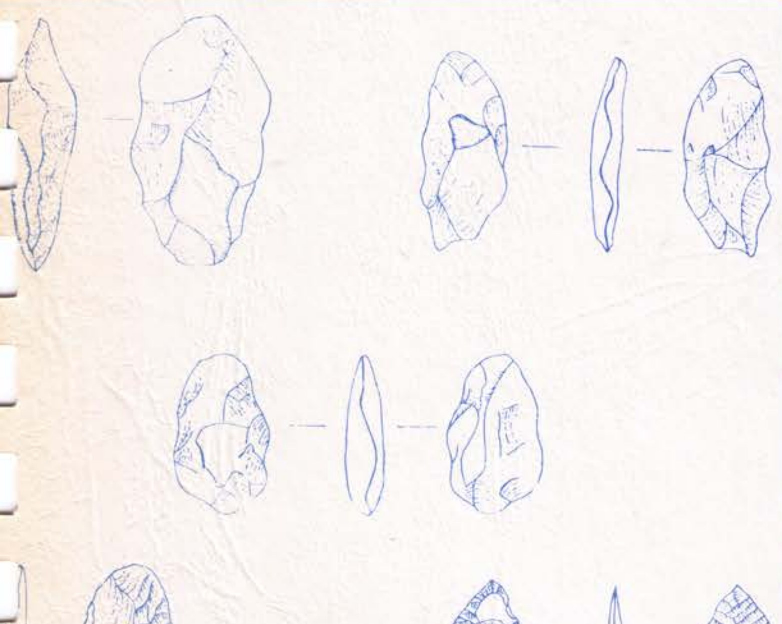
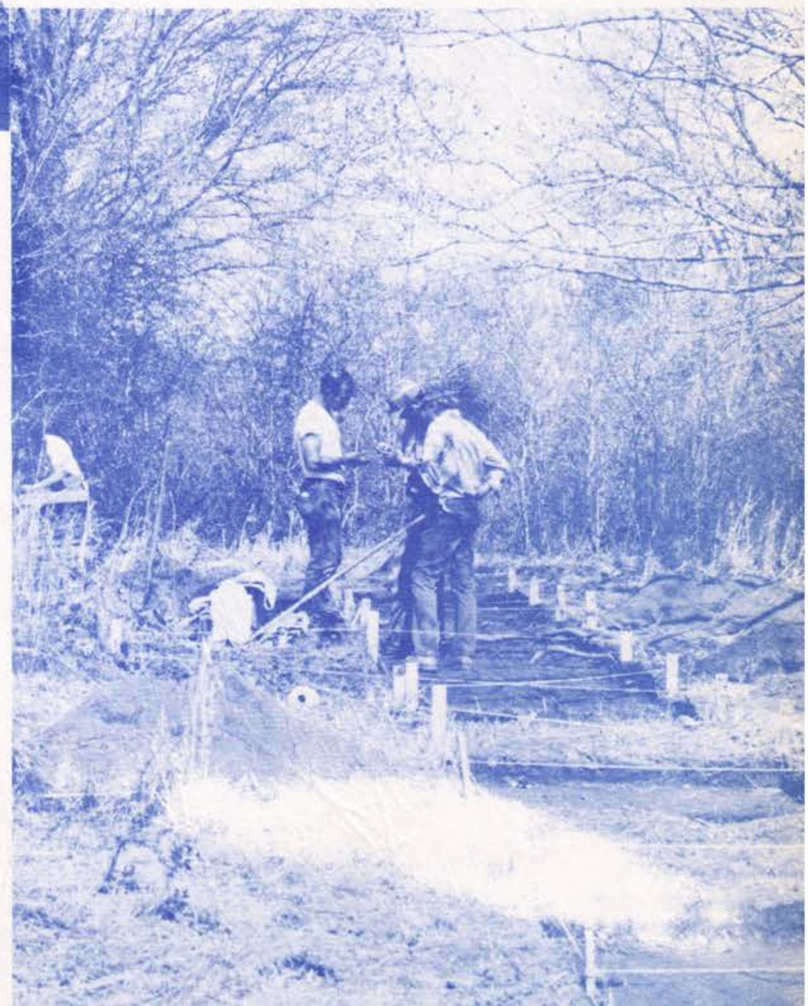
THE DAWSON SITE





OKLAHOMA HIGHWAY ARCHAEOLOGICAL SURVEY PAPERS IN HIGHWAY ARCHAEOLOGY—NO. 5, 1978

OKLAHOMA DEPARTMENT OF TRANSPORTATION
PLANNING DIVISION

THE DAWSON SITE (MY-140): AN ARCHAIC WORKSHOP IN NORTHEASTERN OKLAHOMA

by

Timothy G. Baugh

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Of course, any errors contained herein belong entirely to the author.

ABSTRACT

The Dawson site, My-140, was excavated during a five week period in May and June, 1977, by the Oklahoma Highway Archaeological Survey. The excavation was deemed necessary since the proposed alignment of the Lindsey-Mayes Bridge Project will endanger the site. The Dawson site is the first single component Archaic workshop to be found in northeastern Oklahoma. The cultural remains were analyzed in the framework of a lithic reduction trajectory to more fully determine the nature of the activities at the site. The primary utilization of My-140 probably occurred about 4000 B.P. The Dawson site may have repeatedly served as a lithic collection and reduction station during the Middle to Late Archaic periods. This report also attempts to synthesize some of our knowledge concerning the prehistory of northeastern Oklahoma.

I

GENERAL INTRODUCTION AND BACKGROUND

Communication and transportation systems are a necessary component of a prosperous national and local economy. The Oklahoma Department of Transportation plays a vital role in the state by continually attempting to uphold high quality standards for the Sooner highway systems. As a part of this program the construction of the Lindsey-Mayes bridge was proposed in northeast Oklahoma. When planning and surveying of the new alignment revealed that the Dawson site, My-140, was threatened, the Oklahoma Department of Transportation in cooperation with the State Archaeologist deemed excavation to be advisable. This was deemed necessary since My-140 was the first single component Archaic lithic workshop known for this region. Thus, a team of archaeologists from the Oklahoma Highway Archaeological Survey commenced such work in January, 1976.

In the following pages we will examine the Dawson site's cultural remains and their contextual associations. Although representing a small segment of Oklahoma's culture history, when tied into other archaeological sites a larger panorama begins to emerge. To accomplish this end, this report is divided into three sections. The first of these deals with general information concerning the Dawson site, as well as the natural setting and archaeological background. The second section is concerned with excavation strategies and the recovered cultural materials. The final section provides an intrasite and intersite interpretative analysis.

A. The Oklahoma Highway Archaeological Survey

The major objectives of the Oklahoma Department of Transportation is the planning, construction and maintenance of quality roadways within the state. Yet, they are also cognizant of the benefits that the conservation and preservation of the state's prehistoric and historic cultural resources provide the people of Oklahoma.

As a result a few archaeological investigations were sponsored by the Department of Transportation during the 1950's (cf. Shaeffer 1965 and 1966). However, these projects were terminated in 1962.

In 1972, the Oklahoma Highway Archaeological Survey (OHAS) was formed through the efforts of Dr. Robert E. Bell, University of Oklahoma, Don G. Wyckoff, State Archaeologist, the O. U. Board of Regents as well as Chester Brooks, Director of the Oklahoma Department of Highways, Monty C. Murphy, Planning Engineer, and Clifford Nelms, Rural Transportation Engineer.

The primary task of the OHAS is the management of Oklahoma's cultural resources when directly affected by pending highway construction. Archaeological materials allow us to investigate the activities of past populations and thereby to determine their cultural identity. The final objective is to provide the people of Oklahoma with a better understanding of their past by the analysis and reporting of these materials.

Be that as it may, the end result begins much more modestly. When proposed highway projects are advanced an archaeological team conducts an initial survey. This activity is essential for both highway construction and conservation concerns since not all sites can be excavated. Some sites may not provide any significantly new information or data while others are inherently more valuable. Preferring to concentrate on the latter, an archaeologist can best evaluate a site by test excavations. Thus if realignment is not feasible and the initial survey indicates a possibly significant site, test squares may be placed in strategic locations. Test excavations determine the vertical and horizontal limits of a site as well as the number of components or distinct occupations.

If such test excavations demonstrate the site's importance, more extensive work may follow. Because of their large size, the techniques involved, and the operating budget few sites are excavated in their entirety. Therefore, each site must be approached with a specific problem in mind.

B. The Dawson Site Salvage Project

The Dawson site was first reported in December, 1976, by David Lopez and Vanon Sun Chee Fore. The site was discovered during an intensive field survey of the proposed Lindsey-Mayes Bridge project. Recovered cultural remains included biface fragments, modified and unmodified flakes as well as general workshop debris. This material led to the preliminary belief that My-140 represented a single component, middle to late Archaic, lithic workshop. Since few single component sites relating to this time period were known, evaluative testing was considered necessary.

The site is on a bluff overlooking the Neosho River and covers from two to three acres of land. In January, 1977, two test squares were excavated. More intensive testing occurred in May, 1977, when sixteen new squares were excavated. The bridge project's centerline was used as the primary axis of the grid system with a datum point established at Station 129 (see Figure 4). Including both testing periods a total of eighteen 5 x 5 foot squares were excavated in arbitrary four inch levels.

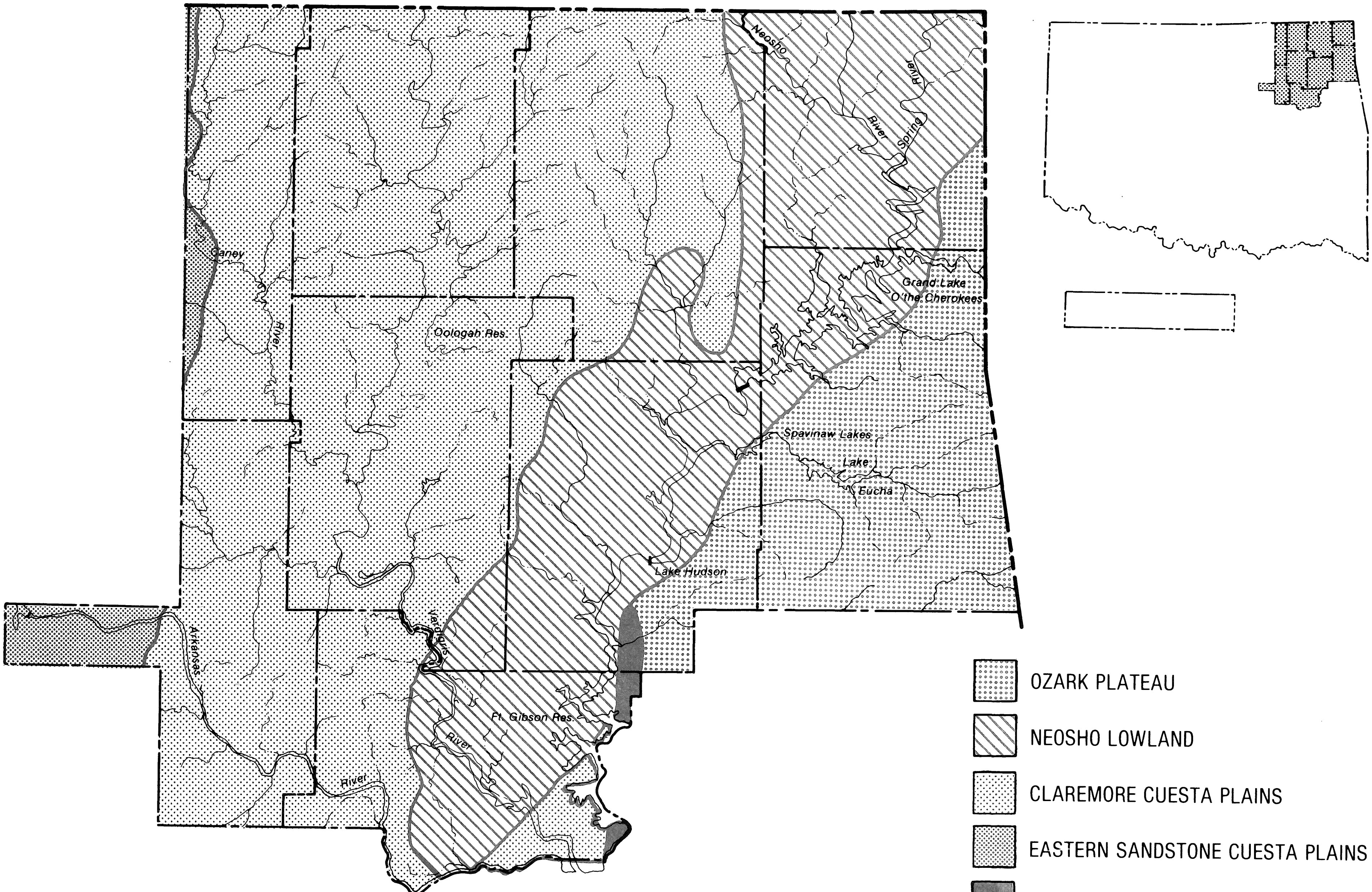
C. The Setting

The Dawson site is approximately seven miles southeast of Pryor Creek, Oklahoma. Found in the Neosho Lowland geomorphic province (see Figure 1) an intermixture of deciduous trees and prairie grasses dotted with varicolored chert nodules cover the site. In 1819, Thomas Nuttall traveled up the Neosho River and noted that above "a bend called the Eagle's nest ... a facade of calcareous rock appears, inlaid with beds of whitish hornstone" (Nuttall 1905:241). These Mississippian limestone formations are interbedded with outcrops of Keokuk and Moorefield chert and are still present today along the banks of the Neosho River.

One soil series, Eldorado, is reported for the immediate vicinity of the Dawson site. Within the site perimeter this soil is relatively shallow and well drained. The primary parent material consists of weathered cherty limestone which decomposed while covered with native grasses (Polone, Newland, and Swafford 1975: 17). Gray and Roozitalab (1976:28-30) and Gray and Stahnks (1970:10-11) classify the Eldorado soil series as Paleudults belonging to the order of Ultisols (mineral soils with an argillic horizon). They are characterized as occurring in humid climates with a fairly even distribution of rainfall, but with a seasonal cycle of limited aridity. Such soils are slightly acidic and have a

Figure 1

GEOMORPHIC PROVINCES OF NORTHEASTERN OKLAHOMA
(After Curtis and Ham 1972)



low organic content resulting from a forest vegetation (Gray and Roozitalab 1976:28).

The contemporary Dawson site is on the boundary of the oak-hickory forest and tall grass prairie (Shelford 1963:19, 307, and 330) or the Ozark and Osage Savanna biotic districts (Blair and Hubbell 1938:427). Figure two depicts the range of these biotic districts in northeastern Oklahoma.

The Dawson site occurs in the Springfield Structural Plain (Huffman 1958:11). Topographically this area is a deeply dissected plateau with flat divides separated by young, V-shaped stream valleys. These rivers and streams form a dendritic drainage pattern across northeastern Oklahoma.

This evidence seems to indicate a fluctuating environmental scene. Unfortunately intensive palynological, paleoclimatological, and biogeographical studies have not been conducted in this part of Oklahoma. However, corresponding research in surrounding areas may provide a generalized understanding of paleoecological processes operating in northeast Oklahoma (cf. Dort and Jones 1970; Gruger 1973; King 1973; King and Lindsay 1976; and Wendorf and Hester 1975).

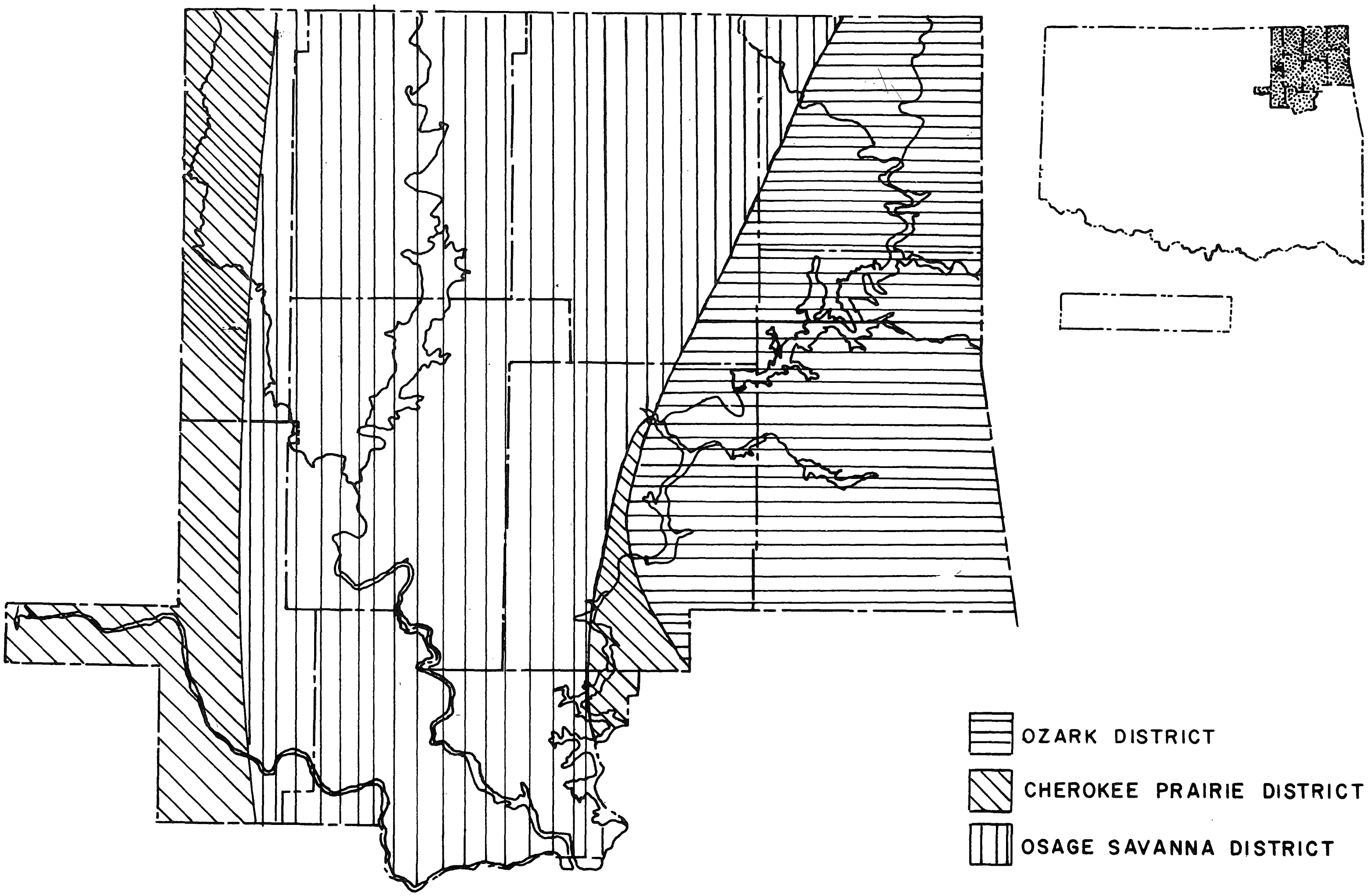
The present day galleria forest in northeastern Oklahoma may be only 2,000 to 3,000 years old. Paleoclimatologists have divided the Holocene epoch into several climatic episodes (see Figure 3a). The earliest of these periods is known as the Pre-Boreal which began about 10,000 years ago (Baerreis and Bryson 1975a:214). Prior to this the Pleistocene epoch was dominant. In the northern regions the Pleistocene was marked by glacial advances and retreats. At the same time, however, the Southern Plains and Oklahoma experienced alternating pluvial (cool and wet) and interval (less moist) periods (Wendorf 1975:12). In association with these either a boreal coniferous forest dominated by <u>Pinus</u> and <u>Picea</u> or a pine savanna made its appearance on the southern Plains (Oldfield and Schoenwetter 1975:149-157).

Afterward, during the Holocene a warmer, dryer interval prevailed throughout the prairie-plains region. During this interval the boreal forests were retreating

Figure 2

BIOTIC DISTRICTS of NORTHEASTERN OKLAHOMA

(After Blair and Hubbell 1938)



northward, being replaced by an expanding grassland composed of Compositae and Gramineae (Wright 1970:166-169). As the flora shifted so too did the fauna. Bison moved toward the Atlantic, later to be isolated in pockets east of the Mississippi.

The Holocene epoch contrasts strongly with the Pleistocene. Generally climatic conditions became somewhat warmer as the glaciers retreated northward. Yet our understanding of the micro-climate for the last 10,000 years in northeast Oklahoma is minimal at best. This results primarily from the vast amount of regional variation present during these years. "The actual character of the climatic episodes must be reconstructed from other evidence, bearing in mind that when it is colder in one region the atmospheric mechanics may require that it be warmer in another" (Baerreis and Bryson 1965a:213).

The Ozark biotic district is presently characterized by an oak-hickory forest with a somewhat barren forest floor. However, several species of shrubs (such as sassafras) may also be present.

On steeper slopes and in deeper ravines there tends to be a balanced water supply and hence a more mesic plant community consisting of sugar maple, hop hornbeam, white oak, chinquapin oak, redbud and flowering dogwood. Because of a more balanced water supply the forest floor is carpeted with herbaceous mesophytes such as wild ginger, yellow dogtooth violets, bloodroot, may apple, and maidenhair fern. In moister sections various mosses, ferns and liverworts are also common.

The exposed grayish limestone and chert bluffs support a more scattered vegetation including junipers or red cedars, blackjack, and winged elm. Here the soil is quite thin and only the rock crevices contain enough deposits to support plant life. Accordingly, ground cover is also relatively sparse with rock dwelling herbaceous plants such as columbines and purple cliff brakes being representative.

The flood plains of the larger stream valleys support a more open forest consisting of silver maple, American elm, red birch, cottonwood, and sycamore as well as linden and the ubiquitous oaks. Along most

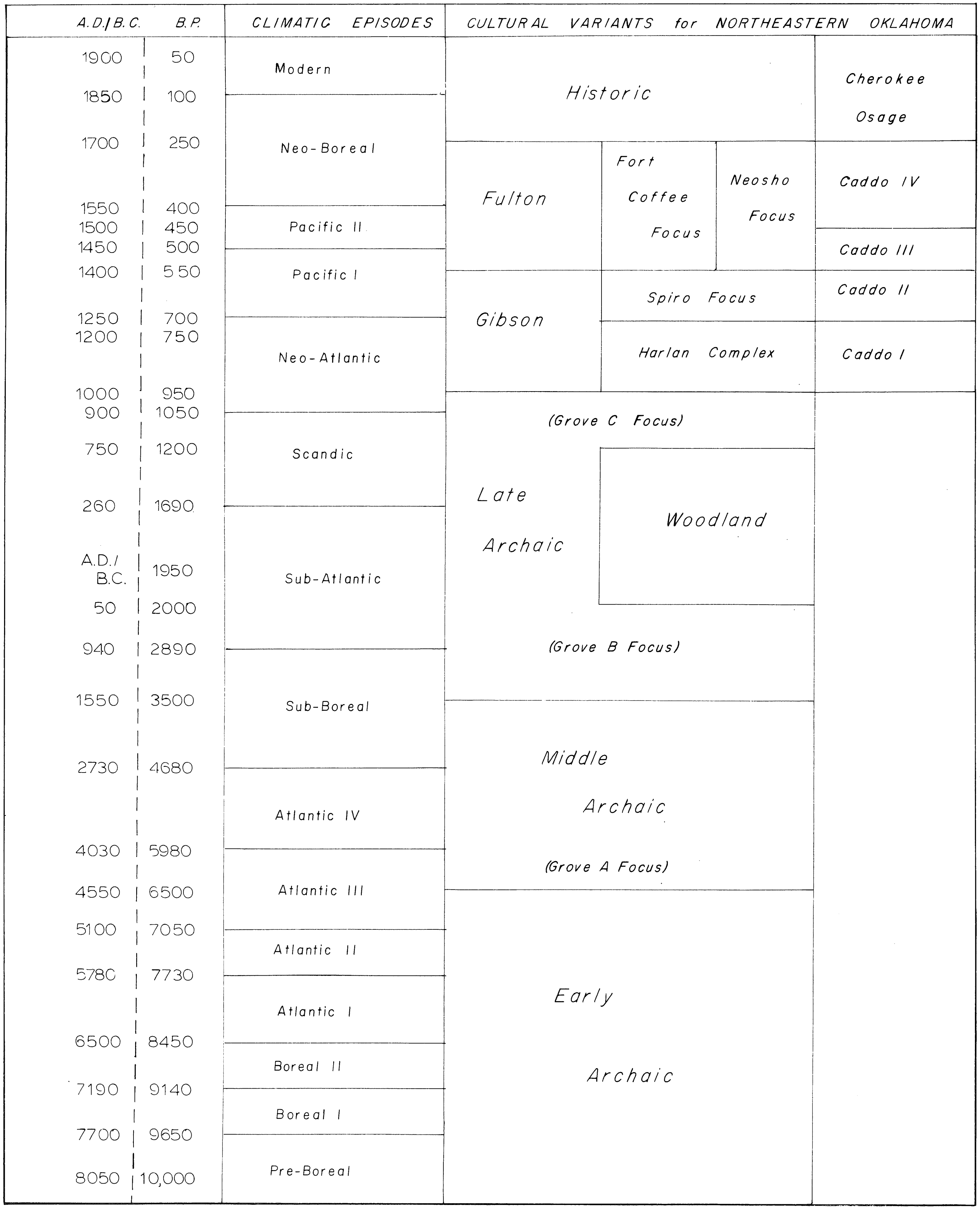


Figure 3a CORRELATION BETWEEN CLIMATIC EPISODES AND ARCHAEOLOGICAL PERIODS IN NORTHEASTERN OKLAHOMA

stream banks willows gently spread their branches while either a soft, green blanket of grass or a scaley, brown coverlet of patinated chert cobbles may occur (Blair and Hubbell 1938: 427-428).

Directly adjacent to this biome and near the vicinity of the Dawson site is the Osage Savanna district (Blair and Hubbell 1938:433-434). This area, primarily in the Claremore Cuesta Plains geomorphic province, is composed of broad shale flatlands with steep-sided hills and ridges of resistant Pennsylvanian sandstone and limestone (see Figure 1).

Dry scrubby forest vegetation, including blackjack, post oak and black hickory, cover the hills and escarpments. However, larger, more mature trees such as American elm, slippery elm, spotted oak, pin oak, hackberries, as well as red birch, black willow and buttonbush occur in the flood plain. Washington Irving toured this region in 1832 and provided us with a description of just such a forest.

> We were overshadowed by lofty trees with straight, smooth trunks, like stately columns; and as the glancing rays of the sun shone through the transparent leaves, tinted with the many-colored hues of autumn, I was reminded of the effect of sunshine among the stained windows and clustering columns of a Gothic cathedral. Indeed there is a grandeur and solemnity in our spacious forests of the West ... (Irving 1956:41)

On the flat to rolling shale plains, grassland communities dominate. Tall grasses such as bluejoint, prairie beardgrass, indiangrass, and switchgrass are most abundant. Herbaceous plants include false indigo, blazing stars, starwort, sunflower, and sage. Occasional persimmon groves occur on the prairie as well.

A third biotic district, the Cherokee Prairie, is also found in northeastern Oklahoma. It is distinguished from the Osage Savanna by more aridity. This is a mixed grassland with both tall and short varieties occurring in the thinner soil of the limestone scarp. The principal

Gramineae are buffalo-grass, side-oats grama, and silver beardgrass. Yucca plants, prickly pear, and occasional persimmon groves are scattered throughout the dry prairie.

The average annual precipitation for Mayes County is about 40 inches. Most occurs during the late spring and early autumn. Snowfall generally accounts for only one-fourth or less of this amount. While traveling with an escort of Rangers, Washington Irving observed an autumn thunderstorm on the Osage Savanna.

> In crossing a prairie of moderate extent, rendered little better than a slippery bog by the recent showers, we were overtaken by a violent thunder-gust. The rain came rattling upon us in torrents, and spattered up like steam along the ground; the whole landscape was suddenly wrapped in gloom that gave a vivid effect to the intense sheets of lightning, while the thunder seemed to burst over our very heads, and was reverberated by the groves and forests that checkered and skirted the prairie. Man and beast were so pelted, drenched, and confounded, that the line was thrown in complete confusion; some of the horses were so frightened as to be almost unmanageable, and our scattered cavalcade looked like a tempest-tossed fleet, driven hither and thither, at the mercy of wind and wave (Irving 1956:101-102).

