# THE HESTER SITE

## An Early Archaic Occupation in Monroe County, Mississippi

## I. A Preliminary Report

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# PREFACE

The Mississippi Department of Archives and History first learned of the existence of the Hester site in December, 1973. Collectors Glenn Beachum and Alan Harrison of Amory located the Monroe County site during the early summer of 1973, dug a large area, and recovered several hundred of the better-made more-complete artifacts.

For two weeks in December, 1973, Department archaeologists excavated a series of five-foot-square test pits (fig. 1) to determine whether any portion of the site remained undisturbed and whether large-scale excavations were feasible. The initial tests proved that there was a deep midden remaining under a substantial portion of the site, and a report on the early tests was published in the Mississippi Archaeological Association Newsletter (Brookes and McGahey 1974). Plans were made for further excavation at the site.

Examination of the Beachum and Harrison collections revealed that most of the Early Archaic forms listed in the Handbook of Alabama Archaeology were present at the Hester site, and it was thus thought that tests at the site could supply information concerning stratigraphic-temporal relationships of many Early Archaic projectile-point forms in the Southeast. The validity of chronological schemes based on projectile-point forms has been demonstrated in several reports. Two of the best and most often quoted references are Coe's (1964) work in the Carolina Piedmont and Broyle's reports (1966, 1971) of excavations in West Virginia. Eastern archaeologists have long used ceramic typology with a confidence approaching fanaticism, but at the same time many have shied away from projectile-point typology and have in some instances omitted the subject entirely. As one who has long had research interests in early cultures, the author has of necessity put great faith in projectile-point types, provided they are explicitly defined and demonstrate usefulness in the ordering of data. The types occurring at Hester do provide a chronological sequence for a major portion of the Early Archaic period.

Numerous sites excavated in Alabama have produced many of these same point types. The chronology, however, is often a bit confusing because of the nature of the sites themselves. One of the best-known Early Archaic sites, the Stanfield-Worley bluff shelter, is a good example of the problem. A rock shelter is a confining space for human activity. Digging pits and burials, and other human activity, often disturbs earlier zones at such sites, bringing earlier artifacts into higher levels, and redepositing later ones at lower levels, thereby confusing the chronological sequence. It was hoped that this problem could be avoided at the more open occupational area of Hester, which is located in the alluvial plain and therefore might have enjoyed a more rapid depositional sequence. Such proved to be the case: in very few instances was disturbance noted or suspected. It was anticipated that after a projectile-points sequence had been established, analysis and comparison of artifact assemblages would not only provide evidence of stylistic change through time, but would as well indicate changes in exploitative techniques and perhaps changes in site utilization.

The early tests conducted in December, 1973, revealed a relatively deep midden. The sequences of points, however, was not readily apparent because only small widely scattered pits were excavated. Excavation of a long trench, it was thought, would enable archaeologists to record a depositional sequence covering a wide area and to delineate any disturbances which might affect stratigraphic contexts. Although subsequent excavations of a trench 150 by 5 feet permitted only a very narrow view of the site and allowed extraction of but limited data, evidence of certain activities at Hester was nonetheless observed, and new facts can be added to the body of knowledge of the Early Archaic period in the Southeast.

## ACKNOWLEDGEMENTS

Excavation at Hester was made possible in part by the board of directors of the Tombigbee River Valley Water Management District. Matching funds secured from that organization with the help of B. H. Fowlkes of Amory enabled the Mississippi Department of Archives and History to conduct further research at the site.

The Hester family, acting through Miss Addie Hester, most generously granted permission to excavate on their property. Their interest in the excavation efforts made the work much more enjoyable.

Field crew members Bruce Gray, Byron Inmon, and Angela Rodrigue, all University of Mississippi graduates with excavation experience, labored diligently in the hot sun. Their work and enthusiasm are appreciated. Glenn Beachum completed the crew. Beachum's archaeological efforts and his technical ability used in servicing and building much of the field equipment are greatly appreciated. The crew was supplemented by John Sparks, a Tupelo resident who joined the work in progress upon hearing of the dig.

Charles Bacon, John Howell, Priscilla Lowrey, Samuel O. McGahey, and Roderick Stennis edited this report, for which John Connaway, Burt Jaegar, John Penman, Angela Rodrigue, and Harold Smith took the photographs.

Permission to use illustrations originally appearing in other works was graciously granted for publications of the Arkansas Archaeological Survey, Catholic University of America, the Mississippi Museum of Natural Science, Mississippi State University, the National Park Service, the _Newsletter of Lithic Technology_, and the Oklahoma Anthropological Society. Full facts of original publication appear on each illustration.

The advice and opinions of colleagues are helpful in the preparation of any report. The author corresponded with numerous individuals, whose interest in the problem of Early Archaic points is greatly appreciated. Jeffrey P. Brain, James W. Cambron, Jefferson Chapman, David L. DeJarnette, Don W. Dragoo, Dan F. Morse, and Clarence H. Webb supplied comments and criticism on statements put to them. All ideas set forth in this report, however, are the sole responsibility of the author.

Samuel O. McGahey, who acted as project coordinator, graciously lent his hand in the excavation and drew the site map (fig. 1). He supplied comments, criticism, and suggestions throughout all phases of the project. His advice and comments on lithic technology are greatly appreciated, and much of what the author knows about Archaic lithic reduction has come from observation of McGahey's flint knappings. After watching him stroll through Standifer Creek, breaking rocks, selecting quality material, and putting it in a bag which he carried on his shoulder, the author feels that he understands much more about the aboriginal who cached the preforms uncovered several thousands of years later.

# 1

# INTRODUCTION

## Environment

The Hester site (22-Mo-569) is located within the Tennessee River Hills physiographic region of Mississippi (fig. 2; see Wolfe 1971). According to a finer division of this region into smaller ecosystems, Hester is in the Eutaw Hills ecosystem (Miller et al. 1973). (For a detailed description of the various ecosystems, the reader is referred to Miller's work as well as Blakeman's [1976] survey report.) More specifically, the site is located in the alluvial floodplain of the Tombigbee River on the east bank of the river's present course. Standifer Creek empties into the Tombigbee just southeast of Hester, but because the creek has been rechanneled quite extensively its original relationship to the site is questionable.

Four distinct soil zones present at Hester, from surface to base of excavation, are: a layer of black sandy humus, a layer of reddish brown sand, a layer of yellow sand, and a layer of white sand (see figs. 7-10). These sand layers conform to the descriptions of Eutaw soil, which is composed of predominantly fine- to medium-grained micaceous glauconite sand. The sand colors are essentially those described by Vestal and McCutcheon: "Fresh sands of the Eutaw may be white, but commonly are gray to greenish gray; the weathered facies are deep reddish to brownish due to the oxidation of the iron-bearing constituents . . ." (1943:25). Discounting the upper humus zone, which is much disturbed by modern activities, some speculations about the soil zones at Hester may be offered.

The reddish brown zone, which contains all the Early Archaic materials at Hester, certainly seems to be oxidized sand. The zone is the deepest and, if the projectile-point forms are as reliable an indicator of change through time as presumed, contains the longest occupational sequences. Heavy use of the reddish brown sand zone at Hester could be responsible for the oxidation that has produced the color change. Inhabitants of the site would have disturbed the soils in their daily activities such as digging. If residences were present, these, as well as heavily utilized work areas and trails, would be lacking in vegetative cover and therefore more subject to oxidation.

The zone of yellow sand at Hester is very thin and contains remnants of only one period (transitional Paleo-Archaic). The zone, hereinafter referred to as the Dalton zone, contains artifacts throughout but lacks the number and variety of tools found in the Archaic (reddish brown) zone. Essentially, this condition means that the Dalton utilization (not "occupation," which implies longer-term more-permanent use) was sparse both in time and in numbers of people and types of activities performed. It is proposed here that the yellow color of this zone indicates an early stage of weathering and oxidation of the lower (sterile) zone of white sand. The upper (reddish brown) zone is presumed to represent an advanced state of weathering.

Soil and pollen analyses have not been made but are planned for a later field season. This work, it is hoped, will answer some of the questions concerning the origins of the various soil zones and their relationships to the Paleo environment. For a proposed regional environmental sequence, see figure 6.

Unfortunately, two factors that made the Hester site attractive to prehistoric man have today opened the site to forces of destruction. First, gravel chert, used by prehistoric man in the manufacture of stone tools, would have been available under the Eutaw sand of the bed of Standifer Creek (or whatever creek or creeks flowed through the area at the time), as well as on sandbars in the Tombigbee River. Present-day gravel-mining operations have destroyed a portion of the Hester site as well as several other promising sites in the immediate vicinity. Second, the Tombigbee River well served prehistoric man as a major highway. One can only hope that modern man's restructuring of the river will not be but another technological folly.

## Excavation Techniques

After mapping the site, a trench 150 by 5 feet was staked (fig. 1). Excavation proceeded in 0.2-foot levels. All artifacts were plotted and then removed, although artifacts were left in situ until it was determined whether they were part of a concentration at a particular level or floor. Dirt from each level was screened and materials were sacked accordingly.

This procedure was adequate for recording large artifacts. Most flake tools were missed, however, their known provenience being to specific levels of particular squares. Goodyear (1974:15) used a method whereby hard-to-recognize tools such as utilized flakes could be located within 50 cm of their original position. It is recommended here that a similar procedure be followed during future excavations at Hester. The author concedes thathis excavation technique left much to be desired in this respect, but time limitations unfortunately dictated many field decisions. Even though a loss of potentially valuable data is conceded, it is hoped that other aspects of this report will generate data which can help to fill gaps in our knowledge.

Three test pit squares were sunk during the 1974 excavation. Two were placed in a low spot between the Mississippi Department of Archives and History (MDAH) trench and the Beachum-Harrison dig area (fig. 1) to compare the stratigraphy in the latter area with that in the MDAH test trench and the earlier test pits dug at the site (Brookes and McGahey 1974). A final pit was located on the far (southeast) side of the Beachum-Harrison dig area.

Square 170S-145E (fig. 11) began as a 5-foot square in the low spot between the MDAH trench and the Beachum-Harrison diggings. A portion of a figure was noted in the southeast corner, so the square was expanded to 10 by 5 feet. No material of any kind was recovered from the discolored soil, and the nature of this feature has not been determined.

Two biface distal ends were recovered from this square, outside the feature. One is of heat-treated local gravel, the other of translucent dark brown chert of unknown source. Glenn Beachum recovered a graver of the latter material during his diggings. No flakes were found.

The strata in this square are very different from those of the MDAH trench and the Beachum-Harrison dig area. Soils in 170S-145E were predominantly clayey, whereas excavations in the trench yielded only small amounts of clay below a sterile layer of sand, which underlay the Dalton zone. The low density of artifacts in 170S-145E also suggests that this portion of the site is radically different.

The second test pit, square 170S-320E (fig. 12), was located on the southwest edge of the Beachum-Harrison dig area. Soil was identical to that observed in Beachum-Harrison and MDAH excavation areas. Many artifacts (mostly flakes and cores) were recovered. Soil was sandy and appeared similar to soils of the Eutaw formation as previously described.

The soil in square 85S-150E (fig. 13), like that in 170S-145E, was predominantly clay, with three zones visible in the profile (fig. 13). No artifacts of any kind were recovered, suggesting that the area was low and swampy during most of the site's occupation and as such was not utilized prehistorically.

# 2

# CERAMIC ANALYSIS

The sample recovered from the surface of the disturbed portion of the site contains excellent type examples of all the major ceramic periods with the exception of the Mississippi period. To date, no shell-tempered ware has been recovered from the Hester site.

Several sherds of the Wheeler Series were found. This fiber-tempered ware, dating from 2000 to 500 B.C. (see fig. 5 for a ceramic chronology of the Tombigbee Valley) represents the earliest pottery in the Southeast. It is usually thick and fiber impressions are visible on both exterior and interior surfaces. Plate 1 A and B are typical examples of Wheeler Plain. Plate 1 C shows Wheeler Simple-stamped, also a type having visible fiber impressions. In this case, however, a tool has been used to produce haphazard lines.

Following the Wheeler Series, the next major ceramic group is the Alexander Series, a sand-tempered pottery dating from 500 B.C. to A.D. 1 which is diagnostic for the Miller I period. Two types have been found at Hester, Alexander Incised (pl. 1 D) and Alexander Pinched (pl. 1 E). Glenn Beachum has found one teat-shaped leg from an Alexander Series vessel, which could be a basal portion of a decorated vessel. When no decoration is present, the designation O'Neal Plain is used.

Miller II period ceramics have a variety of surface treatments but a common paste. They are sand tempered, but with much less sand than the earlier Alexander Series. Clay pellets and other inclusions are sometimes found in Miller II ceramics, but at Hester these have a uniformly sandy paste. Three types of sherds make up the Miller II ceramic complex: Saltillo Fabric-impressed (pl. 1 F), Baldwin Plain (pl. 2 A, B) and Furrs Cord-marked (pl. 2 C-E).

Similar decorative treatments occur during the Miller III period, although fabric-impressed ware has disappeared. Paste is still sandy, but a considerable number of clay pellets are included. The Miller III ceramic period includes two types, Tishomingo Plain (pl. 3 A, B) and Tishomingo Cord-marked (pl. 3 C-E).

The final ceramic occupation at Hester occurred during the Miller IV period. Ceramics from the period differ from those of preceding periods because of tempering. Little or no sand is present, clay pellets are plentiful (see pl. 4 A), and sherds have a soapy feel, in contrast to the gritty feel of earlier ceramics. Three types are present at Hester: Roper Plain (pl. 4 A), Wheeler Check-stamped (pl. 4 B, C), and Mulberry Creek Cord-marked (pl. 4 D). Ceramics from this period are coeval with wares of the Coles Creek period in the Yazoo Basin (fig. 4).

During the course of excavation 183 sherds were recovered. Sherds were sacked according to level, but the information is not presented here since historic materials were mixed with sherds and flint artifacts throughout the uppermost deposit. Several clusters of sherds are apparent in the excavation units (see table 1). Squares 40S through 5S yielded 120 sherds of Miller II ceramic types, and only 5 sherds of other periods. From squares 10N through 25N, a total of 23 Miller III sherds were recovered, and only 5 other sherds, all Miller II, were found.

Excavations produced some usable ceramic data, even though good stratigraphic control was completely lacking because of historic occupations. Different parts of the site were occupied at different times by prehistoric people using different ceramics. As a result, ceramics characteristic of the various periods were concentrated in various locations. Miller I and Miller IV ceramics were absent from the site of the MDAH excavations, and the Transitional Archaic-Woodland period was represented by only one sherd of Wheeler series ceramics. These different occupations could be explained by environmental conditions. The low area of the MDAH test square (170S-145E), which produced no ceramics and only a handful of lithics, possibly was covered by water during part or all of the site's prehistoric existence. A similar situation could have prevailed during the earliest occupation of the site, if the differences between the two groups of Dalton points is as significant as is believed.

# 3

# LITHIC ANALYSIS: BASIC TECHNOLOGY AND NON-PROJECTILE-POINT TOOL TYPES

An abundance of flakeable stone was present near the Hester site. From this deposit of gravel, nodules of chert of a quality suitable for reduction into tools would probably have been obtained. These nodules were the cores from which various blades and flakes were struck or were themselves worked down into bifacial tools.

Chert gravel occurs as nodules of varying size. In order to standardize terminology, Wentworth's Particle Size Classification (Krumbein and Sloss 1963) is used here. The chert at Hester falls into three grades: large pebble (16-32 mm in diameter), very large pebble (32-64 mm in diameter), and small cobble (64-128 mm in diameter). Most specimens from Hester fall in the very large pebble category. These pebbles or cobbles formed the cores from which flakes were struck at the Hester site.

In dealing with non-projectile-point tools, the shortcomings of the narrow MDAH trench were most apparent. Tool types found in the excavation in association with projectile-point types are listed in table 6, except for unifacial end scrapers, which are listed in table 7. Concentrations of artifacts were noted and the assumption was made that these represent work areas, but no detailed descriptions are offered here, since the sampling error involved would be so great as to make useless any conclusions based on the 1974 data alone. Careful measurements were made and will be incorporated into a subsequent report.

It can be stated that differences in artifact quantities and distributions are apparent. These differences will be discussed so that they may be compared with artifacts from the Dalton zone. Artifacts from upper zones at Hester were accompanied by large numbers of flakes. Flintworking was a major activity after the Dalton utilization of the site. It is hoped that geological analysis may help to explain why Hester underwent such a change following the end of the transitional Paleo-Indian-Early Archaic period.

In describing the artifacts recovered from Hester, it was decided to employ a classification system similar to that used in the Cache River report (House 1975a:55-74). The system is functional in that it attempts to indicate the functions, or uses, of artifacts. By so doing it is hoped that some idea of prehistoric activities can be gained. Although a typology of this sort is in some ways educated guesswork, it is superior to grouping artifacts into broad categories without regard to function.

A problem is encountered here with multipurpose artifacts. Bifaces, for example, could be used for a number of functions, such as scraping, cutting, or sawing. In addition, they could represent an intermediate stage in a reduction sequence that was handy when some tool was needed to complete a task. At this point the archaeologist is not on firm ground, as he is not working with intentionally designed tools (the mental template idea) but with objects that were handy and just happened to be utilized.

An excellent linear flow model from the Cache River report (House 1975a: 55; fig. 1) is reproduced by permission in this paper (fig. 16) to aid the reader in understanding the cultural processes which contributed to the lithic assemblages of prehistoric sites. It was thought that a slight modification of House's chart might provide a better glimpse of lithic reduction sequences at Hester. Specifically, biface preforms could be discarded, and often were, because of lateral snap or crenated fractures (see pl. 5 D, E). Such breakages have already been discussed, and their position in the linear flow model is shown in figure 17. Note that crenated fractures occur in the preform state while the preform is being heat treated, and that lateral snap occurs during biface tool manufacture. These are, of course, generalizations, but evidence of such breakages is abundant at Hester, lateral snap being the most common.

## Cores

Cores are cobbles with slight modification in the form of flaking. Cores were produced by the removal of flakes from a cobble, either to produce an artifact or simply to produce flakes that could be used as tools. Cores were utilized as knives, choppers, scrapers, or hammers.

## Blade Cores

Blade cores are cores specifically made for the production of lamellar blades. Flake scars are unidirectional, as opposed to the multidirectional scars found on other cores. Since this category represents a specific industry, it is separated from the larger group of cores.

## Pieces Esquillees

Piece esquillee is the French term for lithics produced using a bipolar flaking technique. It is assumed that such artifacts were placed in pitted cobbles and struck with hammerstones. Only one cobble found at Hester (pl. 5 B) shows the cut marks diagnostic of bipolar flaking. Several theories to explain bipolar flaking have been advanced. Chapman (1975), for example, proposes that this method may have been a way of producing flakes from cobbles too small to be held in the hand. MacDonald (1968:88-90) suggests that pieces esquillees may have been employed as wedges and as slotting tools when applying the groove-and-splinter technique to wood, bone, and antler. Such a use has been suggested for projectile points during the Early Archaic period (Brookes, Gray, Inmon, and Rodrigue 1974:6-9). Three examples of the piece esquillee are illustrated in figure 15 H-J (see also pls. 5 A, 10 M, 11 N). Figure 15 K shows a Decatur point used as a piece esquillee. Chapman illustrates a Kirk Corner-notched projectile point similarly used (1975:pl. 37 B). Chapman's report contains an excellent discussion of this artifact type as well as a rather complete bibliography on the subject.

## Flake Forms

Because of the importance of nodule and lithic reduction sequences at Hester and other sites, it is essential that definitions of terms used be given here. Figure 14 is offered as an aid to the nonprofessional to enhance the verbal description.

Primary decortication flakes are the first flakes detached from a cobble or pebble. Their distinguishing characteristic is a cortex which covers the entire exterior surface of the flake. Usually, primary decortication flakes were discarded.

Secondary decortication flakes exhibit cortex on only a portion of their exterior surface. They were often kept for use as naturally backed blades, the remaining cortex forming a backing for the hand and/or fingers.

Blank flakes are those flakes removed after decortication has been achieved. They vary greatly in size and shape. Several types are illustrated in figure 14, but are not distinguished in the analysis. Flakes of this type could be made into tools or simply used for various purposes without modification.

Flakes produced from bifaces are relatively thin. They often can be recognized by a protruding or overhanging lip at the point from which the flake was struck. The lip represents the edge of the biface.

Flakes of this type were removed to thin bifaces and to resharpen the edges of tools dulled by use.

Block flakes, also known as tabular flakes, are relatively thick and have flat inner and outer surfaces. A variation of a tabular flake is described by White (1963:14) as a tabular flake from a broken nodule, a variation present at Hester. The broken surface was used as a striking platform, and the nodules were often split as neatly as a sliced potato.

True blades are slender flakes characterized by two or more parallel flake scars on the outer surface. A blade industry is one of the most efficient methods of artifact production. For a more refined description of the technique, see Bordes (1968:26-31), Bordaz (1970:fig. 20), and Oakley (1968:fig. 10).

Analysis of flakes from the Hester site is still in progress. A subsequent volume on the Hester site, to be published later, will include data on unutilized flakes and an analysis of Hester artifacts from the Beachum and Harrison collections.

## Utilized Flakes

Many flakes resulting from the core-reduction process could be made suitable for use as tools with only slight modification, usually edge sharpening. Naturally sharp flakes were used without modification. Often it is difficult to distinguish modification from use wear. The type of use is also hard to determine, though most flakes are presumed to have been multipurpose cutting, sawing, and scraping tools.

Several different forms present at Hester are shown in figure 15. Specimens A-G are drawn with central axes running from the bottom of the page toward the top. The striking platform is at the bottom of each example.

Specimen 15 A is a flake with a transverse working edge. Specimen 15 B is a flake with lateral working edges that appear to have been prepared. Specimen 15 C is a flake with an oblique-transverse working edge. The flake is very thin, and the working edge appears to have been used without modification, the nibbling having been produced when resistant material was cut. Specimen 15 D is a flake with a pointed working end. It has undoubtedly been flaked, as the scars are long and relatively uniform. No flaking is present on the underside of the specimen. Specimen 15 E is a serrated denticulate presumably used for sawing. Since most examples have serration along only one side of the flake, the illustrated example is somewhat unusual. Specimen 15 F is an unusual utilized flake. The rounded basal edge appears to have been shaped by careful flaking, while the projecting tip shows nibbling similar to use wear along the sides. Specimen 15 G is another unusual flake. Lateral, transverse, and modified point trimming are present on the specimen, which resembles a tiny notched projectile point. Most of the flake types discussed in this section follow the classification set up by Wyckoff (1973).

## Unifacial Scrapers

Side scrapers are thick tools with scraping and cutting surfaces on lateral edges. It is assumed that these scrapers were used in hide preparation.

The end-scraper category is given special attention here because recent studies have shown the tool to be useful in functional analysis. Reference to Wilmsen's work on the subject was made in the section dealing with the Dalton assemblage. The Dalton end scrapers will again be considered, this time as part of an artifact category which is functional as opposed to cultural-historic in nature.

Wilmsen (1968:156; 1970:70) noted two major distributions of edge-angle values for end scrapers. The first of these was a group with edge-angle values from 46° to 55°. Four possible uses were suggested for this category: (1) skinning and hide scraping; (2) sinew and plant-fiber shredding; (3) heavy cutting, e.g., of bone or horn; and (4) tool back blunting (Wilmsen 1968a:156). The first two uses are commonly inferred to be women's activities, and if this inference is correct, end scrapers could be important as indicators of the division of labor according to sex as well as of female work areas. At some sites, such as possible hunting camps, the tool's presence could be used to indicate the presence of females.

The second category is end scrapers with edge-angle values of 66° to 75°. Four proposed uses for this category are (1) woodworking; (2) bone working; (3) skin softening; and (4) heavy shredding (Wilmsen 1968a:157). Within this category the first two uses are commonly thought to be exclusively male activities, although the truth of this assumption has not been demonstrated. The edges of scrapers with higher edge-angle values have many pressure crushes, and other forms of edge damage suggest that a great deal of pressure was exerted upon an unyielding object. This observation has been made also by Wilmsen (1968a:159). Such use-wear evidence tends to confirm the theory that uses (1) and (2) were male activities.

Sixty-nine end scrapers are present in the MDAH sample from Hester, most of them fairly uniform in morphological characteristics. Most were made from flakes and have shaping on the cutting edge and sides. Work on the lateral edges is crudely done, usually by percussion, a type of work employed apparently to narrow the implement so that it could be socketed for hafting. Goodyear (1974) believes that the artifacts with teardrop shapes were hafted. Similar end scrapers with notches to facilitate hafting have been found in North Carolina

(Coe 1964:fig. 64 C-D).

Edge-angle measurements are shown in figure 30. No angles of less than 33° are present in the sample. Four end scrapers (5.6%) fall within the first category, end scrapers with edge-angle values of 46° to 55°. Sixteen end scrapers (23.2%) fall within the second category, end scrapers with edge-angle values of 66° to 75°. The remaining forty-nine end scrapers have the following angles:

| | | |
|---|---|---|
| Less than 46° | -- | 2 ( 2.9%) |
| 56°-65° | -- | 13 (18.8%) |
| 76°-90° | -- | 29 (42.0%) |
| Greater than 90° | -- | 5 ( 7.2%) |

The sample shows a unimodal distribution, whereas Wilmsen (1970) reports a bimodal distribution, with most of his scrapers falling into the two categories he describes. He does mention that higher edge-angle values, in the 60° to 80° range, were recorded for eastern Paleo sites (1968a:159). Severe damage to the edges of many specimens indicates much heavy use, with edge-angles of 76° to 90° or even higher. It is possible that after continual re-sharpening end scrapers were discarded. Excavated data from Hester have shown Wilmsen's study to be of little use for eastern Early Archaic.

Most end scrapers from Hester were made from thick primary and secondary decortication flakes, often with cortex on the dorsal surface. Usually, but not always, the scrapers have been heat treated. Most end scrapers are of the hafted type, some having notches to facilitate hafting. A few examples are broken by transverse fractures, indicating that heavy pressure was placed on them. Finally, accessory tools such as gravers are most often encountered on end scrapers from the Dalton zone.

## Bifaces

Bifaces constitute one of the largest and certainly most ambiguous classes of artifacts at Hester. After tools were sorted out, thinned bifaces were sorted and labeled preforms. Bifaces were checked for wear and most were found to have none. Most were broken by lateral snap (pl. 5 F-H).

This artifact class is believed to consist of unfinished artifacts, most of which were heated. It is thought that heat was applied at either the split-cobble stage or the biface stage. Analysis of the flakes, though incomplete, reveals that most flaking at Hester was done after heating. Bifaces could serve as knives, choppers, or scrapers. As previously stated, however, most show no use or wear and were either broken during the manufacturing process or rejected because of flaws in the stone, or for unknown reasons.

## Broken Bifaces

Early in the excavation a high incidence of broken bifaces was noted. Complete bifaces, when found, were generally small. The area dug by Beachum and Harrison produced several large bifaces, but large bifaces were completely absent in the area excavated by the MDAH crew. The reason for the discrepancy is not yet known. Fragments of bifaces, however, were the largest artifact category in all Archaic zones (see table 6), suggesting a high degree of flint knapping. Most likely the small bifaces recovered were reworked from larger broken examples.

## Preforms

Preforms are thinned bifaces thought to be blanks suitable for the final stage of modification into projectile points, knives, drills, and other bifacial tools. All examples from Hester are either broken or are so small that they appear to have been reworked from larger, broken pieces of larger bifaces. These artifacts could have served as knives and been used for other light-duty cutting functions.

## Drills

Drills are slender needlelike artifacts. The few examples recovered from Hester were mostly broken distal ends. Although these artifacts are called drills, none show any evidence of rotary motion. Most examples are quite similar to the blades of final-stage Dalton points at the Brand site (Goodyear 1974:30-32). Their function is unknown at present.

## Adzes

Adzes are tools with bevelled cutting edges and ground sides. At Hester the specimens are identical to some found in Arkansas called Dalton adzes (Morse and Goodyear 1973:316-22) but not associated with the Dalton occupation. Rather, they occur with Early Archaic assemblages. It is proposed here that such tools, when found in Mississippi, be referred to as "smooth-sided adzes." This nomenclature should prevent confusion with tools of earlier cultures such as Dalton (no adzes have been found in association with Dalton in Mississippi) and the later, cruder adzes found with Middle-Late Archaic assemblages. The tools may have been used in heavy woodworking. Morse (1973:26) says of the Dalton adze that it was "one of the earliest true adzes in the world and undoubtedly reflects a basic cultural response to making shelters at permanent base settlements and possibly [to making] dugout canoes."

## Knives

A distinction was made between knife types based on resharpening techniques. Knives with bevelled edges were sorted in the hope that eventually these easy-to-spot artifacts could become diagnostic for certain early horizons.

## Choppers

Choppers are large cleaving tools used for butchering animals or for processing certain types of plant food or both. The tools have been recovered from Big Sandy, Decatur, and Beachum zones. An example from the Big Sandy zone, illustrated in figure 19, is made from a large cobble of yellow gravel. When discovered, it was presumed to be a core, but laboratory examination revealed otherwise. Two lateral edges have been bifacially flaked to produce cutting edges. Wear in the form of severe hinge fractures, much deeper than one would expect in platform preparation, is present along both edges. The specimen was evidently hand held.

## Hammerstones

Cobbles with pecked or crushed surfaces are relegated to the hammerstone category. Hammerstones were used to manufacture flint artifacts, to pulverize some foodstuffs, and possibly to crack bone.

## Pitted Stones

Concentrations of pitted stones were noted in several areas at the site. One of the largest was a group of seven in a tight cluster in the Decatur zone, where they were in definite association with burned nut hulls. Another group, in the Pine Tree zone, consisted of five pitted stones, three stacked on top of one another. Examination showed these stones to have rounded depressions, more what one would expect on a "nutting stone" than the sharp marks on anvil stones (see pl. 5 B).

Pitted stones with rounded depressions were separated from anvil stones with cut marks. Schiffer (1975b:103-112) concurs with their separation but Morse takes issue with it. He comments: "Only archaeologists seriously expect someone to crack nuts one by one as we do in our society with pecans just before Thanksgiving" (1975: 117). Considering the fact that female task groups performed such activities as nut harvest--and this would be an activity in which we can expect scheduling because of competition from animals--one wonders how the nuts were cracked. A female work area for processing these nuts could be expected, and such an area could be anticipated to yield nutting stones and other related tools. If, as Morse points out, our modern society cracks nuts only one by one, there is no reason to expect that primitive peoples did otherwise.

### Manos

Any oval stone, usually sandstone, which easily fits the hand and has a flat grinding surface has been included in the mano category. Manos are thought to be specialized tools used in processing plant foods.

### Anvils

Anvils, sandstone slabs with cut marks, were used in conjunction with the piece esquillee. A typical example is illustrated in plate 5 B. Similar specimens have been recovered from Rose Island in Tennessee (Chapman 1975:162-65).

### Abraders and Grooved Stones

Abraders are defined here as pieces of sandstone with concave surfaces that indicate an abrading function. Grooved stones are pieces of sandstone with deep narrow grooves indicative of bone or wood working or edge grinding of bifaces (pl. 21 D).

### Unmodified Sandstone

The category includes unworked sandstone. Most pieces are small and may represent broken fragments of larger processing tools. Some larger pieces may be unused abraders, nutting stones, or similar instruments.

### Fire-Cracked Rock

Small angular chunks of rock make up the class. They are not plentiful at Hester and when present seem to be broken cores and bifaces that were burned or possibly overheated while undergoing heat treating before final shaping, a supposition in line with House's (1975:55-74) theory that most fire-cracked rock in the Cache River Basin is associated with later Archaic culture.

### Bannerstones

One broken bannerstone was recovered in the MDAH excavation, and several are present in the Beachum and Harrison collections. All are made from limonite except one, which is a fine-grained soft gray stone. All are of the Shuttle type, as classified by Knoblock (1939:337-42), who states that Shuttle-type bannerstones were made primarily from limonite, quartzite, sandstone, granite, basalt, and slate, and that most specimens are found in the middle Mississippi Valley area. Shuttle-type bannerstones are the most frequently encountered bannerstones in northeastern Mississippi and adjacent Alabama. Since the specimen from the excavation is quite badly broken, measurements would be of little use. The specimen, broken through the perforation, is illustrated in plate 5 C.

Found in square 10N-5E, the specimen was not in association with projectile points. Farther below were a Pine Tree, a Beachum, and an unidentified type (#1123). Similar artifacts have been found at the Eva site in Tennessee, radiocarbon dated ca. 5000 B.C. (Lewis and Kneberg 1961:68). Bannerstones of a similar form have been recovered from the Doerschuk and Hardaway sites in North Carolina, dated ca. 5000 B.C., a date that seems to mark the appearance of the bannerstone in the Southeast and that accords well with the Middle Archaic levels at Hester. Bannerstones from the two North Carolina sites were in association with Stanly points (Coe 1964:81), which are similar in form to Beachum points at Hester. Just above the Beachum points at Hester is the Eva II-Morrow Mountain I material, estimated to date ca. 4500 B.C. Bannerstones have been found in association with Neville points at the Amoskeag site in New Hampshire (Dincauze 1976:105). Neville points are similar to both Stanly and Beachum points and are presumed to date ca. 5000 B.C.

## The Inmon Cache

During mapping of the site, Byron Inmon of the field crew discovered a cache of cores in an area eroded as a result of bulldozing. The cache was in the reddish brown sand (Early Archaic) layer. It was decided to place these artifacts in the general category of cores, although, specifically, split cobbles, large primary and secondary decortication flakes, and bifaces were present. Their classification as cores was prompted by their size and by the fact that they were thought to have been intended for further reduction.

The artifacts were found stacked in a small place. No remains of a pit could be located, nor was there any evidence of fire, so these stones were not placed there for heat treating. Since some knapping had occurred and no small flakes were present, it is obvious that the pieces were fashioned elsewhere. It seems likely that the cobbles were selected and preliminary knapping was accomplished at another location. Future studies in the vicinity of Hester may locate some of these primary knapping areas and suggest the relationship of Hester to Standifer Creek and gravel sources in the Early Archaic period.

The problem of acquiring fresh flint may have prompted some individual to bury the cores. Stones that have been exposed to the sun do not flake as well as material freshly excavated. Semenov states that "there is some ethnographic evidence that flint, chalcedony and agate pebbles and boulders of other rocks, after prolonged soaking in water or burying in damp earth become more suitable for flaking and retouch" (1964:57).

The Inmon cache includes several different types of rock, all locally available in gravel outcrops in Standifer Creek. Evidently the individual who placed the cores where they were discovered (possibly in a container such as a skin or basket) intended to further reduce them into finished tools.

Thirty-six cores were recovered from the Inmon cache. A breakdown of core types and materials is given in table 2.

Plate 6 A shows the cache in situ after the hardened earth had been chipped away. Most of the specimens are visible in the photograph. Representative types of cores are illustrated in plate 6 B. Two of the cores fit together, though they were not found in such a position. Plate 7 A shows the exterior fit of the two pieces, plate 7 B the interior fit. Both are of yellow gravel, have cortex on one side, and show no evidence of knapping other than having been detached from a large pebble or small cobble.

How prevalent the technology represented by these specimens was and how frequently they were stored in such a manner remains undetermined. The find could represent a very important aspect of Early Archaic lithic systems.

# 4

# LITHIC ANALYSIS: DALTON ASSEMBLAGE

Because of the unusual situation represented by the Dalton zone at Hester, it was decided to give special attention to the Dalton assemblage. These tools were found in a deposit separate[1] from other artifacts, the only known occurrence of such an isolated Dalton deposit in Mississippi and one of the few known in the Southeast. Goodyear (1974) reported a single-component Dalton site, the Brand site, in Arkansas. The two collections are among the few known artifact assemblages from the period not mixed with later materials. Thus it was thought profitable to describe the collection from Hester and to compare it with that from the Brand site. All artifacts recovered at Hester were given field catalog numbers, and those found in the Dalton deposit are presented in the text for the benefit of future researchers. A subsequent report will give similar treatment to later assemblages. The question of the horizontal distribution of tools and activity areas is not covered in the present report for the Dalton or later components. Patterning is indicated, but since no sizable areas have yet been uncovered it is felt more appropriate to discuss the problem after further work has clarified the situation.

Artifacts from non-projectile-point categories are generally found throughout the deposit, but are discussed only as to provenience for the Dalton zone.

## Dalton Assemblage Points

The Dalton projectile-point assemblage at Hester includes a great variety of styles.[2] Although all points share attributes such as

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[1]One exception was that three Dalton points were found in a small disturbed area above the Dalton zone in square 10S-5E (see fig. 8).

[2]A number of Dalton assemblage points were recovered by Beachum and Harrison. Although not described here, they are illustrated in figure 24 and discussed in appendix 1.

basal grinding, edge serration, and light (if any) heat treating, several distinct conventional point types are present. The variations here are not merely differences in form created by use and resharpening. Goodyear (1974), in his work on Dalton point use-retouch, pointed out that even with extensive reworking of blade edges, base measurements and form remain the same. Yet at Hester there is considerable variation even among associated points. One is reminded of Philip Phillips's observation regarding Marksville Incised var. Yokena pottery: "The outstanding characteristic of incised pottery in the late Marksville period--even in a single, close-contained archaeological context--is its extreme variability. One would think that every woman in town had a different idea of what it should look like" (1970:117). Phillips's remark seems applicable to Dalton males at the Hester site regarding their projectile points.

Dalton Point No. 1132
(fig. 23 B; pl. 8 D)

Advanced-stage point, off-white local gravel with traces of pink. No evidence of heating, not waxy. Heavily ground concave base and stem edges with expanded auricles. Base well thinned, almost fluted. Serrations intact. Small portion of distal end missing. Blade edges twisted (but not beveled) by serial flaking employed to thin blades in final stages of manufacture. Point resharpened by using nubs of broken serrations as platforms for pressure retouch to produce new serrations (visible from side as a wavy effect).

Dalton Point No. 1437
(fig. 23 C; pl. 8 E)

Local yellow gravel. No evidence of heat treating. Straight base with expanded auricles. Concave stem edges. Several short, shallow flake scars, indicating base was thinned. Serration indicated, although most of blade missing.

Dalton Point No. 1438
(fig. 23 D; pl. 8 C)

Ground concave base and stem edges with expanding auricles. Base thinned. Serrations intact. Slight break on acute distal end. One blade edge straight, one recurvate; apparently not resharpened. Initial stage point.

Specimen unusual in that it is the only example from the 1974 excavations of a heat-treated Dalton point with a complete color change. The material, local gravel, has been changed to deep, dull red, a color often present on preforms in the later components of Hester. Apparently, the point was inadvertently heated after it was finished. The absence of glossy flake scars on the point suggests again that thermal alteration had not achieved an important position in the manufacture of artifacts until the Early Archaic cultures, beginning in northeastern Mississippi with Big Sandy points.

Lerma Point (pl. 8 H; fig. 23 E)
Suhm and Krieger 1954; Mahan
1955; Cambron and Hulse 1964:48, 55

Local yellow gravel. No basal grinding. Many small hinge fractures on one side of the slightly dulled edges. Some fine retouch along lower blade edges near tip. Twisted appearance resulting from serial flaking employed to thin blade. The only other example of the type from Hester is in the Beachum collection (fig. 24 L), and is made of Fort Payne chert.

Lenser (1959: pl. 7; figs. 4, 6) seems to have found a Lerma point (possibly two) at New Garden, an Alabama site containing an otherwise pure Big Sandy assemblage. If indeed the Lerma is associated with Big Sandy at the site, it must be concluded that the tool type has little value as an index artifact. Function, however, is a different matter. The Lerma "point," whatever its association, seems to have had a single use--as a knife. Examples from Stanfield-Worley (DeJarnette, Kurjack, and Cambron 1962:46) show resharpening similar to that on Lenser's "drill" (1959:fig. 4), which is probably a resharpened Lerma point. Since these artifacts give no evidence of use as projectile points or of a relationship to the original Lerma points named by MacNeish (Suhm and Krieger 1954), it would seem that a name change is in order. Fenwick and Collins have already noted that the classification of specimens from Tennessee and Alabama as Lerma is unfortunate and have commented: "Ambiguous typological designations, such as 'Lerma,' are being applied to a wide variety of specimens, and sometimes taken as evidence for a particular regional or temporal designate" (1974:15). It is hard to place the southeastern Lerma chronologically: at Hester it occurs with Dalton; at New Garden it occurs (in surface collections) with Big Sandy; elsewhere in Alabama it appears to be associated with Dalton and Big Sandy (Cambron and Hulse 1964). References for Lerma points in the southeast include Cambron and Hulse (1960a:11); Travis, Travis, and Lenser (1960:56); Cambron and Waters (1961:11); Work (1961:68); Duncan and Brosemer (1964:15); and Blakeman (1975:190).

Dalton Point No. 2070
(fig. 23 F; pl. 8 K)

Local yellow gravel. No evidence of heat treating. Lightly ground concave base. Heavily ground, slightly recurved auricles. Slightly ground side notches. Basal thinning (several long, wide, flake scars). Slightly convex blade edges. Intact serrations produced by alternate flaking (flake scars on only one side of each blade). Serial flaking on right side of the twisted blade. Initial stage.

