perfect circle with a diameter of 46.2 mm., maximum; and 45.7 mm., minimum. All surfaces are well polished, but the base has a noticeably higher luster than the sides. Salo (1969:131) illustrates a similar artifact described as a "truncated Early Woodland hematite cone."

Polished Stone Prism (Plate 30B). The only definite information about the provenience of this object is that it was found in Cut 1 of Square 60R2. It is not of certain aboriginal origin although this is a likely possibility. The raw material looks like stone rather than any recent ceramic, and the slight irregularities of its form argue for a hand-made origin.

The bases of the prism are triangular and measure 16.0 ±0.2 mm. on a side. The triangles are not superimposed but are slightly offset, so that the edges at the intersection of two sides slope about 30 degrees from the vertical. The artifact is 7.4 mm. thick.

Miscellaneous Ground Stone (Plate 30A). A number of other ground stone artifacts were found on the Bellefonte site. Two tabular pieces of hematite and one hematite concretion exhibit some grinding. Also found was one irregular ground piece of stone similar to the material from which the polished stone bar was made. Four small fragments of polished greenstone and one of sandstone complete the inventory of pecked and ground stone.

Table 2. Projectile Point Metric Data.

Class	Field Specimen	Maximum Length	Maximum Width	Maximum Thickness	Basal Width	Shoulder Width	Juncture Width	Haft Element Length	Haft Modification Width	Haft Modification Depth
1	25-1	39.1	25.7	7.5	25.7	x	x	x	x	x
1	151-1	53.8	24.0	5.5	24.0	x	x	x	x	x
1	241-1	33.2	24.7	5.1	24.7	x	x	x	x	x
1	275-4	41.0	17.7	12.8	17.7	x	x	x	x	x
2	4-1	27.3	13.3	2.5	13.3	x	x	x	x	x
2	4-5	-	13.1	5.1	13.1	x	x	x	x	x
2	15-2	-	-	4.7	-	x	x	x	x	x
2	45-1	20.3	15.9	6.1	15.9	x	x	x	x	x
2	63-4	16.5	15.2	2.9	15.2	x	x	x	x	x
2	78-2	-	15.0	3.6	15.0	x	x	x	x	x
2	115-1	*22.3	*11.7	3.2	*11.7	x	x	x	x	x
2	118-3	-	*17.1	4.9	*17.1	x	x	x	x	x
2	202-3	-	-	6.0	-	x	x	x	x	x
2	202-4	-	15.2	8.2	15.2	x	x	x	x	x
2	210-1	33.7	15.2	4.0	15.2	x	x	x	x	x
2	224-3	-	*18.6	4.3	*18.6	x	x	x	x	x
2	236-7	14.9	9.4	4.8	9.4	x	x	x	x	x
2	246-2	-	12.8	3.7	12.8	x	x	x	x	x
2	251-1	-	13.4	4.1	13.4	x	x	x	x	x
2	280-2	34.0	-	4.6	-	x	x	x	x	x
2	280-3	-	*15.7	5.9	*15.7	x	x	x	x	x
2	300-1	-	13.6	3.4	13.6	x	x	x	x	x
2	300-2	-	14.9	5.5	14.9	x	x	x	x	x
2	318-1	26.8	13.9	2.8	13.9	x	x	x	x	x
3	4-2	-	12.7	3.8	12.7	x	x	x	x	x
3	4-4	20.4	*12.1	11.9	*12.1	x	x	x	x	x
3	4-10	-	12.4	3.4	12.4	x	x	x	x	x
3	38-2	-	*14.7	3.9	*14.7	x	x	x	x	x
3	58-1	*19.9	13.0	3.0	13.0	x	x	x	x	x
3	80-1	23.2	13.8	4.9	13.8	x	x	x	x	x
3	100-1	24.3	*15.9	6.7	*15.9	x	x	x	x	x
3	110-1	-	14.3	3.6	14.3	x	x	x	x	x
3	116-1	*21.8	-	3.2	-	x	x	x	x	x
3	130-1	29.3	13.5	3.2	13.5	x	x	x	x	x
3	151-11	-	-	3.4	-	x	x	x	x	x
3	226-4	24.8	*20.5	3.5	*20.5	x	x	x	x	x

All Measurements in Millimeters

*..approximate measurement
-..indeterminate measurement
x..inapplicable measurement

Table 2. Continued.

Class	Field Specimen	Maximum Length	Maximum Width	Maximum Thickness	Basal Width	Shoulder Width	Juncture Width	Haft Element Length	Haft Modification Width	Haft Modification Depth
3	241-2	-	13.2	3.5	13.2	x	x	x	x	x
3	304-2	-	12.0	3.8	12.0	x	x	x	x	x
3	305-1	25.5	13.4	2.6	13.4	x	x	x	x	x
4	306-1	23.0	9.2	5.1	9.2	x	x	x	x	x
5	78-1	-	19.3	3.9	16.6	x	x	x	x	x
6	28-1	17.1	15.9	3.8	15.9	x	x	x	x	x
6	63-6	-	15.3	3.1	15.3	x	x	x	x	x
6	73-2	-	18.2	3.7	18.2	x	x	x	x	x
6	94-2	-	13.2	2.9	13.2	x	x	x	x	x
6	268-1	-	17.8	4.1	17.8	x	x	x	x	x
6	304-1	15.6	13.9	3.6	13.9	x	x	x	x	x
6	317-1	-	12.8	4.4	12.8	x	x	x	x	x
7	4-3	22.4	13.7	4.5	13.7	x	x	x	x	x
7	202-2	30.2	17.9	5.2	9.1	x	x	x	x	x
7	215-1	28.1	14.9	6.9	11.3	x	x	x	x	x
7	287-2	28.9	*15.0	5.5	*11.1	x	x	x	x	x
8	255-1	-	16.1	4.4	16.1	x	x	x	x	x
9	8-6	-	*27.0	8.6	*27.0	x	x	x	x	x
9	34-5	-	24.8	5.2	24.8	x	x	x	x	x
9	47-4	-	22.4	6.9	22.1	x	x	x	x	x
9	47-9	-	24.6	13.9	21.8	x	x	x	x	x
9	58-4	-	19.6	8.5	19.6	x	x	x	x	x
9	63-5	-	26.4	5.8	26.4	x	x	x	x	x
9	113-2	-	26.8	7.2	22.2	x	x	x	x	x
9	145-2	-	18.9	6.0	18.9	x	x	x	x	x
9	167-4	-	20.8	5.6	20.8	x	x	x	x	x
9	231-1	-	22.2	9.0	22.2	x	x	x	x	x
9	236-6	-	23.7	8.0	23.7	x	x	x	x	x
9	307-2	-	-	5.6	*24.5	x	x	x	x	x
9	319-2	-	22.7	7.2	22.7	x	x	x	x	x
10	4-9	-	21.4	4.7	21.4	x	x	x	x	x
10	48-1	35.0	24.0	5.9	24.0	x	x	x	x	x
10	51-2	-	21.9	6.4	20.7	x	x	x	x	x
10	97-7	-	22.4	5.3	22.4	x	x	x	x	x
10	210-4	37.1	25.8	7.6	25.8	x	x	x	x	x
10	267-1	31.4	25.1	6.1	25.1	x	x	x	x	x

All Measurements in Millimeters

*..approximate measurement
-..indeterminate measurement
x..inapplicable measurement

Table 2. Continued.

Class	Field Specimen	Maximum Length	Maximum Width	Maximum Thickness	Basal Width	Shoulder Width	Juncture Width	Haft Element Length	Haft Modification Width	Haft Modification Depth
10	280-4	-	23.9	5.8	20.1	x	x	x	x	x
10	285-1	*39.3	20.3	5.4	20.3	x	x	x	x	x
10	308-9	-	20.8	5.2	20.8	x	x	x	x	x
11	13-4	-	14.1	4.7	14.1	x	x	x	x	x
11	15-5	-	21.7	5.3	19.1	x	x	x	x	x
11	42-5	-	17.9	6.0	17.9	x	x	x	x	x
11	96-1	-	*22.1	8.5	*22.1	x	x	x	x	x
11	97-1	-	19.9	7.2	18.7	x	x	x	x	x
11	100-3	-	18.7	8.3	18.7	x	x	x	x	x
11	123-2	-	18.1	6.0	18.1	x	x	x	x	x
11	137-1	40.2	18.3	5.7	16.4	x	x	x	x	x
11	143-2	42.8	18.1	7.2	18.1	x	x	x	x	x
11	215-2	*47.0	14.6	6.7	14.6	x	x	x	x	x
11	226-6	-	21.4	8.5	15.7	x	x	x	x	x
11	236-3	44.2	18.5	11.1	18.5	x	x	x	x	x
11	315-1	39.8	18.7	8.5	18.7	x	x	x	x	x
12	34-4	*45.0	20.2	6.9	17.6	x	x	x	x	x
12	113-3	-	21.6	6.4	18.9	x	x	x	x	x
12	133-3	-	19.3	5.9	17.1	x	x	x	x	x
12	141-2	39.2	24.1	5.0	24.1	x	x	x	x	x
12	153-3	44.3	-	6.8	-	x	x	x	x	x
12	176-3	-	24.4	6.0	22.5	x	x	x	x	x
12	215-4	-	23.9	7.7	21.2	x	x	x	x	x
12	230-1	*41.0	26.1	8.9	26.1	x	x	x	x	x
12	287-1	-	24.8	7.5	20.8	x	x	x	x	x
12	304-1	-	26.6	7.3	18.4	x	x	x	x	x
13	58-5	-	17.4	7.0	17.4	x	x	x	x	x
13	67-1	-	22.6	6.1	22.6	x	x	x	x	x
13	160-9	-	29.3	7.7	-	x	x	x	x	x
14	143-3	-	24.5	7.0	23.7	x	x	x	x	x
14	162-3	-	22.1	8.5	22.1	x	x	x	x	x
15	4-6	-	24.7	5.5	24.7	x	x	x	x	x
15	34-3	53.5	29.3	9.1	27.5	x	x	x	x	x
15	72-1	-	26.4	8.0	*25.9	x	x	x	x	x
16	80-2	-	17.9	10.2	14.3	x	x	x	x	x
16	167-1	46.3	18.7	7.7	18.7	x	x	x	x	x

All Measurements in Millimeters

*..approximate measurement
-..indeterminate measurement
x..inapplicable measurement

Table 2. Continued.

Class	Field Specimen	Maximum Length	Maximum Width	Maximum Thickness	Basal Width	Shoulder Width	Juncture Width	Haft Element Length	Haft Modification Width	Haft Modification Depth
17	17-1	20.9	14.7	7.9	13.8	x	x	x	x	x
17	145-5	-	15.2	7.0	15.2	x	x	x	x	x
17	151-5	-	17.2	8.1	17.2	x	x	x	x	x
17	236-4	*31.7	18.6	6.7	18.6	x	x	x	x	x
17	272-4	31.9	18.0	9.6	18.0	x	x	x	x	x
19	118-2	28.7	23.5	5.0	20.3	x	23.5	13.1	x	x
20	13-1	*20.5	*15.3	2.9	*15.3	x	13.5	*8.7	x	x
21	170-1	*36.9	13.6	5.9	6.7	x	13.6	8.3	x	x
22	308-5	-	17.4	7.3	4.0	x	17.4	11.9	x	x
22	308-6	-	15.4	7.1	4.1	x	15.4	12.1	x	x
23	308-7	-	-	5.0	5.6	x	12.4	9.1	x	x
24	115-2	-	17.2	6.4	17.2	x	17.2	10.7	x	x
24	221-1	-	16.2	5.8	16.2	x	16.2	11.3	x	x
25	128-1	45.2	19.0	6.6	16.9	19.0	19.0	5.8	4.6	1.7
25	226-1	43.8	23.9	7.3	21.7	23.9	23.9	7.6	6.1	2.1
25	314-1	41.1	19.1	6.3	21.8	19.1	19.1	6.1	3.8	0.8
26	34-6	-	23.7	4.3	-	23.7	23.7	7.5	6.3	2.8
27	2-1	-	20.9	6.1	20.5	20.9	20.9	9.2	4.5	2.6
28	126-1	-	19.9	5.2	17.8	19.9	19.9	4.8	3.1	1.5
29	10-1	40.6	22.3	6.7	19.8	21.5	21.5	8.5	7.2	1.1
30	123-1	44.8	23.3	9.0	16.4	19.5	19.5	5.6	4.2	0.7
31	169-3	-	21.8	8.3	13.7	21.5	11.7	6.5	3.2	1.6
31	199-2	-	21.0	6.8	17.5	19.5	14.9	5.1	3.3	1.4
31	234-1	44.8	20.1	8.9	13.6	11.7	11.9	7.2	4.1	2.1
32	91-1	-	-	7.2	15.1	14.9	13.7	3.3	4.1	2.0
33	143-1	48.7	23.8	5.8	13.5	11.9	11.7	4.5	1.9	1.7
34	176-2	-	19.5	5.1	10.4	13.7	10.0	4.8	2.6	1.7
35	280-1	-	20.4	5.6	16.4	11.7	17.3	6.4	6.3	0.5
36	308-10	-	17.9	6.0	12.6	10.0	13.2	6.7	9.1	0.9
37	259-2	-	17.2	8.2	5.9	17.3	11.9	6.1	6.9	1.5
38	9-1	-	18.0	4.9	-	13.2	14.6	-	-	-
38	40-2	-	20.5	5.8	16.6	11.9	15.6	4.7	3.0	1.6
38	118-8	-	18.9	7.8	*14.9	14.6	18.9	-	-	-
38	131-2	-	17.7	6.8	16.4	15.6	-	-	-	-
38	160-1	-	18.1	5.1	17.9	18.9	13.7	5.7	3.5	2.2
38	227-2	-	19.7	4.8	16.6	-	15.4	8.1	6.4	1.4
38	310-1	-	*20.7	5.9	17.6	13.7	15.6	8.2	4.4	1.8

All Measurements in Millimeters

*..approximate measurement
-..indeterminate measurement
x..inapplicable measurement

Table 2. Continued.

Class	Field Specimen	Maximum Length	Maximum Width	Maximum Thickness	Basal Width	Shoulder Width	Juncture Width	Haft Element Length	Haft Modification Width	Haft Modification Depth
38	317-1	-	-	-	-	-	-	8.4	3.4	1.2
39	244-1	-	*19.4	7.9	*12.1	*19.3	*13.1	5.4	4.2	1.5
39	311-2	-	22.2	8.1	14.6	19.8	14.5	6.1	5.9	1.9
40	100-2	45.3	-	9.1	-	x	-	11.4	7.8	0.5
41	307-1	-	*16.7	3.7	13.5	*16.7	10.9	8.4	6.2	2.2
42	34-1	78.0	*29.6	7.4	21.8	-	21.8	20.9	14.1	2.1
42	34-2	85.1	*28.8	8.7	22.3	-	22.3	23.5	19.4	3.2
43	10-3	-	27.5	6.6	*17.9	23.9	23.9	9.7	6.7	1.7
43	58-2	-	28.2	8.8	*16.7	24.3	24.3	8.6	9.0	2.5
44	304-5	-	22.7	11.9	11.9	21.5	12.5	11.6	12.7	3.6
45	246-1	*35.7	19.9	7.2	9.1	19.9	11.2	5.8	4.4	2.3
46	125-3	-	23.2	7.2	11.7	22.9	11.8	10.9	6.1	3.8
47	8-1	56.9	24.7	10.7	-	22.9	13.4	13.0	11.1	4.2
48	210-2	39.5	25.6	8.2	12.8	22.9	16.2	9.5	9.6	3.7
49	94-1	34.5	22.8	7.7	13.8	22.8	13.6	7.9	9.5	4.0
50	23-1	-	23.6	8.9	17.1	21.3	17.8	12.8	12.4	2.2
51	196-4	-	24.1	9.0	17.9	22.2	19.9	12.3	10.3	0.8
52	186-2	-	23.1	8.4	12.8	x	21.1	4.7	5.9	0.3
53	118-1	34.4	32.0	7.3	*17.6	32.0	14.1	10.9	7.1	4.5
54	259-1	38.8	-	6.1	13.8	-	13.7	8.9	10.7	6.2
55	48-2	-	-	6.3	14.4	-	13.8	7.3	5.9	3.4
56	210-3	39.8	*33.8	6.8	18.1	-	17.3	9.4	5.9	3.7
57	73-1	-	-	*10.6	18.2	-	17.9	10.7	10.9	6.1
58	8-5	-	32.3	8.9	15.5	32.3	19.0	10.0	13.9	3.1
58	257-2	-	3.16	10.6	13.4	*30.1	16.3	8.9	8.8	2.5
58	264-1	-	30.3	9.0	14.4	30.3	19.4	8.0	15.7	2.9
59	4-8	-	32.5	13.1	15.8	32.5	13.8	10.2	13.0	4.9
59	105-1	-	32.0	6.1	15.1	32.0	15.2	9.6	10.6	4.5
59	199-1	-	22.4	9.2	13.2	21.9	13.8	14.4	10.1	2.7
60	267-2	-	36.3	8.6	20.0	36.3	18.1	9.5	12.1	7.4
61	125-1	55.2	-	8.8	-	-	14.2	12.1	10.6	5.4
62	63-1	49.7	27.9	7.9	8.0	27.9	13.1	10.4	10.7	3.2
63	156-1	*62.0	-	9.2	15.1	-	17.3	9.1	13.4	3.3
63	175-1	46.3	19.7	9.8	7.3	19.7	11.3	11.7	16.1	2.0
63	217-1	53.6	*26.5	8.8	9.2	*26.5	14.2	11.3	12.6	3.9
64	180-1	42.0	20.1	10.3	6.3	x	20.1	10.5	x	x
65	311-1	43.2	20.6	7.2	5.7	20.6	12.6	8.7	11.7	1.8

All Measurements in Millimeters

*..approximate measurement
-..indeterminate measurement
x..inapplicable measurement

Table 2. Continued.

Class	Field Specimen	Maximum Length	Maximum Width	Maximum Thickness	Basal Width	Shoulder Width	Juncture Width	Haft Element Length	Haft Modification Width	Haft Modification Depth
66	151-2	39.6	17.6	5.4	15.8	17.6	13.3	8.9	4.7	1.8
67	128-2	*42.5	20.4	9.7	-	19.7	14.9	7.9	9.0	2.4
68	153-1	*32.5	17.4	6.9	*14.2	*16.1	12.5	6.0	3.9	1.8
69	207-1	37.8	22.4	7.9	18.5	22.4	16.4	8.0	5.9	3.1
70	10-2	-	-	10.1	*12.7	-	13.9	12.4	13.8	3.8
70	49-1	-	28.6	6.4	15.5	28.6	15.7	8.1	12.8	4.1
70	53-1	-	32.8	12.5	13.2	32.8	18.7	12.9	19.3	3.9
70	304-3	-	33.7	8.9	14.8	33.7	18.6	14.5	20.2	6.3
70	317-2	-	21.0	5.9	-	21.0	14.7	8.9	9.3	2.4
71	100-4	-	33.3	*8.7	16.7	33.3	20.2	13.2	14.8	4.1
72	21-2	-	30.7	11.5	14.2	30.7	15.5	8.9	11.1	4.0
73	101-1	-	23.7	10.1	15.8	23.7	19.2	12.6	13.5	1.4
74	224-2	-	24.1	9.4	11.8	24.1	16.7	12.4	13.8	1.9
75	186-1	61.4	25.4	10.1	15.4	25.4	17.9	13.3	16.4	3.1
76	257-3	-	22.3	9.8	14.7	22.3	16.4	11.1	10.7	2.1
77	224-1	49.5	24.4	7.2	13.6	24.4	13.1	7.8	8.7	4.1
78	296-1	51.1	25.9	7.5	15.7	25.9	16.1	8.1	8.8	4.7
79	162-2	-	22.3	8.9	*13.2	22.3	*12.7	*5.4	8.5	2.3
80	308-1	42.6	-	8.7	16.8	-	14.9	9.8	8.0	2.8
81	319-1	-	35.0	9.4	18.4	35.0	19.2	12.6	11.0	4.5
82	272-3	-	23.6	6.6	17.0	23.6	16.4	9.6	10.4	3.1
83	271-1	-	28.5	9.0	15.3	28.5	13.0	11.9	11.6	5.8
84	275-1	-	33.1	9.2	12.1	30.6	15.9	9.6	6.2	3.8
85	303-1	41.4	28.8	9.7	11.9	28.8	13.2	9.7	8.9	4.5
86	205-1	37.7	26.8	7.8	*11.4	26.8	14.5	7.9	9.1	3.9
87	221-2	-	-	-	-	-	-	*12.2	11.3	4.4
88	85-1	-	-	8.4	16.1	*37.5	22.1	11.4	9.8	5.3
88	199-3	-	32.3	9.3	20.1	32.2	20.4	9.3	8.9	3.2
88	272-1	-	25.9	5.6	22.9	25.9	19.3	9.2	6.7	2.7
89	65-1	-	29.8	10.5	-	29.8	-	10.8	10.7	3.6
90	236-1	-	25.9	7.8	19.7	25.9	19.9	11.8	13.6	3.8
91	15-3	-	28.5	8.0	20.9	28.5	21.3	6.6	7.9	1.4
92	272-2	-	31.0	8.9	15.9	31.0	16.7	3.8	5.3	1.5
93	125-2	-	29.4	8.3	15.7	29.4	16.7	5.4	7.9	2.4
94	208-1	-	29.8	9.2	14.6	29.8	15.7	4.4	9.1	1.4
95	141-1	42.4	25.5	6.5	13.8	25.5	14.3	3.8	4.1	1.4
95	151-3	42.0	24.2	4.3	12.5	24.2	13.3	2.6	4.8	1.3

All Measurements in Millimeters

*..approximate measurement
-..indeterminate measurement
x..inapplicable measurement

Table 2. Continued.

Class	Field Specimen	Maximum Length	Maximum Width	Maximum Thickness	Basal Width	Shoulder Width	Juncture Width	Haft Element Length	Haft Modification Width	Haft Modification Depth
96	8-4	-	25.7	7.8	15.1	25.7	15.5	4.4	5.9	1.3
97	151-4	-	28.9	7.9	*19.7	28.9	18.6	6.8	5.7	3.1
98	40-1	-	29.6	10.0	16.9	29.6	18.5	3.6	5.7	2.3
98	47-1	-	*31.1	7.3	19.6	27.7	20.8	8.5	6.8	1.9
98	70-2	-	33.7	6.1	18.0	33.7	17.8	5.1	5.2	2.6
99	6-1	-	29.6	10.0	16.9	25.8	18.2	8.3	8.4	2.5
99	7-1	-	23.9	6.9	13.2	23.9	14.4	9.8	8.8	3.9
100	257-1	47.2	27.0	7.9	10.7	27.0	13.6	3.3	6.4	1.3
101	226-2	37.0	26.9	7.8	10.8	26.9	16.3	4.9	7.3	0.8
102	241-4	-	29.4	*5.6	11.4	29.4	19.6	3.8	9.6	0.6
103	169-2	47.7	*33.5	11.2	7.9	*33.5	20.2	11.7	10.4	2.4
104	176-1	31.6	25.7	6.8	25.7	x	25.7	4.2	x	x
105	202-5	42.9	-	7.5	*14.8	-	16.3	10.4	10.1	5.2
106	42-1	39.1	25.9	5.6	*8.7	24.5	8.8	5.6	3.4	4.9
106	169-1	51.8	*32.4	7.6	*10.0	*28.7	12.8	6.2	5.2	3.8
106	239-1	-	30.9	9.3	22.9	30.9	17.2	10.8	7.6	4.7
107	6-2	-	30.1	*8.5	16.9	30.1	16.3	10.4	10.1	5.2
108	8-2	51.0	-	7.3	-	-	-	9.7	9.6	2.7
109	8-3	-	29.8	5.6	12.1	29.4	9.6	5.6	3.8	4.8
110	42-3	-	-	4.9	13.8	-	11.5	7.6	5.5	3.7
111	47-3	-	24.6	6.8	14.9	24.6	13.3	8.4	5.6	3.4
112	308-2	44.6	-	4.4	14.5	-	13.3	13.9	6.3	3.9
113	88-1	*26.8	23.7	6.2	15.0	23.7	12.8	6.2	3.4	3.1

All Measurements in Millimeters

*..approximate measurement
-..indeterminate measurement
x..inapplicable measurement

Table 3. Projectile Points from General Excavations, Area A.

	Projectile Point Class																									
Depth	1	2	3	5	6	7	9	10	11	12	13	15	16	17	18	20	26	27	29	38	42	43	47	50	55	57
Cut 1	-	2	1	1	1	-	1	1	-	-	1	-	-	-	1	1	-	1	-	-	-	1	-	-	-	-
Cut 2	-	4	6	-	2	1	3	1	2	-	-	2	1	-	-	-	-	-	-	-	-	-	-	1	-	1
Cut 3	1	-	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	2	-	-	-	-	1	-
Cut 4	-	-	-	-	-	-	2	-	1	1	1	1	-	-	-	-	1	-	-	1	2	-	1	-	-	-
Cut 5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-
Total	1	6	7	1	3	1	6	3	3	1	2	3	1	1	1	1	1	1	1	3	2	2	1	1	1	1

	Projectile Point Class																				
Depth	58	59	62	70	72	89	91	96	98	99	106	107	108	109	110	111	114	115	116	117	Total
Cut 1	-	-	-	-	1	-	-	-	1	-	-	-	-	-	-	-	4	7	12	10	47
Cut 2	-	1	1	1	-	-	1	-	-	1	-	-	-	-	-	1	3	3	10	9	55
Cut 3	-	-	-	-	-	1	-	-	1	2	-	1	-	-	-	-	1	5	8	8	33
Cut 4	1	-	-	1	-	-	-	1	-	-	1	-	1	1	1	-	1	-	-	2	21
Cut 5	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	4
Total	1	1	1	3	1	1	1	1	2	3	1	1	1	1	1	1	9	16	30	29	160

Table 4. Projectile Points from General Excavations, Area B.

	Projectile Point Class																											
Depth	1	2	3	6	7	8	9	10	11	12	13	14	16	17	18	19	21	24	25	28	30	31	32	33	34	35	37	38	39
Cut 1	2	8	3	2	2	1	3	5	7	4	1	1	1	2	2	1	-	1	2	-	1	1	1	1	-	1	-	3	1
Cut 2	1	3	3	-	1	-	2	-	1	2	-	1	-	2	-	-	1	1	2	1	-	1	-	-	1	-	1	1	-
Cut 3	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
Total	3	11	6	2	3	1	5	5	8	8	1	2	1	4	2	1	1	2	4	1	1	3	1	1	1	1	1	4	1

	Projectile Point Class																										
Depth	40	45	46	48	49	51	52	53	54	56	58	59	60	61	63	64	66	67	68	69	71	73	74	75	76	77	79
Cut 1	1	-	-	1	1	-	1	1	-	1	1	2	1	-	2	1	-	1	-	-	1	1	1	1	1	1	-
Cut 2	-	1	1	-	-	1	-	-	1	-	1	-	-	1	1	-	1	-	-	1	-	-	-	-	-	-	1
Cut 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
Total	1	1	1	1	1	1	1	1	1	1	2	2	1	1	3	1	1	1	1	1	1	1	1	1	1	1	1

	Projectile Point Class																								
Depth	82	83	84	86	87	88	90	92	93	94	95	97	100	101	102	103	104	105	106	113	114	115	116	117	Total
Cut 1	1	1	1	1	1	3	1	1	-	-	-	-	1	1	1	-	-	1	-	1	14	36	57	58	257
Cut 2	-	-	-	-	-	-	-	-	1	-	1	1	-	-	-	1	1	-	2	-	6	6	14	8	76
Cut 3	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	4	3	6	5	24
Total	1	1	1	1	1	3	1	1	1	1	2	1	1	1	1	1	1	1	2	1	24	45	77	71	357

Table 5. Projectile Points from Feature, Burial, and Post Hole Fill.

	Projectile Point Class																											
Provenience	2	3	4	6	9	10	11	12	18	22	23	25	36	38	39	41	44	65	70	78	80	81	85	112	114	115	116	117
Feature 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	1
Feature 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-
Feature 7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Feature 8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1	1	3	-
Feature 13	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Feature 16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1	-	1
Feature 17	-	1	-	1	1	-	-	1	-	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	2	5	-
Feature 18	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	2	3
Feature 19	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	3	5
Feature 20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1
Feature 21	-	-	-	-	-	1	-	-	-	2	1	-	1	-	-	-	-	-	-	-	1	-	-	1	1	1	7	9
Feature 22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	1	1
Subtotal	2	2	1	1	1	1	-	1	-	2	1	-	1	-	-	1	1	-	1	1	1	-	1	1	4	10	23	22
Burial 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-	-	1	3	-
Burial 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	3	-
Burial 4	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Burial 5	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Burial 6	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	2	1
Burial 7	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2	1
Burial 8	-	-	-	-	1	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1	-	-	-	-	-	-
Burial 9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Subtotal	1	-	-	1	1	-	1	-	1	-	-	1	-	1	1	-	-	1	1	-	-	1	-	-	2	2	10	4
Post Hole 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-
Post Hole 11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Subtotal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	1
Total	3	2	1	2	2	1	1	1	1	2	1	1	1	1	1	1	1	1	2	1	1	1	1	1	6	12	35	27

Table 6. Distribution of Other Chipped Stone Artifacts.

Provenience	Cores	Preforms	Biface Knives	Wedges	Digging Implements	Drills	Perforators	Scrapers on Biface	Graver Spur on Biface	Hoe Chip?	Unfinished	Unidentifiable	Side Scrapers	End Scrapers	Side/End Scrapers	Flake Knives	Backed Flake Knives	Spokeshaves	Notched Flake	Reamers on Flake	Perforators on Flake	Serrated Flake	Microliths	Total
Area A																								
Cut 1	14	6	1	2	-	-	-	-	-	-	7	56	1	-	-	-	3	1	-	1	-	-	3	95
Cut 2	15	3	5	1	-	1	-	1	1	1	2	28	2	-	-	-	-	-	-	-	-	-	2	62
Cut 3	12	2	3	-	1	-	1	-	-	-	2	24	1	1	-	-	1	1	-	-	-	-	2	51
Cut 4	3	-	2	1	-	-	-	-	-	-	1	28	-	-	-	1	-	-	-	-	-	-	-	36
Cut 5	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1
Subtotal	44	11	11	4	1	1	1	1	1	1	12	137	4	1	-	1	4	2	-	1	-	-	7	245
Area B																								
Cut 1	69	22	31	6	14	12	5	2	-	-	28	220	12	6	4	4	2	2	1	1	5	1	11	458
Cut 2	14	10	4	-	3	-	1	-	-	-	6	65	4	-	1	-	-	-	-	-	-	-	4	112
Cut 3	1	2	1	-	3	2	-	-	-	-	1	8	2	-	-	-	-	-	-	-	-	-	3	23
Subtotal	84	34	36	6	20	14	6	2	-	-	35	293	18	6	5	4	2	2	1	1	5	1	18	593
Feature 1	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	2
Feature 2	-	-	-	-	-	1	-	-	-	-	-	6	-	-	-	-	-	-	-	-	-	-	-	7
Feature 3	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1
Feature 6	1	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1	4
Feature 7	-	-	-	-	-	-	-	-	-	-	-	2	1	-	-	-	-	-	-	-	-	-	-	3
Feature 8	-	-	-	-	-	-	-	-	-	-	-	7	-	-	-	-	-	-	-	-	-	-	-	7
Feature 11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1
Feature 13	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	2	4
Feature 15	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	2
Feature 16	1	-	-	-	-	-	-	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-	6
Feature 17	2	1	2	-	-	1	-	-	-	-	-	19	-	-	-	-	-	-	-	-	-	-	2	27
Feature 18	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	1	-	-	-	-	-	4
Feature 19	1	-	1	-	-	-	-	-	-	-	1	11	-	-	-	-	2	-	-	-	1	-	1	18
Feature 20	1	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	3
Feature 21	5	1	-	-	1	-	-	-	-	-	1	19	1	-	-	-	-	-	-	-	-	-	2	30
Feature 22	-	-	-	-	-	-	-	-	-	-	-	3	1	-	-	-	-	-	-	-	-	-	-	4
Subtotal	11	2	3	-	1	4	-	-	-	-	5	81	3	-	-	-	2	1	-	-	1	-	9	123
Burial 1	1	-	-	-	-	-	-	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-	5
Burial 2	-	-	1	-	1	-	1	-	-	-	-	7	-	-	-	-	-	-	-	-	-	-	-	10
Burial 3	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	3
Burial 4	1	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	4
Burial 6	4	1	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	2	8
Burial 7	2	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Burial 8	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1
Burial 9	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1	3
Subtotal	9	1	2	-	1	-	1	-	-	-	-	20	-	-	-	-	-	-	-	-	-	-	3	37
Total	148	48	52	10	23	19	8	3	1	1	52	531	25	7	5	5	8	5	1	2	6	1	37	998

Table 7. Debitage from General Excavations.