This region is characterized by a humid, warm-temperate continental climate. The mean annual temperature is 60°F. Monthly averages vary between about 36°F in December to 80°F in August. During the summer, temperatures soar over the 100°F mark about ten times. Conversely, about ten days out of each winter remain at or below freezing. The first frost may be as early as October 6 while the last freeze may be as late as April 7. The average growing season, however, is about 205 days (Polone, Newland, and Swafford 1975:83-84).

Galleria forests and grasslands support a wide array of wildlife. Acorns, oak twigs, bark and cambium all provide sources of food. Birds such as the greater prairie chicken, turkey, wood duck, American avocets, cranes, and various species of blackbirds were commonly sighted by early Euro-American writers who visited the prairie and forest regions of northeastern Oklahoma. Charles Latrobe, who traveled with Washington Irving, wrote the following lines concerning the fall habits of the prairie chicken.

> Their wariness at this time is extreme; and the slightest indication of the approach of man even at a great distance, is noticed by the cock; who, perched on the topmost twig elongates his neck and peeps first on one side, and then on another, with the most provoking caution (Latrobe 1836:249).

There are over 250 species of birds which may be found in this region (Sutton 1967).

On the other hand, only 63 species of mammals inhabit the northeastern section of the state (Hellack 1974:144-146). These include bison, black bear, badger, white-tailed deer, bobcat, mountain lion, mink, red wolf, beaver, southern flying squirrel, as well as the gray and fox squirrels, woodchuck, eastern chipmunk, black tailed jackrabbit, swamp rabbit, and others. Reptiles too are frequently encountered (see McDermott 1940:156 and 208; Engbretson 1974:103-118).

Such a wide array of plant and animal life made this area a desirable locale for various prehistoric groups.

D. Archaeological Background

Most regional discussions of prehistoric chronologies begin with a Paleo-Indian or Big Game Hunting Tradition (13,000 B.P. - 10,000 B.P.). Skeletal remains of the forest browsing mastodon (*Mammut americanus*) have been recovered from the Three Forks locale, but, at the same time, no cultural materials have been found in association with these remains. Fluted lanceolate points are considered representative of this tradition. However, only scattered surface finds occur in the Ozarks (see Chapman 1948; Scholtz 1969; Wood and McMillan 1969). Even though the more western sites relating to this tradition tend to indicate a hunting subsistence strategy, gathering activities may have played an equally if not more important role (see Alland, et. al. 1968) which continued in the following Archaic period.

The Archaic (10,000 B.P. - 2,000 B.P.) is the first major period represented in northeast Oklahoma. Ecological shifts during this time period have led many archaeologists to conclude that more intensive exploitation patterns were being employed. This situation resulted in a great deal of regional variation. Three Archaic subperiods, Early, Middle and Late, may be defined for northeastern Oklahoma. Be that as it may, intensive ecological studies are needed in order to develop a more comprehensive understanding of Archaic adaptations.

The Early Archaic (10,000 B.P. - 6,500 B.P.) is characterized by hunting implements which may be considered transitional between the Paleo-Indian and later Archaic adaptations (Griffin 1964:225-229). Projectile points, with ground stems and bases as well as beveled and/or serrated blades are most typical. Such forms as Dalton, Agate Basin, Big Sandy and Johnson are representative. Known campsites, such as Rodgers Shelter, Missouri, were occupied for relatively short periods of time (McMillan 1976:223-224).

This period has been correlated with the Pre-Boreal, Boreal I and II as well as Atlantic I-III climatic episodes (see Figures 3a and 3b). At the present our understanding of these post-glacial episodes is even more limited than that of later periods. Thus we have few if any insights into the climatic process operating in northeast Oklahoma during this time (Bryson, Baerreis and Wendland 1970:47).

A second major economic strategy, the Middle Archaic (6,500 B.P. - 3,500 B.P.), evolved between 7,000 to 6,000 B.P. Former nomadic hunting and gathering bands shifted to seasonal exploitation cycles of a localized area. Even more variation in implement form is apparent during this period. Expanding base points such as Marcos, Edgewood, Duncan and Hannah are representative. This economic shift is reflected in base camps being occupied longer and utilized more intensively by apparently larger groups. For northeastern Oklahoma this period has been

Figure 3b KEY SITES OF NORTHEASTERN OKLAHOMA designated Grove A Focus (Baerreis 1951; Bell and Baerreis 1951:10-14). Parallel and expanding stem projectile points, hafted scrapers, choppers, and small grinding stones are implements associated with this period (Baerreis 1951:65-66).

The beginning of the Middle Archaic is associated with Atlantic III and IV which may be correlated with expanding grasslands and warmer temperatures on the Plains (Bryson, Baerreis, and Wendland 1970:57-58).

The Late Archaic (3,500 B.P. - 1,250 B.P.) is basically a continuation of the Middle Archaic techno-economic pattern. The major difference is the exploitation techniques may be even more intensive. Grove B Focus represents the earlier portion of this period (Baerreis 1951; Bell and Baerreis 1951:13-14). The later Grove C Focus is somewhat problematical. In some regions it persisted until relatively late while in other areas outside influences seem to have gradually transformed it into a formative Woodland culture. The Late Archaic has a predominance of contracting stem dart points such as Gary and Langtry.

The initiation of this period is correlated with the Sub-Boreal climatic episode which is characterized by less moisture and cooler temperatures on the Plains (Bryson, Baerreis, and Wendland 1970:60). However, the following Sub-Atlantic episode is associated with more moderate precipitation and temperatures as well as being correlated with the Woodland period.

The Woodland (2,000 B.P. - 1,250 B.P.) is associated with a gradual shift toward part-time horticulture. According to Griffin (1978:63) "It took from roughly 1,000 B.C. to A. D. 700 for agriculture to become a basic subsistence factor, and the populations in the East continued their dependence on hunting and gathering skills developed during the long Archaic period." Pottery and small projectile or arrow points represent the major technological changes. In northeastern Oklahoma the Cooper Focus is considered intrusive (Bell and Baerreis 1951:27-33) while the Delaware A Focus is believed to be a local development out of Grove C Focus (Purrington 1970:531-539).

The Mississippian Tradition represents a second intrusion into northeastern Oklahoma. The Harlan Complex, or Caddo I period, is an early Caddoan manifestation and is represented by a primary mound center at the Harlan site, Cherokee County (Bell 1972) with possible secondary centers at Reed and Lillie Creek in Delaware County. These centers are generally associated with satellite communities such as the Jensen site in Mayes County (Wyckoff 1971:57-72). The political organization of these people appears to be a theocratic rank society as surmised from the elaborate goods placed in some but not all burials. The economic basis of these centers is not well understood at the present, but they seem to be based on a mixed pursuit of horticulture, hunting, and collecting. A florescence occurred during the succeeding Spiro Focus or Caddo II (Wyckoff 1971:72). During this time the Harlan center declines and is eclipsed by the Norman and Hughes mound centers. Reed and Lillie Creek continue through this period, with Huffaker being added, as satellite communities.

The Spiro Focus is followed by the Fort Coffee Focus, or Caddo III and IV, which represents a Caddoan contraction. Of the previous centers all but Norman disappear. Burial associations during these periods indicate a more egalitarian based society with a number of Plains traits, such as bison scapula hoes, gaining acceptance. Paleoclimatologists have speculated that a climatic shift to a period of less precipitation may have occurred during the Pacific I episode in the Plains region (Bryson, Baerreis, and Wendland 1970:64). Related to this climatic shift, Plains influences begin to penetrate into eastern Oklahoma (Baerreis and Bryson 1965a:216; Wyckoff 1971:154-164). "Viewing the Gibson-Fulton transition from the perspective of eastern Oklahoma, it would appear that environmental factors may be operative in producing the shift from one period to the succeeding one" (Baerreis and Bryson 1965b:72).

Between 450 B.P. and 250 B.P. the climax region for the Fort Coffee Focus centered on the Arkansas. The processes of culture change during this time became even more complex according to Baerreis and Bryson (1965a:217) as the onset of the Neo-Boreal episode and European contact began at about the same time.

The Neo-Boreal is sometimes referred to as the Little Ice Age as glaciers began to reappear in the Rocky Mountains and other parts of North America. "It is likely that the growing season was shortened, and that the summers were cooler in the upper Midwest" (Baerreis and Bryson 1965a:217). About 1850 these conditions shifted to our present climatic patterns.

Somewhat further north and east of the Fort Coffee Focus was the Neosho Focus. Recovered cultural remains from Fort Coffee and Neosho components indicate a close relationship between the two. Indeed Wyckoff (1971:196) comments: "That these two manifestations are contemporaneous is evident. That they are the same people is a distinct possibility." Exactly who these people were is somewhat speculative. There are two possibilities. During the historic period the Wichita are known to have occupied this region (Newcomb and Field 1967:246-250). Thus the Fort Coffee and Neosho Focus may be correlated with the Wichita or with an intermediary Caddoan group who traded with the Wichita. Be that as it may, the Wichita were displaced from this area by the Osage in the eighteenth century. Further displacements occurred in the nineteenth century as the southeastern groups were removed from their homelands.

By 1817 about 5,000 Cherokee had been relocated to northwestern Arkansas. Disputes between them and the Osage arose over access to the bison hunting grounds to the west resulting in an Osage withdrawal to Kansas. By 1840, the majority of Cherokee had been forcibly removed to Indian Territory where they established a capital at Tahlequah. After the Civil War the Osage returned to Indian Territory and purchased reservation land from the Cherokee.

Historic archaeological research in northeastern Oklahoma has been somewhat limited. Only two sites, both nineteenth century trading posts, have been excavated by archaeologists (see Wyckoff and Barr 1968; Baugh 1970).

With this background in mind we should now turn to an examination of excavation strategies and cultural remains from the Dawson site.

II

THE EXCAVATION AND RECOVERED MATERIAL

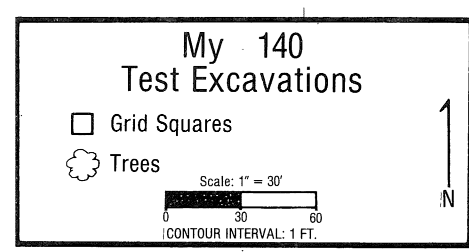
A. Excavation Strategy and Stratigraphy

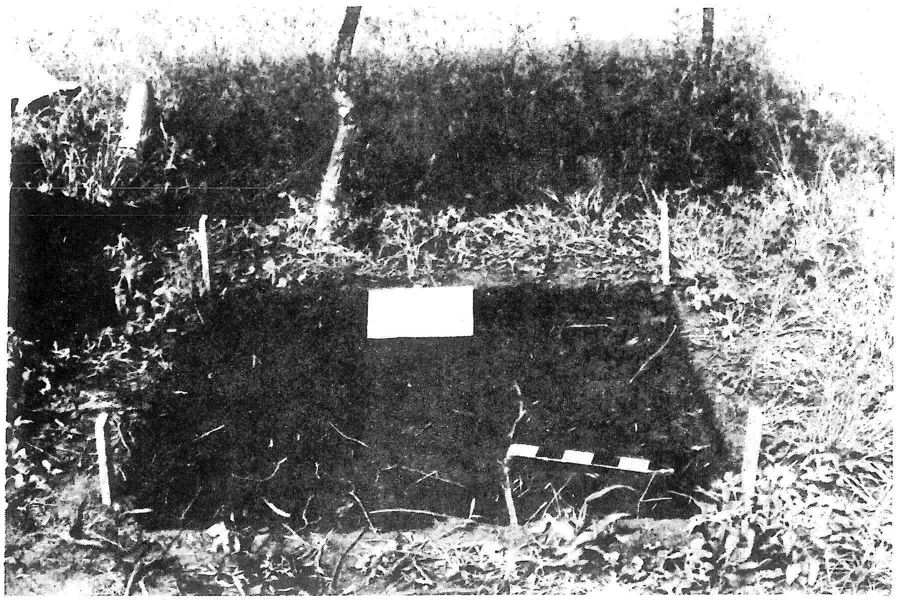
The Dawson site lies within the alignment of the proposed Lindsey-Mayes Bridge Project (see Figure 4). Initial testing was undertaken in January, 1977, when two 5' X 5' test squares were excavated. From this investigation, My-140 appeared to represent a single component Archaic occupation. On this basis, further excavation was recommended. The second phase was conducted over a five week period from May 17, 1977, to June 16, 1977. At this time, the proposed bridge centerline was established as the main axis or abscissa with the 0-0 or datum point placed at Station 129. The bridge alignment is oriented NNW and SSE. The ordinate was imposed at a 90 degree angle to the abscissa or ENE and WSW.

The grid system of 5' X 5' squares was placed in an area to the northeast, southeast, and southwest of the datum point. The northeast stake designated the location of each square. Following from this an assigned square of N20-E10 referred to this unit being twenty squares north and ten squares east or 100' north and 50' east of the datum point. The entire site, which lies between 620' and 625' above mean sea level, was mapped by aerial photography and photogrammetry with computer plotting.

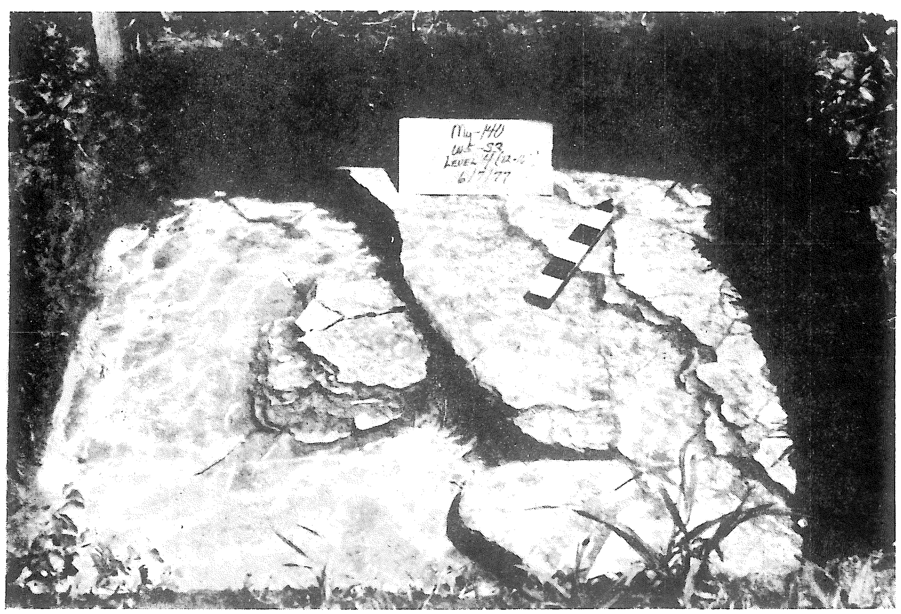
Four inch arbitrary excavation levels were selected to ensure fairly rigid vertical control. All dirt was screened through ¼" hardware mesh. Since the site had been subjected to some horizontal and vertical disturbance, such as plowing, removal of trees, and the construction of a driveway, the first level (0-4") was excavated as a unit. Subsequent levels were removed in quarter section (2.5' x 2.5') squares to strengthen horizontal control. During the course of excavation no cultural features, such as hearths, storage pits, or rock concentrations were encountered.

Stratigraphy consisted of two soil zones (see Figures 5 and 6). A dark brown loam, extending from eight to ten inches below the present ground surface,


My 140
Test Excavations
Grid Squares
Trees
Scale: 1" = 30'
0
30
60
CONTOUR INTERVAL: 1 FT.
N



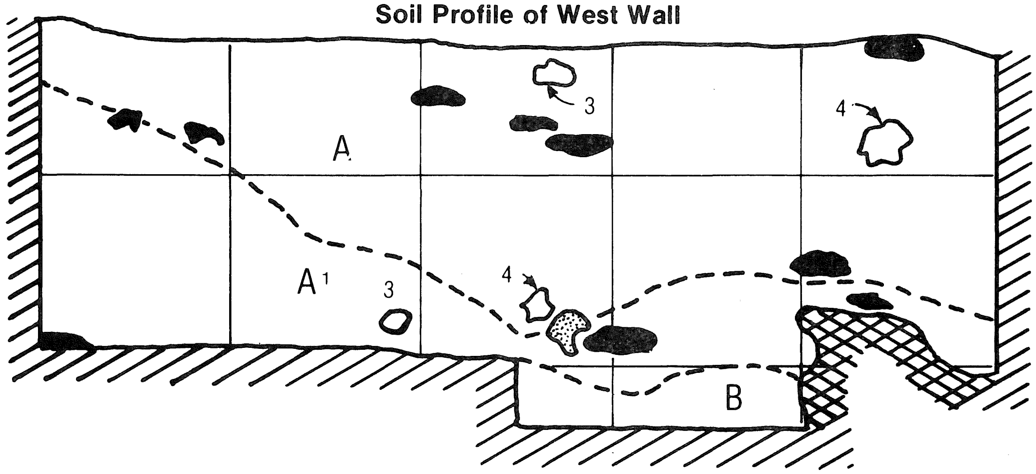
a



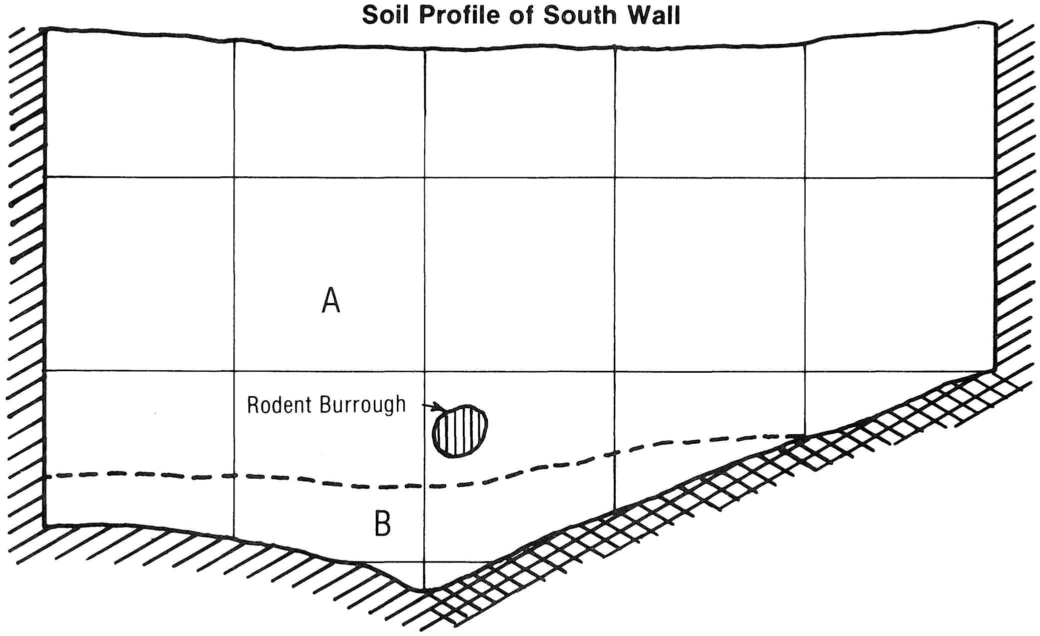
b

Figure 5. The Dawson Site. Two views of square W5-S3: a, Level 1; b, Level 4.

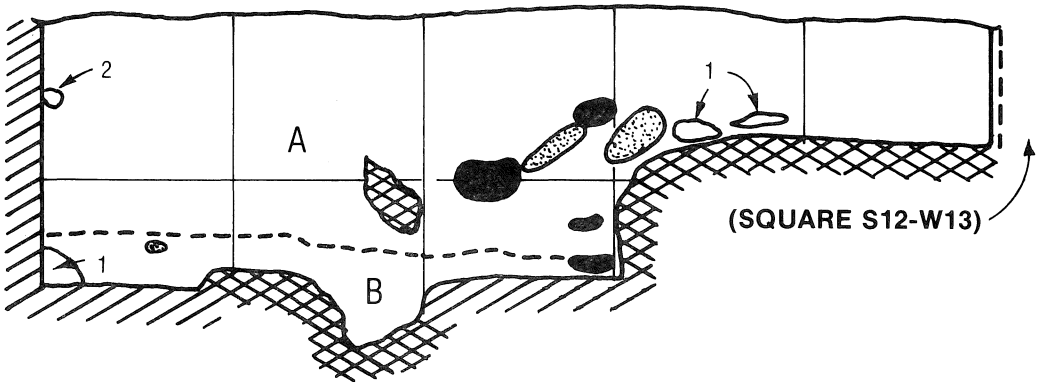
TEST SQUARE S12-W14
Soil Profile of West Wall



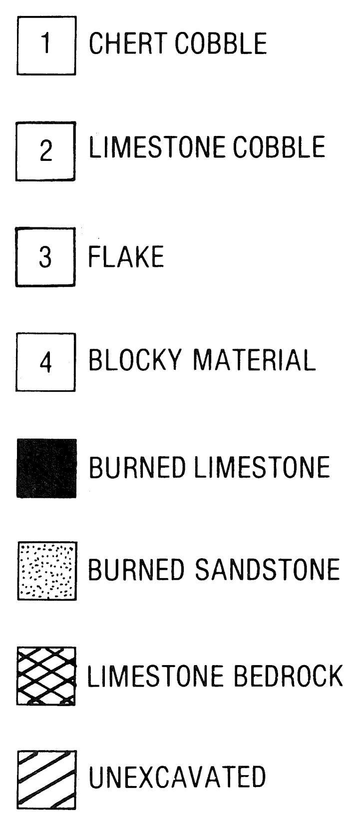
TEST SQUARE O-N10
Soil Profile of South Wall



TEST SQUARE S12-W14 (Actually S12-W15)
Soil Profile of North Wall



Legend



SCALE: 1″=1′

SOIL ZONE A. Dark Brown Loam, Contains much small Gravel.

SOIL ZONE A1. Dark Brown Loam, Contains concentrated Cultural material and Burned Stone, More Compact than Zone A.

SOIL ZONE B. Lighter Yellowish Brown Clay Loam, Contains sparse Cultural Deposit.

represents the uppermost horizon. Below this a lighter yellowish brown clay loam was encountered. Most of the cultural remains were recovered from the uppermost zone. All of the squares were excavated until limestone bedrock was reached.

B. Cultural Remains

The artifacts recovered from the Dawson site are described in this section. These cultural remains consist of lithic material only. These have been divided into two general categories: chipped stone and ground stone implements. More broadly, however, they have been divided according to their placement within a lithic reduction or trajectory system and by attributed function. By utilizing such a format, it is hoped that a more refined classificatory scheme may be presented.

Caution must be used with any functional analysis since an implement may have had multiple functions or even an entirely different use from that traditionally cited by archaeologists (cf. Ahler 1971). Functional designations have been assigned to the Dawson site artifacts on the basis of form and wear patterns. Taken into consideration are such factors as edge angle, bifacial spalling, and unifacial chipping (see Tringham, et. al. 1974). Edge angles were calculated with the use of a contact goniometer. Low edge angles of forty-five degrees or less were interpretated as evidence for cutting implements while higher edge angles represent evidence for scraping implements. At the same time, wear patterns were determined by microscopic examination. When chipping scars appeared bifacially, longitudinal action or cutting was implied. On the other hand, unifacial spalling scars were interpreted as evidence of transverse action or scraping activities.

Data concerning lithic types and provenience may also be found in this section.

Lithic Trajectory Remains

The artifacts presented in the following classes are representative of manufacturing stages at My-140. These stages include: 1) resource acquirement; 2) initial reduction; 3) intermediate reduction; 4) primary modification; 5) secondary modification and final preparation; and 6) recycling processes (for other discussions of lithic reduction strategies one should consult Collins 1975:15-34; Bobalik 1977:31-44).

1. Resource Acquirement

Resource acquirement involves selecting local raw material in the form of pebbles or cobbles, quarrying local stone outcrops, or importing exotic lithic material. The first option tends to be the most commonly employed stategy at My-140 because of the high availability and easy access to local stream bed resources. These occur in the form of Keokuk, Moorefield and other fine-grained Boone cherts. At this point in the reduction strategy, some, none or all of the following stages as discussed above may be performed at the locus of acquirement.

Since a variety of lithic materials were utilized at the Dawson site a brief description of each follows.

Lithic Material

Boone

As Banks (n.d.:11) notes, Boone is a rather amorphous and nebulous term which covers a wide range of lithic material. Baldwin (1970:11) confirms this situation by commenting "that two or more varieties (of Boone) are often found on the same specimen " at the Lightning Creek site. For our purposes then Boone has been divided into four basic categories (see Huffman 1958): 1) Keokuk; 2) Reeds Spring; 3) Moorefield; and 4) a residual group.

Boone - Keokuk Variety

The inventory of material falling under this heading is characterized by a fine grain, dull luster, and mottling. The primary color ranges from white, blue-gray, brownish-gray, and light gray as well as purple. Mottling contrasts with this predominant color with the same range of variation found in it. Cortex tends to be brown in color. Only one-fourth tends to be heat treated.

This material is abundant in the stream beds and gravel bars of extreme northeastern Oklahoma. This variety represents about 42% of the total lithic material.

Boone - Reeds Spring Variety

This chert is characterized by fine grain, a dull luster and a generally uniform pale through medium to dark blue-gray color. About 25% of the artifacts from this material are heat treated. Approximately 28% of the total lithic sample is composed of this lithic type. Reeds Spring flint may be a locally available material found in the stream beds and gravel bars near the site locus.

Boone - Moorefield Variety

Moorefield is the third most commonly used material at the sight composing nearly 18% of the lithic inventory. Moorefield is also a fine grained material with a waxy to glossy luster. Color varies from dark blue-gray to black. Many of the specimens in this sample also exhibit a light brown horizontal banding. Cortex is light grayish brown to brown in appearance. Wyckoff (1963:13) refers to this type as Redbird while Banks (n.d.:19-20) labels it Bayou Maynard. Along the steep northern embankment of the Neosho River, ledges of limestone and Moorefield chert overlay one another. Along these shelves tabular shaped blocks of this material occur which has been removed by frost action. At the same time, small cobbles can be found in stream beds and gravel bars. Both of these sources are readily accessible to the site. Because of its smaller size the Moorefield variety tends not to enter the trajectory until the Thick Biface II stage (see below).

Boone - Residual Category

This is a category for those fine grained, dull lustered Boone cherts which cannot be readily identified or placed in the above categories. However, these may be aberrant varieties or dehydrated portions found on the exterior of cobbles from these same groupings. Color range is similar to those of Keokuk but generally without mottling. Approximately 9% of the lithic material recovered from the site has been placed in this category.

Cotter Dolomite

The overall color range for this fine grained material ranges from light blue-gray through tan and white. It is characterized by wavy, light brownish-gray or bluish-gray bands. Wyckoff (1963:12) may be referring to a similar type of material present at the Kerr Dam site located only a few miles from My-140. However, he labels this material as Bolivar. The source for Cotter Dolomite at My-140 remains uncertain at this point. Yet some specimens exhibit heavily weathered cortex which may represent quarried material. Less than one-half percent of the lithic inventory is represented by Cotter Dolomite.

Unidentified Flints

This is a residual flint category for which there is no information. Many of the specimens have a coarser grain structure than any of the above types. Thus because of these substantially different characteristics, such as grain size, cortex, color and other features, it appears unlikely that these are aberrant forms of the above categories. About two percent of the lithic remains belong to this category.

2. Initial Reduction

Initial reduction is dependent on any preliminary preparations, such as heat treating, that might affect size, form, texture, quality control, and/or surface characteristics. Yet, the actual reducing procedure is directed toward a predetermined objective of the reduction strategy. These can generally be outlined in terms of 1) a biface industry which emphasizes the parent material and thereby treats flakes as waste by-products, 2) a second strategy is a core industry; this process might concentrate on the systematic production of flakes or blades until the prepared core is expended, and 3) a final alternative is the manufacture of both bifaces and flakes. The primary reduction strategy observed at My-140 is oriented toward a biface production sequence.

A biface production industry may involve a number of alternative choices such as split cobble reduction, a quarried block technique, and/or stream cobble modification.

Split cobble reduction refers to dividing a cobble in half along its horizontal axis. Such split cobbles may then be bifacially retouched. This system is a relatively common technique in the Jackfork Creek basin in southeastern Oklahoma (Bobalik 1977:32). However, there is no indication of this reduction strategy being employed at My-140. Quarried block reduction, due to the material's form, involves removing flakes from an angular or tabular stone piece to acquire the proper shape or form. Once this is obtained biface reduction may be initiated. Since less than 5% of the lithic inventory at My-140 exhibits outcrop or heavily weathered cortex, quarried block modification appears to be relatively insignificant.