Obvious similarities and more subtle differences may be seen between specimen no. 2070 and the Hardaway points of the North Carolina-Virginia Piedmont area. The thinned concave base, side notches, recurved auricles, and broad blade are all diagnostic for Coe's Hardaway Side-notched (Coe 1954:66-67; Perino 1968:30). There are differences in the shapes of the blade: the specimen from Hester has convex edges, while those from the Piedmont area are triangular. Serration is usually absent from the North Carolina specimens. The point from Hester, however, is more similar to a Hardaway than Alabama examples usually called Hardaway.

Dalton Point No. 2069
(fig. 23 G; pl. 8 L)

Local yellow gravel. No evidence of heat treating. Lightly ground, slightly concave stem with wide, expanding auricles. Unground basal edge. Thinned base with large, deep, flake scars.

Although at first glance this specimen appears to be the base of a Quad point, the narrow proportions indicate that it is an initial-stage Dalton similar to those in figure 23 J, K.

Dalton Point No. 2074
(fig. 23 H; pl. 8 G)

Distal end. Local yellow gravel. No thermal alteration evident. Serrations typical of other Dalton points at Hester. Serrations on left side intact, half of those on right side broken. No wear or smoothing on serrations. Part of tip broken.

Dalton Point No. 2311
(fig. 23 I; pl. 8 F)

Local yellow gravel. No evidence of heat treating. Serrations intact. Distal end acute.

Dalton Point No. 3488
(fig. 23 J)

Local yellow gravel. No indication of heat treating. Heavily ground concave stem edges and base. Auricles expanded. Broken apparently as result of impact.

Dalton Point No. 1562
(fig. 23 K; pl. 8 A)

Local yellow gravel. Lightly ground, deeply concave basal edge; heavily ground, slightly concave stem edges. Broad thinning flakes along basal edge. Jagged, serrated edges; flake scars larger and deeper than on most other specimens. Serial flaking along left edge. Initial stage point. Trace of red on one auricle, indicating slight thermal alteration. (Most heat-treated Dalton points in Mississippi have red auricles or distal ends, while body midsections are yellow. This coloration results from a type of heat treating peculiar to Dalton-complex artifacts (see app. 1).

Dalton Point No. 1714
(fig. 23 L; pl. 8 B)

Local yellow gravel. Slightly waxy feel and glossy red color on distal end, indicating thermal alteration. Slightly concave stem edges. Concave base with expanding auricles. Heavy grinding along base and stem edges. Distal end intact and sharp. Broken serrations, indicating heavy cutting or sawing. No smoothing along blade edges. No resharpening. Initial stage point.

Dalton Point No. 1702
(fig. 23 M; pl. 8 I)

Local yellow gravel. Glossy, waxy feel commonly associated with heat-treated artifacts. Concave base with one expanding auricle formed by a side notch (other half of base missing). Notch, auricle, and basal concavity ground smooth. Typical Dalton serration on both blade edges. Serrations intact on one side (left side, fig. 23 M) and broken on other side (right side, fig. 23 M). No evidence of smoothing or polishing on right edge. Serial flaking (right side, fig. 23 M). No resharpening. Similar to Hardaway in Alabama and San Patrice point from Louisiana (Webb, Shiner, and Roberts 1971:11-15; Bell 1958:84-85). Initial stage point.

Other Dalton Assemblage Tools by Square

Several groups or clusters of artifacts were found in the Dalton zone. Although limiting the excavation to a narrow trench prevented recovery of complete working areas, the tools recovered did provide a sample of artifact types present in this, the oldest assemblage yet found at Hester.

Square 75S-5E

Two Dalton tools were found in association in the lowest culture-bearing levels in this square.

1. Burin on a true blade (#2591; pl. 11 G; fig. 18). Yellow gravel. Unheated. Flaking on one edge, indicating use as a knife. Artifact evidently broken and a striking platform prepared by flaking a portion of the break. Two burin blows then struck, forming a dihedral burin. Use wear on burin tip. (See fig. 18 for illustration of burin functions.)

2. Knife (#1973; pl. 9 D). Made from secondary decortication flake. Yellow gravel. Red distal end and waxy feel, indicating heat treating. Lateral flaking along most of the length of the edges forms a point at one end. Edges sinuous but not serrated.

Square 70S-5E

1. Projectile point (#1702); see above.

2. Broken biface (#1699). Heat treated. Glossy red (only two of this color recovered from Dalton zone; most of Beachum and Harrison Dalton points, however, are glossy red). Possibly an intrusion piece from Big Sandy occupation, although found in Dalton level.

3. Broken Dalton point preform (#1697; pl. 12 I). Yellow gravel. No evidence of heating. About 4 mm average thickness; small hump in center (6 mm thick). Similar to Brand site specimens described by Goodyear (1974:24-25).

Square 65A-5E

1. Unmodified cobble. (#1719; pl. 12 A). Yellow gravel.

2. Secondary decortication flake (#1721; pl. 9 J). Yellow gravel; discoloration of one edge to dull red, indicating light heating. Naturally backed and flaked along one edge to produce a side scraper.

3. True blade (#1718; pl. 11 F). Yellow gravel. Nibbling along lateral edges, suggesting use wear. Tip a dihedral burin with evidence of use.

4. End scraper on a true blade (#1720; pl. 9 M). Worked on lateral edges. Slight notch, indicating that artifact was hafted. Notches have been observed on end scrapers from Early Archaic sites in North Carolina (Coe 1964:75; fig. 64) and on Dalton end scrapers from Arkansas (Goodyear 1974:44), but not on Dalton end scrapers from Missouri (Price and Krakker 1975:17). Edge angle of 68° suggests either woodworking, bone working, or heavy shredding (Wilmsen 1970:70). No evidence of heat treating.

Square 60S-5E

1. Projectile point (#1714); see above.

2. Graver on a true blade (#1959; pl. 11 D). Yellow-white gravel. No discoloration, but waxy feel, suggesting light heat treating. Lateral edges chipped. Graver on transverse edge of blade; another greatly use-worn graver present.

3. Secondary decortication flake modified into side scraper by flaking of lateral edges (#1960; pl. 9 I). Local yellow gravel. No evidence of heat treating.

4. Side scraper on a bladelike flake (#1962; pl. 10 J). Yellow gravel. No evidence of heat treating. Flaked along one lateral edge. Small flake scars on opposite edge, resulting possibly from cutting wear.

5. Secondary decortication flake (#1963). Nibbling along one lateral edge; small spokeshave on transverse edge, opposite the bulb of percussion. Yellow gravel. Small reddish discoloration, suggesting light heating.

Square 55S-5E

1-2. Broken Dalton preforms:

#1618: Narrow blade with base missing. Yellow gravel. No signs of heating.

#1623: Preform with corner of base missing (pl. 12 J). Straight base; excurvate blade edges. Yellow gravel. No sign of heat treating.

3-5. Side scrapers on secondary decortication flakes of yellow gravel. Unheated.

#1625: Flaked on one blade edge (pl. 11 A). Broken.

#3472: Flaked on both lateral blade edges. Broken (pl. 9 E).

#1622: Flaked on one lateral edge (pl. 9 H).

6. Combination spokeshave and side scraper (no. 3471; pl. 10 B) on yellow unheated gravel secondary decortication flake.

7. Bifacial core (#1619). Yellow gravel. No heat treating.

8. Multipurpose tool (#1621). Spokeshave flanked by two graver tips on one end, a tool combination found often in Early Archaic contexts in the Southeast (Goodyear 1973). Signs of use as a scraping tool on one lateral edge. Edge angle of 74°, indicating heavy or forceful cutting/scraping of bone, wood, or antler. (Most side scrapers have low edge-angle values.)

9. Knife on a tabular (block) flake (#1624). Yellow gravel. No evidence of heat treating. Natural backing of cortex. Blade edge formed by bifacial flaking along lateral axis. Short, deep, flake scars. Sinuous edge, approaching serration, but not so carefully executed.

Square 50S-5E

Projectile point (#1562; pl. 8 A); see above.

Square 45S-5E

Secondary decortication flake worked into a graver (#1634; pl. 11 M). Yellow gravel. No evidence of heat treating. Similar artifact illustrated by Goodyear (1974: fig. 18 J).

Square 40S-5E

Square 40S-5E yielded the second largest number of Dalton artifacts in the excavation, fourteen specimens having been recovered from the lowest zone.

1-4. Sandstone pieces.

#1533: Large nutting stone with three conical depressions (pl. 13 A). Surface very eroded. Possibly used as anvil for bipolar flaking technique. No cut marks remaining.

#1524: Very rough surface. No evidence of use (pl. 13 B).

#1535: Concave surface, indicating use as an abrader. Small groove on reverse side thought to be for awl sharpening or fabricating bone tools. Similar artifacts present in Brand site collections (Goodyear 1974).

#1536: Small fragment with two flat working faces. Type regarded by Goodyear (1974) as part of bone-working toolkit.

5. Broken quartzite hammerstone (#1526). Pecking on one end, other end broken (pl. 10 A).

6-7. Bifaces. Yellow gravel. No evidence of heat treating.

#1527: Exhausted multidirectional core used for manufacture of flakes (pl. 10 D).

#1529: Would probably have been reduced to preform stage with further flaking (pl. 12 D).

8-9. Pieces Esquillees.

#1534: Fort Payne chert. Heavily battered (pl. 5 A).

#1530: Yellow gravel. Evidence of very light heat treating (pl. 10 G).

10. End scraper (#1532). Yellow gravel. No sign of heat treating. Graver spur opposite the scraping plane (pl. 11 H). Edge angle of 77°, indicating cutting/scraping function rather than light-duty scraping, as in hide processing.

11. Side scraper on secondary decortication flake (#1531; pl. 10 I). Flaking along one lateral edge. Yellow gravel. Indications of light heat treating.

12. Thick tabular (block) flake (#1528; pl. 10 H). Yellow gravel. No use wear present. Function unknown.

13. Side scraper on core remnant (#1521). Heavy use on blade edge. Yellow gravel. No evidence of heat treating.

14. Graver on a true blade (#1537). Brown and yellow gravel. Lateral edges flaked, possibly for light cutting or scraping (pl. 11 E). No evidence of heat treating. Associated with this tool, at a depth of 3.22 feet below surface, was the only bone recovered in the Hester excavation. The tiny bit remaining, however, was in a poor state of preservation.

Square 35S-5E

1-2. Pieces Esquillees.

#3397: Yellow chert. Heavy use (pl. 10 C).

#1904: Yellow chert. Heavy use (pl. 11 N).

3. Sandstone piece (#1907; pl. 13 C). Abrading-stone rather than anvil function for bipolar flaking.

4-5. Side scrapers.

#1908: On thick flake of yellow chert (pl. 10 L).

#1463: Made from a core (pl. 9 B). (Pl. 9 A illustrates a similar but better-made specimen.)

6. Bifaces (#3398; pl. 10 I). Yellow chert.

Square 30S-5E

1. Projectile-point fragment (#3488; fig. 23 J).

2-3. Side scrapers.

#1680: On a thick bladelike flake (pl. 9 F). Evidence of light heat treating.

#1685: On a thin flake (a blank flake with transverse flaking) (pl. 9 L).

Square 25S-5E

1. Dalton projectile-point distal end (#2311; fig. 23 I; pl. 8 F).

2-9. Tools. Eight tools were in association in the deepest zone of the square.

#2127: Knife. Primary decortication flake. Yellow gravel. Large, unmodified. Many small hinge fractures produced by use along one lateral edge.

#2128
#2130: Side scraper on a blade (pl. 9 C) and unused blade (pl. 10 N), respectively. Yellow gravel with glossy surface. Reddish discoloration along blade edges opposite striking platform, indicating light heat treating. Striking platform produced by flaking. Platform heavily ground. Blades from same core: discoloration matches in length and striking platforms align when blades are aligned.

#2129: End scraper with graver spur (pl. 11 I). Edge angle of 62°, indicating heavy cutting, shredding, or scraping (Wilmsen 1968 a, b). Graver spur suggests function such as bone working coupled with heavy scraping or shredding.

#2132: Broken biface with graver spurs (pl. 11 J). Probably a preform modified to graver function after lateral snap.

#2131: Side scraper/spokeshave made from secondary decortication flake (pl. 11 K). Lateral scraping edge. Edge angle of 42°. (Term "side scraper" refers to placement of working edge. Side scrapers have much lower edge-angle values than end scrapers.) Spokeshave on both ends. Bone working suggested.

#2126: Piece esquillee.

Square 15S-5E

End scraper on blank flake (#3044; pl. 9 K). Yellow gravel. Edge angle of 87°, indicating heavy cutting, scraping, or shredding.

Square 10S-5E

Square 10S-5E contained the greatest number of Dalton artifacts found in the excavation.

1-3. Projectile points (#2074; #2069; #2070; pl. 8 G, L, K). Three points (fig. 8) were recovered in a small disturbed area just above and to the side of an undisturbed area where twenty-nine other Dalton artifacts were found. These were the only Dalton artifacts found outside the Dalton zone. None were heat treated, in contrast to Big Sandy material above them. Diagnostic form and absence of heat treating made the points quite easy to sort.

4-7. Bifaces (#1373; #1362; #1357; #1358). No observable use wear, so probably were meant to be worked into preforms for Dalton points.

8-10. Preforms. Broken, lateral snap.

#1359: Distal end.

#2060: Distal end.

#2073: Base.

11-12. Primary decortication flakes modified into side scrapers (#1351, #1355). Deliberately flaked.

13-17. Tabular flakes. Unmodified. Cortex present.

#1356: Evidence of use.

#1368, #1363, #1365, #1364: No evidence of use.

18-19. Tabular flakes modified into side scrapers by flaking along lateral edges (#2068, #2076).

20-21. Cores (#2071; #1369).

22. Unmodified large pebble (#1310). No evidence of use.

23-24. Broken pebbles (#1367, #1361).

25. End scraper (#2075). Edge angle of 72°

26. Side scraper (#1376). Made from primary decortication flake.

27. Edge retouch flake (#2065). Evidence of lateral use.

28. <u>Piece esquillee</u> (#1353). Fort Payne chert.

29. Blank flake modified into a point (#2072).

30. Broken piece of quartzite (#2059).

31. Nutstone (#1354). Sandstone

32. Hammerstone (#1372). Sandstone.

Square 5S-5E

1-3. Projectile points (#1434, #1437, #1438); see above.

4-5. Bifaces (#1436 [pl. 10 F], #1432 [pl. 12 C]). Rough. Yellow gravel. No evidence of heat treating.

6-8. Dalton point preforms, or thinned bifaces (#1433 [pl. 12 E], #1427 [pl. 12 F], #1435 [pl. 9 O]). Yellow gravel. No evidence of heat treating.

9. Core (#1429). Yellow gravel. Several flakes struck from one end.

10-11. Tabular flakes (#143, #1428). Unused, unworked. Yellow gravel.

12-13. Bladelike flakes.

#2618: Unused. Evidence of light heat treating (pl. 11 C).

#2614: Use along both lateral edges. No evidence of heat treating (pl. 11 B).

14. Unifacial side scraper (#1426; pl. 9 G). Yellow chert. Light heat treating.

15. Triangular end scraper (#1425; pl. 9 N). Light heat treating. Edge angle of 73°. Scrapers of this type, with narrow contracting ends opposite the scraping plane, are referred to by Goodyear (1974) as hafted end scrapers.

Square 5N-5E

Piece esquillee (#2642; pl. 10 M). Fort Payne chert. Heavily battered.

Square 10N-5E

Dalton projectile points (#1125, #1132).

Square 15N-5E

Broken preform (#1243; pl. 11 L). Yellow chert. Graver tip and spokeshave worked on specimen. This tool combination has been found in early assemblages elsewhere in the Southeast (Goodyear 1973).

Square 50N-5E

1. Side scraper (#1295; pl. 12 B). Yellow gravel.

2. Tabular flake (#1293; pl. 10 E). Yellow gravel. No evidence of use.

3. Dalton point preform, distal end (#1226; pl. 12 G). Yellow gravel. Red tip, indicating light heat treating.

4. Distal end point preform (#1291; pl. 12 H). Made from yellow gravel; has red tip, indicating heat treating.

## Discussion

Upon examination of table 3, it becomes apparent that during the Dalton occupation Hester was used as a hunting-butchering station. The occupation is sparse compared to later occupations at Hester, and chipping debris is lacking. Only two types of flakes occur in the Dalton zone, representing specialized types of stone work intended to produce usable tools in the process of cobble reduction. Eleven tabular flakes exhibit use wear or use modification. Two bladelike flakes represent a blade-core industry. Several true blades were recovered, but all were modified into diagnostic tool types such as burins and knives. Almost all tools in the zone can be associated with hunting, butchering, or related processing activities. In fact, the artifacts from Hester are a more homogeneous group than those found at the Brand site, which Goodyear (1974) has convincingly shown to be a hunting camp.

Several tools are listed separately at the bottom of table 2 because Goodyear did not provide use categories for them. Cores do not necessarily represent artifact production. They could have been used as choppers and placed in functional group VII. Abraders would go well with other bone-processing tools, such as burins, gravers, and <u>pieces esquillees</u>. Pitted stones are thought to have been anvils for the bipolar flaking process associated with the <u>piece esquillee</u>. Spokeshaves are thought to have been used for scraping narrow convex surfaces such as wood or bone. In essence, all categories of artifacts from the Dalton zone would seem quite in place in a hunting-butchering station. See table 4 for a tabulation of Dalton assemblage tools.

It could be that at least two separate Dalton occupations occurred at the Hester site, since most of the Dalton points recovered by Beachum and Harrison are heat treated and identical in color to materials from later components at the site. It is also possible, however, that the Beachum and Harrison collections contain artifacts produced by a different band, who employed heat treating in stone-working technique. Further excavation might determine which theory is correct.

Another difference between the MDAH and the Beachum and Harrison points is that seven of the ten unheated Dalton points from the MDAH excavation are lanceolate in form and only three are side notched (see fig. 23), while only four of the eleven Beachum and Harrison Dalton points are lanceolate and seven are side notched (fig. 24). The trend toward side notching coupled with greater heat treating suggests a later occupation--near the end of the Dalton phase, before the side-notched point phase. Testing the area near the Beachum and Harrison diggings would be very important if this theory should be true. Changes in the toolkit and changes in site utilization could be noted. Moreover, if an early and late Dalton phase did exist, adzes could be associated with the late phase.

There are two significant differences between the Dalton assemblages at Hester and those at the Brand site in Arkansas. One difference is that burins at Hester occur on true blades in contrast to the burinated Dalton points at Brand. To the knowledge of the writer, no burinated Dalton points have been found in Mississippi. The second difference is that no adzes or variants thereof were recovered from the Dalton zone at Hester. Three hypotheses may be advanced for the apparent absence of adzes in the Dalton assemblage at Hester:

1. Dalton adzes are present but were missed because of sampling error.

2. Dalton adzes were not used at hunting stations such as Hester.

3. Dalton peoples in Mississippi did not possess the adze at the time that the Hester site was utilized.

If the first hypothesis is correct, excavators can expect to find adzes or reworked variants. If the second hypothesis is correct, it is possible that adzes will be found at a base camp. If the third hypothesis is correct, the adze was probably brought into Mississippi from Arkansas, where it was developed by Dalton people. It was used in unmodified form through most of the Early Archaic period in Mississippi and its use continued in modified form into Late Archaic times.

A difference in Dalton assemblages in general is also noted between East and West. Dalton points from Arkansas and the Mississippi Alluvial Valley tend to exhibit a right-hand bevel, whereas those to the east in the hill sections of Mississippi have a left-hand bevel. The left-hand bevel is common on later Early Archaic forms in both areas.

# 5

# LITHIC ANALYSIS: NON-DALTON PROJECTILE-POINT TYPES

## Big Sandy

(Kneberg 1956:25; Lewis and Kneberg 1956:34-37;
Bell 1960:8; Cambron and Hulse 1964:13)

The Big Sandy point at the Hester site (see pl. 14, fig. 28 A-L) is side notched and has a triangular blade. Bases vary from straight to concave to, on a few examples, notched. Some examples have ground bases, some have ground tangs, and all have grinding in the notches. At Hester no points of the Big Sandy type have bevelled or serrated blade edges. Most are made of a heat-treated local gravel, a number are of unheated local gravel, and a few are of Fort Payne chert.

Big Sandy points vary widely. Cambron and Hulse originally distinguished between Big Sandy I and Big Sandy II (1964:13), a distinction that was later dropped, although the newest edition of the Alabama point guide (1975) includes three varieties (James W. Cambron, personal communication). The three new varieties are all represented in the Beachum and Harrison collections, along with a fourth variety, the notched base, which had heretofore been classified in Alabama as an Osceola point (Cambron and Hulse 1964:90).

In contrast to many Alabama sites where Big Sandy and Dalton artifacts have been found together, at Hester there is a clear separation between the two types, Dalton points lying beneath Big Sandy points. At the Hester site, therefore, it can be definitely stated that the Big Sandy occupation occurred after the Dalton occupation.

Few of the Big Sandy points at Hester give evidence of having been used other than as projectile points. Examples that have been worked into end scrapers (pl. 17 O) are present, but none show the bevelling-resharpening technique used on projectile-points knives. Only one specimen from the site was used for cutting (pl. 14 D), and only one shows modification into a graver (pl. 14 M). Many examples are broken in a manner suggesting that impact was responsible (pl. 14 O), and a number of the broken specimens have been reworked (pl. 14 E). The damage is usually found on the distal end. A number of these points are represented by bases split laterally through the notches, a type of damage associated with impact. The base, being secured in the haft, remained intact. Points were resharpened by chipping only the lower blade edges and distal ends. Frison (1976) has shown an identical situation on similar points in Wyoming. That the damage occurs most often on distal ends (as opposed to blade edges of projectile points/knives) indicates almost exclusive use as projectile points.

Preforms for the Big Sandy point are triangular blades with straight or convex basal edges. Most are heat treated.

## Greenbrier

(Lewis and Kneberg 1958:5-11; Bell 1960:50; Cambron and Hulse 1964:66; Brookes et al. 1974:6-9)

Greenbrier points are slender specimens with wide, shallow side notches. Bases vary from straight to slightly incurvate. Serrated blade edges are usually excurvate. Flaking was accomplished by the serial technique described by Bradley (1974), which gives a twisted effect to the blade. Grinding is present along the base as well as in the notches.

At Hester, Greenbrier points are made from local gravel. Most are heat treated, but a few are yellow (pl. 22 N-P; fig. 25 G-J). The latter often have red distal ends or auricles, a coloration identical to that of some Dalton points and resulting from a heating technique which does not significantly alter the color of the material. Unheated Dalton and Big Sandy point preforms can be readily distinguished from artifacts that have undergone this heat-treating technique. Points in the first category feel coarse, while those in the latter feel waxy or slightly greasy.

Greenbrier points were used as projectile points/knives. A discussion of the points in several stages of use wear may be found in Brookes et al. (1974). Another interesting feature of Greenbrier points is the number of supposed bone-working tools present on reworked specimens. Gravers, end scrapers, and wedges have been noted. Since there is considerable evidence of use wear on the blades of Greenbrier points and very little evidence of use wear on Big Sandy points, it is possible that, at Hester, Greenbrier points represent a specialized tool type associated with Big Sandy. One was found in a Big Sandy context.

Knowledge of the distribution of the Greenbrier point type is limited, but examples are present in Mississippi at the Beaver Dam site in Panola County and at the Denton site in Quitman County (Connaway 1977:43-44), both in the northern Yazoo Basin. Points of the type are found in northeastern Mississippi, and their association with Big Sandy has been noted (Rucker 1974:89; pl. 1 G). At the Nuckolls site in Tennessee, points of this type were associated with Early Archaic materials (Lewis and Kneberg 1958:60-79). Three examples have been noted by the author in a collection from Halifax County, Virginia (1971:47). It can be said, then, that the distribution is wide, covering a substantial portion of the eastern United States.

## Jude

(Huntsville-Madison Chapter, Alabama Archaeological Society 1961:84; Cambron and Hulse 1964:52)

The Jude point (pl. 22 A-F; fig. 25 A-F) is stemmed and has straight blade edges. Although bevelling is not usually present, one specimen from Hester has bevelled edges (pl. 22 D; fig. 25 D). Stem edges are ground, and sometimes basal edges are smoothed. Many show evidence of resharpening (pl. 22 F; fig. 25 F). Many Jude points found in northeastern Mississippi have been reworked into end scrapers. All examples from Hester and all specimens observed by the author have been made of heat-treated local gravel.

A type similar to Jude has been named the Cave Springs point (Moebes 1974:82). According to Cambron (personal communication), the main difference between Jude and Cave Springs is the bifurcated base of the latter. Some of the Jude points from Hester have the feature (pl. 22 A, B; fig. 25 A, B), and so could be classified as Cave Springs. All points classified as Jude in this report bear a close similarity, however, and it is therefore suggested that the classification Cave Springs be either dropped or relegated to variety status. Jude points at Hester are early, all examples being found either alongside or slightly above Big Sandy points.

Cambron (personal communication) reports that one Cave Springs point from the type site has the same fracture base as Decatur points. Early in the investigation of the Hester site a similarity between some Jude and Decatur points was noted. McGahey (personal communication) also has suggested that the Jude point may be an early variation of the Decatur point. At Hester all Jude points were recovered below Decatur points.

A knowledge of the distribution and associations of the Jude type would be valuable. The points seem to be in association with or slightly later than Big Sandy, but there is a distinct morphological resemblance to Decatur. Moreover, the small number of examples found at Hester, along with the resharpening and reuse of the point, suggests a very specialized function. It may be that the Jude is a special tool type rather than an index artifact for a distinct culture group. It is hoped that future research at Hester will illuminate the history and function of this type.

## Plevna

(DeJarnette, Kurjack, and Cambron 1962:66;
Cambron and Hulse 1964:97)

One Plevna point was recovered during the 1974 excavations, and several examples are present in the Beachum and Harrison collections from the site. The one Plevna point from the MDAH trench (pl. 22 M; fig. 25 K) is corner notched with an excurvate base. The recurved tangs give the point the familiar dovetail appearance. The basal edge is ground smooth except for a notch in the center, an unusual feature which occurs also on two of the Lost Lake points. The Plevna point, then, represents another case of a basal notch being added to a point type normally lacking such a feature.

The specimen from Hester appears to be an initial point form. It has not been bevelled, although it has been alternately serrated. This sharpening process and the thinning of the point by the serial flaking technique (Bradley 1974:191-97) give it a twisted appearance. Both the sharpening technique and the preform thinning technique indicate that this point would have been bevelled after sufficient use and resharpening. Bevelling seems to indicate use of a removable foreshaft as part of the hunting gear.

The specimen from Hester is made from heat-treated local gravel. It was found below Decatur points and above Big Sandy points. Near this example and possibly on the same level were the Ecusta point and two unidentified points illustrated in plate 17 I, J.

Plevna points have not been dated by radiocarbon assay. In many of the Alabama rock shelters they have been found in association with other early points like those found at Hester. Plevna points in Alabama have been described by the Huntsville-Madison County Chapter, Alabama Archaeological Society (1961:83), by Holland (1963:68), and by Duncan and Brosemer (1964:17). In Mississippi they have been reported by Marshall and Glover (1974), Brookes and McGahey (1974:2-7), and Blakeman (1976: 190; pl. 2 A).

Luchterhand, in his study of Early Archaic hunting patterns in the Illinois Valley (1970:33), places the Alabama Plevna point within the Thebes-Dovetail type cluster. The study once again shows regional adaptations of a projectile-point style covering a fairly wide geographical range. Such adaptation seems to be the rule rather than the exception during the Early Archaic period. It is interesting to note that both Thebes and Dovetail points are bevelled (Luchterhand 1970:33), as are most Plevna points (Cambron and Hulse 1964:97).

## Ecusta

(Harwood 1958; Cambron and Hulse 1964:37)

One projectile point recovered from the Hester excavations has been classified as an Ecusta point. It has a broad, slightly excurvate base (pl. 17 N). No grinding is present on the basal edge. Side notches were used to haft the point. The notches were well smoothed, probably to prevent cutting the lashes. The point is made from local heat-treated gravel and is glossy red.

The distal end has been worked into an end scraper. The edge angle of 54.5° is ideal for hide scraping and skinning activities (Wilmsen 1970:70). Wilmsen points out that pulling a scraper across a hide causes wear polish on the ventral side of the artifact, whereas pushing it produces wear polish on the dorsal surface (1970:71). Wear polish on the dorsal side of the specimen from Hester indicates that it was pushed rather than pulled.

Since only one Ecusta point was found at Hester, little can be said of the cultural affiliations of this type in the area. None have been recovered in good stratigraphic sequence elsewhere in the Southeast, as far as the author is aware. The Ecusta point from Hester was located near the Plevna point, below Decatur, and on the same level as a Big Sandy. Cambron and Hulse (1964:37) mention that some examples have fracture bases like Decatur points, a feature the specimen from Hester lacks. Seven examples from Virginia also lack the fracture base mode, although one shows resharpening that indicates use as a projectile point/knife (Brookes 1971:38).

## Decatur

(Cambron 1957:17; Bell 1960:28)

Decatur points are small and corner notched with short stems. Examples from Hester are made from both Fort Payne chert and local gravel. On the points made from local gravel, heat treating is evident, and most of the points are a dark red, although a few are pink or white. All examples have a waxy feel; surfaces appear lustrous.

Considerable variation is present in this type. Like a great many Early Archaic points from the Southeast, the Decatur point was used as a projectile point/knife, and resharpening of edges is responsible for much of the variation.

Initial-stage points are corner notched (pl. 15 A, B; fig. 27 E, F). It is interesting that the fracture base, listed by Cambron (1957:17) as a diagnostic attribute, occurs on only 60% of the Decatur points recovered from the 1974 excavations at Hester (see table 5). The stems of five Decatur points have been broken off by blows intended to fracture the edges of the base, probably to dull the base for hafting purposes. Of these, four have been resharpened by bevelling, and the other has an impact flute, so the absence of a stem apparently did not preclude their use as projectile points/knives. Basal grinding is present on 73% of the points.

These points were resharpened by alternate pressure flaking, which formed a bevelled blade. Such treatment, also a diagnostic attribute, is seen at Hester only on advanced-stage points (pl. 15 C-L; fig. 27 G-L). As one can see, taxonomic schemes must take into account factors such as use wear, resharpening, and breakage.

Specimens L and M (pl. 17) illustrate Decatur points modified into end scrapers.

### Autauga

(Cambron and Hulse 1964:7)

One Autauga point was recovered during the MDAH excavations. The type is similar to the Pine Tree point but differs in that it is smaller and possibly earlier. Though Cambron (Cambron and Hulse 1964:7) describes the point as corner-notched, his illustration is of a side-notched point. The single specimen from Hester is also side notched (pl. 22 G; fig. 25 O).

Edges are serrated but not bevelled. Cambron states that most blade edges are bevelled (Cambron and Hulse 1964:7). Base and notches are ground on the Hester specimen, which is made of heat-treated local gravel. The material is a glossy pinkish red.

The specimen from Hester was found in a zone near Decatur points, indicating an origin of 7500-7000 B.C. While one specimen is little evidence, it is the only example known in Mississippi from an undisturbed context. Most examples from Alabama are surface finds.

### Josselyn (A Provisional Type)

The Josselyn provisional type, introduced in this report, is based on eleven examples in the Beachum and Harrison collections from Hester (pl. 16 A-G). No examples were recovered during the MDAH excavations. Josselyn points are large and corner notched, with serrated edges. All specimens have ground bases and are made from heat-treated local gravel. Several points are white, possibly indicating some degree of selectivity in gravel procurement. One point is made of grayish quartzite, a material frequently used to form Pine Tree points.

The most significant attribute of the Josselyn point is the broad flaring stem. Stems are shorter than on most Lost Lake points but are significantly broader. Serrations are fine, in contrast to the coarser serration found on the Kirk series. Bevelling does not occur on these points. Resharpening was accomplished by a technique of collateral flaking similar to that employed on Pine Tree points. Two examples had been reworked into end scrapers.

Since examples of the Josselyn type occur in the portion of the Hester site excavated by Beachum and Harrison but are not found in the area of the MDAH excavation, Hester may represent a series of encampments. Such a situation has been suggested by the Dalton-point data from Hester. Although no date can be assigned to the Josselyn points, they can be placed in a larger frame of reference probably belonging in the corner-notched subphase between 7500 and 5000 B.C. Similar types are Kirk Corner-notched, Charleston, and Pine Tree.

## Pine Tree

(Cambron 1957:18; Cambron and Hulse 1964:95; Perino 1968:68)

The Pine Tree point is large and corner-notched with serrated blades. Several unfinished points were recovered. These specimens have neither basal grinding nor serrations, attributes which represent the final step in manufacturing the point. Edges of unfinished Pine Trees are excurvate and somewhat sinuous. Initial-stage points are illustrated in plate 18 A-D and figure 26 A-D.

The serration process gives this point type its distinctive appearance. Long narrow flake scars resembling collateral flaking were produced near the distal end of the point, where the flaking runs together. Used as projectile points/knives, the points were resharpened by the removal of long narrow flakes, a process which narrowed the blade and gave the impression of collateral flaking. This resharpening also produced the incurvate blade, an attribute of the classic (advanced-stage) Pine Tree points (see pl. 18 F-M; fig. 26 F-M). The Pine Tree points at Hester were not bevelled by alternate pressure flaking.

Although all Pine Tree points at Hester have been heat treated and most are made of local gravel, shades of pink and white predominate over red. A few examples in the Beachum and Harrison collections are made from a grayish fine-grained quartzite, which is the dominant material of Pine Tree points from Sardis and Grenada reservoirs in northern Mississippi (McGahey, personal communication). Crenated fractures frequently occur on Pine Tree points (see pl. 18 K, L; fig. 26 K, L). Crenated fractures occur when specimens either are quickly removed from the heating element and exposed to cool air or when specimens have been heated to too high a temperature and an attempt is made to flake them (Purdy 1975:137).

Pine tree points have been described and/or illustrated by Cambron (1957:18), Travis and Lenser (1960:61), Bohannon (1972:fig. 15 N, M), and Blakeman (1976:190; pl. 1 D).

Plate 19 shows enlarged views of Pine Tree-point blade edges. The edges of specimen A are sharp and serrations are intact. The serrations on specimen B have been worn from use, and some small hinge fractures attest to heavy cutting or sawing. On specimen C the serrations have been snapped off. The edge was apparently used for some heavy-duty cutting or sawing on material such as bone, wood, or antler. No polishing or smoothing is present. Specimens A, B, and C in plate 19 correspond to points illustrated in plate 18 A, H, and F, and figure 26 A, H, and F.

For an example of a Pine Tree point worked into an end scraper, see plate 18 E and figure 26 E.

## Lost Lake

(Cambron and Hulse 1964:46; Perino 1968:50)

Lost Lake points at the Hester site are large and corner notched with slightly expanding stems. Slightly excurvate basal edges are ground smooth. The long hafting element (stem) is formed by deep corner notches. Sides of the stem are usually ground. Shoulders are barbed, some examples giving the impression of angular basal notching. Blades are triangular with serrated edges. Distal ends are acute.

No preforms or initial-stage points of the Lost Lake type have been recovered from Hester. However, a bevelled knife that could have been made from a Lost Lake-point preform has been described for the nearby Lawson site (Brookes 1975a:3). Two initial-stage Lost Lake points from sites in northeastern Mississippi have been seen by the author. Initial-stage Lost Lake points do not have the bevelled edges of advanced-stage points, and since they have not been resharpened, they are longer than the advanced-stage points. Blade shapes vary from triangular to convex. Some Lost Lake points show evidence of final thinning by the serial flaking technique described by Bradley (1974:191-97) in connection with Hell Gap points. It is interesting to note that when the serial flaking technique (which gives a twisted effect to the blade) occurs on points at Hester, it is associated with types that utilize the alternate bevelling technique of resharpening. Serial flaking does not occur on Big Sandy- or Pine Tree-type points at Hester.

The five Lost Lake points found at Hester are in the advanced stage (pl. 22 H-L; fig. 28 M-Q) and as such are characterized by heavy bevelling of the blade edges, which often causes the shape of the blade to become incurvate (concave). The alternate bevelling-resharpening method is considered indicative of use as a projectile point/knife, and hence of association with a removable foreshaft as part of the hunting equipment. One modification occurring occasionally on Lost Lake points in northeastern Mississippi has been termed a screwdriver tip (McGahey, personal communication). The tip is formed by several short flakes that produce a narrow transverse edge instead of the usual acute distal end. Edge wear of these truncated screwdriver tips in the form of smoothing, polishing, and occasionally small pressure crushes is similar to that on blade edges. All are observed phenomena on this modification. A typical example is illustrated in plate 22 L and figure 28 Q.

One specimen from Hester (pl. 22 I) shows alteration of a projectile point/knife into an end scraper with an edge angle of 48°. This type of scraper is generally thought to be a hafted tool used for skinning, scraping hides, cutting, and shredding plant fibers (Wilmsen 1970:70). No evidence of use is present on this specimen, but it appears to have been resharpened, so use-wear indications were probably obliterated.

Two points exhibit notches in the center of the base. Such notches are not an attribute of Lost Lake points. They have not been noted on any other Lost Lake points observed by the author, nor to his knowledge have they been recorded in the literature. The notch on one example (pl. 22 L) extends to just above the junction of the stem and shoulders. This particular point has one very long barb, but the second barb is missing. It is possible that the basal notch was added after the barb broke to facilitate hafting. According to McGahey (personal communication), replication of such a long, narrow basal notch is very difficult and frequently results in splitting the stem. A second example of basal notching is shown by the point in plate 22 K (see also fig. 28 M). This specimen has very short barbs and a slight notch formed by removal of flakes from both sides of the basal edge of the stem. The presence of flakes on both sides precludes the possibility that the break was accidental.

All Lost Lake points from the Hester site, as from most sites in northeastern Mississippi, are made from local heat-treated gravel, with shades of pink and orange predominating over red. Creamy white shades, common on Pine Tree points at Hester and in northeastern Mississippi, have not been noted on Lost Lake points.

The Lost Lake point seems to be a southeastern variety of the Hardin point (Scully 1951; Redfield 1966; Munson 1967). Lost Lakes are shorter than Hardins, perhaps as a result of cobble-size limitations, and they have more pronounced bevelling. The Lost Lake is found in the hills east of the Mississippi Valley, in northeastern Mississippi and into Alabama, while the Hardin occurs in the Illinois and Mississippi valley areas (Redfield 1962a:103; Redfield 1966; Brain 1971:18; Morris 1975:3).

Several authors have noted a resemblance between the Hardin point and the Scottsbluff (Luchterhand 1970:9; Brain 1971:18). Luchterhand, in fact, goes so far as to state that the Hardin Barbed is "a local type within the Scottsbluff type cluster" (1970:9). Hardin Barbed points were recovered in Missouri in Graham Cave from levels 5 and 6, which were dated at 9700 ± 500 B.P. and 8830 ± 500 B.P. (Logan 1952). Luchterhand (1970) suggests a date of from 7,500 to 10,000 years ago for the Hardin point.

Whatever the relationship between the Scottsbluff, Hardin, and Lost Lake points (and lithic evolution is not being suggested), the similarity in form should be investigated. A type-variety classification, a continuum, or any other such system will not be proposed here, as the data are insufficient. Moreover, the present confusion over projectile-point typology should not be compounded. In an attempt to clear up some confusion in the literature over Lost Lake points, however, a few references will be noted. In earlier articles in the Journal of Alabama Archaeology, Lost Lake points are classified as Cypress Creek points (Travis, Travis, and Lenser 1960; Cambron and Hulse 1960a:18; Cambron and Waters 1961:8; Huntsville-Madison County Chapter, Alabama Archaeological Society 1961:83, pl. 3 B; DeJarnette, Kurjack, and Cambron 1962:53). Tesar (1974:fig. 2 A) illustrates a Lost Lake point but classifies it as a serrated bevelled Motley point. Lost Lake points have been illustrated but not described by Blakeman (1976:190, pl. 2 B). A Lost Lake point is illustrated also in the report on the Womack mound in Yalobusha County, Mississippi (Koehler 1966:46, pl. 10 A).

Beachum Points (A Provisional Type)

Beachum points (Brookes, this paper, fig. 27 A-D) are medium-sized and short-stemmed. Stems, which show no evidence of grinding, are formed by corner removal, a procedure that occasionally produces a point with a corner-notched effect (see fig. 27 D). Shoulders vary from tapered to prominent, but as a rule are not barbed. Most basal edges are incurvate.

The slightly excurvate blade edges are not serrated, and the distal ends are acute. Most examples are fairly thick and crudely worked. On one example (fig. 27 A) the blade edges have been trimmed and a bevelled effect has resulted. The appearance results not from alternate bevelling, however, but rather from a crude trimming technique similar to that found on Benton points. Another example, in the Beachum collection, is made from a flake and is thinner than most but has a concave-convex cross section. All examples from Hester are made from heat-treated local gravel (pls. 16 H-J, 17 A-D).

Beachum points at Hester are found above Pine Tree but below Eva II-Morrow Mountain I points. This position and a radiocarbon date of 5015 $\pm$ 180 would support a date of ca. 5000 B.C., or one contemporary with another type of point not found at Hester but similar to the Beachum type, the Stanly. Stanly Stemmed points, recovered in Alabama and first described by Coe (1964:35), differ from Beachum points in having broader shoulders, a broader, more triangular blade, and a bifurcated stem. Stanley points have been found in Alabama at the Stanfield-Worley bluff shelter (DeJarnette, Kurjack, and Cambron 1962:67), the Flint River shell mound (Webb and DeJarnette 1948), and Russell Cave (Griffin 1974:44). Beachum points also bear a general resemblance to Neville points, New England stemmed points that date between 5790 and 5065 B.C. (Dincauze 1976:29).