Category	Area A Cut 1	Cut 2	Cut 3	Cut 4	Cut 5	Subtotal
Bifacial Retouch Flakes	72	70	52	36	10	240
Flakes	1642	1308	1031	420	68	4469
Utilized Flakes	99	87	55	21	11	273
Decortication Flakes	957	727	472	191	21	2368
Utilized Decortication Flakes	65	62	45	10	1	183
Chunks	196	162	87	52	8	505
3/32" Debitage (grams)	65.0	69.4	67.2	20.2	3.0	224.6
Total	3031	2416	1742	730	119	8038

Category	Area B Cut 1	Cut 2	Cut 3	Subtotal	Total
Bifacial Retouch Flakes	227	71	9	307	547
Flakes	7348	1969	178	9495	13964
Utilized Flakes	359	96	9	464	737
Decortication Flakes	4282	1163	110	5555	7923
Utilized Decortication Flakes	308	74	12	394	577
Chunks	1072	278	26	1376	1881
3/32" Debitage (grams)	446.1	168.1	33.0	547.2	771.8
Total	13596	3651	344	17591	25629

Table 8. Debitage from Feature Fill.

Provenience	Bifacial Retouch Flakes	Flakes	Utilized Flakes	Decortication Flakes	Utilized Decortication Flakes	Chunks	3/32" Debitage (Grams)	Total*
Feature 1	3	53	1	28	-	9	11.9	94
Feature 2	12	140	3	79	3	15	29.9	252
Feature 3	-	60	2	27	2	2	4.7	93
Feature 4	-	36	-	17	2	7	8.5	62
Feature 6	2	114	2	31	-	7	25.2	156
Feature 7	2	60	2	32	2	4	14.1	102
Feature 8	8	139	3	78	-	12	46.4	240
Feature 9	1	10	1	7	-	-	0.7	19
Feature 10	2	19	0	7	-	-	3.4	28
Feature 11	-	8	0	8	-	-	3.1	16
Feature 12	1	31	0	15	-	2	7.2	49
Feature 13	4	84	0	32	-	1	20.7	121
Feature 14	2	9	1	8	-	1	4.3	21
Feature 15	1	20	-	12	-	1	2.7	34
Feature 16	10	237	7	131	4	20	64.0	409
Feature 17	47	1271	10	545	6	105	61.2	1984
Feature 18	1	407	6	210	2	20	21.2	646
Feature 19	9	957	16	429	11	68	87.6	1490
Feature 20	6	420	6	247	2	11	40.3	692
Feature 21	50	1305	13	782	7	105	211.3	2262
Feature 22	1	149	3	54	-	6	21.9	213
Total	162	5529	76	2779	41	396	690.3	8983

*Does not include 3/32" debitage.

Table 9. Debitage from Burial and Post Hole Fill.

Provenience	Bifacial Retouch Flakes	Flakes	Utilized Flakes	Decortication Flakes	Utilized Decortication Flakes	Chunks	3/32" Debitage (Grams)	Total*
Burial 1	3	102	3	30	1	9	18.4	148
Burial 2	7	160	3	84	7	32	28.4	293
Burial 3	–	50	6	19	–	8	16.0	83
Burial 4	2	27	1	13	–	5	1.2	48
Burial 5	1	31	2	21	3	3	15.0	61
Burial 6	4	232	5	147	2	14	2.3	404
Burial 7	3	480	7	184	1	9	57.9	684
Burial 8	2	162	2	54	–	5	10.2	225
Burial 9	3	162	1	50	–	8	10.4	224
Subtotal	25	1406	30	602	14	93	159.8	2170
Post Hole 1	–	1	–	–	–	–	–	1
Post Hole 3	–	–	–	–	–	–	0.3	–
Post Hole 4	–	–	–	–	–	–	x	–
Post Hole 5	–	–	–	–	–	–	x	–
Post Hole 6	–	–	–	–	–	–	x	–
Post Hole 7	–	–	–	–	–	–	x	–
Post Hole 9	–	–	–	–	–	–	x	–
Post Hole 10	–	–	–	–	–	–	x	–
Post Hole 11	–	–	–	–	–	–	x	–
Post Hole 13	–	–	–	–	–	–	x	–
Post Hole 14	–	–	1	1	–	–	0.1	2
Post Hole 15	–	1	–	–	–	–	x	1
Post Hole 16	–	4	–	4	–	3	0.3	11
Post Hole 17	–	–	–	–	–	–	0.1	–
Post Hole 18	–	–	–	–	–	–	x	–
Post Hole 19	–	9	–	2	–	1	0.7	12
Subtotal	–	15	1	7	–	4	1.6	27
Total	25	1421	31	609	14	97	161.4	2197

*Does not include 3/32" debitage.

x Less than 0.1 gram.

Table 10. Distribution of Pecked and Ground Stone.

Provenience	Hammerstones	Anvilstones	Mullers	Steatite Sherds	Grooved Steatite Sherd	Discoidal	Hematite Dome	Prismatic Form	Plummet	Gorgets	Gorget Fragments?	Crinoid Beads	Celts	Expanded Center Bar	Polished Greenstone Fragments	Polished Sandstone Fragment	Ground Hematite	Total
Area A																		
Cut 1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	1	2
Cut 2	1	–	1	–	–	–	1	–	–	–	1	–	–	–	–	–	–	4
Cut 3	1	–	–	–	–	–	–	–	–	–	1	–	2	1	–	–	1	6
Cut 4	–	–	–	4	–	–	–	–	–	–	–	–	–	–	–	–	–	4
Subtotal	2	–	1	4	–	–	1	–	–	–	2	–	2	1	1	–	2	16
Area B																		
Cut 1	15	2	2	3	1	1	–	1	1	–	1	–	1	–	2	–	–	30
Cut 2	–	–	–	3	–	–	–	–	–	3	–	–	–	–	–	–	–	6
Cut 3	–	–	–	1	–	–	–	–	–	–	–	–	1	–	–	–	–	2
Subtotal	15	2	2	7	1	1	–	1	1	3	1	–	2	–	2	–	–	38
Feature 8	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	1
Feature 12	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1
Feature 16	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	1
Feature 17	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2
Feature 19	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	1
Feature 21	–	–	–	–	–	–	–	–	–	–	–	–	1	–	2	–	–	3
Subtotal	3	–	–	1	–	–	–	–	–	–	–	1	1	–	2	1	–	9
Burial 2	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	1
Burial 3	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1
Burial 5	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	1
Burial 6	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1
Burial 7	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	1
Subtotal	2	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	1	5
Total	22	2	3	12	1	1	1	1	1	4	3	2	5	1	5	1	3	68

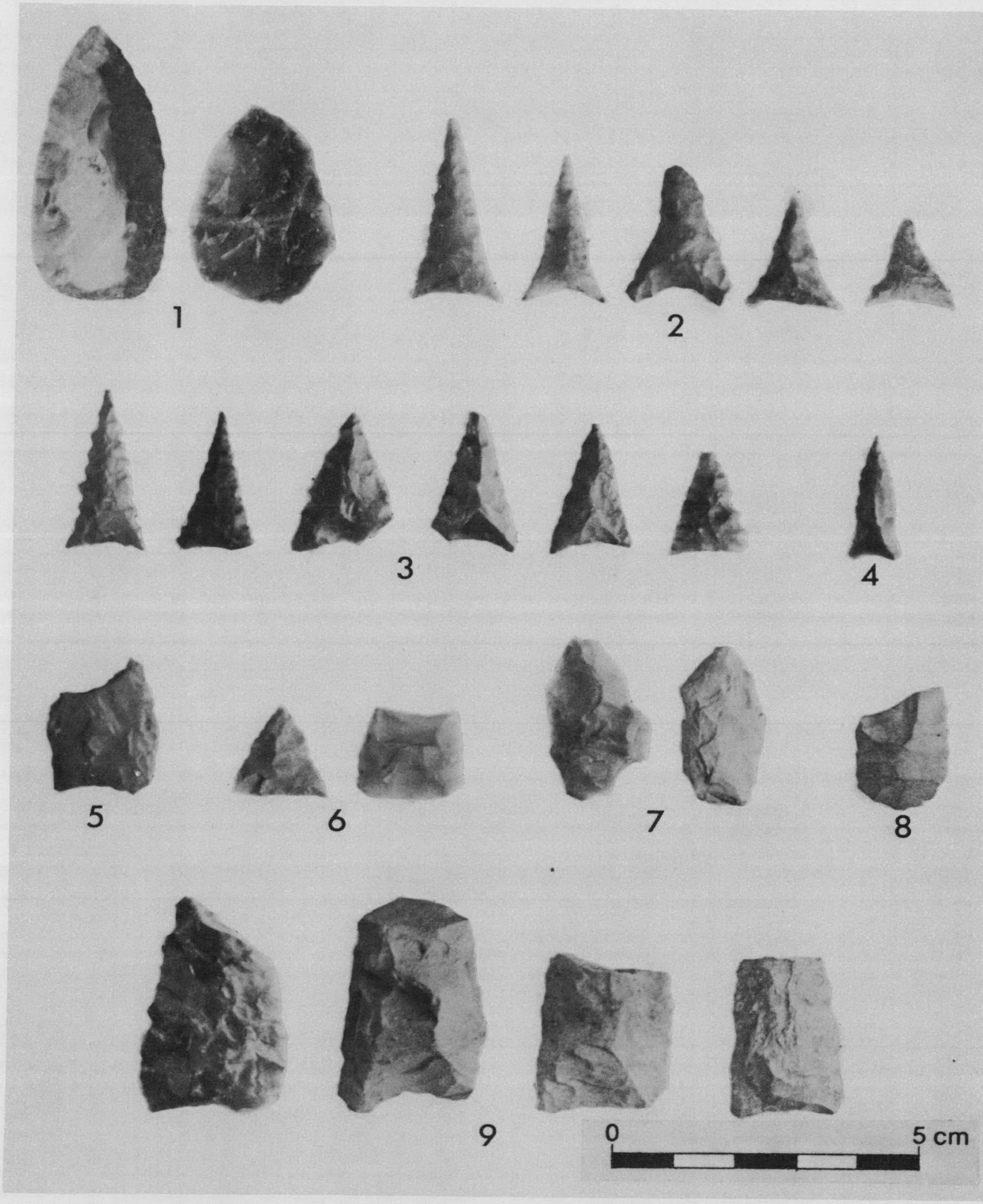


Plate 13. Projectile Point Classes 1-9.

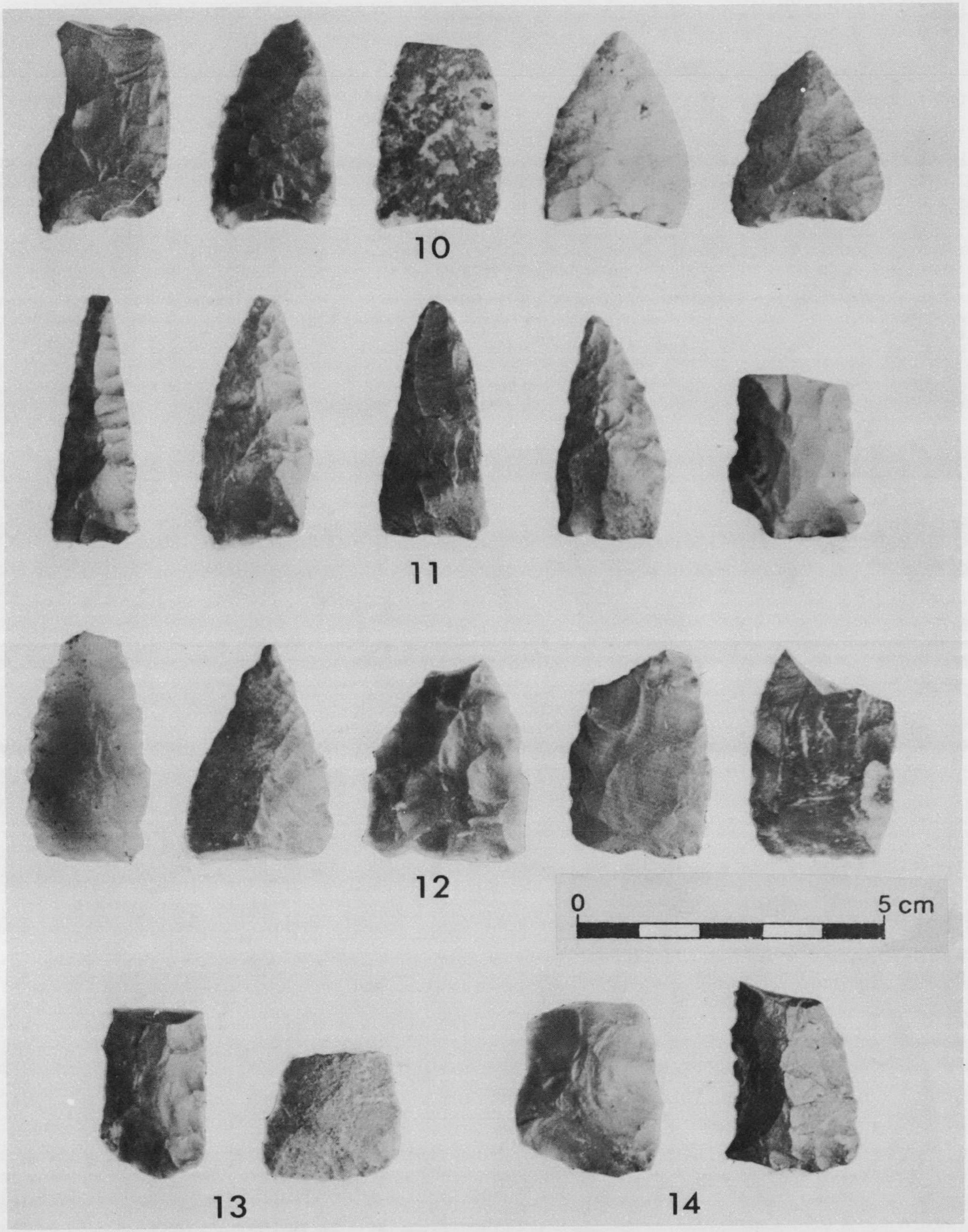


Plate 14. Projectile Point Classes 10-14.

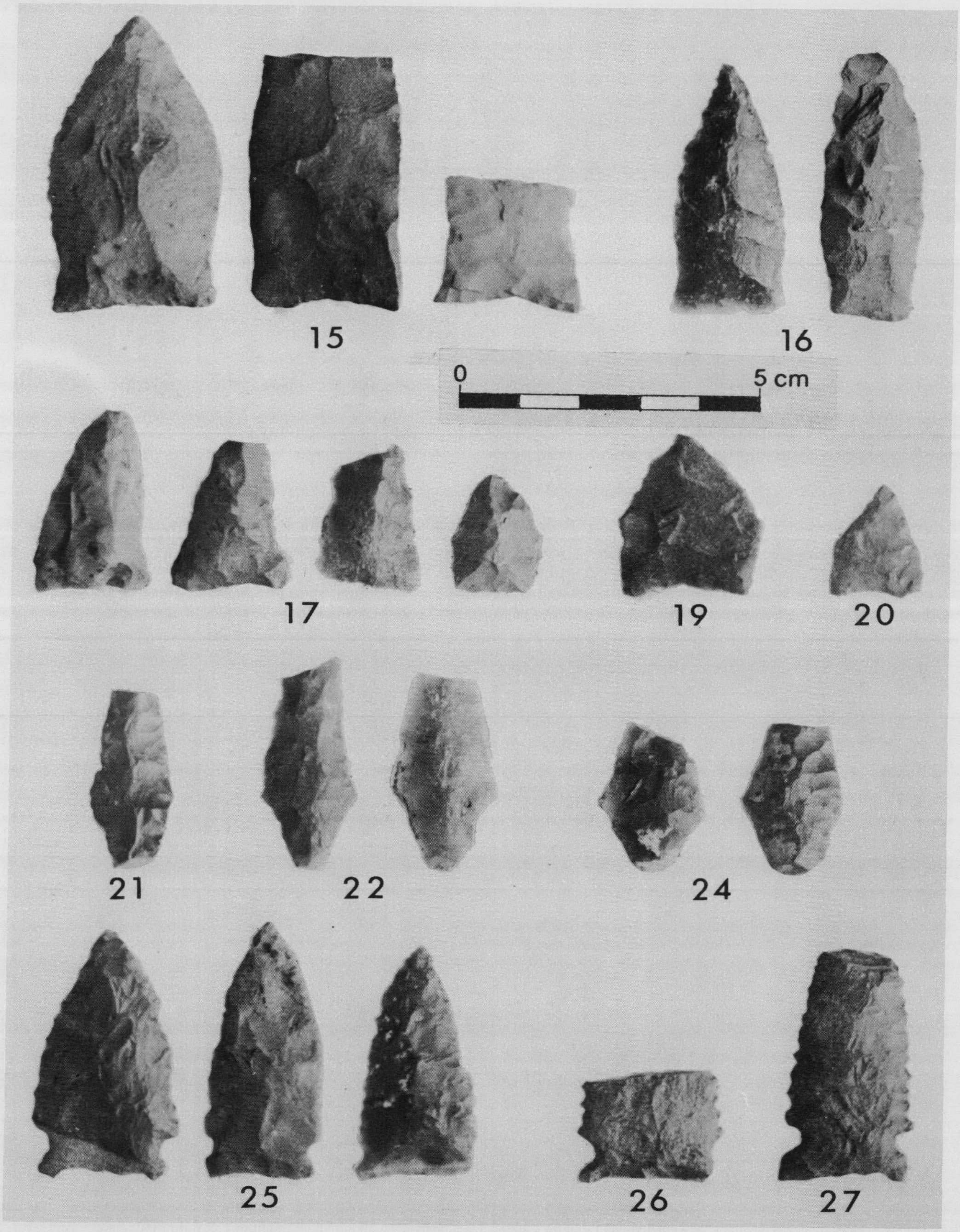


Plate 15. Projectile Point Classes 15-17; 19-22; 24-27.

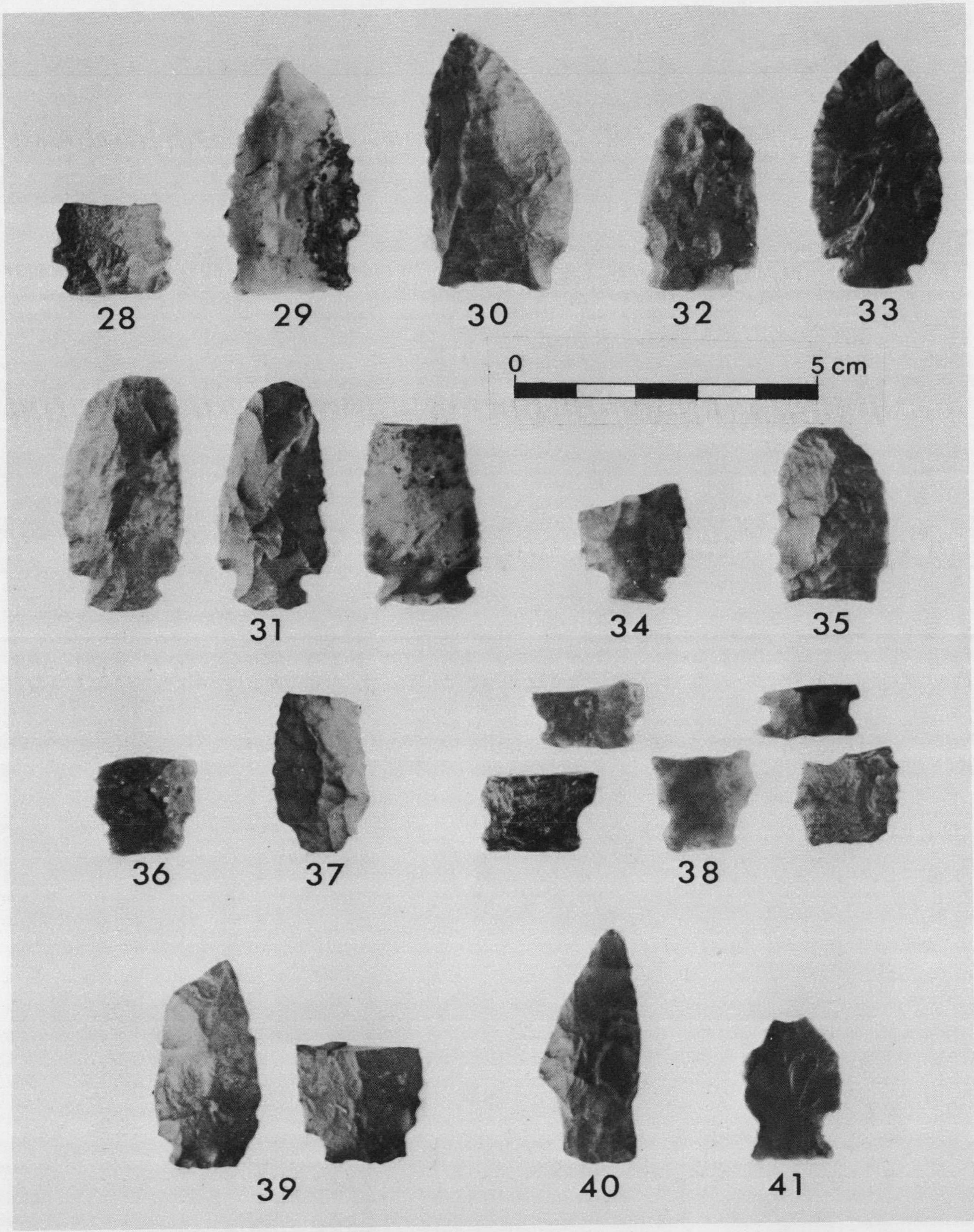


Plate 16. Projectile Point Classes 28-41.

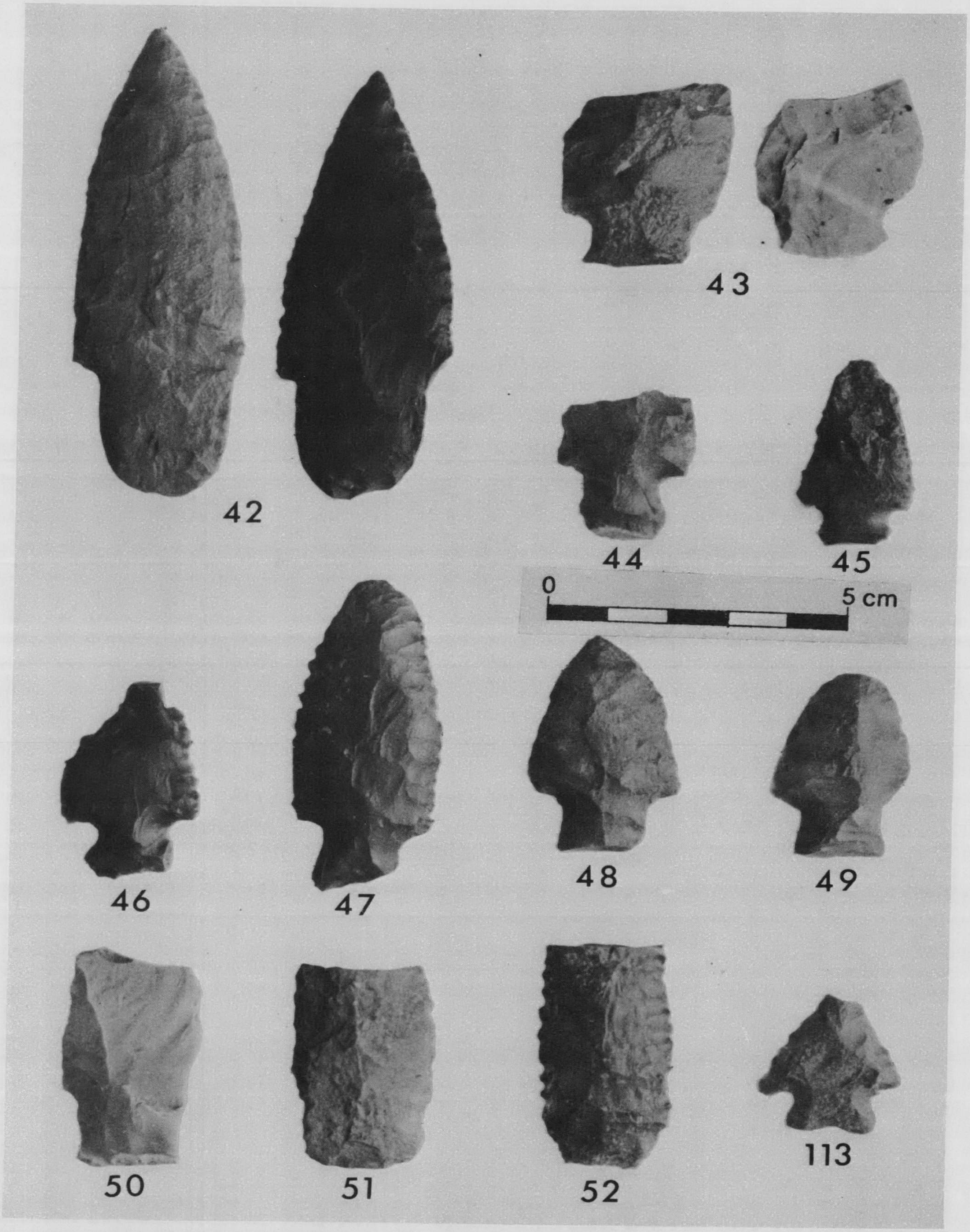


Plate 17. Projectile Point Classes 42-52; 113.

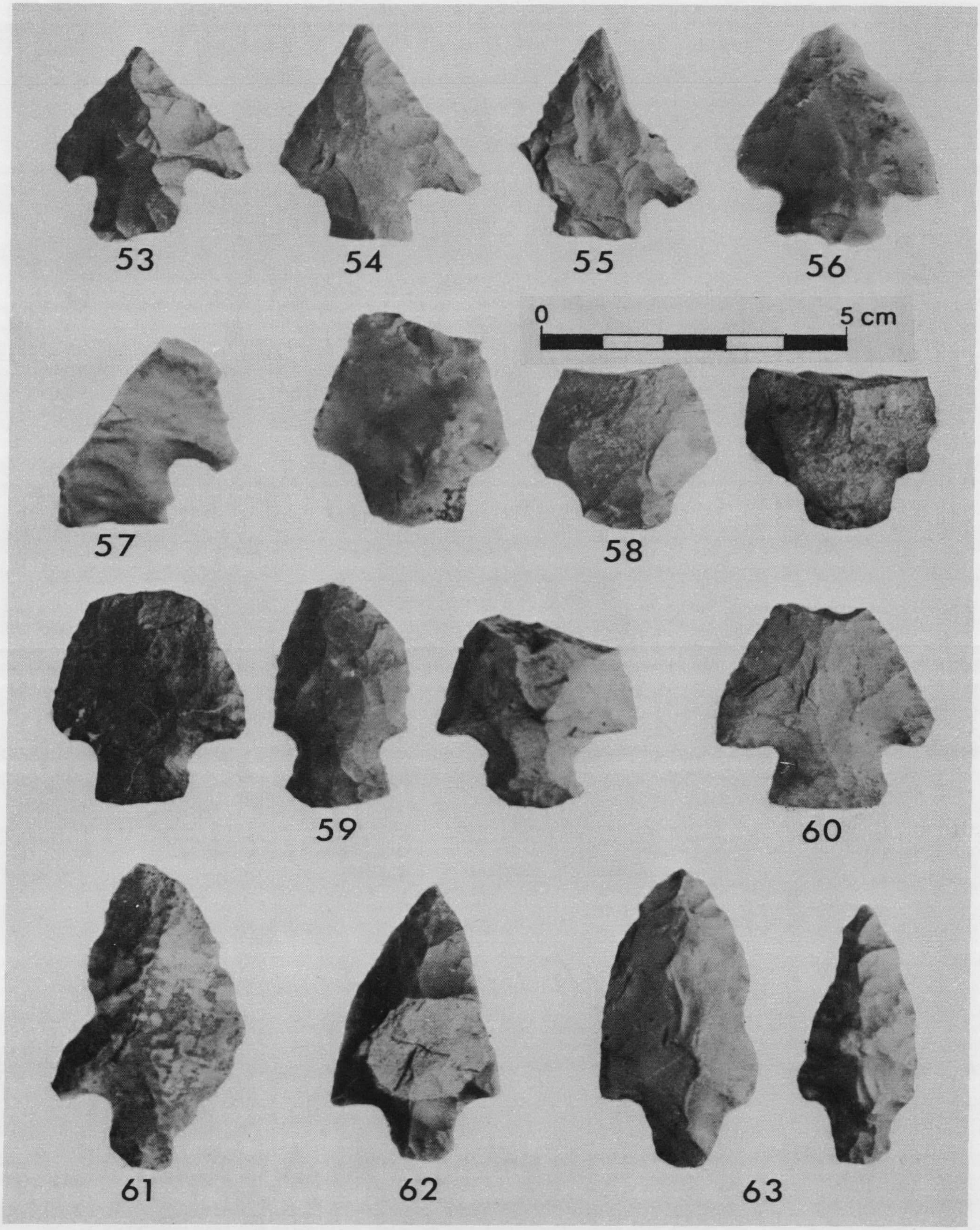


Plate 18. Projectile Point Classes 53-63.

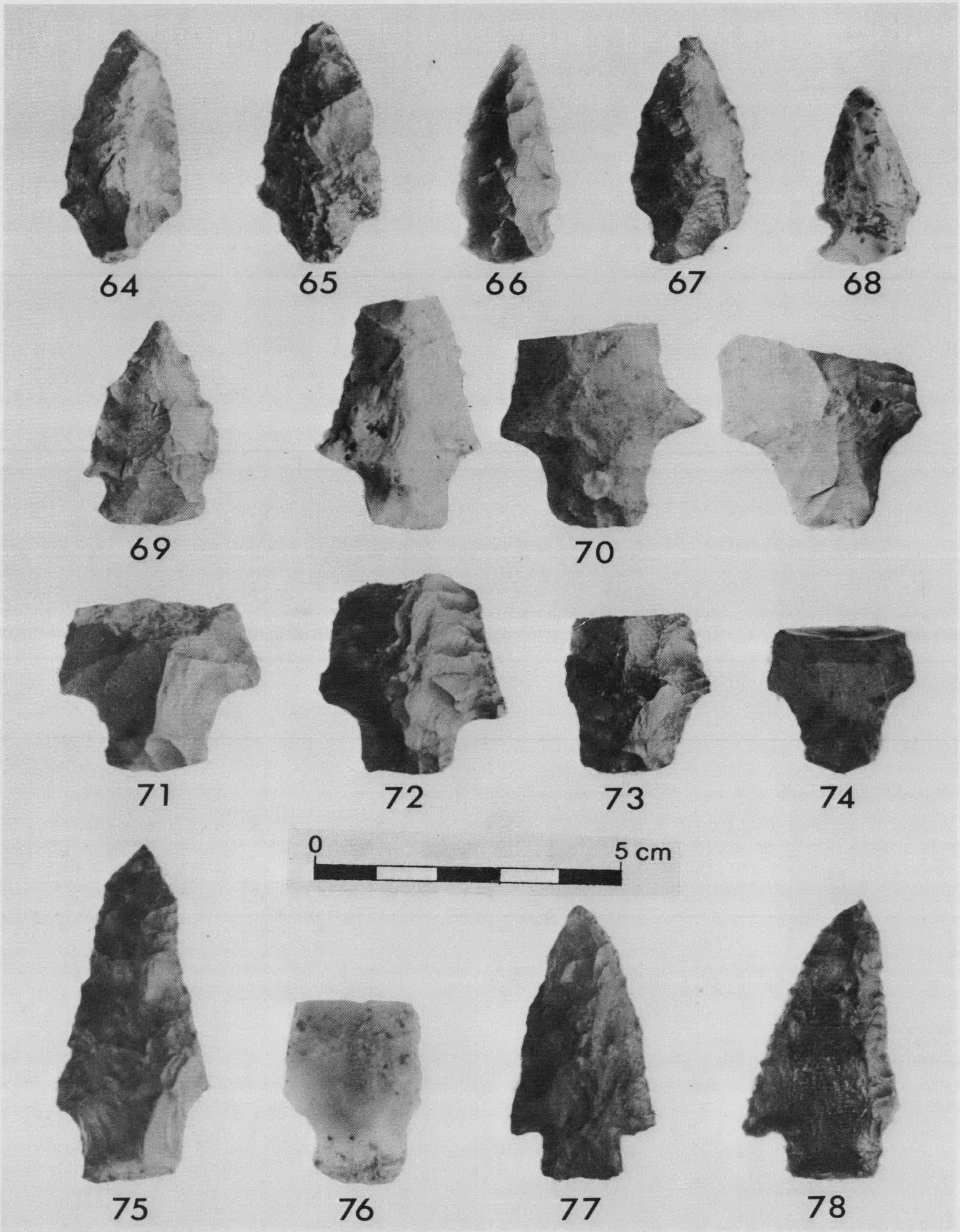


Plate 19. Projectile Point Classes 64-78.