In contrast to the quarried block technique, stream cobble reduction eliminates the necessary preliminary shaping processes if proper specimens are collected. In other words, biface reduction may be initiated almost immediately. With this technological economy in mind, more than ninety percent of the My-140 lithic inventory cortex shows stream wear. On this basis, then, we may conclude that stream cobble reduction is the primary means of implement production at this site. This deduction is based on the Thick Biface I specimens as well as primary and secondary flakes. A generalized diagram of this process may be referred to in Figure 7.

<u>Thick Biface I</u> (Figures 7a, 8a and b)

Number of specimens: 10; complete 6; broken 4

Description: This category of artifacts represents the initial modification of stream cobbles or quarried blocks. They are characterized by large bifacial flake scars, sinuous edges and thick cross-sections with little or no evidence of shaping. About 50% or more cortex is present on these specimens.

Dimensions:

Size (length X width X thickness): 37.0-101.0 mm. X 27.3-57.9 mm. X 13.8-58.4 mm.

Mean thickness: 27.04 mm.
Provenience: Table 1
Lithic material: Table 2
Comments: All but two specimens exhibit hinge or step fractures. The majority of this sample appears to represent discards because of inclusions or difficulty in reducing them to the next stage. Stream cortex is present on all specimens.

3. Intermediate Reduction

The primary objective of intermediate reduction is to obtain a thinner cross-section by reducing the overall mass. Elementary types of implements require only simple retouching to achieve a final product at this stage. Hence after this activity they are removed from the overall trajectory. More complex implements, however, must be 1) initially outlined by retouching their edges and thereby losing to some extent the parent materials original shape; and 2) reduced by removing mass from one or both surfaces. Aside from the elementary and more complex implements (thick biface II or preforms at this stage) debitage or secondary and tertiary flakes are a result of this reduction activity.

<u>Thick Biface II</u> (Figures 7b; 8c-e)

Number of specimens: 23; complete 5; broken 18
Description: These specimens appear to represent further reduction of cobbles or blocks. However, it is possible that extremely large flakes which have been reduced may have entered the trajectory at this point. Thick Biface II's are characterized by relatively thick, irregular cross-sections, about 50% or less cortex, somewhat sinuous edges, large flake scars, and overall outline shaping.
Dimensions:
Size (length X width X thickness): 25.5-79.7 mm. X 28.7-59.1 mm. X 9.7-26.5 mm.
Mean thickness: 17.83 mm.
Provenience: Table 1
Lithic material: Table 2
Comments: The overall thickness of Thick Biface II's is nearly 34% less than that of Thick Biface I's. Most of these broken specimens are the result of end shock whereby the applied force vibrations

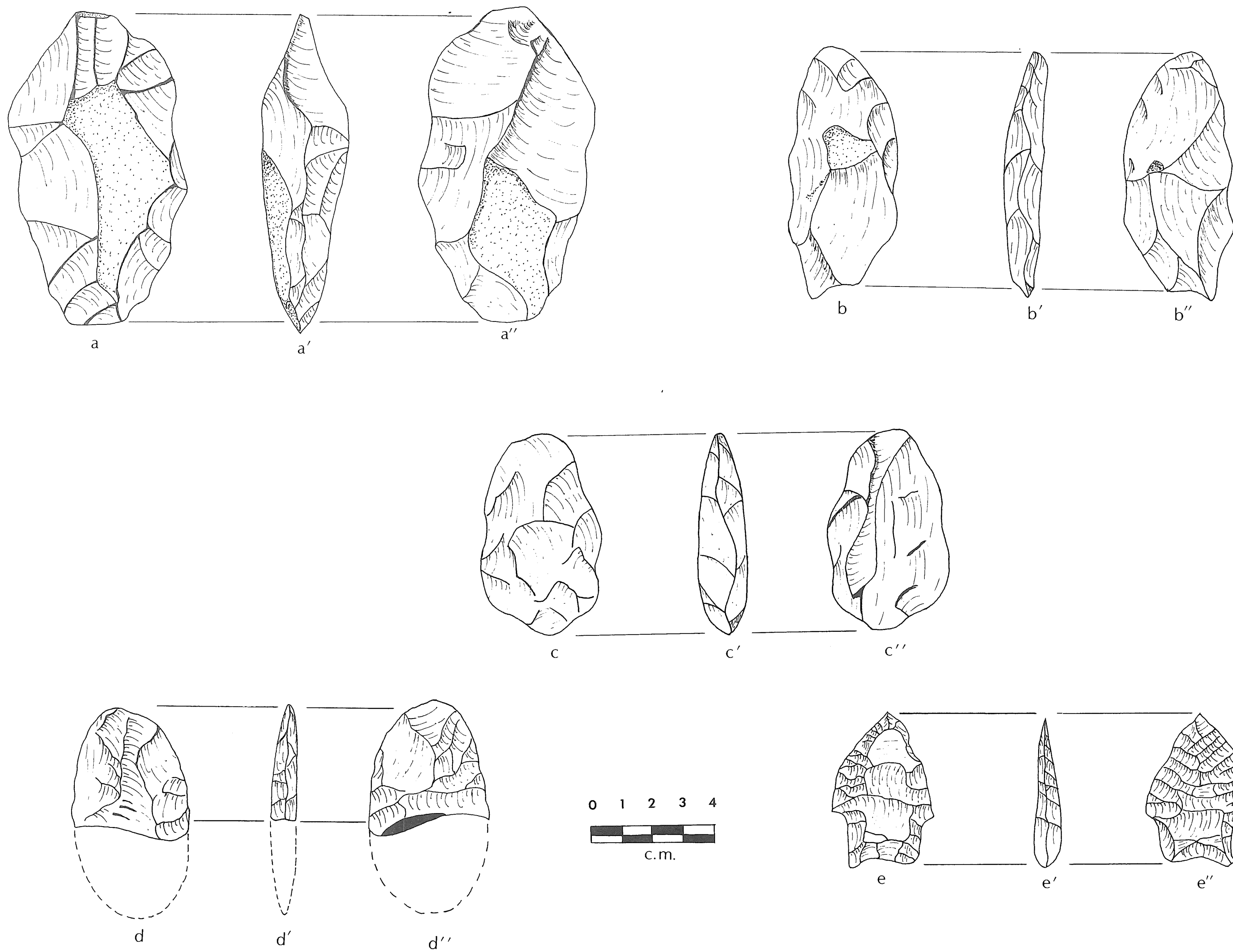


Figure 7. Lithic Reduction Sequence

Figure 7. Lithic Reduction Sequence: a, Thick Biface I; b, Thick Biface II; c, Thin Biface I; d, Thin Biface II; e, Johnson Point.

snap the biface at the opposite end. The complete specimens also exhibit discontinuities such as too much body mass, a large number of hinge fractures or obvious inclusions.

4. Primary Modification

With mass reduction nearly completed a new process, modification, is initiated. Reduction is concerned with creating a more refined size while modification attempts to alter form. In other words, modification produces a more regular and specific shape. Improved form is the result of the following actions: 1) refining outlines by setting up platforms and ridges for more controlled flaking; 2) thinning by removing flakes from one or both surfaces; and 3) aligning edges through selective trimming. Primary modification then is the first series of activities toward achieving this objective. The identifiable products for this stage are Thin Biface I's and Thin Biface II's as well as rejects, tertiary flakes and thinning flakes.

Thin Biface I (Figures 7c; 8f and g)

Number of specimens: 47; complete 3; broken 44
Description: Thin Biface I's are the first intended products of the primary modification activity set. They are characterized by little or no cortex, more uniformity in overall thickness, platform preparation produced mainly by thinning flake scars, and initial edge alignment.
Dimensions:
Size (length X width X thickness): 24.8-63.1 mm X 26.0-62.3 mm. X 8.5-17.5 mm.
Mean thickness: 12.09 mm.
Provenience: Table 1
Lithic material: Table 2
Comments: Thin Biface I's have a reduced mass thickness of about 28% from Thick Biface II's. End shock waves from attempting to reduce an interior body mass or inclusions appear to account for most of the broken specimens.

Thin Biface II (Figures 7d; 8h and i)

Number of specimens: 33; broken 33

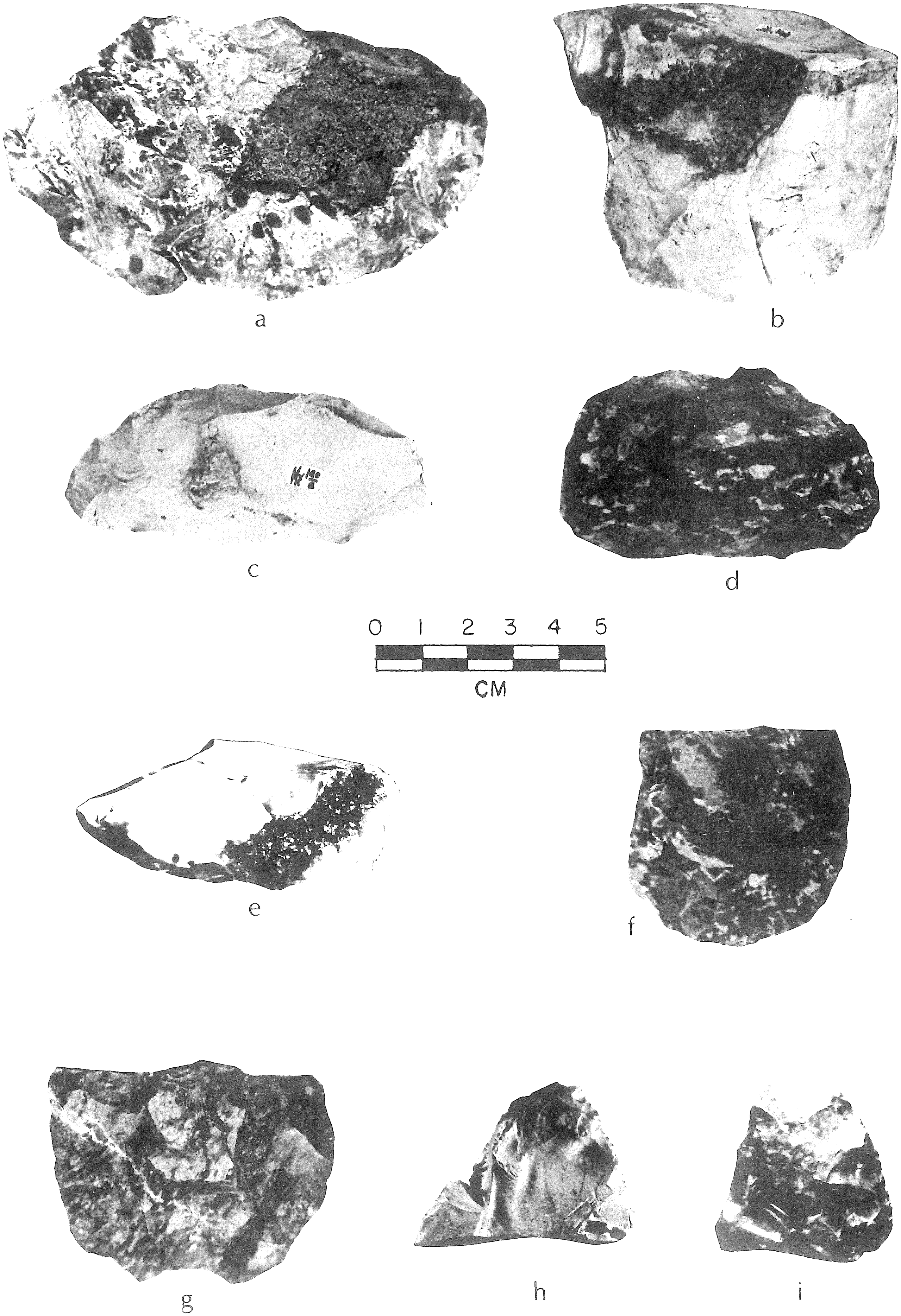


Figure 8. Dawson Site Reduction Bifaces: a and b, Thick Biface I's; c-e, Thick Biface II's (note quartz inclusion in e); f and g, Thin Biface I's; h and i, Thin Biface II's.

Description: Thin Biface II's exemplify a second series of intended products from primary modification. Thinning flake scars are bifacial as well as smaller and more delicate than those present on Thin Biface I's. This category is characterized by regular edges, uniformly thinned cross-sections and predetermined shaping.

Dimensions:

Size (length X width X thickness): 16.0-45.5 mm. X 14.1-46.8 mm. X 4.9-10.7 mm.

Mean thickness: 7.52 mm.

Provenience: Table 1

Lithic material: Table 2

Comments: Thin Biface II's have a reduced mass thickness of approximately thirty-eight percent over Thin Biface I's. End shock waves appear to be the primary cause for these broken specimens.

5. Secondary Modification and Final Preparation

This activity set essentially marks the actual production of predetermined implements. Special techniques of manufacture (such as fluting or beveling of blades, grinding and/or corner, side or basal notching of stems, and serrating or straightening of edges) may be employed during this stage. As Collins (1975:22) remarks: "The products of this activity set are usually among the most variable in any assemblage and their forms probably include the greatest amount of 'stylistic' expression among chipped stone tools." Typological analysis of these implements have traditionally provided the archaeologist with the most precisely defined information concerning temporal and spatial variation as well as distribution. The products readily identified for this stage include finished implements, rejects and thinning flakes.

<u>Stemmed Bifaces -- Projectile Points</u>

Bifacially chipped implements placed in this category are primarily used for hunting. They terminate in an acute tip, have sharp blade edges and a well formed expanding or parallel stem which serves as a hafting area. Stem size may generally conform to the shaft diameter of a dart, lance or spear. Hence, these projectiles may be considered dart points or, possibly, hafted knives.

Expanding Stemmed Bifaces -- Projectile Points

Duncan Type (Figure 9a and b)

Number of specimens: 4; broken 4
Type definition and description: Wheeler 1954: 1; Perino 1971:26-27
Dimensions:
- Length (most complete specimen): 39.6 mm.
- Blade width: 20.0-27.7 mm.
- Basal width: 18.7-22.2 mm.
- Thickness: 6.7-9.6 mm.
- Mean Thickness: 8.1 mm.

Provenience: Table 1
Lithic material: Table 2
Comments: Duncan points have also been identified from the preceramic component at the Packard site (Wyckoff 1964a:46 and 99) and from the lower unit of the Pohly Rock Shelter (Ray 1965:15 and 58-59). These sites are within twenty miles of My-140. Duncan points are commonly found in association with McKean points during the Middle Prehistoric, dating from 4450 B.P. to 2800 B.P. (see Wedel 1961: 250-251; Perino 1971:26). For northeastern Oklahoma, these types are associated with the middle and late Archaic.

Frio Type (Figure 9d and e)

Number of specimens: 4; broken 4
Type definition and description: Suhm and Krieger 1954: 428; Bell 1960:48-49
Dimensions:
- Length (most complete specimen): 38.8 mm.
- Blade width: 22.1-28.8 mm.
- Basal width: 17.4-24.0 mm.
- Thickness: 6.6-7.6 mm.
- Mean thickness: 7.2 mm.

Provenience: Table 1
Lithic material: Table 2
Comments: The most complete projectile in this sample exhibits unifacial retouching along one edge. Frio points have been estimated to range from about 3950 B.P. to 1450 B.P. and are considered to be middle to late Archaic projectiles.

Hannah Type (Figure 9c and f)

Number of specimens: 4; broken 4
Type definition and description: Wheeler 1954: 1; Perino 1971: 44-45
Dimensions:
- Length (two most complete specimens): 29.4 mm and 37.5 mm.
- Blade width (two most complete specimens): 22.1 mm and 26.6 mm.
- Basal width: 17.6 - 23.9 mm.
- Thickness: 5.8 - 9.1 mm.
- Mean thickness: 7.0 mm.

Provenience: Table 1
Lithic material: Table 2
Comments: The two most complete specimens of this grouping have been unifacially retouched. One exhibits such reworking on one edge while the other shows this on the two opposing edges creating a bevel effect. Hannah points are commonly associated with the Duncan type tending to form a continuous series and date from about 4450 B.P. to 2800 B.P.

Marcos Type (Figure 9i-k)

Number of specimens: 8; complete 1; broken 7
Type definition and description: Suhm and Krieger 1954: 442; Bell 1958: 42-43.
Dimensions:
- Length (complete specimen): 50.4 mm.
- Blade width: 20.0 - 34.1 mm.
- Basal width: 18.5 - 26.9 mm.
- Thickness: 6.0 - 9.0 mm.
- Mean thickness: 7.3 mm.

Provenience: Table 1
Lithic material: Table 2
Comments: The complete specimen (Figure 9j) exhibits greater basal thinning than the other Marcos points in this sample. The stem is also variant in that it tends to be more rectangular than expanding. Yet, because of the small representative sample, this specimen is considered the result of individual knapper variation rather than cultural. Marcos points have been reported from Pohly Rock Shelter (Ray 1965:15, 55, and Table 13), Wolf Creek (Kerr and Wyckoff 1964:66 and 77), Kerr Dam (Wyckoff

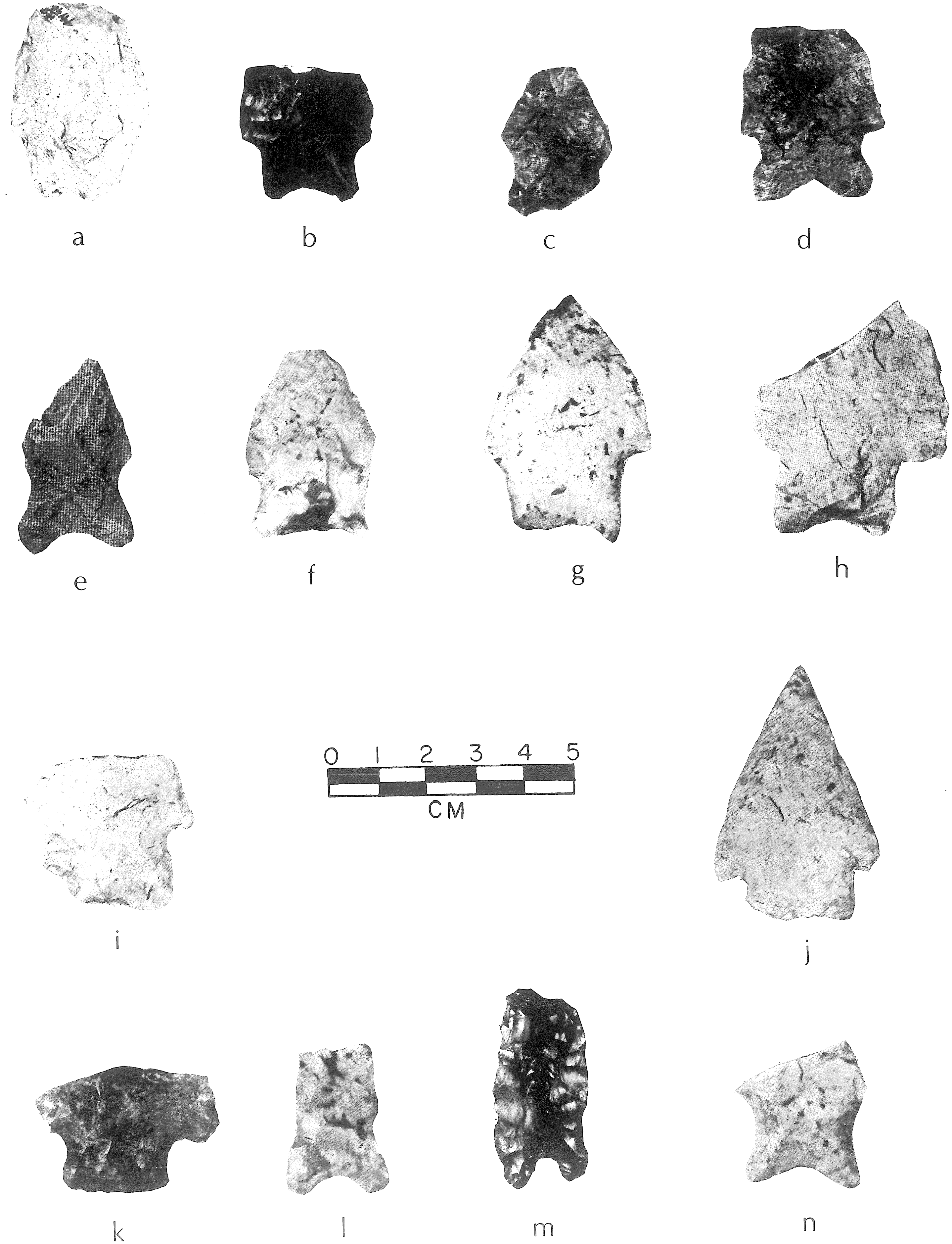


Figure 9. Dawson Site Projectile Points: a and b, Duncan Points; c and f, Hannah Points; d and e, Frio Points; g and h, Johnson Points; i-k, Marcos Points; l and m, McKean Points; n, Uvalde Point.

1963: 19) and Jug Hill (Wyckoff 1964b: 23 and Plate 4) all in Mayes County. Those points from Pohly and Wolf Creek were found in association with pottery and either represent a mixed context or reuse on the part of later occupants. At Jug Hill, however, Marcos points are associated with a late Archaic component. The temporal span for this type ranges from 3950 B.P. to 950 B.P.

McKean Type (Figure 91 and m)

Number of specimens: 2; broken 2
Type definition and description: Wheeler 1952; Bell 1958: 50 - 51
Dimensions:
 Length (most complete specimen): 40.4 mm.
 Blade width: 16.6 - 19.4 mm.
 Basal width: 18.1 - 21.1 mm.
 Thickness: 5.8 - 7.1 mm.
 Mean thickness: 6.5 mm.
Provenience: Table 1
Lithic material: Table 2
Comments: A McKean point has been reported from the lower unit of Pohly Rock Shelter (Ray 1965: 15 and Table 13). The temporal span for this type ranges from approximately 3950 B.P. to 1750 B.P.

Uvalde Type (Figure 9n)

Number of specimens: 1; broken 1
Type definition and description: Suhm and Krieger 1954: 486; Bell 1960: 92-93
Dimensions:
 Length: undetermined
 Blade width: 25.6 mm.
 Basal width: 23.9 mm.
 Thickness: 8.2 mm.
 Mean thickness: 8.2 mm.
Provenience: Table 1
Lithic material: Table 2
Comments: A single Uvalde point was recovered from the lower unit of Pohly Rock Shelter (Ray 1965: 15 and Table 13). The estimated temporal span for this type ranges from 5950 B.P. to 950 B.P.

Parallel Stemmed Bifaces -- Projectile Points

Johnson Type (Figure 9g and h)

Number of specimens: 2; complete 1; broken 1
Type definition and description: Perino 1968: 40-41
Dimensions:
- Length (complete specimen): 48.0 mm.
- Blade width: 33.8 - 39.1 mm.
- Basal width: 22.2 - 24.2 mm.
- Thickness: 7.3 - 7.7 mm.
- Mean thickness: 7.5 mm.

Provenience: Table 1
Lithic material: Table 2
Comments: Although the exact temporal span for this type is uncertain, a speculative estimate would be middle to late Archaic.

Unclassified Projectile Point Fragments

Included within this category are base and stem fragments as well as blade and blade edge sections. None of these remnants can be identified as to type.

Base and Stem Sections

Number of specimens: 5
Provenience: Table 1
Lithic material: Table 2

Midsections

Number of specimens: 6
Provenience: Table 1
Lithic material: Table 2

Stemmed and Unstemmed Bifaces -- General Utility, Fabricating and/or Processing Tools

This category of tools has been employed in a number of tasks ranging from butchering activities, hide processing, implement manufacturing to possibly the procuring and processing of plant resources.

Stemmed Biface Drilling Implements

Number of specimens: 11; broken 11

Description: Because of the internal variation present within this inventory three types have been established. In addition to the six specimens discussed below, there are four broken midsections and one broken tip which could not be classified. Provenience and lithic material for these latter specimens may be found in Tables 3 and 4.

Stemmed Biface Drilling Implements -- Type A (Figure 10a and b)

Number of specimens: 2; broken 2
Description: These drills are bifacially chipped on both the base and stem. The expanding stem has a concave base giving these specimens a bilobed appearance. Bit cross-sections are elliptical while longitudinal cross-sections are either biconvex or plano-convex.
Dimensions:
Length (incomplete): 20.3 mm. and 26.3 mm.
Bit length (incomplete): 9.5 mm. and 16.2 mm.
Bit width: 10.3 mm. and 11.3 mm.
Basal width: 23.4 mm. and 25.6 mm.
Thickness: 7.0 mm. and 7.8 mm.
Mean thickness: 7.4 mm.
Provenience: Table 3
Lithic material: Table 4

Stemmed Biface Drilling Implements -- Type B (Figure 10c and d)

Number of specimens: 2; broken 2
Description: These specimens also have expanding stems but with a straight base. One drill has a parallel sided stem while the other is more rounded. Bit cross-sections are elliptical while longitudinal cross-sections are biconvex.
Dimensions:
Length (incomplete): 21.8 mm. and 33.7 mm.
Bit length (incomplete): 9.8 mm. and 25.5 mm.
Bit width: 10.7 mm. and 12.0 mm.
Basal width: 20.1 mm. and 22.1 mm.
Thickness: 6.0 mm. and 6.4 mm.
Mean thickness: 6.2 mm.
Provenience: Table 3
Lithic material: Table 4

Table 1. Provenience of Reduction Bifaces and Projectile Points.

SQUARE / LEVEL / CATEGORY	TEST 1					TEST 2			S3-W5					S7-W2				S9-W2						S10-W16					S12-W14				
LEVEL	1	2	3	4	5	1	2	3	1	2	3	4	5	1	2	3	4	1	2	3	4	5	6	1	2	3	4	5	1	2	3	4	5
REDUCTION BIFACES																																	
Thick Biface I	-	-	-	2	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1	2	-	-	-	1	-	-	-	-	1	-	1	-
Thick Biface II	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2	-	1	-	-	1	-	3	-	-	-	-	-	1	-
Thin Biface I	-	1	-	-	1	2	-	-	-	-	-	-	-	1	-	-	1	2	4	-	5	-	-	1	-	2	1	-	1	-	1	1	-
Thin Biface II	-	1	-	2	1	1	-	-	-	-	-	1	-	2	-	3	1	3	4	1	3	-	-	-	-	-	1	-	-	-	-	-	-
EXPANDING STEMMED BIFACES -- PROJECTILE POINTS																																	
Duncan	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-
Frio	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hannah	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
Marcos	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
McKean	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Uvalde	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PARALLEL STEMMED BIFACES -- PROJECTILE POINTS																																	
Johnson	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
POINT FRAGMENTS Midsections	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stem Sections	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-

SQUARE / LEVEL / CATEGORY	S12-W15					S19-W12		N1-E16			N10-0						N15-E11				N20-E10				0-E5						S3-E11				S12-	
LEVEL	1	2	3	4	5	1	2	1	2	3	1	2	3	4	5	6	1	2	3	4	1	2	3	4	1	2	3	4	5	6	1	2	3	4	1	2
REDUCTION BIFACES																																				
Thick Biface I	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thick Biface II	-	-	1	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1	-	-	-	1	1
Thin Biface I	1	2	1	-	-	-	1	1	4	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1	-	-	1
Thin Biface II	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	2
EXPANDING STEMMED BIFACES -- PROJECTILE POINTS																																				
Duncan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Frio	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	1
Hannah	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
Marcos	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
McKean	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Uvalde	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PARALLEL STEMMED BIFACES -- PROJECTILE POINTS																																				
Johnson	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
POINT FRAGMENTS Midsections	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
Stem Sections	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 1. Provenience of Reduction Bifaces and Projectile Points.