## Eva II, Morrow Mountain I

Eva II (Lewis and Kneberg 1961:37,40)
Morrow Mountain I (Coe 1964:37)

Since the Eva II and the Morrow Mountain I projectile-point forms closely resemble each other and are difficult to sort, and since they appear in association at Hester, they are discussed together here (see pl. 22 Q-R, V-X; fig. 25 L-N, P-Q). Eva points have triangular blades with a diminutive tapering stem formed by basal notching. Shoulders are barbed. No grinding is present on the base. Morrow Mountain I points differ only in that their shoulders are horizontal.

At the Eva site in Tennessee, Eva I points date ca. 5000 B.C. (Lewis and Kneberg 1961:37, 40). Coe (1964:37) estimated that the Morrow Mountain I at the Doerschuk site in North Carolina dates ca. 4500 B.C. Radiocarbon dates at Rose Island, Tennessee, have confirmed Coe's estimate for Morrow Mountain I (Jefferson Chapman, personal communication). An identical date of ca. 4500 B.C. was reported for a Morrow Mountain I point in Alabama (DeJarnette, Walthall, and Wimberly 1975b). With such a tight dating sequence as this, it is safe to assume that the complex at Hester dates from ca. 5000 to ca. 4500 B.C.

In the Eva report, Morrow Mountain I points are illustrated on the same page as Eva II, and it is difficult to tell where one type ends and the other begins. Noting this similarity, Long and Josselyn (1965:143-45) proposed an evolutionary scheme for the points. Points similar to Morrow Mountain I have been noted in Mississippi (Brain 1971:37) and Florida (Bullen 1968:32). The two types seem to be index artifacts for the Middle Archaic period in the Southeast.

## Madison

(Scully 1951; Perino 1968:52; Cambron and Hulse 1964:53)

Madison points are small and triangular without notches or grinding. Although very thin, many Madison points appear to have been made from cores (Brookes 1975b:23-24). Bases are straight to incurvate. Blade edges are straight, convex, or concave. Most examples are made from heat-treated local gravel (pl. 22 S-U; fig. 25 R-T).

In the Tombigbee region, Madison points appear with the Miller IV ceramic assemblage and continue into the Mississippian period (Rucker 1974:34), a finding which means that the date of their first appearance in this region was ca. A.D. 600-800. In the Yazoo Basin, the Collins point (Brain 1971:63) is the marker type of the Miller IV-Coles Creek period, and Madison points do not appear until ca. A.D. 1000.

## Unidentified Projectile Points

Only eleven projectile points were recovered that did not fit into the current classification system. The points are listed and described below.

Specimen #1547 (pl. 17 I). Corner-notched. Heat-treated creamy-white local gravel. Stem expanded; excurvate base ground. One tang (left, pl. 17 I) broken by a technique similar to that employed on Decatur points. Serrated blade edges resharpened by pressure flaking that has produced collateral flake scars (a technique identical to that used on Pine Tree points). Notches larger than on Pine Tree points. Recovered from layer just above Big Sandy materials. May belong with Plevna-Ecusta point complex.

Specimen #1948 (pl. 17 J). Corner-notched; bevelled. Basal edges thinned and ground. Shoulders barbed; blade triangular. Resharpened by alternate bevelling technique. Local, heat-treated gravel, predominantly white, mottled with pink. Similar in form to Lost Lake type. Found near #1547 in level containing Decatur types above Big Sandy points. May belong with Plevna-Ecusta point complex.

Specimen #1309 (pl. 17 K). Barb of a corner-notched point. Serration to tip of barb, which is bevelled. Heat-treated dull-white local gravel. Recovered in layer just below a Big Sandy point.

Specimen #1188 (pl. 17 G). Initial-stage, corner-notched point. Expanded base lightly ground. Tangs and barbs pronounced. Twisting of incomplete (broken) blade, indicating resharpening by bevelling. Heat-treated, mottled pink-white local gravel. Recovered from layer containing Decatur points.

Specimen #1123 (pl. 17 E). Stemmed point with triangular blade. Base and stem unground. Blade edges serrated, but not with the deep serrations found on other points at Hester. Local heat-treated pink-red gravel. Recovered from zone producing Beachum points.

Specimen #1626 (pl. 17 F). Stemmed point with triangular blade. Unground, straight base. Local heat-treated pink gravel. Recovered from zone yielding Decatur points. Crudeness of this specimen may indicate that it was the work of a novice flint knapper. Flake scars are deep and tend to hinge out, giving a rough appearance to the point surface.

Specimen #1938. Midsection of a corner-notched point. Heat-treated pink-orange local gravel. Entire stem missing. One remaining shoulder with prominent barb. Blade edges serrated and bevelled. Resembles Lost Lake type, but absence of stem prevents positive identification. Found at the top of the Big Sandy zone just below a zone containing Decatur points, this piece was at a much older level than any of the other Lost Lake points. Possibly it is part of a Plevna-point blade.

Plevna points are bevelled, serrated, and corner notched, and the one specimen found in context at Hester occurred just above Big Sandy points in a zone containing Decatur points.

Specimen #1999. Small point with heavily reworked blade and ground stem edges. Heat-treated mottled pink-white local gravel. Although this specimen fits the description of Jude points, the blade is so crudely reworked that it seems out of place with other Jude points from Hester. The recovery of this point from the Woodland-Historic zone indicates that it is either a late (Woodland period) point that resembles a Jude, or a Jude that was reworked and used by later people.

Specimen #2067 (pl. 17 H). Base of a large side-notched point. Notches are wide. Notches and base ground smooth. No evidence of serration, bevelling, or parallel flaking on the triangular blade. Heat-treated gray-pink local gravel. Recovered from Big Sandy zone. The wide notches account for this specimen's designation as unclassified, but it is probably just another variation within the Big Sandy type.

Specimen #2867. Stemmed (corner removed). Local heat-treated red gravel. Base fractured by several blows, apparently in order to form a burin. (Point split from base down two-thirds of its length before basal fracture occurred.) Heavy wear in the form of crushing on blade edges near distal end thought to be associated with heavy cutting, scraping, or sawing of material such as bone, antler, or hard wood. A section of the blade edge near the midbody has been carefully resharpened by pressure flaking to prepare the artifact for heavier work. The point was found in a zone containing Decatur points.

Specimen #2579. Corner-notched. Concave base. Basal edge and notches ground. Triangular blade with neither serrations nor bevelling. Local heat-treated red gravel. Found in zone containing Decatur points, and probably represents a variation within the Decatur type. Two large potlid fractures indicate that this point was exposed to high temperatures after it was finished.

As has been shown, most of the point types from Hester can be readily identified. Those few that cannot be are either rare or may represent variations of established types. It is quite possible that another writer using the typological system employed in this paper would have placed the points with other named types, something that could be done without changing any of the conclusions concerning temporal assignments for point types. Further work at Hester may help to clarify the range of variation found with the types.

# 6

# THEORETICAL CONSIDERATIONS

The preceding sections of this paper are primarily descriptive. The present section expresses the views of the author on various problems concerning the interpretation of data from early lithic sites in the eastern United States.

## Bannerstones and Atlatls

Bannerstones are centrally perforated stone objects of a variety of shapes and materials. The only comprehensive work on the artifact category is by Byron W. Knoblock (1939), an amateur whose publication nonetheless remains the authoritative work. Artifacts of a similar class, known to collectors as boatstones, are polished, grooved, and occasionally drilled. Boatstones differ from bannerstones in that the perforations, when present, are smaller, like those found on pendants, gorgets, and beads. Archaeologists have long held that these two classes of artifacts can be placed together under the category of atlatl weights. The present section describes some of these objects and their associations and examines the assumption that they constitute a portion of prehistoric hunting equipment.

Two often-cited instances seem to have given rise to the theory that bannerstones were a functional part of aboriginal hunting equipment. Kidder and Guernsey reported polished stone artifacts attached to spear throwers in Arizona (1919:180). The polished stone artifacts from Arizona are not in fact bannerstones but are objects more similar to what eastern archaeologists call boatstones. These undrilled forms will not be discussed here, as they do not occur at Hester.

Excavators in Kentucky found bannerstones associated with objects of antler now known as atlatl hooks (Webb 1946), which often accompanied burials. It was noted that the holes in the bannerstones were aligned wth conical depressions drilled in the ends of the antler hooks. Most archaeologists assume that the antler hook was part of an atlatl that was weighted with a bannerstone, the wooden shaft of which had rotted away. Inasmuch as the major stress on the atlatl would be at the hook end, it seems strange that ancient hunters would have weakened that portion by making a composite atlatl with a small shallow conical receptacle to receive the stress. If such were the case, the hunters of the Southeast were unusual in possessing a composite atlatl, for nowhere else in North America has a composite atlatl been found. Atlatls were made from one piece of wood in Florida (Cushing 1897:371), Arizona (Guernsey 1931:72), Utah (Macon 1928:303-08), Texas (Fenega and Wheet 1940:221-23), and Oregon (Cressman, Williams, and Krieger 1940:33), a fact that may help explain why the bannerstone is not found wherever the atlatl occurs, but does not explain why bannerstones were used in the eastern United States.

Palter (1976:500-10) has reached some interesting conclusions about atlatls. First, he found that adding weights to atlatls did not improve the function of the tool. Rather, Palter's experiments with atlatls showed the added weights to be a hindrance. (Perhaps this demonstrated principle of physics explains why one does not see baseball pitchers with weights strapped to their arms; the atlatl is, of course, an extension of the arm.) Palter found both ethnographic and archaeological evidence in the literature to suggest that most atlatls were springy, that is, flexible. Moreover, most of the atlatls were flat in cross section, an important distinction considering that the holes drilled through most bannerstones are round.

Winters's (1968) reanalysis of the Green River Archaic sites presents another problem for the theory that bannerstones were functional parts of hunting equipment. Winters found that 18% of the bannerstones recovered from burials at four sites in Kentucky were in association with females. He admits that this association is hard to explain but offers the following suggestions: "Possibly the association relates to the transfer of the contents of a corporate estate, and has nothing directly to do with the sex of the individual per se. Or perhaps the answer is simply that some women were hunters of one type of game or another" (Winters 1968:206-07). Only three atlatls were found with burials at the Eva site in Tennessee (Lewis and Kneberg 1961:66). One burial (#196, a juvenile male about fourteen years old) contained two atlatl hooks and two bannerstones, one apparently of shell and one of stone. The holes of the bannerstones were aligned with the hooks, a positioning that indicates that the bannerstones and hooks had once been attached to shafts. A second burial containing an atlatl (#114, an infant, sex not determinable) is one of the rare instances in which projectile points are in association with atlatls. Two points were recovered with this burial, a Sykes and an "undifferentiated straight stemmed" (Lewis and Kneberg 1961:131). It would seem that if spear-throwers were used as burial offerings spears would also accompany the burials, but such is usually not the case. Bone projectile points are preserved on the Green River and Tennessee sites, just as are the antler hooks, so either points were made by sharpening the ends of wooden or cane spears, or spears were usually not associated with spear-throwers in burials.

Students of the archaeology of eastern North America show an inconsistency which should be pointed out here. Bannerstones and antler hooks found in alignment offer the only evidence for spear-thrower weights in the southeastern United States. Most museum reproductions and many textbook illustrations show the spear-throwers with an antler hook at the back of the atlatl and a bannerstone just forward of the hook. In all instances of which this author is aware, however, when bannerstones are found aligned with antler hooks in situ, the bannerstone is one-and-one-half to two feet forward of the hook. When "reconstructed" in illustrations, the bannerstone is usually moved nearer to the hook, where it would facilitate handling of the tool. The apparatus thus appears functional.

It may be added that most archaeologists overlook Knoblock's system (1939:131-33) which divides types of bannerstones into classes A, B, and C according to explicitly defined criteria, a system similar to the type-variety system now used by many professional archaeologists. Knoblock not only presents a convincing evolutionary scheme but also shows distributions of types. Since his volume was published almost forty years ago, his distribution maps could doubtless be improved, but his work on the drilling of bannerstones is in the very best form of replication studies. Knoblock points out a very important factor commonly overlooked: that specific types of stone were used for specific patterns. This factor alone would suggest a status-oriented artifact, or sociofact. Winters has suggested that bannerstones may have been the objects of curate behavior. Thus, this class of artifacts would seem to be very different from tools such as axes, projectile points, and manos. Otherwise, one must ask why one part of the supposed hunting gear of ancient man (the atlatl) was deemed sufficiently important to be included with burial furniture, while another part (the spear) was excluded. Only when new hypotheses are formulated can these questions begin to be answered. As long as these artifacts are simply labeled "atlatl weights," that is what they will remain: a part of the cultural gear of a mysterious group of people.

## Smooth-Sided Adzes

Seventeen smooth-sided adzes were recovered in excavations at Hester, four of them in disturbed areas. All seventeen are remarkably similar and appear to be identical to the tool called the Dalton adze in Arkansas (Morse and Goodyear 1973), but since in Mississippi they have not been found in association with Dalton material, it is proposed here that these Hester artifacts be referred to as smooth-sided adzes. This suggestion of different nomenclature does not imply that Morse and Goodyear are wrong in their interpretation. In Mississippi, however, the smooth-sided adze appears first in association with Big Sandy points and continues through the Early Archaic period, so the different name is in order.

Three smooth-sided adzes were found in association with Pine Tree points and other artifacts. The dating of the occupation is unknown, but is assumed to be ca. 6000-5000 B.C. One specimen from the Pine Tree zone is illustrated in figure 20 B. Only one adze was recovered with Lost Lake points. Identical to others recovered at Hester, it is illustrated in figure 21 C.

Adzes were most common in the Decatur zone, where the five specimens recovered are believed to date from 7500 to 7000 B.C. Three of these are illustrated (fig. 21 A, B, D). Specimen #1872 (fig. 20 A) is especially noteworthy as an adze preform. Its gravel is very coarse, flaking is rough and irregular, and some red areas attest to light heat treating. Because of its inferior material, this specimen was probably discarded before the final stages of manufacture were accomplished. According to Morse (1971b:9-20), Dalton adze preforms in the Hawkins cache appear to have been made on thick flakes. At the Brand site, adze preforms were made from cobbles, as was this example from Hester.

Four adzes were recovered from the Big Sandy zone at Hester, believed to date ca. 8000-7500 B.C. Two are illustrated in figure 22 A, C. The latter example is discussed below.

Of the seventeen adzes recovered, only two show evidence of heat treating, the preform (fig. 20 A) and a butt (fig. 21 C). Another specimen, of Fort Payne chert, may have been heat treated. Its association is unknown, as it was found in a disturbed area.

It is not clear when the adze first appeared in Mississippi, but its first occurrence at Hester was with the Big Sandy people following the Dalton occupation at the site. After the Dalton occupation, Hester is believed to have served as a base camp during a major portion of the Early Archaic period. It is not known whether the adze was simply introduced as a new tool type from the Arkansas area or whether the utilization itself of the Hester site changed. At any rate, it can be stated that the Early Archaic smooth-sided adze is a heavy-duty woodworking tool identical in most respects to the Dalton adze in Arkansas. It is not known why this type is not heat treated while the other Early Archaic components at Hester are characterized by great numbers of heat-treated tools. The discrepancy may be due to a combination of factors such as size, technique of manufacture (mostly percussion with a hammerstone), and use. The adze continued as part of the cultural repertoire of people throughout the Early Archaic period at Hester.

Cruder adzes lacking the smooth ground sides of earlier specimens are found at sites with Middle-Late Archaic components in Monroe County, Mississippi. To date, none have been found at Hester, although they are plentiful at nearby sites. Another later adze at the Denton site in the northern Yazoo Basin has recently been described by Connaway (1977:10). These later adzes may be part of a cultural tradition which lasted for several thousand years.

## Adze Modification

In his discussion of recycled adzes at the Brand site, Goodyear (1974: 41-42) recorded four distinct uses: adze knife, adze wedge, adze used as an end scraper, and adze butt used as a flake core. Only one of these use types was found at Hester, and none of the Hester adzes are associated with the Dalton component.

Two adzes found at Hester suggest heavy use and subsequent employment as cores for striking flakes. The one complete specimen (#2291; fig. 22 B) has a heavily battered bit with many hinge fractures and crushing along the edge. Evidently, the ground lateral edges have been used as striking platforms for the removal of flakes. The flake scars are expanding and very deep, much deeper than any other flake scars present on the surface. Because this specimen was found in a disturbed area, its provenience is unknown.

The second example (#1933) is almost complete. Its bit, now missing, was apparently removed to prepare a broad striking platform for removal of flakes. As illustrated in figure 22 C, several long, narrow flakes have been removed. The specimen may have been taken from the haft because of its very small size. Together with #1932 (fig. 22 A), it was found in association with Big Sandy materials. Neither example is heat treated, and both are made of local gravel.

## Previous References to Adzes

Several writers have discussed tools which may be of the same type as the Dalton adze in Arkansas and the smooth-sided adze at Hester. Analysis of collections from sites having Early Archaic components will probably yield more implements of this type now that it has been described in the literature and associations have been noted.

The adze was present at the Eva site in Tennessee (Lewis and Kneberg 1961:63, 65). Though the tool found in Tennessee does not appear to be the smooth-sided type assocated with Early Archaic levels at Hester, it is part of a later Archaic assemblage. Similar implements have been described for a Middle Archaic site in the northern Yazoo Basin, Mississippi (Connaway, 1977).

Several tools from Russell Cave in Alabama (Griffin 1974:51) might also be included in the adze category. Two of these tools, called rounded oblong blades, are illustrated in Griffin's report and appear very similar to the adze. Almost no description is offered, but Griffin comments that they are "relatively large, well-finished tools" (1974:51). Since, in addition, they were present in layer F, they probably represent Early Archaic tools, possibly adzes.

Another mention of a tool resembling an adze is in Huscher's (1964:12, 18) report of the "Standing Boy Flint Industry." Huscher refers to the bit portion of an implement identical to the Clear Fork gouge of Texas. The Standing Boy Flint Industry, located in Georgia, contained bevelled points of the types Ecusta, Plevna, Decatur, and Cypress Creek.

Flint "celts" with smooth ground edges have been recorded by Cambron and Hulse (1960a:27) in Alabama, where they occurred at sites producing Early Archaic and Paleo-Indian artifacts. Similar, if not identical, tools occurred at the Flint Creek rock shelter in association with Early Archaic points in stratum 2 (Cambron and Walters 1961:16). Flint celts and tools called gouges were found in the Stanfield-Worley shelter (DeJarnette, Kurjack, and Cambron 1962:76).

Similar artifacts, then, have been found in the Southeast with early point types. With tools such as the adze, early man was able to expand his capacity to exploit his environment. At one time the Archaic was characterized in terms of negative traits: no pottery, no mounds, and no agriculture. Now, as archaeologists have expanded their trait lists, the once-dreary Archaic period has come to be recognized as a time of rapid cultural advancement. In discussing the many facets of Archaic culture, Willey and Phillips state that "the presence of heavy chipped ax-like or adze-like tools that could be regarded as forerunners of the ground and polished axes and adzes of the 'later' Archaic has been suggested as a criterion for the Archaic beginnings, but the proposition requires further proof" (1958:112). The work of Morse and others in Arkansas has clearly established the Dalton adze as a diagnostic tool type for the transitional Paleo-Indian. At Hester, indications are that either the makers of Dalton points did not possess this artifact or they did not use it at sites such as Hester. Later groups in the Early Archaic period used this tool type with little or no modification. This fact decreases its usefulness as a temporal indicator in northern Mississippi, but certain implications must not be overlooked. Heavy woodworking was an important part of life at the time. If the increasingly accepted concept of the existence of large base camps during this period is valid, we may expect to find remains of houses. Dugout canoes are another possibility for Early Archaic cultural inventories (Morse 1973:26). Canoes would have greatly facilitated the movement of task groups in a riverine environment such as Hester's. In retrospect, it can be said that the addition of the smooth-sided adze to trait lists of the Early Archaic period represents more than just a new artifact type to be recorded. Rather, it opens up new possibilities for generating and testing hypotheses concerning settlement patterns and cultural activities.

## Relationships of Projectile Points

Much confusion has arisen concerning projectile-point relationships--spatial, temporal, and cultural. The confusion results from a lack of stratigraphic data and overemphasis on physical attributes. While physical attributes are of extreme importance in classification, they must be used cautiously in establishing chronological sequences. A good example of the questionable conclusions that can result from such overemphasis is the late Dan Josselyn's (personal communication, 1969) proposed continuum in which the Pine Tree point evolves from the Greenbrier point. While his theory appears convincing on paper and can be demonstrated by ordering groups of points, no such evolution is apparent from the Hester data. Pine Tree points and Greenbrier points are separated in time, and many which do not fit the continuum are found in layers between the two types. Use of this archaeologist-ordered continuum in the LaGrange report (DeJarnette and Knight 1976:22-28) produced the following statement:

> On typological grounds these corner notched forms [Kirk Corner Notched] are distinctly related to the apparently earlier Pine Tree Corner Notched (Cambron and Hulse 1975:105) which in turn . . . may be placed squarely within an ontogenetic continuum including Dalton, Greenbrier, and Pine Tree types (Brock 1969: 51-54, 61). The probability of this earlier evolutionary transition from lanceolate to later corner notched forms has not yet been confirmed by stratigraphic data from the North Alabama area, yet the same idea is implicit in a stratigraphic comparison between the projectile point types of this time range at Coe's Doerschuk and Hardaway sites and Broyles' St. Albans material (Broyles 1971:figure 35).

As is made clear in the above quotation, no stratigraphic data from Alabama supports their contention. The side-notched forms from these sites, which occur before corner-notched forms, are not mentioned. Finally, no lanceolate forms have been recovered yet from the St. Albans site. Stratigraphic evidence at Hester does not show Pine Tree points to be part of any "ontogenetic continuum." No data from Coe's (1964) excavations show Pine Tree points as part of a continuum. In fact, no points that could be classified as Pine Tree are mentioned by Coe. Broyles (1971:56-57) shows a form called the Charleston Corner-notched point that is very similar to the Pine Tree type and earlier than Kirk, but the Charleston points are shorter and narrower, their distribution is different, and they are much earlier than Pine Tree. No dates for Pine Tree points from Hester are available, but they are found at the top of the Early Archaic sequence just below Eva points, which have been dated consistently ca. 5000 B.C. Since Charleston points have been dated earlier than 7000 B.C., a definite gap is present between these two similar types.

The concept of an "ontogenetic continuum" as used by DeJarnette and Knight is related to what is commonly called "tradition." "Tradition," as used in this paper, is defined as "a primarily temporal continuity represented by persistent configuration in single technologies or other systems of related form" (Willey and Phillips 1958:37). Thus, what is sometimes called a continuum, implying evolution, is considered a variation on a theme through time. Many varieties can be present, and often regional variations occur. This scheme is in contrast to the idea that a single artifact type evolves in a strictly defined manner as if governed by some sort of lithic genetic code.

Chapman (1975:249) provides an excellent model of tradition, using a broader class of projectile-point types (bifurcate base points) as a horizon marker. Individual cultural-historic types such as Le Croy, St. Albans, and Kanawha are shown as subhorizon markers, which are, in effect, phase markers. Chapman's model is the same as that offered by Willey and Phillips (1958:41) and should be a useful model for further work on the eastern Archaic, such as Tuck's (1974) synthesis.

In addition to problems of overemphasis on form and lack of stratigraphic data, problems have arisen over the misinterpretation of stratigraphic data. Excavations at Russell Cave in Alabama produced many styles of projectile points. As is true of so many cave sites, many of the better-known types were found in contexts which did not conform to previously reported alluvial sites. This discrepancy probably results from differences in the natures of caves and rock shelters. Griffin (1974:91-94) attempted to handle the discrepancy by employing a model of "coexistent traditions," which provides a possible explanation, but a comparison of alluvial sites and rock shelters generally shows that, in the former, strict stratigraphic sequences are found, whereas, in the latter, some mixing occurs. Few archaeologists would look at a mixed ceramic assemblage and call it an example of coexistent traditions. Griffin (1974:34) freely admitted that some mixing was obvious in the ceramics from Russell Cave. His explanation for the mixing in the upper levels is exactly that put forth in this paper for the rather unreliable data from caves and rock shelters. However, in noting that projectile points were also mixed, he attempted to justify the mixing by the model of coexistent traditions. Griffin found no evidence either to verify or negate true association between Big Sandy and Dalton points at sites such as Stanfield-Worley. He concluded that "whether they [Big Sandy points] will eventually be found in a pure context remains to be seen" (Griffin 1974:94). Hester has answered Griffin's question: Big Sandy points are found in a zone above the Dalton assemblage (see figs. 7-10). Moreover, artifacts from the Dalton complex at Hester are light yellow, in contrast to the heat-treated artifacts of later cultures, which are overwhelmingly reddish in color. In fact, analysis of flakes from Hester may lead to another distinguishing factor between these two types: a different heat-treating technique. Hence, not only point form and soil zone but also technological aspects demand a separation.

One aspect of the Big Sandy problem cannot be solved here. At the Eva site in Tennessee (the type site for Big Sandy), the side-notched points were found high in the excavation, above Eva points in levels dated ca. 3500-1200 B.C. (Lewis and Kneberg 1961:34-37). Tuck (1974) has addressed this situation and offered a suggestion. In his view, the type specimens are not what is now known as Big Sandy. In addition to being later than Big Sandy, they are larger, and have narrower side notches and a less-regular blade form (the earliest points have more triangular blades). Tuck's observations are generally true, but examples from Hester in the Beachum and Harrison collections show a wide range of variation. For example, the largest specimen cataloged has a length of 73 mm, while the smallest is 17 mm in length. Most have ground bases. In addition, some bases are straight, some incurvate, some deeply incurvate, and others are notched like a Cahokia point. The point illustrated by Cambron and Hulse (1964:90) and classified as an Osceola is probably a basally notched Big Sandy. Two Lost Lake points at Hester share this trait, and one Decatur (Brookes and McGahey 1974:fig. 3 B) has side notches added to the blade. That this variation in Big Sandy has been recognized in Alabama is illustrated by the fact that the new point guide (1975) describes all three new types of Big Sandy.

One is left with the conclusion that there is an early side-notched tradition in the Southeast. The points occur immediately above the Dalton zone at Hester and are often in association with Dalton in rock shelters. Tuck (1974:75-76) has mentioned this early horizon and has shown that several regional variants occur on about the same time level. Kessel (Broyles 1966:18), Cache River (Cloud 1969:119), Greenbrier (Lewis and Kneberg 1958), Hardaway (Coe 1964:67), and possibly the Rowan point in North Carolina (Cooper 1970:113) are all side-notched points which occur just after Dalton points in the areas where they are found. Also, some of the side-notched points found at the John Pearce site in Louisiana (Webb, Shiner, and Roberts 1971:15-17) could probably be safely placed on this horizon, since the San Patrice points seem to occur at about the same time as Dalton.

In a recent article (Cleland 1976:59-76), a "Focal-Diffuse Model" was applied to Paleo-Indian and Early Archaic sites in the Southeast. Quite correctly, tool kits and projectile-point forms were said to show a similarity spanning the continent. While there is regional variation, one can speak of broad patterns in projectile point style (Tuck 1974:72-80). It was further stated that this continent-wide similarity was due to a low degree of variability in site size and permanence, hence a low degree of variability in exploitative techniques (Cleland 1976:68-69). Nothing could be further from the truth if one is to believe the data on site utilization during this early period, which indicate that a wide variety of activities was being carried out by groups of people, with varied types of archaeological sites resulting (Morse 1971a:5-10; 1973:23-38; House, Klinger, and Schiffer 1975:93-102; Wilmsen 1968b:67-87; 1970).

At Hester it is obvious that the Dalton occupation of the site represents a different type of site utilization from that of succeeding occupations during the Early Archaic period. But time difference between the Dalton and later occupations is not the best explanation for the different types of utilization. As Wilmsen has pointed out, "the organization of Paleo-Indian culture included a diversified set of structural poses through which responses to ecological conditions were initiated" (Wilmsen 1968:38). In fact, the more recent studies of Dalton culture indicate that the "late diffuse pattern" espoused by Cleland for the Late Archaic, Early and Middle Woodland periods is applicable to transitional Paleo-Indian-Early Archaic as well, since it allows for the exploitation of a variety of resources. While Cleland attempts to narrowly define this period, it is apparent that he is not aware of the more recent studies. His interpretation of the early hunter-gatherers would have been well received fifteen years ago, but not today.

In establishing any sort of model for this early time, one must consider the data on assemblages, not just projectile points. Morse and Goodyear (1973:316-22), in their definitive article on the Dalton adze, open the door for technologies never before credited to the late Paleo-Indian cultures. Heavy woodworking does not fit the concept of seminomadic hunters following herds of animals.

Sites such as Hester and Brand, in northeastern Arkansas, need excavation on a large scale in order to generate data that will enable archaeologists to leave the stage of speculation in which they now flounder and move on into firmer, more realistic constructs.

## Projectile-Point Form and Function

An interesting consideration of point form and function is given in Ahler's (1970) study of points from the Rodgers shelter in Missouri. Ahler's study is lacking in but one area: not enough attention is given to the vertical distribution of artifacts in different categories. Nevertheless, a comparison can be made between data from Rodgers shelter and the Hester site. Ahler, while not using specific historical types, does use categories which can easily be compared to some of the better-known types used in this report. Specifically, his form 3 is comparable to the Lost Lake point, forms 10 and 11 A to Big Sandy, and form 21 to Dalton.

Ahler compared his category 3 points to the Rice or Rice Lobed point found in Missouri (see Perino 1968:76). Category 3 points are large-stemmed points with triangular blades. Edges are serrated and bevelled. This writer agrees with Ahler's conclusion that "acute serration on category 3 specimens is associated with specialized sawing or slicing activities for tools bonded to broad split wooden handles" (1971:119). On the following page, however, Ahler goes on to say that "edge bevelling, in itself, is not a functional indicator, but is often the result of resharpening activities" (1971). Resharpening by bevelling is a diagnostic trait for some projectile-point types, e.g., the Lost Lake point. Because bevelling is a very patterned technique of resharpening, it can be concluded that the Lost Lake point served the dual function of projectile point/knife. Frison has shown several resharpening techniques for broken points in Wyoming (Frison, Wilson, and Wilson 1976). There, the resharpening took place wherever the point was damaged. With Lost Lake points (and others with bevelling) the damage is exclusive to the blade edge and, after resharpening, the same area is worn and resharpened again. Hence, bevelling is an important indicator of function, that is, of knife resharpening.

Use as a projectile point/knife is only one technological function demonstrated by repeated resharpening of blade edges. The author believes that use as a projectile point/knife requires use of a removable foreshaft as part of the hunting gear. Such has been suggested by Dan Morse (Goodyear 1974:33) for Dalton points in Arkansas. One of the more outstanding instances of projectile points being attached to bone foreshafts is an account of a Clovis burial in Montana. Clovis points are among the earliest known spearpoints in North America, often found in association with mammoth remains. They are thought to have been hand-held thrusting weapons rather than thrown spears. The Montana burial yielded several Clovis points and associated bone foreshafts (Lahren and Bonnichsen 1974). Lahren and Bonnichsen theorized that not only would a bone foreshaft provide the hunter with several spearpoints, enabling him simply to "reload" his weapon after the main shaft had been retrieved, but bone foreshafts "would undoubtedly be more resilient to stress than wood in the actual stabbing operation and would allow for deeper penetration of the point into the animal" (1974:149). These factors would explain how and why the foreshaft was introduced. When a shift in exploitative patterns occurred, as when the white-tailed deer became the main game of hunters in the Southeast after 8000 B.C., the foreshaft continued as a valuable part of the hunting equipment. Though spears were either thrown or propelled with an atlatl, the foreshaft was still popular because the spear could be used as a point/knife, which enabled the hunter to butcher his kill in the field. Again, since the foreshaft with its stone dart point was small and light, the user could carry several in case one became damaged.

Not all inhabitants of the Hester site utilized the foreshaft. Eva points show no signs of use as knives, so makers of this style point evidently had for unknown reasons dropped the foreshaft from their hunting equipment. Most of the earlier points either show the bevelled resharpening techniques associated with this cultural trait or have the patterned bifacial retouch that characterizes Pine Tree points. One notable exception at Hester is Big Sandy points, none of which show patterned resharpening. A few specimens have been broken and reworked, but there is nothing like the repeated patterned resharpening present on other types. In fact, only one Big Sandy shows any evidence of use as a cutting tool (pl. 14 D). Ahler found a similar situation with his categories 10 and 11 A, which are similar to the Big Sandy point at Hester. He tentatively suggested that "category 10 and a few other side-notched specimens functioned as projectile tips" (1971:119). No explanation will be offered here as to why makers of these side-notched point forms did not use a projectile point/knife in their hunting. More detailed analysis of tool kits, use wear, and settlement patterns may elucidate this matter.

### The Bifurcate-Point Tradition in Northeastern Mississippi

Since no points of the bifurcate tradition have been found at Hester, it may seem superfluous to devote time and space to the topic. The importance of the bifurcate-point tradition as a horizon marker for much of the eastern United States, however, has been pointed out by several authors (Fitting 1964:92-94; Broyles 1966:1-43; 1969:31-36; 1971:30; Chapman 1975:235-76; 1976:1-12). According to Chapman, the tradition began in the early seventh millenium B.C. and continued for 500 to 700 years (1975:244).

Although the tradition left no evidence at Hester, it did occur during the occupation of the site and should be noted because it provides data which reinforce Chapman's (1976:1-12) contention that the tradition was a mid-Atlantic phenomenon. The writer feels that it is important to distinguish between the mid-Atlantic traditions and those of the southeastern United States. There is a valid dichotomy between the two, despite their great similarities. It is hoped that from a discussion of some aspects of this dichotomy further research can be proposed which may yield clues as to the cultural dynamics involved.

Chapman (1975:253) correctly predicted that points of the bifurcate tradition could be expected to occur in the northeastern corner of Mississippi, and bifurcate points of the Le Croy type do indeed occur in the region. Most examples are larger than those at the Rose Island site in Tennessee and those from the Piedmont area of Virginia. Specimens from northeastern Mississippi generally conform in size and shape to those illustrated by Bell (1960:64) from the Le Croy site in Tennessee. Most specimens examined by the author are made from a bluish gray chert of unknown source. The material is not Fort Payne chert, although it does resemble that material. Few examples are found made from local materials, but when they do occur the points are heat treated and have the familiar pink-orange-red-creamy-white hues noted on other points made of heat-treated local gravel from the area.

It is obvious, then, that northeastern Mississippi is on the fringe of the bifurcate-tradition distribution. The points of this tradition are almost certainly imports from the north, probably brought in by small bands moving principally along the Tennessee River and occasionally going down the Tombigbee. That most of the points are of a nonlocal material is further evidence for this conclusion. If concentrations of these points could be found, testing of certain sites could provide an interesting look at a meeting of peoples of the mid-Atlantic bifurcate tradition and their contemporaries in the southeastern area.

## Projectile-Point Sequence for the Eastern United States

Figure 29 shows a proposed projectile-point sequence for the eastern United States. While the chart is based on findings at several sites, the data have been ordered so that undated sites may be brought into proper perspective. All points were drawn actual size before reduction so that the proportions would be correct. (Usually they were traced from illustrated examples in the original reports.) The chart was compiled using data from the Rose Island site in Tennessee (Chapman 1975:107, 109, 116, 119); the John Pearce site in Louisiana (Webb, Shiner, and Roberts 1971:12, 14, 16-18); the Thunderbird site in Virginia (Gardner 1974:38a); the Stanfield-Worley site in Alabama (DeJarnette, Kurjack, and Cambron 1962:47-70 *passim*); the St. Albans site in West Virginia (Broyles 1971:49); the Doerschuk Hardaway site in North Carolina (Coe 1964:36, 38, 66, 68, 69, 71, 72); the Eva site in Tennessee (Lewis and Kneberg 1961:41, 42, 44, 45); and the Hester site.

In placing the well-known but as yet undated lanceolate forms of the Southeast, the author has used Gardner's (1974:15) proposed scheme, which employs a "Middle Paleo Sub-Phase," a phase based on findings at the Thunderbird site, where Gardner found a shift from classic Clovis points to smaller points with longer fluting and more edge retouching. The shift in point form is similar to that which occurred on the Great Plains at about the same time, that is, from Clovis to Folsom. Brain (1971:13-15) has proposed a similar sequence for the Yazoo Basin. It may be added that while points of this period in the Southeast do not exhibit true fluting, there is an overall similarity between types both in form and in the basic technology of flint knapping. Peter P. Cooper (personal communication) also has used Gardner's scheme in his studies in North Carolina.

PLATES, FIGURES, AND TABLES

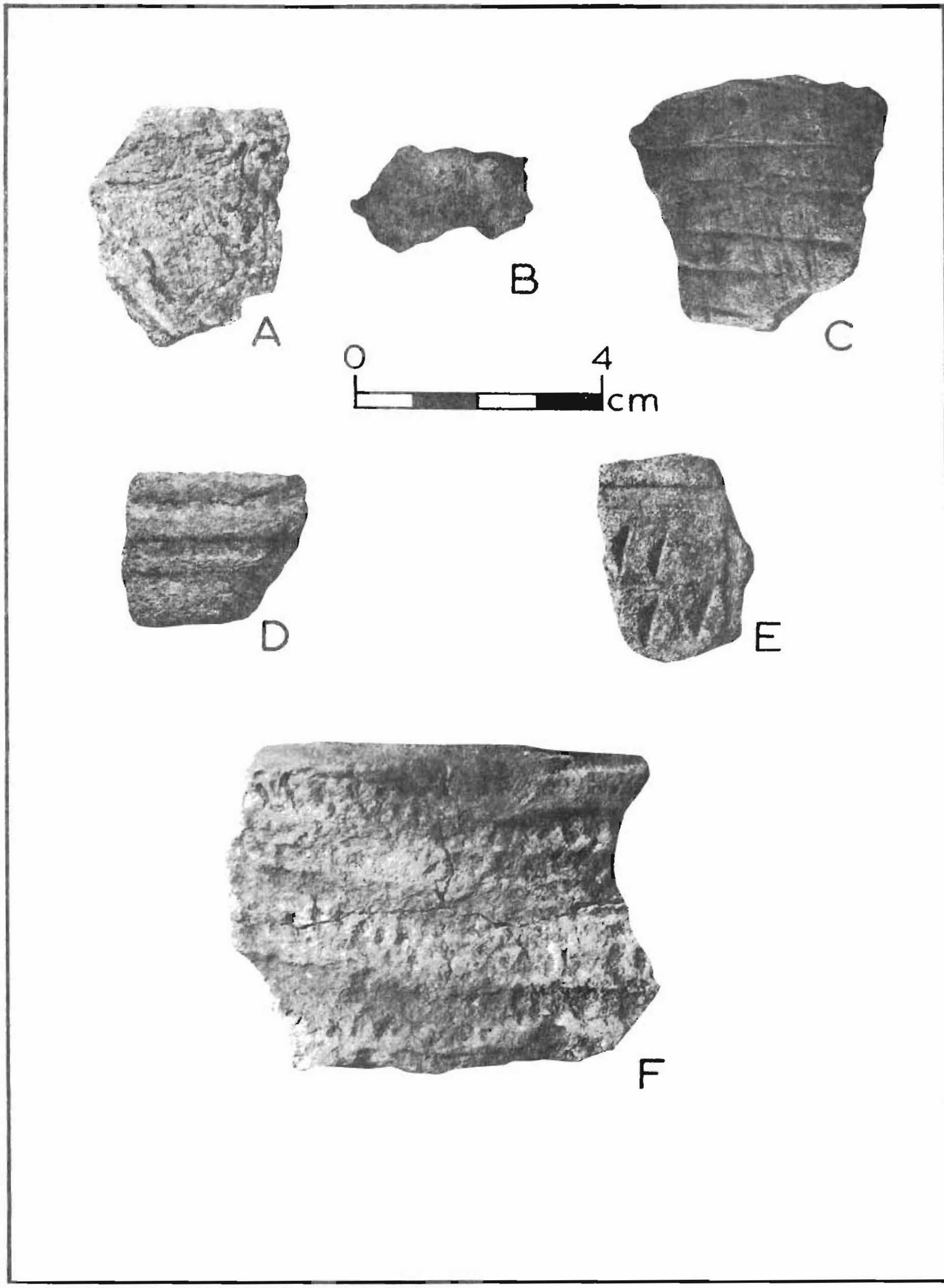



PLATE 1. TRANSITIONAL ARCHAIC-WOODLAND AND MILLER I CERAMICS. A-B, Wheeler Plain; C, Wheeler Simple-stamped; D, Alexander Incised; E, Alexander Pinched; F, Saltillo Fabric-impressed.