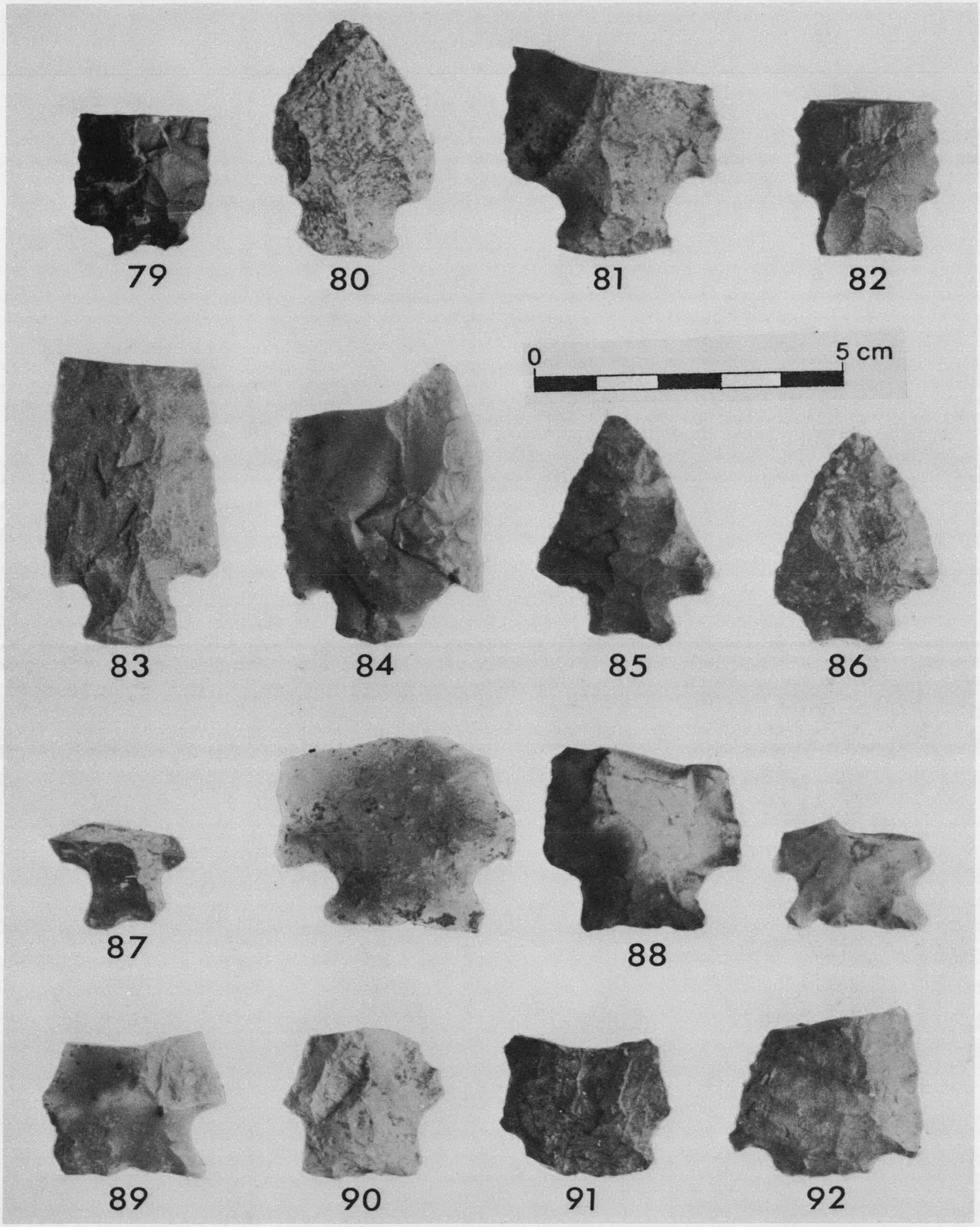


Plate 20. Projectile Point Classes 79-92.

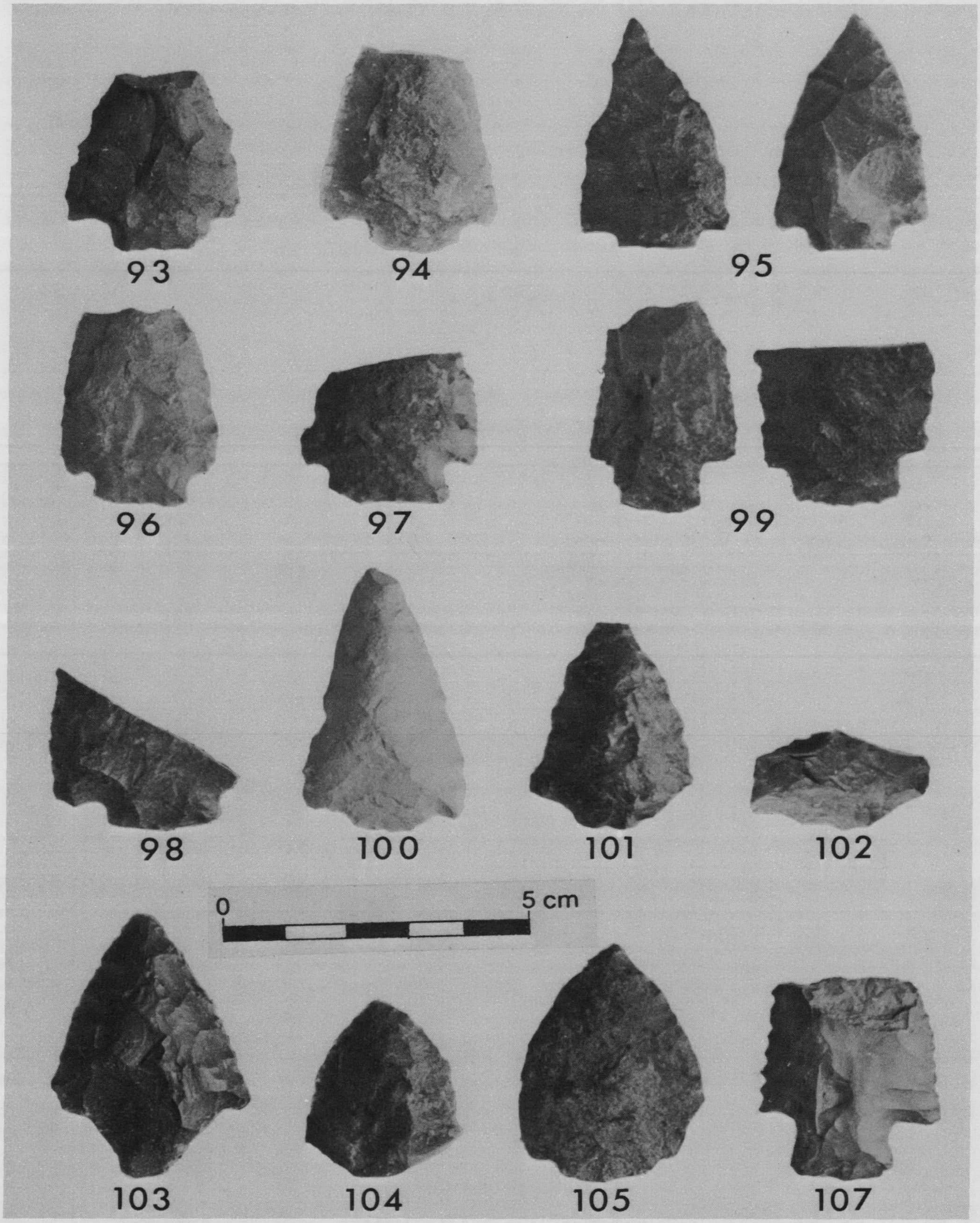


Plate 21. Projectile Point Classes 93-105; 107.

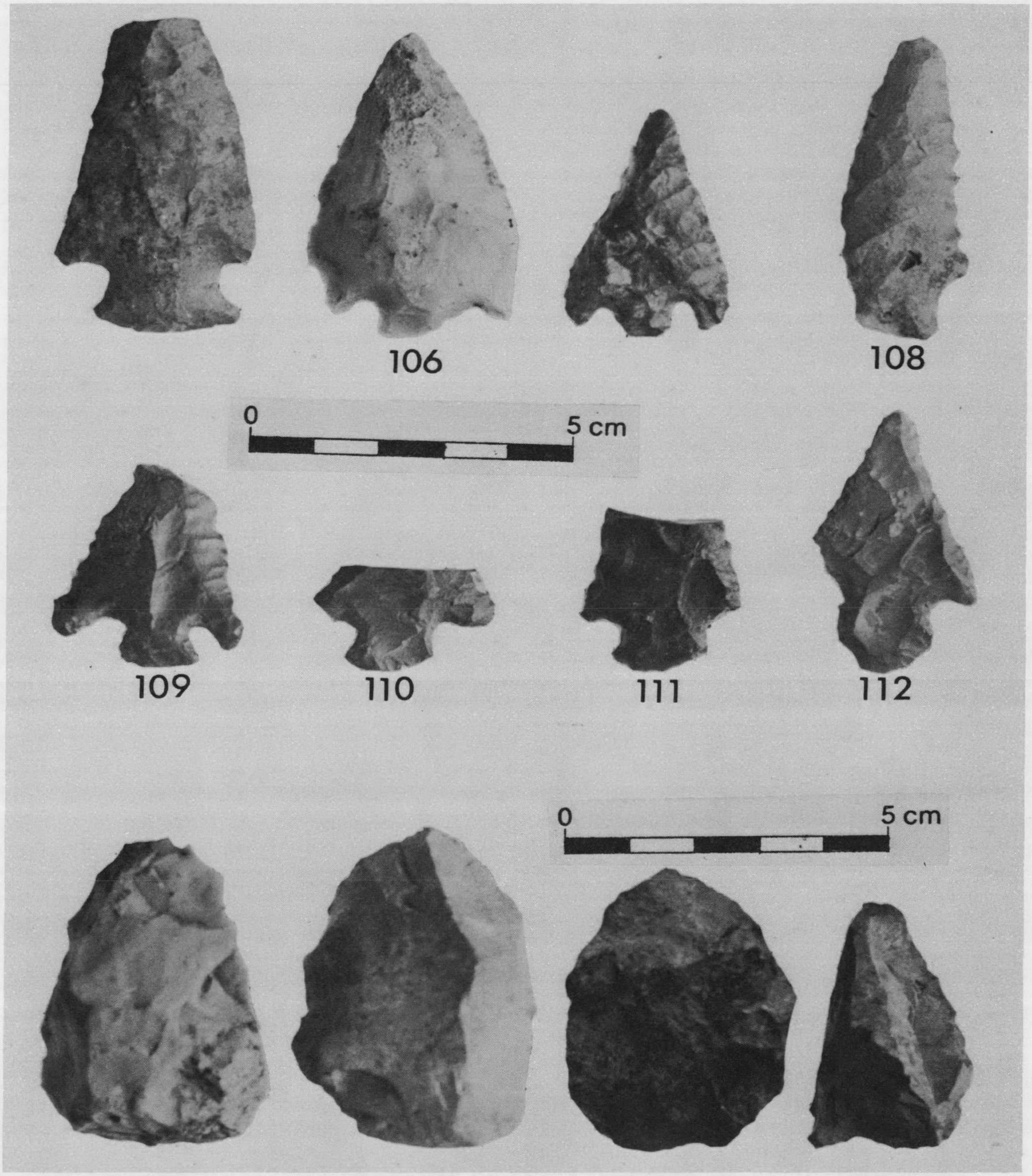


Plate 22. Projectile Point Classes 106; 108-112.

Plate 23. Preforms.

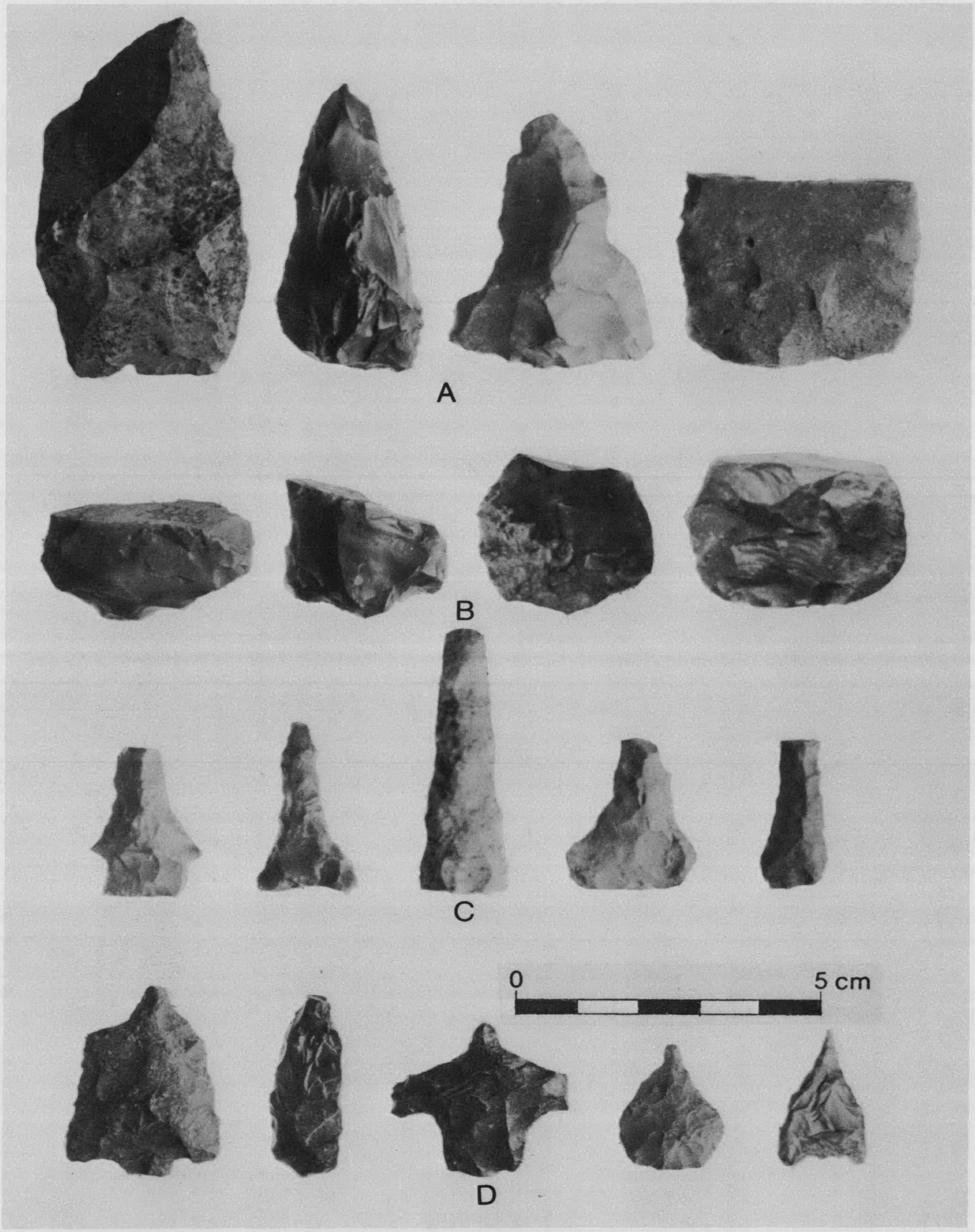


Plate 24. Chipped Stone Tools: A, Biface Knives; B, Wedges; C, Drills; D, Perforators.

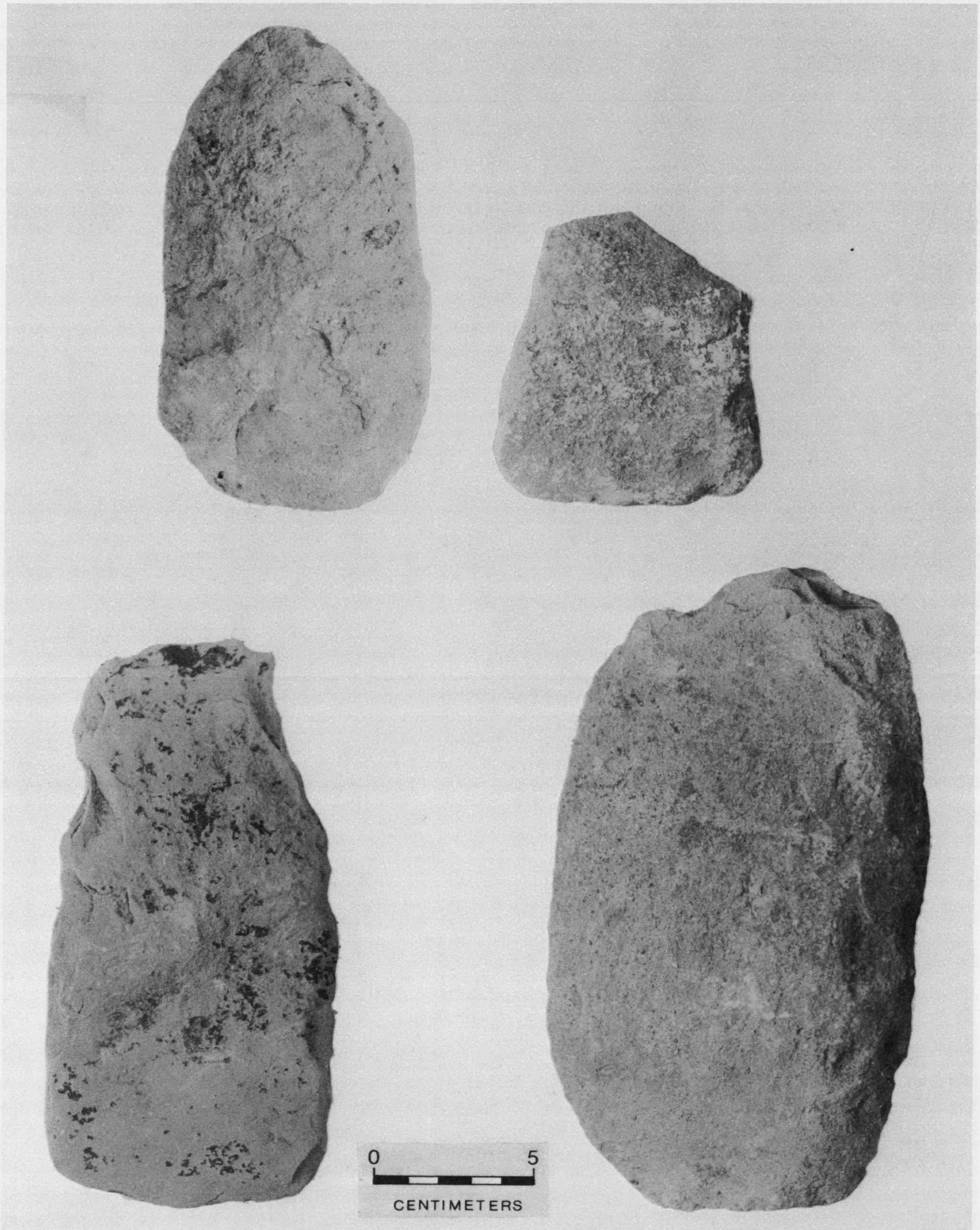


Plate 25. Digging Implements.

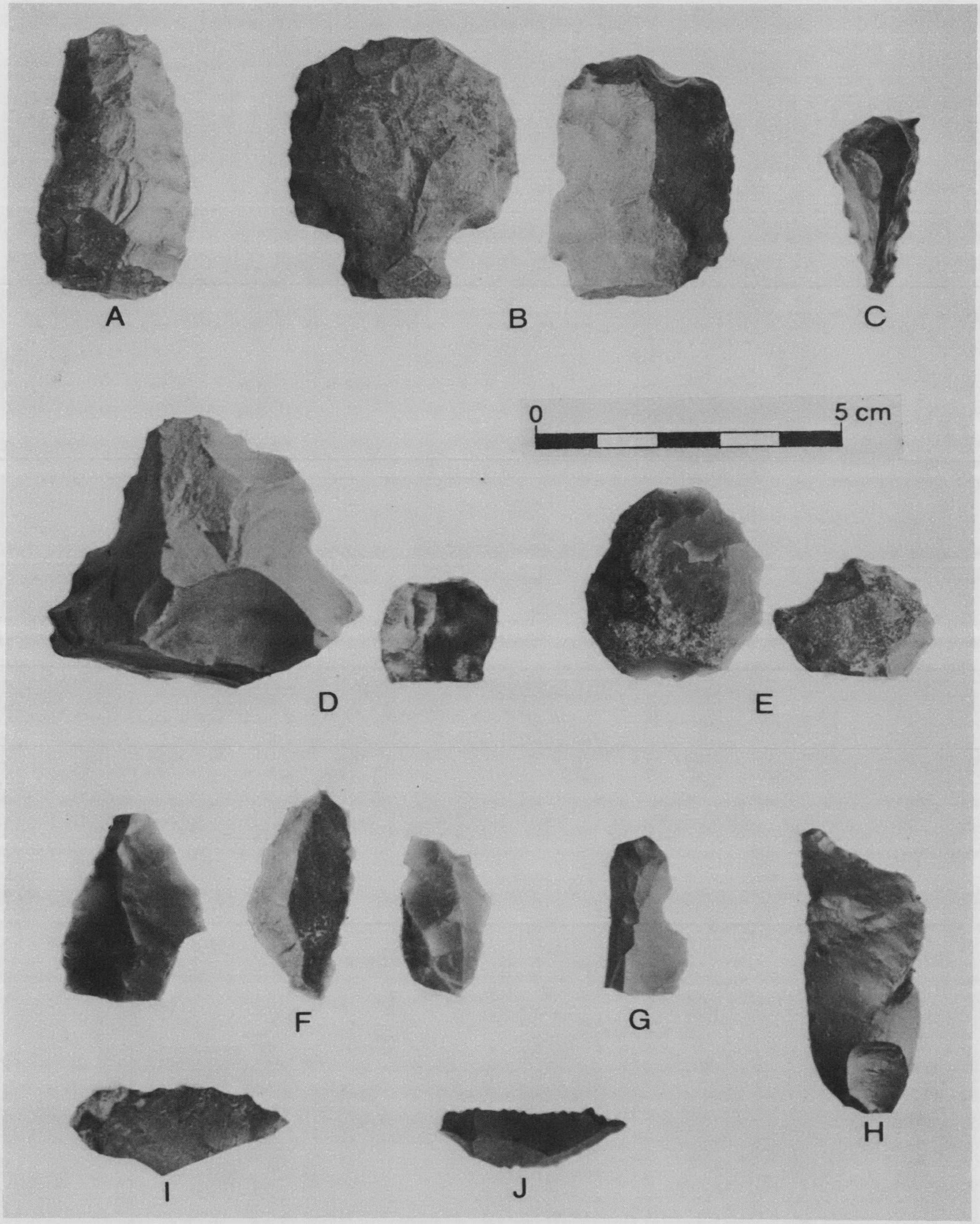


Plate 26. Chipped Stone Tools: A, Side Scraper on Biface; B, End Scrapers on Biface; C, Graver Spur on Biface; D, End Scrapers; E, Side-End Scrapers; F, Side Scrapers; G, Spokeshave; H, Reamer on Flake; I, Notched Flake; J, Serrated Flake.

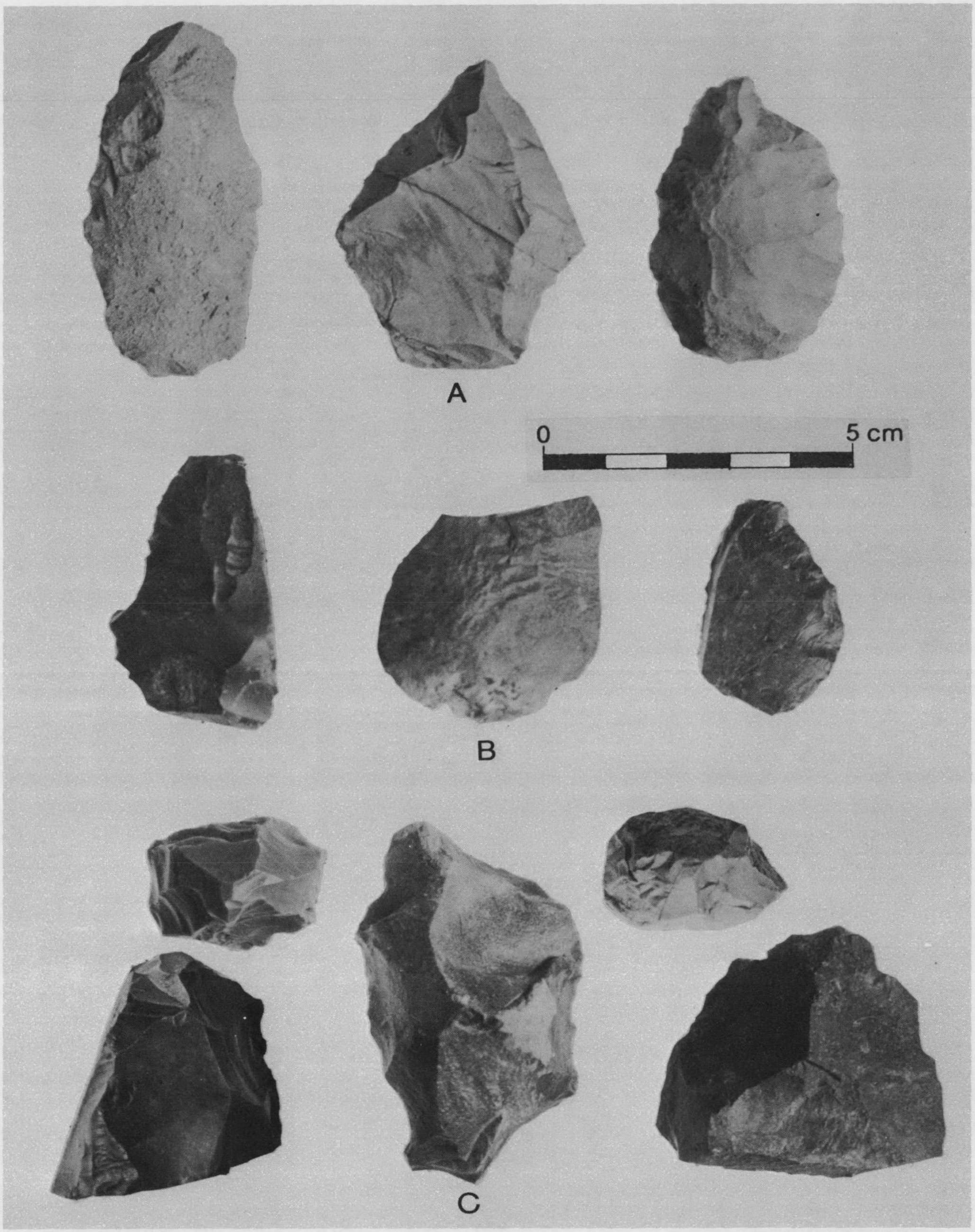


Plate 27. Chipped Stone Tools: A, Flake Knives; B, Backed Flake Knives; C, Cores.

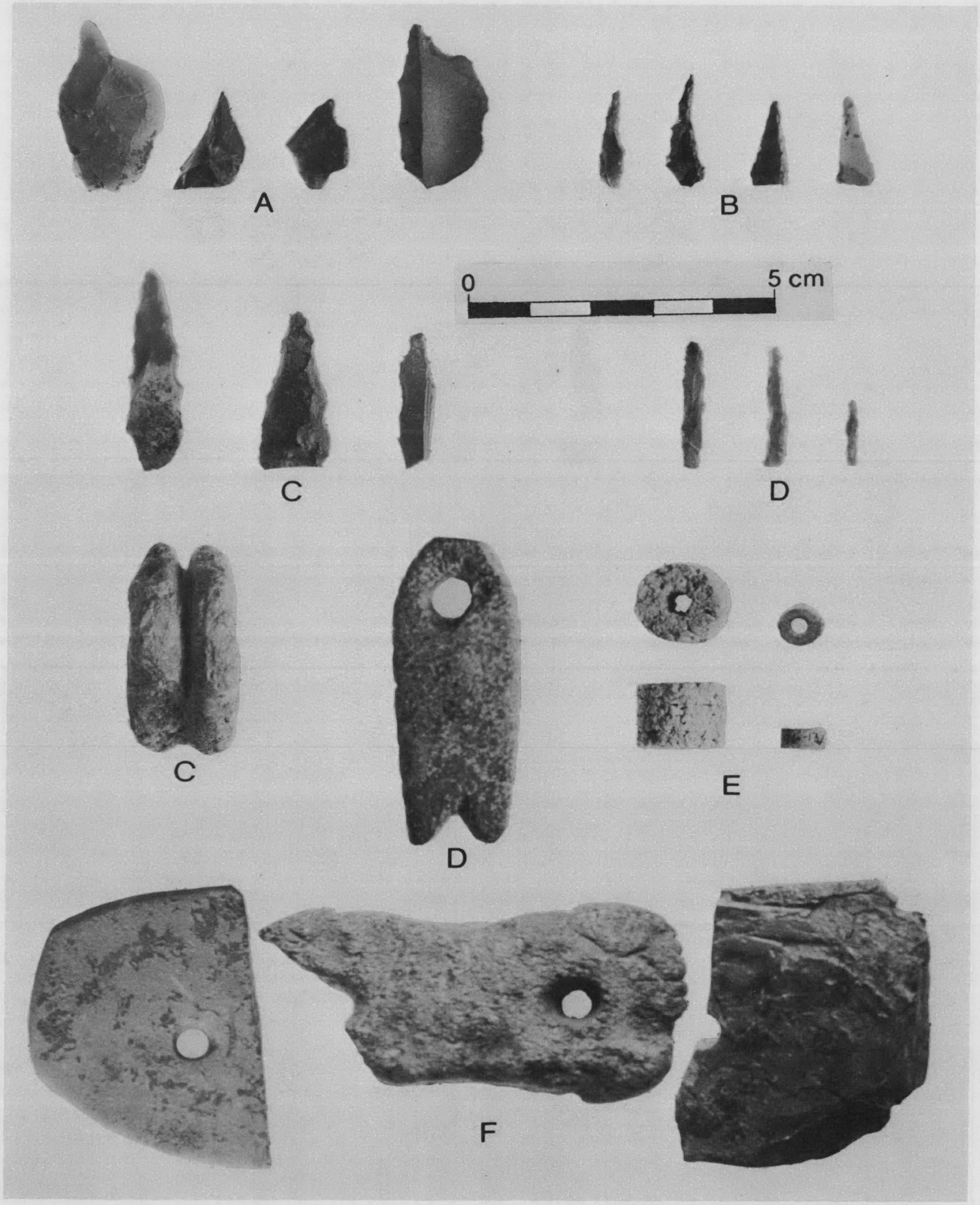


Plate 28. Chipped Stone Tools, Pecked and Ground Stone: A, Perforators on Flake; B, Microliths; C, Grooved Steatite Sherd; D, Pendant; E, Crinoid Beads, Top and Side Views; F, Gorgets.