TEST 1			TEST 2			S3-W5					S7-W2				S9-W2						S10-W16					S12-W14					S12-W15					S19-W12		N1-E16			N10-0						N15-E11				N20-E10				0-E5						S3-E11				S12-E7			S14-E3					S20-E10					S*	T*
3	4	5	1	2	3	1	2	3	4	5	1	2	3	4	1	2	3	4	5	6	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	1	2	3	1	2	3	4	5	6	1	2	3	4	1	2	3	4	1	2	3	4	5	6	1	2	3	4	1	2	3	1	2	3	4	5	1	2	3	4	5		
-	2	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1	2	-	-	-	1	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	10
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-	-	1	2	-	-	-	-	-	-	-	1	-	-	1	2	4	-	5	-	-	1	-	2	1	-	1	-	1	1	-	1	2	1	-	-	-	1	1	4	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	1	-	-	-	-	-	-	7	47
-	2	1	1	-	-	-	-	-	1	-	2	-	3	1	3	4	1	3	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	2	-	1	-	-	-	-	-	1	-	-	-	3	33
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	Non-Heat Treated						Heat Treated						
	Keokuk	Reeds Spring	Moorefield	Residual Boone	Unidentified	Sub-Total	Keokuk	Reeds Spring	Moorefield	Residual Boone	Unidentified	Sub-Total	TOTAL
Reduction Bifaces													
Thick Biface I	4	3	--	3	--	10	--	--	--	--	--	0	10
Thick Biface II	10	5	2	4	2	23	--	--	--	--	--	0	23
Thin Biface I	21	6	4	2	2	35	5	5	--	--	1	11	46
Thin Biface II	7	12	3	--	--	22	6	6	--	--	--	12	34
Expanding Stemmed Bifaces-Projectile Points													
Duncan	--	2	1	--	--	3	1	--	--	--	--	1	4
Frio	3	1	--	--	--	4	--	--	--	--	--	0	4
Hannah	1	2	--	--	--	3	--	1	--	--	--	1	4
Marcos	--	4	--	1	--	5	1	2	--	--	--	3	8
McKean	1	--	1	--	--	2	--	--	--	--	--	0	2
Uvalde	--	1	--	--	--	1	--	--	--	--	--	0	1
Parallel Stemmed Bifaces-Projectile Points													
Johnson	--	1	--	--	--	1	--	1	--	--	--	1	2
Unclassified Projectile Points													
Midsections	--	6	--	--	--	6	--	--	--	--	--	0	6
Base and Stem Sections	1	--	1	1	--	3	1	1	--	--	--	2	5
TOTALS	48	43	12	11	4	118	14	16	0	0	1	31	149

Table 2. Lithic Material of Reduction Bifaces and Projectile Points

Stemmed Biface Drilling Implements -- Type C (Figure 10e-g)

Number of specimens: 3; broken 3
Description: Expanding, bifacially flaked bases also characterize this drill type. The overall base outline, however, tends to be ovate. Bit cross-sections are elliptical while longitudinal cross-sections are either biconvex or asymmetrical convex.
Dimensions:
Length (incomplete): 30.7 mm. - 35.6 mm.
Bit length (incomplete): 3.7 mm. - 18.9 mm.
Bit width: 4.8 mm. - 11.6 mm.
Basal width: 22.9 mm. - 29.1 mm.
Thickness: 6.6 mm. - 8.0 mm.
Mean thickness: 7.17 mm.
Provenience: Table 3
Lithic material: Table 4
Comments: Similar type drills have been reported from the Jug Hill site (Wyckoff 1964b: 31 and Plate 4) and Kerr Dam (Wyckoff 1963: 21 and Plate 3).

Broken Biface Cutting Implements (Figure 10h-j)

Number of specimens: 24; broken 24
Description: These bifacially chipped implements have parallel to expanding flake scars and evenly aligned edges. Secondary retouching as well as step hinging on both faces indicates use and resharpening. Following from this and the low edge angles these bifaces appear to have been possibly utilized as knives or cutting implements.
Dimensions:
Thickness: 4.4 mm. - 10.5 mm.
Mean thickness: 7.3 mm.
Provenience: Table 3
Lithic material: Table 4

6. Recycling Processes

During any of the previous stages rejects, damaged and/or worn products may be recycled into the trajectory as newly employed or resharpened implements. By such an economical use of an implement both time and material are conserved. Concerning this concept Frison (1967: 44-45) has delineated three factors which any tool maker

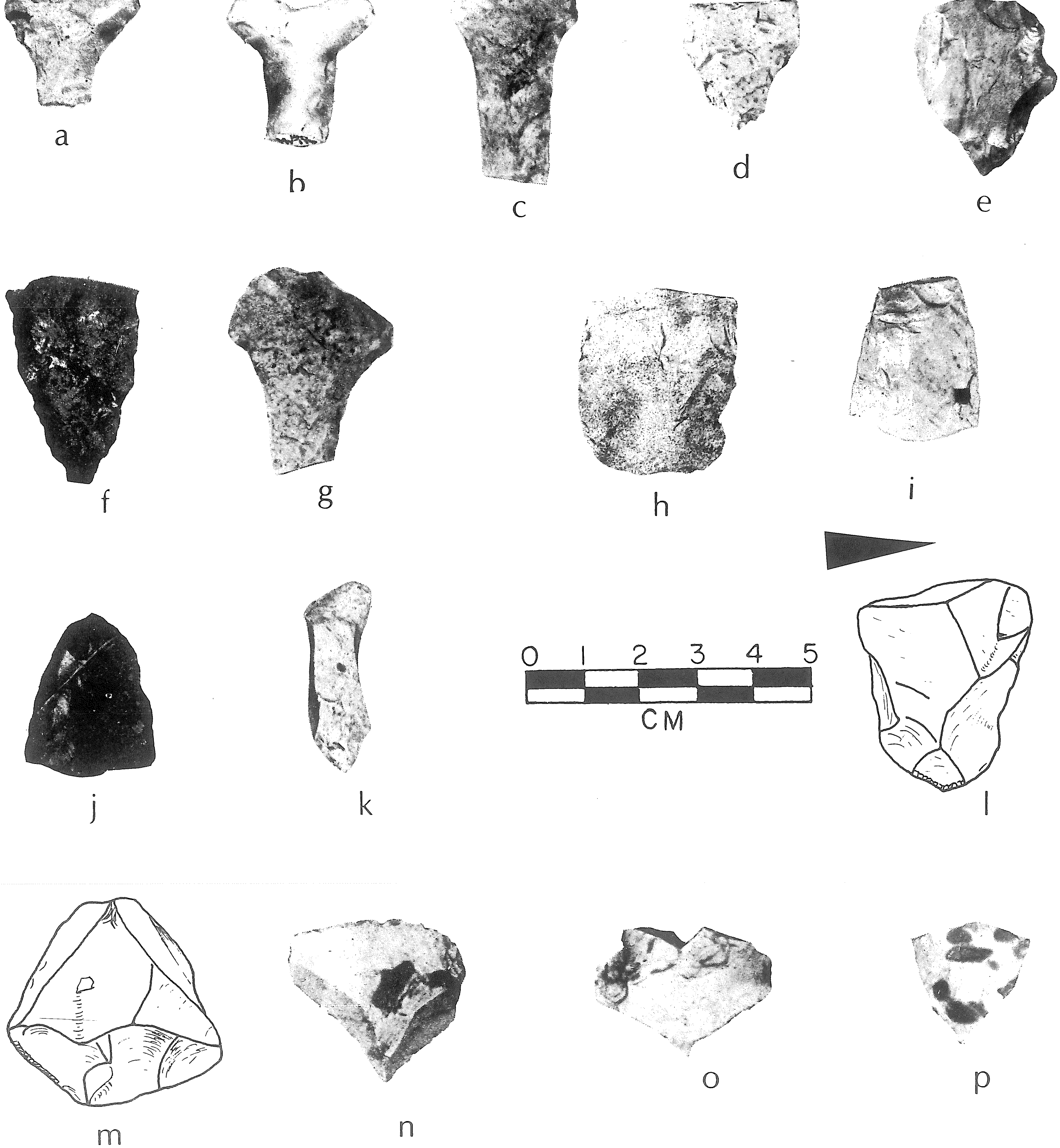

Figure 10. Dawson Site Artifacts: a and b, Type A Drills; c and d, Type B Drills; e-g, Type C Drills; h-j, Broken Biface Cutting Implements, k, Broken Biface Graving Implement; l-m, Broken Biface Scraping Implements; n-p, Flake Graving Implements.

or user might consider. These are 1) minimizing cost and scarcity; 2) maximizing time and material; and 3) maximizing utility.

The first of these refers to resource acquirement. Although Boone chert is plentiful in the vicinity of My-140, selecting proper material requires quality control by sorting and inspecting. Even then inclusions may not be recognized until actual reduction begins. This involves a further investment of time and effort. Once quality specimens have been selected, they are then carried back to the habitation site and/or place of use. Thus the tool user would prefer to prolong an implement's actual productive life for as long as possible.

The second factor of maximizing time and material deals directly with resharpening an implement.

> With any cutting or scraping tool a balance must be maintained between a number of factors. As a tool becomes dull, an increasing amount of discomfort is experienced and a like amount of time and effort expended until a point is reached where it is expedient to stop work and sharpen the tool rather than try to continue with a dull one. Stone tools, like any others, eventually reach a stage where resharpening no longer renders them useful again and they are discarded and new ones chosen and the process is repeated. There is always a reluctance on the part of an artisan to give up a tool ... This is especially true with regard to tools that change physical characteristics of weight, length, thickness, etc. during their lifetime of use (Frison 1967:44).

The third factor of maximum utility refers to blade thickness as opposed to cutting ability. A thin blade is sharper and cuts more readily than a thick one. Yet, if the blade is too thin it can be easily damaged requiring a complete reworking of the edge. "A blade of the proper thickness must be maintained that is sharp enough to cut but will not be nicked by hitting a knot and this holds true whether the tool is made of stone or steel" (Frison 1967:45). Also, as Sheets and Muto

(1972:633) suggest, the ratio of the cutting edge to the weight of the total flake or blade should be taken into consideration.

The following implements have been placed under this recycling stage since the production of bifaces appears to be the primary industry performed at My-140.

Recycled Implements

Broken Biface Graving Implement (Figure 10k)

Number of specimens: 1; broken 1
Description: This specimen represents a broken biface fragment. One edge has been retouched to form a triangular projection. There are a series of step fractures occurring on one surface of this specimen.
Dimensions:
Size (length X width X thickness): 31.8 X 11.4 X 6.6 mm.
Provenience: Table 3
Lithic material: Table 4
Comments: The retouching and wear patterns of this specimen indicate recycling and use as a graving implement.

Broken Biface Scraping Implements (Figure 10 l and m)

Number of specimens: 3; broken 3
Description: These specimens are broken biface fragments which have been unifacially retouched. One of these exhibits chipping at its tip while the other two have been retouched along lateral edges. The plano-convex longitudinal cross-section indicates possible usage as scraping implements.
Dimensions:
Thickness: 10.1 mm. - 14.6 mm.
Mean thickness: 12.3 mm.
Provenience: Table 3
Lithic material: Table 4
Comments: Based on mean thickness, these specimens probably represent Thin Biface I's which were broken and recycled into the trajectory as scraping implements.

Broken Biface Fragments

Number of specimens: 25; broken 25

Description: These specimens exhibit flake scars on both surfaces. At least two represent outrepasse fractures which result from too much force being applied to the reduction biface. Another appears to be fire cracked. The cause of breakage for the remainder has not been determined.

Provenience: Table 3

Lithic material: Table 4

Comments: Because of their generally small size the exact placement of these fragments in the reduction trajectory cannot be made.

Flake Graving Implements (Figure 10 n-p)

Number of specimens: 7; complete 4; broken 3

Description: These flakes have a single small, triangular projection (six specimens) or two small, triangular projections (one specimen) which have been reinforced by secondary chipping. Dorsal retouching occurs on three of these specimens while the remaining four flakes have been chipped bifacially. One implement has been made from a secondary flake while the remaining six are tertiary flakes.

Dimensions:

Size (length X width X thickness): 18.2 mm. - 31.2 mm. X 16.4 mm. - 30.1 mm. X 4.3 mm. - 10.4 mm.

Projections (length): 1.0 mm. - 3.4 mm.

Mean thickness: 6.3 mm.

Provenience: Table 3

Lithic material: Table 4

Comments: The flaking and wear patterns of these specimens indicate recycling from the lithic debitage category and use as graving implements.

Flake Scraping Implements (Figure 11 a)

Number of specimens: 2; complete 1; broken 1

Description: The complete specimen has been unifacially retouched along both lateral edges and distally. The longitudinally broken specimen has been only unifacially retouched along its distal end. This same end also exhibits numerous step fractures.

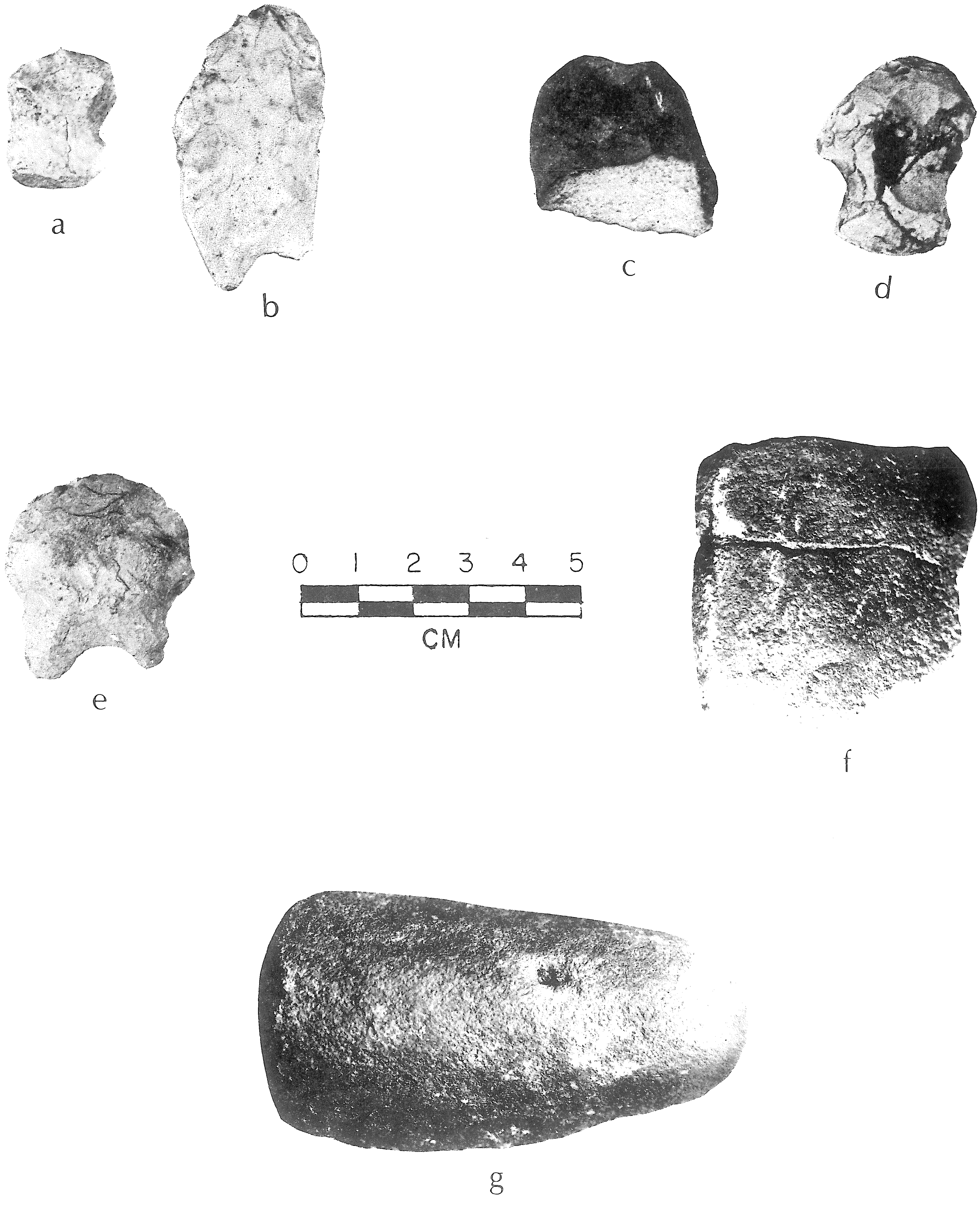

Figure 11. Other Dawson Site Artifacts: a, Flake Scraping Implement; b, Stemmed Biface Cutting Implement; c, Pebble Scraping Implement; d and e, Stemmed Biface Scraping Implements; f and g, Grinding Stones.

Because of the unifacial retouching and wear as well as relatively steep edge angles these specimens have been classified as scraping implements.

Dimensions:

Size (length X width X thickness):

Complete specimen: 24.9 mm. X 19.7 mm. X 6.8 mm.

Broken specimen: 29.9 mm. X -- X 5.8 mm.

Mean thickness: 6.3 mm.

Provenience: Table 3

Lithic material: Table 4

Pebble Scraping Implement (Figure 11c)

Number of specimens: 1; complete 1

Description: This broken stream pebble was unifacially modified along its broken edge. Transverse wear patterns and unifacial flaking in conjunction with a relatively steep edge angle indicate a possible usage as a scraping implement.

Dimensions:

Retouched edge (length): 26 mm.

Size (length X width X thickness): 30.8 mm. X 33.2 mm. X 9.8 mm.

Provenience: Table 3

Lithic material: Table 4

Comments: Although most of the intermediate reduction steps have not been performed, this implement is placed in this section because of its apparent intentional modification.

Stemmed Biface Cutting Implements (Figure 11b)

Number of specimens: 2; broken 2

Description: Both specimens are reworked projectile points. One has impact fractures breaking both the tip and stem. The other has been broken both distally and longitudinally. Secondary bifacial retouching as well as scalar scars on both faces indicate use and resharpening. Because of these features and the low edge angles these former projectile points were probably converted to cutting implements. Since both of these specimens have been broken and reworked no attempt to formally identify the projectile point type has been made.

Dimensions:

Size (length X width X thickness):

Table 3. Provenience of General Utility, Fabricating and/or Processing Tools.

TEST 1				TEST 2			S3-W5					S7-W2				S9-W2						S10-W16					S12-W14					S12-W15					S19-W12		N1-E16			N10-0						N15-E11				N20-E10				0-E5						S3-E11				S12-E7			S14-E3					S20-E10					S*	T*
2	3	4	5	1	2	3	1	2	3	4	5	1	2	3	4	1	2	3	4	5	6	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	1	2	3	1	2	3	4	5	6	1	2	3	4	1	2	3	4	1	2	3	4	5	6	1	2	3	4	1	2	3	1	2	3	4	5	1	2	3	4	5		
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1	1	-	3	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	1	-	-	-	-	-	1	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1	-	1	-	3	-	1	1	-	-	-	1	9
1	-	-	-	2	-	-	-	-	1	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7
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Table 3. Provenience of General Utility, Fabricating and/or Processing Tools.

SQUARE	TEST 1					TEST 2			S3-W5					S7-W2			
CATEGORY / LEVEL	1	2	3	4	5	1	2	3	1	2	3	4	5	1	2	3	4
STEMMED BIFACE DRILLING IMPLEMENTS																	
Type A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Type B	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
Type C	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
Drill Bits	-	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
Broken Biface Cutting Implements	1	-	-	-	-	-	-	-	-	-	1	1	-	1	-	-	-
RECYCLED FLAKE IMPLEMENTS																	
Broken Biface Graving Implements	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Broken Biface Scraping Implements	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Broken Biface Fragments	1	1	1	-	3	2	1	-	-	-	-	-	-	-	-	-	-
Flake Graving Implements	-	1	-	-	-	2	-	-	-	-	1	-	-	-	-	-	-
Flake Scraping Implements	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pebble Scraping Implements	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stemmed Biface Cutting Implements	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stemmed Biface Scraping Implements	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-

SQUARE	S9-W2						S10-W16					S12-W14					S12-W15				
CATEGORY / LEVEL	1	2	3	4	5	6	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
STEMMED BIFACE DRILLING IMPLEMENTS																					
Type A	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
Type B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Type C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Drill Bits	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Broken Biface Cutting Implements	2	3	1	-	-	-	-	-	-	-	-	1	-	1	1	-	-	-	1	-	-
RECYCLED FLAKE IMPLEMENTS																					
Broken Biface Graving Implements	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Broken Biface Scraping Implements	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Broken Biface Fragments	-	-	-	2	-	-	-	1	-	-	-	-	-	1	-	-	-	1	1	-	-
Flake Graving Implements	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Flake Scraping Implements	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
Pebble Scraping Implements	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
Stemmed Biface Cutting Implements	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stemmed Biface Scraping Implements	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

SQUARE	S19-W12		N1-E16			N10-0						N15-E11			
CATEGORY / LEVEL	1	2	1	2	3	1	2	3	4	5	6	1	2	3	4
STEMMED BIFACE DRILLING IMPLEMENTS															
Type A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Type B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Type C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Drill Bits	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Broken Biface Cutting Implements	-	-	-	2	-	-	-	1	1	-	-	-	-	-	-
RECYCLED FLAKE IMPLEMENTS															
Broken Biface Graving Implements	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Broken Biface Scraping Implements	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Broken Biface Fragments	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Flake Graving Implements	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Flake Scraping Implements	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pebble Scraping Implements	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stemmed Biface Cutting Implements	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
Stemmed Biface Scraping Implements	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

SQUARE	N20-E10				0-E5						S3-E11				S12-	
CATEGORY / LEVEL	1	2	3	4	1	2	3	4	5	6	1	2	3	4	1	2
STEMMED BIFACE DRILLING IMPLEMENTS																
Type A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Type B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Type C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Drill Bits	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-
Broken Biface Cutting Implements	-	-	-	-	1	-	-	-	-	-	2	1	-	-	1	-
RECYCLED FLAKE IMPLEMENTS																
Broken Biface Graving Implements	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Broken Biface Scraping Implements	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
Broken Biface Fragments	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
Flake Graving Implements	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Flake Scraping Implements	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pebble Scraping Implements	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stemmed Biface Cutting Implements	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
Stemmed Biface Scraping Implements	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

	Non-Heat Treated						Heat Treated						
	Keokuk	Reeds Spring	Moorefield	Residual Boone	Unidentified	Sub-Total	Keokuk	Reeds Spring	Moorefield	Residual Boone	Unidentified	Sub-Total	TOTAL
Stemmed Biface Drilling Implements													
Type A	1	--	--	--	--	1	--	1	--	--	--	1	2
Type B	2	--	--	--	--	2	--	--	--	--	--	0	2
Type C	1	1	--	--	--	2	--	--	--	--	--	0	2
Drill Bits	2	2	--	--	1	5	--	--	--	--	--	0	5
Broken Biface Cutting Implements	10	7	1	3	--	21	2	2	--	--	--	4	25
Broken Biface Graving Implements	1	--	--	--	--	1	--	--	--	--	--	0	1
Broken Biface Scraping Implements	2	--	--	--	--	2	--	1	--	--	--	1	3
Broken Biface Fragments	5	7	6	2	1	21	2	2	--	--	--	4	25
Flake Graving Implements	3	1	1	--	2	7	--	--	--	--	--	0	7
Flake Scraping Implements	--	1	--	1	--	2	--	--	--	--	--	0	2
Pebble Scraping Implement	--	1	--	1	--	2	--	--	--	--	--	0	2
Stemmed Biface Cutting Implements	1	--	--	--	--	1	--	1	--	--	--	1	2
Stemmed Biface Scraping Implements	1	1	--	--	--	2	--	--	--	--	--	0	2
TOTALS	29	21	8	7	4	69	4	7	0	0	0	11	80

Table 4. Lithic Material of General Utility, Fabricating and/or Processing Tools

Most complete specimen: 50.3 mm. X 30.1 mm. X 8.3 mm.
Less complete specimen: 36.9 mm. X 22.1 mm. X 6.6 mm.
Mean thickness: 7.45 mm.

Provenience: Table 3

Lithic material: Table 4

Stemmed Biface Scraping Implements (Figure 11 d and e)

Number of specimens: 2; complete 1; broken 1

Description: These specimens represent broken projectile points which have been reworked. The distal ends have been rounded and unifacially chipped to form a scraper-like implement. The proximal end of both specimens consists of stems which may indicate hafting. Both stems are slightly expanding. Also, one is convex along its basal edge while the other is concave.

Dimensions:

Length: 35.4 mm. and 37.0 mm.
Blade width (complete specimen): 28.6 mm.
Basal width: 20.5 mm. and 24.5 mm.
Thickness: 7.9 mm. and 9.6 mm.
Mean thickness: 8.75 mm.

Provenience: Table 3

Lithic material: Table 4

Incidentally Modified Flake Implements -- Flake Implement Series I

This general heading consists of a series of categories representing flakes which were picked up and employed because of their naturally sharp feather edges. However, small chipping spalls are present. In other words, this inventory of implements represents utilized flakes or reduction flakes which have not been intentionally modified. This analysis essentially follows that of Wyckoff (1973:34-49) and Hofman (1975:31-40).

At this point we should note that the term primary flaking refers to incidental wear while secondary flaking is associated with intentional modification. We should also keep in mind that a particular flake may have been well suited to its task and hence secondarily retouched when it did become dull. Thus, although these implements differ from intentionally modified flakes, they actually represent a continuum of use. At the same time, they are not always easily recognized as incidentally modified. This is especially valid for scraping implements. Concerning such implements Tringham, et. al. (1974:189) has commented:

> Contact is concentrated in a smaller locus of the edge so that the scars are densely distributed in a continuous line along a smaller part of the edge than longitudinal action, and sometimes merge into each other ... The scars are regular in size and shape on a single edge (although not to such an extent as those resulting from deliberate retouch).

One last set of definitions should be presented before we continue. These deal with the terms longitudinal action which refers to bifacial spalling indicating use as a cutting implement and transverse action refering to unifacial spalling indicating a scraping implement. These concepts, however, should also be used in conjunction with the degree of edge angle as discussed earlier.

Flake Implement Series Ia (Concave-Straight Bilateral and Distal End Retouching, Figure 12a)

Number of specimens: 1; broken 1

Description: This tertiary reduction flake is secondarily spalled along a concave and a distal edge on its dorsal surface. The remaining edge is spalled on the ventral surface.

Dimensions:

Retouched edges:

Concave edge (length X depth): 11.1 mm. X 1.4 mm.

Straight edge (length): 6.6 mm.

Distal edge (length): 11.5 mm.

Size (length X width X thickness): 16.6 mm. X 17.4 mm. X 6.1 mm.

Edge angle: 55-66 degrees.

Provenience: Table 5

Lithic material: Table 6

Comments: The various edges of this specimen may have possibly been used for scraping purposes since they are unifacially spalled, have uniform edges and tend to have relatively steep edge angles.

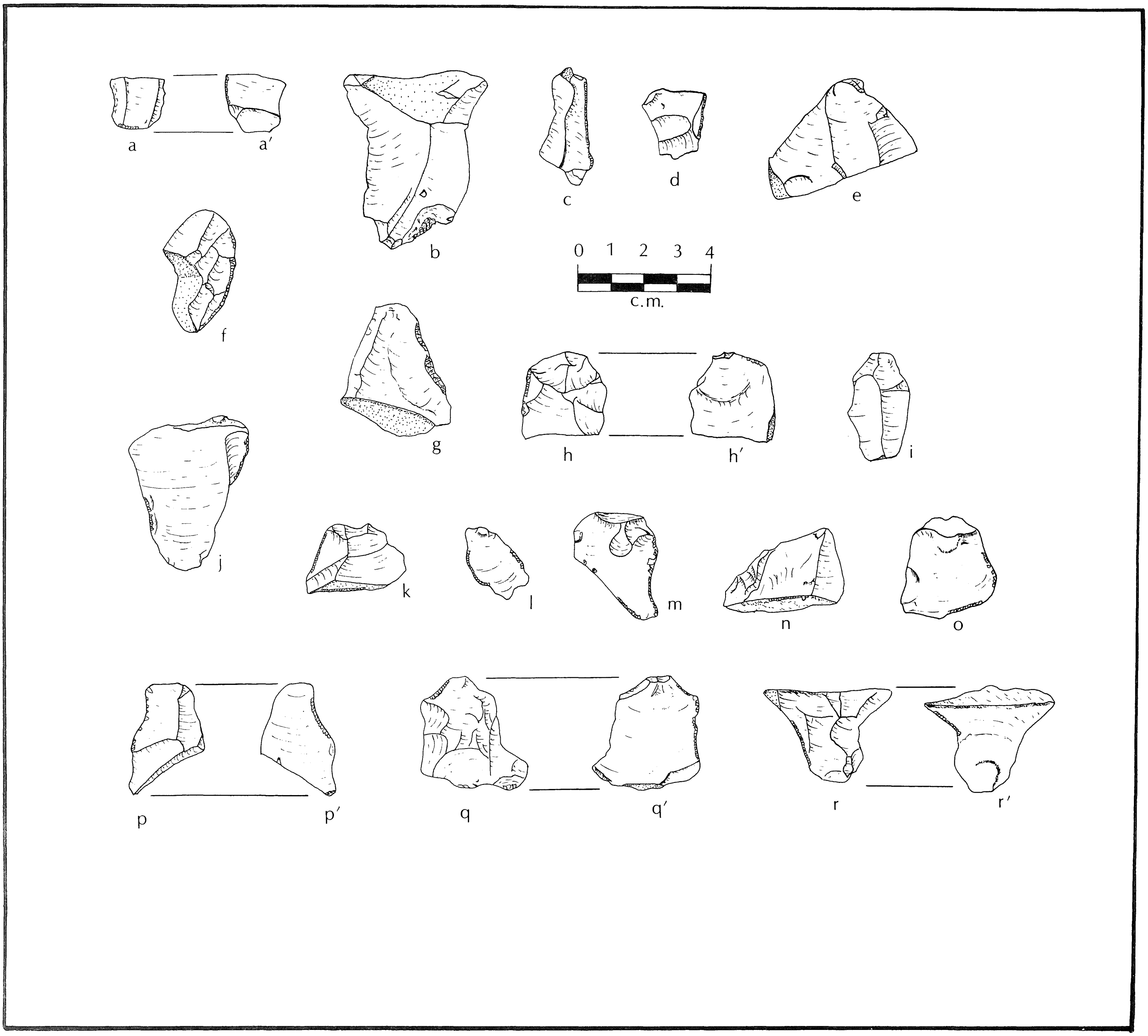

Figure 12. Incidentally Modified Flake Implements — Flake Implement Series I: a, FIS-Ia; b, FIS-Ib; c and d, FIS-Ic Longitudinal Action; e, FIS-Ic Transverse Action; f, FIS-Id Longitudinal Action; g, FIS-Id Transverse Action; h, FIS-Ie; i, FIS-If Longitudinal Action; j, FIS-If Longitudinal — Transverse Action; k, FIS-If Transverse Action; l, FIS-Ig Transverse Action; o, FIS-Ij; p, FIS-Ih Longitudinal Action; q, FIS-Ih Longitudinal — Transverse Action; r, FIS-Ih Transverse Action.

