Ka-3, THE DEER CREEK SITE

An Eighteenth Century French Contact Site

in

Kay County, Oklahoma

Byron Sudbury

PURPOSE

This paper is not a typical archeological report in several ways. First, it addresses itself primarily to an examination of surface collections from the site under study. Secondly, it considers only a small portion of the available artifact sample. Thus, an explanation of the criteria and reasoning behind the selection of materials for the preparation of this report is warranted.

When first introduced to the Deer Creek Site (Ka-3) and the Bryson site (Ka-5) (see Appendix II for a discussion of the Bryson site) on a November, 1966 field trip, I was very intrigued by what I was told of the presumed history of the sites, by the features I saw, and by the artifacts which I found. An examination of the literature for information about these two historic sites revealed that very little had been written about them. With this realization, I developed a desire to make surface collections from both sites and prepare a detailed report comparing and contrasting their respective artifact samples in an attempt to determine their relationship. With this objective in mind, I began to surface-hunt the sites whenever possible. I would go first to the Deer Creek site and then to the Bryson site, sometimes spending several days at a time collecting from them. Gradually, I began spending proportionally more time at the Deer Creek site. As this imbalance continued, my Deer Creek collection grew enormously while my Bryson collection remained small. When I finally was ready to begin a comparative analysis three problems presented themselves. First, I had an inadequate amount of cultural material from Bryson upon which to base an adequate comparison. The second problem was the great bulk of material which I had amassed from the Deer Creek site. The third problem was that I was starting college and the available time was not nearly adequate to prepare a report on my collection.

Now, several years later, the need for the report still exists. My desire to fulfill this need is still strong, but available time continues to be short. Thus, I have elected to prepare a report on the Deer Creek site. For this report, I have selected the fraction of materials most informative about the time and origin of the occupation which experienced the white contact evident at the Deer Creek site. The body of this report will deal with the trade goods. It is felt that the presentation of this data will fulfill several current needs. First, it will fill a void in the literature about when and by whom this site was occupied by supplying the supporting, comparative and artifactual data as well as the conclusions. Secondly, as the Deer Creek site is slated for excavation in the near future, it is hoped that the information in this report will assist the excavators in assessing the goals they set and the questions they hope to answer by their excavations. In addition, it is felt that this presentation will enable placement of the Deer Creek site in proper chronological sequence with several other related sites.

In conjunction with my initial hopes for this report, a brief description of some Bryson site trade goods is presented in Appendix II. This information is sufficient to allow comparison with the more complete Deer Creek site trade goods sample. Also, a brief summary of the native-made artifacts found at the Deer Creek site is given (Appendix III); this brief supplement is intended to complement the trade goods information by indicating the general types of native cultural debris present at the Deer Creek site.

Thus, the primary thrust of this paper is an in-depth analysis of the Deer Creek site based on the European contact materials present. In addition, information and conclusions regarding its relationship to the Bryson site is also included.

ACKNOWLEDGMENTS

As in any archeological endeavor, the aid of many persons is required to turn out a final report, and this work is no exception. I wish to express my appreciation to the following contributors to this study.

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My thanks also go to Jay C. Blaine for allowing me to reproduce his excellent flintlock mechanism and fusil illustrations in this report. R. King Harris generously supplied me with the Bryson bead data which is presented in Appendix II. Thanks are also in order to R. King Harris and Jay C. Blaine for having cleaned several of the metal artifacts described in this report.

Photographs of many of the trade goods in this report were taken and prepared by Mary Ann Holmes and Marsha Hill (both formerly of Oklahoma Archaeological Survey). My special thanks to them for an excellent job on this very sizeable undertaking. I also wish to thank Mary Louise Dolan and Rick Taggart (University of Pittsburgh) for darkroom assistance, and Dr. Peter Ove (University of Pittsburgh) for having furnished darkroom equipment and materials used in preparing other photographs used in this report. The aerial photograph of the site was purchased from the United States Geological Survey.

The maps presented in Appendix I are located in the Darlington Memorial Library, University of Pittsburgh, and the Western Pennsylvania Historical Society, Pittsburgh, Pennsylvania. I wish to thank the staff of these two institutions for their assistance in locating needed documents.

Thanks are also in order to several persons for having allowed me use of physical facilities. First, Mr. Robert E. Ford, Principal at Ponca City Senior High School, made lab facilities available to me in the 1968-1969 school year which enabled me to begin in-depth work with my materials from the Deer Creek site. Upon entering college, Del Rowe of Ponca City allowed me to store my entire collection on his property where it remained until 1974. In the summer of 1973, Dr. James N. Baxter (Department of Chemistry, Oklahoma Christian College) made available lab space which enabled me to begin this particular analysis. He also made available chemicals and apparatus needed in cleaning various specimens.

A special thanks go to Norman Hiatt and Walt Rosborough of Ponca City, Oklahoma, for having loaned their Deer Creek site collections to me for an extended length of time for incorporation in this analysis. Inclusion of these additional specimens has greatly increased the sample size and composition and thus increased the potential knowledge available from this study. My additional thanks to Walt for having first taken me to the Deer Creek and Bryson sites on a field trip in 1966. In addition, Delia Castor has made several items from the Bryson site available for this study.

Two other people who have been very instrumental in this report are Clark and Francile Miller of Newkirk, Oklahoma. They generously allowed me access to the Deer Creek site for a number of years so I could surface hunt. Despite all of the times people had taken advantage of their kindness and destroyed property in their care, they gave me--a stranger--an opportunity to surface hunt. I was not penalized for the atrocities some of my predecessors had performed. It is due to the Miller's hospitality that this report exists. In the intervening years, I have grown close to this couple. They are good and very generous people, always willing to give a helping hand when needed. They still don't really understand what motivates some people to go out and spend all day looking for beads and arrowheads; even so, the entire archeological community is deeply indebted to this couple and to Clark's parents. For all of the years that Clark and his late father, Carl Otis Miller, leased the land that the Deer Creek site is on, they performed the monumental task of protecting and preserving the site from potholers. Without their continued diligence, it is quite probable that a large portion of the site would have been destroyed. As it is now, an important historical site still exists relatively undisturbed, and should yield a wealth of information to the archeologist.