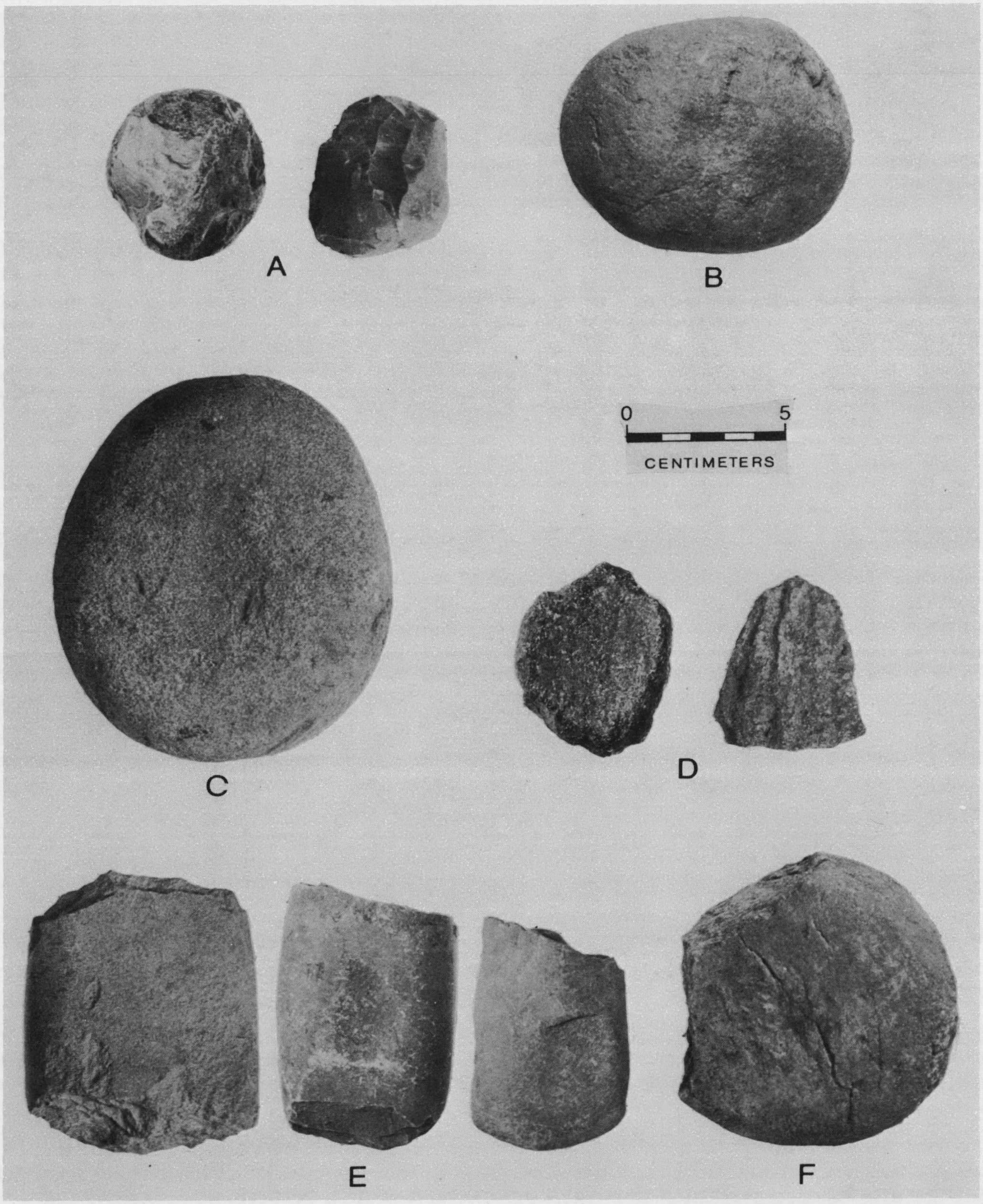


Plate 29. Pecked and Ground Stone: A, Hammerstones; B, Anvilstone; C, Muller-Anvilstone; D, Steatite Sherds; E, Celts; F, Discoidal.

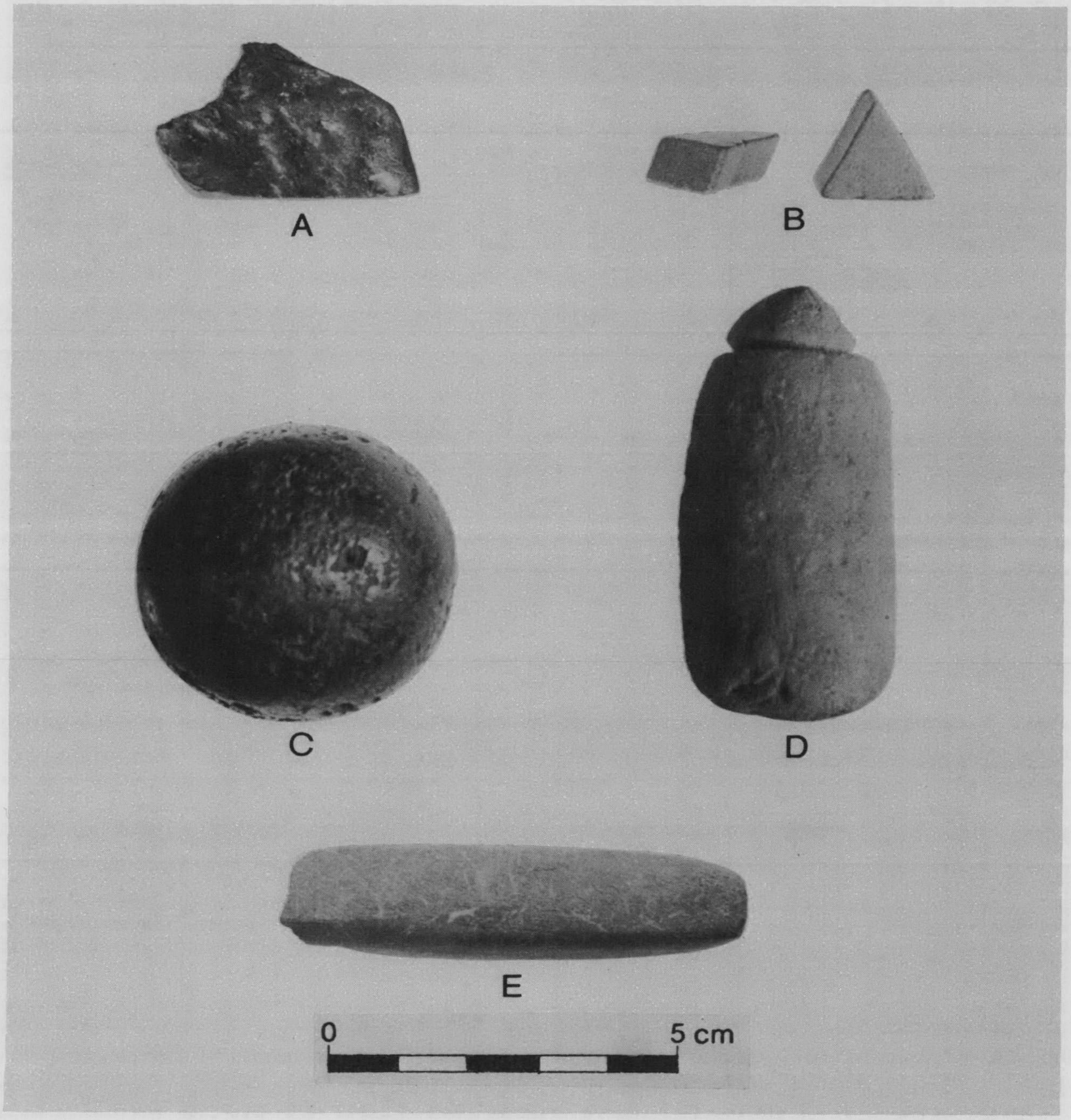


Plate 30. Pecked and Ground Stone: A, Ground Hematite; B, Prism, Top and Side Views; C, Hematite Dome; D, Plummet; E, Bar.

CHAPTER V

CERAMIC ARTIFACTS

With a few exceptions to be detailed later, the ceramic artifacts from Bellefonte consist of sherds of pottery vessels. The site was repeatedly occupied by pottery-making groups, and sherds of all five temper-based pottery wares normally found in the area were present. Most of the sherds found are in the size range of from about 1 to 5 cm. in diameter. Very few sherds were as large as 10 cm. in diameter, and these were generally confined to pit fill.

The pottery sherds from Bellefonte were sorted into groups on the basis of temper and surface treatment. Type names were then applied to the sherd groups when appropriate. Unless otherwise specified, the pottery type names are as given for the Guntersville Basin by Heimlich (1952). The distribution of ceramic artifacts is given in Tables 11 and 12. Sherds in plates are shown in actual size.

Shell Tempered

Plain Shell (Plate 31A). Almost all of the shell tempered pottery from Bellefonte is undecorated body sherds classified as Plain Shell. A few small rimsherds were from bowls with small flared rims. The only appendage found was a small handle attached to the lip of one sherd. The handle is broken and may have been either a strap or a rounded lug. A single node is present on the handle directly over the lip.

Langston Fabric Marked (Plate 31B). Two sherds typical of this type were found. They are the only recovered shell tempered sherds not having a plain surface.

Eroded Shell Tempered. Many shell tempered sherds were of such poor preservation that surface treatment was indeterminate.

Miscellaneous Shell Tempered (Plate 31C). One irregular broken object was found which could be a crude adorno figure or handle. On the other hand, it may simply be a kiln wad.

Clay-Grit Tempered

The term clay-grit in this report is used to refer to a variety of tempering agents, all with two common factors: they are all grit in the sense of being a crushed, manufactured product; and part of the temper is made of clay. The clay portion of the temper may be either crushed, fired clay (grog) or pounded dry clay. The other grit included under this type is generally limestone but includes some quartz, quartzite and even chert. The presence of these non-clay particles could be the result of making grog from sherds tempered with these materials. Small uncrushed nodules of manganese or iron oxide are also frequent inclusions. These may have been present in the clay.

Some of the clay-grits present are rounded pellets rather than angular fragments. This indicates the use of dry clay rather than grog in these instances. Dry clay fragments absorb water and become rounded during the mixing and forming stages of manufacture; grog fragments remain angular. There is, in general, more clay in the clay-grit tempered sherds from Bellefonte than has been noted for the entire basin. Heimlich states, "The clay-grit category in the Guntersville Basin includes mainly sherds containing a variety of pulverized rock with a scarcity of the sherd tempered variety found more commonly in the Pickwick Basin and in Arkansas and Mississippi" (1952:46). Clay is the major, if not the only, tempering agent in the Bellefonte clay-grit tempered sherds.

The distribution of clay-grit tempered sherds in Guntersville Basin is so meager it does not seem to represent a separate occupation of the area. At Bellefonte, therefore, the sample should be associated with the Late Woodland or the Mississippian occupation, or both. The strongest distributional evidence is for an association of shell and clay-grit tempered wares. The only features containing clay-grit tempered pottery were Mississippian, Features 16, 17, 18, and 19. Of course, this could be the result of the earlier material mixed in the feature fill containing the clay-grit sherds, but the sherds are much more concentrated in the feature fill than in the surrounding deposit. In fact, over half of all the clay-grit pottery came from these four features.

McKelvey Plain (Plate 31D). Most of the sherds in this type are small body sherds. Many of them may be from smooth areas of cord marked vessels. One rimsherd had a notched lip.

Mulberry Creek Cord Marked (Plate 31E). This is the majority clay-grit tempered type from Bellefonte. Clay, particularly grog, is the most frequent temper, and most sherds contain no other grit. Those that do usually contain limestone.

The surface treatment consists of closely spaced, overlapping cord impressions, some subsequently smoothed, some not. Two rimsherds were found, both flaring and having rounded - flattened lips. One has a smoothed exterior fold about 1 cm. wide.

Clay-grit Tempered Fabric Marked. Five sherds of this type were found. One has an impression of a twined fabric with warp threads and weft threads, both spaced about 4 mm. apart, giving the appearance of a net. Three other sherds have roughened surfaces without clear impressions. One is an excurvate rim with a broken lip.

Benson Punctated (Plate 31F). One small, thin sherd has a row of four punctations. The punctations are unusually small, about 1 mm. wide and 1 to 1.5 mm. deep.

Clay-Grit Tempered Incised. One sherd has two parallel incised lines.

Eroded Clay-grit Tempered. This category includes clay-grit tempered sherds of indeterminate surface treatment.

Miscellaneous Clay-grit Tempered. A ceramic bead was found in Cut 2 of Area B. The bead is a crude flattened cylinder 21.2 mm. long, 12.5 mm. wide and 10.9 mm. thick. One clay-grit tempered object may be a fragment of a noded handle of a kiln wad.

Limestone Tempered

Almost all of the Woodland period ceramics from Guntersville Basin are limestone tempered, and this is the majority ware from Bellefonte in both number and variety.

The undecorated limestone tempered ceramics show a variety of surface treatments. Some are smooth, polished or burnished; while others are roughened by rubbing, wiping, scraping or brushing. These surface treatments are traditionally divided into two pottery types, Mulberry Creek Plain and Flint River Brushed, and there is a general consensus that the percentage of brushed ceramics increases through time. However, there is some inconsistency in the separation between the two types. Some authors include all roughened surfaces in Flint River Brushed and reserve Mulberry Creek Plain for the smooth surfaces (Heimlich 1952). Others reserve Flint River Brushed for sherds exhibiting fine narrow incised lines and place the scraped sherds in the type Mulberry Creek Plain (Faulkner and Graham 1965, 1966a, 1966b). Another alternative has been to place the scraped ceramics into a third type. Graham (1964) has classified scraped limestone tempered sherds as Hamilton Plain and used a tripartite division which also included Mulberry Creek Plain and Flint River Brushed. This three-part classification method has been used in this report as being the best compromise since it permits an approximation of either of the two-part systems for comparative purposes. Also, the fact that Flint River Brushed is considered to be later in time in both two-part classifications suggests that a third separation may also have chronological significance, *i.e.* smooth, scraped, and brushed surfaces are successively later. The difficulties in using this system in classification are that all three types intergrade and that two arbitrary cut-off points are used instead of one. Also, one vessel could yield sherds of all three types.

Mulberry Creek Plain, Smooth (Plate 31H, 32A). This category includes the sherds with a smooth exterior. Some have tool marks present, but these are on the surface only and do not significantly alter the texture of the sherd. The vessel forms, rims and lips, are as have been described by Heimlich (1952).

Mulberry Creek Plain, Rough (Plate 32B). This second category of Mulberry Creek Plain includes the sherds with scraped exteriors. This type was called Hamilton Plain by Graham (1964) after Lewis and Kneberg (1946), but that name has not been used here because Lewis and Kneberg differentiate between Mulberry Creek Plain and Hamilton Plain: "However, the resemblance lies in the posts and surface finish rather than in other details" (1946:84). The vessel shapes for this category are like those for the smooth variety and were described by Heimlich (1952).

Two fitting rimsherds excavated from adjacent squares are unusual in that each possessed some appendage, apparently a lug. The lugs are about 5.5 cm. apart on the reconstructed rim. The rim is incurvate and suggests an open bowl form.

Flint River Brushed (Plate 32C, 33A). Flint River Brushed is limited here to limestone tempered sherds with a surface treatment characterized by the fine shallow incised lines typical of other brushed types. The result is that Flint River Brushed is a minority type in comparison with the two categories of Mulberry Creek Plain. No particular differences in vessel form were distinguished in the sherds of this type.

Flint River Cord Marked (Plate 33B). This was a minority type for the site with only eight sherds found. One is a portion of the shoulder of a globular vessel with a flaring rim.

Wright Check Stamped (Plate 33C). Check stamping was the most common stamped design on the site, and Wright Check Stamped is the most numerous limestone tempered stamped type. Most of the sample comes from Feature 21. Only body sherds, each completely stamped, were found. There was no indication on any of the sherds that the stamping was confined to a band on the upper part of the vessel as was the case at Russell Cave (J. Griffin 1974). On the other hand, the Bellefonte material included no stamped rims or bases to confirm that the stamping was not so confined.

Bluff Creek Simple Stamped (Plate 33D). Seven sherds of limestone tempered simple stamped pottery were found. Four were in Feature 21. One of these is from a flat based vessel with the represented portion of the vessel wall being straight and nearly vertical. On one body sherd from this feature and on one from the general excavations the stamping is confined to a band.

Pickwick Complicated Stamped (Plate 33E). Three sherds of this type, all possibly from the same vessel, were found in Feature 21. Following John Griffin's (1974) approach of separating Pickwick Complicated Stamped designs by motifs, the Bellefonte sherds have Swift Creek motifs.

Long Branch Fabric Marked (Plate 33F). This was the third most frequent type on the site. No basketry impressions or appendages as mentioned by Heimlich were found. Most of the rimsherds were straight to slightly incurvate or excurvate.

Most of the lips were rounded, but a few were flattened.

Cox Punctated (Plate 33G). Two small sherds show rows of circular punctations.

Limestone Tempered Incised (Plate 34A-B). Eight crudely incised limestone tempered incised sherds were found. Five are body sherds exhibiting parallel incised lines. One sherd is a rim with parallel vertical lines incised over a roughened surface. A second rimsherd has widely spaced vertical incised lines over a brushed surface. The final sherd, also a rim, has a notched lip and incised lines extending diagonally down the vessel from a group of four of the notches.

Limestone Tempered Zone Punctated (Plate 34C). One limestone tempered sherd has two parallel incised lines forming an arch approximately 13 mm. wide. One row of round punctations is centered between the lines.

Eroded Limestone Tempered. This category contains limestone tempered sherds of indeterminate surface treatment.

Miscellaneous Limestone Tempered (Plate 34D). The first item in this category is a perforated limestone tempered ceramic object with an ovoid cross section. Found in the pit fill of Burial 2, it could be part of a pipe stem or a large bead.

The second specimen is a large curved fragmentary object approximately 9 cm. in length and 3.5 cm. in diameter. This may be a large lug handle which was attached to a vessel at one end. Such handles are described and illustrated by Heimlich for limestone tempered pottery (1952:16, and Plate 6,F).

The final limestone tempered ceramic object is a slightly tapered cylinder. The diameter is about 15 mm., and the section remaining is 48 mm. long. The use of this object is unknown. It may be an accidentally fired coil fragment.

Quartz and/or Sand Tempered

The two major surface treatments under this temper group are plain and fabric marked. The temper in these sherds ranges from crushed quartz in a paste with little sand, to sand with very little quartz. Original sorting of these sherds attempted to differentiate between sand tempered, Benson Fabric Marked and O'Neal Plain (Heimlich 1952); and quartzite tempered, Watts Bar Plain and Watts Bar Fabric Marked (Lewis and Kneberg 1957).

The first attempted sorting criterion was the presence or absence of quartzite grossly larger than the sand and angular, not water-worn. However, only the smallest sandy paste sherds showed no quartz fragments, and the quartz was consistently not water-worn to a noticeable degree. Another potential sorting criterion was the type of quartz used. There is a strong tendency for the quartz in the sandy paste sherds to be clear, while in the non-sandy sherds with lots of quartz, the quartz is white; but there is some overlap and inconsistency. Ultimately the only workable method of separation was to divide the material into groups with a high percentage of quartz and groups with a high percentage of sand, with an indeterminate group in the middle. The other choice was to lump, which was done.

Quartz and Sand Tempered Plain (Plate 34E). The quartz tempered pottery in this category would be classed as Watts Bar Plain (Lewis and Kneberg 1957), but the sand tempered plain ware presents more of a problem. The 1957 description of the Watts Bar series includes some sand tempered sherds, but these may or may not be part of the Watts Bar series. Heimlich (1952) has used O'Neal Plain for the earlier plain sand tempered pottery in Guntersville Basin. There is some question, however, about the appropriateness of this. There are some differences between the description Heimlich has given for the material she called O'Neal Plain and the original description by Haag (1939). Haag notes the temper as having "well rounded grains" and under form, notes "...and all base fragments are flat with feet" (p. 6). Heimlich, on the other hand, describes the tempering as "predominately angular" and concerning form states that the characteristic shape is the bowl, most frequently flat based, with flaring or excurvate walls: "Tetrapodal supports... also occur" (1952:10-11).

Another cause for hesitation in the use of the name O'Neal Plain for the sand tempered plain pottery in Guntersville Basin is one of context. Haag's 1939 description lists the notched and noded rims for this type which associate it with the Alexander series; gradual restriction of usage has occurred so that most authors now use the name for the plain member of the Alexander ceramic series. Decorated sherds of the Alexander series are very rare in Guntersville Basin, and Heimlich does not note the presence of Alexander traits among her O'Neal Plain sample. Considering the unlikely possibility of an Alexander association for most of the Guntersville Basin material, the absence of Alexander material from Bellefonte, and the number of alternate possible sources, this author would not call any of the sand tempered plain sherds from the Bellefonte site O'Neal Plain. The Bellefonte sample consists of small body sherds only.

Quartz and Sand Tempered Fabric Marked (Plate 34F, 35G). The temper in this group is most often mixed, containing considerable amounts of fine sand and crushed quartz. The extremes of one temper over the other are less pronounced than in the plain category. The sherds with large amounts of quartz contain enough sand to produce the typical gritty surface of sand tempering, and sherds without much quartz are small and may be from sections of the vessel containing relatively little quartz. A single small straight rimsherd has a crudely flattened lip.

Quartz and Sand Tempered Simple Stamped (Plate 35A). Four simple stamped body sherds and one basal sherd with a podal support contain sand and quartz. This is the only support found on the site.

Kirby Complicated Stamped (Plate 35B). One small sand tempered sherd is stamped with a rectilinear complicated stamped design.

Sauty Check Stamped (Plate 35D). Five sand tempered check stamped sherds were found. On the basis of appearance, all could be from a single vessel. One is a flaring rimsherd with a thinned rounded lip.

Quartz and Sand Tempered Cord Marked (Plate 35F). This category contains a single small sherd.

Quartz Tempered Net Impressed (Plate 35E). One sherd had been impressed with a knotted net. The mesh is roughly square, about 5 to 6 mm. on a side.

Quartz and Sand Tempered Incised. One of the three sherds in this group could be called brushed. The others are crossed by a single incised line. The brushed and one incised example contain large amounts of quartz. The other contains mostly sand.

Eroded Quartz and Sand Tempered. This category contains all quartz and sand tempered sherds with an indeterminate surface treatment.

Sand Tempered Pipe (Plate 35C). One fragmentary perforated object was found which on the basis of size and shape is inferred to be a pipe stem. The fragment is 33.0 mm long and slightly flattened, tapering from 22.9 mm. to 21.5 mm. maximum diameter, and from 19.4 mm. to 18.6 mm. minimum diameter. The object is decorated on one of the two broader surfaces. The fragmentary decoration consists of three long and narrow concentric arches along the stem formed by rows of punctations. The temper consists of very fine micaceous sand.

Fiber Tempered

Wheeler Plain (Plate 35H). All of these sherds are fiber tempered body sherds with plain surfaces.

Eroded Fiber Tempered. This category contains fiber tempered sherds with an indeterminate surface treatment.

Miscellaneous

Mat or Basketry Impression. One piece of fired clay in the fill of Feature 17 shows the impression of a plaited mat or basket with a twilled weave. The vertical and horizontal splits are even in size, averaging about 3 mm.

Table 11. Ceramics from General Excavations.

Provenience	Plain Shell	Langston Fabric Marked	Eroded Shell Tempered	Subtotal	McKelvey Plain	Mulberry Creek Cord Marked	Clay-Grit Tempered Fabric Marked	Benson Punctated	Eroded Clay-Grit Tempered	Miscellaneous Clay-Grit Tempered	Subtotal	Mulberry Creek Plain, Smooth	Mulberry Creek Plain, Rough	Flint River Brushed	Flint River Cord Marked	Wright Check Stamped	Bluff Creek Simple Stamped	Long Branch Fabric Marked	Cox Punctated	Limestone Tempered Incised
Area A																				
Cut 1	9	-	6	15	1	5	1	-	1	-	8	499	711	36	-	-	-	9	-	-
Cut 2	7	-	1	8	-	2	-	-	-	-	2	373	494	32	2	3	1	58	-	-
Cut 3	2	-	4	6	3	5	-	1	-	1	10	128	143	11	1	1	-	103	-	-
Cut 4	-	-	-	-	-	-	-	-	-	-	-	17	18	-	-	-	-	41	-	-
Cut 5	-	-	-	-	-	-	-	-	-	-	-	5	3	-	-	-	-	1	-	-
Subtotal	18	-	11	29	4	12	1	1	-	1	20	1022	1369	79	3	4	1	212	-	-
Area B																				
Cut 1	62	-	40	102	2	4	2	-	1	-	9	1412	1398	135	2	3	1	253	2	2
Cut 2	20	1	6	27	1	-	2	-	-	-	3	539	465	31	-	-	-	179	-	-
Cut 3	1	-	-	1	-	-	-	-	-	-	-	21	45	-	1	-	-	29	-	-
Subtotal	83	1	46	130	3	4	4	-	1	-	12	1972	1908	166	3	3	1	461	2	2
Total	101	1	57	159	7	16	5	1	2	1	32	2994	3277	245	6	7	2	673	2	2

Table 11. Continued.

Provenience	Limestone Tempered Zone Punctated	Eroded Limestone Tempered	Miscellaneous Limestone Tempered	Subtotal	Quartz/Sand Tempered Plain	Quartz/Sand Tempered Fabric Marked	Quartz/Sand Tempered Simple Stamped	Kirby Complicated Stamped	Sauty Check Stamped	Quartz/Sand Tempered Cord Marked	Quartz Tempered Net Impressed	Quartz/Sand Tempered Incised	Eroded Quartz/ Sand Tempered	Sand Tempered Pipe	Subtotal	Wheeler Plain	Eroded Fiber Tempered	Subtotal	Total
Area A																			
Cut 1	-	464	-	1719	-	-	-	-	-	-	-	-	2	-	2	-	1	1	1745
Cut 2	1	486	-	1450	2	7	1	-	-	-	-	-	3	-	13	1	-	1	1474
Cut 3	-	235	2	624	3	11	-	-	-	-	-	-	1	-	15	-	-	-	655
Cut 4	-	55	-	131	-	-	-	-	-	-	-	-	1	-	1	-	-	-	132
Cut 5	-	10	-	19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19
Subtotal	1	1250	2	3943	5	18	1	-	-	-	-	-	7	-	31	1	1	2	4025
Area B																			
Cut 1	-	1005	-	4213	19	21	-	1	3	1	1	4	11	1	62	2	2	4	4390
Cut 2	-	454	-	1668	5	9	2	-	2	-	-	1	1	-	20	3	1	4	1722
Cut 3	-	13	-	109	-	-	-	-	-	-	-	-	-	-	-	-	-	-	110
Subtotal	-	1472	-	5990	24	30	2	1	5	1	1	5	12	1	82	5	3	8	6222
Total	1	2722	2	9933	29	48	3	1	5	1	1	5	19	1	113	6	4	10	10247

Table 12. Ceramics from Feature, Burial and Post Hole Fill.

Provenience	Plain Shell	Langston Fabric Marked	Eroded Shell Tempered	Miscellaneous Shell Tempered	Subtotal	McKelvey Plain	Mulberry Creek Cord Marked	Clay-Grit Tempered Incised	Eroded Clay-Grit Tempered	Subtotal	Mulberry Creek Plain, Smooth	Mulberry Creek Plain, Rough	Flint River Brushed	Flint River Cord Marked	Wright Check Stamped	Bluff Creek Simple Stamped	Pickwick Complicated Stamped	Long Branch Fabric Marked	Limestone Tempered Incised	Eroded Limestone Tempered	Miscellaneous Limestone Tempered	Subtotal	Quartz/Sand Tempered Plain	Quartz/Sand Tempered Fabric Marked	Quartz/Sand Tempered Simple Stamped	Quartz Tempered Net Impressed	Eroded Quartz/Sand Tempered	Subtotal	Miscellaneous	Total
Feature 1	-	-	-	-	-	-	-	-	-	-	11	4	-	-	-	-	-	6	-	5	-	26	-	4	-	-	-	4	-	30
Feature 2	-	-	-	-	-	-	-	-	-	-	30	4	-	-	2	-	-	41	-	28	-	106	-	3	-	-	-	3	-	109
Feature 3	-	-	-	-	-	-	-	-	-	-	14	3	-	-	-	-	-	5	-	12	-	34	-	2	-	-	-	2	-	36
Feature 4	-	-	-	-	-	-	-	-	-	-	9	-	-	-	-	-	-	3	-	7	-	19	-	-	-	-	-	-	-	19
Feature 6	-	-	-	-	-	-	-	-	-	-	13	-	6	-	-	-	-	13	-	16	-	48	-	-	-	-	-	-	-	48
Feature 7	-	-	-	-	-	-	-	-	-	-	19	12	7	-	-	-	-	5	1	39	1	83	-	-	-	-	-	-	-	83
Feature 8	1	-	-	-	1	-	-	-	-	-	19	6	2	-	-	-	-	93	-	53	-	173	2	3	-	-	1	6	-	180
Feature 10	-	-	-	-	-	-	-	-	-	-	4	3	-	-	-	-	-	4	-	-	-	11	-	-	-	-	-	-	-	11
Feature 11	-	-	-	-	-	-	-	-	-	-	2	6	-	-	-	-	-	-	-	1	-	9	-	-	-	-	-	-	-	9
Feature 12	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	2	-	3	-	8	-	-	-	-	-	-	-	8
Feature 13	-	-	-	-	-	-	-	-	-	-	24	24	19	-	-	-	-	-	-	34	-	101	-	-	-	-	-	-	-	101
Feature 14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	-	6	-	-	-	-	-	-	-	6
Feature 15	-	-	-	-	-	-	-	-	-	-	2	2	-	-	-	-	-	-	-	4	-	8	-	-	-	-	-	-	-	8
Feature 16	20	-	10	1	31	8	-	-	-	8	95	57	17	2	1	-	-	9	-	224	-	405	-	-	-	-	-	-	-	444
Feature 17	27	-	32	-	59	-	9	1	1	11	402	44	53	-	-	-	-	27	4	679	-	1209	1	1	1	-	1	4	1	1284
Feature 18	4	-	6	-	10	5	3	-	-	8	115	24	-	-	-	-	-	3	-	144	-	286	-	-	-	1	2	3	-	307
Feature 19	18	-	17	-	35	2	8	-	-	10	201	33	34	-	-	-	-	5	-	464	-	737	-	-	-	-	-	-	-	782
Feature 20	-	-	-	-	-	-	-	-	-	-	37	2	-	-	-	-	-	10	-	91	-	140	-	-	-	-	-	-	-	140
Feature 21	-	-	-	-	-	-	-	-	-	-	653	13	3	-	13	4	3	238	-	612	-	1539	1	1	-	-	1	3	-	1542
Feature 22	-	-	-	-	-	-	-	-	-	-	66	85	38	-	-	-	-	1	-	115	-	305	-	-	-	-	-	-	-	305
Subtotal	70	-	65	1	136	15	20	1	1	37	1716	325	179	2	16	4	3	465	5	2537	1	5253	4	14	1	1	5	25	-	5452
Burial 1	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	15	-	5	-	21	-	-	-	-	1	1	-	22
Burial 2	-	-	-	-	-	-	-	-	-	-	48	7	1	-	1	-	-	44	-	54	1	156	-	6	-	-	-	6	-	162
Burial 3	-	-	-	-	-	-	-	-	-	-	8	2	-	-	-	-	-	4	-	13	-	27	-	-	-	-	-	-	-	27
Burial 4	-	-	-	-	-	-	-	-	-	-	2	4	-	-	-	-	-	3	-	6	-	15	-	-	-	-	-	-	-	15
Burial 5	-	-	-	-	-	-	-	-	-	-	16	10	-	-	-	-	-	4	-	28	-	58	-	-	1	-	-	1	-	59
Burial 6	-	-	1	-	1	-	-	-	-	-	164	182	26	-	2	1	-	22	-	340	-	737	-	-	-	-	-	-	-	738
Burial 7	1	-	-	-	1	-	-	-	-	-	120	105	15	-	-	-	-	7	-	237	-	484	-	1	-	-	-	1	-	486
Burial 8	2	-	-	-	2	-	-	-	-	-	48	39	3	-	-	-	-	2	1	66	-	159	-	-	-	-	-	-	-	161
Burial 9	3	1	-	-	4	-	-	-	-	-	36	58	3	-	-	-	-	3	-	47	-	147	-	-	-	-	1	1	-	152
Subtotal	6	1	1	-	8	-	-	-	-	-	443	407	48	-	3	1	-	104	1	796	1	1804	-	7	1	-	2	10	-	1822
Post Hole 16	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	12	-	15	-	-	-	-	-	-	-	15
Subtotal	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	12	-	15	-	-	-	-	-	-	-	15
Total	76	1	66	1	144	15	20	1	1	37	2159	735	227	2	19	5	3	569	6	3345	2	7072	4	21	2	1	7	35	1	7289

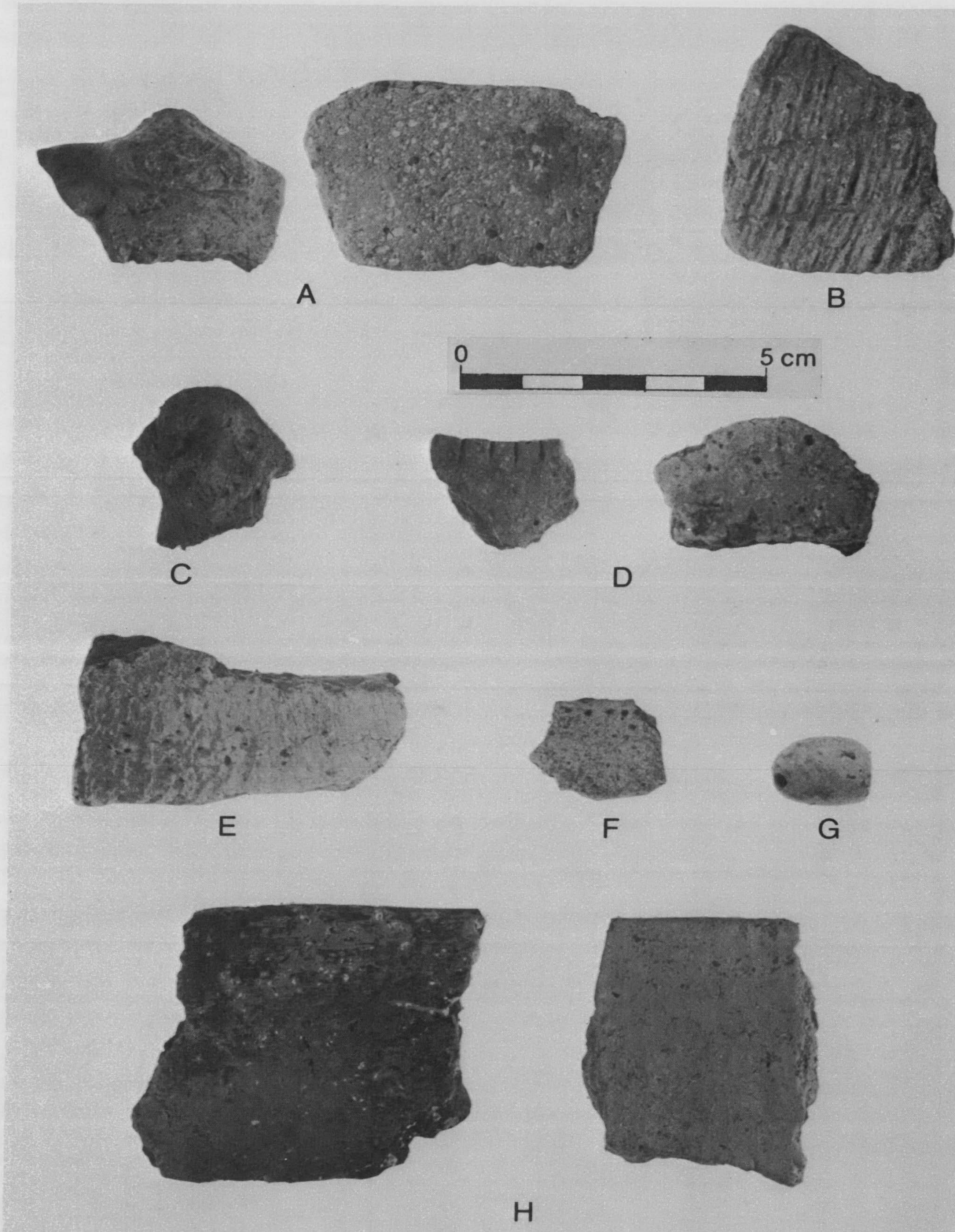


Plate 31. Ceramics: A, Plain Shell; B, Lankston Fabric Marked; C, Miscellaneous Shell Tempered; D, McKelvey Plain; E, Mulberry Creek Cord Marked; F, Benson Punctated; G, Clay-Grit Tempered Bead; H, Mulberry Creek Plain, Smooth, rims.