Flake Implement Series Ib (Distal End Retouching, Figure 12b)

Number of specimens: 1; broken 1

Description: This large secondary decortication flake has been secondarily spalled on its irregular distal end. This spalling appears only on the dorsal surface.

Dimensions:

Retouched edge (length): 17.7 mm.

Size (length X width X thickness): 49.9 mm. X 43.1 mm. X 13.9 mm.

Edge angle: 67 degrees

Provenience: Table 5

Lithic material: Table 6

Comments: Unifacial spalling and a relatively steep edge angle may indicate possible use as a scraping implement.

Flake Implement Series Ic (Straight Unilateral Retouching)

Based on microwear studies this category has been divided into two subgroupings. They are longitudinal action or cutting implements and transverse action or scraping implements.

Straight Unilateral Retouching -- Longitudinal Action (Figure 12 c and d)

Number of specimens: 10; complete 3; broken 7

Description: These implements are characterized by a single linear edge which exhibits spalling. Spalling occurs on the dorsal surface of four of these specimens while five others exhibit such scars on their ventral face. The other specimen is angular in appearance and has been equally spalled on both faces. The angular specimen represents secondary decortication. The other nine flakes are of the tertiary variety.

Dimensions:

Retouched edge (length): 12.4 mm. - 28.2 mm.

Size (length X width X thickness):

Tertiary flakes: 20.3 mm. - 34.9 mm. X 12.5 mm. - 42. 3 mm. X 3.1 mm. - 10.9 mm.

Secondary flake: 41.6 mm. X 26.5 mm. X 22.8 mm.

Edge angle: 41-74 degrees

Provenience: Table 5
Lithic material: Table 6
Comments: All but two of these specimens have an edge angle between 41 and 60 degrees. Secondary spalling on both surfaces, serrated edges and relatively low edge angles indicate a possible use as cutting implements.

Straight Unilateral Retouching -- Transverse Action (Figure 12e)

Number of specimens: 4; complete 2; broken 2
Description: These four tertiary flakes exhibit secondary spalling and step scars on their dorsal surface. The edges are linear in outline.
Dimensions:
Retouched edge (length): 6.9 mm. - 37.8 mm.
Size (length X width X thickness): 11.9 mm. - 28.4 mm. X 13.7 - 45.6 mm. X 2.8 mm. - 15.3 mm.
Edge angle: 80-91 degrees
Provenience: Table 5
Lithic material: Table 6
Comments: The extremely steep edge angles and unifacial scars indicate possible scraping, planing or shaving implements.

Flake Implement Series Id (Irregular Unilateral Retouching)

This category has also been divided into two subgroupings.

Irregular Unilateral Retouching -- Longitudinal Action (Figure 12 f)

Number of specimens: 15; complete 10; broken 5
Description: These flakes exhibit secondary spalling along both surfaces of the same irregular edge. Seven specimens have been most heavily scarred on their dorsal surface while seven others show their heaviest wear on their ventral surface. The remaining implement has been equally scarred on both surfaces. This inventory is represented by one primary decortication flake, eight secondary flakes, and six tertiary decortication flakes.
Dimensions:
Retouched edge (length): 9.1 mm. - 50.8 mm.

Size (length X width X thickness): 15.9 mm. - 51.1 mm. X 16.0 mm. - 60.9 mm. X 4.5 mm. - 19.9 mm.
Edge angle: 42-81 degrees

Provenience: Table 5

Lithic material: Table 6

Comments: Serrated edges, bifacial spalling and a relatively low ended edge angle range all indicate that these implements may have possibly been used for cutting or slicing purposes.

Irregular Unilateral Retouching -- Transverse Action (Figure 12 g)

Number of specimens: 20; complete 1; broken 19

Description: These implements have a single edge which is irregular in outline and exhibits secondary spalling. Fifteen flakes have been scarred on their dorsal surface and five on their ventral face. There are two secondary decortication flakes and eighteen tertiary decortication flakes.

Dimensions:

Retouched edge (length): 9.8 mm. - 25.6 mm.
Size (length X width X thickness): 10.3 mm. - 54.9 mm. X 13.5 mm. - 46.7 mm. X 2.6 - 11.2 mm.
Edge angle: 60-87 degrees

Provenience: Table 5

Lithic material: Table 6

Comments: The unifacial scarring and steep edge angles displayed by these specimens may possibly indicate scraping implements.

Flake Implement Series Ie (Alternate Unilateral Retouching, Figure 12 h)

Number of specimens: 4; complete 1; broken 3

Description: These tertiary decortication flakes have a single edge which has been secondarily scarred. A portion of this edge shows flaking on the dorsal as well as ventral surface. Edge outlines tend to be irregular.

Dimensions:

Retouched edges (length): 20.5 mm. - 47.9 mm.
Size (length X width X thickness): 19.6 mm. - 42.3 mm. X 24.6 mm. - 36.0 mm. X 6.9 mm. - 11.3 mm.
Edge angle: 50-80 degrees

Provenience: Table 5

Lithic material: Table 6
Comments: These specimens have a wide range of variation in their edge angles, alternate unilateral scarring and sinuous edges. Their possible function has not been determined.

Flake Implement Series If (Straight Bilateral Retouching)

This category has been divided into three subgroups: longitudinal action or cutting implements, longitudinal-transverse action or multiple function implements, and transverse action or scraping implements.

Straight Bilateral Retouching -- Longitudinal Action (Figure 12 i)

Number of specimens: 2; broken 2
Description: These tertiary decortication flakes have been primarily scarred on their dorsal surfaces. Edge outlines tend to be relatively linear.
Dimensions:
Retouched edges (length): 11.2 mm. - 26.9 mm.
Size (length X width X thickness): 19.9 mm. - 31.5 mm. X 20.1 mm. - 26.6 mm. X 4.8 mm. - 9.1 mm.
Edge angle: 47-63 degrees
Provenience: Table 5
Lithic material: Table 6
Comments: Sinuous edges, bifacial flake scars, and a relatively low edge angle range may indicate a possible function as cutting implements.

Straight Bilateral Retouching -- Longitudinal-Transverse Action (Figure 12 j)

Number of specimens: 1; complete 1
Description: This tertiary flake has secondary retouching on two edges. One edge has flakes removed from its dorsal surface while the other alternates between dorsal and ventral. This latter edge also tends to be rather sinuous.
Dimensions:
Retouched edges (length): 14.6 mm. and 36.5 mm.
Size (length X width X thickness): 46.9 mm. X 37.0 mm. X 10.0 mm.
Edge angle: 57 and 80 degrees
Provenience: Table 5

Lithic material: Table 6

Comments: The relatively steep edge angle and unifacial spalling present on one edge tends to indicate a possible use as a scraping implement while the other edge, which exhibits alternate spalling, has an uncertain function.

Straight Bilateral Retouching -- Transverse Action (Figure 12 k)

Number of specimens: 2; complete 1; broken 1

Description: Both of these specimens have two linear, scarred edges. The complete specimen has also been worked on the distal end. The broken flake has been scarred on its dorsal surface while the complete flake has been worked on its ventral face. Both of these specimens are tertiary decortication flakes.

Dimensions:

Retouched edges (length):

Lateral edges: 8.1 mm. - 26.4 mm.

Distal edge: 11.3 mm.

Size (length X width X thickness): 19.5 mm. - 24.2 mm. X 13.8 mm. - 30.7 mm. X 3.3 mm. - 7.7 mm.

Edge angle: 67-88 degrees

Provenience: Table 5

Lithic material: Table 6

Comments: Relatively steep edge angles, non-sinuous edges and unifacial spalling indicate that these flakes may have possibly been used as scraping implements.

Flake Implement Series Ig (Irregular Bilateral Retouching)

This inventory of flake implements has been subdivided into three categories: longitudinal action or cutting implements, longitudinal-transverse action or multi-purpose implements, and transverse action or scraping implements.

Irregular Bilateral Retouching -- Longitudinal Action (Figure 12 l)

Number of specimens: 1; complete 1

Description: This tertiary decortication flake exhibits secondary spalling mainly on its ventral surface.

Dimensions:

Retouched edges (length): 10.1 mm. and 15.1 mm.

Size (length X width X thickness): 17.3 mm. X 22.4 mm. X 4.1 mm.

Edge angle: 52 degrees

Provenience: Table 5

Lithic material: Table 6

Comments: This specimen exhibits bifacial spalling, a relatively low edge angle and somewhat irregular edges which may indicate possible usage as a cutting implement.

Irregular Bilateral Retouching -- Longitudinal-Transverse Action (Figure 12 m)

Number of specimens: 5; complete 3; broken 2

Description: This subcategory consists of implements which have one relatively straight edge and one irregular edge. Ventral surfaces on all but two of these flakes bear the primary spalling. The distal end of one specimen (dorsal surface) has also been utilized. One of these specimens represents a primary decortication flake while the other four are tertiary.

Dimensions:

Retouched edges (length):

Lateral edges: 9.0 mm. - 27.9 mm.

Distal edge: 9.5 mm.

Size (length X width X thickness): 25.2 mm. - 36.5 mm. X 21.2 mm. - 29.5 mm. X 5.2 mm. - 8.1 mm.

Edge angle: 55-84 degrees.

Provenience: Table 5

Lithic material: Table 6

Comments: These implements probably served a multifunctional purpose. Secondary spalling on both surfaces indicates possible cutting implements while unifacial edges with steeper edge angles indicate possible scraping implements.

Irregular Bilateral Retouching -- Transverse Action (Figure 12 n)

Number of specimens: 1; broken 1

Description: This tertiary decortication flake exhibits bilateral spalling on its dorsal surface.

Dimensions:
Retouched edges (length): 8.7 mm. and 10.1 mm.
Size (length X width X thickness): 25.6 mm. X 35.8 mm. X 7.6 mm.
Edge angle: 60-71 degrees
Provenience: Table 5
Lithic material: Table 6
Comments: Uniform edges, relatively steep edge angles, and unifacial scars indicate possible use as a scraping implement.

Flake Implement Series Ih (Alternate Bilateral Retouching)

This series has been divided into three subcategories: longitudinal action or cutting implements, longitudinal-transverse action or multiple function implements, and transverse action or scraping implements.

Alternate Bilateral Retouching -- Longitudinal Action (Figure 12 p)

Number of specimens: 4; complete 1; broken 3
Description: These tertiary decortication flakes have secondary spalling along their lateral edges with a primary series located on each surface.
Dimensions:
Retouched edges (length): 8.1 mm. - 18.7 mm.
Size (length X width X thickness): 13.2 mm. - 32.9 mm. X 22.7 mm. - 29.4 mm. X 5.0 mm. - 10.0 mm.
Edge angle: 64-75 degrees
Provenience: Table 5
Lithic material: Table 6
Comments: Despite relatively steep edge angles, sinuous edges and bifacial spalling may indicate possible usage as cutting implements.

Alternate Bilateral Retouching -- Longitudinal-Transverse Action (Figure 12 q)

Number of specimens: 2; complete 1; broken 1
Description: One secondary and one tertiary decortication flake are represented in this sample. They are characterized by secondary spalling occurring mainly on opposing surfaces. Edge outlines tend to be irregular in form.

Dimensions:

Retouched edges (length): 5.7 mm. - 16.7 mm.

Size (length X width X thickness): 13.8 mm. - 33.9 mm. X 23.9 mm. - 32.4 mm. X 6.9 mm. - 11.2 mm.

Edge angle: 51-56 degrees and 75-81 degrees

Provenience: Table 5

Lithic material: Table 6

Comments: These specimens may have been multi-purpose tools. The low edge angle and a bifacially spalled lateral edge indicate possible use as a cutting implement while the opposite side has a steeper angle and unifacial spalling indicating a possible scraping function.

Alternate Bilateral Retouching -- Transverse Action (Figure 12 r)

Number of specimens: 4; complete 2; broken 2

Description: These four tertiary flakes exhibit secondary spalling on the two edges of the opposing faces. This flaking, however, is unifacial in nature.

Dimensions:

Retouched edges (length): 8.3 mm. - 21.8 mm.

Size (length X width X thickness): 25.6 mm. - 39.1 mm. X 24.7 mm. - 38.9 mm. X 5.3 mm. - 15.1 mm.

Edge angle: 55-85 degrees

Provenience: Table 5

Lithic material: Table 6

Comments: Relatively steep edge angles and unifacial spalling appear to indicate possible usage as scraping implements.

Flake Implement Series Ii (Straight Unilateral and Distal End Retouching, Figure 12 o).

Number of specimens: 1; complete 1

Description: This tertiary flake has been ventrally spalled along a lateral edge and its distal end.

Dimensions:

Retouched edges (length): 11.3 mm. and 12.4 mm.

Size (length X width X thickness): 22.4 mm. X 28.6 mm. X 9.2 mm.

Edge angle: 82 and 85 degrees

Table 5. Provenience of Incidentally Modified Flake Implements.

SQUARE	TEST 1					TEST 2			S3-W5					S7-W2				S9-W2					
CATEGORY / LEVEL	1	2	3	4	5	1	2	3	1	2	3	4	5	1	2	3	4	1	2	3	4	5	6
INCIDENTALLY MODIFIED FLAKE IMPLEMENTS																							
FIS-Ia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
FIS-Ib	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FIS-Ic (LA)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FIS-Ic (TA)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FIS-Id (LA)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	1	-	-	-	-
FIS-Id (TA)	1	2	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
FIS-Ie	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FIS-If (LA)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FIS-If (LTA)	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FIS-If (TA)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FIS-Ig (LA)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FIS-Ig (LTA)	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FIS-Ig (TA)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FIS-Ih (LA)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FIS-Ih (LTA)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
FIS-Ih (TA)	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FIS-Ii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

SQUARE	S10-W16					S12-W14					S12-W15					S19-W12		N1-E16			N10-0					
CATEGORY / LEVEL	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	1	2	3	1	2	3	4	5	6
INCIDENTALLY MODIFIED FLAKE IMPLEMENTS																										
FIS-Ia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FIS-Ib	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FIS-Ic (LA)	-	-	-	-	-	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1	-	-
FIS-Ic (TA)	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-
FIS-Id (LA)	-	-	-	-	-	2	1	-	2	-	-	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-
FIS-Id (TA)	-	-	-	-	-	2	-	-	1	-	-	-	-	-	-	-	-	-	2	-	-	1	-	-	-	-
FIS-Ie	-	-	1	-	-	1	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-
FIS-If (LA)	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
FIS-If (LTA)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FIS-If (TA)	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
FIS-Ig (LA)	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FIS-Ig (LTA)	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FIS-Ig (TA)	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
FIS-Ih (LA)	-	-	-	-	-	1	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
FIS-Ih (LTA)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FIS-Ih (TA)	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FIS-Ii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

SQUARE	N15-E11				N20-E10				0-E5						S3-E11				S12-E7			S14-E3					S20-E10					S*	T*
CATEGORY / LEVEL	1	2	3	4	1	2	3	4	1	2	3	4	5	6	1	2	3	4	1	2	3	1	2	3	4	5	1	2	3	4	5		
INCIDENTALLY MODIFIED FLAKE IMPLEMENTS																																	
FIS-Ia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		1
FIS-Ib	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		1
FIS-Ic (LA)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1	1	2	1	-	1	-	-	-	-	-	-		10
FIS-Ic (TA)	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-		4
FIS-Id (LA)	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-		15
FIS-Id (TA)	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	1	-	-	-	-	2	-	-	1	1	-	1	-	-	1	-		20
FIS-Ie	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		4
FIS-If (LA)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		2
FIS-If (LTA)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		1
FIS-If (TA)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		2
FIS-Ig (LA)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		1
FIS-Ig (LTA)	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-		5
FIS-Ig (TA)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		1
FIS-Ih (LA)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-		4
FIS-Ih (LTA)	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		2
FIS-Ih (TA)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-	-		4
FIS-Ii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-		1

Table 5. Provenience of Incidentally Modified Flake Implements.

SQUARE	TEST 1					TEST 2			S3-W5					S7-W2				S9-W2						S10-W16				
CATEGORY / LEVEL	1	2	3	4	5	1	2	3	1	2	3	4	5	1	2	3	4	1	2	3	4	5	6	1	2	3	4	5
INCIDENTALLY MODIFIED FLAKE IMPLEMENTS																												
FIS-Ia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
FIS-Ib	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FIS-Ic (LA)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FIS-Ic (TA)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FIS-Id (LA)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	1	-	-	-	-	-	-	-	-	-
FIS-Id (TA)	1	2	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
FIS-Ie	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
FIS-If (LA)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FIS-If (LTA)	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FIS-If (TA)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FIS-Ig (LA)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FIS-Ig (LTA)	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FIS-Ig (TA)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FIS-Ih (LA)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FIS-Ih (LTA)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
FIS-Ih (TA)	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FIS-Ii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

SQUARE	S12-W14					S12-W15					S19-W12		N1-E16			N10-0						N15-E11			
CATEGORY / LEVEL	1	2	3	4	5	1	2	3	4	5	1	2	1	2	3	1	2	3	4	5	6	1	2	3	4
INCIDENTALLY MODIFIED FLAKE IMPLEMENTS																									
FIS-Ia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FIS-Ib	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FIS-Ic (LA)	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
FIS-Ic (TA)	-	-	-	-	-	-	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
FIS-Id (LA)	2	1	-	2	-	-	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FIS-Id (TA)	2	-	-	1	-	-	-	-	-	-	-	-	-	2	-	-	1	-	-	-	-	-	-	-	-
FIS-Ie	1	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FIS-If (LA)	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FIS-If (LTA)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FIS-If (TA)	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
FIS-Ig (LA)	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FIS-Ig (LTA)	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FIS-Ig (TA)	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FIS-Ih (LA)	1	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FIS-Ih (LTA)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FIS-Ih (TA)	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FIS-Ii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

SQUARE	N20-E10				0-E5						S3-E11				S12-E7			S14-E3					S20-E10					S*	T*
CATEGORY / LEVEL	1	2	3	4	1	2	3	4	5	6	1	2	3	4	1	2	3	1	2	3	4	5	1	2	3	4	5		
INCIDENTALLY MODIFIED FLAKE IMPLEMENTS																													
FIS-Ia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
FIS-Ib	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
FIS-Ic (LA)	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1	1	2	1	-	1	-	-	-	-	-	-	-	10
FIS-Ic (TA)	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	4
FIS-Id (LA)	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-	15
FIS-Id (TA)	-	-	-	2	-	-	-	-	-	-	-	1	-	-	-	-	2	-	-	1	1	-	1	-	-	1	-	-	20
FIS-Ie	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
FIS-If (LA)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
FIS-If (LTA)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
FIS-If (TA)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
FIS-Ig (LA)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
FIS-Ig (LTA)	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	5
FIS-Ig (TA)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
FIS-Ih (LA)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	4
FIS-Ih (LTA)	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
FIS-Ih (TA)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-	4
FIS-Ii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1

	Non-Heat Treated						Heat Treated						
	Keokuk	Reeds Spring	Moorefield	Residual Boone	Unidentified	Sub-Total	Keokuk	Reeds Spring	Moorefield	Residual Boone	Unidentified	Sub-Total	TOTAL
FIS-Ia	--	1	--	--	--	1	--	--	--	--	--	0	1
FIS-Ib	--	--	--	1	--	1	--	--	--	--	--	0	1
FIS-Ic(LA)	2	3	5	--	--	10	--	--	--	--	--	0	10
FIS-Ic(TA)	2	--	--	1	--	3	--	1	--	--	--	1	4
FIS-Id(LA)	4	--	9	2	1	16	--	--	--	--	--	0	16
FIS-Id(TA)	2	5	5	1	--	13	7	--	--	--	--	7	20
FIS-Ie	--	2	1	--	--	3	--	--	--	--	--	0	3
FIS-If(LA)	--	1	1	--	--	2	--	--	--	--	--	0	2
FIS-If(LTA)	--	--	1	--	--	1	--	--	--	--	--	0	1
FIS-If(TA)	--	2	--	--	--	2	--	--	--	--	--	0	2
FIS-Ig(LA)	--	1	--	--	--	1	--	--	--	--	--	0	1
FIS-Ig(LTA)	--	2	2	--	--	4	1	--	--	--	--	1	5
FIS-Ig(TA)	--	--	1	--	--	1	--	--	--	--	--	0	1
FIS-Ih(LA)	1	2	1	--	--	4	--	--	--	--	--	0	4
FIS-Ih(LTA)	--	--	2	--	--	2	--	--	--	--	--	0	2
FIS-Ih(TA)	2	1	--	--	--	3	--	1	--	--	--	1	4
FIS-Ii	--	1	--	--	--	1	--	--	--	--	--	0	1
TOTAL	13	21	28	5	1	68	8	2	0	0	0	10	78

Table 6. Lithic Material of Incidentally Modified Flake Implements

Intentionally Modified Flake Implements -- Flake Implement Series II.

A uniform occurrence of small chipping scars along one or more marginal edges characterize these implements. Quite probably this inventory represents reduction flakes which were originally employed because of certain specific attributes -- such as blade length, edge angles, etc. Then, because of dulling resulting from use, they were retouched and reused. Frison (1968:152) noted a similar situation among artifacts recovered from Piney Creek, Wyoming. Such factors as the material's physical properties, edge angles and thickness must have been considered by the aboriginal user. Therefore, rather than throwing an implement away because its edges had simply become dull, it would be retouched or resharpened. Recycling resulted from the user's familiarity with the implements handling and physical characteristics. From such information, we may postulate that the lithic industry at My-140 may have followed a similar pattern of recycling. This would represent a highly efficient system not based on waste to any great extent. In the following categories the location of these retouching scars and microwear patterns are the determining factors for classification.

Flake Implement Series IIa (Concave Scrapers, Figure 13a and b)

Number of specimens: 5; complete 3; broken 2
Description: A concave retouched area occurs on one lateral edge of these flakes. The alternate face (dorsal surface) of the opposing edge on one specimen has also been retouched. Concave retouching occurs on the dorsal face of three flakes while the other two have been retouched on the ventral surface. All of these specimens are tertiary flakes.
Dimensions:
Retouched edge (length X depth): 9.0 mm. - 12.6 mm. X 1.4 mm. - 2.0 mm.
Size (length X width X thickness): 14.5 mm. - 51.5 mm. X 14.6 mm. - 27.2 mm. X 3.1 mm. - 9.7 mm.
Edge angle: 60-65 degrees
Provenience: Table 7
Lithic material: Table 8

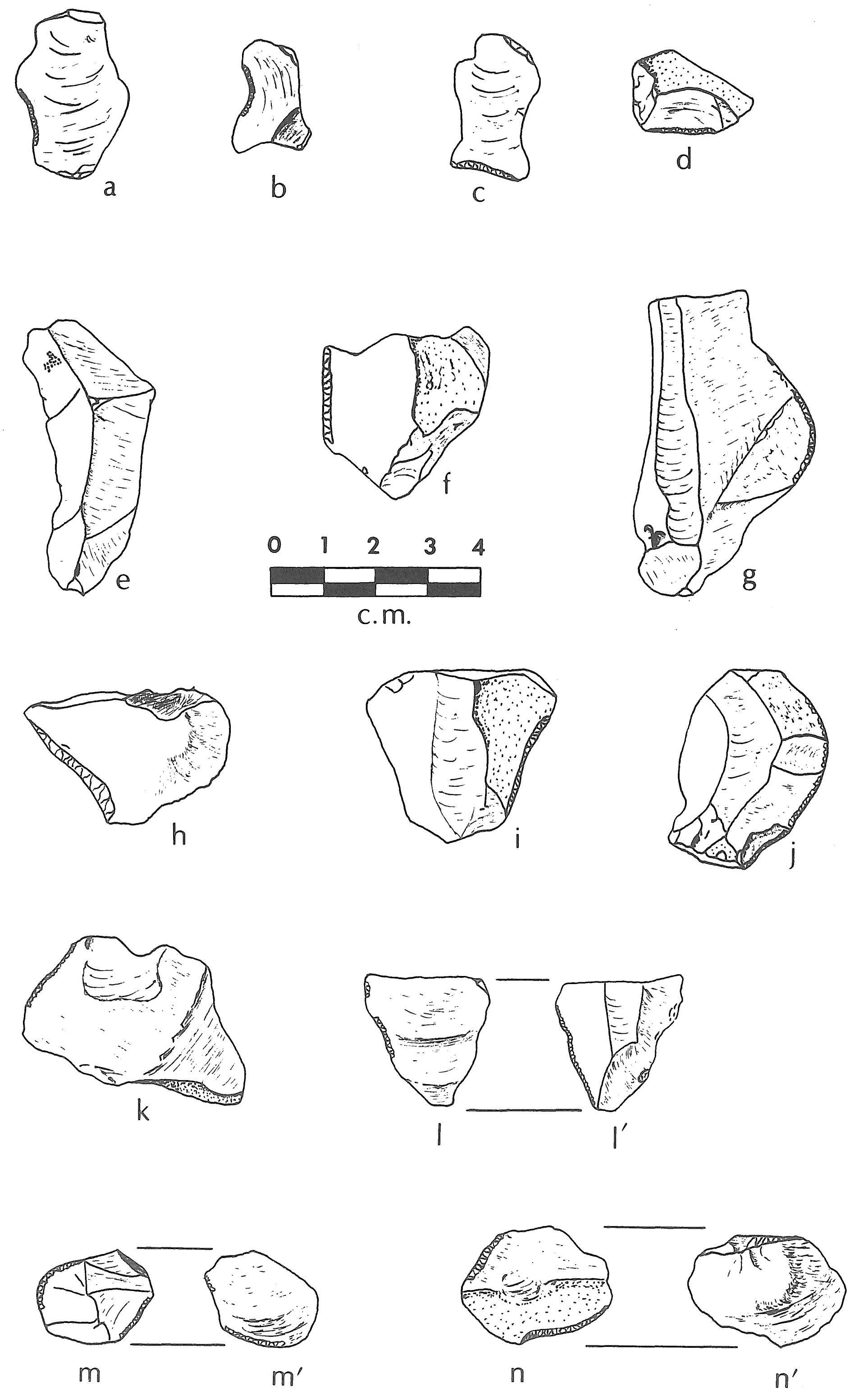

Figure 13. Intentionally Modified Flake Implements – Flake Implement Series II: a and b, FIS-IIa; c and d, FIS-IIb; e, FIS-IIc; f, FIS-IId; g, FIS-IIe Longitudinal Action; h, FIS-IIe Transverse Action; i, FIS-IIf; j, FIS-IIg Longitudinal Action; k, FIS-IIg Transverse Action; l, FIS-IIh Longitudinal Action; m, FIS-IIh Longitudinal – Transverse Action; n, FIS-IIh Transverse Action.

Comments: These implements may have been employed in woodworking activities such as shaping and finishing of shafts or handles. Previously, similar implements have been referred to as spokeshaves.