I wish to express my sincere thanks to R. King Harris whose guiding hand has been very helpful to me in this analysis. Mr. Harris has examined and made important comments and observations on most of the specimens included in this report. Prior to meeting Mr. Harris, I knew a certain amount about historic artifacts through the literature and through talking with fellow amateurs. Through conversations and correspondence, Mr. Harris confirmed the things which I already knew about the sample under consideration. But being the virtual storehouse of information that he is, he went far beyond that and greatly extended my knowledge regarding this sample as well as historical archeology as a whole. Without his help, this report could not have been written. Even with this fine leadership, errors or inadequacies are possible contained herein; if present, they are solely the responsibility of the author.

I wish to dedicate this report to my wife, Mary Ann, who has helped and encouraged me throughout this study. Without her support, this report would have never been completed.

ARCHEOLOGICAL BACKGROUND AND SEQUENCE

The Deer Creek site is located on land purchased by the United States Army Corps of Engineers in conjunction with the construction of Kaw Dam and Reservoir. In 1963 and 1964, members of the Kay County Chapter of the Oklahoma Anthropological Society engaged in an extensive survey for archeological sites in the confines of the proposed reservoir. The sites reported and the artifacts found were examined by Don G. Wyckoff. A report of the reservoirs' archeological resources was prepared, and salvage excavations were recommended on sixteen of the sites (Wyckoff 1965). Excavations in the reservoir area began in 1967 under Tyler Bastian. Two sites near the location of the dam were excavated (Bastian 1969). This phase of the reservoir work has been designated as Phase I. Phase II was carried out in 1972 excavations conducted by Charles Rohrbaugh. It consisted of the excavation of two sites, and the resurvey and testing of all reported sites in the southern part of the reservoir (Tohrbaugh 1973:ix). Phase III consisted of the excavations of three sites and the testing of two others in the central section of the reservoir area. A report on four of these sites has been prepared (Rohrbaugh and Neal 1974:1). Phase IV was conducted on a small scale in 1974 with the testing of three sites in the northern sector of the planned reservoir area (Hartley 1974:6-7). The final phase, Phase V, is planned "to solve any specific problems which may arise in the first four phases, by the selective excavation of sites in the reservoir area in general" (Rohrbaugh and Neal 1974:1). Although the Deer Creek site is on land purchased by the Corps of Engineers for the reservoir, its study has not fallen within the first four phases of reservoir work. Its selection as a National Historic Landmark indicates the Deer Creek site will be preserved. Thus, the urgency with which the reservoir salvage operations have been carried out is not present. More extensive excavations than possible under salvage procedures will be conducted in order to properly understand the Deer Creek site. Other archeological fieldwork conducted in the region immediately surrounding the Kaw Reservoir has been previously summarized, and will not be repeated at this time (Bastian 1969:5-6).

Wyckoff's (1965) initial report on the Kaw Reservoir archeological sites, proposed an archeological sequence for the area. Bastian (1969:123), upon completion of Phase I and extensive literature research, redefined and further differentiated this sequence. The assignment of Late Plains Village occupation was made for the Deer Creek and Bryson sites, and at that time Bastian (1969:122) concluded that "there appears to be a cultural and chronological hiatus between the late Early Village complexes in the Kaw Reservoir region and the earliest (White) contact sites. . . . The hiatus may indicate that there was movement into the area by a new group, or that transitional complexes have not been identified". Even after completion of reports through Phase III, this hiatus continues to exist.

With access to more recent information, Rohrbaugh (1974:159-168) confirmed Bastian's general sequence but felt that the divisions which Bastian suggested for the Plains Woodland period are not currently supported by the archeological evidence. The following general sequence has been proposed (Rohrbaugh, ibid.) based on Bastian's proposals and more recent evidence: Middle Archaic, 5000-500 B.C.; Plains Woodland, 100-1000 A.D.; Early Village, 1000-1500 A.D.; and Late Plains Village, 1500-1800 A.D. Although concepts of the Archaic and Woodland periods in the reservoir are currently not clearly defined, the Late Plains Village occupations present at the Deer Creek and Bryson sites are clearly defined. However, their immediate predecessors and their link to the Early Village horizon are currently unknown. The only work in the reservoir area which has possibly shed light on this situation is that reported by Neal. The Stockton site was assigned to the Late Village period, and Neal (1974:89-90) suggested that it was earlier than and possibly related to the Love site. The primary differences in the Love and Stockton sites' artifact inventories was in the pottery, and the presence of white contact materials at the Love site. The relationship of the Stockton site to Wedel's Lower Walnut Focus is also unclear.

For a more extensive discussion of the archeological sequence of the Kaw Reservoir area, see Bastian (1969:7-10, 120-123), and Rohrbaugh (1974:160-168).

Figure 1. Ka-3, The Deer Creek Site: The Deer Creek Site is located in the pasture south of Deer Creek, and approximately one-third of the way west across the field. "a" is the road in the pasture. "b" is the center of the horseshoe-shaped feature. Other letters represent the location where photographs in the following Figures were taken: c, 2:1; d, 2:2; e, 2:3, f, 2:4; g, 3:1; h, 3:2; i, 3:3; j, 4:1; k, 4:2; l, 4:3; and m, 4:4.