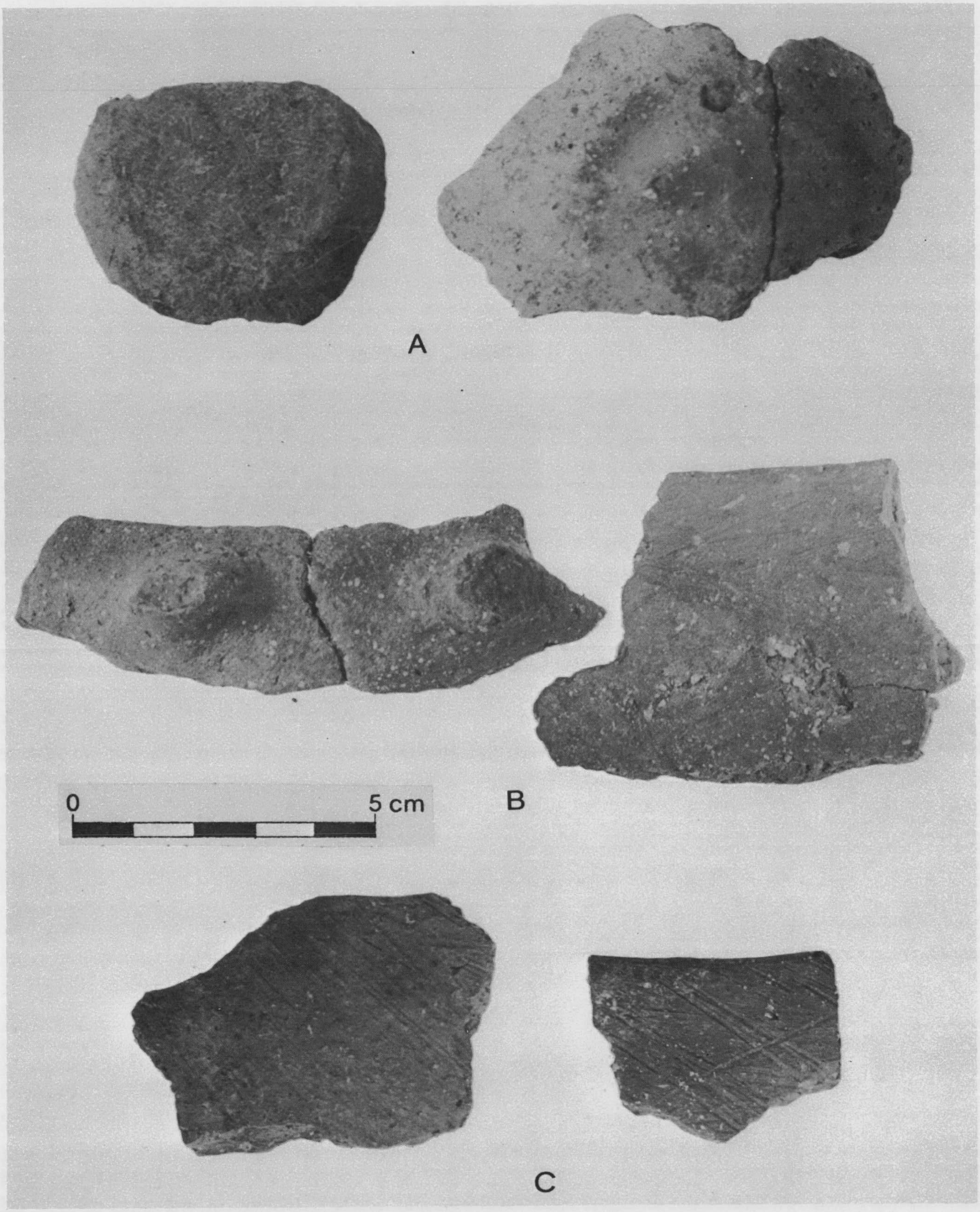


Plate 32. Ceramics: A, Mulberry Creek Plain, Smooth, bases; B, Mulberry Creek Plain, Rough, rims; C, Flint River Brushed, rims.

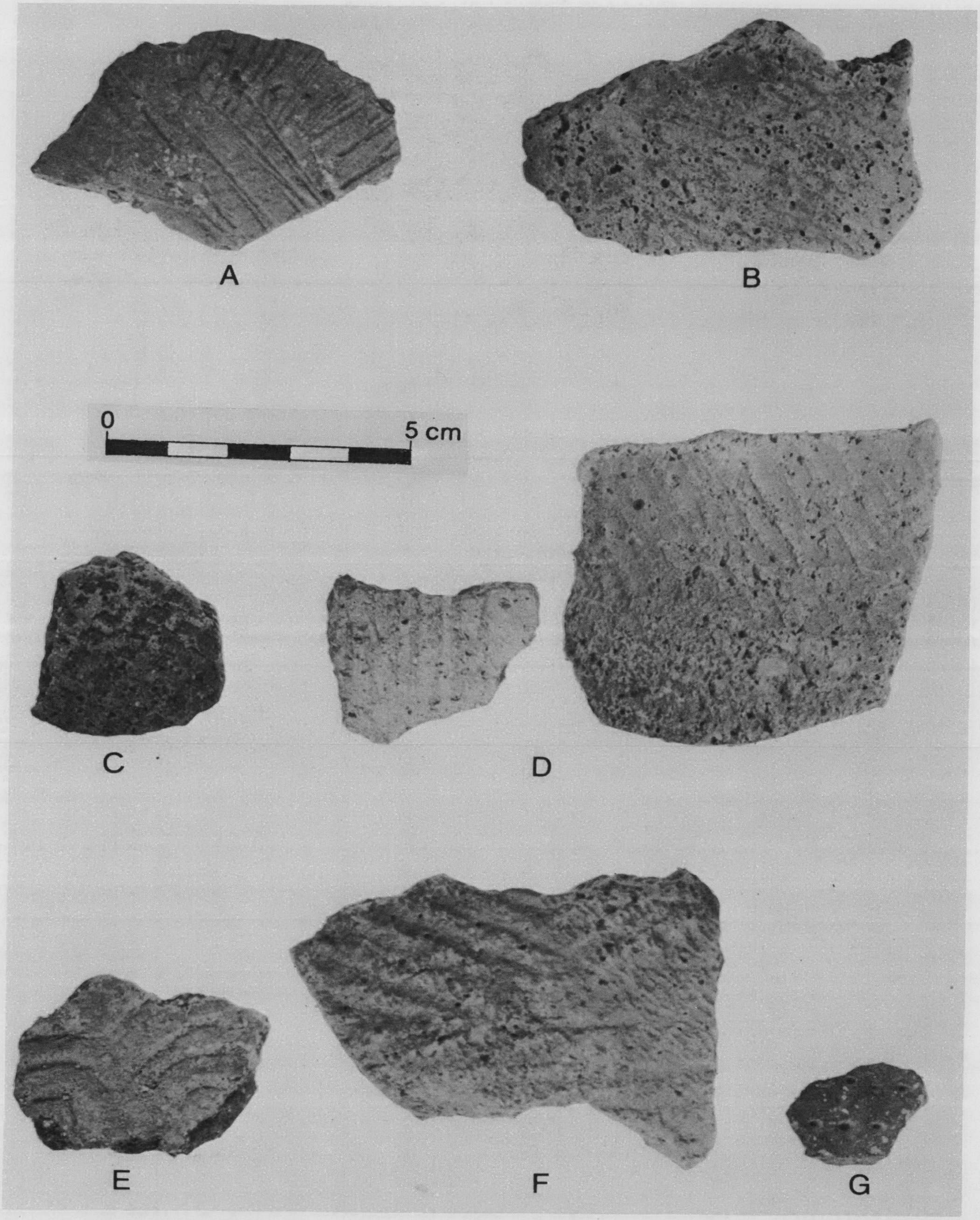


Plate 33. Ceramics: A, Flint River Brushed, base; B, Flint River Cord Marked; C, Wright Check Stamped; D, Bluff Creek Simple Stamped; E, Pickwick Complicated Stamped; F, Longbranch Fabric Marked; G, Cox Punctated.

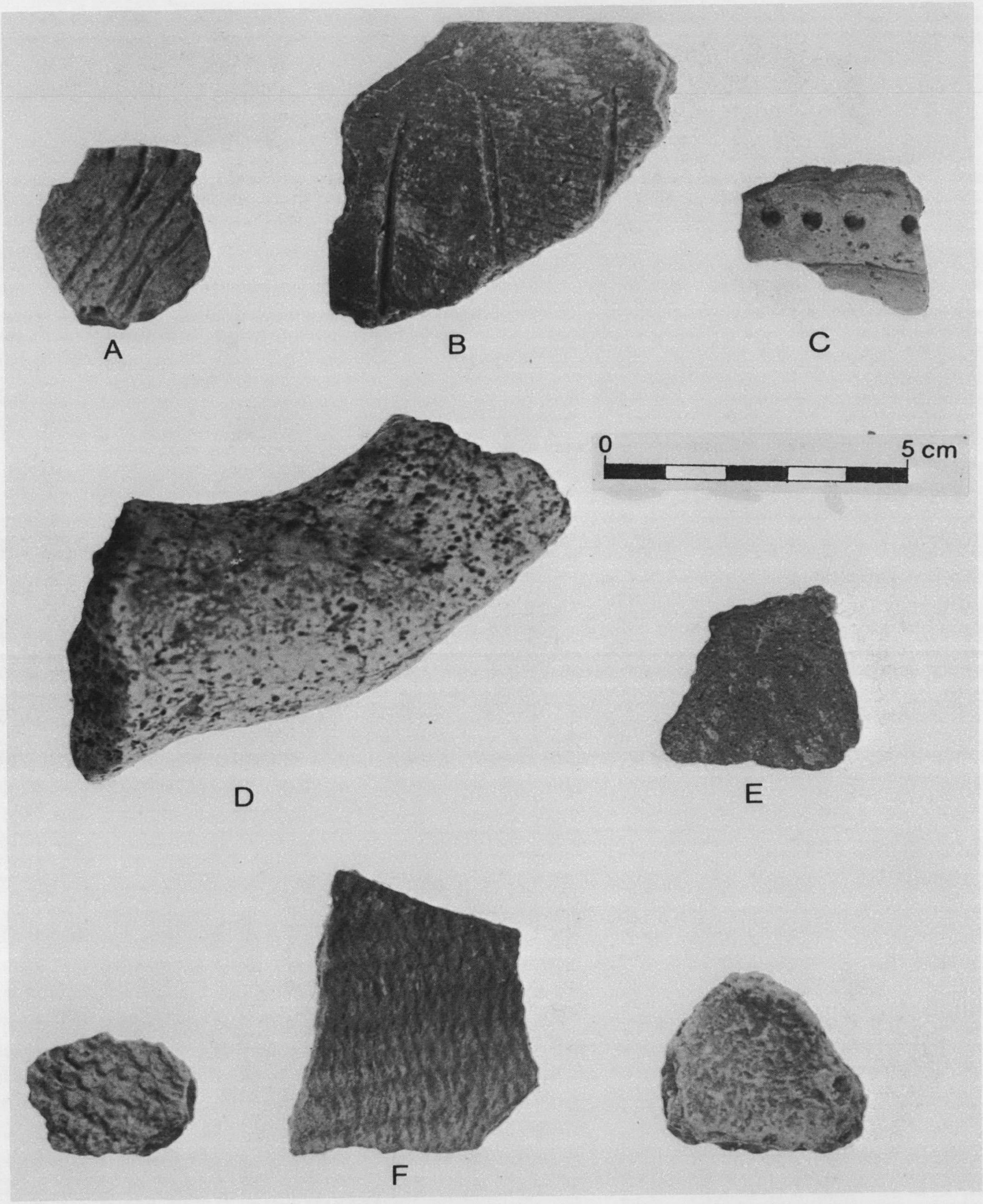


Plate 34. Ceramics: A, Limestone Tempered Incised; B, Limestone Tempered Incised Over Brushed; C, Limestone Tempered Zone Punctated; D, Limestone Tempered, Lug Handle?; E, Quartz/Sand Tempered Plain; F, Quartz/Sand Tempered Fabric Marked.

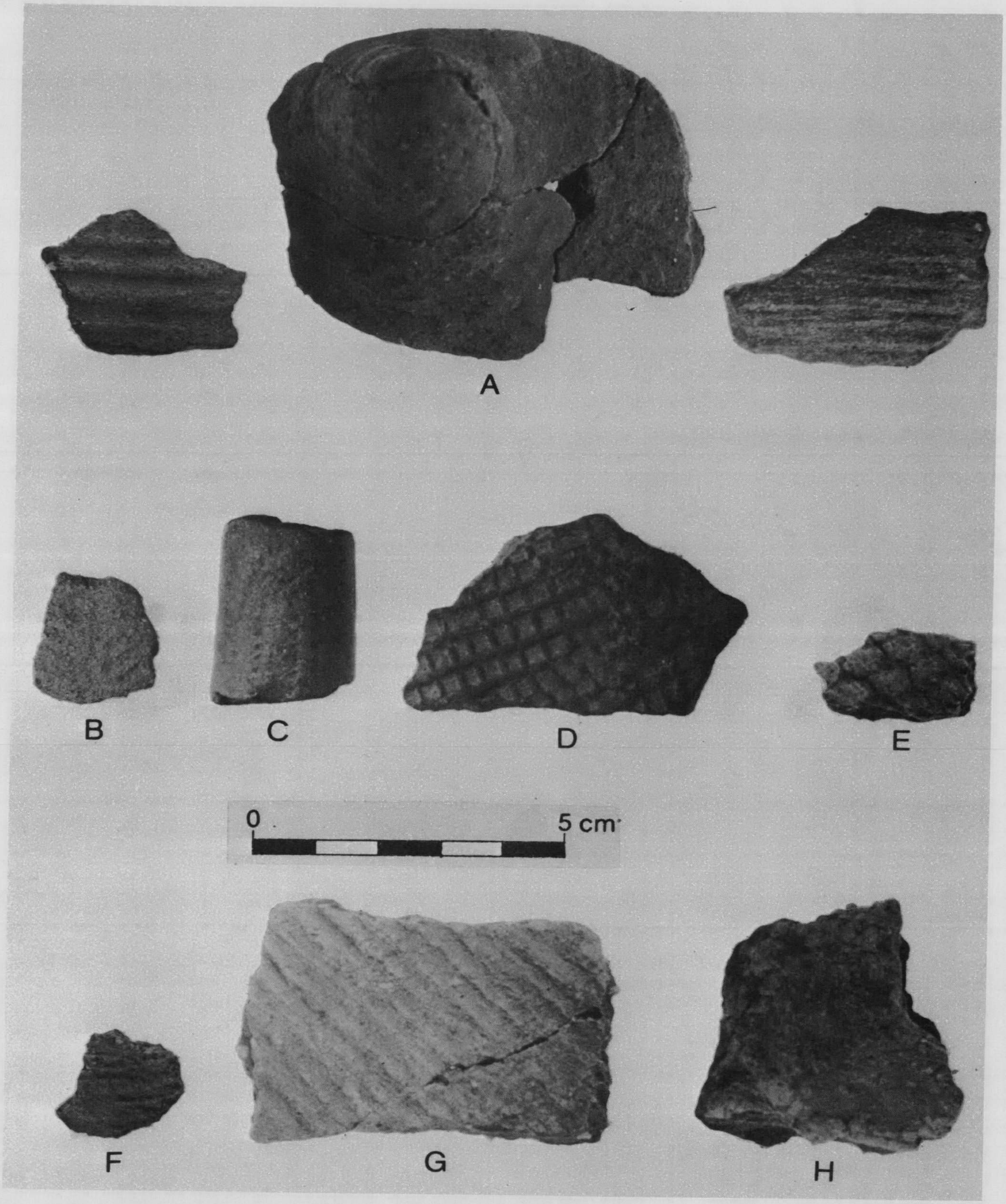


Plate 35. Ceramics: A, Quartz/Sand Tempered Simple Stamped; B, Kirby Complicated Stamped; C, Sand Tempered Pipe; D, Sauty Check Stamped; E, Quartz Tempered Net Impressed; F, Quartz/Sand Tempered Cord Marked; G, Quartz/Sand Tempered Fabric Marked; H, Wheeler Plain.

CHAPTER VI

FAUNAL REMAINS, BONE AND SHELL ARTIFACTS

Cailup B. Curren, Jr.; Betsy Reitz and James Walden

Vertebrate Fauna

Excavated materials from the Bellefonte site include approximately 88,511 fragments (6,281.8 grams) of vertebrate animal remains. Zooarchaeological analysis of this bone revealed the presence of thirty-nine species (Tables 13-14) of animals. As a class the mammals were present at the site most frequently (60%, Table 15). The next most frequent class present was the reptiles, followed respectively by the fishes, amphibians and birds.

The negative evidence of bird species is rather interesting. This area of the Tennessee Valley today is not located on any major flyway for migrating waterfowl. This could also have been the case during the prehistoric occupancy of the Bellefonte site. Occasional waterfowl may have frequented the area around the site and thus been available on a limited scale to the aboriginal inhabitants. A single occurrence of the blue-winged teal *(Anas discors)* at the site attests to the occasional presence of edible waterfowl in the area. Other sites in North America have produced abundant remains of waterfowl, which indicates palatability to the aboriginal populace. The presence of the wild turkey is not surprising based on their large numbers in other zooarchaeological reports, but the presence on this prehistoric site of the domestic chicken is a bit shocking until one considers the high probability that the bones of this species represent a very recent chicken box lunch.

Boney fishes such as the bowfin, herring-shad, freshwater catfish, and freshwater drum were eaten by the inhabitants of the Bellefonte site. Two objects excavated at Bellefonte indicate methods of fishing; a bone fishhook, and a net sinker. A third object which bears mention is a net-impressed pottery sherd excavated from the site. At least this indicates the knowledge of net construction. That this is indicative of fishing net usage is something else altogether.

Of the reptiles and amphibians present, a variety of frogs, toads, salamanders, turtles, and snakes appeared. It is widely accepted that the turtle served as a periodic food and ornament source for the American Indian, but an old question arises with the presence of frogs, toads, salamanders, and snakes at the site. Did the people eat these species or were they "natural" occurrences on the site? Although there were butchering marks present on some of the turtle bone, none were observed on the aforementioned frogs, toads, salamanders, or snakes. There is ethnographical evidence for the pro and con of ingestion of these animals, but at this point we would have to say only that the species were present at the Bellefonte site and they may have been eaten by the prehistoric inhabitants.

This brings us to the mammals and the most frequent species present at the site, the white-tail deer *(Odocoileus virginianus)*. Based on this analysis the deer provided most of the meat for the people of this site.

An environmental reconstruction and a vertebrate procurement system at prehistoric Bellefonte can be summarized based on the species present in the refuse at the site. The people were living and hunting in both the riverine areas directly adjacent to the Tennessee River and the uplands to the north. Judging by the species present, hunting and fishing may have been conducted by boat within the riverine area.

Butchering marks were noted on some of the bone of species such as the deer, fox, turtle, and turkey. The marks noted on the deer were primarily for removing the limbs of the animal and most frequently the hind limbs. Butchering marks appeared on turtle carapace and plastron, along with an example of the removal of the lower jaw from the grey fox. Many of these marks on the longbones were due to altering the bone for tool preparation rather than to butchering for food preparation.

Detailed zooarchaeological analysis of this site based on cultural stratigraphy is not possible at this time because the site was stratified but shallow, so that the separations are not clearly drawn. Thus the tabulation of artifacts by cut shows the proper sequence of pottery types and lithics, but there is considerable overlap in the sequence. Most features are pits refilled with midden containing earlier material. For example, the most definite Mississippian pits on the site, Features 17, 18, and 19, overlapping pits, also contain over 2000 sherds of Woodland pottery mixed in the fill. Therefore, this zooarchaeological analysis can be temporally delineated only as a collection of animal bone refuse from the Archaic through the Mississippian periods. Feature 21 may be the only exception to this vagueness; both the artifacts and radiocarbon date indicate a Middle Woodland Copena context. For this reason separate tables for Feature 21 are provided in this report.

The recovery technique used during the excavations at Bellefonte should be mentioned here in relation to the faunal remains. The detailed description of the excavation procedures is presented in another section of this report and does not need to be repeated here. Basically, the general excavation was by trowel recovery only; the features and burials were waterscreened through 1/4" and 3/32" mesh, and a 50cm^2 column within each excavation square was waterscreened through 1/4" and 3/32" mesh. The question that exists here is one of amount of knowledge gained in relation to effort and time expended. In other words, zooarchaeologically at which point did the information obtained cease to justify the effort expended? Was it necessary to waterscreen through 1/4" and 3/32" mesh? Was it necessary to waterscreen all features and burials along with column samples from all the excavation squares?

The mass of small bone that was recovered from the excavation was considerable (2,259.6 grams), and identification was time consuming (approximately 300 hours). At what point in this period would efforts have been better spent on other phases of the analysis such as interpretation? These are obviously extremely difficult questions to answer. However, general recommendations can be made following this zooarchaeological effort. Waterscreening through the 1/4" and 3/32" mesh certainly increased the number of species considerably (Table 18). Without this technique many of the smaller species most likely would not have been detected. It is suggested, though, that columns with features and burials be waterscreened with fine mesh rather than entire features and that every third square with the general excavations be column-sampled rather than every square. Some may argue for total recovery of materials, but in the great majority of field situations this is impossible. It is true that by reducing the amount of material fine screened that the unique or unusual animal may be missed, but this is one of those frustrations that must be dealt with when time and funds are limited. It should be noted here, in all fairness to the excavation team, that one of the objects of using these techniques was to test their validity in the laboratory.

Gastropoda (Snails)

Land snails (3 genera, 3 species) were present in small numbers at the Bellefonte site (Table 19). In some archaeological reports based on a few specimens, it has been suggested that the land snail served as food for the aboriginal populations. This is not thought to be the case at Bellefonte. The presence of the land snails at this and probably other shell middens can be explained as a natural phenomenon. Shell-making snails require lime and are attracted by anything containing it — not only limestone rock, but old mussel or oyster shell heaps as well. The Bellefonte shell midden fits the bill for this situation.

The aquatic snails were much more numerous at Bellefonte than were the land snails. The large number of *Campeloma* sp. at the site may well indicate a concentrated effort at harvesting aquatic snails in the marginal, slower moving mud bottom areas of the Tennessee River. Other species of aquatic snails present at Bellefonte *(Lithasia verrulosa, Anculosa praerose, Io fluvialis)* indicate harvesting at river shoals near the site. However, the fewer numbers of them present may through negative evidence suggest more intensive harvesting of the marginal waters of the river. It is stressed here that all the aquatic snails present in the midden at the site may not have been transported there by Indians. Some of the snails may have established themselves there at times of prolonged flooding of the Tennessee River. We know through the historic record that prior to dam construction along the river the site was periodically flooded. It is conceivable that some of the snails may also have been washed in during these flood times.

Pelecypoda (Mussels)

At Bellefonte, 2,112 individuals were identified, with 39 species noted (Table 20). While a total Tennessee River mussel assemblage was not observed in the midden, the species present do not indicate an environment any different from that in the area prior to the construction of dams on the river. The mollusca in general (snails and mussels) point to a river in a much more natural state than the Tennessee is today.

Hydroelectric dams and dredging have eliminated sections of swift water. The alteration of the areas of water "riffles" or shoals erased conditions favorable to many swift water species of mussels. The water flow that was witnessed by the prehistoric inhabitants of the Bellefonte site was quite different from that today.

A rather curious fact presented itself upon species identification from the midden at Bellefonte. By far the most numerous species present were two deeper water species of mussels (*Elliptio crassidens, Dromus dromas*), while thin shelled, slower water, mud bottom species did not appear. It seems that the inhabitants were "musseling" in sections of the river which would support these deeper water species. To suggest that the people were diving for the mussels is highly speculative and rather bold. What seems more plausible is that the people may have waded along areas of gravel bars at times chest or neck deep, "feeling" for the mussels with their feet. When they located them (probably in groups or beds) to duck under water and gather several at a time would not have seemed unpleasant to a riverine people.

Zooarchaeological conclusions in a temporal vein at Bellefonte are difficult if not impossible. That is, invertebrate as well as vertebrate remains must be examined for food habits of Woodland and Mississippian period peoples in general rather than for specifics such as changing subsistence patterns through time.

Bone Artifacts

Worked bone at the Bellefonte site consisted mainly of three categories: awls, fishhook, and butcher marked bone:

Awls (Plate 36A). Seventeen fragments of bone awls are identified. All are polished from construction and use. Mammals provide the source of the bone as raw material for manufacture. Two of the awl tips appear burned and highly polished. One of the specimens could be classified as a bone pin.

Fishhook (Plate 36C). One fragment of a bone fishhook is identified from 1 Ja 300. The point of the hook is broken, and the remaining shank is highly polished with a line attachment groove in the surface.

Butcher Marked Bone (Plate 36D). Seven fragments of bone identified from Bellefonte contain cut marks attributed to the preparation of the animal for eating and/or skinning. Marks appear on turtle, deer, and fox bone. One mandible *(Vulpes fulva)* was cut transversely across the ascending ramus to accomplish removal of the lower jaw or skinning the animal. A calcaneum and an astragalus of the white-tail deer *(Odocoileus virginianus)* exhibit butchering marks, both evidence of long bone butchering.

Two other examples of worked bone include the distal portion of a scraper and a fragment of what may have been a comb (Plate 36B).

Shell Artifacts

The shell artifacts excavated from the Bellefonte site consist of *Anculosa* beads, one circular shell gorget and 17 shell beads comprising a single necklace. The gorget and the beads were found in a Mississippian period child burial (Burial 3). Although the bone from the flexed burial was poorly preserved, the shell artifacts proved to be still in good condition. There were several child burials at the site, but this was the only one containing shell artifacts other than *Anculosa* beads. Both the beads and the gorget exhibit a remarkable aboriginal knowledge of shell work.

Shell Gorget (Plate 37). A marine gastropod served as the source of the shell gorget. To say more as to the species of conch or whelk is most difficult as only a section of the exterior whorl of the shell was utilized in construction.

The diameter of the gorget is 9.5 cm., with two successive concentric grooves spaced at 1 cm. intervals from the periphery of the artifact. Within the circles of the innermost groove exists a barred cross. The diameter of the space occupied by the cross is 5 cm., and the width of each bar is 1 cm. The entire design is displayed on the interior concave whorl surface. Two holes, each with a 3 mm. diameter, are present in the exterior groove of the gorget, presumably for suspension from the neck of the wearer.

While the media of construction of the gorget was marine shell, no attempts at surface alteration were made. Portions of the original natural glossy surface (nacre) of the shell are still to be found on the specimen.

Execution of the surface designs of the circular grooves and barred cross was accomplished by three steps: (1) incising two concentric circles and four right angles within the innermost circle, (2) widening or grooving the concentric circles with a blunter instrument, and (3) scraping the space between the four right angles, resulting in an inset barred cross.

The meaning of this design other than the usual "ceremonial" label attached to it is at this point open for debate. The barred cross is among a group of "Southern Cult" or at least Mississippian period symbols. To attempt to decipher its meaning in more depth, various students of prehistoric iconography have suggested the barred cross as (1) symbol for the world, (2) indicating the four cardinal directions, (3) a symbol concerning the harvest, and (upon showing the object to a local artist) simply (4) a pleasing geometric design.