Flake Implement Series IIb (Distal End Retouching, Figure 13c and d)

Number of specimens: 15; complete 10; broken 5
Description: The distal edge on these specimens has been steeply retouched. All but five of these flakes exhibit such scars on their dorsal surfaces. Three are secondary decortication flakes while the remainder are tertiary flakes. Edge outlines tend to be concave (1), convex (2), straight (9) or irregular (3).
Dimensions:
Retouched edge (length): 7.4 mm. - 25.0 mm.
Size (length X width X thickness of complete specimens): 14.1 mm. - 32.7 mm. X 16.7 mm. - 48.7 mm. X 4.2 mm. - 13.0 mm.
Edge angle: 65-80 degrees
Provenience: Table 7
Lithic material: Table 8
Comments: Scraping implements are implied by the steepness of edge angles and lack of any secondary spalling on the opposing surface.

Flake Implement Series IIc (Proximal Shoulder Retouching, Figure 13e)

Number of specimens: 5; complete 5
Description: Secondary flaking on the descending shoulder from the striking platform distinguishes this category. Three specimens have been worked on the ventral surface while the remainder have been retouched on the dorsal surface. In the former case, retouching occurs along the right shoulder (when facing the proximal end -- dorsal side up) of two specimens and the left shoulder of the other. Meanwhile, in the case of the dorsally retouched flakes, chipping scars are found on the left shoulder. One specimen also exhibits step-flaking along the alternate lateral edges. Another flake has been intentionally modified along the lateral edge just below the retouched shoulder. All of these specimens represent tertiary flakes.

Dimensions:

Retouched edge (length): 7.9 mm. - 23.2 mm.

Size (length X width X thickness): 27.6 mm. - 50.5 mm. X 22.0 mm. - 47.9 mm. X 6.1 mm. - 8.8 mm.

Edge angle: 60-67 degrees

Provenience: Table 7

Lithic material: Table 8

Comments: The steep edge angles, uniform edge outlines, and the absence of secondary spalling on the opposing surface indicate possible use as scraping, planing, or shaving implements.

Flake Implement Series IId (Straight Unilateral Retouching, Figure 13f)

Number of specimens: 22; complete 4; broken 18

Description: These implements are typified by a single linear retouched edge. Retouching scars occur on thirteen dorsal surfaces, eight ventral surfaces, and one undetermined surface. Three flakes are of the secondary decortication variety while the remainder are tertiary forms.

Dimensions:

Retouched edges (length of both complete and broken specimens): 5.9 mm. - 21.2 mm.

Size (length X width X thickness of complete specimens): 26.0 mm. - 31.7 mm. X 19.4 mm. - 31.3 mm. X 4.8 mm. - 7.6 mm.

Edge angle: 54-80 degrees

Provenience: Table 7

Lithic material: Table 8

Comments: The steep edge angles of these flakes are interpreted to suggest scraping, planing or shaving activities as the most common function. One implement exhibits step-flaking along its ventrally retouched edge. However, deep hinge fractures on the dorsal face of this flake have given it a distinctive stepped longitudinal cross-section. Such stepping may have possibly acted as a guide for the working of bone or antler. The thickness of the overhanging scraping region measures 5.8 mm. while the body, located distal to the scraping region, measures 12 mm.

Flake Implement Series IIe (Irregular Unilateral Retouching)

Under this heading three subcategories have been distinguished on the basis of microwear. These are longitudinal action or cutting implements, transverse action or scraping implements and an undetermined grouping.

Irregular Unilateral Retouching -- Longitudinal Action (Figure 13g)

Number of specimens: 8; complete 2; broken 6

Description: Retouching along a single irregular edge and one surface typifies this subcategory. Only one specimen exhibits flaking on its ventral surface. The remaining seven have been worked on their dorsal face. Two of these implements have been formed from secondary decortication flakes while the remainder are tertiary flakes.

Dimensions:

Retouched edges (length): 8.2 mm. - 50.6 mm.

Size (length X width X thickness): 14.0 mm. - 55.5 mm. X 12.4 mm. - 31.8 mm. X 3.1 mm. - 10.4 mm.

Edge angle: 46-65 degrees

Provenience: Table 7

Lithic material: Table 8

Comments: Although the upper range for these edge angles overlaps somewhat with the following subcategory the overall range indicates less steepness. At the same time, six implements exhibit incidental flake scars on the opposing surface of the retouched edge. These factors tend to indicate longitudinal action rather than transverse. From this information utilization as cutting implements may be implied.

Irregular Unilateral Retouching -- Transverse Action (Figure 13h)

Number of specimens: 9; complete 2; broken 7

Description: These nine flakes are retouched along a single edge and face. The chipping scars are uniform in nature while the edge outline is irregular. Six flakes exhibit dorsal retouching with ventral chipping occurring on the remainder. There are one secondary flake and eight tertiary flakes in this category.

Dimensions:

Retouched edges (length): 6.8 mm. - 20.8 mm.

Size (length X width X thickness): 16.5 mm. - 38.5 mm. X 17.3 mm. - 39.0 mm. X 3.5 mm. - 17.2 mm.

Edge angle: 62-79 degrees

Provenience: Table 7

Lithic material: Table 8

Comments: Because of the uniform nature of the retouching and steepness of the edge angle these implements may have served as scrapers, planes or shavers.

Irregular Unilateral Retouching -- Undetermined

Number of specimens: 3; broken 3

Description: These tertiary flakes exhibit short retouched edges which are somewhat irregular in outline. Two are retouched on their dorsal surface and one is worked on its ventral face.

Dimensions:

Retouched edge (length): 7.1 mm. - 11.3 mm.

Size (length X width X thickness): 7.0 mm. - 13.6 mm. X 14.2 mm. - 15.4 mm. X 2.1 mm. - 2.8 mm.

Edge angle: 51-79 degrees

Provenience: Table 7

Lithic material: Table 8

Comments: No functional interpretations have been determined for these specimens because of their short retouched edges and overall incompleteness.

Flake Implement Series IIf (Straight Bilateral Retouching, Figure 13i)

Number of specimens: 1; broken 1

Description: This secondary decortication flake is bilaterally retouched on its dorsal surface. Both edges are linear in outline.

Dimensions:

Retouched edges (length): 21.6 mm. and 22.9 mm.

Size (length X width X thickness): 30.9 mm. X 35.9 mm. X 7.0 mm.

Edge angle: 65 and 75 degrees

Provenience: Table 7

Lithic material: Table 8

Comments: The steepness of the edge angle may possibly indicate that this implement has been used as a scraper.

Flake Implement Series IIg (Irregular Bilateral Retouching)

Two subcategories, based on microwear patterns, have been established under this heading. These are flakes with longitudinal action or cutting implements and flakes with transverse action or scraping implements.

Irregular Bilateral Retouching -- Longitudinal Action (Figure 13j)

Number of specimens: 4; complete 1; broken 3

Description: These flakes are intentionally chipped on both lateral edges of the same surface. The complete specimen has also been retouched on its distal end. Three have been retouched on their dorsal surface while the other specimen has been reworked on its ventral surface. All of these implements are tertiary decortication flakes.

Dimensions:

Retouched edges (length):

Lateral edges: 13.6 mm. - 35.0 mm.

Distal edge: 15 mm.

Size (length X width X thickness): 20.7 mm. - 37.8 mm. X 20.9 mm. - 30.8 mm. X 4.3 mm. - 7.8 mm.

Edge angle: 60-70 degrees

Provenience: Table 7

Lithic material: Table 8

Comments: Despite the relatively steep edge angles of these specimens, the irregular, slightly serrated edges combined with secondary spalling flakes on the opposing surfaces may indicate possible cutting implements.

Irregular Bilateral Retouching -- Transverse Action (Figure 13k)

Number of specimens: 3; complete 1; broken 2

Description: Intentional flaking on the irregular lateral edges of the dorsal surface define this subcategory. These specimens represent tertiary decortication flakes.

Dimensions:
Retouched edges (length): 11.2 mm. - 23.0 mm.
Size (length X width X thickness): 22.2 mm. - 36.0 mm. X 25.4 mm. - 42.0 mm. X 4.9 mm. - 7.6 mm.
Edge angle: 55-75 degrees
Provenience: Table 7
Lithic material: Table 8
Comments: Steep edge angles and unifacial wear patterns appear to indicate possible use as scraping implements.

Flake Implement Series IIh (Alternate Bilateral Retouching)

Based on microwear studies this category has been divided into three subgroupings: longitudinal action or cutting implements, longitudinal - transverse action or cutting-scraping implements and transverse action or scraping implements.

Alternate Bilateral Retouching -- Longitudinal Action (Figure 13 1)

Number of specimens: 7; complete 2; broken 5
Description: The alternate opposing edges of these specimens have been retouched. In other words, one intentionally worked edge is located on the dorsal surface while the other edge is found on the ventral face. One specimen has also been retouched on its distal end. All of these implements are tertiary decortication flakes.
Dimensions:
Retouched edges (length):
Lateral edges: 12.1 mm. - 29.3 mm.
Distal edge: 11.6 mm.
Size (length X width X thickness): 18.5 mm. - 37.8 mm. X 22.7 mm. - 38.9 mm. X 3.8 mm. - 13.3 mm.
Edge angle: 64-76 degrees
Provenience: Table 7
Lithic material: Table 8
Comments: Cutting implements represent the most probable use of these implements because of their irregular and serrated edges as well as the numerous incidental flake scars on the opposing surfaces.

Alternate Bilateral Retouching -- Longitudinal-Transverse Action (Figure 13 m)

Number of specimens: 2; broken 2
Description: Both of these tertiary decortication flakes have been retouched on two opposing surfaces similar to the previous category.
Dimensions:
Retouched edges (length): 13.7 mm. - 19.0 mm.
Size (length X width X thickness): 17.1 mm. - 18.0 mm. X 21.4 mm. - 26.3 mm. X 3.5 mm. - 4.2 mm.
Edge angle: 62-70 degrees
Provenience: Table 7
Lithic material: Table 8
Comments: These specimens appear to have a multi-purpose function. Secondary flake spalls and serration indicate that one edge may have possibly been used for cutting. The other edge, however, lacks these features which may indicate scraping implements.

Alternate Bilateral Retouching -- Transverse Action (Figure 13 n)

Number of specimens: 1; complete 1
Description: This secondary decortication flake has been intentionally retouched around its entire perimeter. Most of the secondary flaking has occurred on the dorsal surface. Yet, there is a small portion of the proximal end which has been worked on the ventral face.
Dimensions:
Retouched edge (perimeter length): 57.7 mm.
Size (length X width X thickness): 22.9 mm. X 29.2 mm. X 6.3 mm.
Edge angle: 75-80 degrees
Provenience: Table 7
Lithic material: Table 8
Comments: The steep edge angle and uniform nature of the secondary retouching may possibly indicate that this flake was used as a scraping implement.

7. Lithic Trajectory Debitage

During the process of lithic reduction, mass is removed and overall shape is produced by percussion and

CATEGORY / SQUARE / LEVEL	TEST 1					TEST 2			S3-W5					S7-W2				S9-W2						S10-W16					S12-W14					S12-W15					S19-W12		N1-E16			N10-0						N15-E11				N20-E10				0-E5						S3-E11				S12-	
	1	2	3	4	5	1	2	3	1	2	3	4	5	1	2	3	4	1	2	3	4	5	6	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	1	2	3	1	2	3	4	5	6	1	2	3	4	1	2	3	4	1	2	3	4	5	6	1	2	3	4	1	2
INTENTIONALLY MODIFIED FLAKE IMPLEMENTS																																																																					
FIS-IIa	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
FIS-IIb	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1	-	-	-	2	-	-	-	1	1	1	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1	1	-	-	-	-	1	-	-	-	-	-
FIS-IIc	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1
FIS-IId	1	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-	1	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-	-	1	-	-	-	-	-	-	2	1
FIS-IIe (LA)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
FIS-IIe (TA)	2	-	-	1	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FIS-IIe (UND)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FIS-IIf	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FIS-IIg (LA)	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
FIS-IIg (TA)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1	-	-	1
FIS-IIh (LA)	-	-	-	-	-	-	-	-	-	1	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
FIS-IIh (LTA)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1
FIS-IIh (TA)	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Grinding Stones	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 7. Provenience of Intentially Modified Flake Implements.

EST 1			TEST 2			S3-W5					S7-W2				S9-W2						S10-W16					S12-W14					S12-W15					S19-W12		N1-E16			N10-0						N15-E11				N20-E10				0-E5						S3-E11				S12-E7			S14-E3					S20-E10					S*	T*
3	4	5	1	2	3	1	2	3	4	5	1	2	3	4	1	2	3	4	5	6	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	1	2	3	1	2	3	4	5	6	1	2	3	4	1	2	3	4	1	2	3	4	5	6	1	2	3	4	1	2	3	1	2	3	4	5	1	2	3	4	5		
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5
-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1	-	-	-	2	-	-	-	1	1	1	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1	1	-	-	-	-	1	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	15
-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	5
-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-	1	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-	-	1	-	-	-	-	-	-	2	1	1	1	-	1	-	1	-	2	-	-	-	-	22
-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1	-	1	-	-	-	1	-	-	-	8
-	1	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	9
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	3
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	Non-Heat Treated						Heat Treated						
	Keokuk	Reeds Spring	Moorefield	Residual Boone	Unidentified	Sub-Total	Keokuk	Reeds Spring	Moorefield	Residual Boone	Unidentified	Sub-Total	TOTAL
FIS-IIa	2	--	1	2	--	5	--	--	--	--	--	0	5
FIS-IIb	9	--	4	1	1	15	--	--	--	--	--	0	15
FIS-IIc	3	--	1	1	--	5	--	--	--	--	--	0	5
FIS-IId	10	--	5	5	2	22	--	--	--	--	--	0	22
FIS-IIe(LA)	6	--	1	1	--	8	--	--	--	--	--	0	8
FIS-IIe(TA)	4	--	3	1	1	9	--	--	--	--	--	0	9
FIS-IIe(UND)	2	--	1	--	--	3	--	--	--	--	--	0	3
FIS-IIf	1	--	--	--	--	1	--	--	--	--	--	0	1
FIS-IIg(LA)	3	--	1	--	--	4	--	--	--	--	--	0	4
FIS-IIg(TA)	2	--	1	--	--	3	--	--	--	--	--	0	3
FIS-IIh(LA)	5	--	2	--	--	7	--	--	--	--	--	0	7
FIS-IIh(LTA)	1	--	1	--	--	2	--	--	--	--	--	0	2
FIS-IIh(TA)	1	--	--	--	--	1	--	--	--	--	--	0	1
TOTAL	49	0	21	11	4	85	0	0	0	0	0	0	85

Table 8. Lithic Material of Intentionally Modified Flake Implements

pressure flaking. In other words, lithic debitage consists of chert or dolomite fragments resulting from the manufacture, employment and rejuvenation of stone implements. These specimens differ from the previously discussed flake implement series in that they display no evidence of either incidental or intentional modification. Yet, in some cases, such evidence may not be readily apparent. For example, flakes used in butchering activities tend to accumulate fatty deposits and unless used for longer than four minutes tend not to show wear patterns (Brose 1975:93). Also, "Where large amounts of preferred raw material exist there are apt to be fewer observed striations, as there would be little need to exceed, or even approach, loss-of-function times" (Brose 1975:93). Be that as it may, this inventory of lithic debitage is not considered functional implements.

Although this material has been generally ignored by archaeologists until recently, such debitage plays an important role in the analysis section of this report. As will be seen lithic debitage is useful for determining the number of components, for providing insights into a lithic trajectory system, for establishing cultural affinities and for investigating activity patterns at a particular site.

The following descriptions of lithic debitage at My-140 have been divided into eight categories similar to those used by Schneider (1972), Wyckoff (1973:72-74) and Hofman (1975:49-58).

Because of time limitations all of the flakes from six selected squares were examined. These six squares, out of eighteen excavated, were chosen on the basis of distribution and number of removed levels or depth. The site itself was divided into quadrants with the northwest quarter proving to be sterile. From the remainder, two squares were selected from each of the three quadrants. These included N20-E10, N10-0, S12-E7, S14-E3, S12-W14, and S12-W15. The flakes from these squares may be considered representative of the total inventory.

In the analysis section some of these categories may be combined while others are excluded altogether to enhance our understanding of the reduction strategies employed at My-140. The eight categories are: primary decortication flakes, secondary decortication flakes, tertiary flakes, thinning flakes, broken decortication flakes, broken flakes without cortex, fire fractured flakes, and miscellaneous lithic debitage. The broken flake categories have been included since they lack a proximal end containing the striking platform and bulb of percussion. Without these features a finer classification as to type of biface reduction flake is not possible. By examining the distribution of fire fractured flakes and miscellaneous lithic debitage it is sometimes possible to distinguish hearth areas at a site.

Lithic Debitage Flakes

Primary Decortication Flakes (Figure 14)

Number of specimens: 47

Description: These are the first flakes to be removed from a pebble, cobble or nodule. Therefore, they may be considered to represent initial reduction processes. For this reason, they are characterized by cortex on their entire dorsal or outer surface. They also tend to be expanding in form. Generally, striking platforms are not prepared since the cortex itself provides strength. Yet, in some cases, the striking platform itself may not exhibit cortex. Bulbs of percussion tend to be well pronounced.

Provenience: Table 9

Lithic material: Table 10

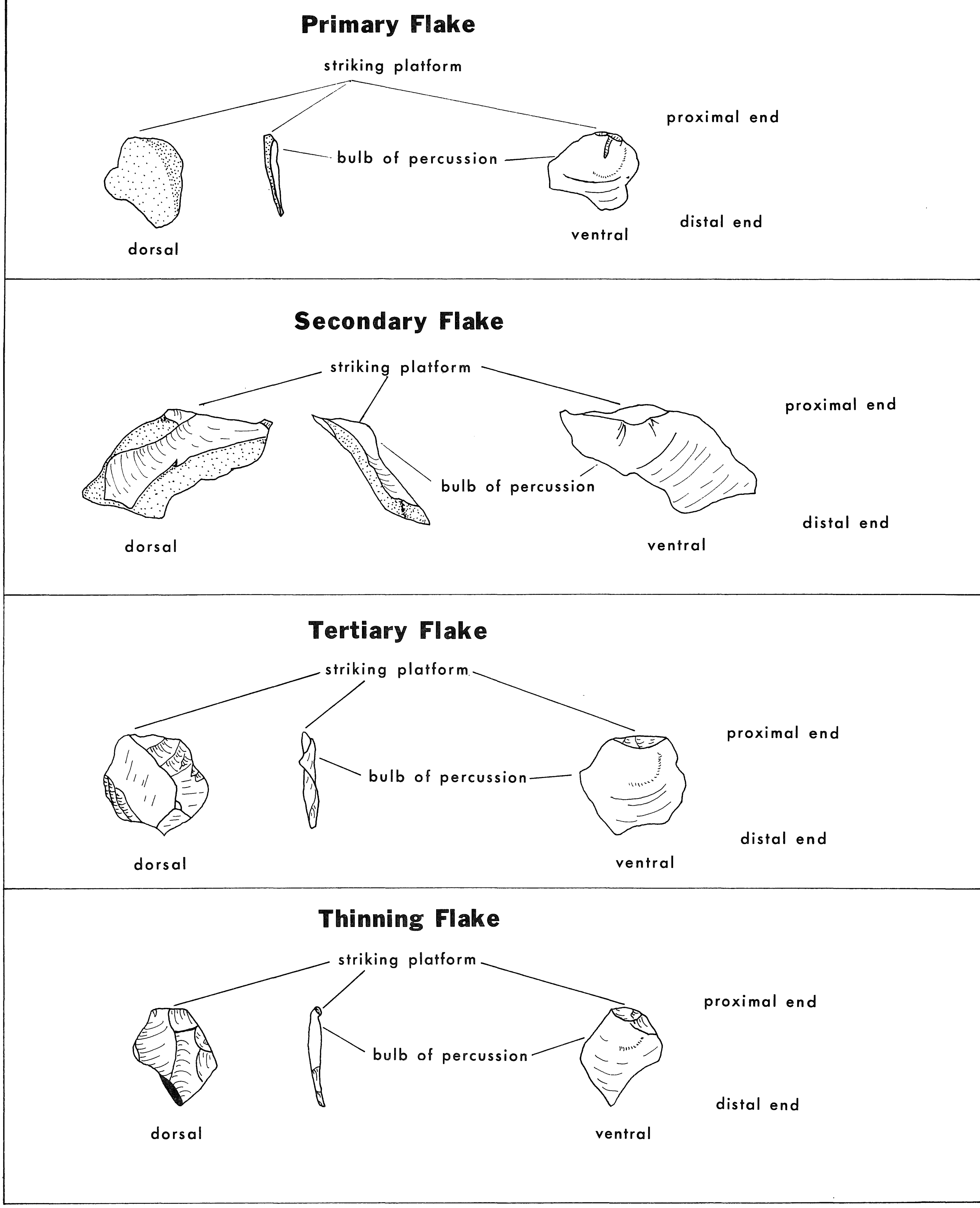
Secondary Decortication Flakes (Figure 14)

Number of specimens: 149

Description: Like primary decortication flakes, these specimens may represent initial reduction, but more commonly they represent intermediate reduction processes. On this basis then they tend to have 30% or more cortex on their dorsal surface. At the same time, their outer surface exhibits ridges and scars from previously removed flakes. These ridges tend to determine flake form as the percussion shock waves move along these lines (cf. Faulkner 1972). Although cortex tends to strengthen their striking platforms, nearly five times as many secondary flakes as compared to primary flakes exhibit

Figure 14

FLAKE TYPES AND ATTRIBUTES



grinding or crushing. Similar to primary decortication flakes these specimens tend to expand distally and exhibit a prounounced bulb of percussion.

Provenience: Table 9

Lithic material: Table 10

Tertiary Retouching Flakes (Figure 14)

Number of specimens: 932

Description: These flakes are representative of primary and secondary modification processes. Their dorsal surface exhibits ridges and scars from prevously removed flakes with little or no cortex remaining. Striking platforms tend to be flat and unifacial, although faceting occurs on about 16% of these specimens. Platform preparation in the form of grinding or crushing appears on approximately 20% of these flakes. Both pronounced and diffuse bulbs appear in this sample.

Provenience: Table 9

Lithic material: Table 10

Biface Thinning Flakes (Figure 14)

Number of specimens: 271

Description: These flakes tend to be representative of final preparation and recycling processes. There is little or no cortex present on the dorsal surface which exhibits previously removed flakes, scars and ridges. The striking platform for these flakes tends to be situated at a more acute angle than previous flake types. Platforms also exhibit preparation in the form of multifaceting and display a high degree of lipping. The bulb of percussion tends to be quite diffuse with relatively few erailure scars. Flake form for this category tends to be parallel, contracting, or expanding.

Provenience: Table 9

Lithic material: Table 10

Broken Decortication Flakes

Number of specimens: 503

Description: The proximal end of these primary and secondary decortication flakes is missing. Because

of this no determination concerning specific flake type or platform preparation can be made. However, this category is representative of initial and intermediate reduction processes.
Provenience: Table 9
Lithic material: Table 10

Broken Flakes Without Cortex

Number of specimens: 2679
Description: This category includes the distal ends of secondary, tertiary, and bifacial thinning flakes and are assumed to represent primary and intermediate modification as well as final preparation and recycling processes.
Provenience: Table 9
Lithic material: Table 10

Fire Fractured Flakes

Number of specimens: 306
Description: These flakes exhibit fire spalling or fracturing which was accidental in nature. Although no discernable features were found at My-140, this flake category may provide some evidence concerning hearths, and/or initial or intermediate processes of reduction.
Provenience: Table 9
Lithic material: Table 10

Miscellaneous Lithic Debitage

Number of specimens: 96
Description: This residual category includes angular or blocky pieces of chert which cannot be placed with any of the above types. These specimens exhibit flake scars but lack such attributes as striking platforms, bulbs of percussion, and readily recognized dorsal or ventral surfaces.
Provenience: Table 9
Lithic material: Table 10

8. Ground Stone Implements

These tools fall outside of the previously discussed lithic reduction trajectory, yet, their value in

Table 9. Provenience of Lithic Debitage

Square	S12-W14					S12-W15					N10-0						N20-E10				S14-E3					S12-E7			
Level	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	6	1	2	3	4	1	2	3	4	5	1	2	3	TOTAL
Flake Type																													
Primary	3	--	3	2	--	4	1	3	--	--	1	1	--	--	--	--	2	--	--	--	2	5	1	6	--	3	3	7	47
Secondary	13	9	5	6	3	2	7	7	4	--	2	--	--	--	--	2	--	1	--	--	6	12	6	16	--	16	16	13	146
Tertiary	56	70	34	18	7	26	72	34	27	2	24	18	10	11	6	12	5	3	2	--	25	81	73	148	3	76	47	43	933
Thinning	12	11	5	10	--	5	8	4	8	4	8	3	6	3	--	--	3	--	1	--	14	21	13	66	1	26	26	13	271
Broken with Cortex	16	10	12	13	5	26	20	23	14	3	16	7	3	5	4	3	--	3	4	--	33	33	24	102	2	62	38	24	505
Broken without Cortex	202	121	69	55	18	93	139	95	70	16	119	43	30	39	20	28	9	7	7	--	110	215	243	551	15	123	142	100	2679
Fire Fractured	19	19	8	1	2	14	16	11	10	6	12	--	--	2	1	2	2	1	--	--	18	24	37	63	1	27	18	7	321
Miscellaneous	20	3	2	3	--	1	2	3	--	1	--	--	--	--	--	2	--	--	--	--	5	2	3	8	--	14	10	8	87
TOTAL	341	243	138	108	35	171	265	180	133	32	182	72	49	60	31	49	21	15	14	--	213	393	400	960	22	347	300	215	4989

Table 10. Lithic Debitage by Lithic Type

Lithic Material	Keokuk	Reeds Spring	Moorefield	Residual Boone	Cotter Dolomite	Unidentified	Total
Flake Type							
Primary	25	0	1	21	0	0	47
Secondary	97	2	9	34	0	4	146
Tertiary	585	39	96	205	4	4	933
Thinning	170	10	33	56	0	2	271
Broken with Cortex	253	8	43	198	3	0	505
Broken without Cortex	1444	211	157	827	4	36	2679
Fire Fractured	124	5	60	126	1	5	321
Miscellaneous	39	1	9	25	12	1	87
TOTAL	2737	276	408	1492	24	52	4989

cultural survival is indeed significant. Implements which appear under this heading were used for processing plant or mineral resources.

Grinding Stones (Figure 11 f and g).

Number of specimens: 5; broken 5.
Description: These fine grained sandstone cobble fragments have been smoothed on one surface (two specimens) or both surfaces (three specimens). Shaping may have occurred by pecking on some portion of their edges.
Dimensions:
Thickness (range): 37.7 mm. - 58.3 mm.
Mean thickness: 48.0 mm.
Provenience: Table 3
Comments: These implements were possibly used as manos in conjunction with a grinding basin or slab for the processing of seeds, nuts or other plant resources.

III

INTERPRETIVE ANALYSIS

Up to now this report has been concerned primarily with 1) data collection by explicating excavation procedures and 2) data integration by describing and classifying the recovered cultural material. These remains provide us with an idea of implement form and function which permit comparison and placement in time and space. Also, some clue as to the type of technological and economic endeavors of the occupants may be revealed. Yet, this information is superficial at best.

To arrive at a more meaningful set of answers dealing with technological and economic processes at a site, specific questions must be carefully formulated and relationships intensively analyzed. This approach requires precise techniques to be employed during excavation and analysis.

A. Intra-Site Analysis

A site is rarely completely excavated. At My-140, for example, less than one-half percent of the site's two to three acre surface area was excavated. Questions and answers concerning horizontal and vertical distribution, reconstruction of paleoenvironments, the number of cultural components, as well as the type and concentration of cultural features depend on the accuracy of these limited observations of data collection.

Turning first to horizontal distribution, the suspected occupation area was divided into four sections. Preliminary investigations such as testing soil zone depths and surface collections indicated that the northwest quarter was sterile. Squares were then placed in the northeast, southeast, and southwest quadrants. A concentration index for these three sections has been calculated based on the following formula:

$CI = N_a/N_sV$ Where: N_a = number of artifacts

N_s = number of squares V; = volume

This information is presented in Table 11.

Table 11

My-140 Artifact Concentration Indices by Site Quarters

Quadrant	N_a/N_sV	CI	%
Northeast	28/103.13	.27	8.41
Southeast	97/123.75	.78	29.13
Southwest	208/237.19	.88	62.46

From Table 11 the southern portion of the site is producing the greatest concentration of artifacts. The high disparity in percentage of recovered materials between the southeast and southwest quarters can be accounted for by almost twice as many squares being placed in the southwest quadrant. The greatest amount of material culture and, inferentially, cultural activity, then, occurred in this southern half as a possible unit. Our next question must necessarily examine cultural assemblages and components which directly relate to this unit.