SITE DESCRIPTION AND GEOGRAPHICAL BACKGROUND

The Deer Creek site (also known as the Miller site, Fernandina, and Ferdinandina) has been designated the site number Ka-3 in the archeological site files established by Dr. Robert E. Bell at the University of Oklahoma. The site is located in north-central Kay County, Oklahoma, on a high terrace on the west bank of the Arkansas River immediately south of the confluence of Deer Creek (Figure 1). The entire expanse of the site area is dotted with low circular mounds which are from 65 to 70 in number. Thoburn (McRill 1963:145) referred to these as domiciliary mounds although Wyckoff (1965:12, personal communication, 1973) indicates that they are most likely trash mounds. Steen (1962:form, National Survey of Historic Sites and Buildings) also referred to these as refuse mounds. As for house remnants, Wyckoff (1965:11) noted, "A number of depressed are visible over the site; these features may indicate house locations".

The western portion of the site, representing about 25% of the site area, has been under cultivation for many years. This portion of the site contains three large mounds which are still clearly visible. Steen (1953:178) referred to these as bison bone middens. This is due to the large quantity of bone, primarily bison, present in these mounds. Also, these mounds contain numerous other items of cultural debris--both native and European in origin (Appendix III contains a brief summary of native artifacts while the bulk of this report deals with European trade goods from the site). In addition to these three mounds, there appears to have been at least one other mound originally present in the north end of the field which has since been plowed level. Also, at least two mounds are along the north-south fence row running across the site, and their western portions have been cultivated (Figure 2, 1 and 2). It is from these six mounds and the area immediately adjacent to them that the major portion of the materials present in Deer Creek site collections have been found. Four additional artifact sources have been the pasture road, cow trails, other eroded areas and ant hills; all of these are located outside the cultivated area.

The major portion of the site is in pasture and has never been plowed. It is undisturbed except for the undefined Thoburn work in 1917 and for the destructive potholing activities conducted over the years in many of the mounds (Figure 4, 2).

One large feature in the north-central part of the site is a horseshoe-shaped rampart and accompanying ditch which open roughly to the north (Figure 1, area a; Figure 3, 4; Figure 4, 1). McRill (1963:156) considered the available evidence to indicate that this "moat surrounding the stockage" was the location of a French trading post known as Ferdinandina. The name assignment occurred in the 19th century and is the only written record we currently have indicating a European occupation of the site. However, Wyckoff (1965:12) pointed out that the function of this structure is currently unknown, and it could as well be a circular series of trash mounds or some other type of structure. More recently, Wyckoff (1973, personal communication) has indicated his belief that this feature represents a fortified Wichita village. From the artifactual evidence available, there can be no doubt that the Deer Creek site occupants participated in French trade in the 18th century. However, the specific nature and origin of the earthen horseshoe-shaped feature, and thus identification of the central structure at the site, cannot be conclusively made until careful archeological excavations are conducted. Thus, due to the inconclusive knowledge regarding the type and extent of French occupation at the site, the currently correct term "French contact site" is used in this report to refer to the Deer Creek site.

The Deer Creek site occupants apparently did not remain confined to their centralized village area of about 13.0 hectares (32 acres). What appears to be a mound is located on the north bank of Deer Creek across from the village site. About 0.4 kilometers (¼ mile) south-southwest of the Deer Creek site, in the part of the field immediately east of the original Miller homestead, occasional flint scrapers (identical to those at the Deer Creek site) and flake debris may be found. Wyckoff (1965:11) notes that "numerous small areas of scattered occupational debris can be found within a quarter mile distance north and south of the main site area".

As for general geological and geographical features, the Deer Creek site is located immediately south of a bend in the Arkansas River where it changes from a brief westerly course to a southerly one (Figure 1). At this bend, immediately northeast of Deer Creek, a number of rock ledges run in a southeasterly direction from an origin on the west bank. These are visible when the river is low (Figure 2, 3). Deer Creek is a rather slow flowing stream (Figure 2, 4; Figure 3, 1), and in dry periods it breaks up into a series of isolated pools. However, the spring mentioned by Thoburn (McRill 1963:145) as located just northwest of the site and on Deer Creek would possibly have provided a fresh water source to the site occupants in dry times.

In the banks of the Arkansas River and of Deer Creek, adjacent to the village, are deposits of blue-grey clay which could have been the clay source for indigenous pottery vessels.

The Deer Creek site is located near the westernmost extent of the Bluestem Hills. A large butte-like ridge, characteristic of this region, is located one mile west-northwest of the site (Figure 4, 3). Trees in the site area are primarily along or immediately adjacent to the creek and river banks. The soil at the Deer Creek site is of the brown, deep loamy Vanoss Series with a 1-5% slope. It is described (Culver 1967:28-29, Map Sheet No. 27) as having a 16 inch surface layer of brown silt loam and a 22 inch thick brown silty clay loam subsoil below which the subsoil below which the subsoil takes on a lighter brown to reddish brown color. A detailed presentation of the geography, fauna, and flora of the region has previously been reported (Bastian 1969:2-4; Sudbury 1968:87-89) and does not need to be repeated here.

SITE HISTORY

Since as early as 1914, it has been known that the Deer Creek site's Indian occupation had been exposed to early white contact (McRill 1963:143). An examination of known white activitiy in the region surrounding the site will be useful in determining what possible contact could have occurred during the site's native occupation. Also, the tribes known (through historical documents) to have inhabited the area will be presented. In addition, what is known of the historical record of the site proper from its initial discovery to present will be presented, as well as future plans regarding preservation and development of the site.

Initial European contact with the central regions of what is now the United States was made by the Spanish. Beginning with their 15th century introduction to the Americas, the Spaniards began to explore the new land and to exploit its inhabitants and the land's mineral wealth. The first expedition of interest to this discussion is Coronado's 1540 expedition. The purpose of this expedition was to locate Quivira. Quivira was reached by Coronado, and according to W. R. Wedel (1959:21, 61) was probably located in Rice and McPherson counties, Kansas. Here, his party spent nearly a month exploring the region surrounding the 25 villages of Quivira (Wedel 1959:21) before returning to Mexico.