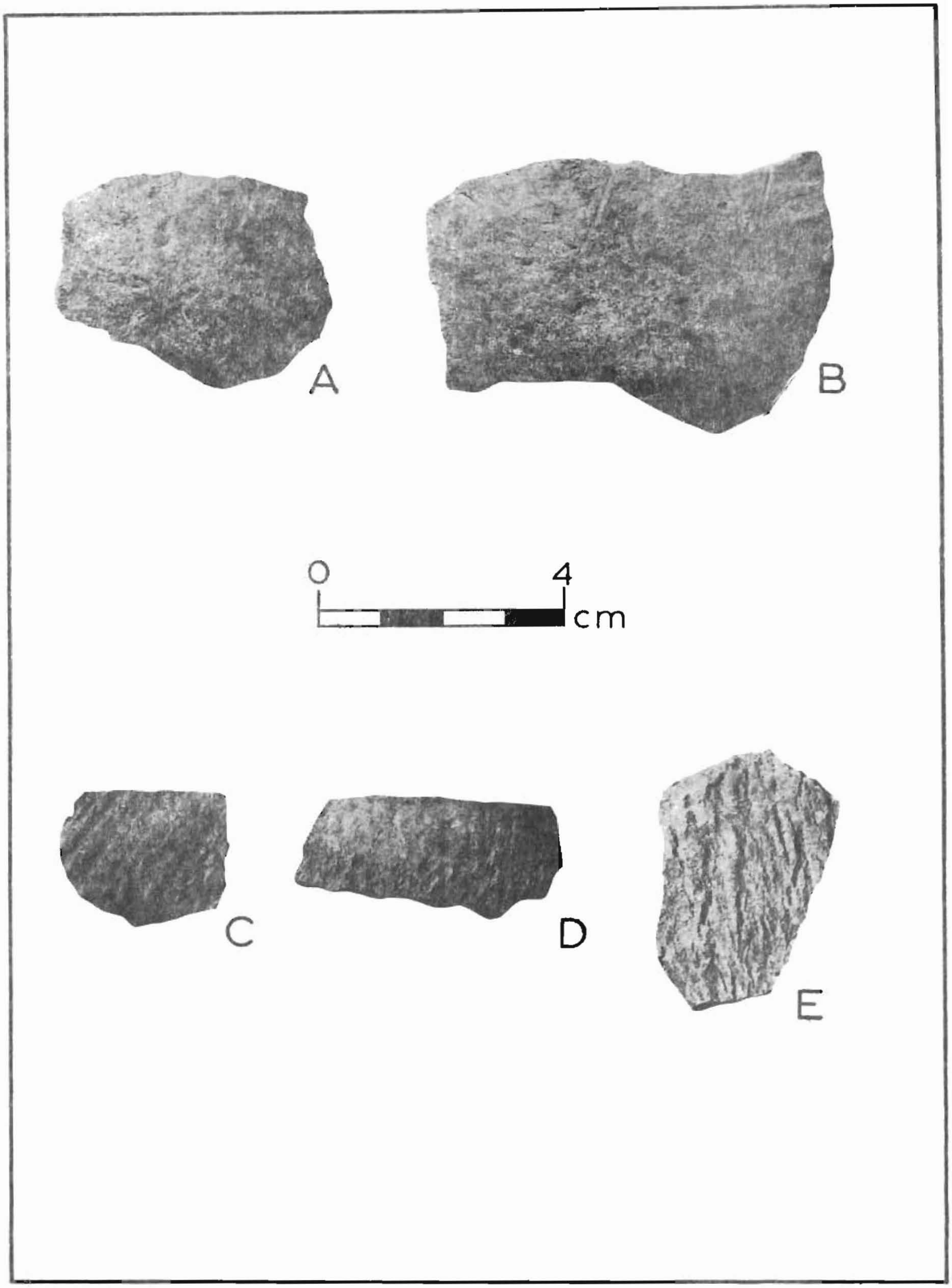



PLATE 2. MILLER II CERAMICS. A-B, Baldwin Plain; C-E, Furrs Cord-marked.

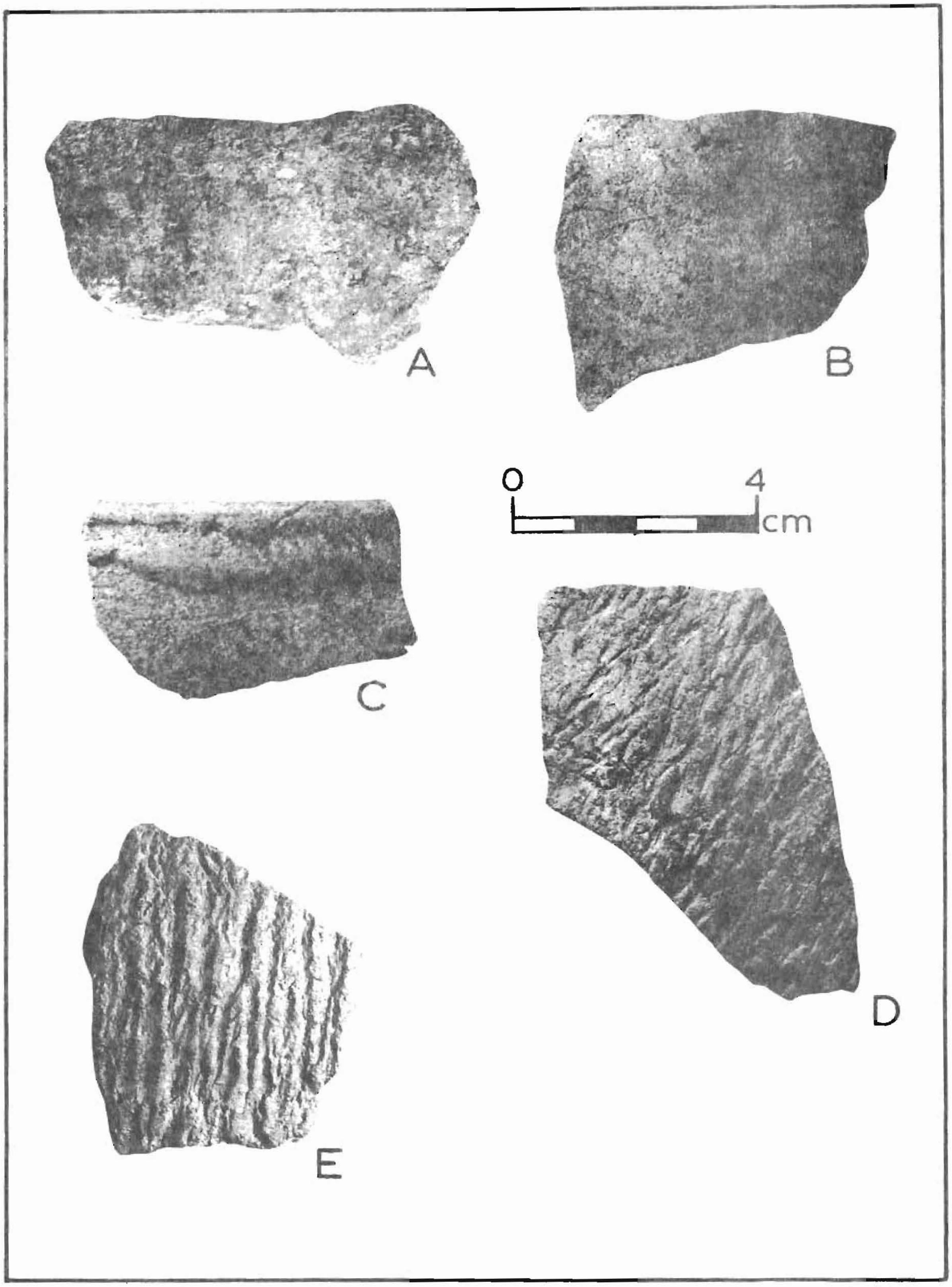



PLATE 3. MILLER III CERAMICS. A-B, Tishomingo Plain; C-E, Tishomingo Cord-marked.

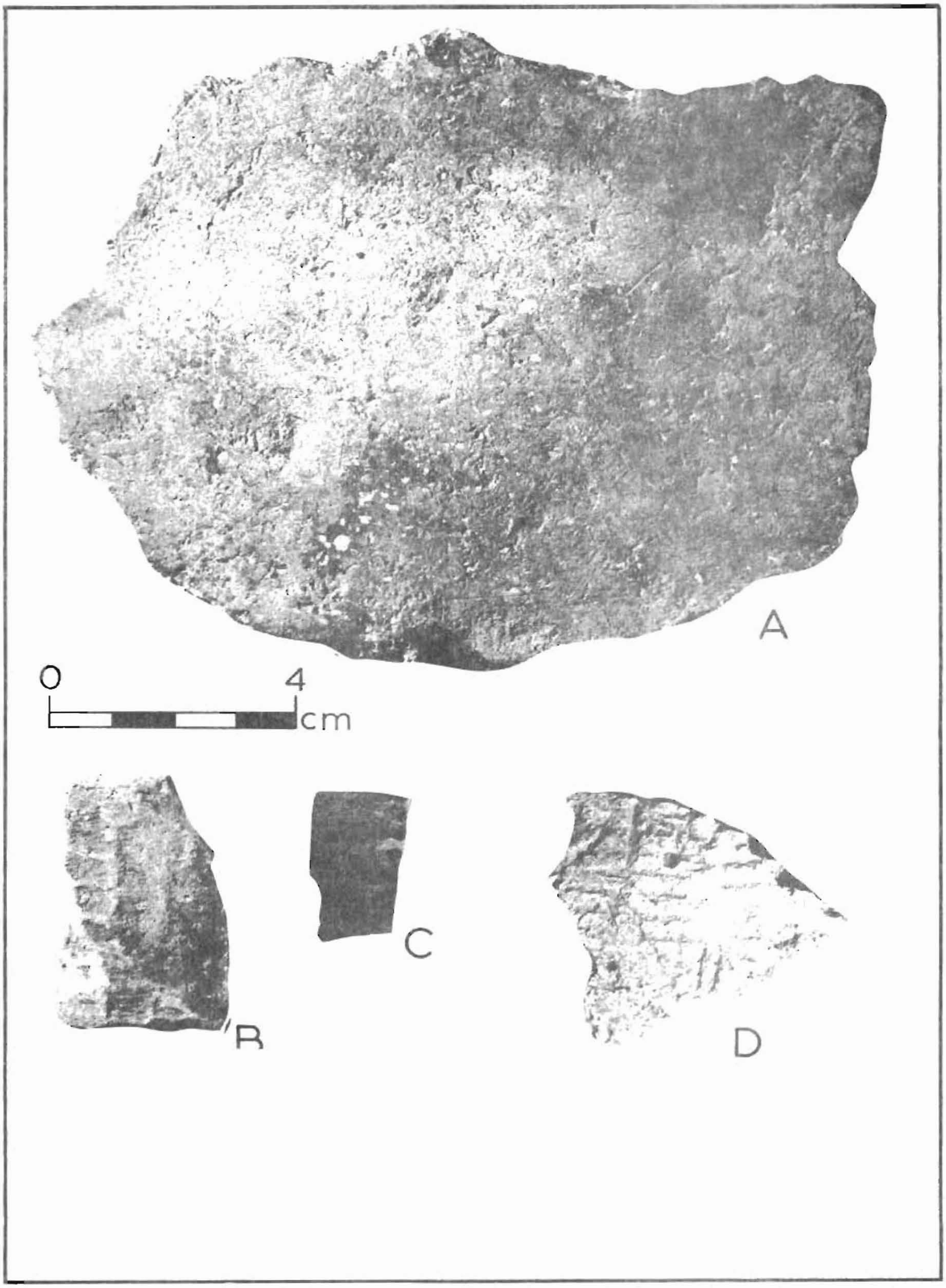



PLATE 4. MILLER IV CERAMICS. A, Roper Plain; B-C, Wheeler Check-stapmed; D, Mulberry Creek Cord-marked.

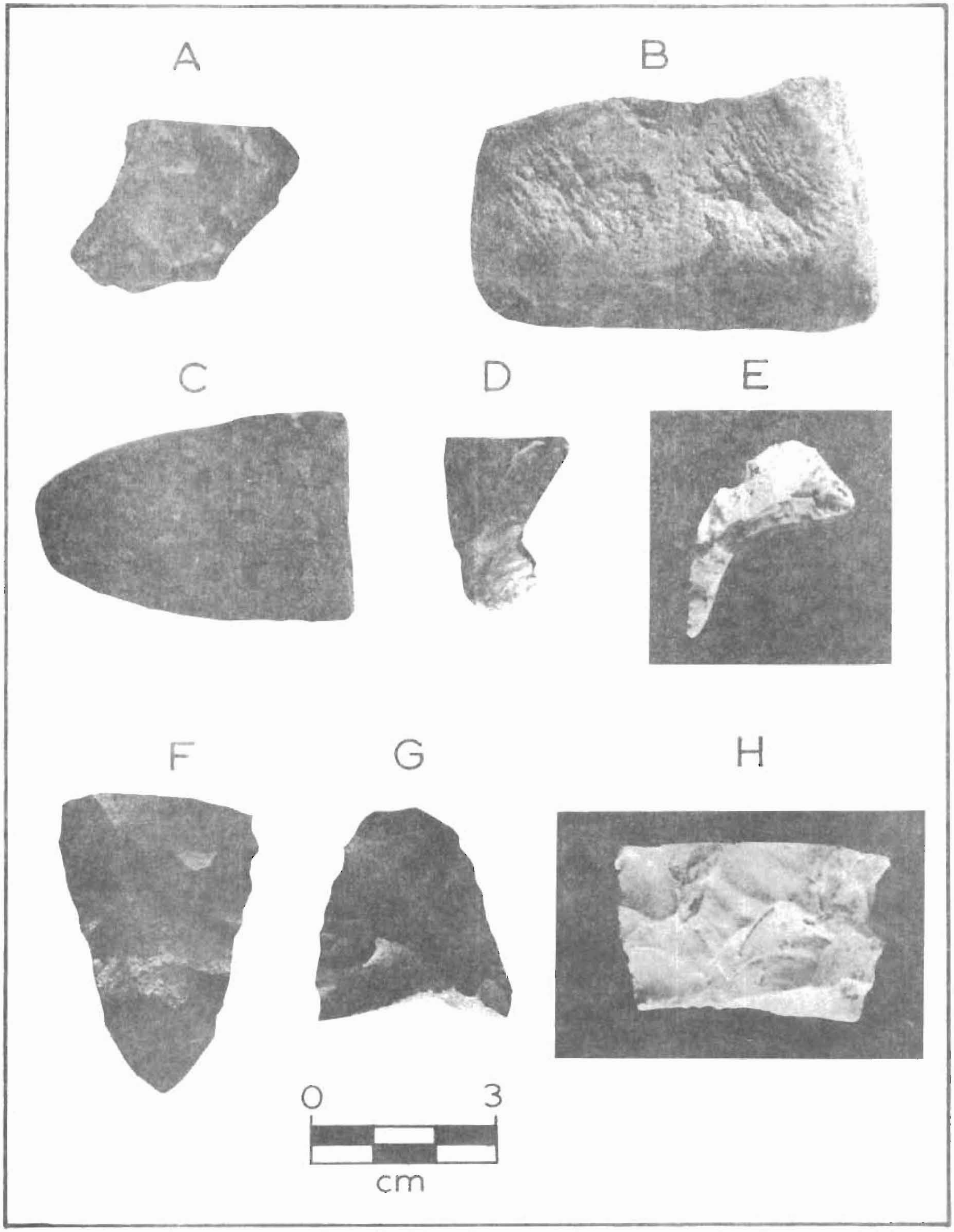



PLATE 5. MISCELLANEOUS ARTIFACTS. A, piece esquillee; B, anvil showing marks of piece esquillee; C, fragment of "shuttle" bannerstone; D-E, bifaces with crenated fractures; F-H. bifaces with lateral snap.

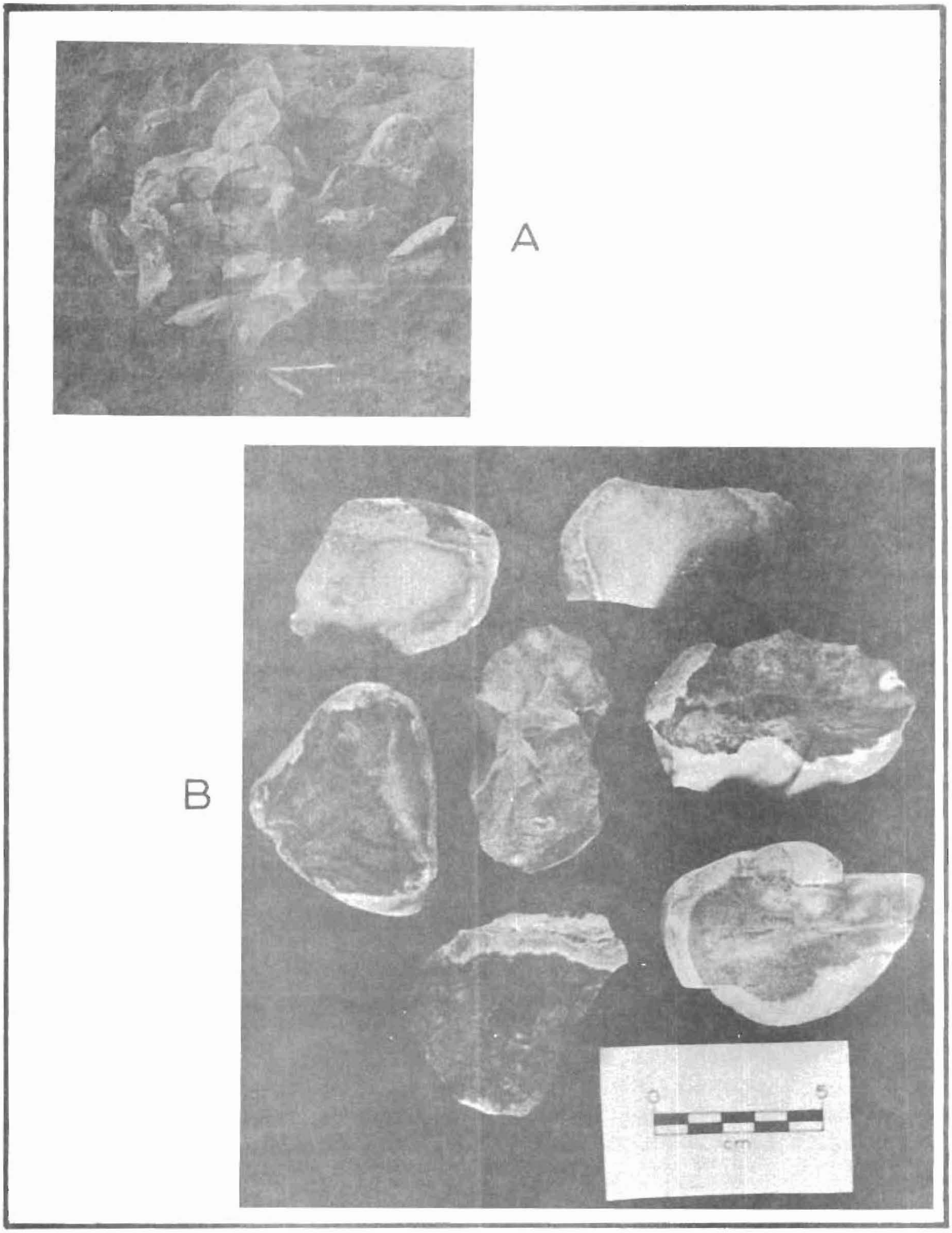



PLATE 6. INMON CACHE: A, *in situ*; B, primary and secondary decortication flakes.

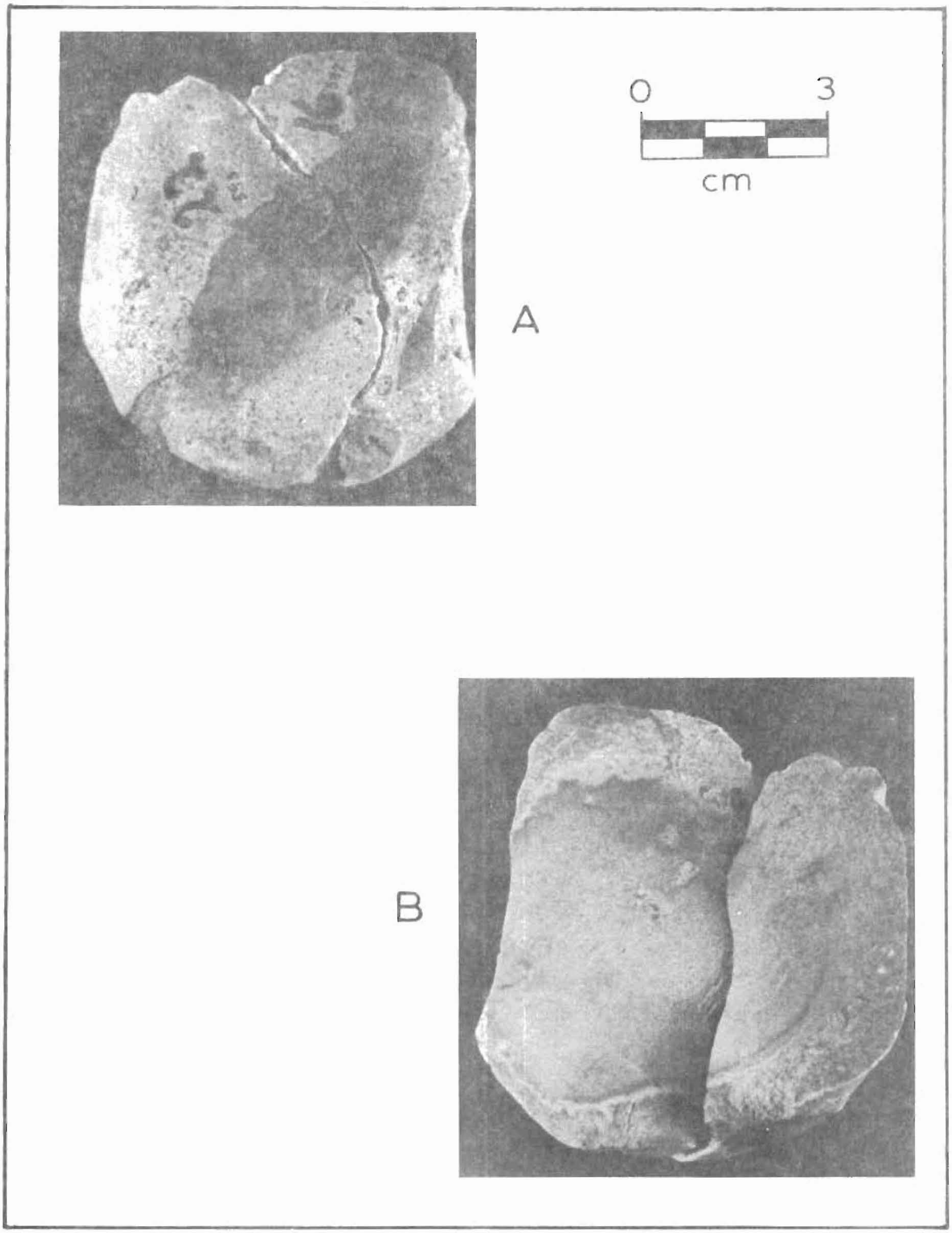



PLATE 7. INMON CACHE: A, primary decortication flakes; B, secondary decortication flakes.

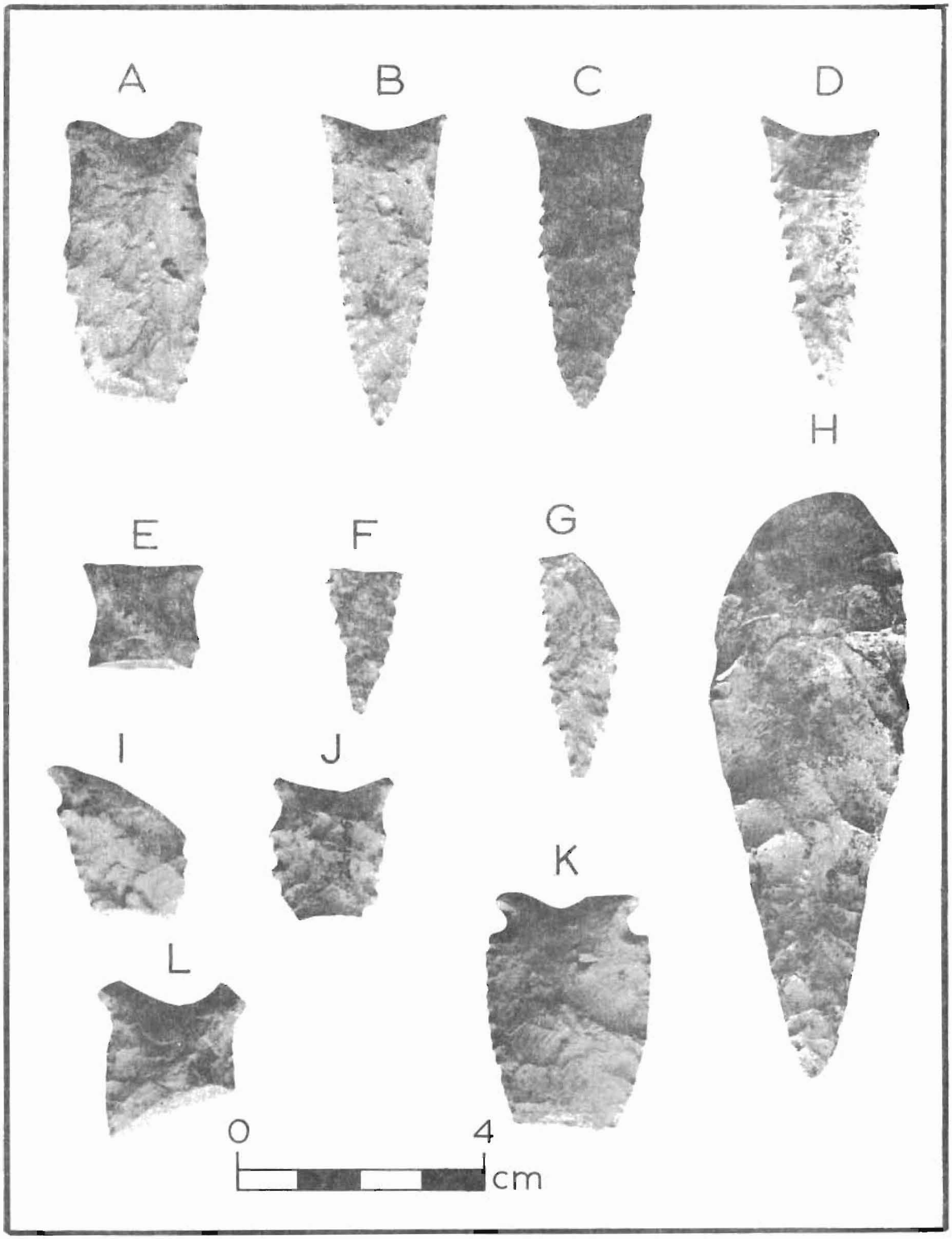



PLATE 8. DALTON ASSEMBLAGE POINTS.

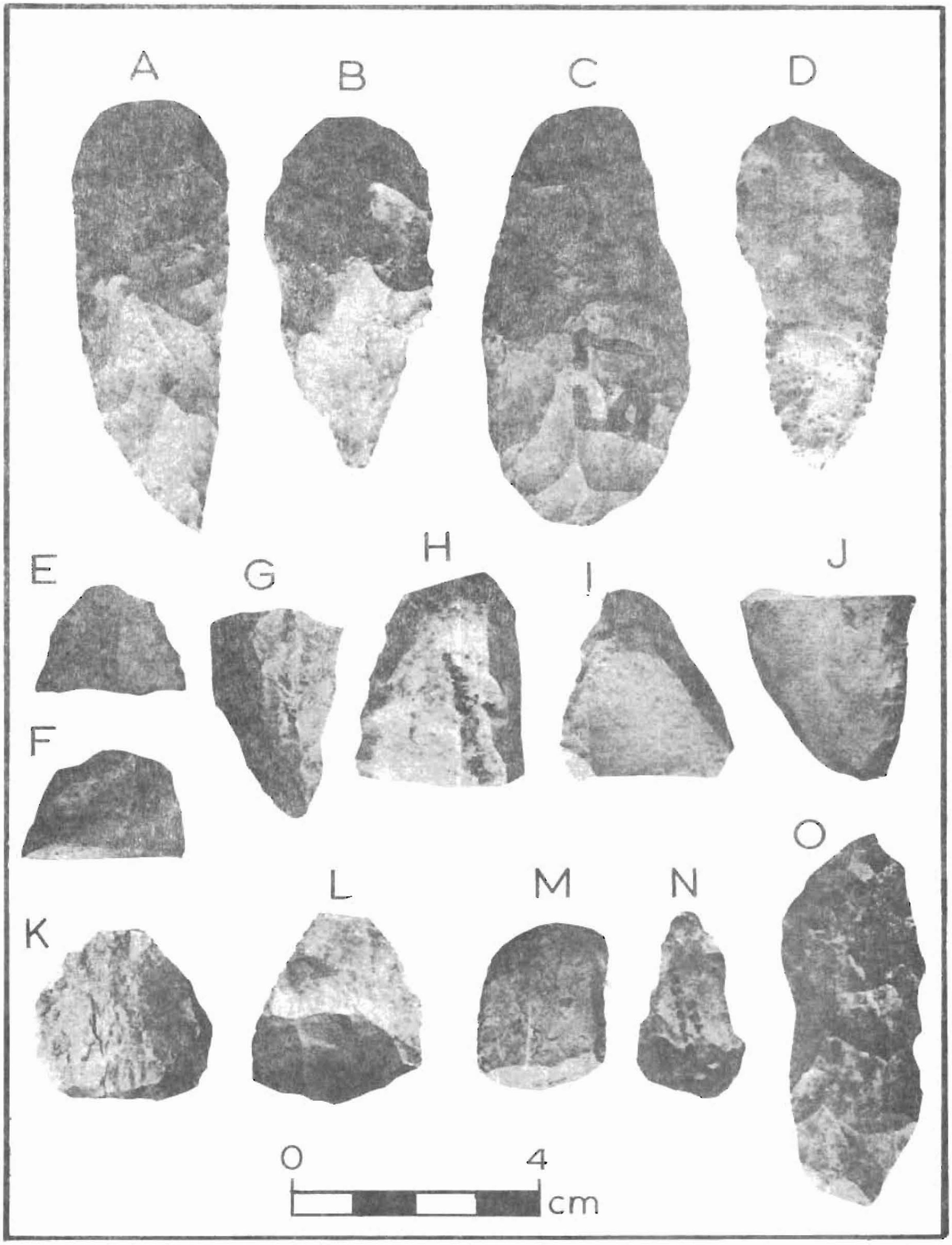



PLATE 9. DALTON ASSEMBLAGE ARTIFACTS. A-C, side scrapers; D, knife; E-J, side scrapers; K, end scraper; L, side scraper; M-N, end scrapers; O, preform.

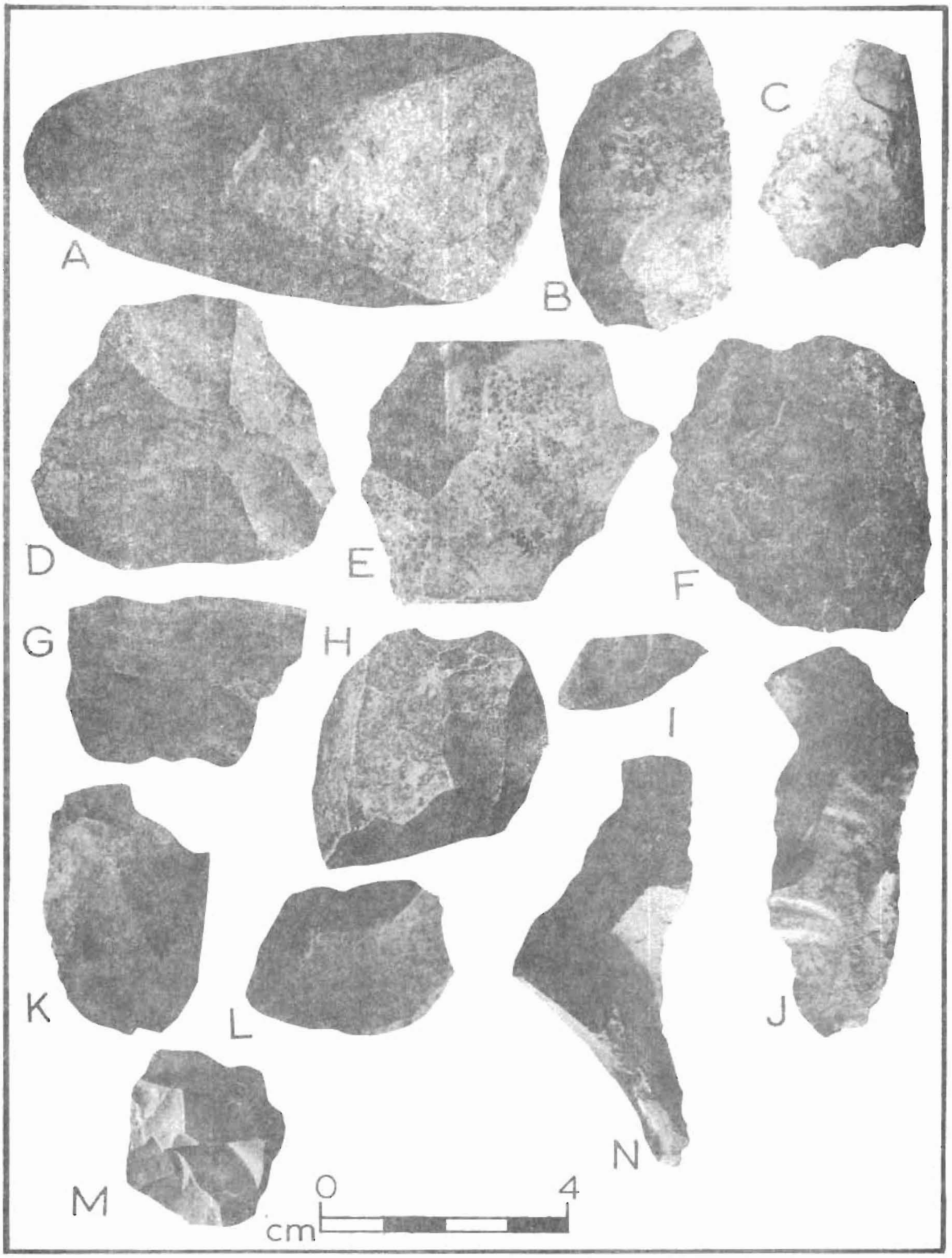



PLATE 10. DALTON ASSEMBLAGE ARTIFACTS. A, quartzite hammerstone; B, side scraper/spokeshave; C, piece esquillee; D, multidirectional core; E, tabular flake; F, biface; G, piece esquillee; H, tabular flake; I, biface; J-L, side scrapers; M, piece esquillee; N, blade.

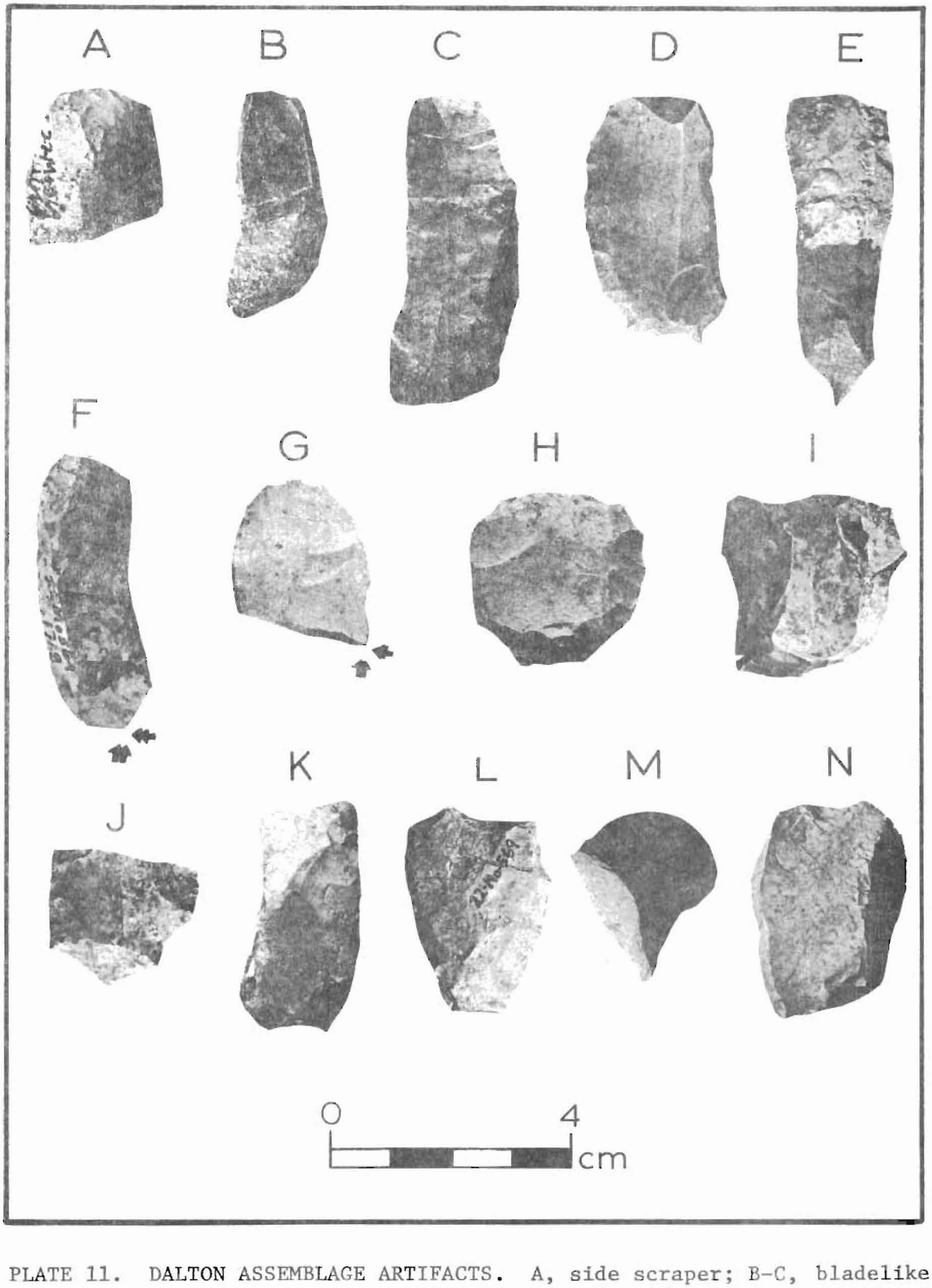



PLATE 11. DALTON ASSEMBLAGE ARTIFACTS. A, side scraper; B-C, bladelike flakes; D-E, gravers; F-G, burins; H-I, end scraper/gravers; J, graver; K, side scraper/spokeshave; L, graver/spokeshave; M, graver; N, _piece esquillee_.

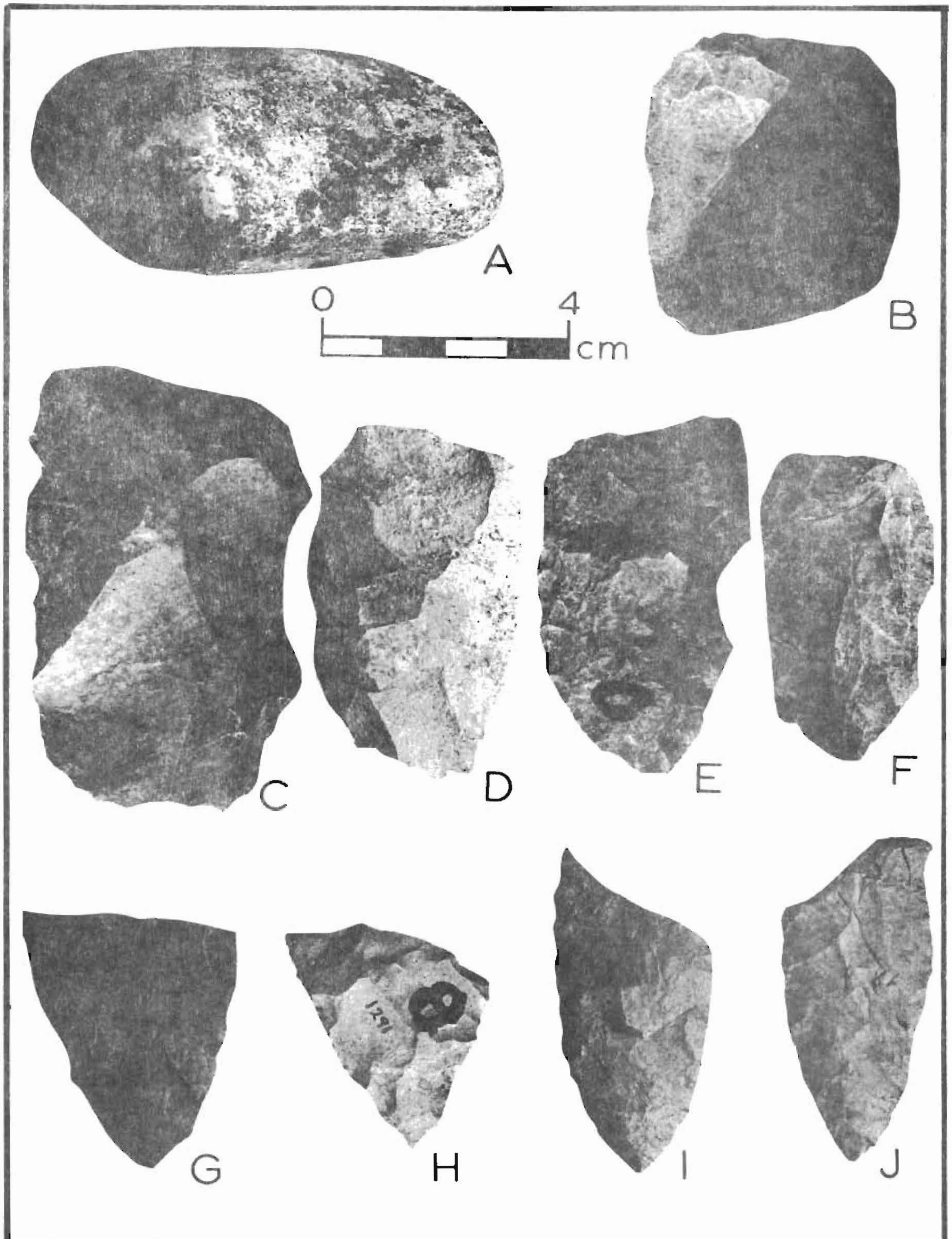



PLATE 12. DALTON ASSEMBLAGE ARTIFACTS. A, unworked cobble; B, side scraper; C-D, bifaces; E-J, preforms.