Columella Beads (Plate 37). The 17 beads recovered from the child burial appear to have been constructed from the columella of a large marine gastropod (species indeterminate) The bead shapes are generally cylindrical, but some exhibit rather amorphic shapes. They vary in length from 1.8 to 2.9 cm. with each having been cut from the columella, ground on the ends, and drilled through the longitudinal plane. The artisan who made the beads drilled a hole to the midpoint of the longitudinal axis of the bead, then turned the shell 180 degrees and drilled a second hole again to the midline. The two holes met at the core of the shell; thus the object could be labeled - bead. The diameter of the drill bits used to make the holes were 6, 7, and 8 mm.

Other observations of the shell artifacts include the obvious existence of either a coastal trade network or individual journeys to marine waters from the Bellefonte site during the Mississippian period. These objects represent not only ornamental objects, but also objects of trade and prestige. And last, but certainly not least, the burial of these shell ornaments reflects the human emotion of an individual or group some five centuries ago when burying a child.

Anculosa Beads. These beads were made by grinding the wall of the shell to form a perforation for stringing. They were found in association with each child burial at Bellefonte.

Table 13. Skeletal Elements of Identified Species, Total Excavations, Excluding Feature 21.

Scientific Name	Common Name	Claw	Tooth	Vertebrae	Spines	Quadrate	Pharyngeal Plate	Articulator	Scale	Operculum	Shaft	Humerus	Femur	Tibia	Ulna	Radius	Metapdial	Maxilla	Dentary	Skull	Pelvis	Scute	Marginal	Plural	Neural	Scapula	Xiplastron	Hypoplastron	Pygal	Nucal	Coracoid	Clavicle	Tarsometatarsus	Acetabulum	Astragalus	Calcaneous	Phalange	Rib	Bulla	Carpal	Tarsal	Antler	Patella	Fragments	Total
Decapoda	Freshwater Crab	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Fish, unidentified		-	2	225	37	2	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5
Amia calva	Bowfin	-	-	9	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	269
Clupeidae	Herring, Shad	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10
Ictaluridae	Freshwater Catfish	-	-	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Aplodinotus grunniens	Freshwater Drum	-	143	-	-	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	5
Reptile-Amphibian, unidentified		-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	151
Amphibia	Amphibians	-	-	3	-	-	-	-	-	-	1	1	-	-	-	-	-	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Urodela	Salamanders	-	-	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8
Anura	Frogs & Toads	-	-	20	-	-	-	-	-	-	1	2	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	64
Reptilia	Reptiles	-	-	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25
Chelonia	Turtles	-	-	4	-	-	-	-	-	-	1	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10
Kinosteron subrubrium	Mud Turtle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	133	6	15	7	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	12	184
Sternotherus sp.	Musk Turtle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	2	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7
Emydidae	Box & Water Turtle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Terrapene carolina	Box Turtle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14	4	1	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	21
Chysemys picta	Painted Turtle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	4	6	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	5	21
Chysemys scripta	Pond Slider Turtle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Trionyx sp.	Softshell Turtle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
Serpentes	Snake	-	-	183	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	27	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	34
Aves	Bird	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	183
Anas discors	Blue-winged Teal	-	-	-	-	-	-	-	-	-	11	1	-	2	1	-	-	-	1	-	-	-	-	-	-	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1	19
Meleagris gallopavo	Wild Turkey	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Gallus gallus	Domestic Chicken	-	-	2	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Mammalia	Mammal	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1	1	1	2	-	-	-	-	-	-	-	-	-	3	14
Small Mammal, unidentified	(Elements Unsorted)																																												540*
Medium Mammal, unidentified	(Elements Unsorted)																																												186*
Large Mammal, unidentified	(Elements Unsorted)																																												846*
Didelphis virginiana	Northern Oppossum	-	10	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	287*
Insectivora	Insect Eaters	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14
Soricidae	Shrews	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Scalopus aquaticus	Eastern Mole	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
Carnivora	Flesh Eaters	-	2	-	-	-	-	-	-	-	-	2	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Mephitis mephitis	Striped Skunk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Lutra canadensis	River Otter	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Canidae	Dogs	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Vulpes fulva	Red Fox	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Urocyon cinereoargenteus	Grey Fox	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Canis familiaris	Domestic Dog	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	4
Procyon lotor	Raccoon	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	3
Ursus americanas	Black Bear	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-	-	7
Odocoileus virginianus	White-tail Deer	-	52	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1
Rodentia	Rodents	-	37	-	-	-	-	-	-	-	1	6	-	2	3	1	38	1	8	-	5	-	-	-	-	4	-	-	-	-	-	-	-	-	6	3	10	2	3	3	5	4	-	1	165
Sciurus sp.	Squirrel	-	17	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	41
Sciurus niger	Eastern Fox Squirrel	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18
Sciurus carolinensis	Eastern Grey Squirrel	-	53	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Castor canadensis	Beaver	-	1	-	-	-	-	-	-	-	-	-	1	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	7	6	-	-	-	-	-	-	-	74
Cricetidae	Mice, Vole	-	2	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Oryzomys palustris	Rice Rat	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Peromyscus sp.	White-footed, Old Field, Cotton, Golden Mice	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Sigmodon hispidus	Hispid Cotton Rat	-	7	8	-	-	-	-	-	-	-	1	1	2	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7
Microtene Rodent		-	2	-	-	-	-	-	-	-	-	-	3	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	23
Ondatra sibethicus	Muskrat	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Microtus pintorium	Pine Vole	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Syvilagus sp.	Rahbit	-	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Homo sapiens	Man, adult	-	12	-	-	-	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	15
Homo sapiens	Man, child	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	7	-	-	14	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	9	-	-	-	-	-	-	-	70
Worked Bone		-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	24	30
		-	-	-	-	-	-	-	-	-	19	-	-	-	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	2	-	-	25
	Total	5	364	541	38	2	9	1	1	1	36	22	8	8	6	2	47	9	25	38	10	182	19	28	9	9	1	2	!	2	2	2	1	5	13	13	30	2	3	3	5	6	3	51	1565

*Not Included in Total

Table 14. Skeletal Elements of Identified Species, Feature 21.

Scientific Name	Common Name	Claws	Spines	Vertebrae	Scales	Teeth	Pharyngeal Plate	Shaft	Pelvis	Humerus	Tibia	Dentary	Maxilla	Scutes	Plurals	Neurals	Marginals	Scapula	Talon	Metapodials	Phalanges	Femur	Ulna	Rib	Calcaneous	Astragalus	Radius	Antler	Bulla	Fragments	Total
Decapoda	Freshwater Crab	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30
Fish, unidentified		-	28	153	460	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	641
Amia calva	Bowfin	-	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8
Clupeidae	Herring, Shad	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Ictaluridae	Freshwater Catfish	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Aplodinotus grunniens	Freshwater Drum	-	-	-	-	76	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	78
Urodela	Salamanders	-	-	29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	29
Anura	Frogs & Toads	-	-	20	-	-	-	14	8	5	3	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	57
Chelonia	Turtles	-	-	1	4	-	-	-	-	1	-	-	-	60	145	3	7	-	-	-	-	-	-	-	-	-	-	-	-	-	221
Kinosternon subrubrium	Mud Turtle	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	10
Trionyx sp.	Softshell Turtle	-	-	-	-	-	-	-	-	-	-	-	-	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7
Serpentes	Snake	-	-	140	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	140
Aves	Bird	-	-	-	-	-	-	16	-	3	1	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	2	24
Melaegris gallopavo	Wild Turkey	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1
Small mammal, unidentified		-	-	22	-	37	-	18	1	17	3	-	6	-	-	-	-	5	-	13	94	7	6	4	-	-	-	-	-	9	242
Didelphis virginiana	Northern Oppossum	-	-	-	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
Soricidae	Shrews	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Mustela vison	Mink	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1
Mephitis mephitis	Striped Skunk	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
Procyon lotor	Raccoon	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Odocoileus virginianus	White-tail Deer	-	-	-	-	19	-	-	-	-	-	1	1	-	-	-	-	-	-	16	3	1	1	1	-	-	2	1	2	-	48
Rodentia	Rodent	-	-	-	-	49	-	-	1	15	2	3	-	-	-	-	-	-	-	3	38	-	4	-	-	-	-	-	-	-	115
Sciurus sp.	Squirrel	-	-	-	-	62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	62
Sciurus carolinensis	Eastern Grey Squirrel	-	-	-	-	3	-	-	1	5	5	-	1	-	-	-	-	1	-	-	-	-	1	-	5	9	2	-	-	-	33
Tamias striatus	Eastern Chipmunk	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Castor canadensis	Beaver	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Peromyscus sp.	White-footed, Old Field, Cotton, Golden Mice	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	3
Microtus pintorium	Pine Vole	-	-	-	-	3	-	-	-	5	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9
Syvilagus sp.	Rabbit	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Homo sapiens	Man, adult	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Worked Bone		-	-	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
	Total	30	28	376	464	268	2	52	11	51	15	9	13	67	149	3	13	7	2	32	135	8	12	5	7	10	4	1	2	13	1789

Table 15. Minimum Number of Vertebrate Individuals by Class.

Class	Common Name	Feature 21 MNI	Feature 21 Percent	Rest of Site MNI	Rest of Site Percent
Mammalia	Mammals	24	66.7	33	60.0
Reptilia	Reptiles	4	11.1	9	16.3
Osteoichthyes	Bony Fishes	4	11.1	5	9.1
Amphibia	Amphibians	3	8.3	4	7.3
Aves	Birds	1	2.8	4	7.3
	Total	36	100.0	55	100.0

Table 16. Animal Species Present, Minimum Number of Indiviudal Animals (MNI), and Frequency of Each Species (%MNI), Excluding Feature 21.

Scientific Name	Common Name	No.	MNI	Percent MNI	MNI Basis
Decapoda	Freshwater Crab	5	2	x	Claw
Amia calva	Bowfin	10	1	1.8	-
Clupeidae	Herring, Shad	1	1	1.8	-
Ictaluridae	Freshwater Catfish	5	1	1.8	-
Aplodinotus grunniens	Freshwater Drum	151	2	3.6	Pharyngeal Plate
Urodela	Salamanders	64	2	3.6	Vertebrae
Unura	Frogs & Toads	25	2	3.6	Vertebrae
Kinosternon subrubrium	Mud Turtle	7	1	1.8	-
Sternotherus sp.	Musk Turtle	2	1	1.8	-
Emydidae	Box & Water Turtle	21	1	1.8	-
Terrapene carolina	Box Turtle	21	1	1.8	-
Chysemys picta	Painted Turtle	2	1	1.8	-
Chysemys scripta	Pond Slider	4	1	1.8	-
Trionyx sp.	Softshell Turtle	34	1	1.8	-
Serpentes	Snake	183	2	3.6	Vertebrae
Anas discors	Blue-winged Teal	1	1	1.8	-
Meleagris gallopavo	Wild Turkey	1	1	1.8	-
Gallus gallus	Domestic Chicken	14	2	3.6	Acetabulum
Didelphis virginiana	Northern Oppossum	14	1	1.8	-
Soricidae	Shrews	4	1	1.9	-
Scalopus aquaticus	Eastern Mole	3	1	1.8	-
Mephitis mephitis	Striped Skunk	1	1	1.8	-
Lutra canadensis	River Otter	1	1	1.8	-
Vulpes fulva	Red Fox	1	1	1.8	-
Urocyon cineroargenteus	Grey Fox	4	2	3.6	Astragalus
Canis familiaris	Domestic Dog	3	1	1.8	-
Procyon lotor	Raccoon	7	1	1.8	-
Ursus americana	Black Bear	1	1	1.8	-
Odocoileus virginianus	White-tail Deer	165	4	7.1	Astragalus
Sciurus niger	Eastern Fox Squirrel	2	1	1.8	-
Sciurus carolinensis	Eastern Grey Squirrel	74	4	7.1	Astragalus
Castor canadensis	Beaver	3	2	3.6	Humerus
Oryzomys palustris	Rice Rat	1	1	1.8	-
Peromyscus sp.	White-footed, Old Field, Cotton, Golden Mice	7	2	3.6	Dentary
Sigmodon hispidus	Hispid Cotton Rat	23	2	3.6	Femur
Ondatra zibethicus	Muskrat	1	1	1.8	-
Microtus pintorium	Pine Vole	1	1	1.8	-
Syvilagus sp.	Rabbit	15	1	1.8	-
Homo sapiens	Man (adult)	70	2	3.6	Patella
Homo sapiens	Man (child)	30	1	1.8	-
	Total	982	57	98.9%	

Table 17. Feature 21, Animal Species Present, Minimum Number of Individual Animals (MNI) and Frequency of Each Species (%MNI).

Scientific Name	Common Name	No.	MNI	Percent MNI	MNI Basis
Decapoda	Freshwater Crab	30	9	x	Claw
Amia calva	Bowfin	8	1	2.8	-
Clupeidae	Herring, Shad	1	1	2.8	-
Ictaluridae	Freshwater Catfish	2	1	2.8	-
Aplodinotus grunniens	Freshwater Drum	78	1	2.8	-
Urodela	Salamanders	29	1	2.8	-
Anura	Frogs & Toads	57	2	5.6	Vertebrae
Kinosternon subrubruim	Mud Turtle	10	1	2.8	-
Trionyx sp.	Softshell Turtle	7	1	2.8	-
Serpentes	Snake	140	2	5.6	Vertebrae
Meleagris gallopavo	Wild Turkey	1	1	2.8	-
Didelphis virginiana	Northern Oppossum	6	1	2.8	-
Soricidae	Shrews	3	3	8.3	Dentary
Mustela vison	Mink	1	1	2.8	-
Mephitis mephitis	Striped Skunk	4	1	2.8	-
Procyon lotor	Raccoon	3	2	5.6	Teeth
Odocoileus	White-tail Deer	48	2	5.6	Radius
Sciurus carolinensis	Eastern Grey Squirrel	33	6	16.7	Astragalus
Tamias striatus	Eastern Chipmunk	3	1	2.8	-
Castor canadensis	Beaver	1	1	2.8	-
Peromyscus sp.	White-footed, Old Field, Cotton, Golden Mice	3	1	2.8	-
Microtus pintorium	Pine Vole	9	3	8.3	Humerus
Syvilagus sp.	Rabbit	2	1	2.8	-
Homo sapiens	Man (adult)	1	1	2.8	-
	Total	480	45	100.5%	

Table 18. Comparison of Excavation Methods for Bone Recovery: Species, Fragment Weight, and Fragment Count.

Species	Trowel	1/4" Screen	3/32" Screen
Decapoda, Freshwater Crab	-	-	X
Amia calva, Bowfin	-	X	X
Aplodinotus grunniens, Freshwater Drum	X	X	X
Kinosternon subrubrium, Mud Turtle	X	X	-
Sternotherus sp., Musk Turtle	-	X	-
Terrapene carolina, Box Turtle	X	X	-
Chysemys picta, Painted Turtle	X	-	-
Chysemys scripta, Pond Slider Turtle	X	X	-
Trionyx sp., Softshell Turtle	X	X	X
Anas discors, Blue-winged Teal	X	-	-
Meleagris gallopavo, Wild Turkey	-	-	X
Gallus gallus, Domestic Chicken	X	-	-
Didelphis virginiana, Northern Oppossum	X	X	X
Scalopus aquaticus, Eastern Mole	X	X	X
Mustela vison, Mink	-	X	-
Mephitis mephitis, Striped Skunk	-	X	X
Lutra canadensis, River Otter	X	-	-
Vulpes fulva, Red Fox	X	-	-
Urocyon cineroargenteus, Grey Fox	X	X	X
Canis familiaris, Domestic Dog	X	-	-
Procyon lotor, Raccoon	X	X	-
Ursus americana , Black Bear	-	X	-
Odocoileus virginianus, White-tailed Deer	X	X	X
Sciurus sp., Squirrel	-	-	X
Sciurus niger, Eastern Fox Squirrel	-	-	X
Sciurus carolinensis, Eastern Grey Squirrel	-	X	X
Tamias striatus, Eastern Chipmunk	-	-	X
Castor canadensis, Beaver	X	X	X
Oryzomys palustris, Rice Rat	-	X	-
Peromyscus sp., White-footed, Old Field, Cotton, Golden Mice	-	X	X
Sigmodon hispidus, Hispid Cotton Rat	-	-	X
Microtene rodent	-	-	X
Ondatra zibethicus, Muskrat	X	-	-
Microtus pintorum, Pine Vole	-	X	-
Syvilagus, sp., Rabbit	X	X	X
Total Species	19	21	19
Total Weight (grams)	1,803.3	2,218.9	2,256.6
Total Count	1,451	5,636*	81,434*

* Includes unidentified bone counts estimated from an average of two weighed samples.

Table 19. Identified Gastropod Species from Features.

LAND SNAILS	
Mesodon clausus (Say)	4
Triodopsis notata (Desnaynes)	2
Zonitoides arboreus (Say)	10
AQUATIC SNAILS	
Anculosa sp.	25
Anculosa praerosa (Say)	166
Campeloma sp.	1,798
Eurycaelon anthony (Budd)	28
Gyraulus parvus (Say)	1
Io fluvialis (Say)	2
Lithasia sp.	4
Lithasia armigera	17
Lithasia geniculata (Conrad)	1
Lithasia verrucosa (Rafinesque)	423
Physa sp.	3
Pleurocera sp.	669
Pleurocera caniculata (Say)	846
Viviparus georgianus (Lea)	4
Total	4,003

Table 20. Identified Pelecypod Species from Features.

Scientific Name	Common Name	Number of Individuals	Percentage of Total
Megalonaias gigantea (Baynes)	Washboard	1	*
Ambelema plicata (Say)	Three Ridge	10	0.5
Tritogonia verrucosa (Rafinesque)	Buckhorn	1	*
Quadrula cylindrica (Say)	Rabbit's Foot	6	*
Quadrula metanevra (Rafinesque)	Monkey Face	25	1.2
Quadrula pustulosa (Lea)	Pimple Back	2	*
Fusconaia ebena (Lea)		25	1.2
Fusconaia edgariana (Lea)		24	1.1
Fusconaia sp.		6	*
Cyclonaias tuberculata (Rafinesque)	Purple Warty-Back	157	7.4
Lexingtonia dolabelloides (Lea)		6	*
Plethobasus cyphyus (Rafinesque)	Bullhead	28	1.3
Plethobasus cicatricosus (Say)		6	*
Plethobasus cooperianus (Lea)		7	*
Pleurobema clava (Lamark)		9	*
Pleurobema ovifoyme (Conrad)		7	*
Pleurobeme pyramidatum (Lea)	Tabulated with *P. cordatum*		
Pleurobema cordatum (Rafinesque)		135	6.4
Elliptio crassidens (Lamark)	Elephant's Ear	548	25.7
Elliptio dilatatus (Rafinesque)	Spike	201	9.5
Ptychobranchus fasciolaris (Rafinesque)	Kidney Shell	15	0.8
Obliquria reflexa (Rafinesque)	Three Wart	3	*
Cyprogenia irrorata (Lea)	Fan Shell	31	1.5
Dromus dromas (Lea)		759	35.9
Actinonaias sp.		1	*
Plagiola lineolata (Rafinesque)	Butterfly	19	0.9
Obovaria olivaria (Rafinesque)	Hickory-Nut	7	*
Obovaria subrotunda (Rafinesque)		10	0.5
Obovaria retusa (Lamark)		32	1.5
Conradilla caelata (C nrad)		1	*
Villosa sp.		1	*
Lampsilis ovata (Say)	Pocketbook	1	*
Lampsilis fasciola (Rafinesque)		2	*
Lampsilis orbiculata (Hildreth)		6	*
Lampsilis sp.		3	*
Dysnomia brevidens (Lea)		2	*
Dysmonia sp.		9	*
Dysmonia sp.		2	*
Dysmonia sp.		4	*
Total Number of Individuals		2,112	

* Less than 0.5%.

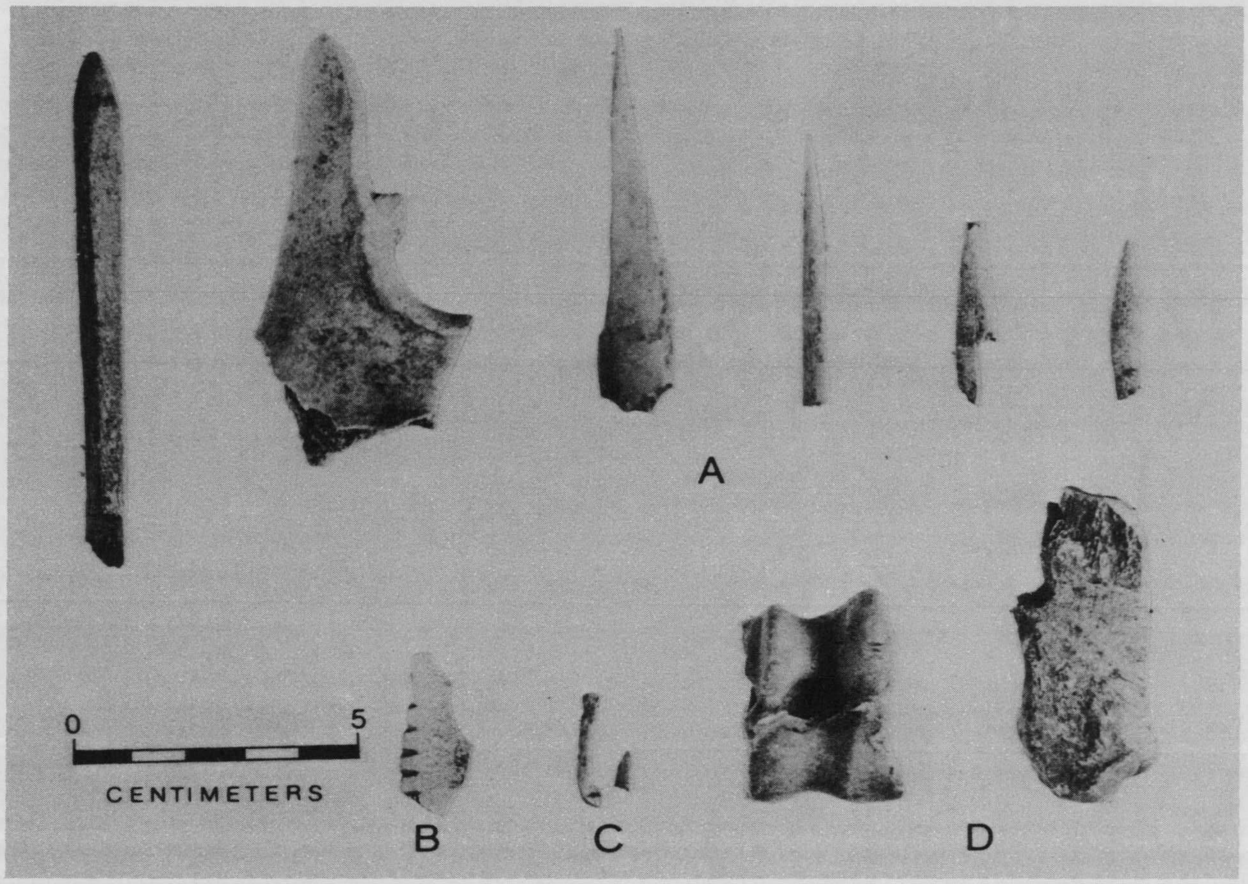


Plate 36. Bone Artifacts: A, Bone Awls; B, Comb Fragments?; C, Fishhook; D, Butcher-marked Bone.

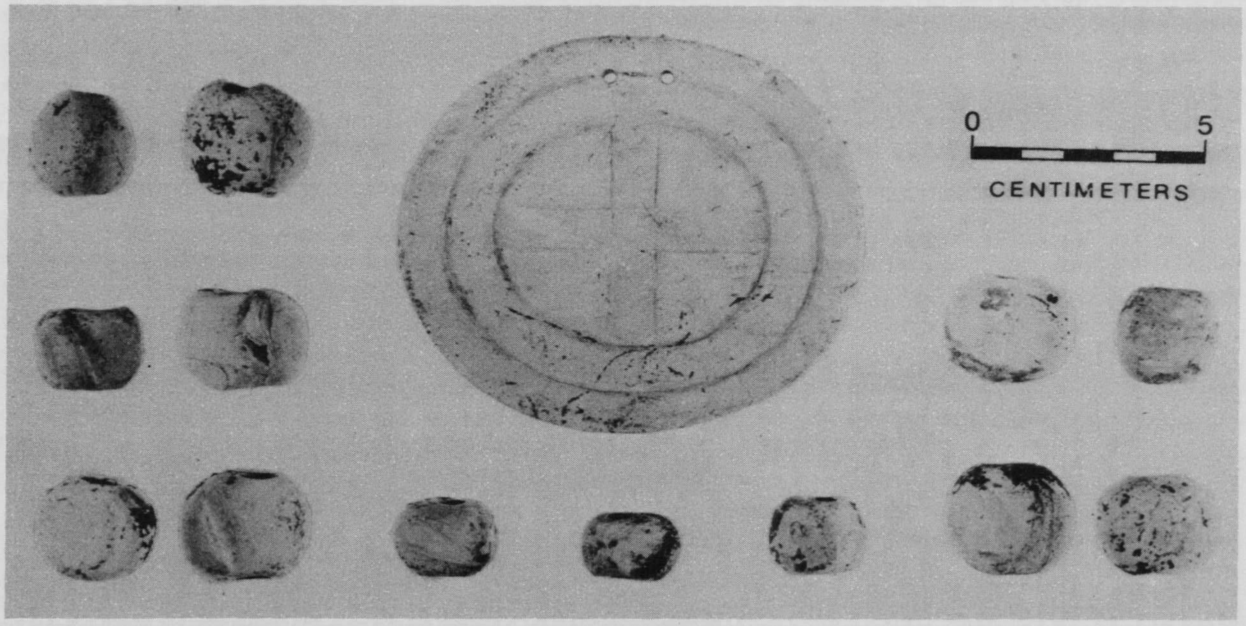


Plate 37. Shell Gorget and Columella Beads.

CHAPTER VII

PLANT REMAINS

C. Earle Smith, Jr. and Gloria M. Caddell

The plant remains from 1 Ja 300 include material gathered from wild vegetation in the area and cultivated plant material. Unfortunately, only a single feature from the site was isolated in chronology. This unit, designated Feature 21, was also radiocarbon dated at A.D. 420, as well as containing largely unmixed Copena culture deposit.

The contents of Feature 21 included about 17,832 fragments of *Carya* (hickory) shell, 7 *Quercus* (oak) fragments, 1 *Vitis* (grape) seed, 1 *Juglans* (walnut) fragment, 18 *Diospyros* (persimmon) seed fragments, 19 unidentified berry fragments and other unidentified pieces including the ubiquitous wood charcoal. Recognized in this were also 2 *Ipomoea* (bindweed) seeds which probably are not part of the original pit contents but became mixed into the top after European use of the area.

All of the plant materials appear to have been gathered from the surrounding forest. In spite of the late date, no cultivated plant material was recovered from the feature. Once again, we note the disproportionately large amount of hickory shell fragments. Only the use of hickory nut shell as fuel for cooking fires could possibly account for the carbonization of this amount. The gathered material indicates an autumn period of occupation, inasmuch as grapes and persimmons are not very enduring in storage.

The remainder of the plant material recovered from the site is summarized in Table 21. The aggregate covers a chronology from Archaic to Mississippian cultures with no indication of a terminal date on either end. While the occupations were undoubtedly discontinuous, the material from different periods and occupations cannot be separated. Thus, we cannot predict which plants were gathered or grown by which cultural group during which time period at this site. The species of gathered plant materials indicate an autumn gathering, but the maize may have been mature from midsummer to autumn. The presence of *Viburnum* seeds is not surprising, as this shrub must once have been prominent in the vegetation of northern Alabama. It is the only item identified which has not been widely reported for other Alabama sites.

Table 21. Identified Plant Material, Excluding Feature 21.

Provenience	*Carya*	*Quercus*	*Juglans*	*Diospyros*	*Vitis*	*Zea* Cupule	*Zea* Kernel	Other	
Feature 1	2,886	2	1	–	–	–	–	–	
Feature 2	7	–	–	–	–	–	–	–	
Feature 3	104	–	–	–	–	–	–	–	
Feature 4	335	3	1	–	–	–	–	–	
Feature 6	226	–	–	–	–	–	–	–	
Feature 7	609	35	–	2	–	–	–	–	
Feature 8	4,338	–	–	–	1	–	–	1	Huckleberry
Feature 8A	751	–	–	–	1	8	–	–	
Feature 8B	277	–	–	–	–	–	–	–	
Feature 9	112	–	–	–	–	–	2	–	
Feature 10	357	–	–	1	2	–	–	–	
Feature 11	223	–	–	–	–	1	–	–	
Feature 12	4,368	6	–	4	–	–	–	–	
Feature 13	2,190	22	1	9	2	3	–	–	
Feature 14	45	1	–	–	1	–	–	–	
Feature 15	361	1	1	1	–	2	–	–	
Feature 16	4,216	–	–	4	57	33	1	–	
Feature 17	296	–	1	1	–	1	–	–	
Feature 18	212	–	–	1	–	–	–	–	
Feature 19	798	1	–	1	–	1	–	–	
Feature 20	263	–	–	–	–	–	–	–	
Feature 22	1,864	–	1	–	–	4	–	–	
Subtotal:	24,838	71	6	24	64	53	3	1	
Burial 1	1,446	–	2	–	–	–	1	–	
Burial 2	1,836	–	1	–	–	–	–	–	
Burial 3	310	–	–	–	–	–	–	–	
Burial 4	63	–	–	–	–	–	–	–	
Burial 5	1,002	–	–	5	–	–	–	–	
Burial 6	82	–	–	–	180	–	–	–	
Burial 7	2,706	11	–	–	–	8	6	–	
Burial 8	55	–	–	–	–	–	–	–	
Burial 9	438	–	–	–	–	–	–	8	*Viburnum*
Subtotal:	7,938	11	3	5	180	8	7	8	
Cut 1	1,746	–	–	2	–	–	–	5	*Viburnum*
Cut 2	4,458	–	1	–	1	6	3	4	Berry
Cut 3	2,789	–	–	1	–	4	–	–	
Cut 4	935	–	1	–	–	–	–	–	
Subtotal:	9,928	–	2	3	1	10	3	9	
Total:	42,704	82	11	32	245	71	13	18	

CHAPTER VIII

THE HUMAN SKELETAL REMAINS

Kenneth R. Turner and Kathleen D. Turner

Reports on human skeletal series recovered from archaeological sites vary widely in styles of presentation. This variety of style is due partly to historical developments and partly to the idiosyncratic attitudes of particular authors. There never has been a standard format for these reports, and such standardization is neither desirable nor possible. The exigencies of any site tend to be somewhat unique and play a role in determining the nature of the skeletal report they demand. Still, it is appropriate to provide some introductory comments to reports which explain the viewpoints of authors and their immediate intentions.

It has been apparent for some time (Howells 1969) that the univariate approach in osteometry is of little value in assessing population affinities. For this and other reasons, the publication of skeletal measurements alone is essentially useless, particularly when sample sizes are small. None of the traditional measurements are given in this report, since their function would be primarily a decorative one.

The morphological and metrical varieties of the American Indian skull which were devised by such writers as von Eickstedt Hrdlicka, and Neumann have likewise lost their utility. This should not be taken as a denigration of these men, whose work was appropriate and admirable for their time. The disciplines of archaeology and physical anthropology have merely developed different sorts of problems and different techniques of problem-solving. There is therefore no discussion in this report concerning relations of the material studies to such classificatory entities as Sylvid, Gulf or Walcolid.

Information which continues to be useful in these reports includes estimates of age, sex, and stature. Also, in the contemporary literature of physical anthropology one finds an abiding interest in skeletal anomalies. It is necessary to include information on these as well, in part because their potential interpretive value may not yet be fully realized. Pathologies also must be described as fully as possible since they often provide useful information about the conditions of life in the past.

Finally, it is the responsibility of the physical anthropologist to approach the biological and cultural implications of the observations reported. This is a hallmark of an anthropological report, and it is desirable whether one specimen or hundreds are dealt with. Failure to consider such implications penalizes the archaeologists for whom skeletal reports are prepared.

The body of this report is built around descriptions of each of the nine human skeletons recovered from Site 1 Ja 300. The descriptions of each skeleton begins with estimates of the age at death and sex of the individual represented by the skeletal remains. Pathologies are then described as fully as possible, followed by a similar description of anomalies. Comments and inferences based on pathologies or anomalies are given with the descriptions. Following the nine individual skeletal descriptions, a summary is provided which considers the more general aspects of the total series. Thus, the report submitted here is primarily descriptive. Its ultimate objective, however, is to provide information about the lives of the people whose remains are being studied.