The next recorded Spanish expedition into this region was that of Bonilla and Humaña in 1593 or 1594. This expedition also penetrated to central Kansas (Wedel 1959:21). This was followed by the 1601 expedition of Don Juan de Oñate. Wedel (1959:21-22) has proposed that the location reached by this expedition was in Cowley County, Kansas. Next, a late 17th century (between 1664 and 1680) expedition occurred: its purpose was to locate and return several Taos families who had fled to the "buffalo plains". Of interest from this expedition was that "The fugitives were found in possession of 'kettles and other pieces of copper and tin' which they said they had obtained from the Quivira . . ." At that time, "it was possible to travel by way of Quivira to the Pawnees with whom the French were said to be trading" thus indicating French activity west of the Mississippi River by 1680 (Wedel 1959:23). During a 1719 expedition, note is made that the French, Pawnee, and Jumanos (Wichita) were allied with each other in an attack against a Paloma Apache group (Wedel 1959:24). A 1720 Spanish expedition to determine the extent of French westward encroachment was defeated by the Pawnee (supposedly aided by the French). This evidentally "ended serious exploration by the Spanish of the Northeast . . . ." (Wedel 1959:25). Report is also made of French questioning Apaches about the whereabouts of the Comanche whom they were trying to locate (Wedel 1959:25).

Several items of importance are learned from the documents resulting from these Spanish expeditions. One observation is the documented late 17th Century French penetration of the area. Another is the identification of the occupants of Quivira. "Identification of the natives of Quivira with the Wichita has been based primarily on the close similarity between the mode of life and material culture reported by Coronado and Oñate on the one hand, and what is known of the Wichita tribes, on the other" (Wedel 1959:61). Wedel (1959:62-63) uses the term "Wichita" to include several linguistically related groups that formed the 18th century Wichita Confederacy; whether or not the actual Wichita tribe comprised the natives of Quivira remains a moot question. The problem of name assignments for specific tribes still has not been resolved. The difficulty is that different names, and different spellings, have been used to refer to the same group. The situation is much clearer in the later historic periods than during the first several centuries of White contact when references were sparse. A partial listing of Wichita synonyms has been prepared (Bell, Jelks, and Newcomb 1967:332-339).

French incursions of about 1680 had reached as far west as the Pawnees. As no French documents of this period mention the French presence this far from the Mississippi valley, the

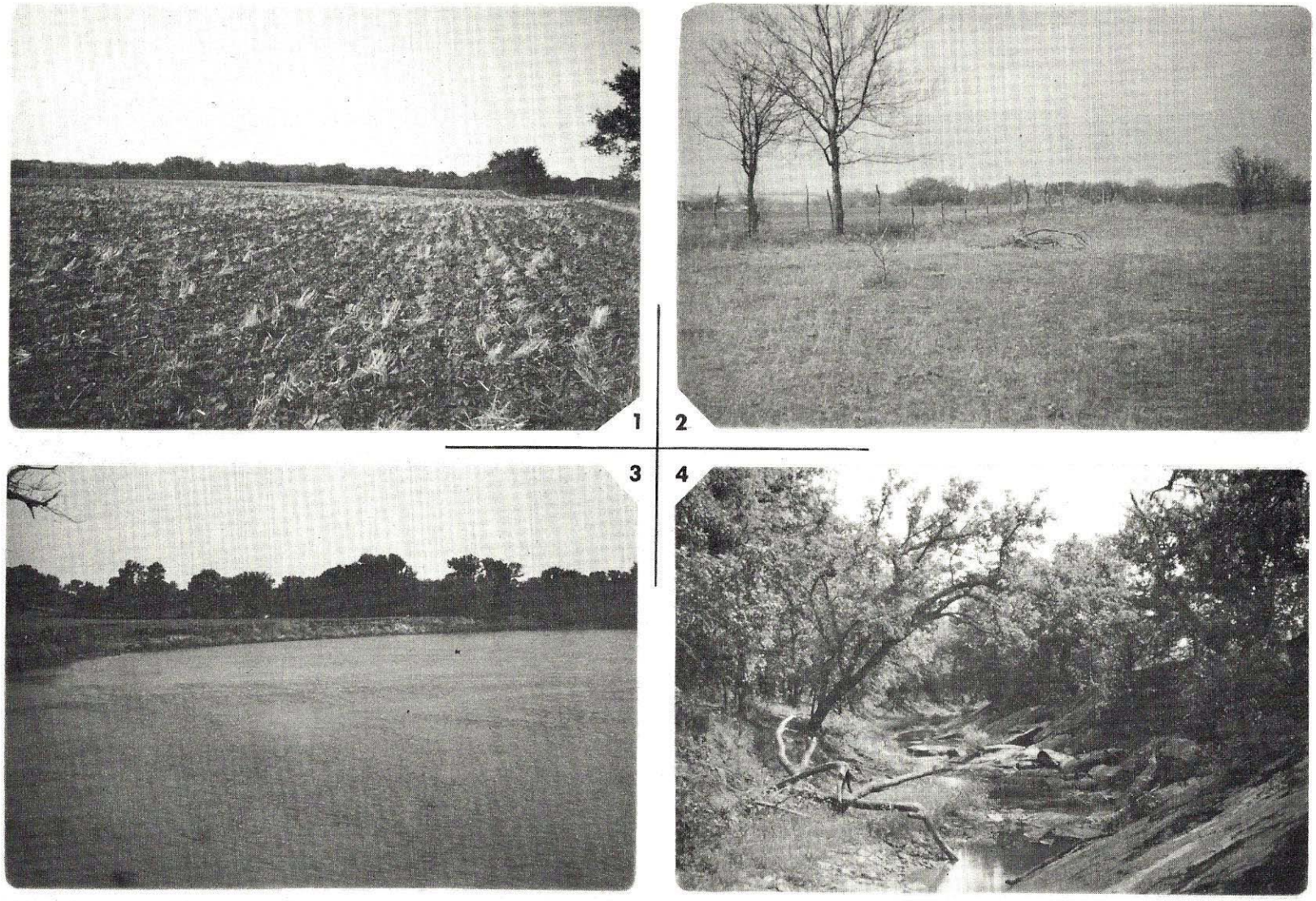

Figure 2. Ka-3, The Deer Creek Site: 1. View of mounds in field and along fence row, looking north. 2. View of mound along fence row, looking northwest. 3. Arkansas River taken from the mouth of Deer Creek, looking northeast. 4. View of Deer Creek, looking northeast.