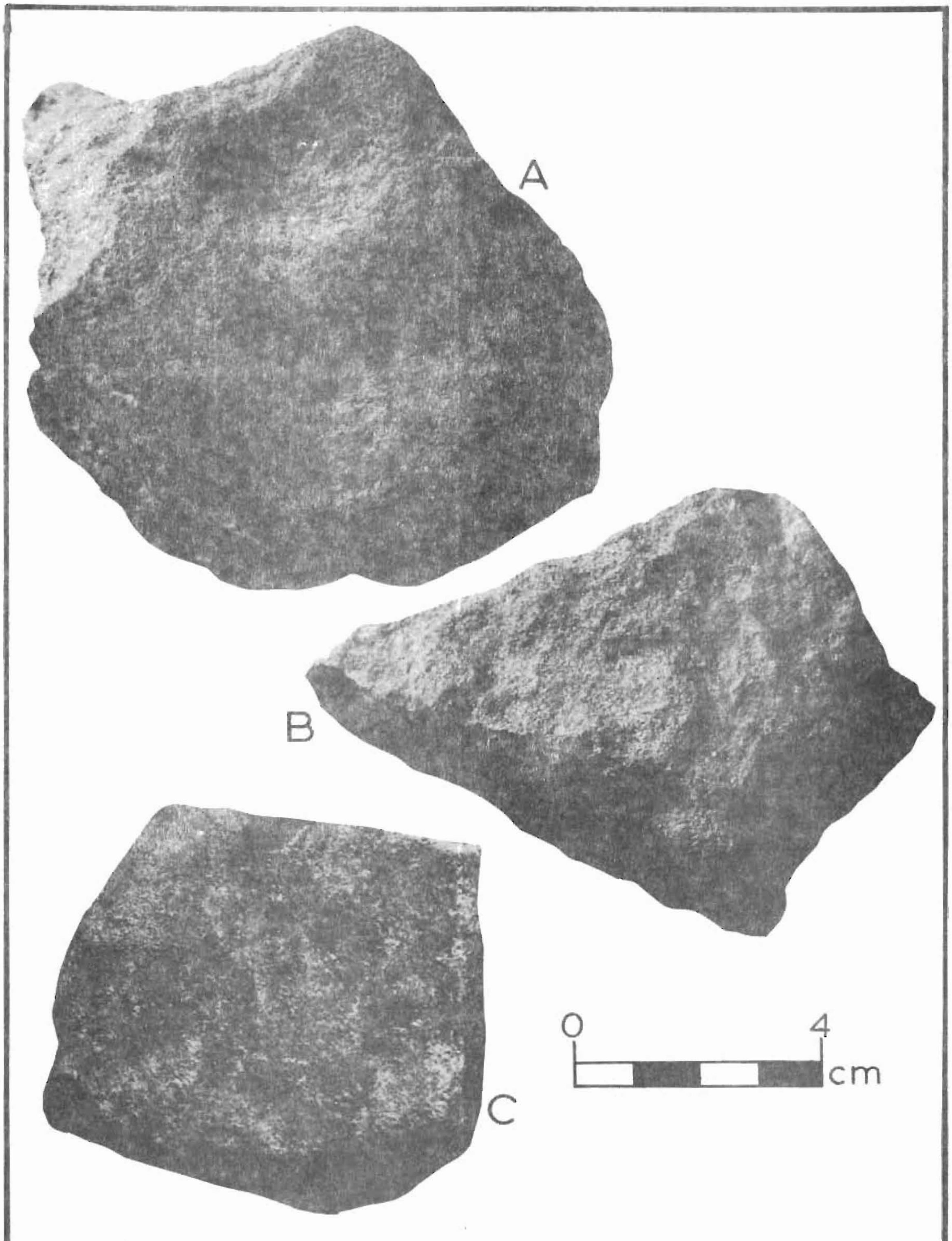



PLATE 13. DALTON ASSEMBLAGE ARTIFACTS. A, sandstone nutstone; B, unworked sandstone; C, sandstone abrader.

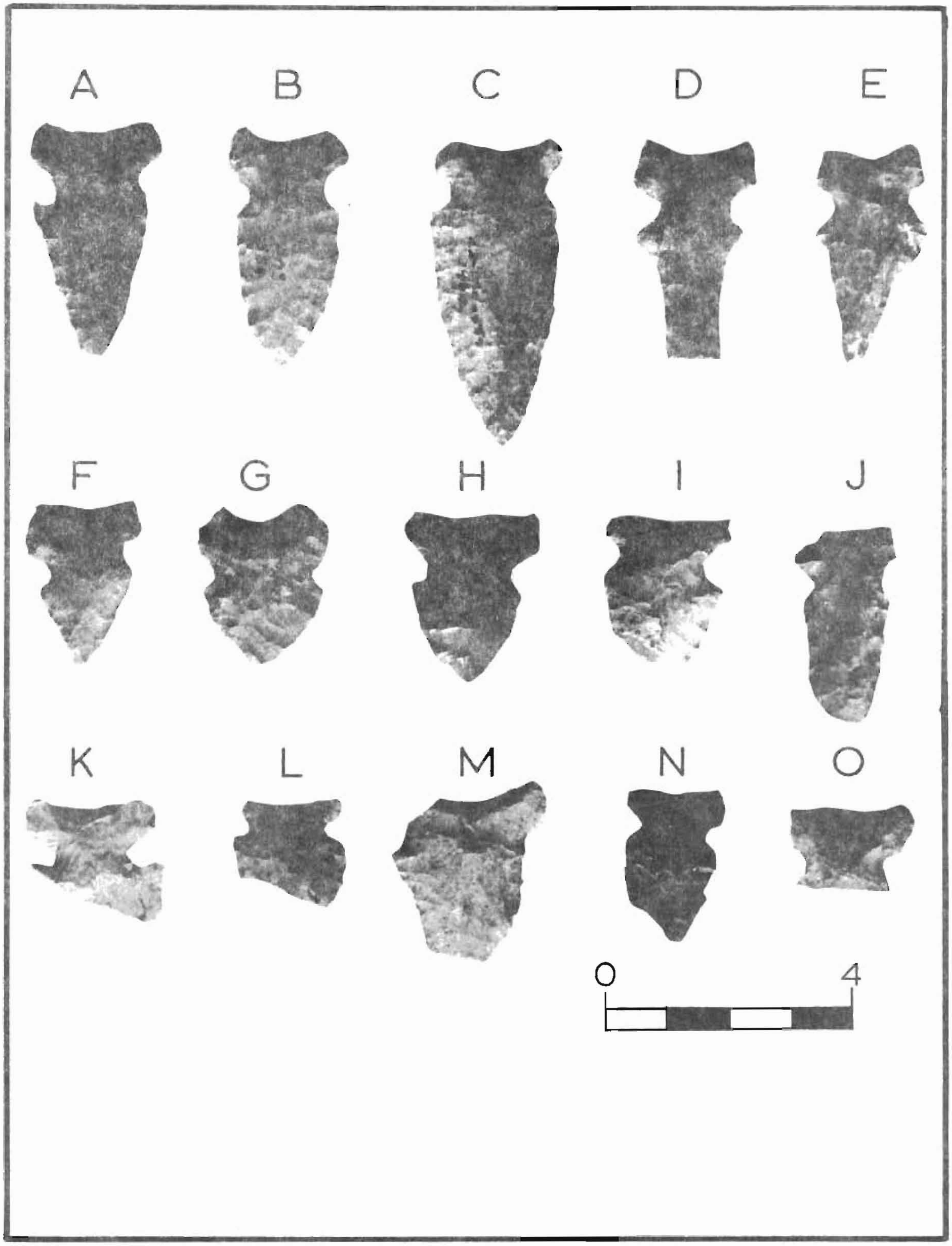



PLATE 14. BIG SANDY POINTS.

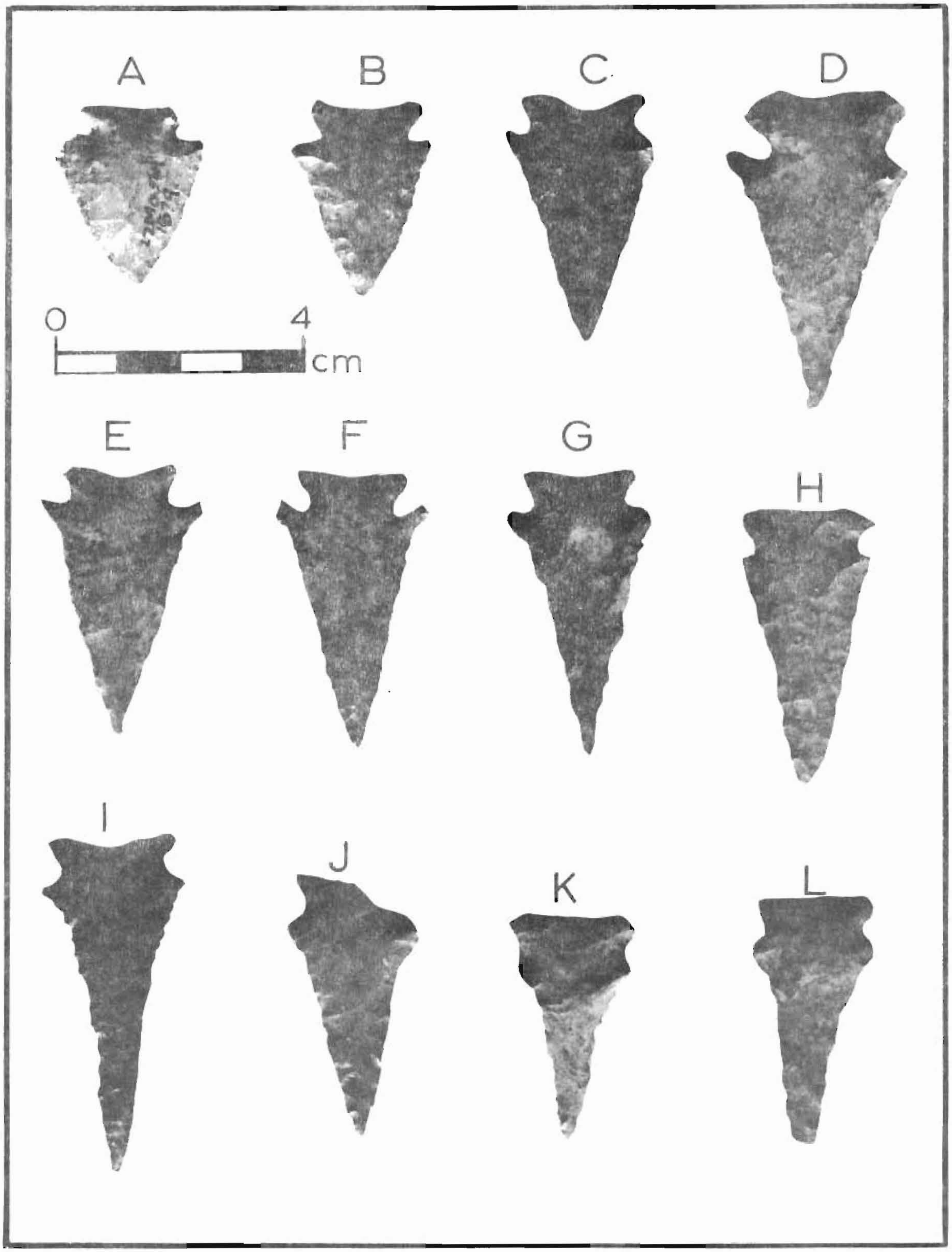



PLATE 15. DECATUR POINTS. A-B, initial stage; C-K, advanced stage; L, final stage.

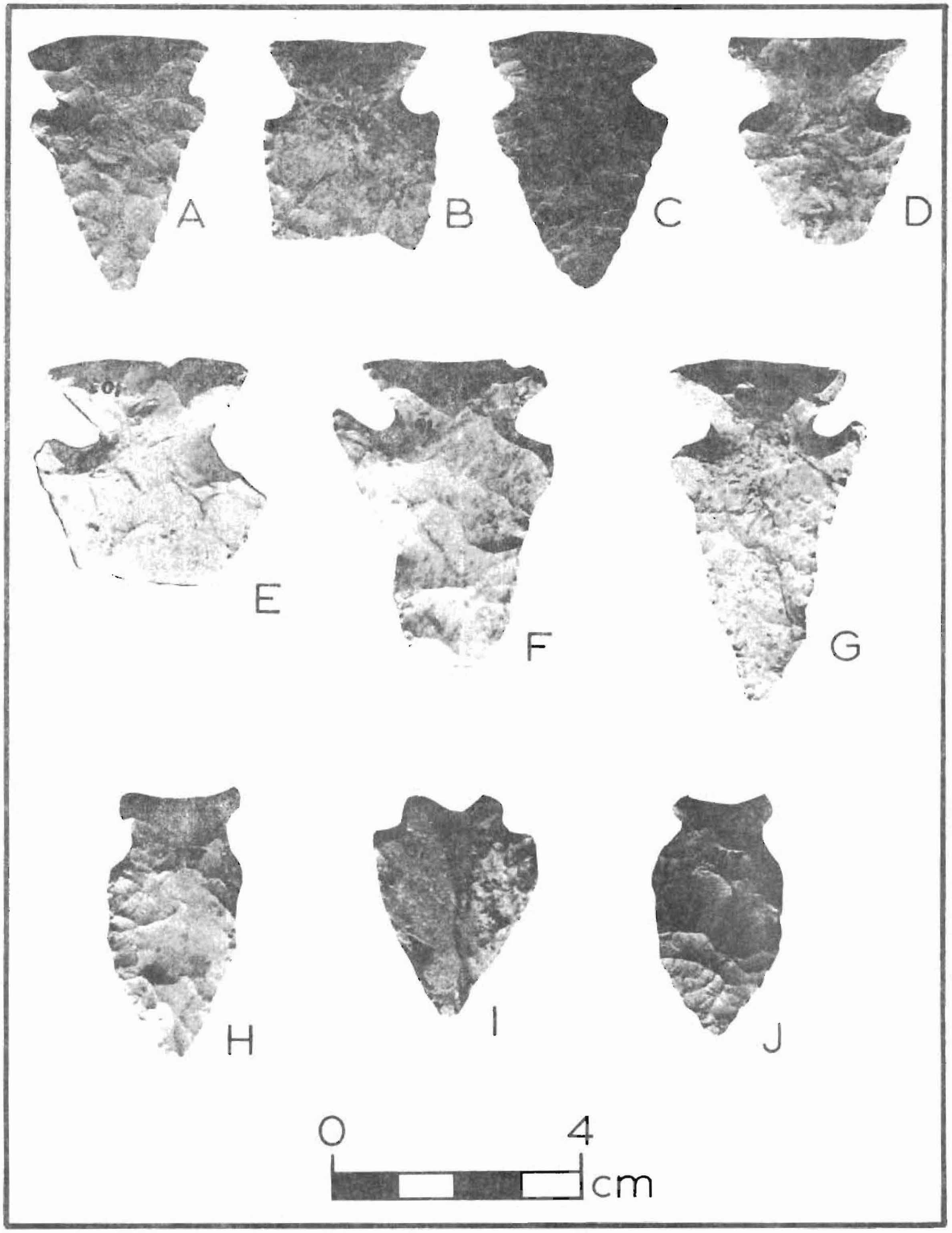



PLATE 16. PROJECTILE POINTS. A-G, Josselyn (provisional type); H-J, Beachum (provisional type).

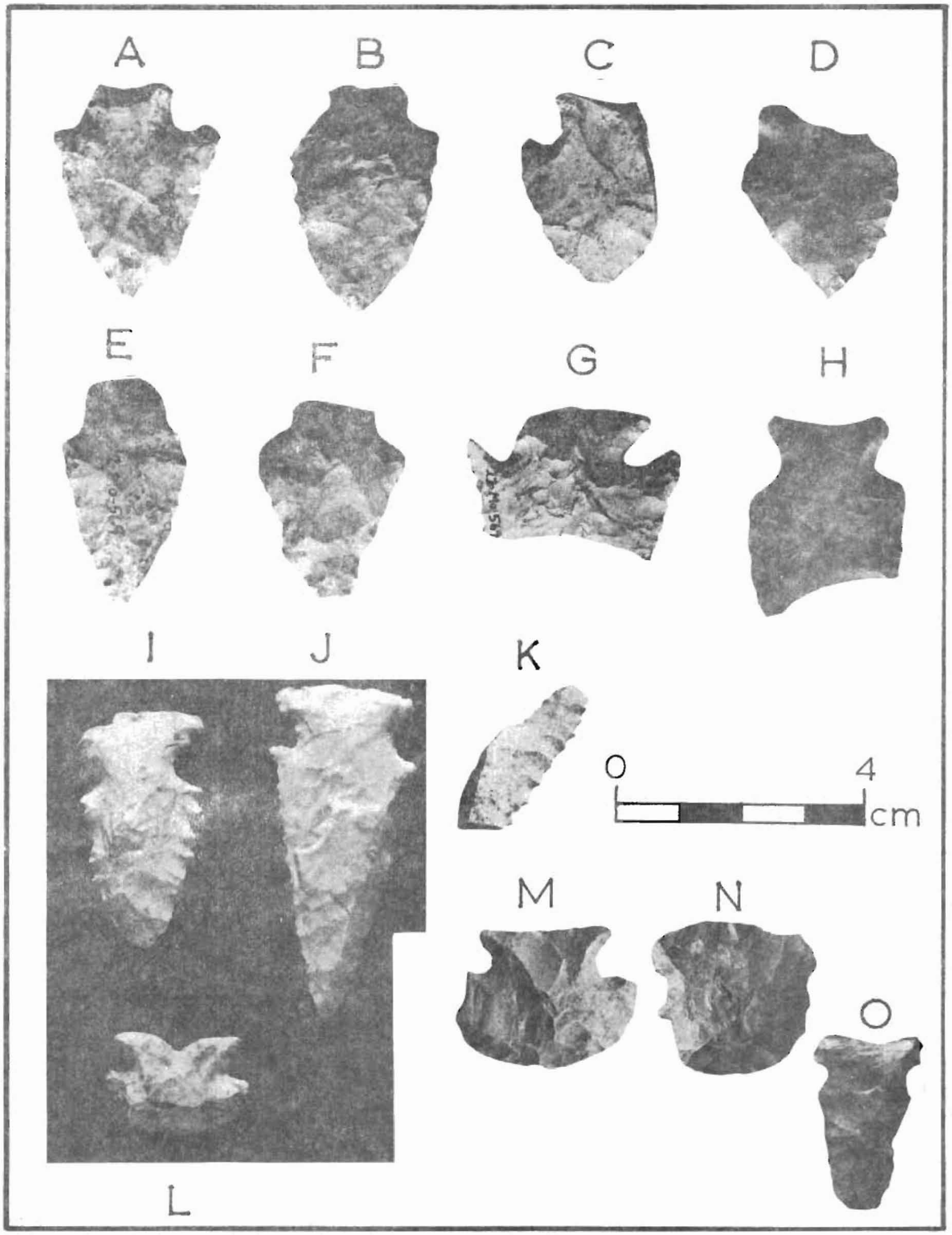



PLATE 17. PROJECTILE POINTS. A-D, Beachum points (provisional type); E-K, unidentified points; L-M, Decatur end scrapers; N, Ecusta end scraper; O, Big Sandy end scraper.

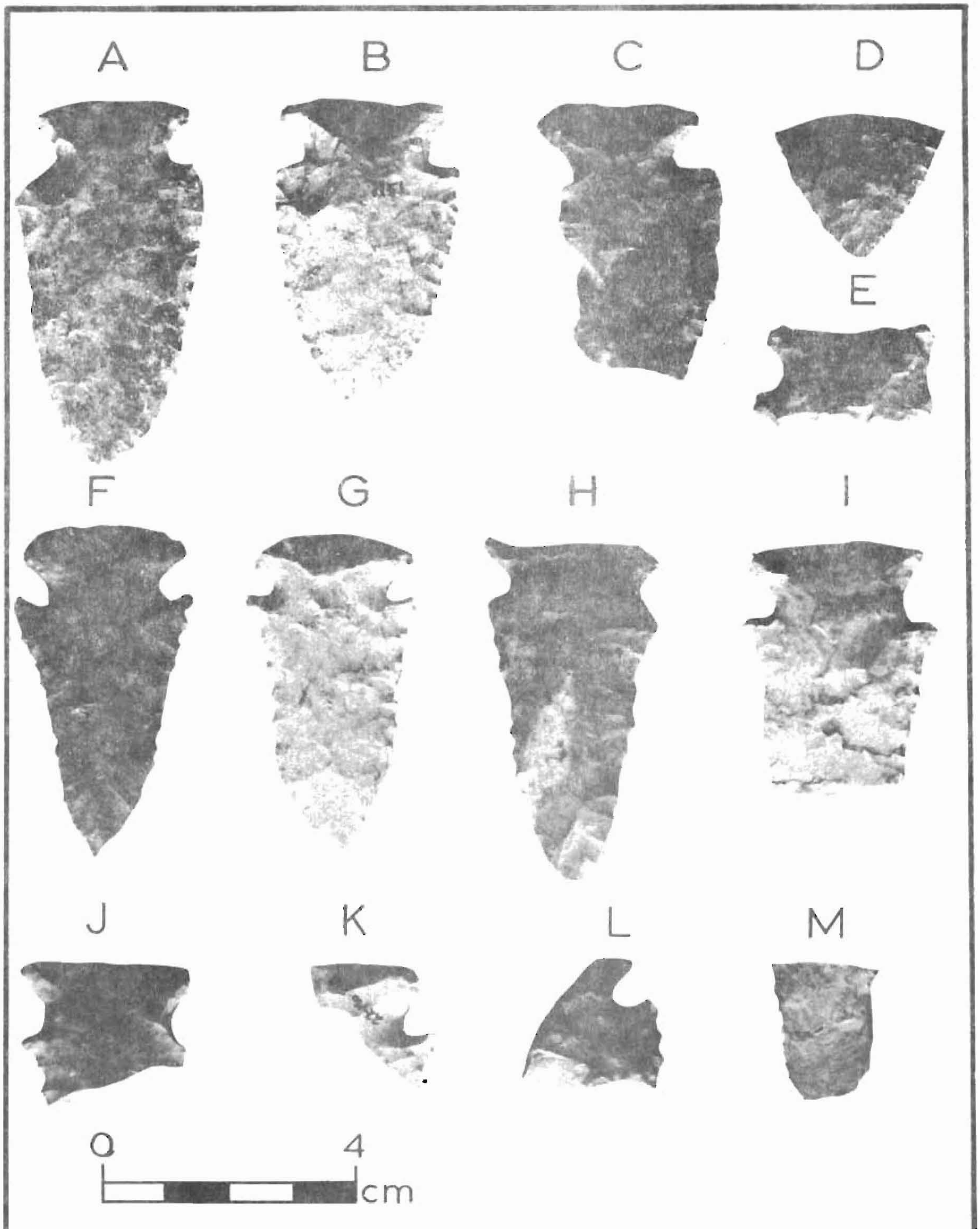



PLATE 18. PINE TREE POINTS. A-D, initial stage; E, end scraper; F-M, advanced stage.

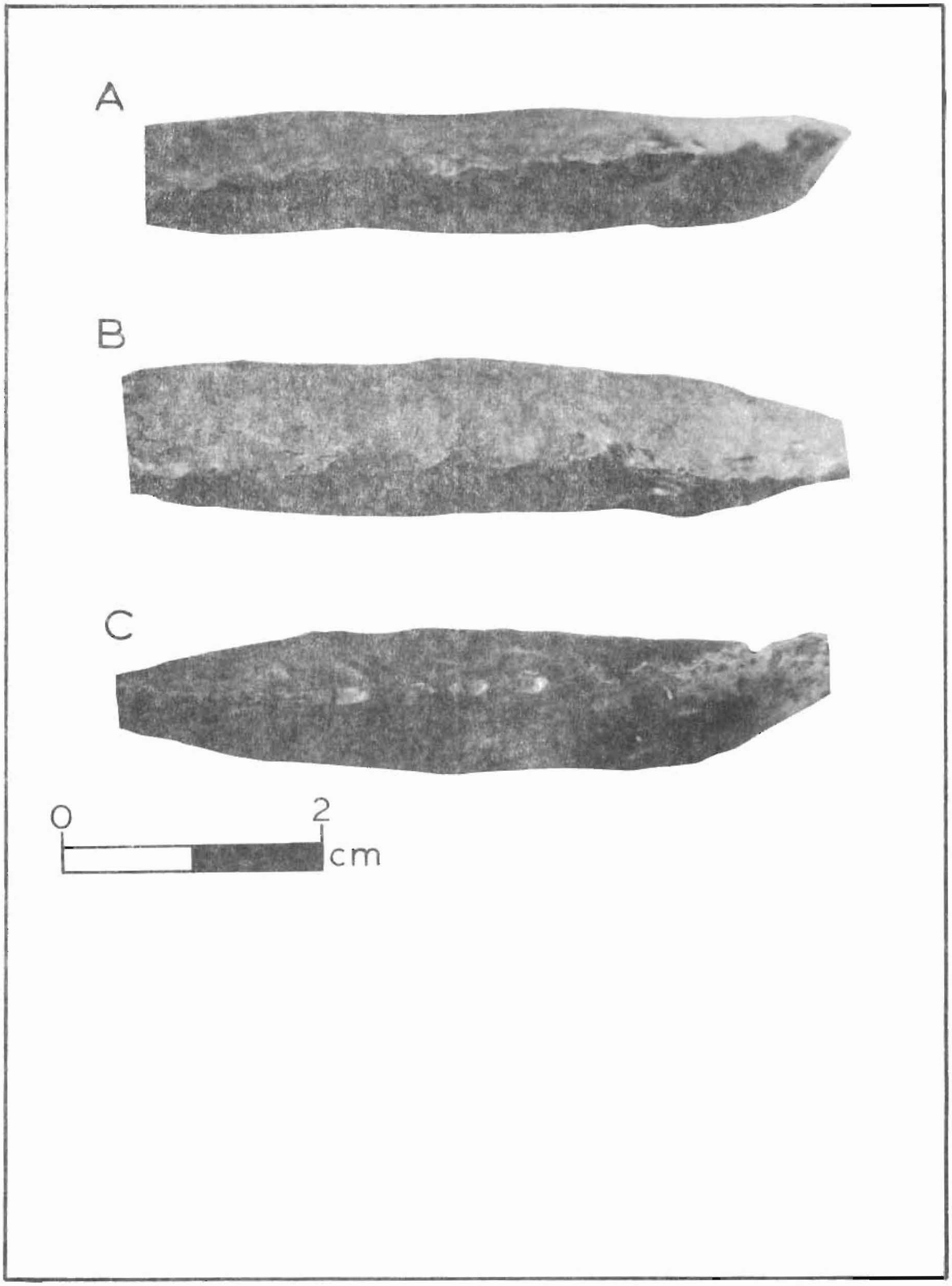



PLATE 19. PINE TREE POINTS WITH EDGE WEAR. A, edge of initial-stage point; B, edge of advanced-stage point (note crushing around serrations); C, edge showing serrations broken from heavy cutting.

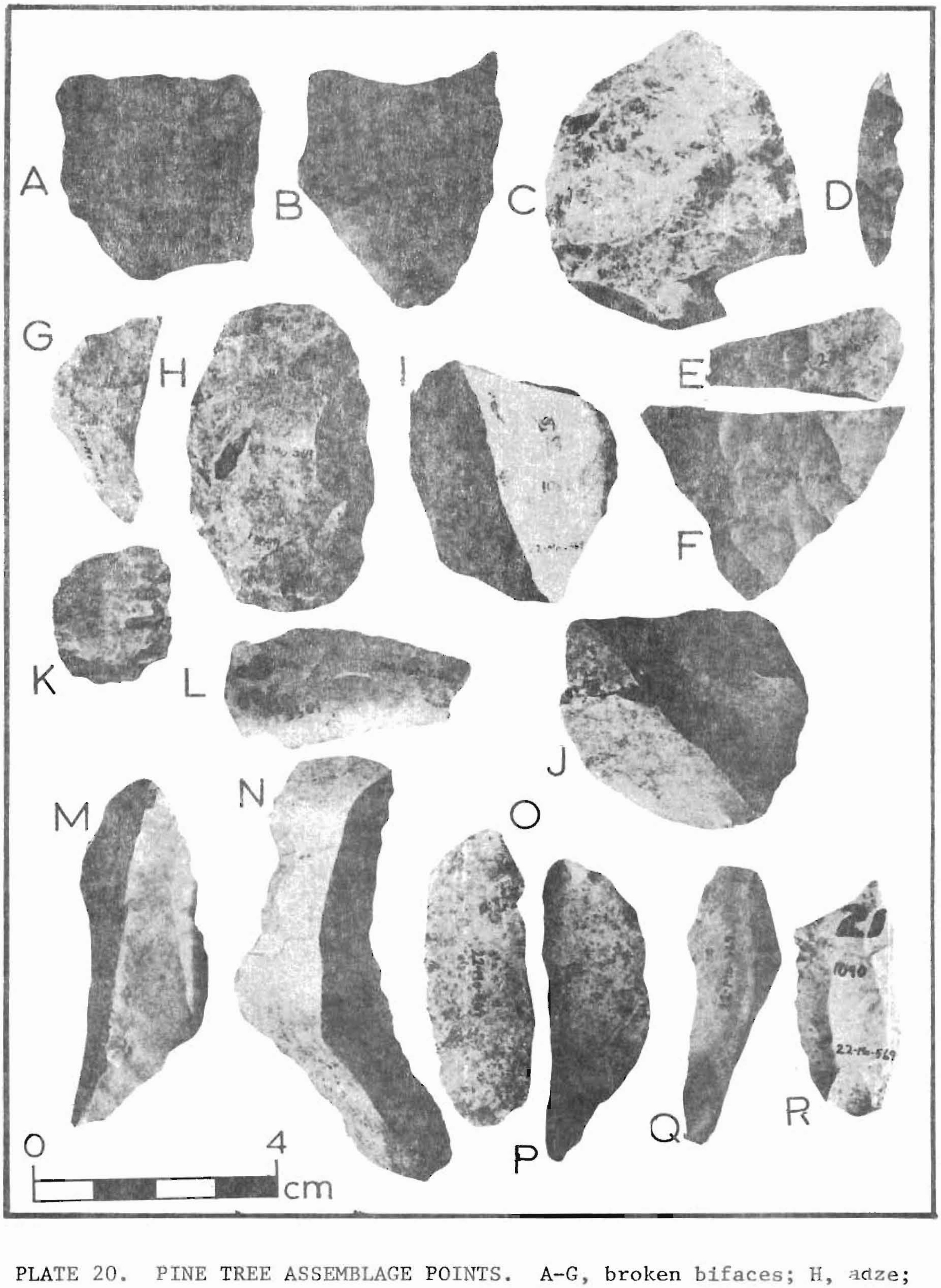



PLATE 20. PINE TREE ASSEMBLAGE POINTS. A-G, broken bifaces; H, adze; I-J, tabular flakes; K, piece esquillee; L, notched side scraper; M-R, bladelike flakes with worked edges.

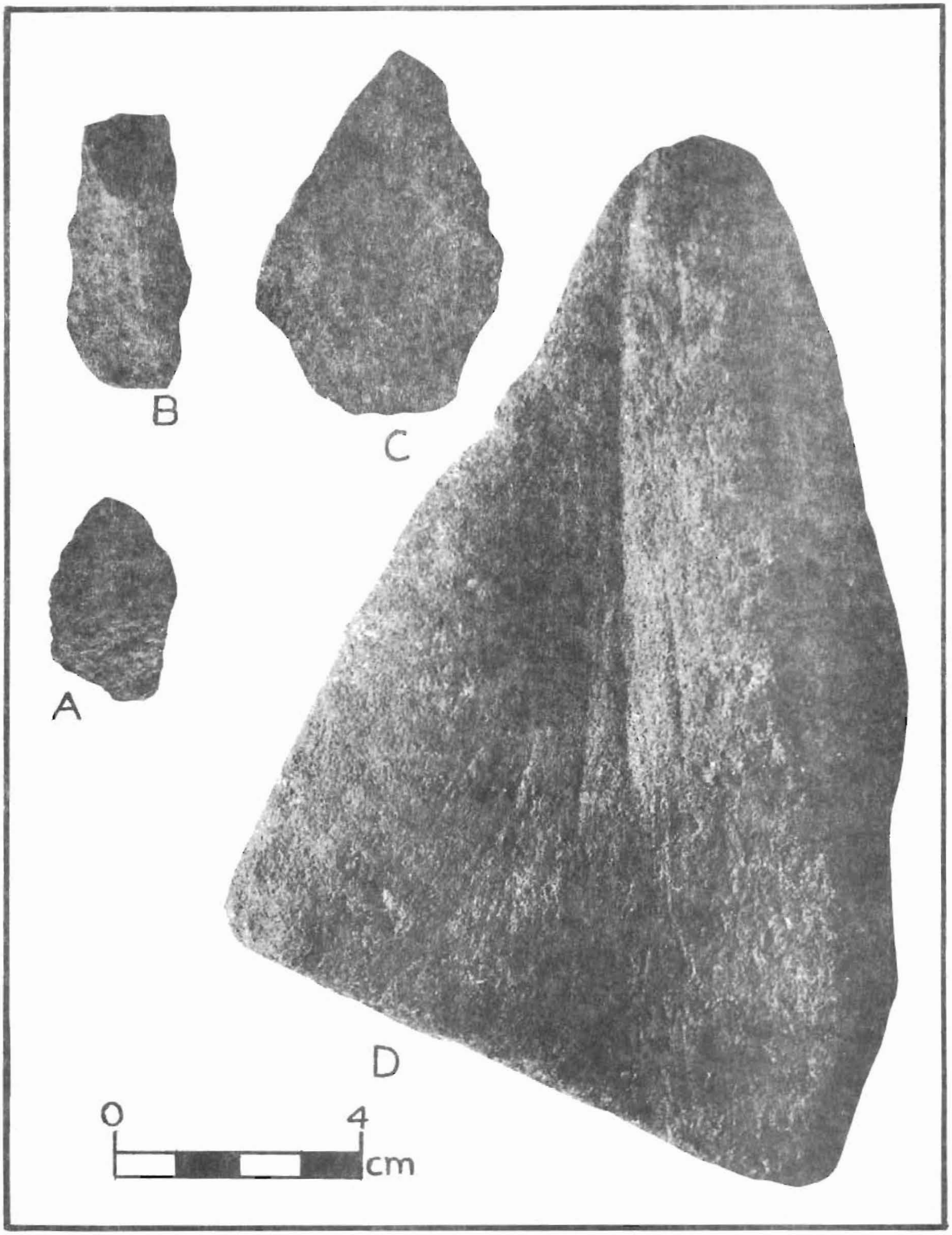



PLATE 21. PINE TREE ASSEMBLAGE TOOLS. A-C, sandstone abraders; D, grooved stone.

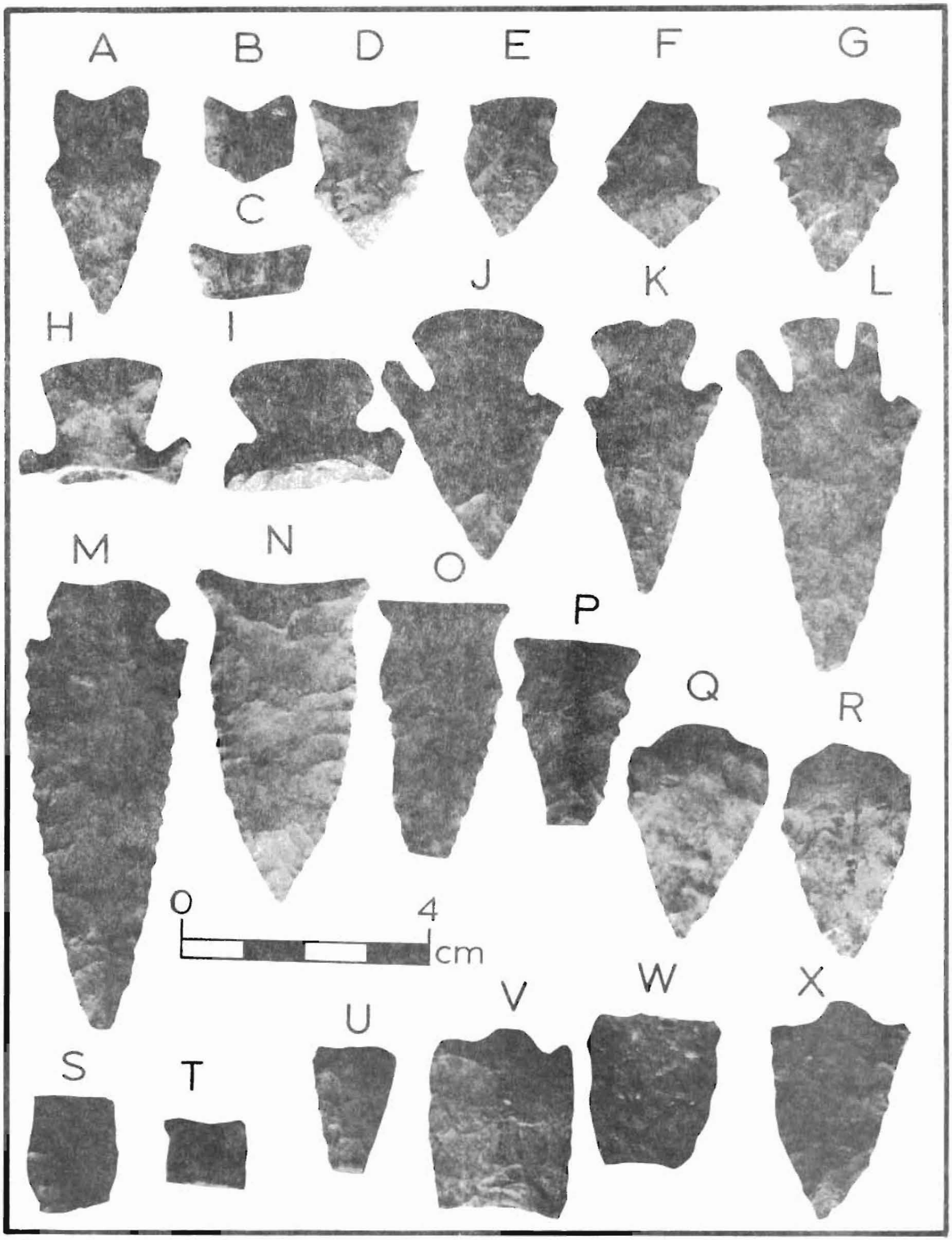



PLATE 22. MISCELLANEOUS POINTS. A-F, Jude; G, Autauga; H-L, Lost Lake; M, Plevna; N-P, Greenbrier; Q-R, V-X, Eva II-Morrow Mountain I; S-U, Madison.