Only two of the skeletons (those designated Burials 8 and 9) can be described as very poorly preserved, since they consist almost entirely of small scattered fragments which cannot be reconstructed into more than one or two sizeable parts of whole bones. Each of these two burials comprises less than half the original skeleton. Both were burials of infants. The estimates of age at death for Burials 8 and 9 are based primarily on their dentitions, which are almost completely preserved.

The remaining seven skeletons are generally well preserved, with a majority of their bones present in either undamaged or reconstructable condition. Of these seven, Burials 2 and 3 are exceptional in that very little remains of their skulls. Only the symphyseal region of the mandible remains of the skull of Burial 2, while several cranial fragments and a complete mandible were recovered with Burial 3. The crania of the remaining burials are largely or wholly reconstructable. Considered simply as a tissue, the bone is very well preserved throughout the series.

Age, sex, and stature estimates given without citation of sources may create difficulties for readers engaged in literature surveys; yet practical considerations do not allow full accounting of all the criteria utilized for each skeleton described below. As many as seventeen criteria were utilized to estimate age, and up to thirteen criteria were used to estimate sex in particular cases. As a compromise between these two antagonistic considerations, the sources of all the criteria employed in this study are given in body below. Copies of the notes compiled during this research are retained by the authors and are also filed with the original field notes.

Estimations of age at death were based on the development and eruption of teeth (Schour and Massler 1944; Stewart 1954), the fusion of skeletal growth centers (Bass 1971; Krogman 1962; McKern and Stewart 1957; Stewart 1954; Warwick and Williams 1973), and the degenerative age changes of the adult skeleton (Kerley 1970; Stewart 1958). Age estimates are given as ranges, since that is all the criteria allow. Sex estimates were based on morphological and univariate metrical criteria (Bass 1971; Krogman 1962). Where possible, Hanihara's discriminant function for sexing mandibles was also applied (Giles 1964). Methods exist for estimation of sex in subadults, but they were not attempted except in one case. No attempt was made to estimate sex through comparison of dental and skeletal maturation rates, since the material at hand was insufficient for such applications.

Stature estimations were based on the Mongoloid formulae of Trotter and Gleser (1958). In the case of Burial 3, left humerus length was estimated through Muller's technique

(Krogman 1962:179-180) and then applied to the appropriate regression formula for stature estimation. Thus, the stature estimate for Burial 3 displays a relatively large confidence interval. Stature estimates are given as mean values with 95 per cent confidence intervals. In the past, authors have tended to give stature estimates as single values, which is incorrect procedure and has led to undue confidence. The topic of stature estimation in archaeological remains deserves further discussion, but would be too great a digression for this report.

Description of Skeletons

Burial 1. The skeleton of this 40 to 60 year-old male is that of a robust, comparatively tall individual beset with osteoarthritis, badly worn teeth, and lingering infections. A common and expectable concomitant of age, vertebral osteophytosis (Stewart 1958) is pronounced among the cervical and lumbar centra. A Schmorl's node, due to hernia of an intervertebral disc, had left a deep osteoclastic excavation on the superior surface of one lumbar vertebral centrum. Since it apparently did not rupture through the posterior longitudinal ligament, this herniation would have been only mildly irritating, if at all noticeable to its possessor (Woodburne 1969: 292-293). Osteoarthritis of synovial joints had begun to remodel the proximal row phalanges of the hands and the metatarsels of both feet. Probably a consequence of active younger years, these osteoarthritic deposits in the extremities are not extensive enough to have impaired movement.

The dentition is extremely worn. A few teeth retain bits of enamel, the majority being ground down to the roots. The two right maxillary incisors and the left second maxillary premolar were the only teeth lost before death. Although the alveoli of the posterior dentition in the maxillae and mandible were almost entirely resorbed, all the remaining teeth are present, many apparently having been held in place by the gingiva. Some of the teeth had even rotated in their alveoli so that several roots are worn along their sides. Interproximal grooving (Ubelaker, Phenice, and Bass 1969) is clearly visible on the distal surfaces of both third maxillary molars. This grooving is produced by palliative attempts and may indicate that some irritation was felt between these second and third molars.

In fact, the oral tissues were heavily infected. Peridontosis is evident in the maxillae and mandible, but is most extensive on the left side of the mandible. The infection had traveled down the lateral surface on the left horizontal ramus to reach the mental foramen, which is surrounded by periostitic bone. Abscesses had developed in the alveoli of both maxillary canines and the left second mandibular premolar. A separate infectious locus had produced an abscess accompanied by a drainage sinus, or cloaca, on the lateral wall of the right maxillary body. Here, the small cloaca, now surrounded by old reactive bone, had perforated the outer cortical bone without noticeably affecting the internal wall of the maxillary sinus.

Yet another local site of infection had produced an abscess in the palatal process of the right maxilla. This abscess drained through a cloaca, on the superior palatal surface, which is bordered by rapidly deposited reactive bone tissue with a pumice-like texture. On the interior surface of the palatal process, rapid periosteal deposition left a small blister of pumice-like bone tissue which seals the perforation from the oral cavity. The sharp borders of the cloaca on the superior palatal surface indicate that this infection was still active at the time of death.

The post-cranial skeleton also reveals traces of infection. Plaques of reactive periostitic bone had formed on the subcutaneous surface of the right patella and the medial surface of the distal diaphysis on the right tibia. Further periostitic activity had swollen the lateral surface of the distal right fibula. An unusual small depression observed behind the left scapular glenoid and on the supraspinous fossa was probably a consequence of local enlargement of the nutrient branches of the suprascapular artery, a minor feature not necessarily of pathological origin.

The patterns of reactive bone observed in this skeleton indicate at least two, and perhaps three, separate centers of infection. The most advanced center is associated with the oral tissues. The interproximal grooving, peridontosis, and absence of caries are evidence that this oral infection originated as gingivitis. The infection appears to have spread from the gums along two paths. One of these traveled down the outside of mandible to the left mental foramen, where it came in contact with large vessels and could easily have become hematogenous, *i.e.*, transported by circulatory system to other parts of the body. The second path of infection journeyed into the dental alveoli to form abscesses. One such alveolus was that of the left second mandibular premolar, which is of course very close to the left mental foramen. The other two abscessed alveoli were those of the maxillary canines, which may have provided the pyogenic microorganisms that produced the extra-dental cloaca on the lateral wall of the right maxilla. This would mean that these pyogenic microorganisms had osteomyelitic potential and were therefore, most likely staphylococcal (Morse 1969: 17-18).

With such a hematogenous infection present in one part of the body, it becomes difficult to attribute other nearby sites of reactive bone to separate local infections. For instance, the pyogenic osteomyelitic site on the right palatal process probably represents another expression of the infection originally beginning as gingivitis. On the other hand, it could have been a separate center produced by local infection of the soft nasal tissues. The presence of an older, similar site on the lateral wall of the same maxilla argues that the former interpretation is correct.

The periostitis of the right patella, tibia, and fibula constitutes another center of infection in this skeleton. It is unlikely, though not impossible, that the hematogenous infection beginning in the gingiva could travel to the lower right leg and instigate reactive remodeling without leaving similar traces elsewhere in the skeleton. It is more likely that the periostitis of these limb bones arose in response to a separate infection involving the soft tissues of the lower left leg, such as might develop from an infected superficial injury.

The collection of pathologies in this skeleton leads to two general observations. First, the individual represented by the remains had led a physically active life. The osteoarthritis and Schmorl's node, like the non-pathological strongly defined muscle attachments, are sequels to a career of stress and strain for the body tissues. Secondly, the life of this individual was rigorous, compared to our present-day standards, in both physical and hygenic perspectives. Ambient abrasives in the diet, not necessarily derived from "grinding stones" alone, had worn the teeth almost out of existence. The irritated gingival tissues had given way to infection which, untreated, had spread throughout the deep and superficial tissues around the face. An injury to the leg, perhaps originally very minor, had provided another entry for infection. Here again, the untreated infection had spread to several bones and stimulated reactive deposition by the periosteum. In the leg, the reactive bone tissue shows the smooth texture of an old, quiescent inflammation. That associated with the lower face was still active at the time of death. It cannot be established with certainty that this active infection was the cause of death. There is no evidence on the cranial bones that the brain or adjacent tissues were inflammed, yet the lack of evidence does not entirely negate the possibility.

A number of developmental anomalies were also observed on this interesting skeleton. A large dentinous cyst occupied the alveolar bone between the posterior to the roots of the central maxillary incisors. The cyst displayed no differentiation of tissues into enamel and had not erupted out of the bone. A dehiscence of the right tympanic plate was observed, but the left tympanic was missing. There are five inter-sutural bones along the lamboloid suture, including one very large specimen which makes up much of the left side of the squamous occipital. No artificial cranial deformation was present. The first cervical vertebra displays an accessory foramen adjacent to the left body and on the posterior arch. A septal aperture perforates the left humerus.

Several instances of incomplete ossification appear throughout the skeleton. Both radial tuberosities, for example, present deep central pits with smooth cortical surfaces. Some pathological origins of these pits are possible, such as benign tumors or evulsion of the biceps tendon. However, the bilateral occurrence of the pits renders such pathological origins unlikely. Since separate ossification centers appear in the radial tuberosities "sometimes" (Warwick and Williams 1973:332), it is more probable that these bilateral pits represent the appearance of such cartilaginous centers and their subsequent failure to ossify.

Incomplete ossification of cortical bone was also noted on the articular surfaces of the left cuboid for the calcaneous, left first cuneiform for the first metatarsel, and the proximal articular surface of a first row, second digit pedal phalanx. These imperfect surfaces take the form of pits, often clearly defined, with floors of dense bone. Careful examination with a stereomicroscope confirmed the impression that these anomalies were neither post-mortem artifacts nor of antemortem traumatic origin. Like the dehiscence of the right tympanic plate, they are simply failures of ossification.

Burial 2. This skeleton, of a male 40 to 60 years of age at death, is similar in several ways to the skeleton of Burial 1. Aside from the obvious equivalence in age and sex, Burials 1 and 2 both display osteoarthritis and periostitis. Osteophytosis is visible on a lumbar vertebral centrum from Burial 2, but this is the only vertebra preserved well enough to display osteophytes. Osteoarthritic lipping associated with synovial joints occurs along the rim of the right scapular glenoid, around the auricular surfaces of both innominates, and on several bones from the right foot. While the osteoarthritis of the scapula and innominate is unremarkable and can be attributed to general degenerative aging processes, the pathology of the right foot deserves special attention.

The pathologically involved bones of the right foot include the talus, the calcaneus, and the proximal phalanx. Extensive resorptive remodeling, reminiscent of very advanced osteoporosis, is displayed on the middle calcanean articular surface of the talus and on the sustentaculum tali of the calcaneus, including its articular surface of the talus. Comparatively slight traces of similar resorptive activity are visible on the posterior articular surfaces of the talus and calcaneus. The suleus tali and suleus calcanei are filled with bony excrescences. The margins of the affected joint surfaces display very little osteoarthritic lipping, and there is no eburnation. No evidence of fracture healing is present. None of the other bones in this skeleton presented a similar pathology.

It is apparent that both degenerative and traumatic osteoarthritis should be eliminated as descriptive of this pathology. Neoplasms, or tumors, may also be eliminated. A benign neoplasm would not produce such resorption of two articulating surfaces across the synovial fluid, especially without affecting underlying trabecular bone. Metastasis of a malignant neoplasm from other tissues to bone would produce multiple effects throughout the skeleton (Morse 1969:25). Likewise, rheumatoid arthritis is systemic and would affect more than one joint.

The pathology is most likely an example of what is variously referred to as pyogenic, suppurative, or septic arthritis (Miles 1975:17-19; Morse 1969:15). This form of arthritis develops after a joint becomes infected and the host is unsuccessful in resisting the invading microorganisms. The synovial fluid accumulates pus which leads to dissolution of articular cartilage, followed by resorption of the underlying bone. Generalized septicemia, more widely known as "blood poisoning," may develop at this point, followed by death of the host. If the host survives, reparative bone growth is exuberant and often the joint ankyloses. Since very little regenerative bone tissue exists on the tarsals of Burial 2, it may well be that this infected ankle proved fatal to its possessor. This infection was certainly painful and limited movement severely. The absence of eburnation indicates that the right foot was not used in walking.

A proximal row pedal phalanx from one of the three middle digits displays a well-developed bony excrescence on its distal shaft. This excrescence impinges on the border of the distal articular surface, which displays some eburnation. It is most likely that this is an example of traumatic osteoarthritis, brought on by direct injury to the digit. Comparisons with prepared specimens indicate that this phalanx is from the right foot, in which case the excrescence would be on the lateral surface of the bone. This pathology may have arisen independently of that seen on the right talus and calcaneus.

Only two teeth, the right central maxillary incisor and right lateral mandibular incisor, were recovered from this skeleton. Of the mandible itself, only the symphyseal region to the alveoli of the first premolars was preserved. Nothing remained of the alveolar maxillae. Those alveoli which were present, however, were unremodeled. This indicates that the anterior dentition of the mandible was lost post-mortem. The two incisors which were preserved showed occlusal wear exposing dentine on the maxillary incisor and secondary dentine on the mandibular incisor. A curious wear pattern was observed on the lingual surface of the maxillary incisor. This lingual wear had exposed dentine along the distal rise of the "shovel" and is inconclusive evidence of an overbite.

The only anomalies observed on this rather poorly preserved skeleton are associated with phalanges. The first row first digit phalanx of the right hand displays a crevice in its proximal articular surface which is definitely not a post-mortem artifact. The first row, third digit phalanx of the same hand also displays a pit not produced by post-mortem damage. The first row, first digit phalanges of both feet also possess such anomalies. On one of the pedal phalanges the proximal articular surface is cleft, while on the other it displays a large pit. In all four of these phalanges the cortical bone is continuous along the sides and bottoms of the depressions. There is no eburnation and no evidence of destructive or reparative activities. Each of these four proximal articular surfaces simply experienced incomplete ossification of the proximal epihpyses. The affected joints apparently were not functionally altered by these modifications of their structure.

The general observations which can be drawn from this skeleton are similar to those concerning Burial 1. The two teeth preserved for Burial 2 are not as extensively worn as those in Burial 1, yet it is apparent that the individual represented in Burial 2 also lived in surroundings which were favorable to infection.

Burial 3. This skeleton, of a female 18 to 30 years old at death, was poorly preserved. Still, the only teeth missing post-mortem were one incisor and one premolar from the maxillae, plus one incisor and one premolar from the mandible. All the remaining teeth, with the exception of both third mandibular molars, are worn to their necks. Several of the teeth which are present resided in partially resorbed alveoli, and had apparently begun either evulsion or rotation in their sockets. Only the roots of the right first mandibular molar remain, and these display extensive carious lesions. The alveolus of this tooth had undergone such advanced remodeling that, if the roots had not been present, it would have been considered evidence of ante-mortem loss of the teeth. The mesial-buccal root surface of the left first maxillary molar was surrounded by a large abscess, the only evidence of an infection directly affecting bone tissue in this skeleton.

On the left scapula, a well-defined pit with a maximum diameter of 8 mm. and depth of 8 mm. lies just behind the glenoid rim on the dorsal surface of the bone. The cortical bone is smooth and continuous across the pit and surrounding it. Unlike the depression noted on the left scapula of Burial 1, the floor of the scapular pit in Burial 3 was not pierced by a nutrient foramen. The smooth edges of this pit on the scapula of Burial 3, together with the absence of any inflammatory reactive bone, is evidence of some sort of benign tumor. The pit may have enclosed a chondroma, a benign tumor composed of cartilaginous tissue, especially since it is near epiphyseal zones. However, it must be noted that a variety of tumors can produce similar effects (Morse 1969:22). There is no reason to believe that this pathology was detrimental to the life of its possessor.

Two anomalies were observed among the bones of Burial 3. One of these is a dehiscence of the right tympanic plate. The left tympanic plate was not preserved. The second anomaly concerns the left mandibular mental foramen, which is very large with a mesial-distal diameter of 7 mm. and a vertical diameter of 5 mm. This contrasted to a diameter of 3 mm. in both planes of the right mental foramen. There is no evidence of pathological processes associated with the enlarged foramen.

Burial 4. The skeleton of this 35 to 40 year-old female was fairly well preserved with the exception of the facial bones and several articular surfaces of long bones. Such selective preservation resulted in the loss of many informative portions. For instance, the extent of osteoarthritis throughout the skeleton could not be adequately assessed since only a few fragments of articular surfaces are present. No osteoarthritic lipping was observed among the few fragments of synovial joints which were preserved. Pieces of the centra of four cervical vertebrae, one thoracic vertebra, and the first sacral vertebra are present and display some osteophytes, but the extent of osteophytosis in the vertebral column could not be confidently estimated.

Four fragments of the maxillae were preserved together with most of the mandibular body. Twenty-seven alveoli could be examined, and all present extensive resorptive remodeling. Most of the anterior mandibular alveoli were entirely remodeled, and the teeth they contained had undoubtedly been lost long before death. Of the remaining teeth, only the right first maxillary premolar and the right second mandibular molar could be identified. These two teeth were so greatly worn that they retain only small bits of enamel. Three other teeth are present as loose specimens, worn past their necks, and could be identified only as anterior dentition, probably from the maxillae.

No caries were observed. However, a large abscess had developed at the apical region of the left maxillary canine alveolus, perforating the lateral wall of the maxilla. This could be interpreted as a sequel to a carious lesion of the left maxillary canine. There are no other well-defined traces of infection associated with the jaws.

Both tibiae display deposits of reactive periosteal bone on their medial diaphyseal surfaces. These are areas of subcutaneous bone, easily subject to direct physical trauma, and the deposits probably represent the effects of injuries to the shins accompanied by local infection. Certain systemic infections enhance the susceptibility of subcutaneous bone to reactive periosteal deposition, but the absence of similar periosteal deposition in other parts of the skeleton makes it unlikely that such a generalized infection was active in this individual.

The left forearm of Burial 4 had been fractured some years before death. This old, well-healed fracture crosses the distal metaphysis of the left radius. The distal articular surface had been displaced posteriorly, and the distal metaphysis had healed with an unusual posterior angulation. The bony callus surrounding the distal radial metaphysis is not extensive, although the entire region was obviously expanded. The grooves and tubercles of the posterior distal radius are almost obliterated by deposits of reparative bone. Still, it is readily apparent that the fracture had been healed for several years and remodeling of the callus was essentially finished. There is no evidence that the region had become infected.

The distal left ulna had not fractured, but it had undergone extensive traumatic osteoarthritic remodeling. The entire proximal rim of the distal ulnar articular surface had been extended proximally by bony deposition. Eburnation of this extension, coupled with superficial degeneration of the original articular surface, indicates that the osteoarthritic outgrowth of bone had provided a new articular surface. The existence of this new articular relationship also indicates that, as a consequence of the fracture, the original relationship of the two bones had been permanently altered. There is no evidence of ankylosis, and the joint was apparently functional.

The location and direction of the fracture is typical of a Colles' fracture, which is produced when an individual falls forward and impacts on the heel of the hand (Wells 1964:51-55). The left pisiform of Burial 4 exhibited extensive osteoarthritic remodeling, including eburnation and resorption of the articular surface, probably as a consequence of the same incident producing the fractured left radius.

The skeletal anomalies of Burial 4 include a septal aperture of the left humerus and a dehiscence of the right tympanic plate. A flat-bottomed oval depression about 3 cm. in maximum width runs along and on either side of the sagittal suture. The raised borders of the oval separate just behind bregma, attain their maximum divergence near obelion, and converge just below lambda. The definition of the borders is very clear on the parietals, but poor on the occipital. A similar structure is described in Martin (1959:1313) as common among the Chaga, a tribe of Bantu agriculturalists, and is not an artificial cranial deformation according to that text. No other references to such depressions could be found in the literature. It is difficult to imagine how the oval depression on the cranium of Burial 4 could be artificially produced by applying pressure to the growing head. It seems that this also is not an instance of artificial deformation.

The biological significance of this anomaly is not clear. It does not seem to be related to any pathology, but it may be a variant of the sagittal ridges occasionally described in some populations as expressions of robusticity. These ridges must not be confused with the sagittal crests which provide areas of origin for the temporalis muscles of certain early Pleistocene hominids. There are no comparitive studies of sagittal ridges in the archaeological populations of the southeastern United States, but it is interesting that Neumann (1952) seems to have considered such ridges more characteristic of Woodland than Mississippian populations.

Burial 5. The sex of this 1 to 2 year-old infant was not estimated, since sex criteria cannot be confidently applied to subadult material. All eight deciduous incisors display slight occlusal wear without exposure of dentine. Thus, dental wear had become noticeable after about one year of use among these teeth. Marked periostitis of both tibiae and both fibulae was present, so that the diaphyses of these bones were appreciably swollen. No other bones of this skeleton were similarly affected. It is tempting to attribute this periostitis to a treponema infection, but the restricted involvement of the lower legs and a consideration of probably climatic conditions makes such a disease unlikely. A specific diagnosis is, in fact, impossible. The periostitis could represent a variety of conditions, one of the most likely being a local irritating infection of the soft tissues of the lower legs.

Burial 6. The skeleton of this 40 to 60 year-old female exhibits two properties which distinguish it from the previously described 1 Ja 300 skeleton remains. These two properties are artificial cranial deformation and very extensive dental caries. Caries were observed in the neck regions of twelve maxillary teeth and six mandibular teeth. The right first maxillary molar contained a very large carious lesion which had reached the pulp cavity of the molar and produced an abscess in the alveolus of the lingual tooth. This abscess had penetrated the lingual alveolar bone and apparently drained into the gingival tissues of the mouth. The left second mandibular molar displays a polished carious surface on its distal interproximal neck which appears to represent interproximal grooving. There is no evidence of gingivitis of any of the alveolar bone.

The occlusal enamel is completely worn off all teeth except the second and third mandibular molars of both sides. Dental tartar deposits are widespread, and their distribution indicates that the gums had receded well below the necks of most teeth. This gingival recession was probably a simple consequence of age.

Age-associated osteoarthritic lipping of synovial joint margins was slightly expressed, but present throughout the skeleton. The most extreme instance involved the intervertebral articular surfaces of two of the third through sixth certival vertebrae, wherein extensive osteoarthritic deposition was accompanied by eburnation of the joint surfaces. Osteophytic excrescences were observed on the centra of some cervical and lumbar vertebrae, but few of these vertebrae and no thoracic vertebrae were preserved.

Periostitis was also distributed widely throughout the skeleton as discrete, local plaques of pumice-like rapid reactive bone. The most extensively developed of these plaques is on the anterior distal metaphysical surface of the left radius where the deposit is at least 3 mm. thick. Other plaques of reactive periosteal bone were noted on the costal surface at the inferior angle of the right scapula, the anterior surface of the right humerus just above the medial epicondyle, the anterior surface of the interosseous crest at the mid-shaft of the left ulna, the circumference of the middle diaphysis of the right ulna, the postero-medial distal metaphyseal surface of the left femur, and on the lateral mid-shaft surface of the right tibia. Thus, all four limbs were involved and there was no clear pattern of distribution. Obviously, some systemic disturbance was responsible. Perhaps these several areas of periosteal activity represent the early stages of a hematogenous infection which would have presented a more classic picture if the host had lived longer.

The post-cranial pathologies are even more intriguing when they are combined with several observations of cranial pathologies in the same individual. The frontal bone displays a depression 10 mm. in diameter with no evidence of an old fracture, while the left parietal exhibits a blister of schlerotic bone, much like an osteoma, of about the same size. Above the temporal lines of both parietals and the frontal are several patches of exposed diploe, which were originally thought to be products of post-mortem erosion. On closer examination, however, it was discovered that some of these patches are sharply bordered, and, in one instance, the border is augmented by remodeled bone. No remodeling or erosion was observed on the endocranial table.

This total collection of cranial and post-cranial pathologies is suggestive of a treponemal infection. It is very difficult to argue strongly for such an infection in this case since the disease, whatever it was, had not run its course in the skeleton. The reactive periosteal deposits of the long bones have the macroscopic appearance of fine fibrous mats. While there is no evidence of resorptive enlargement of the medullary cavities, which argues against Paget's disease in this specimen, there is no obvious internal thickening of the cortical bone through trabecular deposition as seen in advanced treponematoses. Furthermore, no erosion of nasal or palatal bones was observed. It may be concluded only that the individual represented in Burial 6 suffered a systemic hematogenous pathology which behaved in several ways as a treponemal infection, but failed to leave conclusive evidence on the skeleton before the death of its host.

A septal aperture of the right humerus is the only skeletal anomaly accompanying a rather obvious artificial cranial deformation. This deformation consisted primarily of frontal flattening, but a trace of occipital flattening is also observable. This is the only instance of artificial cranial deformation encountered in an adult from the 1 Ja 300 series.

Burial 7. The remains of this 4 to 6 year-old individual exhibit one of the two instances of artificial cranial deformation found in this skeletal series. Although it is not circumspect to estimate the sex of skeletal remains at such an early age, this individual was tentatively identified as a female on the evidence of a large sciatic notch and clearly-developed preauricular sultus.

The only pathologies are associated with the teeth. Both maxillary deciduous first molars display caries on the distal neck, extending onto both crown and root. All the deciduous maxillary incisors had developed enamel caries near their necks. Reactive deposits extend down the roots of these incisors as evidence of periodontosis, or inflammation of the tissues surrounding the teeth.

The maxillary incisors also displayed a curious wear pattern. In addition to the predictable wear of their occlusal edges, these teeth were also worn on their lingual surfaces. This lingual wear took the form of small inverted ledges which exposed dentine and apparently resulted from an overbite.

The only post-cranial anomaly is a deep cleft on the left side of the manubrium sternum. This cleft is the result of a separate ossification center and would most likely have disappeared if the individual had lived longer. The human manubrium may ossify from as many as three centers, and separation of these centers into adulthood is not rare (Warwick and Williams 1973:251).

The cranium displays a pronounced artificial deformation which took the form of asymmetric flattening of the occiput. There was no premature synostosis of the cranial sutures. The flattened area covers the posterior half of the left parietal the left squamous portion of the occipital, and the mastoid region of the left temporal. There is no flattening elsewhere on the cranium, which is thereby given a decidedly plagiocranic appearance. Since it is so asymmetric, this may be unintentional artificial deformation.

Burial 8. No attempt was made to estimate the sex of this 3 to 5 year-old subadult. No pathologies were observed among the bones of this skeleton; the deciduous dentition however, displays several anomalies. The left and right deciduous second maxillary molars exhibit four roots due to the addition of a second lingual root. The right deciduous central and lateral mandibular incisors are fused to one another from their midcrowns to the spices of their roots. No disabilities would have ensured from these anomalous roots, yet the four-rooted molars might have proven difficult to evulse when the permanent second premolars began to erupt.

Burial 9. The remains of this 6 month to 1 year-old infant consist primarily of twelve deciduous teeth and the buds of two permanent teeth. The right ischium, some cranial fragments, a few phalanges, and several vertebral centra and laminae, together with odd fragments of the post-cranial skeleton complete the remains recovered. No pathologies or anomalies were observed, and no attempt was made to estimate the sex of the individual.

Estimation of Stature

Stature estimations were carried out for all the adult skeletons in this series. As implied in earlier comments, there is some reason to question the utility of stature estimations in archaeological series, particularly small ones.

The estimations of stature for the 1 Ja 300 series are treated together at this point as a device to demonstrate some of the reasons for such skepticism. The estimates given in Table 22 are based on the Mongoloid formulae of Trotter and Gleser (1958) and include the 95 per cent confidence intervals which may be derived from those formulae.

Inspection of Table 22 initially seems to indicate an extremely divergent small stature for Burial 3. Caution must be exercised, however, in interpreting this divergent individual. It should be remembered that the stature estimate for Burial 3 is itself based on an estimate of humerus length, as described earlier. Thus, the stature calculations for Burial 3 represent an estimate based on an estimate, and the potential for error is compounded. Although the ranges of error in the two estimations are accounted for, it is still difficult to argue that the female of Burial 3 was really such an extremely short individual. It must be admitted that the primary motivation for estimating stature in this case was obeisance to tradition in writing skeletal reports. Now that tradition has been fulfilled, the action seems hollow and basically uninformative.

Further investigation of Table 22 shows that, if Burial 3 is excluded, the confidence intervals of all other stature estimations overlap greatly. Even though males seem slightly taller, there are no statistically significant differences among the several estimates. It may readily be concluded that stature estimations for the 1 Ja 300 series have provided no worthwhile information toward revealing patterns within the series itself.

Summary

The skeletal series from 1 Ja 300 generally fails to sort itself into clearly definable and useful subdivisions based on either anomalies or pathologies. Two crania, however, those from Burials 6 and 7, display artificial cranial deformation. Such deformation apparently did not appear in the southeastern United States until Mississippian times, with the exception of Copena peoples. Beyond this, all the skeletons produce similar information about the people they served.

Some form of infection, ranging from dental abscesses to pyogenic arthritis, is evidenced in Burials 1 through 6. All adults display evidence of inflammatory reactions, and thereby testify to what was apparently an ever-present but invisible threat to personal health. The pyogenic arthritis of Burial 2, where there is no evidence of a direct injury to the bones of the ankle, reveals that even a slight wound could become fatal. As if in intentional contrast, the Colles' fracture of Burial 4 demonstrates that a fairly serious injury could be successfully repaired, so long as it did not become infected. Burial 1 demonstrates that even irritated gums might provide entry for microorganisms which could then travel through the bloodstream to other tissues. Bacterial and viral threats were among the greatest dangers to the health of these people and, as is well shown in this skeletal series, could enter the body at any location literally from head to foot.

Dental wear, which is most extensive in Burials 1 and 2, and dental caries, most severely developed in Burial 6, also range throughout the series. These three burials represent the oldest individuals in the series, all being about 50 years old. By this age then, the dentition tended to be lost to one cause or another, and may have been a signal of approaching senility. It is interesting to speculate that this alteration in one's ability to chew certain foods brought a change in nutritional intake and a decline in health. If this were so, dental health may have acted as a major parameter of average life span among these people. The lingual wear observed on the maxillary incisors of Burials 2 and 7 is an interesting refutation of the popular belief that an "edge-to-edge" occlusion typified American Indians, a belief based on incautious articulation of mandibles and maxillae containing worn teeth.

The repeated observations of skeletal and dental anomalies throughout the series suggest that a larger study of such anomalies in archaeological populations of the southeastern United States could be very valuable. Since skeletal anomalies are useful in assessing population affinities, such a larger study would be helpful in research based on small skeletal series, particularly those in which cultural affinities are unclear.

The small skeletal series from 1 Ja 300 is, in a strict sense, an inadequate foundation to support major generalizations about the lives of the people who existed at the site at various times. However, certain characteristics of the skeletal series are at least consistent with what is already known of those times. This distribution of ages at death indicates that death was most common among the very young and the fully matured. If one survived the first few years, life and health were relatively secure until later adulthood.

There was no evidence of "violent" death. Instead, the people were plagued by mostly minor injuries and infections. These took their toll over the years and, by the fifth decade or so, the scars of a rigorous existence inevitably marked the teeth and bones. Stress and strain left remodeled joints, omnipresent grit wore teeth away, caries eroded other teeth, and microorganismsm invaded the body at any opportunity. The attainment of an age beyond fifty years symbolized a hard-worn victory for the body tissues and the immune system. Such were the major obstacles to health confronting the people of 1 Ja 300, and they were once exceedingly common obstacles. In this sense, at least, the people of 1 Ja 300 were not unique.

Table 22. Stature Estimations and 95 Per Cent Confidence Intervals to Nearest Half Inch.

Provenience	Sex	Stature Estimate
Burial 1	Male	5 ft. 6.5 in. ± 3.5 in.
Burial 2	Male	5 ft. 4.5 in. ± 3.5 in.
Burial 3	Female	4 ft. 6.5 in. ± 4.0 in.
Burial 4	Female	5 ft. 4.5 in. ± 3.5 in.