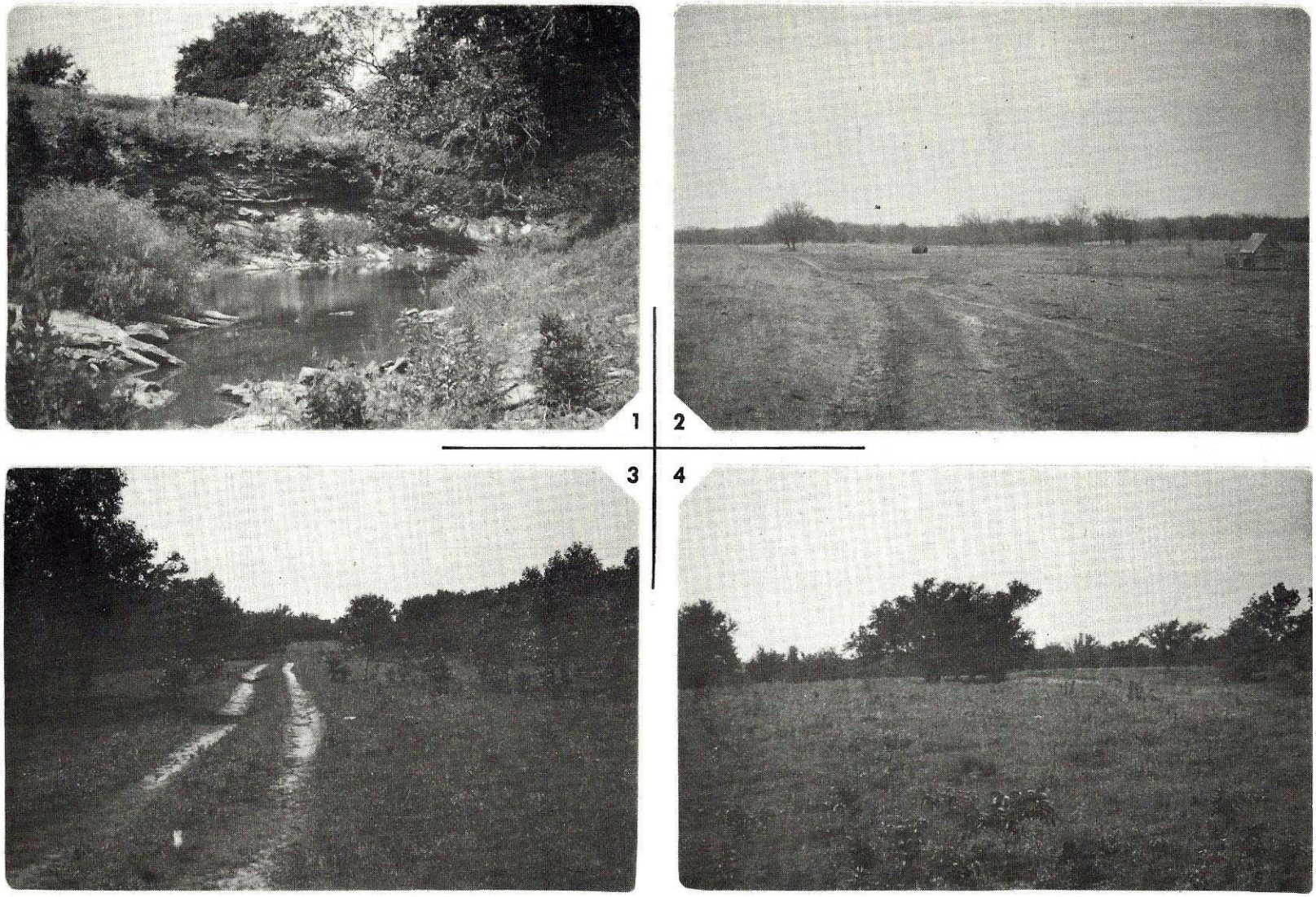

Figure 3. Ka-3, The Deer Creek Site: 1. View of Deer Creek, looking west. 2. View of the site from its southern perimeter, looking north-northeast. 3. View of mounds along pasture road where late beads were found, looking south-southwest. 4. View of a portion of the horseshoe-shaped rampart and ditch (on right).