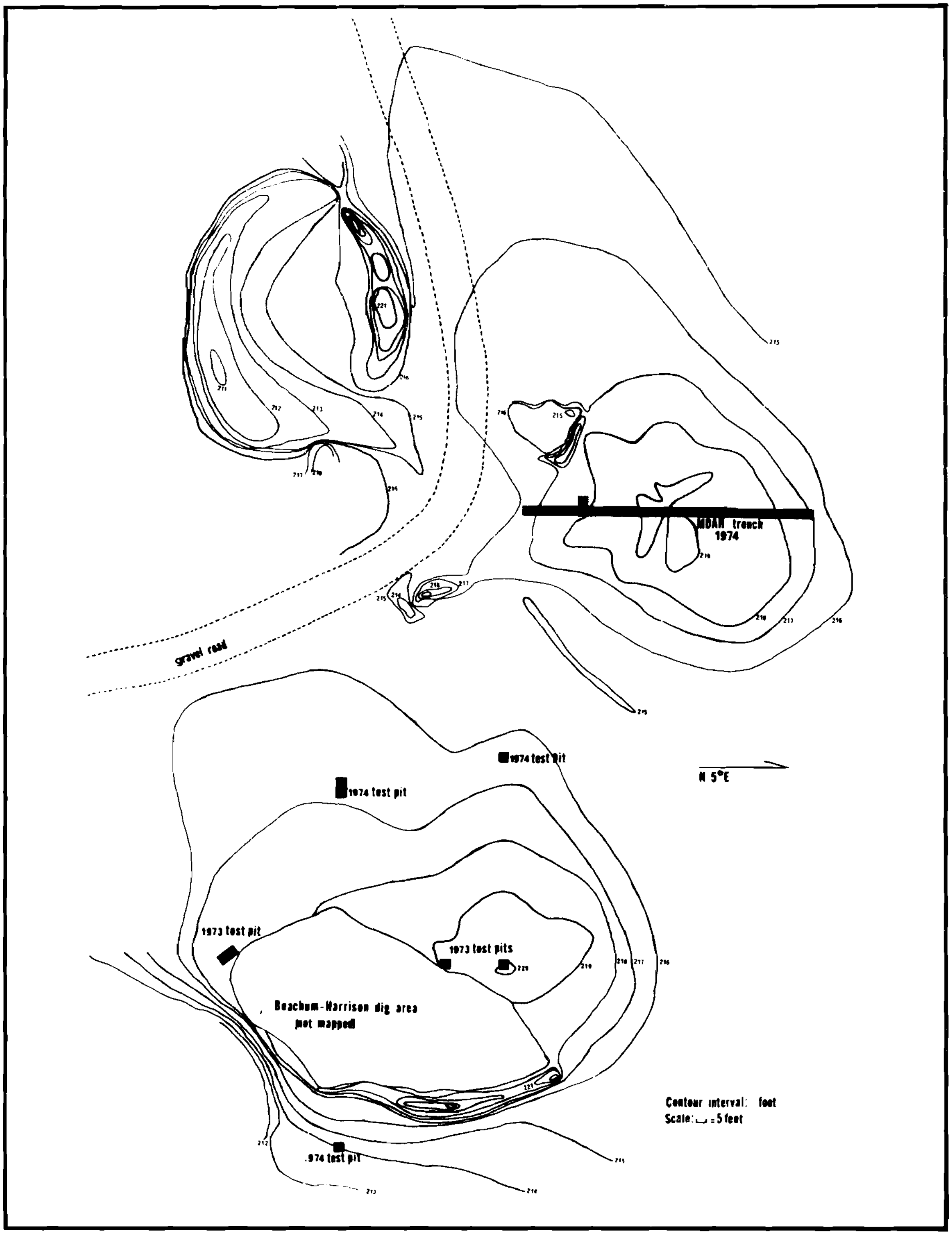



FIGURE 1. CONTOUR MAP OF HESTER SITE.

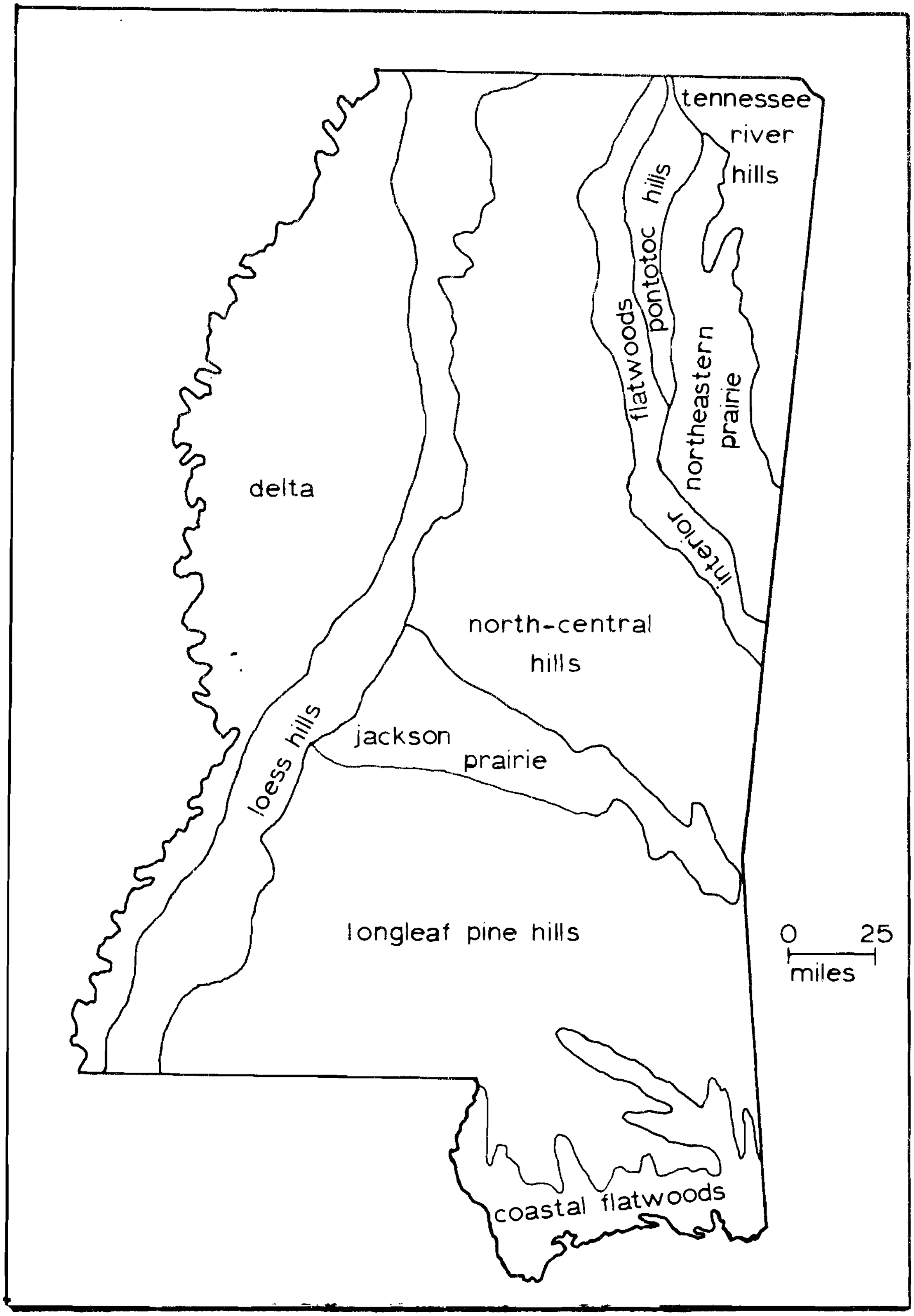



FIGURE 2. PHYSIOGRAPHIC REGIONS OF MISSISSIPPI.

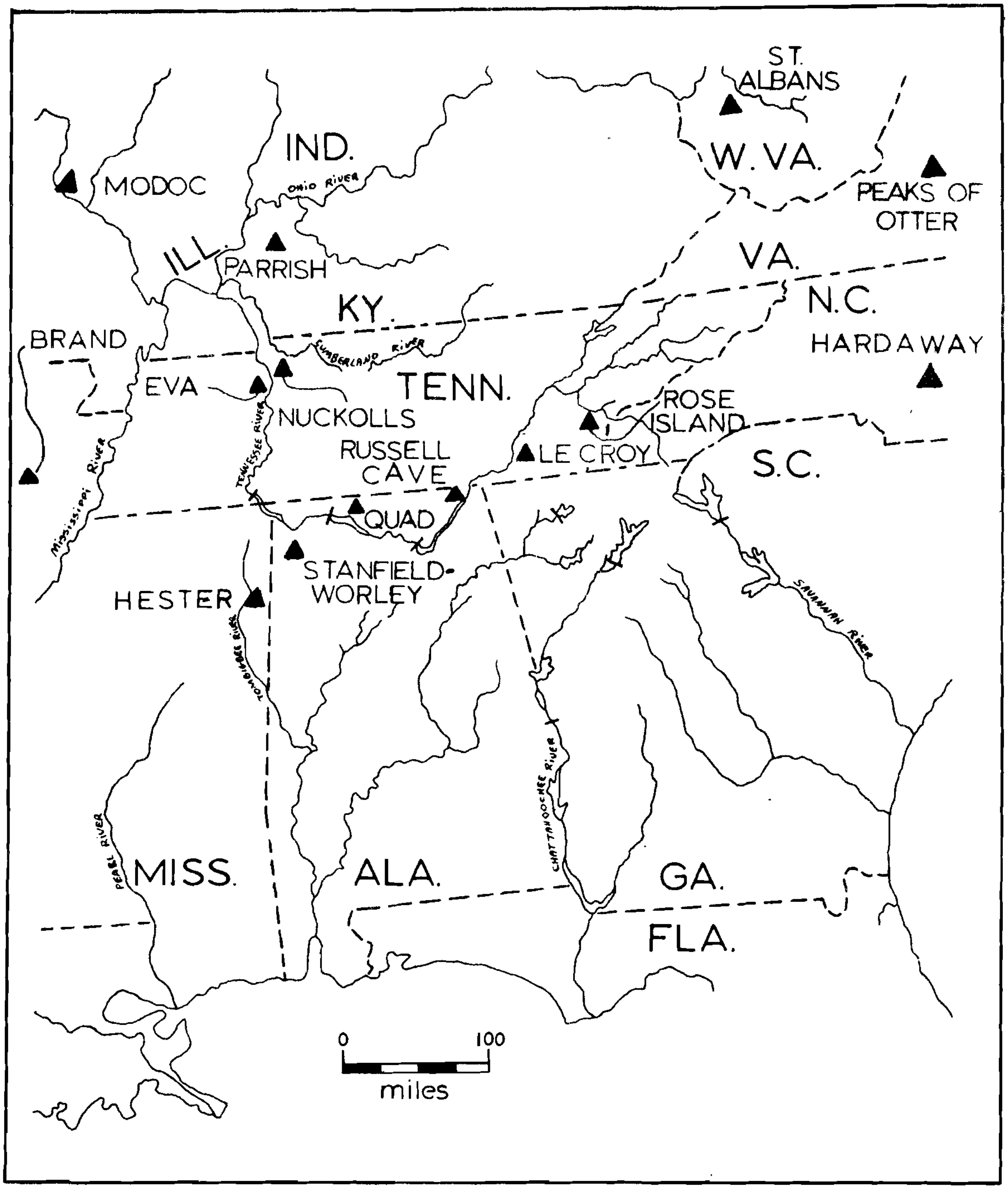



FIGURE 3. EARLY ARCHAIC SITES IN SOUTHEASTERN UNITED STATES.

| | TRADITION | LOWER MISSISSIPPI VALLEY | | TOMBIGBEE VALLEY |
|---|---|---|---|---|
| | | Phase | Period | Period |
| 1800 | | | | |
| | Mississippian | Historic | | |
| 1600<br>1400<br>1200<br>1000 | | Russell<br>Deer Creek<br>Mayersville<br>Crippen Point | Mississippian | Mississippian |
| 800 | | Kings Crossing<br>Aden | Coles Creek | Miller IV |
| 600<br>400 | Late Woodland | Bayland<br>Deasonville | Baytown | Miller III |
| 200<br>A.D. 1 | Middle Woodland | Issaquena<br>Anderson Ldg. | Marksville | Miller II |
| 200<br>400 | Early Woodland | Tuscola | Tchula | Miller I |
| | | Jaketown | Poverty Point | |
| 1000<br>3000<br>5000 | Eastern Archaic | | Late Archaic<br>Middle Archaic<br>Early Archaic | |
| 6500 | Paleo-Indian | | | |
| 15000<br>B.C. | | | | |

FIGURE 4. CHRONOLOGY FOR LOWER MISSISSIPPI AND TOMBIGBEE VALLEYS.

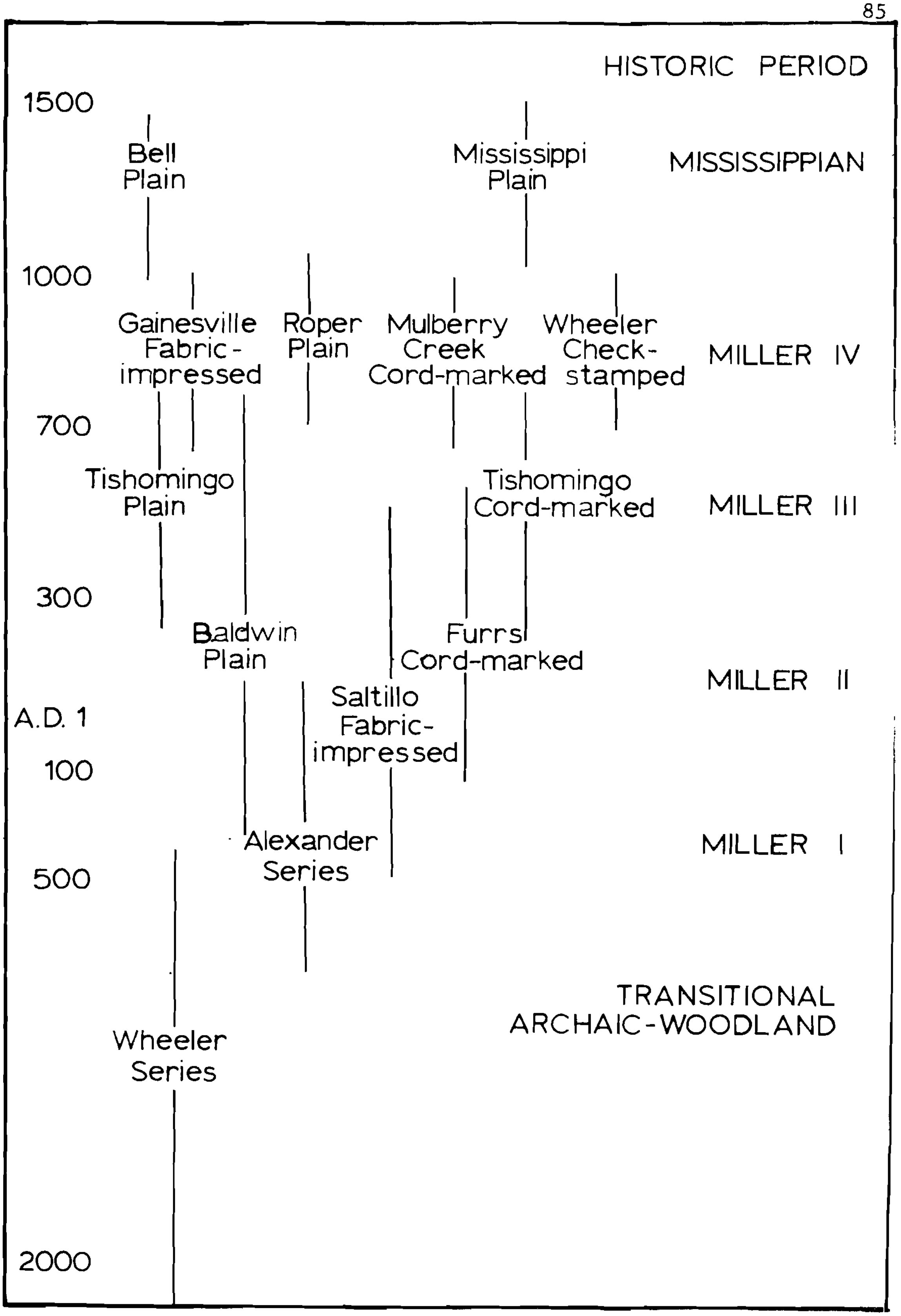
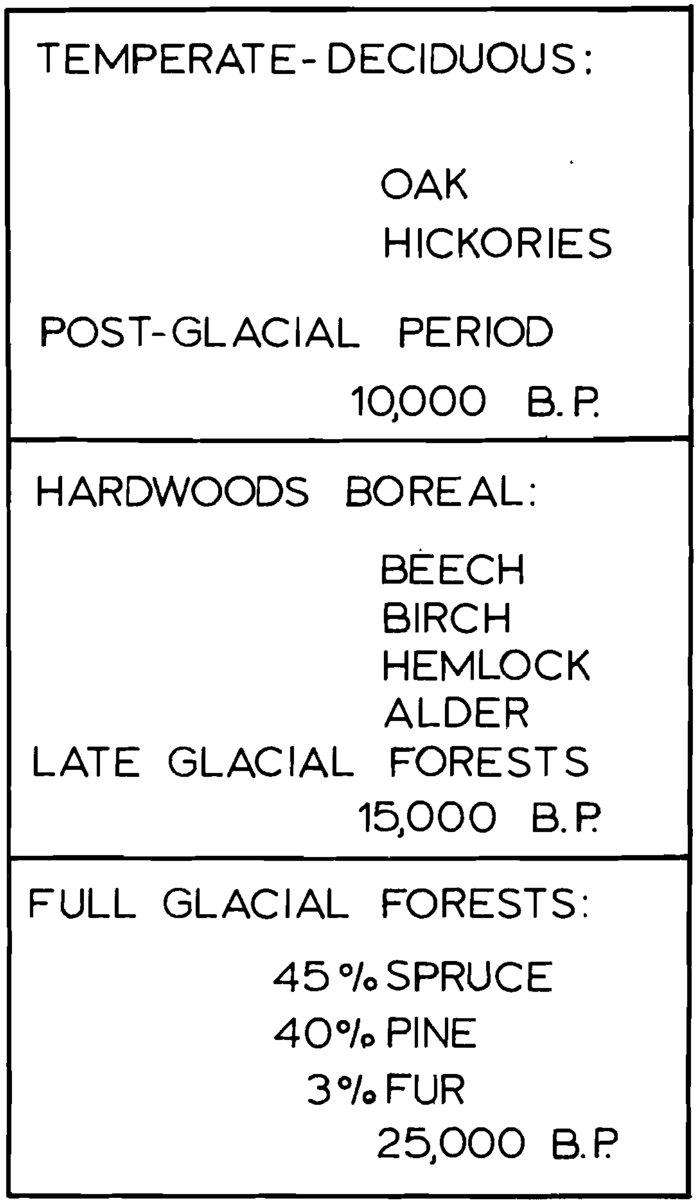



FIGURE 5. TENTATIVE CERAMIC CHRONOLOGY FOR UPPER-CENTRAL TOMBIGBEE VALLEY.




Modified from Victor A. Carbone, THE FLINT RUN PALEO-INDIAN COMPLEX: A PRELIMINARY REPORT, 1971-73 SEASONS, ed. William M. Gardner (Washington: Catholic University of America, 1974). Used by permission.

FIGURE 6. PALEO-ENVIRONMENTAL SEQUENCE FOR SOUTHEASTERN UNITED STATES.

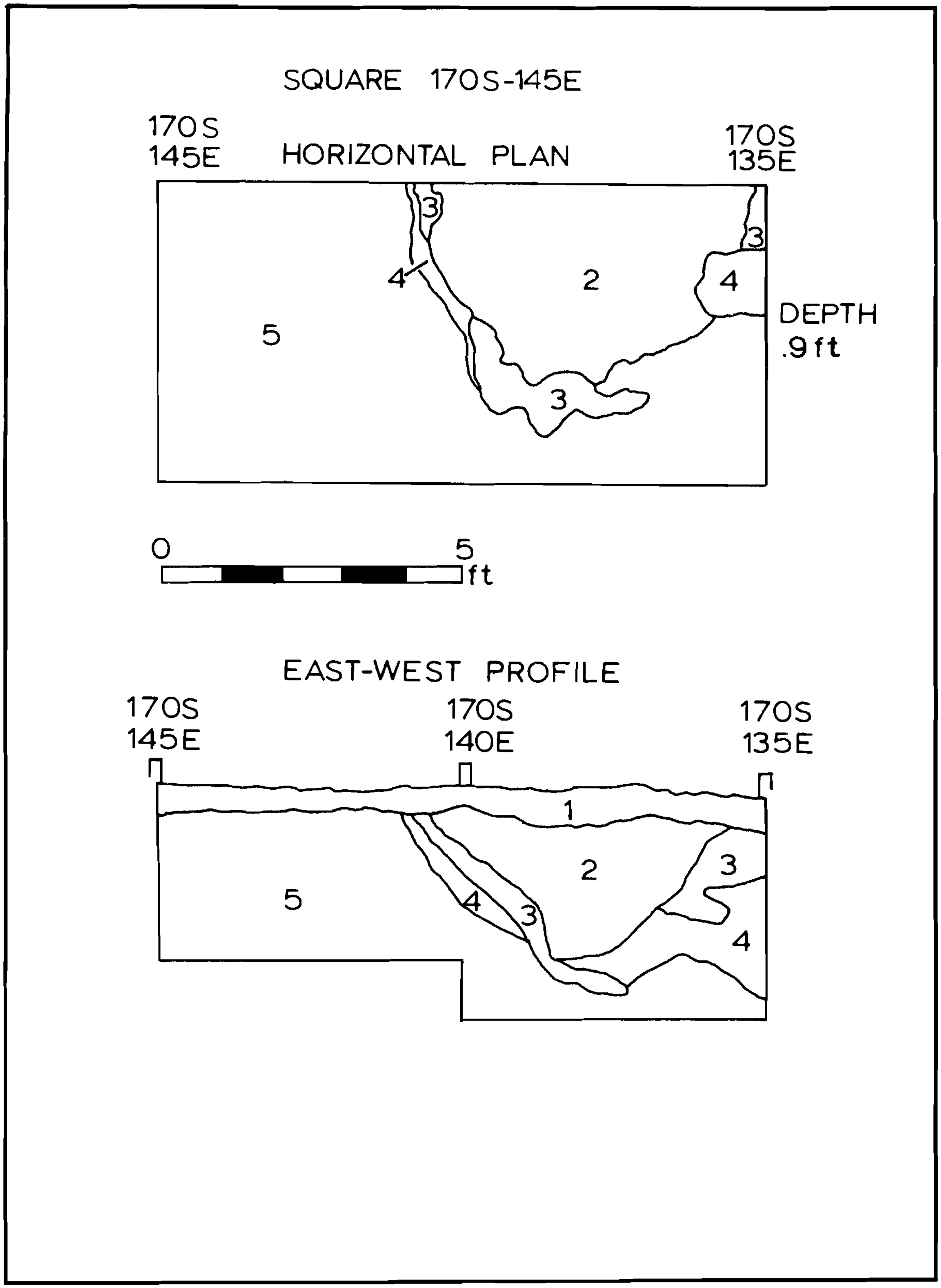



FIGURE 11. HORIZONTAL PLAN AND EAST-WEST PROFILE, SQUARE 170S-145E. 1, black humus; 2, yellow sandy clay; 3, gray clay; 4, brown clay; 5, tan clay.

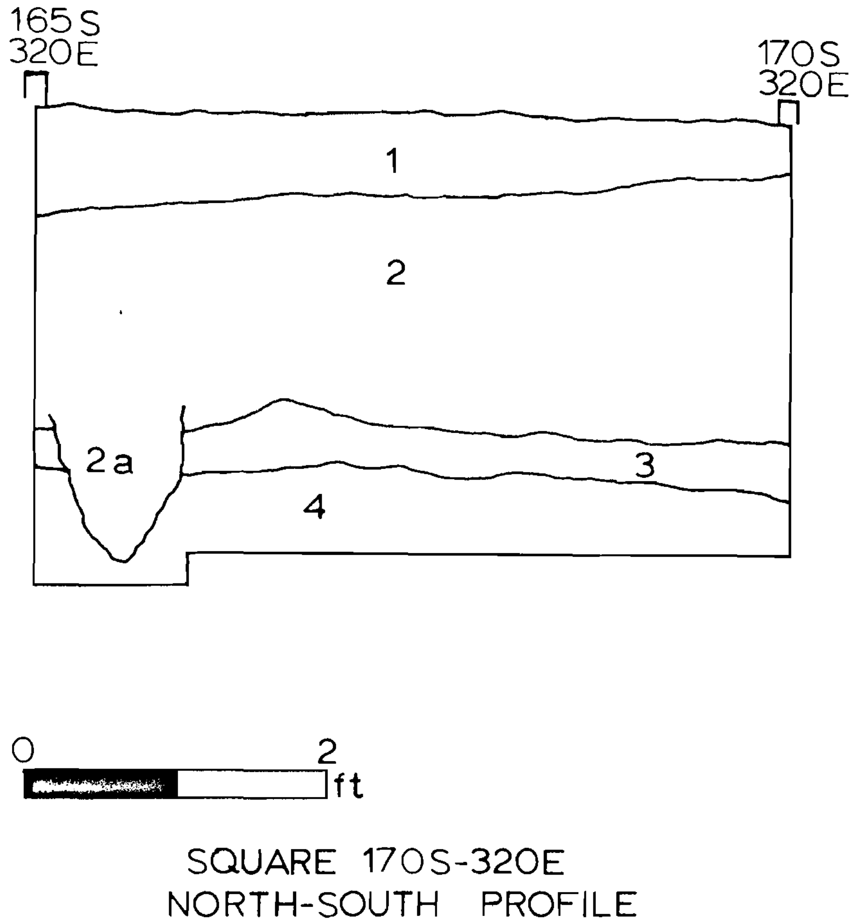



FIGURE 12. NORTH-SOUTH PROFILE, SQUARE 170S-320E. 1, black sandy humus; 2, reddish brown sand; 2a, tree root; 3, yellow sand; 4, white sand.

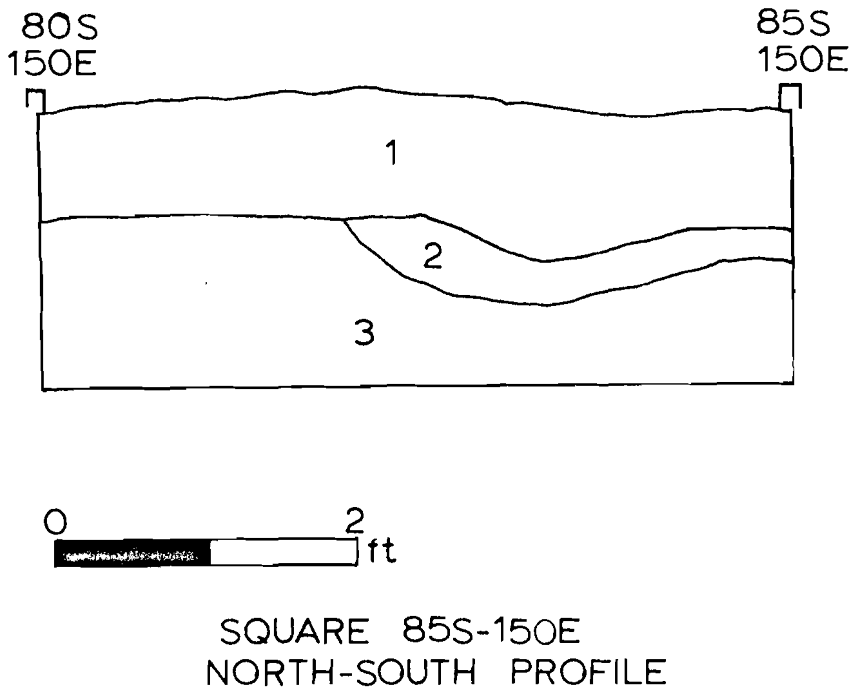



FIGURE 13. NORTH-SOUTH PROFILE, SQUARE 85S-150E. 1, black sandy humus; 2, yellow clay; 3, tan clay.

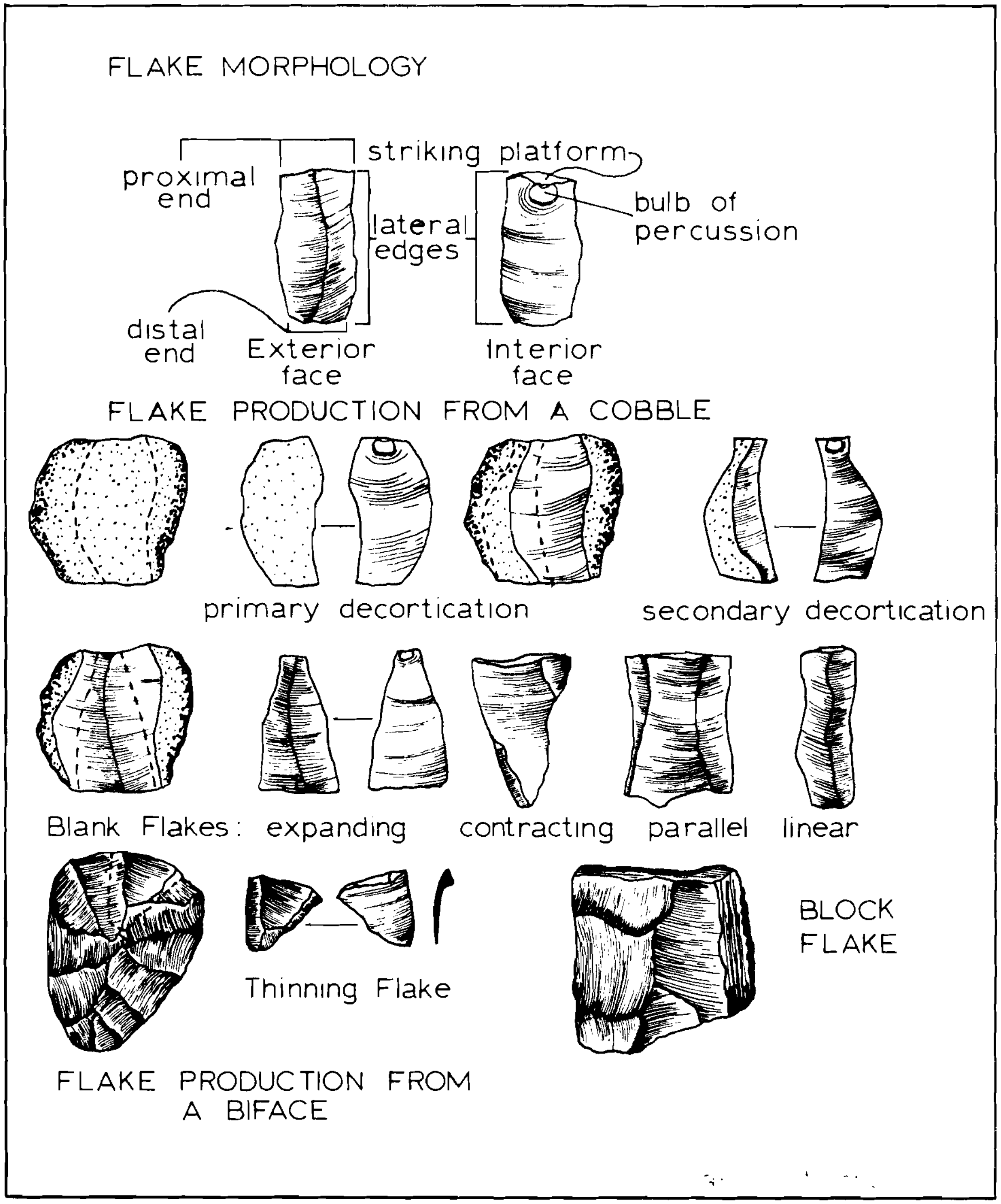



FIGURE 14. FLAKE MORPHOLOGY.

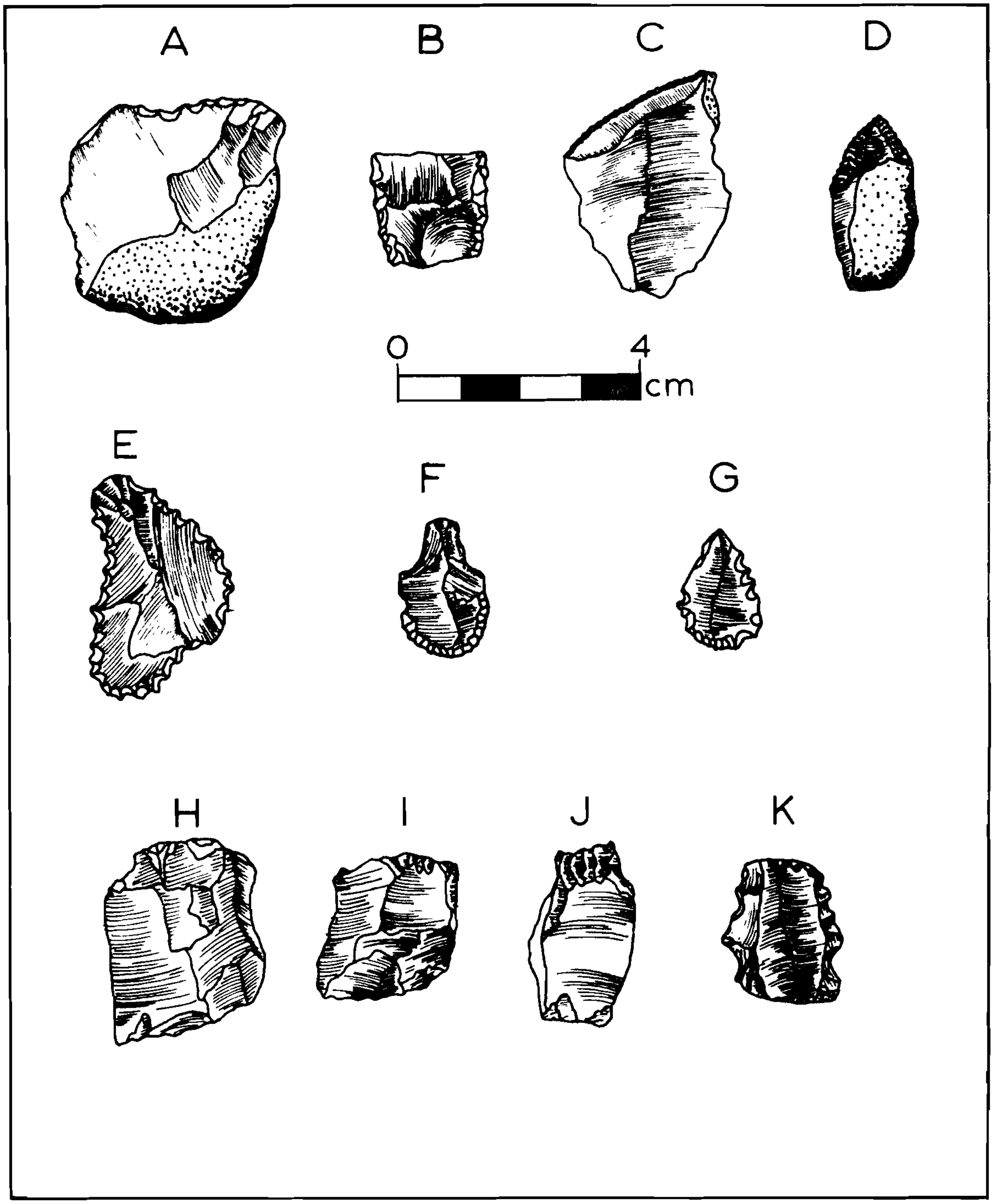



FIGURE 15. UTILIZED FLAKES AND PIECES ESQUILLEES. A, transverse use; B, lateral use; C, oblique-transverse use; D, point; E, denticulate, F-G, unusual forms; H-J, pieces esquillees; K, piece esquillee on Decatur point.

From John H. House, in The Cache River Archaeological Project: An Experiment in Contract Archaeology, Michael B. Schiffer and John H. House, comps. (Fayetteville: Arkansas Archaeological Survey, 1975).

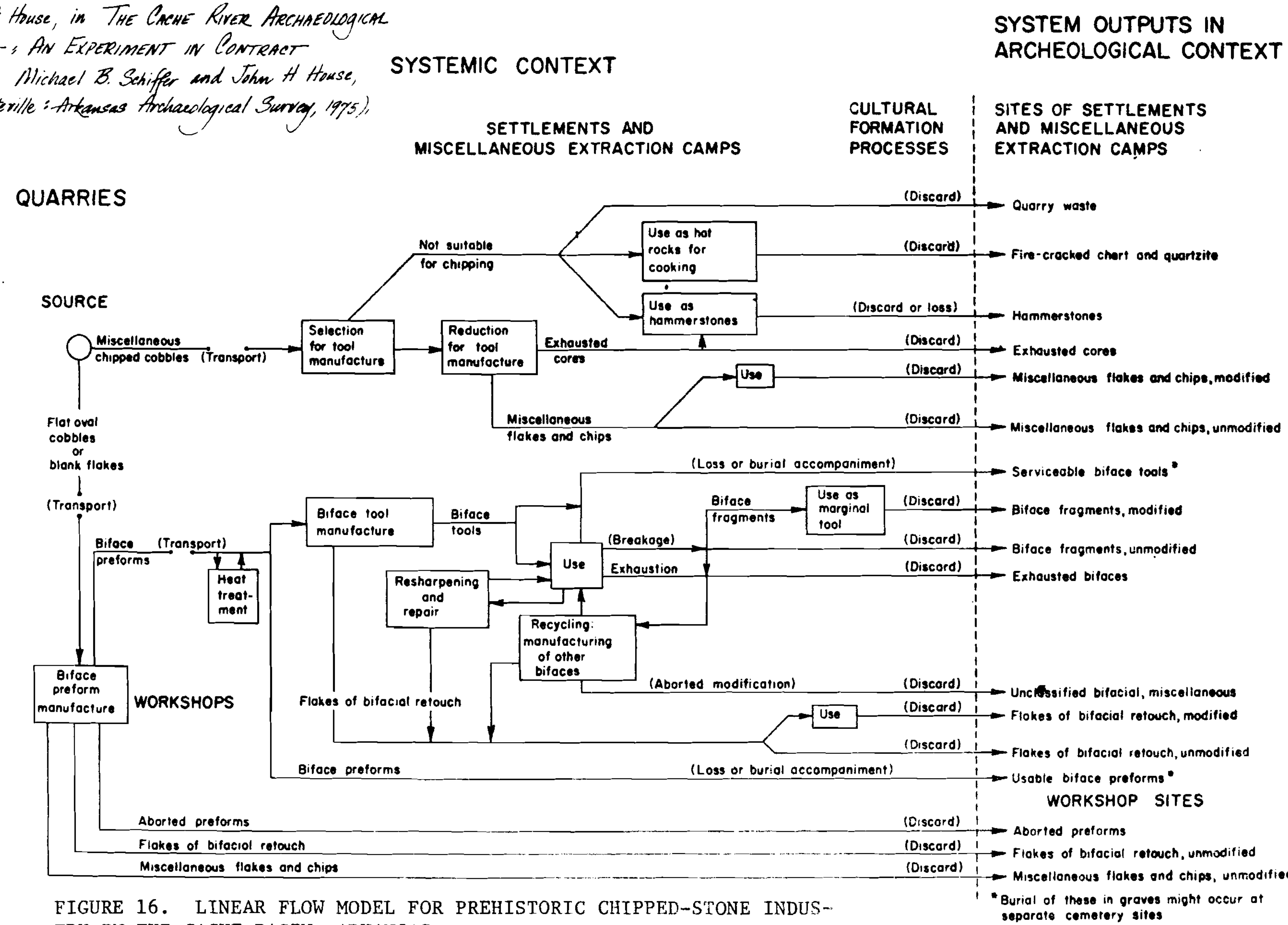



FIGURE 16. LINEAR FLOW MODEL FOR PREHISTORIC CHIPPED-STONE INDUSTRY IN THE CACHE BASIN, ARKANSAS.

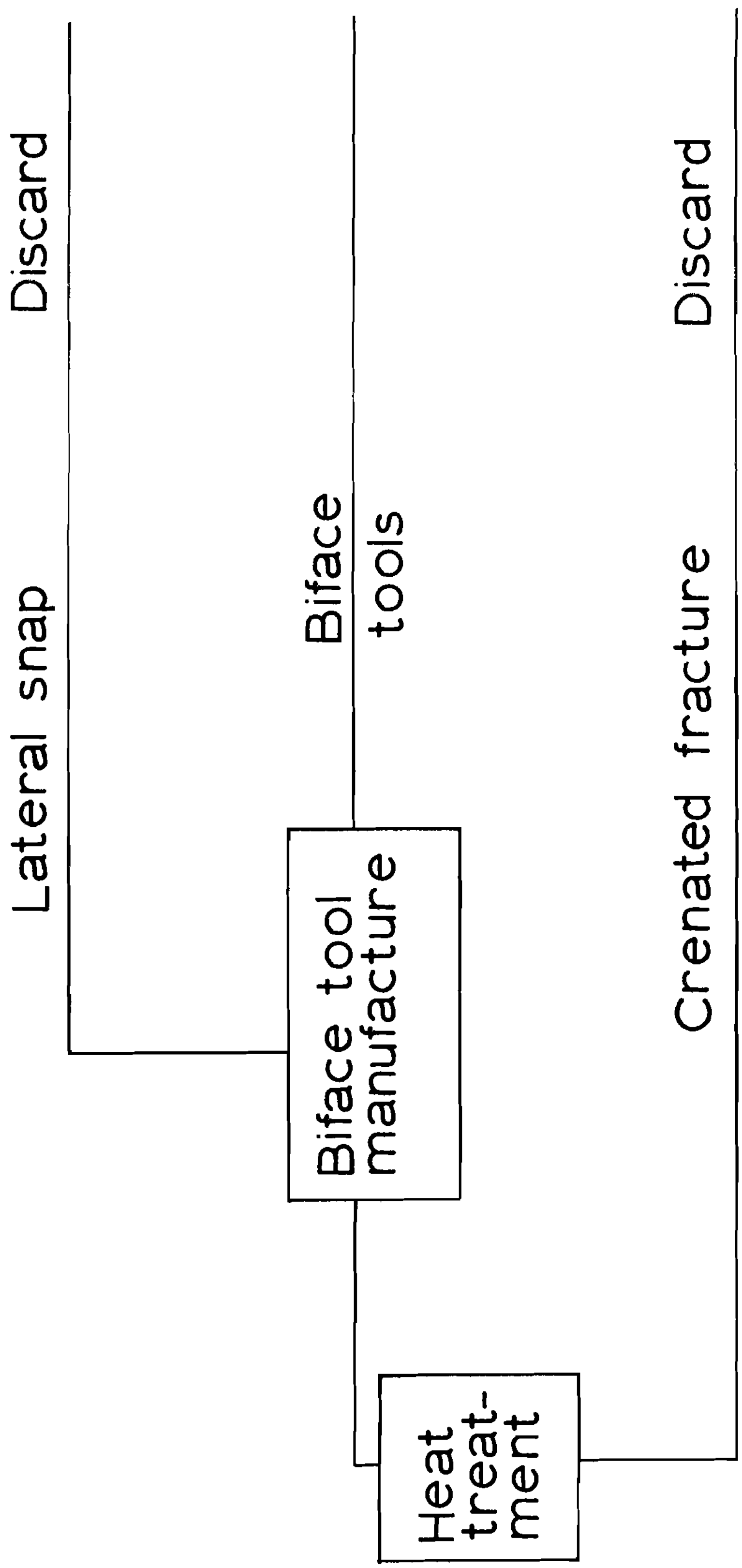



FIGURE 17. LINEAR FLOW MODEL SHOWING BIFACE BREAKAGE AT HESTER SITE.