CHAPTER IX

CONCLUSIONS

Evaluation of Sampling Techniques

The site sampling strategy at Bellefonte was the type commonly referred to as intuitive sampling. This is a frequent method in salvage situations, and in practice usually consists of concentrating the excavation in those portions of the site which produce the most artifacts, features, burials, etc., in the most well defined context, such as stratigraphic position or feature association. This method is often combined with mechanically stripping the overburden on the site to expose as great a number of features as possible over a wider area. This was not done at 1 Ja 300. It was felt that the combination of tree cover and shallowness of most of the features would result in excessive disturbance of most features by the stripping process.

The major concern of this portion of the report, however, is not the site sampling techniques, but the material sampling techniques applied within the excavated area. This evaluation must consider three aspects, the size of the sample, its distribution and its method of recovery. Three recovery methods were used at Bellefonte, troweling through the excavated soil and picking out specimens by hand, waterscreening through one-fourth inch square mesh, and waterscreening through three-thirty-seconds inch mesh. The two screens were nested so that only material passing through the coarse mesh was caught in the finer mesh, but obviously, it may be assumed that all material caught by the larger screen would have been caught by the smaller.

The hand recovery sample consisted of the 2- by 2-meter excavation units, except for the upper right 50- by 50-cm. block. These blocks were screened and make up a regular 6.25 per cent sample of the general excavations. Of course disruptions by features, adjustments for leaving balks, etc., prevented the sample from being completely regular.

The use of small screen size and waterscreening or flotation for the recovery of small materials will continue to grow in importance as the analytical and interpretive value of specimens recovered by these methods increases. However, the use of fine screen sampling greatly increases the time required to process these materials in the field and laboratory. Several hundred hours were required to sort the fine screen material from Bellefonte, and about 300 hours were spent identifying the small animal bone alone. The reduction of screen size and increase in recovery and labor are geometric progressions. In situations where time and funds both have definite limits, the balance point must be considered. When does expenditure of resources outweigh information gained? How can increased efficiency shift the balance point to give the same information for less effort, or more information for the same effort?

Archaeologists are well aware that screen size affects the recovered sample, and that no one size is best for all broad classes of material. An attempt at recovery of a pottery sample and charred botanical specimens in a single screen would have obvious drawbacks. The lithic, ceramic, faunal material, and charcoal samples from Bellefonte are first evaluated with respect to the different methods by which the samples were collected.

Material from Square 16L2 is used for the discussion of lithic and ceramic materials. This unit was selected for two reasons. First, it was uninterrupted by features so that the control column was a consistent percentage of the unit. Second, it was one of the deepest excavation units on the site, reaching a depth of 40 cm. Only a single unit was excavated to 50 cm. For purposes of this comparison, material was grouped without regard to cut. The excavation unit had a 15-cm. wide balk along the base line, so the actual volume of excavated soil was .1 M^3 for the control column, and 1.38 M^3 for the hand recovery.

In comparing the lithic material from the hand recovery with that from the one-fourth inch screen, there is a large numerical difference. On the basis of excavated distribution, we would expect to find 13.8 specimens in the hand recovered sample for each specimen in the screen. The actual ratio is only 2.4:1 (N = 506:210) indicating that a great many more specimens were recovered by screening. The artifact to debitage ratios for hand and one-fourth inch screen recovery are 1:13.5 and 1:25.3, respectively. The mean weight per piece of debitage, respectively, is 1.8 grams and 1.0 grams. Thus, the major differences seem to indicate that the screen was recovering more, and smaller pieces of debitage.

There are possible areas for significance of smaller debitage. Various sizes of debitage may be expected to result from differing manufacturing operations. Thus, the smaller material should be relevant to studies of lithic technology. Selection for further modification and utilization of debitage should have been influenced by size of the piece. Interestingly at Bellefonte, the ratios for utilized: non-utilized flakes is nearly the same for the two samples, being 1:15.2 for the hand recovery, and 1:16.8 for the screen. This indicates that the smaller debitage caught by the screen was only slightly less likely to be utilized.

The very small lithic material from the site which passed the coarse screen and was caught in the smaller screen proved to be of minimal use for the general types of analysis performed for this report. The estimated number of specimens is about 64,150, based on weight. Twenty-three items are identifiable as artifacts: 6 projectile point distal ends (Class 117), 12 microliths, and 5 unidentifiable chipped stone fragments. The rest consists of minute flakes and angular pieces of chert.

Nearly all of the ceramics from Bellefonte were limestone tempered, and only the limestone ceramics from Square 16L2 are considered here. This discussion is limited to the comparison of the hand and one-fourth inch screen. Thus, the small ceramic pellets caught in the fine screen were disregarded for this report.

As was the case for the lithic sample, a higher number of specimens per volume of soil was recovered in the screen. The expected ratio is again 13.8:1, while the observed ratio is only 2.2:1 (N = 384:174). This is surprisingly, but perhaps only coincidentally, close to the lithic recovery ratio of 2.4:1. The size of most of the additional sherds was small, and the use of the screened sample affected both the number and proportions of identified ceramic types. This effect was likely accentuated at Bellefonte due to the presence of three varieties of basically plain ware; smooth, rough and brushed. Due to difficulty of identification, the screened sample had a greater proportion of sherds classed as smooth *vs.* rough and brushed (1:3.2 hand, 1:1 screen). The screened material also had a much greater proportion of eroded sherds, 63.8 per cent *vs.* 12.2 per cent.

Another effect of screen size on ceramics is in the relative frequency of different temper types. This was not a significant factor at Bellefonte because limestone was so dominant on the site, but the problem has been recognized and discussed by Chapman (1973). On the whole it appears that one-quarter inch is too small a screen for standard typological analysis. Ceramic samples from other sites have been standardized at one inch (Chapman 1973, 1976a), and this author has used a one-half inch screen to standardize ceramic samples (Futato 1973).

It is more difficult to evaluate the effect of screening on the faunal material on the basis of the present data. Many species of vertebrates at the site are represented by only a few elements, often only one. Size of identifiable elements varies greatly within as well as between species. Some species were found only in features, and this may be due to differential preservation as well as recovery. The different species recovered by each method is given in Table 18. This data, compared with the list of recovered elements (Tables 13-14), indicates that small animals were recovered mainly by screening.

The recovery of snails was also enhanced by screening. The presence of *Anculosa* beads in Burials 7, 8, and 9 was not noted on the field forms for these burials. These beads, mixed with the other shell in the fill, could easily have been overlooked by the excavators. In one instance all of the beads were recovered in the three-thirty-second inch screen. Clearly, the known distribution of this artifact class was relative to the recovery method used. Without screening they were found clustered at the elbows of one child burial. With one-fourth inch screen they were found in three of four child burials. With finer mesh they were recovered from all child burials.

The impact of mesh size on charcoal recovery is obvious. Virtually no charcoal was caught in the large screen, and it is probable that smaller seeds passed through the smaller screen. Table 21 shows that the recovery of botanical material from a non-feature context was generally not productive.

While the peculiarities of archaeological sites and the varying goals and limitations of archaeological research projects prohibit the feasibility, or even desirability, of a standardized set of recovery techniques, certain generalizations may be drawn from Bellefonte for consideration in other circumstances. For the kinds of analysis performed for this report, the following screen sizes might have been most efficient: one-inch for ceramics; one-fourth inch for lithics and faunal material; three-thirty-seconds inch and possibly smaller for charcoal.

There are some obvious caveats which may be brought up here. Any implication that screening the above materials to a smaller size is non-productive, is unintentional. There are exceptions to these screen sizes within this very report. Two in particular are the high percentage of microliths and *Anculosa* beads caught in the small screen.

An additional point to consider is the recovery of material for the immediate purpose of preservation rather than analysis. This has always been one product of archaeology, and I think it is a valid one in salvage situations. The question is, "What should be preserved?" The answer is, "All that is practical." The small debitage from the fine screen used at Bellefonte was of little use in this study, but there are certainly studies for which it would be useful, or even vital. Perhaps we need more consciously to deal with differing concepts of what is sampled (preserved) in the field, and what is sampled (analyzed) in the laboratory. This has always been an implicit part of archaeology. It needs to be dealt with in a more explicit manner. Sampling in the laboratory, in addition to sampling in the field, is receiving more and more consideration. This will permit the examination of many sampling problems in the laboratory. The number of control columns at Bellefonte, for example, may have been reduced by a factor of two or four for this report without significant changes in the result. It will probably always be easier to answer questions of sample adequacy in the laboratory than in the field. Large salvage projects do, and should, recover as much material and data as possible, and the time and funds for the analysis and reporting just will not permit a "complete" study.

Advances in laboratory methods and techniques must parallel the continued advances of field methods and techniques. One of the most beneficial advances would be the ability to separate mechanically fine screened material samples into basic components, stone, shell, bone, ceramics, etc. This type of sorting consumes a disproportionate amount of time, and its reduction would greatly increase the volume of material which could be studied. In fact, work with differential specific gravity of material classes, now is permitting chemical floatation and separation of these materials, but this is only one area of potential advancement.

Discussion of Occupations

Archaic

In the first chronology for the Guntersville Basin, Webb and Wilder define the Gunterlands I period for the entire preceramic occupation of the area. They note the lack of large, deep shell middens for the Archaic here, as compared to downstream, and characterize the occupation:

> ...as reported on a few sites, there were found strata which showed fire basins, fire-cracked rocks, hammerstones, flint spalls and cores, and fragments of vessels made of sandstone or steatite. These strata were without pottery of any kind...While the evidence for prepottery occupancy in the Guntersville Basin is small, it is nevertheless, conclusive (Webb and Wilder 1951:270).

This present report, and indeed, most other work in the immediate area, have added little more to our understanding of the Archaic in this area, except more fully to document the successive occupations on the basis of projectile point styles.

Early Archaic. The Early Archaic occupation of the Bellefonte site was apparently transient in nature and is recognizable only by a few projectile points. The earliest documented occupation is marked by points assignable to the Kirk Corner Notched Cluster (Classes 68-69, 103, 109-112). No radiocarbon dates are available for this occupation of the Middle Tennessee River Valley, but on the basis of dates from the Tellico Reservoir on the Little Tennessee River (Chapman 1976a, 1976b), we may expect the dates to be between 7500 and 6500 B.C. This estimate is given some support by the dates from Lower Layer G at Russell Cave. The major projectile point types found here were Kirk Serrated and LeCroy which post-date Kirk Corner Notched. The dates from this layer range from 6485 to 5615 B.C. (J. Griffin 1974).

A single bifurcate base point with ground haft element edges (Class 113) was found at Bellefonte. It may be somewhat specious to project an occupation of a site on the basis of only a couple of projectile points, and even more so in the case of a single artifact, but the Class 113 point, along with the possible inclusion of Classes 85-87, may be indicative of utilization of the site by makers of bifurcate points. The use of bifurcate points as a horizon marker for a portion of the Early Archaic is becoming more and more widespread in the Eastern United States (Fitting 1964; Chapman 1976a, 1976b; Walthall n.d.). Within this horizon, numerous projectile point types and archaeological phases based on point types have been proposed, but taken as a whole, the bifurcate points date roughly between 7000 and 6000 B.C. (Broyles 1971; Chapman 1976a, 1976b).

It is not possible to assign any other artifacts to a specific Early Archaic provenience, although other artifacts which may date from this time include the flake knives and some scrapers. The lack of discernible change in the Early Archaic non-projectile point lithic assemblage from Rose Island has been pointed out by Chapman (1976a), and without stratigraphic criteria, no specific assignment may be offered for the Bellefonte specimens.

Middle Archaic. This occupation of the site is also best marked by projectile points; Class 106 contains two Eva points, and Classes 100-102 are Morrow Mountain points. Use of the site again was brief, and other artifacts are not assignable to this occupation. Eva points are more common in the lower Tennessee River Valley, and no separate Eva occupation of North Alabama is recognized by Walthall (n.d.). In fact, the Morrow Mountain horizon is the only specific Middle Archaic complex discussed by Walthall. He attributes this to two factors; the relative lack of comparative research dealing with this period, and the increased diversity of the materials from this period. Eva points from the Middle Tennessee Valley are generally found in association with Morrow Mountain points, and they are considered for this report as a combined Eva-Morrow Mountain occupation. Technically Morrow Mountain-Eva might be a better term for use in North Alabama, for in contrast to a rather secondary occurrence of Eva materials, there is an extensive distribution of Morrow Mountain materials. In the area around Guntersville Lake, significant Morrow Mountain occupations have been recorded at Russell Cave (J. Griffin 1974) and in a series of bluff shelters on Sand Mountain (Clayton 1965).

Three radiocarbon dates from Layer F at Russell Cave, which contained most of the Morrow Mountain artifacts, are 4360±140 B.C., 4300±190 B.C., and 4030±200 B.C. (J. Griffin 1974). The first two of these dates are from Burial 4 and Burial 1, respectively. The five Layer F burials at Russell Cave did not contain artifacts, in contrast to the Morrow Mountain burials from the Stanfield-Worley Bluff Shelter (DeJarnette, Kurjack, and Cambron 1962). This coupled with the intrusion into Burial 4 of a pit containing Morrow Mountain artifacts led Griffin to consider the burials to be a little pre-Morrow Mountain.

A Morrow Mountain date for northeastern Alabama is available from a hearth at the Stucks Bluff site. Charcoal from this hearth, which contained a Morrow Mountain point, was dated at 4500±120 B.C. (DeJarnette, Walthall, and Wimberly 1975). A sample of dispersed charcoal from the pit excavated at 40 Cf 107 in the Normandy Reservoir on the Duck River, and containing a fragment of a Morrow Mountain point, was dated at 4575±165 B.C. (McCollough 1976). Chapman (1976b) gives a Morrow Mountain date of 5045 B.C. for a site on the Little Tennessee River. As a whole, these dates indicate that the Eva-Morrow Mountain materials from Bellefonte evince some utilization of the site between 5000 and 4000 B.C.

Additional Middle Archaic utilization of the site may be indicated by projectile point Classes 92-98, similar to the Sykes and White Springs points. However the temporal provenience can be stated only as from Eva-Morrow Mountain to sometime in the Late Archaic, as Sykes-White Springs points have been found in a very broad context in a number of sites such as Eva (Lewis and Lewis 1961), Stanfield-Worley (DeJarnette, Kurjack and Cambron 1962), Westmoreland-Barber (Faulkner and Graham 1966a), the Normandy Reservoir (Faulkner and McCollough 1973), and the Champion site (Oakley and Futato 1975). There is apparently a broad temporal and spatial boundary around the artifacts classed as Sykes-White Springs, and this is one particular subject needing closer definitive and comparative work.

Late Archaic. Relatively large, stemmed projectile points, generally considered Late Archaic, were common on the site, and a number of classes are assignable to this occupation. However, most of these projectile points may be grouped into two clusters. These are the Pickwick cluster and the apparently later Wade cluster, generally analogous to the Ledbetter and Wade clusters of the Normandy Reservoir (Faulkner and McCollough 1973). These two clusters are intuitively based at Bellefonte; the specific number of archaeological phases represented is unknown. In addition, it is not possible to say that artifacts in these clusters are restricted to a Late Archaic provenience; indeed, there is evidence from other sites indicating that this is not the case. The Pickwick cluster contains large straight or tapering stemmed points similar to those typed as Pickwick, Ledbetter, or Little Bear Creek (Classes 70-76). The Wade cluster at Bellefonte contains stemmed projectile points having short, broad triangular blades. They are similar to the Wade, Elora, and Cotaco Creek types (Classes 53-60). Classes 61 and 62 are also included.

Comparative data on the Late Archaic in this area are available from the reports of work in the Nickajack Reservoir, which included the upper portion of Guntersville Lake. Shell middens are recorded for Archaic components at the Bible site (Faulkner and Graham 1966b) and the Westmoreland-Barber site (Faulkner and Graham 1965, 1966a), but are generally confined to the last part of the Late Archaic. This indicates that shellfish collecting at Bellefonte may have begun late in the Archaic.

There are some differences between Bellefonte and the Nickajack sites. The Late Archaic sites from Nickajack yielded pits, fire basins, and one round grave burial. No features from the excavated portion of the Bellefonte site could be classed as Late Archaic. One Class 70 point in Feature 17, a Mississippian pit, was the only artifact from either the Pickwick or Wade cluster in feature association. The lack of excavated Late Archaic features at Bellefonte might indicate a more transient occupation.

Other artifacts from Bellefonte which are probably associated with the Late Archaic include other classes of stemmed projectile points, biface knives, and scrapers. The pecked and ground stone assemblage probably includes the limestone plummet, and some of the steatite vessel sherds. The steatite sherds are significant in that they demonstrate some direct or indirect contact with the Georgia Piedmont area during the Late Archaic or Early Woodland.

Woodland

Early Woodland. The dividing line between Archaic and Woodland cultures in Alabama has usually been based on the appearance of pottery, and the term Woodland has been applied to a great variety of pre-Mississippian ceramic manufacturing groups. Walthall and Jenkins (1976) have recently offered an organizational framework for the Southeast which places the early ceramic cultures of the South Coastal Plain into the Gulf Formational Stage. The pertinent archaeological cultural assemblages of the Middle Tennessee Valley are the Wheeler and Alexander complexes, which are classified as Middle and Late Gulf Formational, respectively. This taxonomic system is adopted for this report because it served two purposes. It eliminates the problem of whether the fiber tempered ceramics should be considered Late Archaic, Early Woodland, or Transitional Archaic-Woodland. In light of a posited cultural continuum, this is largely inconsequential in any case. Secondly, and more importantly, it permits differentiation of the North Alabama materials into those which are part of the Gulf Tradition (Caldwell 1958), and those which may be more properly called Woodland in the original sense, as in relation to the Woodland Pattern (Woodland Conference 1943).

There are small amounts of Wheeler and Alexander ceramics present in Guntersville Basin, although only the former was present at the Bellefonte site. The possible occupation of this area by the makers of these ceramics is important, for resolution of this will to some degree either strengthen or weaken the correlation of Gulf Formational Cultures with the Gulf Coastal Plain. The presence of each of the ceramics in the area may be accounted for in two ways, local manufacture or trade.

Given an estimated date of 1000 - 800 B.C. for the arrival of Wheeler ceramics in the western Middle Tennessee Valley (Jenkins 1973, 1974), and Walthall's estimate of 500 B.C. for Alexander in this area (Walthall n.d.), there is enough time for the diffusion of these ceramics into Guntersville Basin, prior to 340±150 B.C., the earliest available date for fabric marked ceramics in this area (Faulkner and Graham 1966a). However, only one sherd of fiber tempered pottery was recovered from the Westmoreland-Barber site which produced a Late Archaic date of 755±155 B.C. (Faulkner and Graham 1966a), indicating little significance for pottery by this time.

It is also possible that further research in Guntersville Basin may produce earlier dates for Long Branch Fabric Marked. An early Woodland component of the Nowlin II site in Normandy Reservoir has been dated at 675±140 B.C. and 400±125 B.C. (McCollough and DuVall 1976). A date of 480±180 B.C. was obtained by Salo (1969) for the Watts Bar zone at the Bacon Bend site on the Little Tennessee River. He felt the date was too early at that time, but it is in line with other dates such as those from Nowlin II. Early dates for the Kellog focus also fall within this range. Garrow (1975) cites two dates from the

Mahan site in northwest Georgia of 540±100 B.C. and 630±100 B.C. Consequently, there may be only a short span of time available for potential Gulf Formational occupation of Guntersville Basin between the preceramic and Long Branch occupations.

David Dye (1973) has described the Hardin subphase III for the Alexander occupation of about the upper one-third of Wheeler Basin through Guntersville Basin. However, very few sherds of decorated Alexander series types were recorded by Heimlich for Guntersville Basin (1952), and the plain sand tempered sherds called O'Neal Plain by both authors may have in part come from a number of non-Alexander types. All things considered, it seems to this author that based on current typological and temporal evidence, a Wheeler complex occupation of Guntersville Basin is possible but clearly of a limited scope. A distinct Alexander occupation seems unlikely, and the concept of a Hardin subphase III probably should be considered superfluous, at least until supported by clear stratigraphic or similar evidence.

Long Branch Fabric Marked was recognized as the earliest major pottery type in Nickajack Reservoir (Faulkner and Graham 1966a) and this is true at Bellefonte as well. Radiocarbon dates for Long Branch Fabric Marked in this area are 340±200 B.C. at Russell Cave (Griffin 1974). Walthall (n.d.) has described the Colbert culture for this area and time, named after Caldwell's (1958) Colbert focus. The Bellefonte ceramic assemblage from this time contains Long Branch Fabric Marked, Mulberry Creek Plain, and most, if not all, of the quartz/sand tempered pottery, particularly the plain, fabric marked, and simple stamped types.

The major projectile point types associated with this occupation are a variety of medium sized triangular artifacts in the Copena Triangular cluster, Classes 9-14, 16-20. These correspond to the types Copena Triangular, Camp Creek, Greenville, and Nolichucky. There is evidence among these classes from Bellefonte to indicate that these artifacts were often used as knives. Other projectile points which may date from this occupation include those forms such as the Wade cluster which apparently date from Late Archaic through Early Woodland, plus Class 42 (Adena), Classes 44-47 (Flint Creek) and other stemmed projectile points.

Projectile point Classes 25-39 are similar to a number of previously described Woodland types; Upper Valley Side Notched (Kneberg 1956), Knight Island, and Sublett Ferry (Cambron and Hulse 1964). These classes are referred to as the Upper Valley cluster. The descriptions of these types give an Early to Middle Woodland provenience, possibly extending into Late Woodland. These artifacts may be part of the Colbert assemblage, but are not a conspicuous part of the lithic assemblage at related sites. Four Upper Valley Side Notched points were found at Westmoreland-Barber (Faulkner and Graham 1966a), and three artifacts typed as Sublett Ferry are reported from the restudy of the McDonald site, 1 Ms 147, by Walthall (1973). Points comparable to these were absent at the Camp Creek site (Lewis and Kneberg 1957), the Watts Bar zone at Bacon Bend in the Tellico Reservoir (Salo 1969), and Stratum II at the Higgs site (McCollough and Faulkner 1973) all marked by fabric marked ceramics. On the other hand, they were not noted for three

Middle Woodland villages reported on by Walthall (1973). It seems that the association of projectile point Classes 25-39 remains in question.

The Colbert occupation of Guntersville Basin saw a large increase in the size and number of sites. At Bellefonte, there seems to have been a corresponding increase in the intensity of occupation. Burials 1 and 2 contained large percentages of Long Branch Fabric Marked pottery and are apparent Colbert burials. Burial 3 had a preponderance of plain pottery in the fill, but a sample of bone yielded a date of 460±85 B.C. (DIC 538), minimum age. If this is accurate, it will be among the earliest dates for Long Branch. Features 2 and 8 may be Colbert features or may be somewhat later. The intrusion of Burial 2 into Feature 2 gives some support to its placement as a Colbert feature, because Burial 2 also contained a high percentage of Long Branch Fabric Marked and Mulberry Creek Plain, Smooth. Small amounts of Wright Check Stamped were present in both Burial 2 and Feature 2 and may indicate a somewhat later date.

Numerous shell middens were laid down during this time, and much of the Bellefonte midden may date from this occupation. Colbert culture occupations are frequent in uplands surrounding Guntersville Basin. Layer D at Russell Cave (Griffin 1974) and several of the Sand Mountain bluff shelters had Colbert culture components (Clayton 1965). It is presumed that occupation shifted on a seasonal basis, with the riverine environment being most heavily exploited in warm weather, but supportive data and details of the occupation seasonality and scheduling of economic activities are few.

Middle Woodland. The Middle Woodland occupation of the Bellefonte site is assignable to the Copena culture, and the data from this site may be added to a growing body of information on the range of Copena culture outside of the ceremonial mortuary complex. The ceramic assemblage is typified by the contents of Feature 21 which contained large amounts of Mulberry Creek Plain, nearly all smooth, along with Wright Check Stamped, Bluff Creek Simple Stamped and Pickwick Complicated Stamped. Long Branch Fabric Marked pottery was also contained in the pit but may have been redeposited. Feature 21 was a large bell-shaped pit, presumably dug for storage and later filled with midden. The botanical and faunal material indicate a broad use of forest and riverine products including deer, squirrels, crayfish, mussels, aquatic snails, turtles, raccoon, beaver, fish, nuts, persimmons, and berries.

A charcoal sample from the pit yielded a date of A.D. 420±60 (DIC-536). This seems to be from the later part of the Middle Woodland based on both the time span of Copena estimated by Walthall at A.D. 150 to 500 (Walthall 1972), and the presence of all three types of stamping; check, simple, and complicated. The date is also slightly later than the dates on two Copena Mounds from Marshall and Morgan counties, A.D. 320±65 and A.D. 375±75 respectively (Walthall 1977).

The Copena chipped stone assemblage at this site includes points of the Copena triangular cluster, many used as knives, Copena (Class 15), Bradley Spike (Classes 21-23) and probably New Market (Class 24). Bradley Spike points were also found in the Middle Woodland context at the Icehouse

Bottom site (Chapman 1973), and one was found in a Henderson phase pit in central Alabama dated at A.D. 530±100 (Dickens 1971). Four points of this type were also found at the Lay site in Nickajack Reservoir (Faulkner and Graham 1966b) where there was a large component of limestone tempered plain and stamped pottery.

The microlith assemblage may first have appeared on the site during the Middle Woodland occupation. Two microliths were found in Feature 21, and all features and burials containing microliths in the fill have an apparent association of Middle Woodland or later. This inference is somewhat weakened, however, by the lack of contrastive data. That is, while there are several post-Middle Woodland features which demonstrate the presence of microliths, there are few pre-Middle Woodland features to demonstrate the absence of microliths.

In addition to Feature 21, only Feature 20 may be considered Middle Woodland with moderate confidence. Almost all of the pottery from this pit is Mulberry Creek Plain, Smooth. Flexed village burials are noted for sites of this time period such as Wright Village (Walthall 1973) and the Lay site (Faulkner and Graham 1966b), so some of the burials at Bellefonte may date to the Copena occupation, although no traits of the Copena mortuary complex were present.

The proposed settlement pattern is basically the same as that for the Colbert culture, and is in the same marginal state of clarity and confirmation. There is, however, one possible significant difference. On at least three sites in the

Guntersville Reservoir Late Archaic/Early Woodland shell middens are separated from Late Woodland shell middens by a Middle Woodland stratum without shell. Two of these sites are the Westmoreland-Barber and Lay sites (Faulkner and Graham 1966a, 1966b) adjacent sites on the upper end of former Guntersville Lake. The third is the Harris site (Webb and Wilder 1951, Walthall 1973) near the southern end of Guntersville Lake. The mussel collecting hiatus during the Middle Woodland at these sites is certainly an interesting phenomenon. Is it due to the availability of mussels at these sites only, or is it more widely spread? There were some mussels in Features 20 and 21 at Bellefonte so mussels were apparently used to some degree, but are there more extensive Middle Woodland shell middens in the area to compare with those which come before and after? If not, why not?

Late Woodland. The Late Woodland ceramic assemblage from the Guntersville Basin area is distinct from that of the Hamilton culture farther up the Tennessee in that the cord-marked ceramics of Hamilton association are lacking. Also, the burial mounds of the Hamilton culture are present in a much reduced state of complexity, if at all. For these reasons, Walthall (n.d.) has termed the Guntersville Basin culture Flint River. The pottery types of the Flint River culture are Mulberry Creek Plain and Flint River Brushed. The brushed ceramics are considered to be the late time marker, and the inconsistencies in what is called plain *vs.* brushed impede comparisons between reports. The pottery type Mulberry Creek Plain, Rough is used in this report in an attempt to isolate the scraped or otherwise roughened ceramics at times included as brushed, and at times not. Hopefully, this will permit comparison of the Bellefonte sherd counts and percentages with those from other sites based on either sorting method.

The projectile points from the Flint River occupation at Bellefonte are the small incurvate-base triangular points of the Hamilton cluster (Classes 2-4). Microliths were found in Late Woodland association at the Westmoreland-Barber site and at Moccasin Bend near Chattanooga (Faulkner and Graham 1966a, Graham 1964). Microliths were found in association with Late Woodland ceramics in Features 11 and 13 at Bellefonte.

Features 11 and 13 were small basin shaped pits. Feature 22 was a partially excavated deep rectangular pit which also contained Flint River ceramics. All of these features were found to contain traces of corn (Table 21), although the amount is very small in each case. Corn was found in a Flint River context at Westmoreland-Barber in Feature 50, dated at A.D. 625 ± 105 (Faulkner and Graham 1966a). If degree of use is in proportion to representation in the archaeological record, however, gathered plants were still of the greatest importance.

The settlement pattern proposed for the Flint River culture by Walthall (n.d.) is an adaptation of the Hamilton model advanced by McCollough and Faulkner (1973). Three basic types of sites are involved; large summer floodplain settlements occupied in summer and fall, smaller dispersed winter base camps, and temporary upland camps for hunting, etc. Following this, Bellefonte might be expected to be a winter base camp, but data on seasonality is inconclusive. The botanical material includes mostly fall-winter products. Fish, turtles and mussels are frequently thought to be indicators of warm weather occupation.

Mississippian

The Mississippian occupation of Bellefonte consists of a single Early Mississippian component. All of the shell tempered ceramics are Plain Shell, except for a single sherd of Langston Fabric Marked. One noded lug or fragmentary strap handle is the only definite appendage found. The clay-grit tempered ceramics on the site are possibly associated with the Mississippian occupation. Three Mississippian refuse filled pits all contained clay-grit tempered pottery, and they were the only pits to contain sherds of this temper group. Jenkins and Nielsen (1974) have defined the West Jefferson phase in Jefferson County, Alabama, which is marked by a mixture of Woodland and Mississippian ceramic traits. The majority ceramic type is West Jefferson plain, a clay tempered type usually in the shape of globular bowls, often with loop or strap handles. Nine radiocarbon dates for the phase from three sites range from A.D. 875 to 1060. The authors also propose a source for at least some of the Mississippian traits in the Hiwassee Island culture and a route of transmission down the Sequatchie Valley. Given a date of A.D. 1160$\pm$60 (DIC-539) for Burial 7 at Bellefonte, it is not inconceivable that clay tempered ceramics were present during the Mississippian occupation. On the other hand, it must be admitted that they could have been introduced on the site in the latter part of the Woodland and not found their way into any clear Woodland context. In any case, the clarification of the association of the clay-grit ceramics in Guntersville Basin, with the resultant implications concerning outside contact, is certainly an area for continued research. Other Mississippian artifacts from Bellefonte include small triangular projectile points, and a quartzite discoidal.

The Mississippian occupation at Bellefonte produced the only evidence of any structures on the site. Feature 16 was a small, semi-subterranean structure made with individually set posts. Features 17, 18, and 19 were large overlapping, irregular Mississippian pits containing large amounts of fire-cracked rock. Their proximity to Feature 16 and its small semi-subterranean nature lead to the inference that this was a sweat lodge. However, whether it was used for ceremonial sweating, for a winter sleep house, for both, or for neither is not certain. More typical Mississippian house structures may or may not have been present on unexcavated portions of the site.

Burials 6, 7, 8, and 9 are assignable to the Mississippian component. Burial 6 was radiocarbon dated at A.D. 700± 165 years (DIC-537). However, the sample consisted of charcoal from the pit fill which may not have been in primary association. A single sherd of shell tempered ceramics in the pit fill, and fronto-occipital deformation of the skull argue for a Mississippian placement. Skeletal material from Burial 7 was dated at A.D. 1160±60 (DIC-539). Burials 7, 8, and 9 were all children and were located near the other Mississippian features of Area A. All had *Anculosa* shell beads in the pit fill. In addition, Burial 9 was wearing a necklace of columella beads and a circular shell gorget engraved with a circular cross design (Plate 37). This design falls into Kneberg's early group of motifs (Kneberg 1959), which is consistent with the radiocarbon date. This is a common design, and Kneberg illustrates an identical gorget from the Hixon site in Tennessee (Kneberg 1959, Fig. 3). A second identical gorget is illustrated by William Webb (1939, Plate 95) from Hobbs Island in Wheeler Basin. Elaborations of this design on gorgets and painted pottery are also known (Kneberg 1959: Figs. 4, 27; W. Webb 1939: Plates 96, 97; Webb and Wilder 1951: Plate 76D).

The number of burials, particularly of children, and the construction of at least one relatively permanent structure indicate a more sedentary occupation of the Bellefonte site during the Mississippian. Several large Early Mississippian sites in the basin were excavated and reported on by Webb and Wilder (1951). Presumably the Bellefonte site was the locus of a small hamlet or farmstead allied to one of these large villages.

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