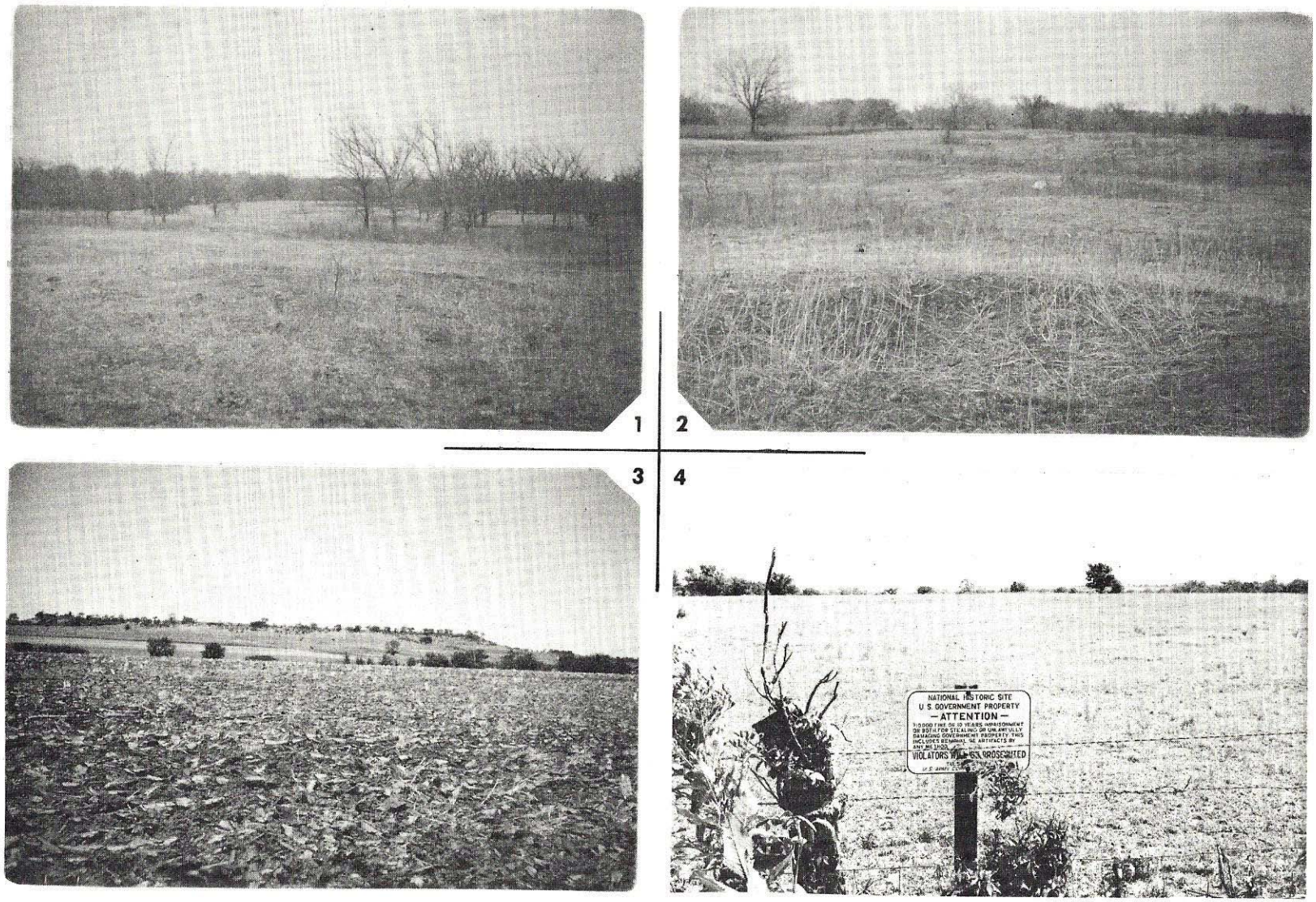

Figure 4. Ka-3, The Deer Creek Site: 1. View across the horseshoe-shaped rampart and ditch, looking northeast. Note the mound in the foreground. 2. View across the same mound as in No. 1, looking northwest. Note the large pothole in the mound. 3. View of butte-like ridge, looking northwest. 4. Notification of the status of anyone who attempts to hunt the site, looking east across the field.

travel was most likely limited to traders and not to explorers per se (Wedel 1959:26).

French records of their trading network's westward expansion as it affected Oklahoma began to appear with several well known early 18th century expeditions. Whereas early Frenchmen entering the Mississippi valley region did so by way of the Great Lakes route, their penetration up the Arkansas River valley was made a more practical endeavor by their settlement near the mouth of the Mississippi River. By 1673, Marquette and Joliet began explorations of the Mississippi River. In 1682, LaSalle followed the Mississippi River to its mouth and claimed Louisiana in the name of Louis XIV (Graebner, Fite, and White 1970:65). Several years later, LaSalle's attempt to establish a colony (Fort St. Louis) on the Gulf of Mexico ended in his murder and the colony's failure (Brebner 1955:272-274). Shortly thereafter Tonti, who was based at Fort St. Louis on the Illinois River, established the Arkansas Post (Fort St. Louis in Texas) near the mouth of the Arkansas River (40 miles up the Arkansas) in 1686 after he failed to locate LaSalle's colony (Brebner 1955:274-275). In 1688 Tonti searched for the survivors of the Gulf Colony. His search was conducted in and between the Trinity and Red River valleys; upon concluding all of LaSalle's party were dead, he returned to the Illinois River (ibid.).

Upon learning of the "foreigners" approach to Spanish borders the Spanish set out to determine what actual advances had been made. A number of expeditions led to the rescue of ten of the French colonists from the Indians as well as the discovery of the ruins of Fort St. Louis (Brebner 1955:276-277). In 1690, a Spanish mission was established just north of the Trinity valley near the Red River. The next year another attempt was made to establish additional missions on the frontier. However, within two years, "Indian hostility, the menace of the French at Pensacola, and adverse climatic conditions brought about the abandonment of the eastern Texas missions" (Brebner 1955:277). Thus, Spain's attempt to counteract French advances and reestablish its control over all of the Southwest failed.

> "By the establishment in 1699 and the following years of the colony of Louisiana on the lower Mississippi and the Gulf Coast to the east of its mouth, France secured a base on the ocean for exploitation of the great (Mississippi) valley and for commercial competition with the Spaniards and the English among the Indians west as well as east. Very soon, moreover, following the lead of Tonti, the traders at the French posts near the confluence of the Illinois, the Mississippi and the Missouri ('The Illinois'), found it wise to avoid Montreal hostility and the difficulties of the Great Lakes route by using the Mississippi as their link with the outside world. Thus Spain saw her mainland colonies really separated and realized that her northward expansion along lines that promised, even if they seldom yielded, new mines, and her potentially profitable trade with the plains Indians must now be flanked, and indeed outflanked, along the Mississippi. Both Spaniards and French began to think about the rivers which entered the Mississippi from the west. Unfortunately, from the French voyageurs' standpoint, the more southern of these rivers could hardly be classed as navigable, for they seemed always to be either in dangerous flood or too shallow for boats, and were frequently made dangerous by debris" (Brebner 1955:278).