The first of these, cultural assemblage, refers to a set of related implements restricted to a culturally distinct group of people (Willey and Phillips 1962:52; Wyckoff 1973:76). In other words, a social group exhibits patterns of economic exploitation which conforms with the ecological surroundings as well as their technological, ideological, political and social institutions. Once these patterns have been established they tend to remain relatively consistent until new situations are encountered. Even then social and cultural change tends to be a rather gradual transformation. These new situations may be presented by environmental fluctuations and/or by a series of cultural phenomena such as migration, integration, adaptation, innovation, diffusion or other factors. Secondly, a manifestation of cultural consistency at a particular site is referred to as a component

Table

ESTIMATED AGE RANGES FOR PROJECTILE POINTS
My-140

POINT TYPE	PREVIOUS ESTIMATED AGE	REFERENCE
Duncan	4450 B.P. - 2800 B.P. Middle to Late Archaic	Wheeler 1954:1 Perino 1971:26-27
Frio	3950 B.P. - 1450 B.P. Middle to Late Archaic	Suhm and Krieger 1954:428 Bell 1960:48-49
Hannah	4450 B.P. - 2800 B.P. Middle to Late Archaic	Wheeler 1954:1 Perino 1971:44-45
Marcos	3950 B.P. - 950 B.P. Middle to Late Archaic	Suhm and Krieger 1954:442 Bell 1958:42-43
McKean	3950 B.P. - 1750 B.P. Middle to Late Archaic	Wheeler 1952:45-50 Bell 1958:50-51
Uvalde	5950 B.P. - 950 B.P. Middle to Late Archaic	Suhm and Krieger 1954:486 Bell 1960:92-93
Johnson	6640 $\pm$ 70 B.P. (TX-1550)* Early to Middle Archaic	Bartlett 1963:28-29 Perino 1968:40-41

* Date supplied by Frank Schambach, Arkansas Archaeological Survey

(McKern 1939:308). Component identification allows archaeologists to obtain a clearer understanding of local and regional exploitation patterns by cultural groups both synchronically and diachronically.

Diagnostic implements such as projectile points should provide us with information on the number of assemblages at the Dawson site. Based on the clustering of these artifacts a temporal and spatial context may also be constructed. Following the integrative section of this report, most of the projectile points can be placed in a single assemblage. This assemblage relates to a middle through late Archaic occupation. Point types include Duncan, Frio, Hannah, Marcos, McKean, and Uvalde points. On the other hand, Johnson points are somewhat problematical. Normally they are considered to represent an early to middle Archaic context. However, these points at the Dawson site may represent previously utilized implements discovered later and put into service with minor retouching. Only one site, Pawpaw in southwestern Arkansas, has produced Johnson points in a context which has been radiocarbon dated (Schambach, personal communication).

Table 12 presents this datum along with the temporal spans for the other point types. These dates range between 7000 B.P. to 950 B.P. (5050 B.C. to A.D. 1000). More specifically we might tentatively suggest an estimated age for the Dawson site to fall between 4450 B.P. to 1450 B.P. (2500 B.C. to A.D. 500).

In considering the horizontal distribution of these points we find that seven have been recovered from the southwest section while eight are from the southeast quarter. The remaining ten points are from surface collections. Figures 15-18 present the horizontal distribution for not only point types but also for the major recovered implement categories from the Dawson site. From figures 16-18 we find that, out of 100 total reduction bifaces, 77 have been recovered from the southwest quadrant, 14 from the southeast, and 9 from the northeast. In comparison with 163 modified flakes, representing processing activities, we find that 84 are from the southwest section, 65 from the southeast and only 14 from the northeast. By calculating a concentration index for our major categories the following results (Table 13) are obtained.

Figure 15

THE DAWSON SITE

HORIZONTAL DISTRIBUTION OF PROJECTILE POINTS

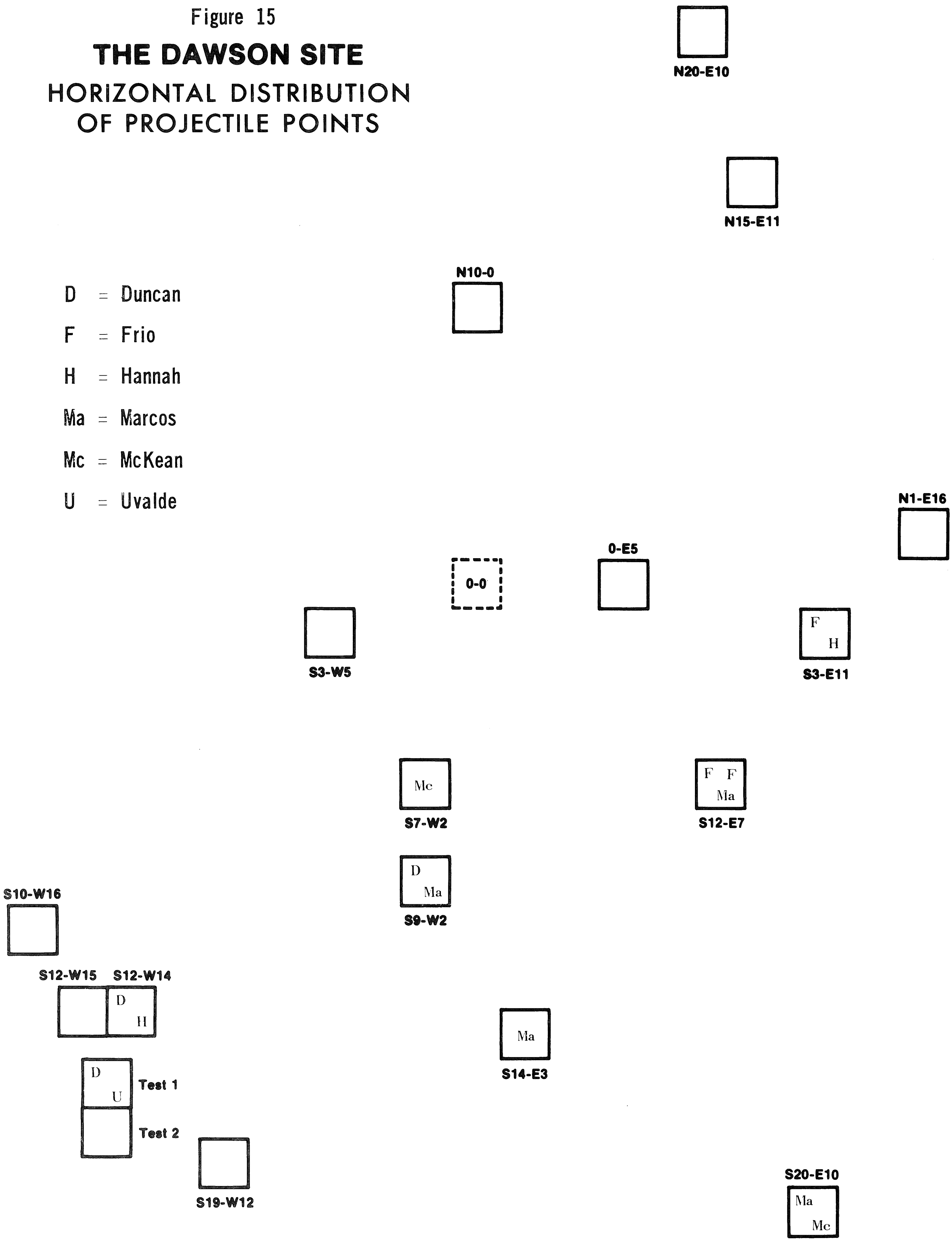


Figure 16

THE DAWSON SITE

HORIZONTAL DISTRIBUTION OF REDUCTION BIFACES

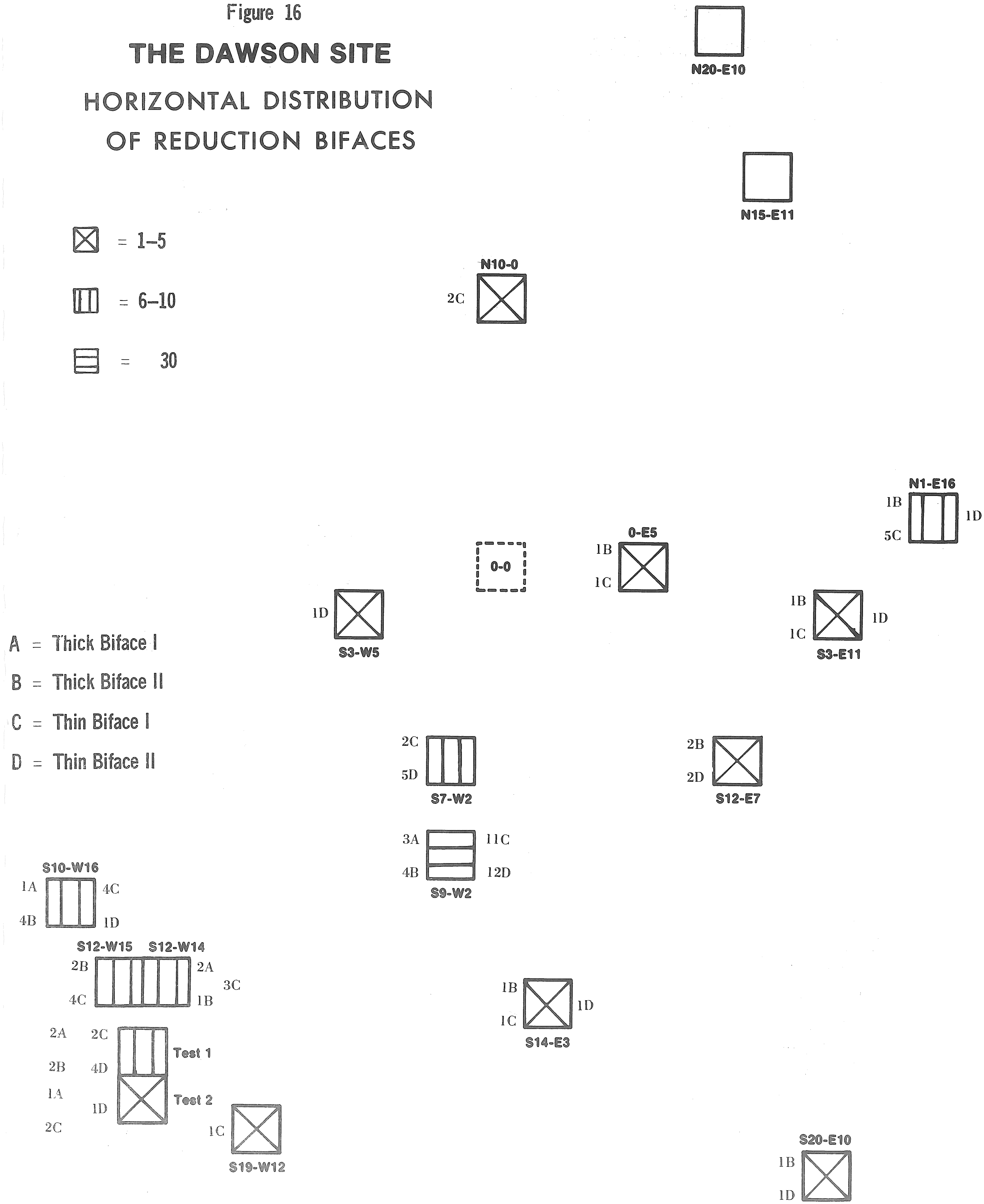


Figure 17

THE DAWSON SITE

HORIZONTAL DISTRIBUTION OF FLAKE IMPLEMENT SERIES I

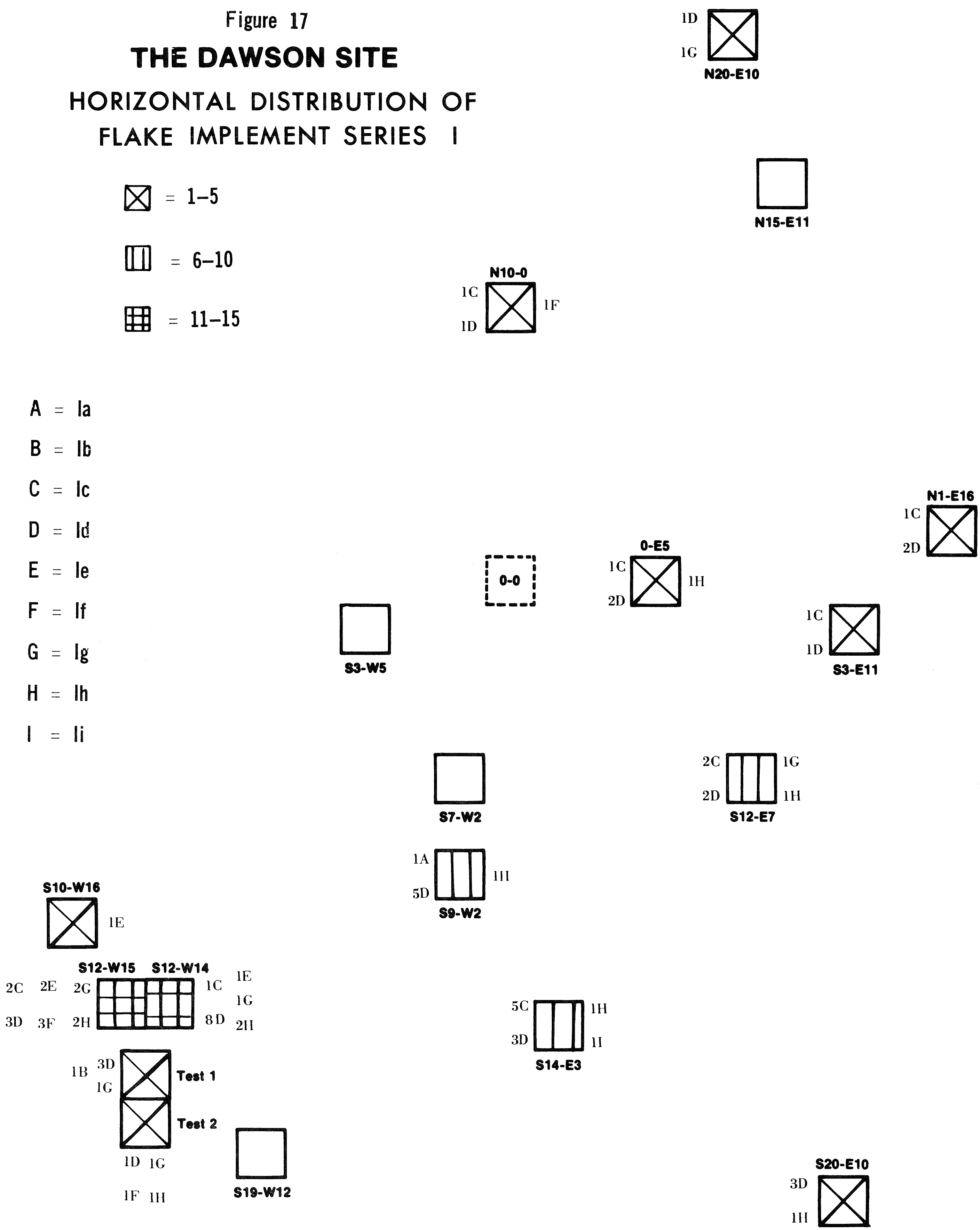
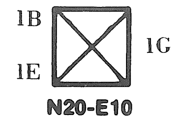


Figure 18

THE DAWSON SITE

HORIZONTAL DISTRIBUTION OF FLAKE IMPLEMENT SERIES II



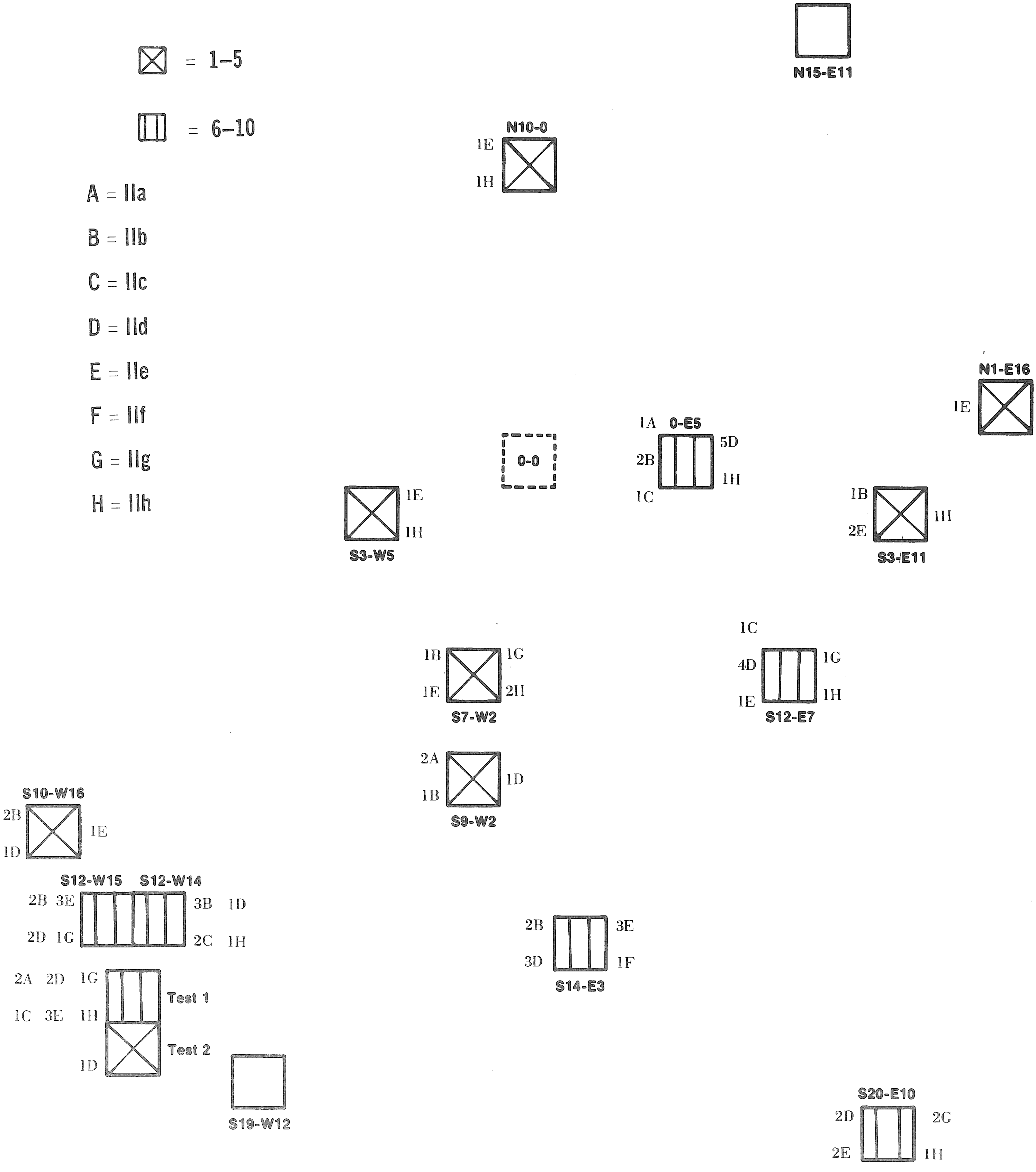


Table 13

My-140 Comparative Concentration Indices by Quadrant

Quadrant	Concentration Indices					
	Reduction Bifaces	Biface Tools	Projectile Points	Flake Tools	Modified Flakes	Grinding Stones
Southwest	.32	.07	.04	.03	.35	.02
Southeast	.11	.16	.10	---	.53	---
Northeast	.09	.05	---	---	.14	---

The index for reduction bifaces and modified flakes is relatively equal in the southwest quarter while there is a much higher concentration of modified flakes in relation to reduction bifaces in the southeast section. This may be evidence that the southeast quarter was used as a processing area while the southwest quadrant served as a reduction station. Three chi-square tests have been constructed to examine this data for significant differences (see Table 14). The null hypothesis is that no significant differences exist between each of the quadrants at the .05 level of significance. The first test, for the southwest and northeast quadrants, upholds our proposition that there is no difference between the observed and expected frequencies for reduction bifaces and modified flakes. The second and third tests, however, indicate that there are significant differences between types of artifacts being recovered from the southeastern quadrant and other areas of the site. These tests, then, tend to confirm the possibility of final lithic processing occurring in the southeast quadrant.

Table 14

Chi-square Tests

Quadrant	Concentration Indices: Reduction Bifaces	Modified Flakes	Test Results
1. Southwest	77	84	$X^2 = .67$
Northeast	9	14	df = 1 H_o Accepted
2. Southwest	77	84	$X^2 = 20.39$
Southeast	14	65	df = 1 H_o Rejected
3. Southeast	14	65	$X^2 = 4.66$
Northeast	9	14	df = 1 H_o Rejected

df = Degrees of Freedom $\quad X^2_{95} = 3.84$

With this proposition in mind an examination of vertical distribution is in order. To initiate this discussion lithic debitage from six selected squares, two from each of the producing quadrants, will be examined in detail. These excavation units are: 1) N20-E10; 2) N10-0; 3) S12-E7; 4) S14-E3; 5) S12-W14; and 6) S12-W15. The maximum depth reached in any one of these squares is 24 inches or six levels. At least three levels, or 12 inches, have been excavated for each of these six squares; all but one extended through 16 inches or level 4. Four squares were excavated to level 5 or 20 inches below the surface while only one square reached a depth of 24 inches or level 6. These squares are considered to be representative of both horizontal and vertical distributions.

A concentration index has been calculated for each of the six levels and is presented in Table 15. According to these concentration indices level 4 contains the greatest amount of material which tapers off in levels three through one. A comparison with the concentration index for the total number of recovered tools and implements has also been made (see Table 16).

Level 4 again has the highest density of artifacts while levels 3 through 1 taper off somewhat. From these computations, level 4 appears to represent the original, as well as the most intensive occupation of the site. However, this locality was not completely abandoned afterward. The data for levels 3 through 1 indicate a continued use of the lithic resources available at the Dawson site. Thus, My-140 is representative of a single component site with several occupations occurring over a relatively long period of time. The primary behavioral endeavors appear to have been the collection of lithic resources and their reduction as well as the modification of these resources into finished implements.

A second series of concentration indices was calculated by quarters on the lithic debitage at My-140. This examination was limited to those flakes readily identified as specific parts of the lithic trajectory system. Based on Table 17 an extremely high concentration of tertiary and thinning flakes has been detected for all levels of the southeast quarter. There is one possible explanation of this situation. The southeast quarter may represent an area in which the final stages of manufacture were performed. Figure 16 indicates that all of the Thick Biface I specimens, recovered in context, are from the southwest quarter. Also, the vast majority of Thick Biface II's and Thin Biface I through II specimens are associated with the southwest quarter. A number of these specimens have been broken because of shock wave action (see Faulkner 1972:76-79). More specifically, all of the Thin Biface II's are incomplete, while only three Thin Biface I's are unbroken.

Of the latter the thinnest specimen with the least sinuous edges is from the southeast quarter. On the other hand, the highest concentration index for finished

Table 15

My-140 Flake Concentration Indices for Six Selected Squares

Level	N_f/N_sV	CI	%	P	S	Ty	Tg
1	1275/49.5	25.76	25.57	.30	.79	4.28	1.37
2	1286/49.5	25.98	25.79	.20	.91	5.88	1.39
3	996/45.38	21.95	19.97	.31	.68	4.32	.93
4	1261/30.94	40.76	25.29	.26	.84	6.59	2.81
5	120/12.38	9.69	2.41	---	.24	1.45	.40
6	49/6.19	7.92	.98	---	.32	1.94	----

Where: N_f=total number of flakes; N_s=total number of excavated squares; V=volume (8.25 cubic feet)

CI=Concentration Index; P= Primary decortication flakes; S= Secondary Flakes

Ty= Tertiary flakes; Tg= Thinning flakes

Table 16

My-140 Implement Concentration Indices

Level	N_i/N_sV	CI	%
1	106/148.50	.71	31.18
2	98/134.06	.73	28.82
3	61/103.13	.59	17.94
4	64/49.50	1.29	18.82
5	10/20.63	.49	2.94
6	1/4.13	.24	.29

Where: N_i = total number of implements

N_s = total number of excavated squares

V = volume (8.25)

CI = Concentration Index

implements, such as projectile points, biface cutting, and biface scraping implements, as well as drills, are from the southeast quadrant. These factors tend to indicate that the majority of heavy percussion work was carried out in the southwest quarter while the finer, more delicate, processes were performed in the southeast section.

Table 17

My-140 Flake Concentration Indices by Quadrants for Six Selected Squares

Level	Northeast				Southeast				Southwest			
	P	S	Ty	Tg	P	S	Ty	Tg	P	S	Ty	Tg
1	.18	.12	1.76	.67	.30	1.33	6.12	2.42	.42	.91	4.97	1.03
2	.06	.06	1.27	.18	.55	1.94	8.86	3.25	.06	.97	8.61	1.15
3	---	---	.73	.42	.10	1.84	11.25	2.52	.42	.83	4.71	.62
4	---	---	1.33	.36	1.45	3.87	35.84	15.98	.19	1.55	4.17	3.20
5	---	---	.97	---	----	----	1.46	.48	---	1.46	4.37	1.94
6	---	.48	2.91	---	----	----	----	---	---	----	----	----

Where: P = Primary decortication flakes S = Secondary flakes

Ty = Thinning flakes Tg = Thinning flakes

B. Inter-Site Analysis

The Dawson site (My-140) has not provided any material which could be readily dated by radiocarbon or other chronometric dating techniques. Therefore, projectile point frequencies were analyzed from reports on six sites in northeastern Oklahoma for seriation dating (see Figure 19). These sites were chosen because they have rather well stratified deposits, some of which have been radiocarbon dated. They are located in Delaware County, Reed (Dl-11) (Purrington 1970:354-393); Mayes County, Kerr Dam (My-72) (Wyckoff 1963), Packard (My-66) (Wyckoff 1964a), Pohly (My-54) (Ray 1965), and Wolf Creek (My-72) (Kerr and Wyckoff 1964); and Nowata County, Lawrence (Nw-6) (Baldwin 1969).

Seriation is not an absolute dating method. Rather, it permits us to arrange in sequence the components of various sites (Michels 1973:66-82). This in turn produces a means of relative dating and establishing a tentative regional chronology. Seriation is based on the proposition that material items, such as pet rocks, black powder pistols, and projectile point styles, are representative of specific human behavior. Such items begin with a low level of acceptance and increase in popularity through time. Later they are replaced by other implements with a resultant decrease in the number of these items being found in the cultural inventory. Such waxing and waning produces lenticular or "battleship-shaped" curves which are wider in the middle than at either end. The problem, of course, is determining which end represents the initial point of development and which the terminal. Fortunately, this problem has been alleviated by the availability of radiocarbon dates for the beginning, middle, and end of our sequence.

Our information concerning the Reed site (Dl-11) is derived from Purrington's (1970:354-393) dissertation. Dl-11 is a deep midden site belonging to the Spiro Focus. This site has produced numerous projectile points such as Fresno, Scallorn, Reed, Cooper, Edgewood, Gary, and Standlee which have been used in our analysis. This midden has also produced a number of radiocarbon dates which form the basis of the upper end of our seriation. Ranging from 670 ± 55 B.P. (WIS-253) in level nine to

890 ± 55 B.P. (WIS-247) in level five, these dates bracket the temporal span, but not the stratigraphic sequence.

The Kerr Dam site (Wyckoff 1963) consists of two components. The lowest of these contains only expanding stemmed points such as Afton, Marshall, and Williams. The association of this component is unclear, but it may relate to the Afton Complex (Wyckoff 1963:50). The Afton Complex in the Ozark Highland of southwestern Missouri is defined by Wood (1961:88-90). It has been radiocarbon dated from the upper portion of Stratum III at Blackwell Cave at 1150 ± 85 and 750 ± 150 B.C., suggesting a temporal range of between 3100 and 2700 B.P. (Falk 1969:86). For our purposes this component is referred to as Kerr Dam I.