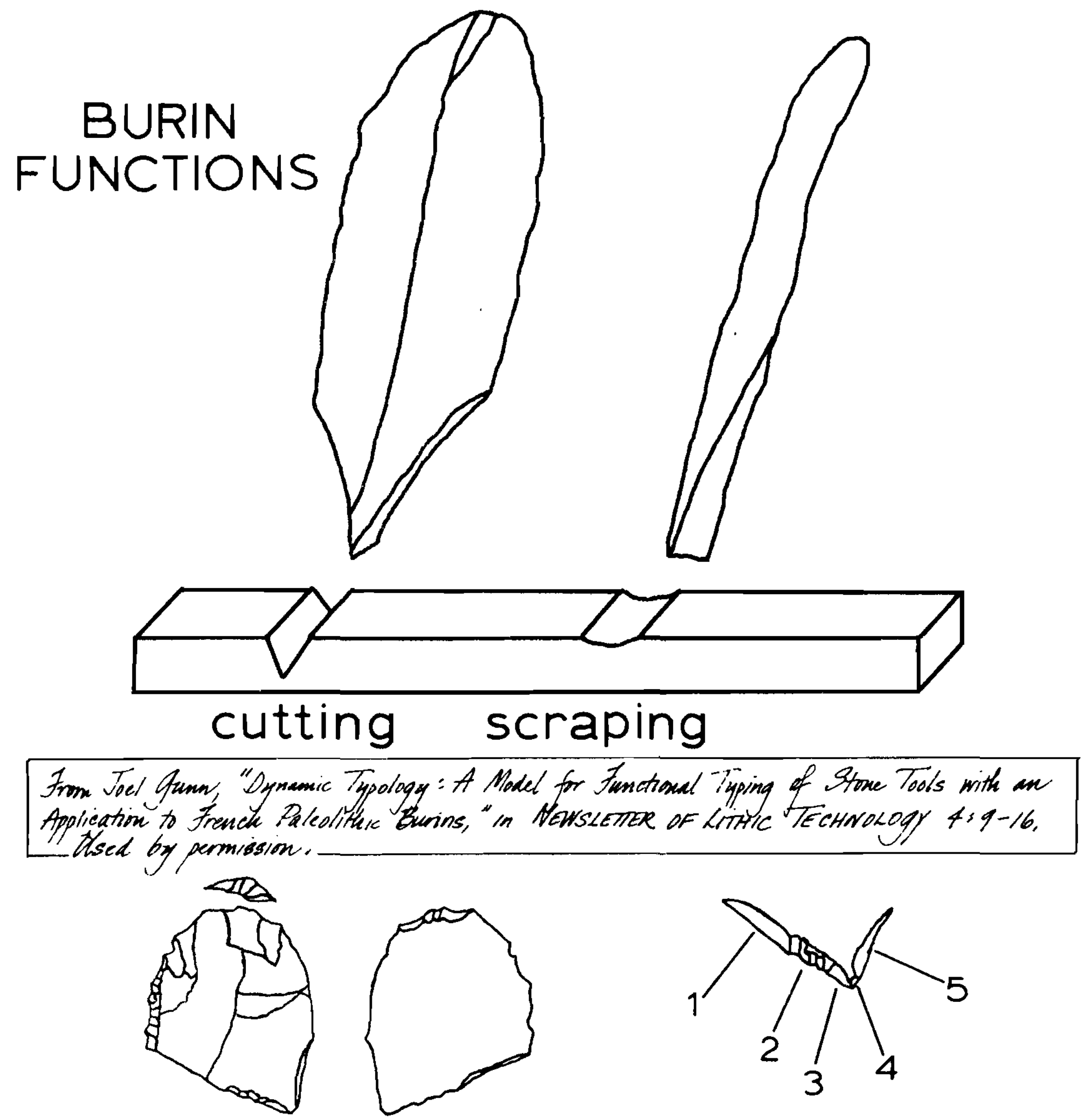



FIGURE 18. BURIN FUNCTION AND DALTON ZONE BURIN. Botton left, burin from Dalton zone on true blade, dorsal and ventral views; botton right, (1) original burin blow, (2) edge preparation, (3) secondary burin blow, (4) use wear, (5) original burin blow.

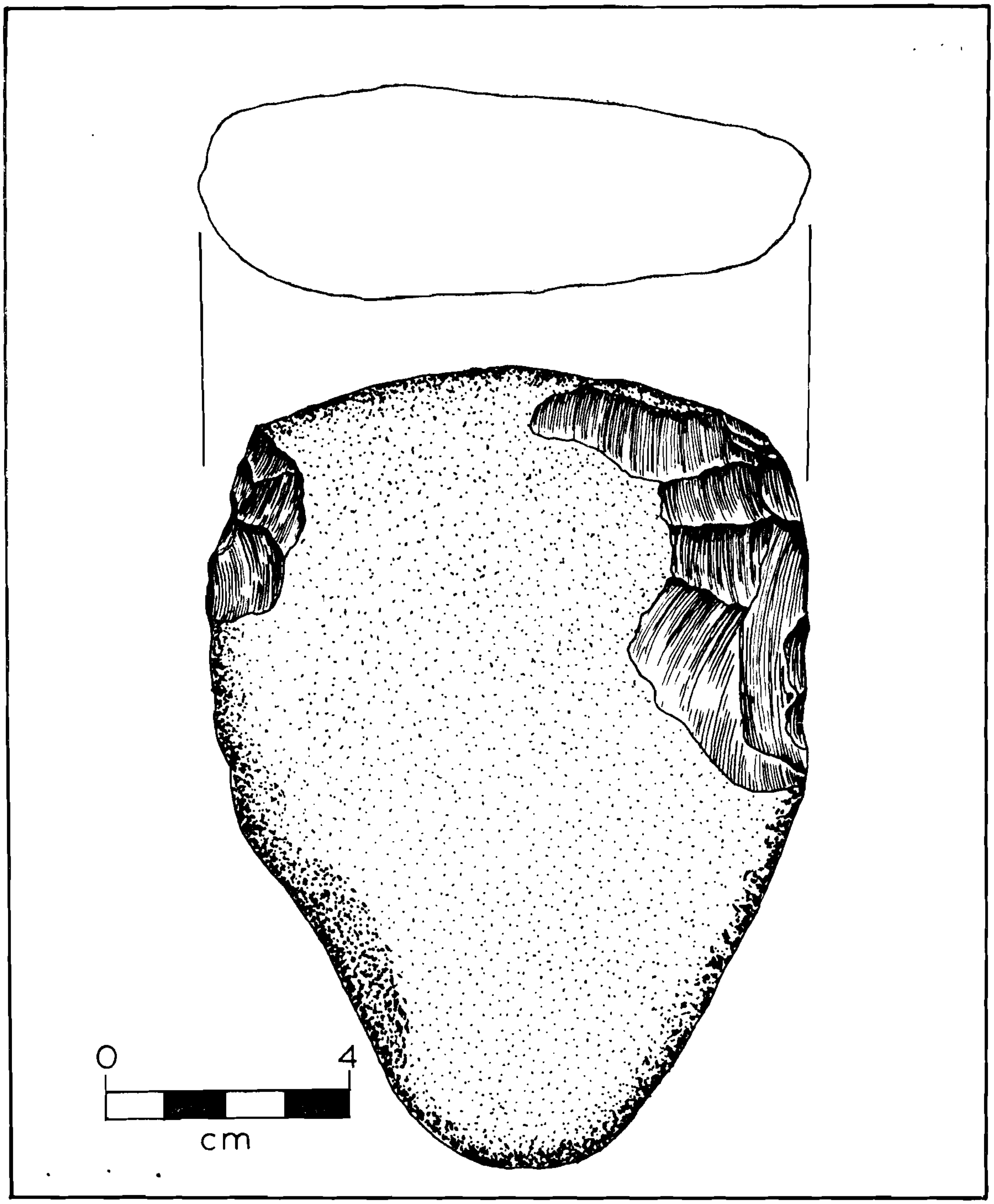



FIGURE 19. CHOPPER FROM BIG SANDY ZONE.

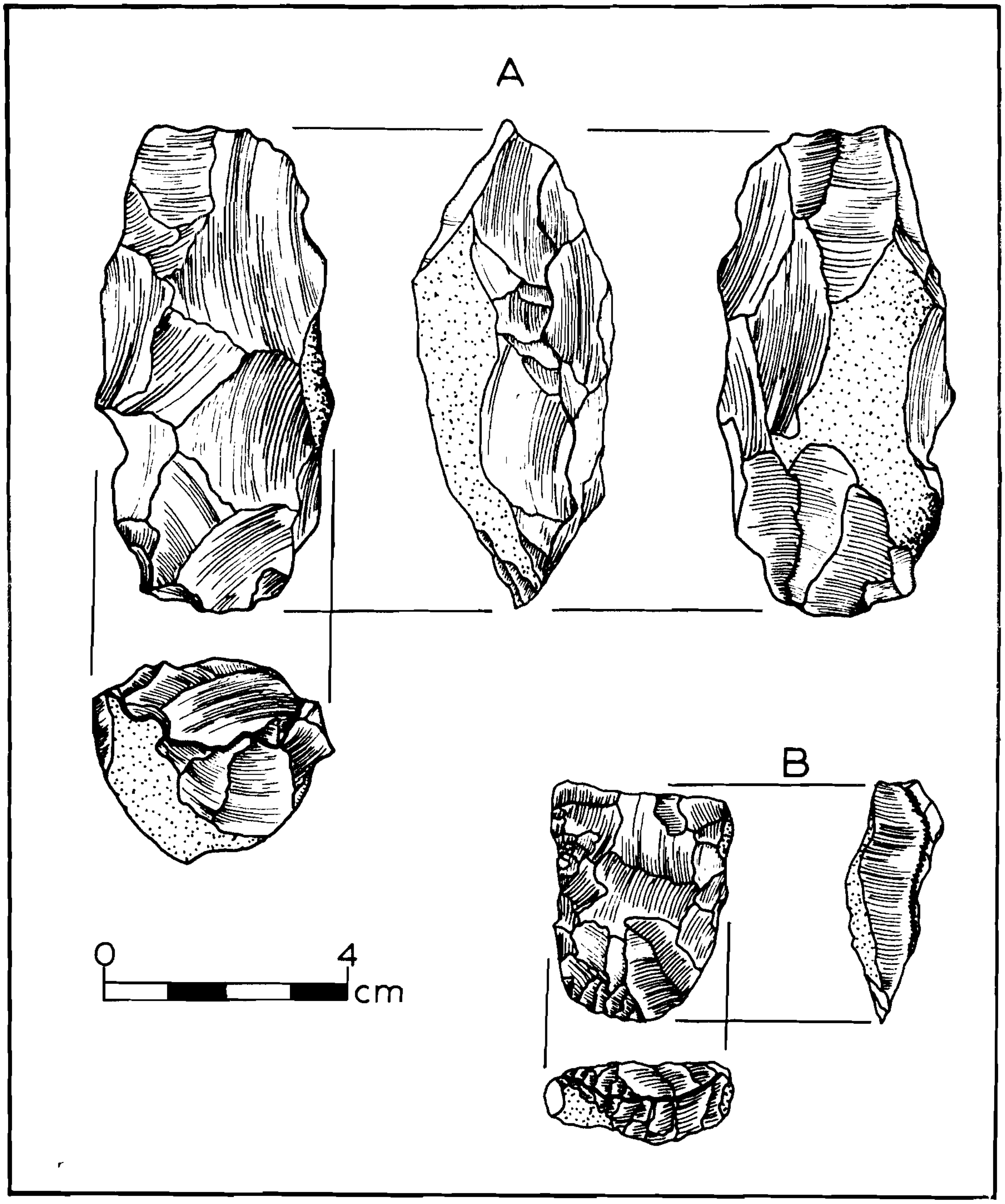



FIGURE 20. ADZES. A, adze preform; B, adze.

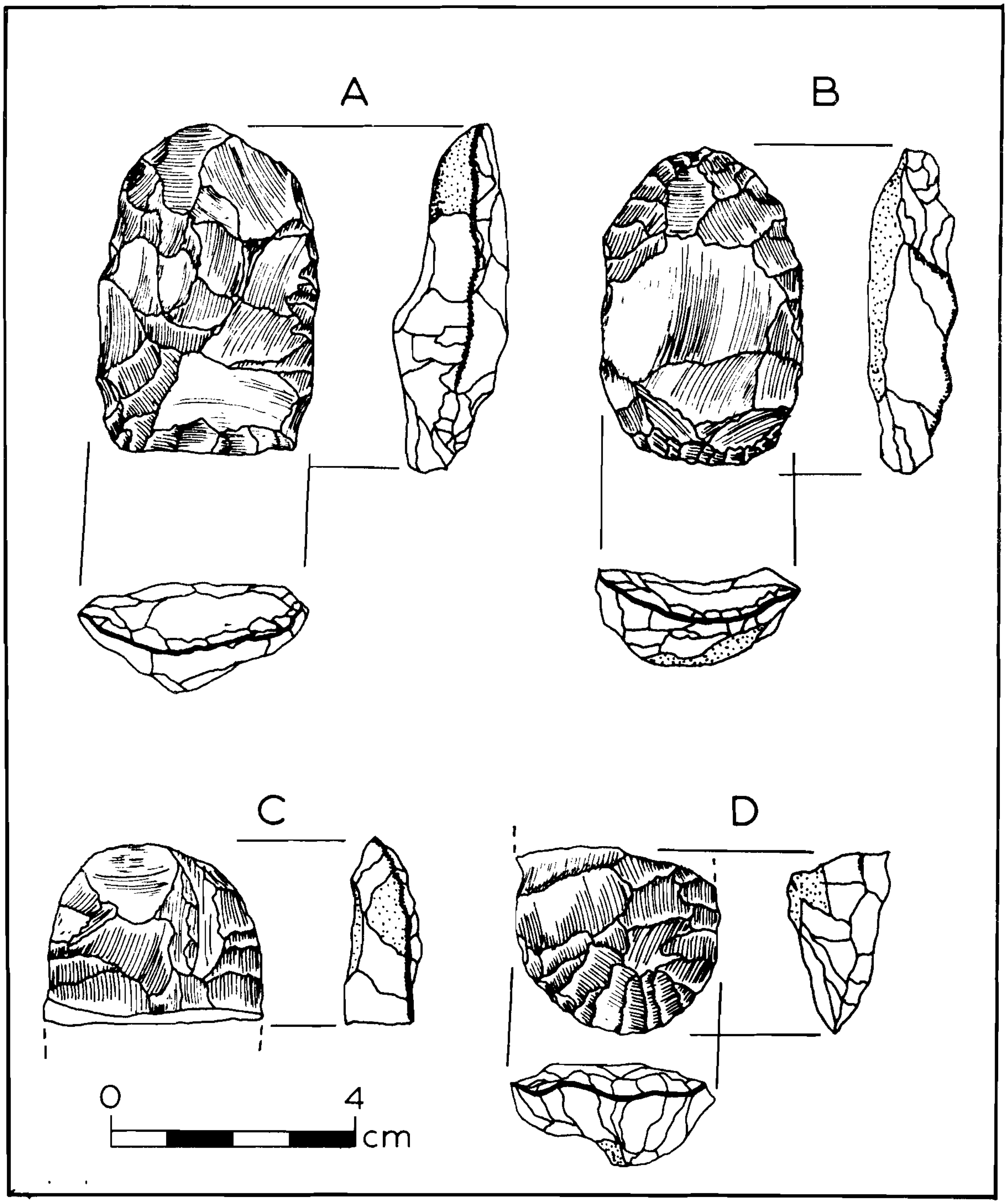



FIGURE 21. ADZES. A-B, adzes; C, adze butt; D, adze bit.

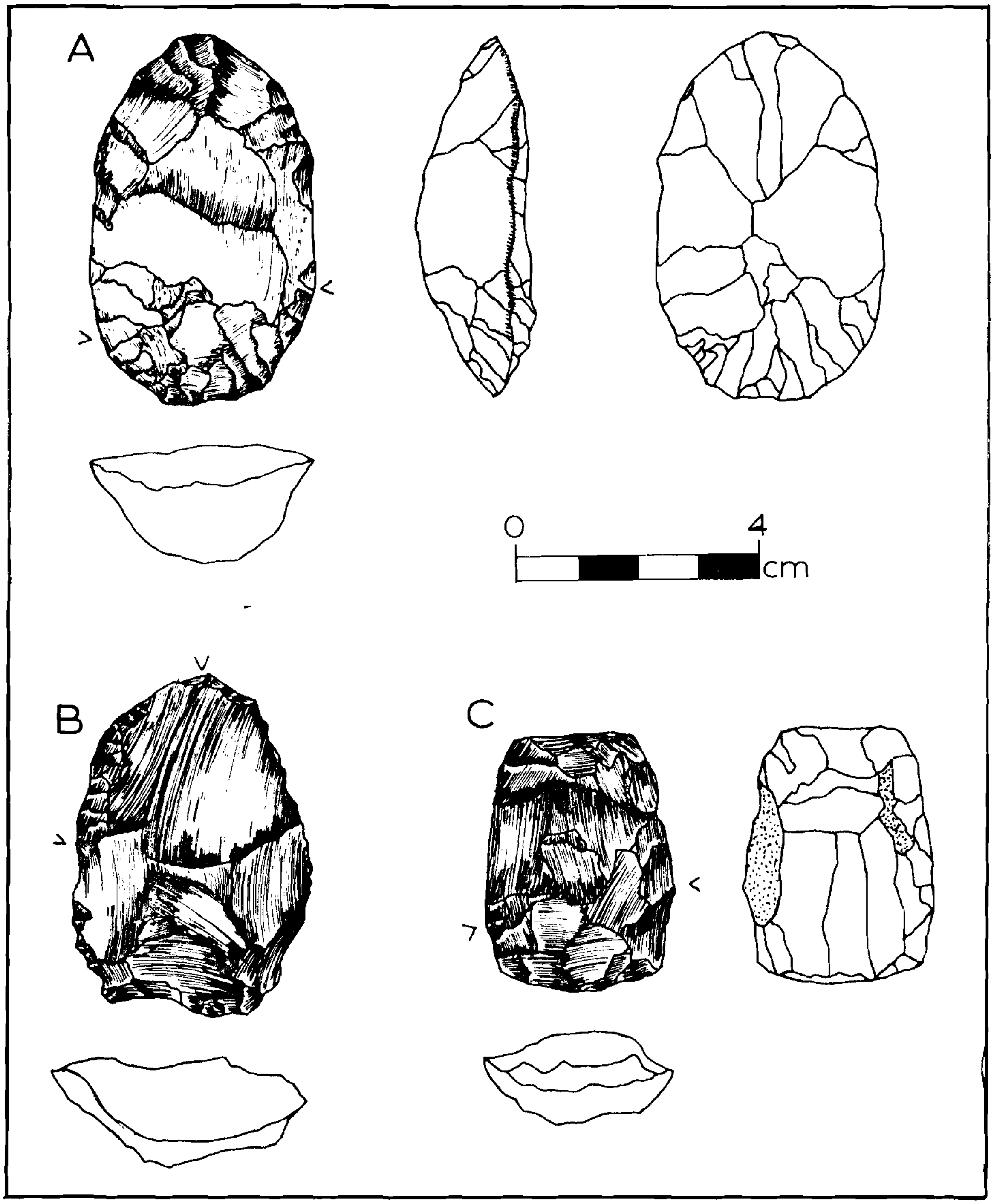



FIGURE 22. ADZES. A, adze; B, recycled adze used as core; C, recycled adze used as lamellar blade core.

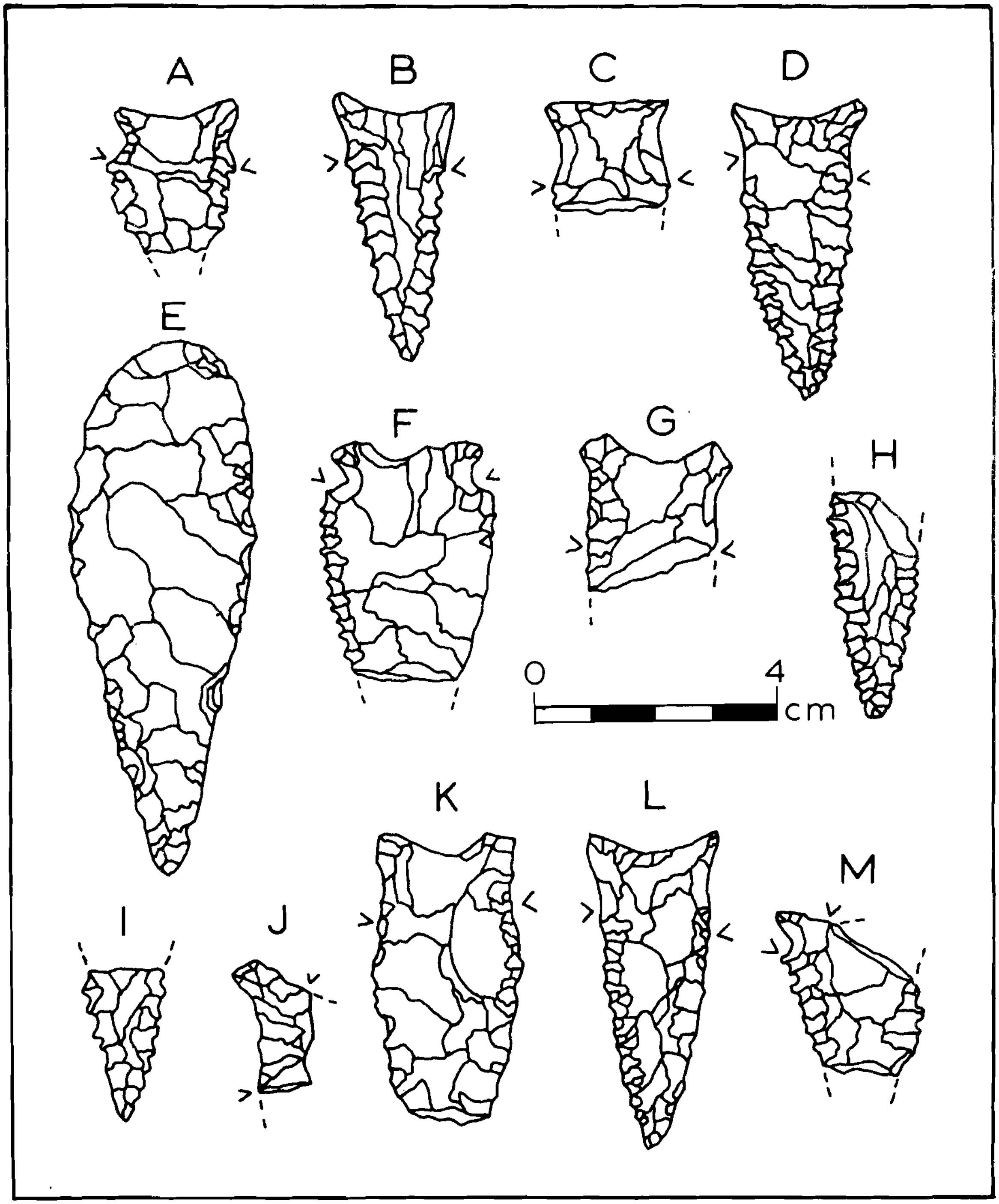



FIGURE 23. DALTON ASSEMBLAGE POINTS.

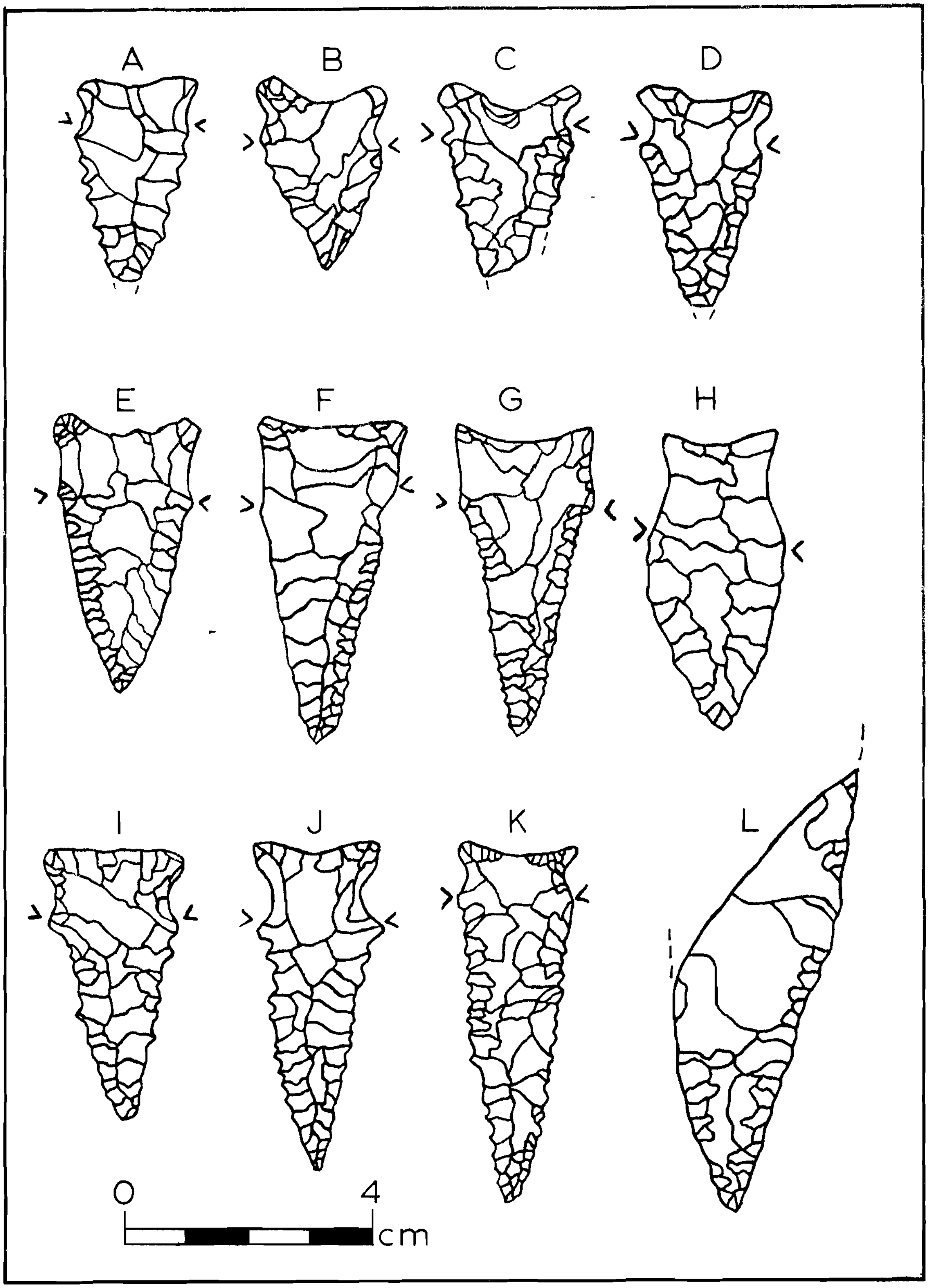



FIGURE 24. DALTON ASSEMBLAGE POINTS. From Beachum and Harrison collections.

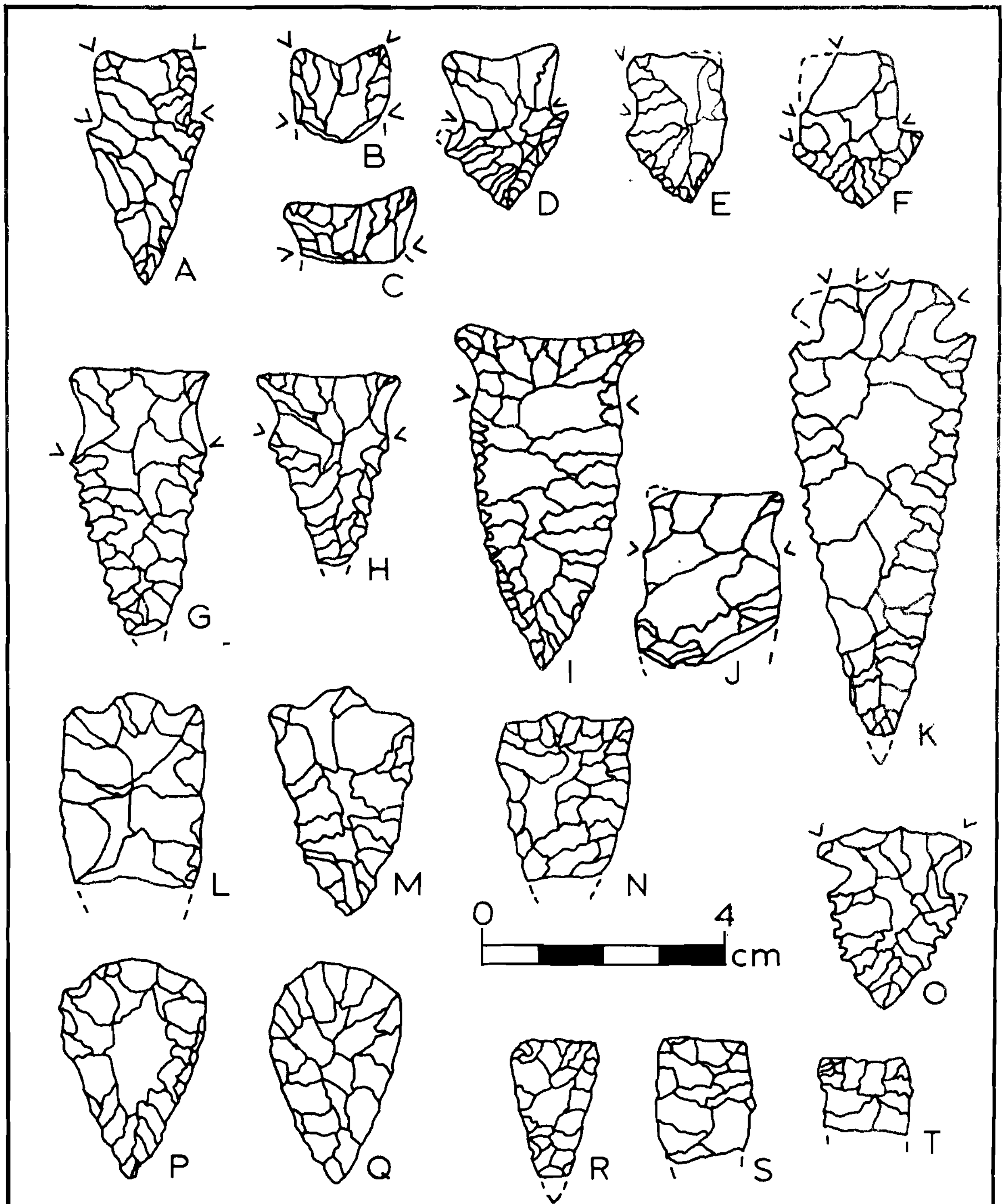



FIGURE 25. MISCELLANEOUS PROJECTILE POINTS. A-F, Jude; G-J, Greenbrier; K, Plevna; L-N, Eva II; O, Autauga; P-Q, Morrow Mountain I; R-T, Madison.

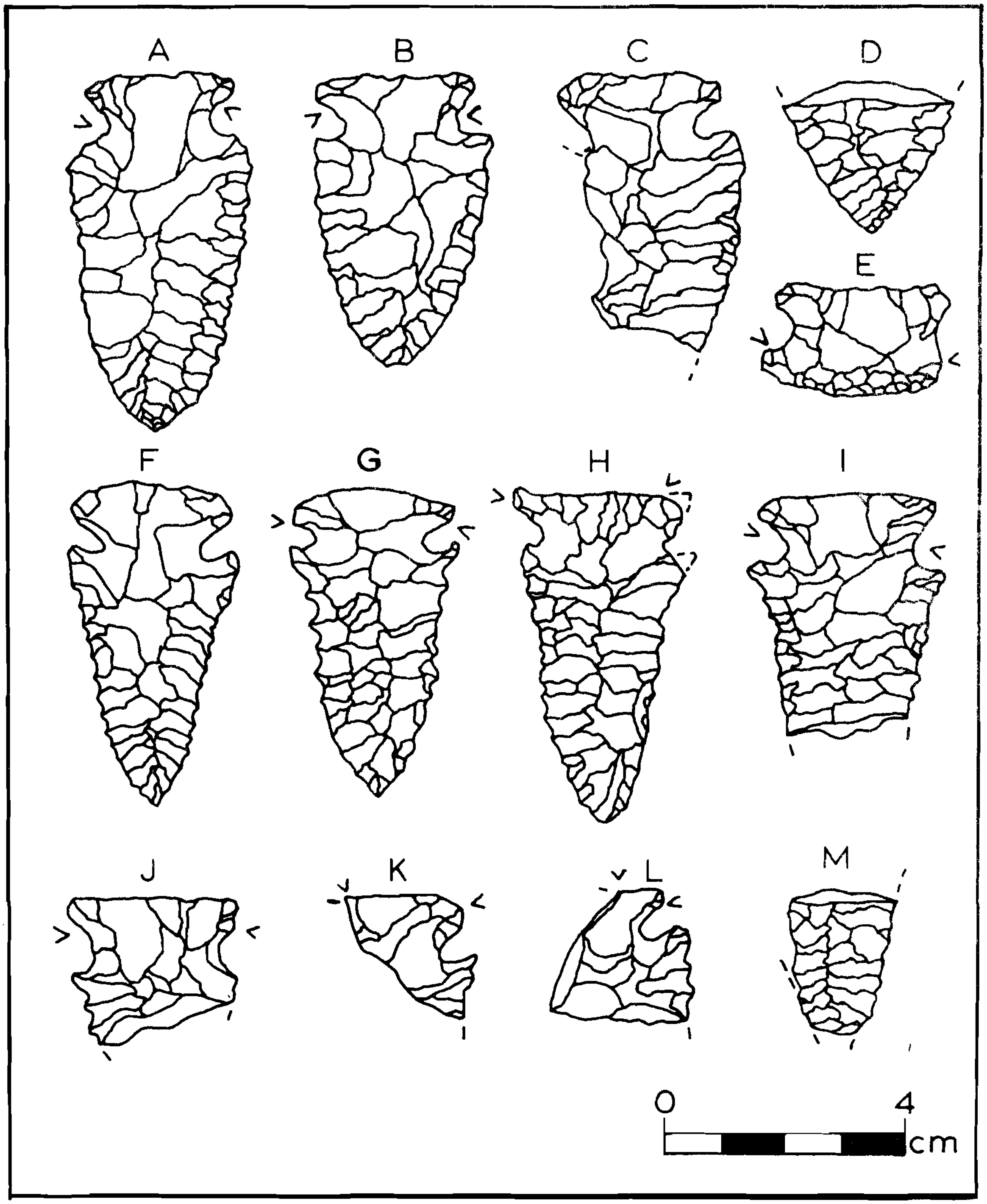



FIGURE 26. PINE TREE POINTS. A-D, initial stage; E, end scraper; F-M, advanced stage.

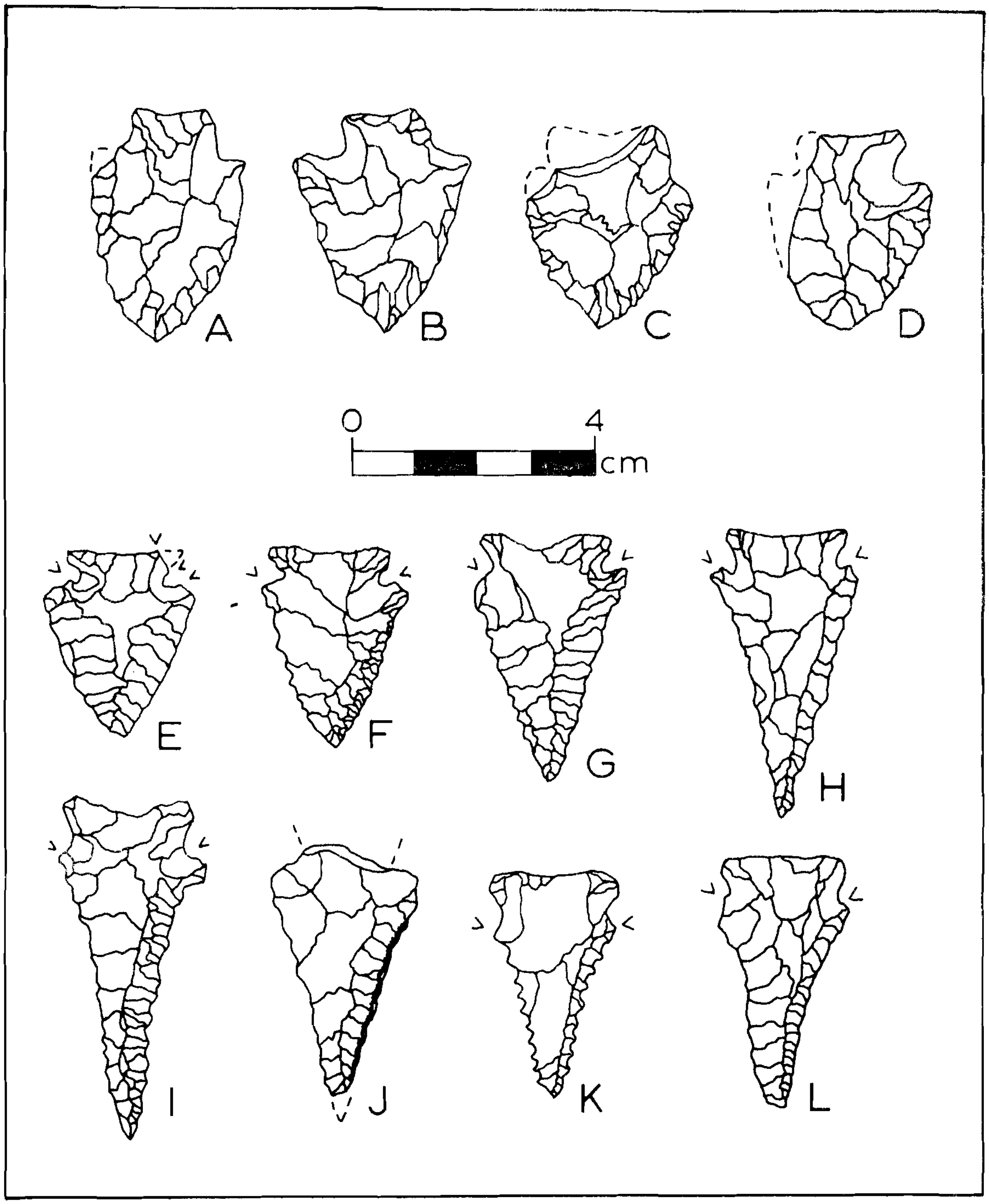



FIGURE 27. BEACHUM (PROVISIONAL TYPE) AND DECATUR POINTS. A-D, Beachum; E, initial-stage Decatur; F-K, advanced-stage Decatur; L, final-stage Decatur.