The French hoped to gain the trade of the Indians between the Mississippi and the outlying Spanish settlements of the southwest as well as of the Spanish settlements themselves. They sought to establish a thriving trade and to learn of the Spanish territories. Their goal was a route to the Spanish settlements by way of friendly native villages.

> "French westward movement began in the south about 1700 and involved the north by a progressive advance as one after another of the western tributaries of the Mississippi was explored. The most tempting river was the Red, and from about 1700 on, Louis de St. Denis explored its possibilities for trade with the Indians and Spaniards" (Brebner 1955:280).

In 1714, St. Denis established Natchitoches on the Red River and then made trade contact with the Spanish settlements on the Rio Grande (ibid.).

> "From 1716 to 1719 or 1720 there was a curious sort of half-friendly, half-hostile commerce between Louisiana and the Rio Grande, but the authorities in Spain gradually brought it to a stop. The outcome, in so far as new exploration was concerned, was that Spain seemed to block it by 'occupying' Texas with a few scattered missions and military posts between the Rio Grande and the old mission region near the Red river..... None the less the Spanish 'front' in east Texas and the difficulties of travelling up the Red river valley beyond its great bend to the west made the Louisianians try their fortunes further north..." (Brebner 1955:281).

Establishment of the Nassonite Post by Bernard de La Harpe in 1719 on the Red River above the Cadodacho village there resulted in an effective barrier against the Spaniards regaining a hold on the region (Bolton 1914:44-45).

This shift in emphasis to more northern streams, and the Spanish presence on the western Red River, resulted in the 1719 journey of La Harpe up the Red River to its western bend from where he headed north until he intersected what appears to have been the Canadian River. Here, La Harpe met a group of nine related tribes which included several principal Wichita tribes (Bolton 1914:46; Thoburn and Wright 1929:37-39; Brebner 1955:281-282). Also, La Harpe learned that these nine tribes "were allied with the Panioussas living 40 leagues to the north" (Margry, 1886, pt. 6:289; cited in Wedel, 1959:65). Wedel (1959:65) comments that this Panioussas tribe was probably located north along the Arkansas drainage. Although the exact location of the nine tribes is not certain, and the exact distance represented by a league in this reference is not certain, it is conceivable that this Panioussas group was in the region near the two protohistoric Kay County village sites being considered in this study.

In the period from 1719-1722, La Harpe

> "opened up the Indian trade in the territory north of the Red River by exploring the Arkansas and Canadian river valleys . . . . The French thereafter did their best to build up intertribal peace and commercial dependence on French goods among the south-western Indians. The Spaniards had been very loath to sell firearms, but the French freely satisfied the demand for them, and whereas the Spaniards had depended chiefly on trade in horses, the French provided manufactured goods in studied abundance. Competition was keenest for the friendship of the Comanche and the Apache tribes, whose military power enabled them to bar the way from the Mississippi to the Spanish settlements" (Brebner 1955:282).

Another major French expedition at the same time as La Harpe's initial thrust into Oklahoma was that of Lieutenant Claude-Charles Dutinsé. In 1719, Dutinsé left Kaskaskia, went up the Missouri River to the Osages and attempted unsuccessfully to cross to the Panis. On a second attempt, Dutinsé traveled overland to the Osages, and then went southwestward about 40 leagues to the Panis (M. M. Wedel 1972:12-17; 1973:147-163) in his attempt to make contact with the Comanche. The name "Panis" was used to refer to the Taovayas, Wichita, Iscani, and Tawakoni (Bell, et. al. 1967:332-336). The exact location of these Panis settlements has long been the subject of heated debate.

> "In 1719, DuTinsé reportedly traveled 4 days, or 40 leagues, southwest from the Osage villages in present Vernon County, Mo., to a 'Panis' or 'Panioussa' (Wichita) village. En route, says La Harpe (Margry 1886, vol. 6, p. 311), Dutinsé crossed four streams, three of them inconsequential tributaries of the Osage River. The fourth and largest was the 'Atcansas,' and 12 leagues beyond was the village on the bank of another stream; a league to the northwest, on the same stream, was another village as large as the first. Each village was said to have 130 houses and 200 warriors; and the two had 300 horses. Various locations have been suggested for these villages, including the Neosho valley near Vinita, Okla., and the Arkansas valley in Kay County, Okla.
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> "The Neodesha locale is about 85 miles airline southwest of the Osage sites in Vernon County, Mo. To reach it in 4 days, DuTinsé would have had to travel about 20 to 22 miles daily; he would have crossed creeks tributary to the Osage and finally the largest stream, the Neosho, about 20 to 25 miles east or northeast of present Neodesha. To reach the Vinita locality, he would have had to travel mostly south from the Osage villages, and the daily marches would have been at least 25 to 30 miles. To reach the Kay County sites, which are probably chronologically acceptable, he would have had to travel not less than 150 miles, or a highly improbable average of 40 miles or more per day; and he would have crossed the Neosho, the Verdigris, probably Fall River and Caney creeks, and perhaps other south-flowing streams that he could hardly have mistaken for tributaries of the Osage. In short, the Neodesha sites seem to fit the geography and also the distances and directions supposedly traveled, provided it can be assumed that the French mistook the Neosho for the 'Atcansas'; and a shell-tempered pottery complex would be a probable one for a Wichita community of this period. The Kay County sites seem much too far away; and the Vinita locality, aside from the difficulities raised by distance and direction, has not yet produced White contact Indian sites that might be of the period demanded (W. R. Wedel 1959:533).