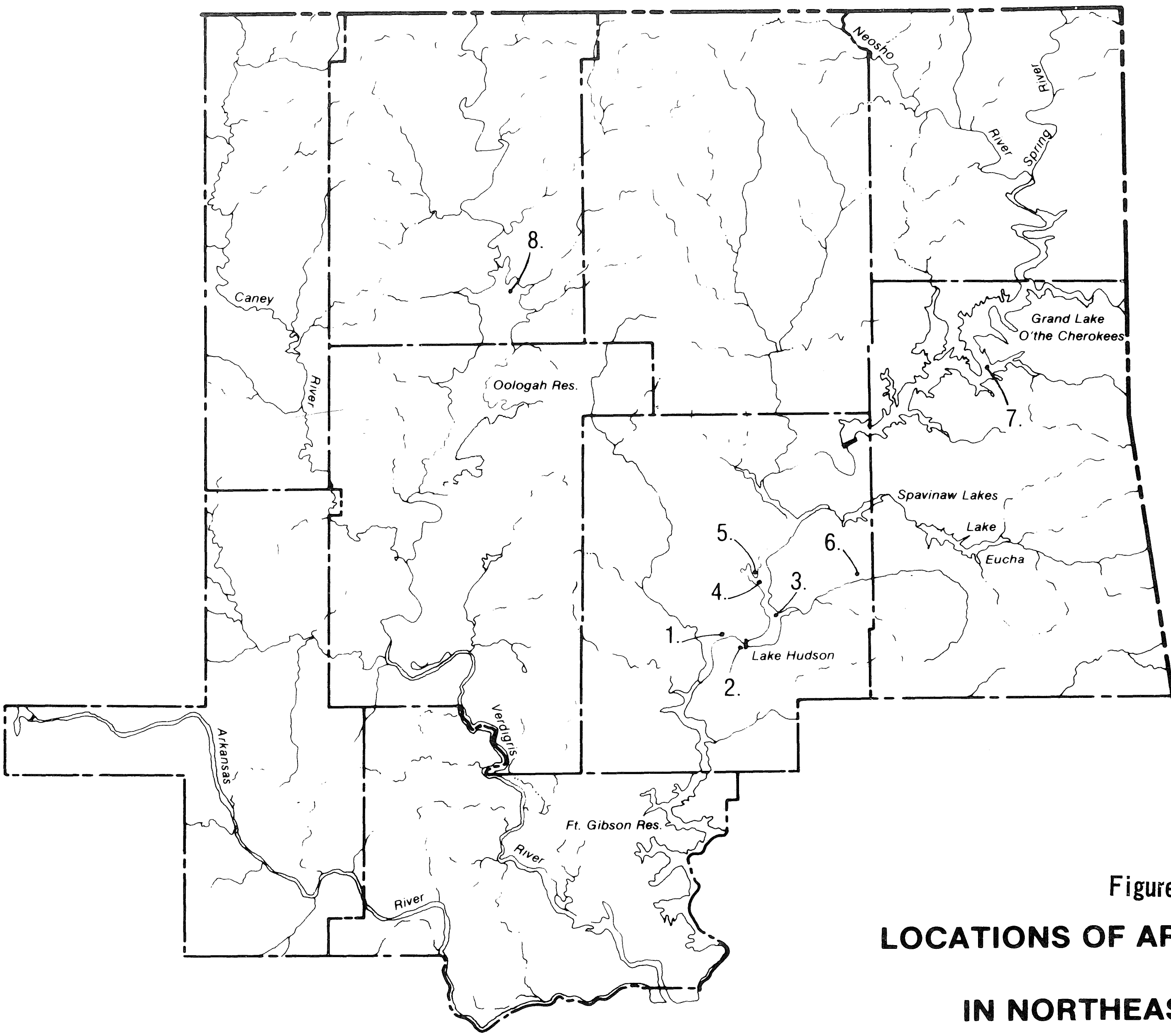
The upper occupational unit produces a mixture of cultural materials. These include contracting stem points (such as Gary, Langtry, and Bulverde), expanding stem dart points (such as Fairland and Hardin) as well as small projectile points (such as Fresno). Wyckoff (1963:45) places this unit in a transitional phase between Grove B Focus and Grove C Focus. We have designated this component as Kerr Dam II.

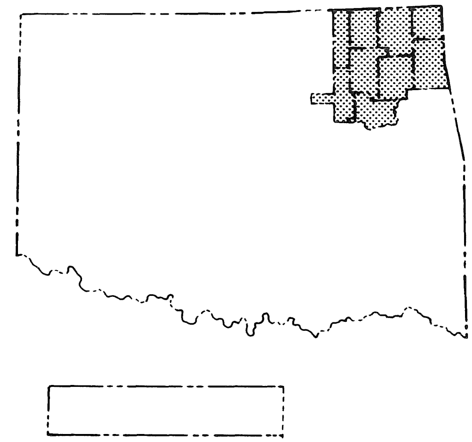
The Packard site (My-66) (Wyckoff 1964a) is a stratified site consisting of a ceramic and preceramic horizon. Wyckoff (1964a:92-109) determined that this sequence begins with an Early Archaic component and continues into a Neosho Focus component in Late Prehistoric times. Table 18 provides an abbreviated examination of Packard.

Because of the lack of any distinguishing or diagnostic implements in Preceramic Zone IV we will not consider this unit in our analysis.

The Pohly Rock Shelter (Ray 1965) is composed of three occupational units. For convenience this information is placed in Table 19.

Another stratified site for Mayes County is Wolf Creek (My-72). Kerr and Wyckoff (1964:55-80) consider Wolf Creek to have three components. These are presented in Table 20 with our modified sequence.





1. DAWSON (My-140)
2. KERR DAM (My-48)
3. WOLF CREEK (My-72)
4. JUG HILL (My-18)
5. PACKARD (My-66)
6. POHLY (My-54)
7. REED (DI—11)
8. LAWRENCE (Nw-6)

Figure 19

LOCATIONS OF ARCHAEOLOGICAL SITES

IN NORTHEASTERN OKLAHOMA

Table 18 Cultural Sequence at the Packard Site (My-66)

Reported Sequence	Assigned Dates	Cultural Remains	Modified Sequence
CERAMIC ZONE			
Neosho Focus (levels 1-4)	----	Representative Points: Fresno Scallorn Langtry Pottery: Shell Tempered Sherds	Packard V
Woodland Component (levels 4-5)	----	Representative Points: Snyder Castroville Gary Langtry Pottery: Grit Tempered Sherds	Packard IV

Table 18 Continued

Reported Sequence	Assigned Dates	Cultural Remains	Modified Sequence
PRECERAMIC ZONE			
Preceramic Zone I Grove Focus (levels 6-10)	c. 4700 B.P.	Representative Points: Gary Hidden Valley Duncan Williams Dalton	Packard III
Preceramic Zone II (levels 11-16)	c. 8950 B.P.	Representative Points: Agate Basin Dalton Merserve	Packard II
Preceramic Zone III (levels 17-21)	c. 9416 ± 193 B.P.* (NZ-478)	Representative Points: Agate Basin Big Sandy	Packard I
Preceramic Zone IV	----	-----	-----

*Based on radiocarbon date obtained from a firepit in this zone.

Table 19 Cultural Sequence at the Pohly Site (My-54)

Reported Sequence	Cultural Remains		Modified Sequence
CERAMIC ZONE			
Neosho Focus (levels 1-7, Upper Unit)	Representative Points:	Triangular Fresno Scallorn Reed Gary Langtry Bulverde Marcos Williams	Pohly III
	Pottery:	Woodward Plain Neosho Punctate Grid Tempered Sherds	
LITHIC ZONE			
Late Grove Focus (levels 8-15, Upper Unit)	Representative Points:	Triangular Gary Langtry Bulverde Fairland Williams	Pohly II
Early Grove Focus (layers A-D, Lower Unit)	Representative Points:	Gary Langtry Bulverde Duncan McKean Uvalde	Pohly I

Table 20 Cultural Sequence at the Wolf Creek Site (My-72)

Reported Sequence	Cultural Remains	Modified Sequence
CERAMIC ZONE		
Woodland/Neosho Focus (levels 1-2)	Representative Points: Fresno, Scallorn, Gary, Langtry, Marcos Pottery: Shell Tempered Sherds, Grit Tempered Sherds	Wolf Creek III
PRECERAMIC ZONE		
Grove C Focus (levels 3-4)	Representative Points: Gary, Langtry, Type A-Expanding Stem, Type B-Expanding Stem, Type C-Parallel Stem	Wolf Creek II
Grove A or B Focus (levels 5-6)	Representative Points: Gary, Langtry, Table Rock Stemmed	Wolf Creek I

Finally, the Lawrence site (Nw-6) is a single component site which Baldwin (1969:112) interpreted as Late Archaic with Woodland overtones. This relatively late assignment was modified, however, when radiocarbon dates were calculated (Burton 1970). These dates indicated a temporal span ranging from 2710 ± 70 B.P. (TX-815) to 3460 ± 110 B.P. (TX-816). In addition, expanding stem dart points (such as Afton, Marshall, and Williams) occur along with stemless points (such as Lawrence Category I). Baldwin (1969:91) identified one projectile type, Category O, as being probable arrowpoints. However, by plotting the published measurements concerning length and thickness, the expected bimodal distribution does not appear. For this reason these projectiles are considered to represent the low end range of expanding stem dart points and are included in that category for analysis.

Detailed information presented in these site reports allows us to construct the diachronic curves given in Figure 20. Projectile points are products of human behavior and have been selected for our analysis because of their distinctiveness, recurrent quality, and their readily apparent morphological transformation through time (see Rouse 1967:166-173).

If we interject other artifact categories with our point types certain errors would be committed. The first of these might be referred to as an isochronal error. Stylistic rates of change between projectile points and cutting or scraping implements are neither equivalent nor correlated. Thus, by including these different categories within the same framework the sequential patterning might be distorted or completely masked. The second factor might be designated an interpretative error. Rigorous and systematic artifact classification relating to form and function has been somewhat uneven in the past. In other words, we are not certain that the designation of scraper or knife is equivalent in all cases. If they are superficially considered so, a certain quantative bias might be introduced. Projectile points, more than any other implement type, have been subjected to these rigorous and systematic standards. For this reason, projectile points are considered to be our best indicators of cultural change in northeastern Oklahoma at this time.

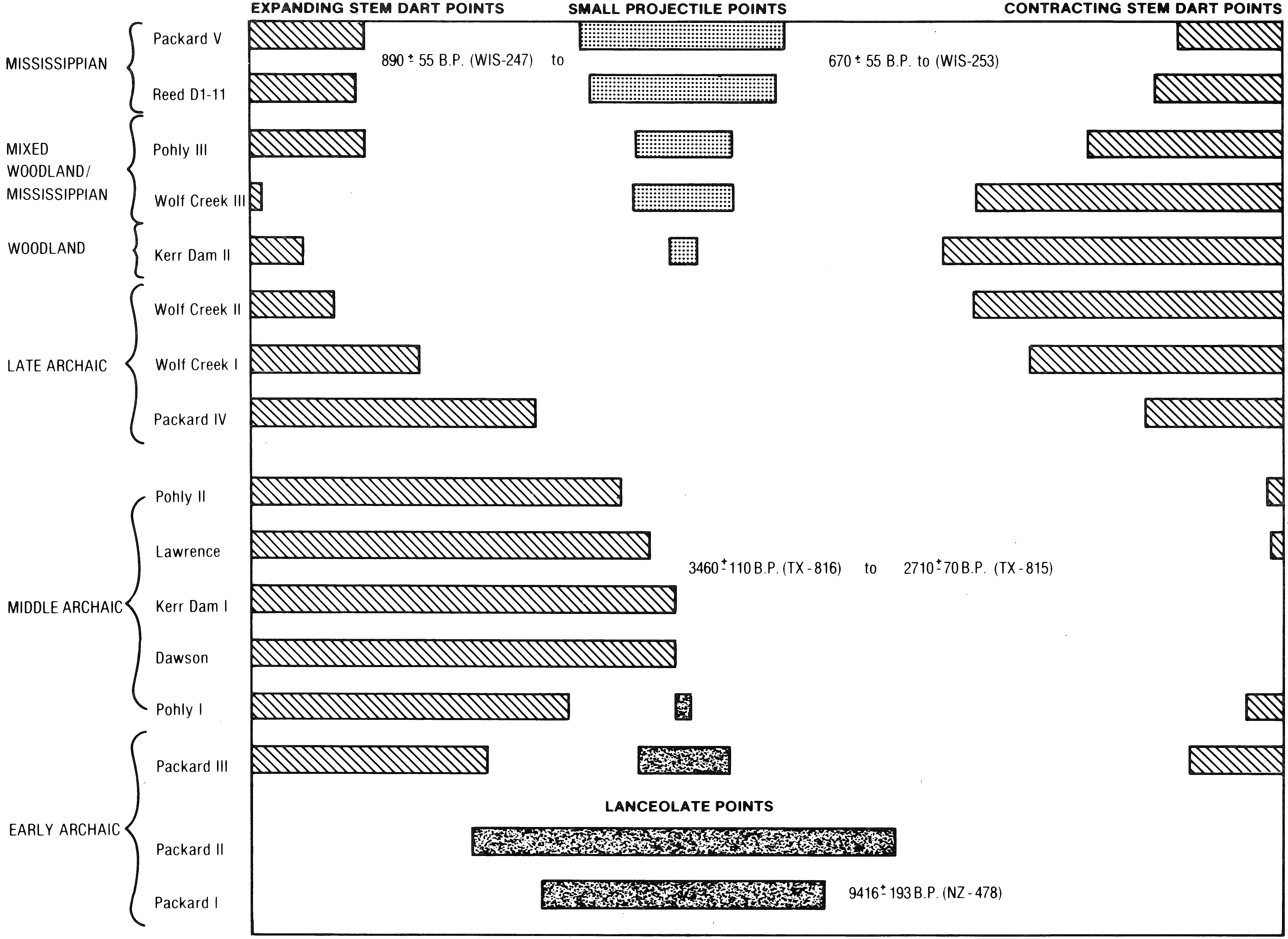


Figure 20. FREQUENCY OF PROJECTILE POINTS FROM SELECTED SITES IN NORTHEASTERN OKLAHOMA

The seriation results are discussed below. Also, the limitations and implications for future research will be outlined.

EARLY ARCHAIC

Lanceolate points have been recognized as the oldest lithic projectiles for a number of years (see Figgens 1927; Cook 1927). In the west these points (Clovis, Folsom, and Plainview) have been associated with various forms of megafauna. Even though mammoth bones have been removed from the confluence of the Verdigris and Arkansas rivers, no cultural material has been found in association with these remains. At this time, our earliest definable cultural evidence for northeastern Oklahoma indicates an Archaic type of adaptation. The Early Archaic is composed of lanceolate points as well as side-notched and stemmed points which fall outside of the Lithic stage lanceolate tradition. For our sequence the Early Archaic includes the components Packard I, II, and III. Packard I dates, according to radiocarbon samples obtained from a deep lying hearth, at 9416 ± 193 B.P. (NZ-478) or 7466 B. C. Recovered implements from these components suggest hunting as the primary economic activity. These include projectile points and processing implements such as hafted and non-hafted knives, scrapers, choppers, and tanning stones.

These habitations appear to have been occupied for short periods of time and are hence considered to be ephemeral campsites. At this point we should note that as our knowledge of hunting and gathering societies increases, a heavy reliance on plant resources becomes increasingly evident. Thus, because of the ephemeral nature of these Early Archaic campsites, our understanding of the total economic structure may be somewhat skewed.

MIDDLE ARCHAIC

The Middle Archaic period seems to be marked by an increasing use of expanding stem dart points and a decreasing frequency of lanceolate points. From Figure 20 we may conclude that the following components belong to the Middle Archaic: Pohly I, Dawson, Kerr Dam I, Lawrence, and Pohly II.

Radiocarbon dates from the Lawrence site range between 2710 $\pm$ B.P. (TX-815) in levels five through six and 3460 $\pm$ 110 B.P. (TX-816) in levels six through seven. The cultural remains from these components indicate an expanded economic base. Such items as single and bifaced mullers, grinding basins, shredders, and manos reveal a greater dependence on plant resources. From this series of sites we also find lithic manufacturing stations. Feature five at Kerr Dam I was interpreted by Wyckoff (1963:36-37) as a possible workshop area. The Dawson site, too, fits into this category of an Archaic lithic workshop.

Faunal remains from Lawrence and Pohly II indicate that deer may represent the primary game animal during this era. Other faunal remains from Lawrence include raccoon, squirrel, turtles (both terrestrial and aquatic), fish, and birds as possible food resources. In this same context coyote, gopher, beaver, badger, and spotted skunk remains were found. Burials appear for the first time at Pohly I and II. Pohly I burials, however, appear to be rather unusual. Burial 1, as Ray (1965:8) designated it, contained three human crania, two mandibles, as well as several split and cracked long bones. Several deer bones were found in association with the skeletal remains. Ray (1965:8) advanced two propositions to explain the mixed nature of this burial: 1) the osteological materials represented a multiple secondary burial which had experienced an unusual amount of disturbance and displacement due to rodent activity and other natural phenomenon; or 2) that this feature actually represented an area of refuse deposition.

> To support this second suggestion is the fact that all of the human and animal long bones recovered from Burial 1 were split down the middle as if to get at the marrow. Also, sections of the same skull were scattered throughout this five foot long area and were often resting on a different skull. Two different mandibles were also found together, without skulls ... (Ray 1965:8)

Ray seems to be suggesting that some form of cannibalism may have taken place at Pohly. If such were the case we might assume from ethnological or cross-cultural data that we are dealing with ritual rather than gustatory cannibalism. Only in extremely rare cases, usually involving stress, do human groups rely on human flesh as a major staple. No other sources dealing with the prehistory of northeastern Oklahoma report similar occurrences. This seems to indicate that such an activity at the Pohly site may have been an isolated incident or that this material is explainable by other means.

Burial 2, also related to Pohly I, was that of an adult female. A projectile point found in association with the pelvis may have been the cause of death. The long bones in this case were not split or cracked. Burials 3 and 5 have been associated with Pohly II. These inhumations, one of an infant and the other of an adult, represent less dramatic circumstances.

The evidence presented from these site components indicate longer habitations and a wider range of subsistence activities. Collecting of plant resources along with hunting plays an equally important economic role. Many of these locations may have served as seasonal (?) base camps from which individual groups exploited the available flora and fauna. Upon their return, meat might be butchered and distributed while plants were being processed and prepared. In some cases, the appearance of cache pits may indicate storage capabilities. Also, we find specialized localities such as the Dawson site being used as lithic collection stations and workshops. The initial stages of manufacturing were performed here. Final reduction and maintenance activities, on the other hand, were conducted at the base camps. Whether or not these sites actually represent seasonal base camps has yet to be determined, however.

LATE ARCHAIC

At the present time our understanding of the Late Archaic is not complete. The major indicator is a decline in expanding stem points (Marshall, Marcos, etc.) which are gradually being replaced by contracting stem projectiles (Gary, Langtry, etc.). The same inventory of hunting and butchering as well as plant processing implements remain fairly constant from the previous period. The specific types of plants and animals being utilized are unknown. What we might expect is an expanding base for the use of plants. As people begin to comprehend the relationships between seeds and fully matured plants, an attempt to gradually control this process may occur. In other words, these people would be gaining a necessary prerequisite knowledge for the domestication of these plants. This point is underscored by the research at Phillips Springs in southwestern Missouri (Chomko 1976:89) where evidence for the domestication of sunflower and squash appears as early as 4100 B.P. The representative components for this era are Packard IV, Wolf Creek I and II, and Kerr Dam II. There are no radiocarbon dates from any of these components.

WOODLAND

Unfortunately, the succeeding or Woodland horizon is even less well clarified by our seriation. The only components which fall into this era, Kerr Dam III and Pohly III, contain highly mixed material with later Neosho Focus materials. This occurs in the form of grit and shell tempered pottery found from the same contexts. From our seriation of projectile points, contracting stem dart points begin to decline with the appearance of small projectile or arrow points. The types of subsistence activities, settlement patterns, and population densities are therefore extremely obscure at this point. Bell and Baerreis (1951:27-33) remark that our best source for a Woodland horizon in northeastern Oklahoma is from the Cooper sites in Delaware County. This is not considered an indigenous development as "the occupation in Oklahoma represents the southernmost thrust of peoples who had previously migrated to Missouri and eastern Kansas" (Bell and Baerreis 1951:27). Currently this expansion is best known from sites in Delaware County such as Cooper (Dl-33 and Dl-49) and Cooper Shelter (Dl-48) and an unnamed site, Dl-37 (cf. Purrington 1970; McHugh 1963). Purrington (1970:534) maintains that these northern immigrants seemed to have had a small impact upon the indigenous Delaware County people. "One significant effect that the Cooper Focus people might have had on the native Delaware Countians is the possible introduction of maize which might have contributed to the population explosion and increased sedentism of the local peoples" (Purrington 1970:534).

LOWER MISSISSIPPIAN

Somewhat later a second intrusion occurred in northeastern Oklahoma, this time from the south. Caddoan people moved into Delaware County and occupied such sites as Reed (Dl-1, Dl-2, Dl-4, Dl-10, and Dl-11) and Huffaker (see Baerreis 1954 and 1955). The major pottery is Woodward Plain with some red filmed, incised, and engraved wares also appearing. This Mississippian horizon is indicated in our seriation by Reed (Dl-11) which has been radiocarbon dated between 890 $\pm$ 55 B.P. (WIS-247) and 670 $\pm$ 55 B.P. (WIS-253) or A.D. 1060 to A.D. 1280. On the basis of point types a continued increase in small projectiles and a decrease in contracting stem dart points occur. At the same time, a small increase in the number of expanding stem dart points is present. It appears that the bow and arrow never completely replaced lances even in the historic period. This may account to some extent for the increase in expanding stem points. The Spiro intrusion into this area appears to have developed a symbiotic relationship with the indigenous population, each equally influencing the other. For Mayes County our understanding of this process of cultural interaction remains nebulous at best.

UPPER MISSISSIPPIAN

At this point an hiatus in the prehistoric record is encountered. The next emergent archaeological culture in northeastern Oklahoma is the Neosho Focus, a late Mississippian phase manifestation. Early interpretations of this focus (Baerreis 1940 and 1941; Bell and Baerreis 1951:71) affiliated it with the Oneota Focus, a Siouan culture located to the north. More recently, however, the Neosho Focus is considered an indigenous development related to the Fort Coffee Focus of east central Oklahoma. As Wyckoff (1971:196) remarks, "The close relationships of the Neosho Focus to the Fort Coffee Focus are obvious, especially with reference to material goods." Furthermore, he continues, "That these two manifestations are contemporaneous is evident. That they are the same people is a distinct possibility" (cf. Freeman 1962; Bell, et. al. 1969; Wyckoff 1970:153).

For our seriation chronology Packard V is the only component represented. Although no radiocarbon dates are available from Packard V, Jug Hill (My-18) provided two such dates from undisturbed features related to the Neosho Focus. These dates are A.D. 1400 $\pm$ 100 (0-2162) and A.D. 1625 $\pm$ 100 (0-2126) (Wyckoff 1971:166; Wyckoff 1967) and represent the termination of our sequence.

Three types of habitation sites are associated with the Neosho Focus. Packard V probably represents a small, open hunting camp with no discernible features. Another site, Jug Hill (My-18), contrasts with this as an open village site in which one structure with a rectangular pattern of post holes was found. The mixed components of Wolf Creek III and Pohly III represents a third type in the form of rock shelters.

Faunal remains indicate an expansion of the subsistence base for Neosho Focus people. Although deer remain important, bison bones imply forays into the Prairie-Plains where these animals were readily available. Fresh-water resources were also being exploited as indicated by mussel shell. We would expect mussel shell to have appeared earlier in our sequence, but they have not been found in earlier contexts. Another subsistence activity for the Neosho Focus was the collecting of acorns and hickory nuts. Horticulture may also have been practiced as some sites have yielded bison scapula hoes.

Although tracing prehistoric cultures into the ethnographic present is difficult, Wyckoff (1971:212) suggests a possible identification with the Wichita. This assumption is supported by the work of John (1975: 304-306; 338; 344) who maintains that pressure from the Osage and the breakdown of French trade forced the Wichita to migrate from the Arkansas and Illinois River valleys. Moving to the Red River new villages were constructed and trade reestablished with the French through Natchitoches.

C. A Commentary on Seriation

The strength of our seriation chronology lies in its correlation with available radiocarbon dates. Let's now briefly examine some of the basic elements needed for a successful seriation (cf. Rouse 1967). The first of these deals with the units of seriation. These units must have a temporal referent. In this case our units are projectile points which are the end products of specific actions or events. Following from this, even though projectile points are being used, the actual seriation orders the time at which these actions were performed. A second element concerns the criteria of seriation. These criteria must be recurrent qualities shared by a number of these units. Since the methods of production tend to follow a certain mental template on the part of the flint knapper, this requirement has been fulfilled. This in turn allows us to correlate our units with one another. The careful reader by now may have noticed that not all of our units are equivalent. When considering dart points, specific features, such as expanding or contracting stems, were examined. Yet small projectile points have been lumped together. For our purposes this lumping appears to be practical since contracting and expanding stemmed dart points continue and the presence of radiocarbon dates at the upper end provides the necessary continuity.

A third element of any seriation is to determine the temporal continuity or tradition of a technological system. Any outward manifestation of a technological system will undergo change. Our problem then is to determine if these changes have internal continuity. Even though point styles may change, the underlying production or manufacturing techniques may continue to be the same. For example, a shift from the production of expanding to contracting stem dart points may occur, yet the basic manufacturing process may involve the same cobble reduction strategy. Thus one of the more reliable means to assess cultural continuity may be the detailed study of the lithic reduction system itself. Such a study has not been undertaken for the archaeological cultures of northeastern Oklahoma, pointing to the need for future research. Such a limited geographical analysis might also reveal whether or not we are dealing with one or more ethnic groups living in coexistence during the Archaic and Woodland periods.

Returning to our previous concept we maintain that few, if any, traditions exist in a vaccuum. Eventually, contact with other traditions will occur. This situation has been considered a primary factor for the introduction of both the Woodland and early Mississippian (Spiro Focus) phases. When this happens four possibilities may result (Rouse 1967): 1) the indigenous tradition will become extinct, leaving only the intruding tradition; or conversely, 2) the intruding tradition will become extinct, leaving only the indigenous form. From another point of view we have 3) an integration between the two traditions resulting in the formation of a new tradition; or in opposition to this, 4) the two traditions may coexist while retaining separate identities. For northeastern Oklahoma these four results have not been intensively studied and again require future study.

The final element to be discussed is the limiting of a seriation to a specific geographical area. This has been partially discussed above, but one more statement should be made for clarification. By using this limiting element we are able to examine culture change temporally while holding geographical and cultural form factors relatively constant.

Our discussion of seriation chronology demonstrates a number of gaps in our knowledge concerning the culture history of northeastern Oklahoma. Such activities as subsistence systems, settlement patterns and their relationships to microenvironments are poorly understood in all phases. Furthermore, sites representing the critical junctures or transitions between Early and Middle Archaic, Late Archaic and Early Woodland, Late Woodland and Early Mississippian, as well as that between the Spiro and Neosho Foci are almost entirely absent. At the same time our understanding of the relationships and interactions between Spiro Focus sites at Reed and Huffaker with the indigenous populations of Mayes and even Delaware Counties is minimal at best. Partially this is a result of the nature of salvage archaeology. Yet, these are questions that archaeologist will be attempting to answer in future studies.

Overall, then, we have attempted to design a master pattern on the basis of seriation. Yet, our pattern is not complete. Seriation of cutting, scraping, and drilling implements as well as pottery should be constructed and compared. Once this has been established a master pattern may be established and new data or information dealing with artifacts and site components can be readily inserted.

D. Summary Perspective of The Dawson Site

The Dawson site is located along the Neosho River in Mayes County, Oklahoma. The Oklahoma Highway Archaeological Survey tested this site in January of 1977. More intensive testing occurred the following spring. This was accomplished since approximately one-half of the site will be affected by the construction of the Lindsey-Mayes Bridge Project. The excavation strategy was designed to test the horizontal and vertical distribution within the construction area. Less than one-half percent of the total site was tested. This work revealed no occupational features.

Analysis of cultural remains indicated that My-140 is a single component site with possibly the same group of people returning to the locale several times. The major activity was collecting of lithic resources and initial reduction. In other words, My-140 was used primarily as a lithic workshop with cobble reduction being the main production strategy employed.

Temporally, the Dawson site has been placed in the Middle to Late Archaic. After this time it was probably used infrequently. For comparative purposes a seriation chronology was established and the overall sequence discussed. This chronology allowed us to examine a number of gaps in our current reconstructions and to present possible future research designs. Overall, My-140 provides some insight into the nature of specialized sites during the Middle to Late Archaic. The Dawson site, then, represents one more link in our chain of knowledge concerning the prehistory of northeastern Oklahoma.

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