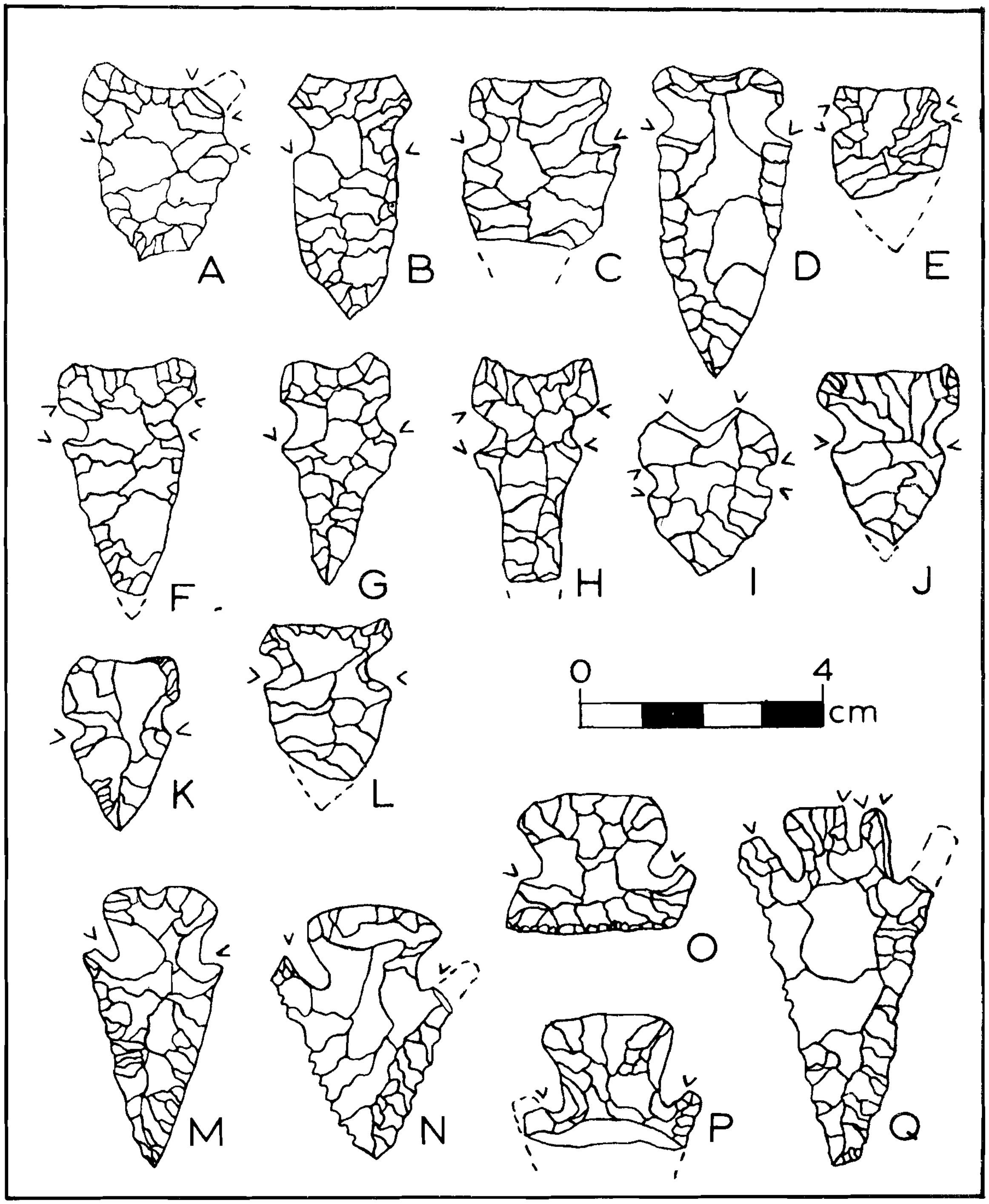



FIGURE 28. BIG SANDY AND LOST LAKE POINTS. A, Big Sandy with graver tip; B-L, Big Sandy; M-N, Lost Lake; O, Lost Lake end scraper; P-Q, Lost Lake.

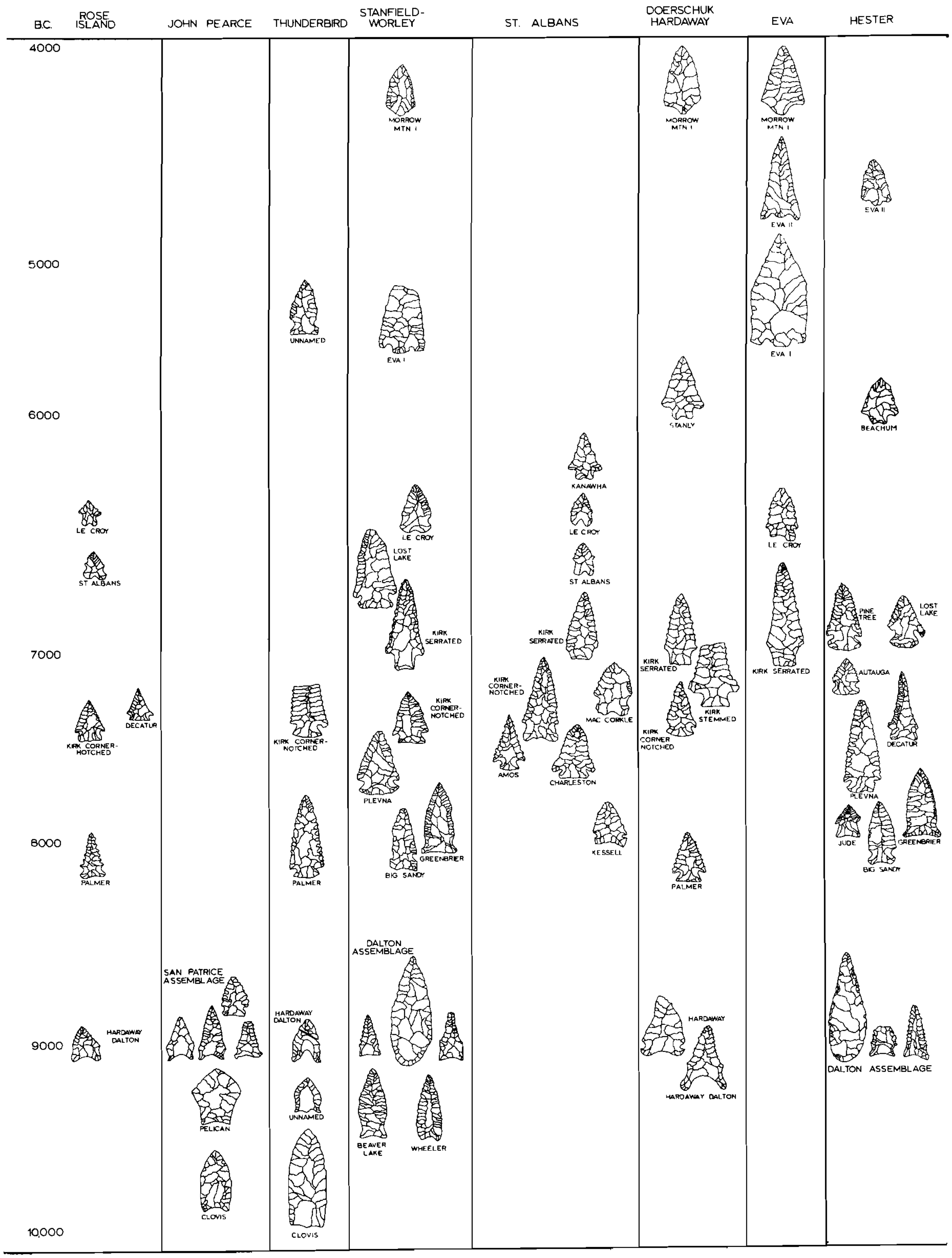



FIGURE 29. EARLY ARCHAIC POINT CHRONOLOGY.

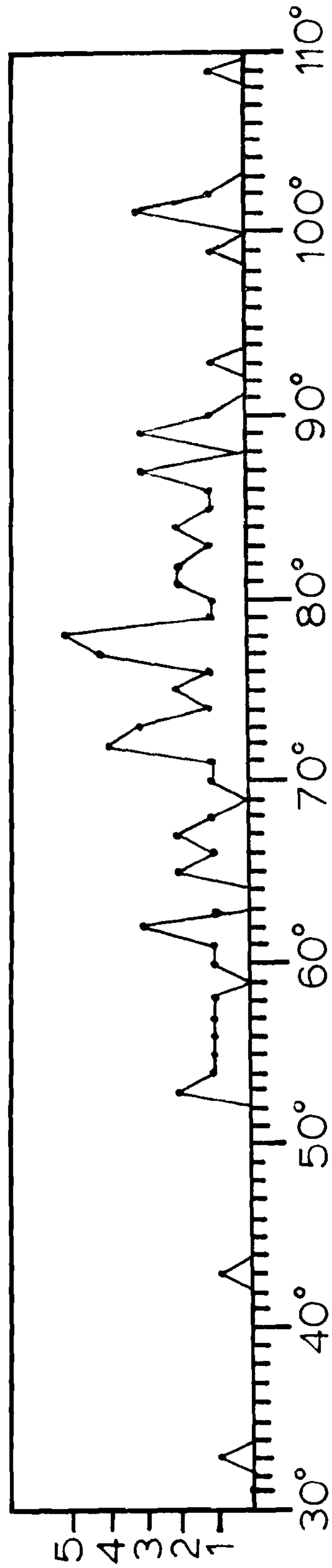



FIGURE 30. END SCRAPER EDGE-ANGLE VALUES.

| Excavation Unit | Wheeler Plain | Tishomingo Cord-marked | Furrs Cord-marked | Baldwin Plain | Total |
|---|---|---|---|---|---|
| 75S - CL | | 1 | | | 1 |
| 60S - CL | | | 1 | 4 | 5 |
| 40S - CL | 1 | 3 | 11 | | 15 |
| 35S - CL | | | 21 | | 21 |
| 30S - CL | | | 16 | 2 | 18 |
| 25S - CL | | | 32 | 1 | 33 |
| 20S - CL | | 1 | 5 | 1 | 7 |
| 15S - CL | | | 14 | 7 | 21 |
| 5S - CL | | | 9 | 1 | 10 |
| 5N - CL | | | | 1 | 1 |
| 10N - CL | | 13 | 1 | 1 | 15 |
| 15N - CL | | 5 | | 1 | 6 |
| 25N - CL | | 5 | 1 | 1 | 7 |
| 35N - CL | | | 6 | | 6 |
| 50N - CL | | 3 | | | 3 |
| 55N - CL | | 4 | 2 | | 6 |
| 150E - 85S | | | 8 | | 8 |
| Total | 1 | 35 | 127 | 20 | 183 |

TABLE 1. SHERDS.

| | Yellow gravel | Red gravel | Total |
|---|---|---|---|
| Primary decortication flakes | 8 | 5 | 13 |
| Trimmed primary decortication flakes | 5 | 2 | 7 |
| Secondary decortication flakes | 3 | 3 | 6 |
| Trimmed secondary decortication flakes | 3 | 1 | 4 |
| Bifaces | 3 | 3 | 6 |
| Total | 22 | 14 | 36 |

TABLE 2. FLAKE TYPES PRESENT IN INMON CACHE.

| Functional Group | Tool Type | Number |
|---|---|---|
| I Sawing-cutting | Completed preform, initial- and advanced-stage points | 28 |
| II Dalton-use attrition | Dalton tips, bodies, bases, and ears | 6 |
| III Heavy cutting | Adze knives | 0 |
| IV Splitting-wedging | Piece esquillee, adze wedge | 7 |
| V Grooving | Burins, gravers | 7 |
| VI Scraping | End and side scrapers | 24 |
| VII Cleaving, chopping, hammering, anvil work | All cobble tools | 2 |
| VIII Perforating | Final-stage Dalton-point perforators | 0 |
| IX Light cutting | True blades, bladelike flakes, utilized flakes | 14 |
| | Other tools: | |
| | cores | 5 |
| | abraders | 5 |
| | pitted stones | 2 |
| | spokeshaves | 3 |

Modified from Albert C. Goodyear, THE BRAND SITE: A TECHNO-FUNCTIONAL STUDY OF A DALTON SITE IN NORTHEAST ARKANSAS (Fayetteville: Arkansas Archaeological Survey, 1974). Used by permission.

TABLE 3. FUNCTIONAL CLASSIFICATION OF DALTON TOOL TYPES.

| | |
|---|---|
| Abraders | 5 |
| Bifaces | 8 |
| Blades | 1 |
| Bladelike flakes | 2 |
| Burins | 2 |
| Cores | 5 |
| End scrapers | 5 |
| Gravers | 4 |
| Hammerstones | 2 |
| Knives | 2 |
| Piece esquillees | 7 |
| Pitted stones | 2 |
| Preforms | 10 |
| Projectile points | 14 |
| Side scrapers | 18 |
| Spokeshaves | 3 |
| Tabular flakes | 11 |
| Total | 101 |

TABLE 4. DALTON ASSEMBLAGE TOOLS.

Post-Dalton Projectile-Point Types

Big Sandy
Decatur
Greenbrier
Jude
Plevna
Autauga
Ecusta
Pine Tree
Lost Lake
Beachum
Eva II-Morrow Mountain I
Madison

Abbreviations

B = broken
BB = broken base
BEV = bevelled
ES = end scraper
FB = fracture base
FT.P = Fort Payne chert
GB = ground base
GR = graver
GS = ground stem
IN = initial stage
LG = local gravel
LGHT = local gravel, heat treated
MAT = material
NB = notched base
RS = resharpened
SER = serrated
ST = screwdriver tip

Measurements expressed in millimeters

TABLE 5. ATTRIBUTES OF POST-DALTON PROJECTILE POINTS.

BIG SANDY

| Catalog No. | L | W | T | Mat | Other |
|---|---|---|---|---|---|
| 564 | 40.5 | 21 | 7.5 | LGHT | GB |
| 2114 | 29.5b | 23 | 6.5 | LGHT | |
| 1238 | 28.5b | 26.5 | 7 | LGHT | GB |
| 1936 | 28.5 | 19.5 | 7 | LGHT | GB |
| 1426 | 27 b | 17 | 5.5b | LGHT | GB |
| 1940 | 6.5b | 21.5 | 6 | LGHT | GB |
| 1246 | 39.5b | 22.5 | 8 | LGHT | GB |
| 1462 | 52 | 22.5 | 6.5 | LGHT | GB |
| 2645 | 23 b | 19.5b | 7.5 | LGHT | GB |
| 2378 | 15.5b | 21.5 | 6 | LGHT | GB |
| 1236 | 27.5b | 22 | 7 | LGHT | GB |
| 2017 | 15 b | 24 | 6.5 | LGHT | GB |
| 1941 | 19.5b | 22.5b | 6.5b | LGHT | GB |
| 3063 | 22.5b | 22.5b | 5.5 | LGHT | |
| 1482 | 37 b | 20.5b | 7 | LGHT | GB |
| 1706 | 37.5 | 19 | 6.5 | LGHT | GB RS |
| 1617 | 14 b | 23 b | 6 | LGHT | GB |
| 544 | 37.5b | 20.5 | 6.5 | LGHT | GB RS |
| 1949 | 31.5b | 28 b | 8 | LGHT | GB GR |
| 1935 | 34 b | 18 b | 6.5 | FT.P | GB |
| 1920 | 39.5b | 15.5b | 8 | FT.P | GB |
| 2813 | 19 b | 19.5 | 5 | LG | |
| 1415 | 9.5b | 19.5 | 6.7 | LGHT | |

TABLE 5A. ATTRIBUTES OF BIG SANDY POINTS.

DECATUR

| Catalog No. | L | W | T | GB | FB | BEV | MAT | Other |
|---|---|---|---|---|---|---|---|---|
| 1232 | 57.5 | 25 | 7.6 | yes | no | yes | LGHT | |
| 1958 | 34 | 24.5 | 6.5 | yes | yes | no | " | IN |
| 1204 | 54 | 31 | 7.5 | yes | yes | yes | " | |
| 530 | 44.5 | 22 | 5.5 | yes | yes | yes | " | BB |
| 1450 | 48.2 | 24.6 | 6.1 | yes | yes | yes | " | |
| 1662 | 32.8b | 23 | 6.5 | yes | no | no | " | |
| 2008 | 46 | 22.2 | 7.2 | yes | yes | yes | " | |
| 1679 | 41 | 22 | 6.5 | yes | no | no | " | ST |
| 1643 | 38.8 | 19.5 | 5 | yes | no | no | " | |
| 1191 | 33 b | 26.8 | 7.1 | yes | yes | yes | " | |
| 1339 | 30 b | 26.2 | 6 | yes | yes | yes | " | |
| 3019 | 29.4b | 22.2 | 6.1 | yes | no | no | " | |
| 559 | 22 b | 29.56 | 6 | yes | no | no | " | IN |
| 1879 | 30.5 | 26.4 | 6.5 | yes | no | no | " | IN |
| 1712 | 38.3 | 21.6 | 8 | yes | yes | yes | " | |
| 524 | 45.9 | 27.2 | 6.6 | yes | yes | yes | " | |
| 1195 | 42 | 26.5 | 6 | yes | yes | yes | " | |
| 1202 | 12.5b | 19.5 | 5.5 | yes | yes | yes | " | |
| 1196 | 41.8b | 23.3 | 5.6 | ? | yes | no | " | BB |
| 1518 | 42 | 21 | 7.5 | yes | yes | yes | " | ST |
| 1069 | 41.2b | 21 | 5.7 | ? | yes | yes | " | BB |
| 1208 | 46 | 28 | 6 | no | yes | no | Ft. P | BB |
| 1555 | 46.4 | 26 | 6 | yes | yes | no | Ft. P | |
| 1404 | 42.4b | 24.6 | 6.8 | ? | yes | yes | LGHT | BB |
| 1479 | 37 | 29.1 | 6 | yes | yes | no | LGHT | IN |
| 2327 | 11 b | 26.4b | 5b | yes | yes | ? | " | |
| 3064 | 16.5 | 23.2 | 6.5 | yes | no | yes | " | ES |
| 1717 | 24 | 31 | 7.2 | ? | yes | no | " | ES |

TABLE 5B. ATTRIBUTES OF DECATUR POINTS.

GREENBRIER

| Catalog No. | L | W | T | GB | SER | MAT | Other |
|---|---|---|---|---|---|---|---|
| 402 | 56 | 30 | 7 | yes | yes | LG | IN |
| 1344 | 29.5b | 24.5 | 6 | yes | no | LGHT | IN |
| 1494 | 32 b | 22.4 | 7.2 | yes | yes | " | |
| 1181 | 44 b | 23 | 8 | yes | yes | " | |

JUDE

| Catalog No. | L | W | T | GB | GS | MAT | Other |
|---|---|---|---|---|---|---|---|
| 409 | 39 | 19.8 | 8 | no | yes | LGHT | |
| 4000 | 26 | 21.4 | 6.7 | no | yes | " | |
| | | | | | | | |
| 1237 | 25.8 | 16.4 | 6.6 | | yes | " | |
| 1170 | 26.2 | 20 | 5.8 | yes | yes | " | BLV |
| 1205 | 15.6b | 16 b | 7 b | yes | yes | " | |
| 2810 | 11 b | 21.1b | 5.4b | no | yes | " | |
| 1068 | 15 b | 12.9b | 6.2 | yes | yes | " | |

PLEVNA

| Catalog No. | L | W | T | GB | SER | MAT | Other |
|---|---|---|---|---|---|---|---|
| 1519 | 76 b | 29 | 9.1 | yes | yes | LGHT | NB BEV |

AUTAUGA

| Catalog No. | L | W | T | GB | SER | MAT | Other |
|---|---|---|---|---|---|---|---|
| 1471 | 30 | 23.1b | 7.5 | yes | yes | LGHT | ES |

ECUSTA

| Catalog No. | L | W | T | GB | SER | MAT | Other |
|---|---|---|---|---|---|---|---|
| 1458 | 27 | 28.5 | 7.4 | yes | yes | LGHT | ES |

TABLE 5C. ATTRIBUTES OF GREENBRIER, JUDE, PLEVNA, AUTAUGA, AND ECUSTA POINTS.

PINE TREE

| Catalog No. | L | W | T | MAT | Other |
|---|---|---|---|---|---|
| 1118 | 45.5b | 30 b | 7.5 | LGHT | IN |
| 1151 | 50 b | 30.5 | 8.5 | " | GB, IN |
| 1044 | 60.5 | 31.5 | 10 | " | GB, IN |
| 2492 Distal End | 24.5b | 29 b | 6.5 | " | IN |
| 1046 | 56 | 29 b | 9.5 | " | GB |
| 1080 | 55 | 29 | 8.5 | " | GB |
| 550 | 52.5 | 29 b | 8 | " | GB |
| 1290 | 19 b | 31 b | 6 | " | GB |
| 1139 | 22.5b | 24 b | 6.5 | ? | GB |
| 3083 Distal End | 23.5b | 18 b | 8 | LGHT | |
| 1972 | 24.8b | 28.9 | 8 | " | GB |
| 1930 | 42 b | 33 | 9.5 | " | GB |

LOST LAKE

| Catalog No. | L | W | T | GB | BEV | MAT | Other |
|---|---|---|---|---|---|---|---|
| 552 | 42.8 | 30.5b | 7.3 | yes | yes | LGHT | |
| 1614 | 22.1b | 29.3 | 6.5 | yes | yes | " | |
| 1136 | 47 | 24 | 8 | yes | yes | " | NB |
| 1281 | 60.9 | 32.1b | 8.2 | yes | yes | " | NB, ST |
| 1360 | 23.5 | 30.8 | 8 | yes | yes | " | ES |

BEACHUM

| Catalog No. | L | W | T | MAT |
|---|---|---|---|---|
| 560 | 37 | 39 | 9.5 | LGHT |
| 414 | 34b | 27 | 8.2 | " |
| 2109 | 33.2 | 21.4b | 6.6 | " |
| 406 | 39.5 | 25.1 | 9 | " |
| 1710 | 26.5 | 19.5 | 7.6 | " |

EVA II-MORROW MOUNTAIN I

| Catalog No. | L | W | T | MAT |
|---|---|---|---|---|
| 1443 | 33.2 | 24.1 | 8.2 | LGHT |
| 1286 | 32 b | 24.6 | 8.2 | " |
| 2004 | 27.5b | 22.9 | 9 | " |
| 1446 | 36.9 | 22 | 8 | " |
| 1440 | 37 | 24 | 7 | " |

TABLE 5D. ATTRIBUTES OF PINE TREE, LOST LAKE, BEACHUM, AND EVA II-MORROW MOUNTAIN I POINTS.

| Catalog No. | L | W | T | MAT |
|---|---|---|---|---|
| 526 | 20.6b | 16.1 | 3.9 | LGHT |
| 539 | 12 b | 14.8 | 3.9 | " |
| 2000 | 22.2b | 14.5 | 4 | " |

TABLE 5E. ATTRIBUTES OF MADISON POINTS.

| Tools | Big Sandy | Decatur | Pine Tree | Lost Lake | Beachum | Eva |
|---|---|---|---|---|---|---|
| Abrader | 16 | 26 | 19 | 4 | 7 | 9 |
| Adze | 4 | 5 | 3 | 1 | 0 | 0 |
| Anvil | 2 | 3 | 0 | 0 | 0 | 0 |
| Grooved stone | 2 | 2 | 0 | 0 | 0 | 0 |
| Bevelled knife | 0 | 1 | 0 | 0 | 1 | 0 |
| Biface | 13 | 6 | 14 | 1 | 2 | 6 |
| Blade core | 1 | 0 | 0 | 0 | 0 | 1 |
| Broken biface | 61 | 101 | 55 | 7 | 17 | 17 |
| Chopper | 1 | 1 | 0 | 0 | 1 | 0 |
| Core | 32 | 55 | 30 | 7 | 16 | 3 |
| Drill | 1 | 3 | 2 | 1 | 0 | 1 |
| Hammer-stone | 4 | 4 | 4 | 0 | 1 | 0 |
| Knife | 0 | 4 | 0 | 0 | 0 | 2 |
| Piece esquillee | 5 | 9 | 4 | 0 | 2 | 1 |
| Pitted stone | 10 | 9 | 4 | 0 | 1 | 0 |
| Preform | 6 | 10 | 5 | 0 | 0 | 2 |
| Project. point | 23 | 28 | 12 | 5 | 5 | 5 |

TABLE 6. TOOL TYPES.

| Catalog No. | Assoc. | Mat. | Edge Angle | Accessories | Type |
|---|---|---|---|---|---|
| 2075 | Dalton | Gravel | 72° | None | Thick flake |
| 1729 | " | " | 68° | Notch | True blade |
| 1532 | " | " | 77° | Graver | Thick flake |
| 2129 | " | " | 62° | Graver | " " |
| 3044 | " | " | 87° | None | " " |
| 1425 | " | Gr. heated | 73° | None | " " |
| 1162 | Big Sandy | " " | 82° | " | " " |
| 1264 | " " | " " | 84° | " | " " |
| 1263 | " " | " " | 87° | " | " " |
| 1355 | " " | Gravel | 62° | " | " " |
| 1620 | " " | " | 86° | " | " " |
| 1905 | " " | Gr. heated | 78° | " | " " |
| 2027 | " " | " " | 78° | " | " " |
| 3415 | " " | " " | 77° | " | Thin flake |
| 2626 | " " | " " | 77° | " | Thick flake |
| 2724 | " " | Gravel | 89° | " | " " |
| 2835 | " " | " | 89° | Notch | " " |
| 2515 | " " | Gr. heated | 73° | None | " " |
| 2855 | Decatur | " " | 89° | " | Broken biface |
| 2647 | " | " " | 61° | " | Thin flake |
| 2394 | " | " " | 76° | " | " " |
| 2390 | " | " " | 80° | " | Thick flake |
| 2676 | " | " " | 67° | " | " " |
| 2407 | " | " " | 70° | " | Thin flake |
| 2217 | " | " " | 60° | " | Thick flake |
| 2658 | " | Gr. heated | 75° | " | Thin flake |
| 2846 | " | " " | 74° | " | " " |
| 2805 | " | " " | 65° | Notch | Thick flake |
| 2801 | " | " " | 101° | None | " " |
| 2800 | " | " " | 100° | " | " " |
| 2875 | " | " " | 62° | " | " " |
| 2478 | " | " " | 72° | " | Thin flake |
| 2940 | " | Gravel | 78° | " | Thick flake |
| 2390 | " | " | 80° | " | " " |
| 2394 | " | Gr. heated | 76° | " | Thin flake |
| 2647 | " | " " | 61° | " | " " |
| 1480 | " | " " | 90° | " | Thick flake |
| 1546 | " | Gravel | 43° | " | " " |
| 1605 | " | Gr. heated | 82° | " | " " |
| 1629 | " | " " | 57° | " | " " |
| 2007 | Pine Tree | " " | 72° | " | " " |
| 2820 | " " | Gravel | 54° | " | " " |
| 2972 | " " | Gr. heated | 55° | " | Thin flake |
| 2992 | " " | " " | 67° | " | " " |
| 2511 | " " | " " | 81° | Graver | Thick flake |
| 2821 | " " | " " | 99° | None | " " |
| 2968 | " " | " " | 87° | " | " " |
| 2797 | " " | " " | 83° | " | " " |
| 2193 | " " | Jasper htd. | 93° | " | " " |

TABLE 7. ATTRIBUTES OF END SCRAPERS.

| Catalog No. | Assoc. | Mat. | Edge Angle | Accessories | Type |
|---|---|---|---|---|---|
| 3180 | Beachum | Gravel | 66° | None | Thin flake |
| 2818 | " | Gr. heated | 84° | " | Thick flake |
| 1924 | " | " " | 53° | " | Thin flake |
| 1441 | Eva-Morrow Mtn. | " " | 63° | " | " " |
| 2002 | " " " | " " | 78° | " | Thick flake |
| 2003 | " " " | " " | 81° | " | " " |
| 2252 | " " " | " " | 102/109° | Dble. scraper | " " |
| 2330 | " " " | " " | 73° | None | Thin flake |
| 2252 | " " " | " " | 75° | " | " " |
| 2329 | " " " | " " | 56° | " | " " |
| 2283 | " " " | " " | 53° | " | " " |
| 2376 | " " " | " " | 85° | " | " " |
| 3163 | Unidentified | Ft. Payne | 78° | Graver | Thick flake |
| 2578 | " | Gr. heated | 58° | None | Thin flake |
| 3378 | " Beachum? | " " | 65° | " | Thick flake |
| 2467 | " Decatur? | " " | 77° | " | " " |
| 2576 | " Decatur? | " " | 79° | Notch | " " |
| 3463 | " Beachum? | " " | 72° | None | " " |
| 2293 | " | " " | 33° | " | " " |
| 2332 | Woodland ? | Jasper" | 71° | " | " " |

TABLE 7. ATTRIBUTES OF END SCRAPERS.

| | DALTON | | GREENBRIER | | BIG SANDY | |
|---|---|---|---|---|---|---|
| | Light heating | Heating with complete color change | Light heating | Heating with complete color change | Light heating | Heating with complete color change |
| Beachum and Harrison collections | 1=5% | 12=54% | 0 | 7=63% | 16=25.3% | 63=74.7% |
| MDAH excavation | 8=36% | 1=5% | 1=9% | 3=27% | 1=5.2% | 19=94.8% |
| Total | 9=41% | 13=59% | 1=9% | 10=90% | 17=20.7% | 82=79.3% |

TABLE 8. HEAT TREATING OF DALTON, GREENBRIER, AND BIG SANDY POINTS.

# APPENDIX 1

## HEAT TREATING

Most artifacts from the Hester site were manufactured from heat-treated local gravel, which, when heated, undergoes extreme color changes from yellow to white, orange, red, pink, or blue. Accompanying the color change is a change in texture. Unheated gravel is coarse to the touch, while heated gravel is slick, sometimes even giving the impression of being greasy. Fort Payne chert from Hester commonly feels slick or even slightly greasy, but it cannot be determined whether the Hester examples were subjected to thermal alteration.

Several specimens from Hester illustrate that bifaces were heated and, during the final reduction stage, broken by a lateral snap. One such specimen is illustrated in plate 5 G. Part of its surface is a dull red but some flakes show a glossy yellow beneath the red. It is assumed that the specimen did not receive sufficient heat to produce a complete color change since only the surface was discolored. The inside of the piece, however, did undergo a change from coarse-feeling to a slick, greasy texture. House notes the occurrence of this phenomenon in the Cache River Basin:

> Archaeological specimens with glossy flake scars overriding dull surfaces are occasionally observed. These data strongly suggest widespread heat treatment but further experiments are necessary. For instance, it is probable that less intense heating may satisfactorily improve the chipping properties of chert without producing drastic changes in color (1975b:84).

This less-intense heating appears to be culturally significant over a large portion of northern Mississippi in the Early Archaic period. Dalton points and other early forms such as San Patrice are often yellow with red distal ends or auricles. Most Dalton points from Florida lack heat treating, while later Archaic forms were heated (Barbara Purdy, personal communication 1977). In most instances, thermal alteration is indicated by the greasy feel of the points. Just why the method of heating was followed is hard to say. Some artifacts from the Dalton zone at Hester, however, may suggest a hypothesis which can be tested by lithic technologists. Two blades, illustrated in plates 9 C and 10 N, appear to be from the same core. Each is glossy yellow with a red discoloration on one end. It appears that the core from which these blades were drawn was not worked before heating. That is, a cobble was first heated, and then blades were struck from it. In contrast, during later periods preforms were heated. Cores may have been subjected to less intense heat to prevent them from cracking.

Three of the earlier types at Hester seem to represent a transition from light to more-intense heat treating. The general trend is made apparent in table 8. Dalton, the earliest of the three types, has a total of 59% with the light form of heating. Big Sandy points were heated in this manner only 20.7% of the time. Only one of ten Greenbrier points exhibits characteristics of light heating. Apparently there are significant differences in heat-treating techniques in these point categories between the MDAH and Beachum and Harrison excavation areas. A larger sample of these types would be useful.

Following the Big Sandy occupation at Hester, all points as well as most tools were heavily heat treated. Flint work seems to have been done by reducing cobbles to preforms, heating, and then reducing the preform into the finished artifact. During this era of several thousand years, most of the chipped-gravel artifacts in northeastern Mississippi were heated, and drastic changes in both color and texture were produced.

The tradition of heat treating at the preform stage, then, had its roots in the Early Archaic period and remained a viable cultural trait for at least 8,000 years. Heat treating was occasionally done in the Yazoo Basin in northwestern Mississippi, but few of the chipped-stone artifacts from that area show any evidence of thermal alteration.

# APPENDIX 2

## RADIOCARBON DATES

Five samples from Hester were sent to the University of Georgia for radiocarbon assay. Results were disappointing. Charcoal at the site was rare, and when found was in the form of small flecks. Material was gathered by squares, and collecting a single small sample usually took over an hour.

Two samples were located near a disturbed area in square 15N-5E. The hope that these might not have been contaminated or intrusive from higher levels was not realized, however, since sample 1 (U. Ga. 861) yielded a date of A.D. 1050 ± 85. The sample was located above a Decatur point and had been expected to date between 6000 and 5000 B.C. Sample 5 (U. Ga. 968) yielded a date of A.D. 1140 ± 110. Again, it was thought that the date would have been much earlier. The original association of the samples is not known. Since they occurred in the top portion of the Early Archaic zone, they were expected to bridge the gap between Early and Middle Archaic.

Sample 2 (U. Ga. 862), taken from the north end of square 5N-5E, provided a date of 4290 ± 400 B.C. The date falls within the Middle Archaic period, but the association of the sample is uncertain. Decatur points in the square were below the level of sample 2, so the expected date was 6500-6000 B.C. In the adjoining square (10N-5E) at the same level was a Beachum point which underlay a Pine Tree point. The sequence was unusual since most Beachum points at Hester were above Lost Lake and Pine Tree points.

Sample 3 (U. Ga. 863) was taken from adjoining square 10N-5E also but at a slightly lower level. Its date (6385 ± 305 B.C.) was within the expected range for the Pine Tree type. Definite association, however, was lacking. The sample was above Decatur points.

Sample 4 (U. Ga. 864), yielding a date of 5015 ± 180 B.C., was taken from square 65S-5E. This is believed to be the only dated sample from Hester that was found in association with a (Beachum) point. On the basis of the level and form of the point, the expected date for the sample was approximately 5500-5000 B.C., or what this author considers to be the beginning of the Middle Archaic period.

In summary, the radiocarbon dates from Hester were of little use. Only one date, 5015 $\pm$ 180 B.C., falls within the predicted time range and seems to date a point type. This one date is important, however, because it does furnish a partial sequence for the Archaic occupation at the site.

It may be helpful at this point to review the chronology of the Early Archaic period in the eastern United States. Coe (1964) estimated a date of 4500 B.C. for his Morrow Mountain I. A date of ca. 4500 B.C. was obtained for a Morrow Mountain I type in Alabama (DeJarnette, Walthall, and Wimberly 1975b), and two dates of ca. 4500 B.C. have been obtained for the type at the Rose Island site in Tennessee (Chapman, personal communication). Coe's estimate thus seems to have been correct. Dates of ca. 5000 B.C. have been reported for Eva points from the type site in Tennessee (Lewis and Kneberg 1961). At Hester these two types occur at the very top of the Archaic zone. They are considered Middle Archaic types, and in connection with other sites in the Southeast are dated between 5000 and 4500 B.C.

Stanly points described by Coe in 1964 were assigned a date of ca. 5000 B.C. These points were not radiocarbon dated, but they underlay Morrow Mountain I. Stanly points have been reported in Tennessee (Chapman, personal communication) and Alabama (DeJarnette, Kurjack, and Cambron 1962; Webb and DeJarnette 1948; and Griffin 1974). Dincauze (1976:29) dated the Neville point, a similar type from New England, ca. 5700-5065 B.C. A date of 5015 B.C. has been assigned to Hester Beachum points, a type assumed to represent the earliest Middle Archaic occupation at the site.

Below Beachum points at Hester are Lost Lake and Pine Tree types. Excavations did not yield data to suggest which of these types is earlier. Both are relatively large corner-notched forms suggestive of the larger variety of Kirk (Broyles 1971). On the basis of this resemblance, Lost Lake and Pine Tree points were placed in the Early Archaic point chronology (fig. 29) at ca. 7000 B.C., although they may in fact be later. A review of the literature reveals no radiocarbon dates for these types and very little in the way of stratigraphic data except from caves and rock shelters.

Plevna, Autauga, and Ecusta are represented at Hester by but one specimen each, so no attempt has been made to estimate their relative ages. They occur alongside or just above Decatur points.

Decatur points are the dominant corner-notched form found at Hester. They were not radiocarbon dated, but because of their low position in the deposit (just above Big Sandy points), their resemblance to other early corner-notched forms (Kirk), and their size (generally small, comparable to Palmer), they were placed in the period ca. 7500-7000 B.C. Jefferson Chapman (personal communication) has recovered Decatur points below bifurcate-tradition points and expects them to date with that period. At any rate, they should be earlier than 7000 B.C., the beginning date for the bifurcate-point tradition.

Below Decatur points at Hester, and probably dating ca. 8000-7500 B.C., are Greenbrier, Jude, and Big Sandy points. The association of the Greenbrier type is questionable. A connection has been noted among the Jude, the Cave Spring (which this writer regards as a variety of Jude), and the Decatur points. All appear to be part of a tradition similar to bifurcate points and the Eva-Morrow Mountain I types.

The side-notched Big Sandy point is earlier than the Jude, although toward the end of the Big Sandy horizon the two may be contemporaneous. At several sites Big Sandy points have been recovered in association with Dalton points, but these associations are probably not valid, since they have occurred in caves and rock shelters, where disturbances are much more likely than in open sites. Goodyear (1974:5) has suggested that the Dalton and Big Sandy points at Stanfield-Worley in fact represent separate components, with Dalton being the earlier. Similar side-notched points occur over a wide portion of the eastern United States. At the St. Albans site in West Virginia (Broyles 1971), Kessell Side-notched points have been dated at 7900 ± 500 B.C. Kessell points are very similar to Cache River points. At Hester some of the Big Sandy points fall within the Cache River cluster. Because of this similarity, and because Big Sandy points immediately follow Dalton in time and side-notched forms generally predate corner-notched forms, Big Sandy points should be expected to date between 8000 and 7500 B.C.

No radiocarbon dates have been obtained for the Dalton component at Hester. Dates of 9640 ± 450 B.P. and 8920 ± 400 B.P. have been obtained from the Dalton zone (D) at Stanfield-Worley (DeJarnette, Kurjack, and Cambron 1962:85-87). It seems likely that the charcoal for these dates was taken from a mixed context containing both Big Sandy and Dalton components. At Graham Cave in Missouri, Dalton points were dated at 7744 ± 500 B.C. (Logan 1952), but again, both these dates seem very late when compared to dates from sites such as St. Albans. In this writer's opinion, Dalton points in the Southeast will eventually be shown to date between 9000 and 8000 B.C.

## APPENDIX 3

## A RESEARCH DESIGN FOR THE HESTER SITE

The present publication results from a test conducted at the Hester site to determine the potential of the site for answering questions concerning man's activities during the Early Archaic period. Much valuable information has been gained from the excavation, but much more is needed to supplement the data recovered thus far. Three major research projects will be proposed here in the hope that they will be given highest priority and implemented as soon as possible.

First, an intensive survey should be made of Monroe County, Mississippi, with emphasis on Early Archaic occupations. Much work has been done in nearby areas to be affected by the Tennessee-Tombigbee Waterway, but the hill areas remain unexplored. A survey of the county would yield information on settlement patterns, lithic-resource procurement, and subsistence activities. Illustrations of the kinds of information such a survey could yield are in Luchterhand (1970), Redfield and Moselage (1970), Morse (1971a, 1973), Redfield (1971), Faulkner and McCollough (1973), Goodyear (1975), House (1975 a, b), and Price and Krakker (1975). The survey should make full use of amateur collections. Although as is well known most amateurs do not record artifact provenience, doubtless some of that information could be elicited and preserved while it still exists in memory. Amateur collections could also greatly supplement surface collections made by archaeologists.

Second, it is proposed that the Lawson site (22-Mo-572; Brookes 1975b) be excavated. A small, apparently Early Archaic site, it could be entirely excavated in a relatively short time and would provide valuable data for comparison with longer-occupied sites such as Hester. The exact nature of the Lawson site could be defined and then compared to results of the survey work.

Third, the Hester site should be utilized as an ongoing research project. Each field season (June through August) a small area could be excavated. Material could then be compared to results of survey work, the Lawson excavation, and previous work at Hester. By using the summer as a field season, students could be employed for the actual excavating, and local labor could be employed to wash and catalog artifacts in the field. Student workers could further aid the project by using some of the data for research projects during the academic year.

## Excavation Methods

1. Future excavations at Hester should continue to use the foot as the unit of measure.

2. A small area should be excavated each field season. Ideally, the area should not exceed four ten-foot squares. Two excavators should be placed in each ten-foot square. Artifacts, including flakes, should be left in situ until the working floor has been exposed for a given level in each square. Flakes, artifacts, and features should be pedestalled until it is ascertained that the area is clear. The features should then be carefully photographed and mapped. An excellent example of the employment of such a technique is found in Gardner's (1974) preliminary report on the Thunderbird Paleo-Indian site in Virginia. Near limitless possibilities exist for the utilization of such data. Using such excavation techniques, feedback could come to play heavily in generating and testing hypotheses.

3. Specialists in fields other than archaeology from nearby universities should be on call. Geologists, pedologists, and possibly botanists could provide assistance in explaining depositional sequences and soil processes at Hester. Charred organic matter could be identified quickly and, if treated carefully, used for radiocarbon dating. Thought should be given to alternative methods of dating, such as thermoluminescence and archaeomagnetism. Specialists in these techniques could supply vital information, and communication with them should be opened prior to excavating at the site.

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## ERRATA

The following credits for works used by permission were inadvertently and regrettably omitted from art work in the text:

Figure 2, page 82, is modified from James L. Wolfe, *Mississippi Land Mammals: Distribution, Identification, Ecological Notes* (Jackson: Mississippi Museum of Natural Science, 1971).

Figure 3, page 83, is modified from John W. Griffin, *Investigations in Russell Cave* (Washington: National Park Service, 1974).

Figure 5, page 85, is from Marc D. Rucker, *Archaeological Survey and Test Excavations in the Upper-Central Tombigbee River Valley: Aliceville-Columbus Lock and Dam and Impoundment Areas, Alabama and Mississippi* (State College: Mississippi State University, 1974).

Figure 14, page 94, is from Don G. Wyckoff, *The Lowrance Site of Murray County* [Okla.] (Norman: Oklahoma Anthropological Society, 1973).