Thus, the actual locale of the two villages of the Panis reported by Dutinsé remains uncertain. It has earlier been suggested that the Deer Creek site is a Wichita site (Bell and Baerris 1951:91), and this concept is strengthened by comments regarding the Wichita's history and characteristics as mentioned in the historical record (Wedel 1959:19-47, 60-68, 532-534). In addition to the information given about the rivers and distance traveled, the location of the sites 12 leagues west of the major stream on a tributary, and the northern site being northwest of the other site, completely disagree with the possibility of the Deer Creek and/or Bryson sites being the location of Dutinsé's initial 1719 Panioussa contact. They are both located within 0.5 kilometers of the Arkansas River on the west bank. In defense of these Kay County locations, McRill (1963:135) cites an interesting 1720 French trading company memoir which orders the founding of an "establishment in the height of the Arkansas River toward the Padoucas who trade with the Spanish." Also cited is another reference which indicates that it was possible to induce tribes to move their village, and the implication made is than even if the Kay County sites are not the intial points of European contact, it was possible that they were the tribes contacted and were convinced to move to the west bank of the Arkansas River in Kay County (McRill 1963:135). Although this is possible, the other discrepancies in the text still go unexplained. It is apparent that the French desired to extend their influence further up the Arkansas. It is also obvious, based on the artifact samples available, that the Kay County sites are French contact sites. But it does not necessarily follow that they were established at this time.

It appears, based on the trade goods present, that the Bryson site was probably established sometime during the 1720's when the French expansion first affected the Arkansas in this region, and certainly no later than 1740 (see Appendix II). It is currently impossible to know whether or not the sites' initial European contact was the direct result of Dutinsé's 1719 journey or of another French contact. At present, several other Kay County sites west of the Arkansas River have yielded a very few materials which are probably assignable to this time period. These two sites are both located along Bois d'Arc Creek and their contact materials may represent losses during hunting activities and not an established settlement receiving French trade. Ka-42, the Hartshorne Site (east of Bois d'Arc), was cited by Bastian (1969:10) as apparently being an early contact site. Also, Ka-141, the Gordy Site, yielded on broken white olive-shaped glass trade bead with blue stripes which is probably of early 18th century French origin. As there is not more contact material from these heavily cultivated sites, it is probably that these finds represent hunting activities along the Bois d'Arc bottomlands and are not the result of early European contact with actual Indian villages. The finding of distinct contact sites which also show evidence of a Wichita-type culture west of the Arkansas River on a tributary in either Kay or Grant counties would lend considerable credibility to the theory that the establisment of the Bryson and/or Deer Creek sites was a direct result of Dutinsé's 1719 contact with the Panis. As of right now, this concrete evidence does not exist.

Wedel's recent rendering of the Dutinse text allows a considerably different interpretation of the location of the 1719 Panis villages (M. M. Wedel, 1973:153). She proposes that the statement "the River of the Alcansas" refers not to the name of the river but to the stream which, upon descending, one would arrive at the Arkansas Indian villages. Based on Dutinsé's description, the Panis villages are placed in the Neosho-Verdigris basin (M. Wedel 1973:156). This new interpretation seems valid, and again suggests that the two Kay County sites are not the location of Dutinsé's 1719 visit. In discussing the identity of the Panis, M. Wedel (1973:152-153) relates that Dutinsé

> "arrived at the village of the people he called variously pants, panis, or panioussa. In later times they came to be designated Wichita, thereby applying to the whole confederation what seems to have originally been the name of a single clan or band. . . . Panis was a useful shorter term or nickname applied to the Paneassa, but it came to have a much broader usage which included the related Central Plains Pawnee. . . . Moreover, in certain seventeenth and eighteenth century documents, Panioussa is used for the Wichita bands living lower down the Arkansas River, while Panis designates those farther upstream. The significance of this distinction in nomenclature is not clear."

We have been discussing an unanswerable question. What is more important is that the French contact in either northeastern or north-central Oklahoma begin by about 1719. La Harpe's reference (Wedel 1959:65) to a Panioussa village 40 leagues north or northwest of a locale presumed to be on the Canadian River near its junction with the North Canadian River seems to come closer to being the sites under discussion in Kay County than Dutinsé's 40 leagues southwest of the Osage. These references also place the Panioussa in the Arkansas basin, or possibly northeast of the Arkansas basin in northeastern Oklahoma. It also confirms the Panioussa alliance

with the French. The Bryson and Deer Creek site artifact samples indicate that these two sites were involved in the French trade pre-1740, and possibly pre-1730 (see Appendix II and Conclusions of this report). Also, the lithic inventory of both sites contains a large number of scrapers which indicates the economic importance of hide processing to the village economy. As the French thrust to establish trade in the region included fur trade, the large quantity of scrapers give supportive evidence to the trade goods indicating the French activity in the area. Thus, based on the artifact samples, although it cannot be demonstrated that the Bryson and/or Deer Creek sites were the initial points of French contact in the region, it appears that they were probably established as trading points within 10 to 20 years of this initial contact.

The next noteworthy development in the French trade involved Etienne Veniard de Bourgmond. ". . . he and his men established Fort Orleans about 300 miles up the Missouri and from it, between 1722 and 1728, explored and opened up for French trade a good deal of the region between the Arkansas and Platte river valleys" (Brebner 1955:283). Thus, trade in the Arkansas region continued to be developed from the northeast as well as from the mouth of the Arkansas River.

The aim in developing trade along the Arkansas and throughout the west was to reach the Spanish settlements of New Mexico. The final French success in reaching the Spanish settlements was by the Mallet brothers who in 1739 left from the Illinois region. The standard route taken in previous attempts to reach New Mexico had been to ascend the Missouri River. However, Pawnees near the Platte River informed the party that it was better to follow the Platte and its southerly tributary out to the high plains. They did this, and upon reaching this westward extent they turned south and successfully reached New Mexico (Brebner 1955:284-288). The party split up on the return trip, part going down the Canadian to the Arkansas and the remainder returning to Illinois by "the route of the Panis" (McRill 1963:139).

A return expedition up the Canadian River to New Mexico was attempted in 1741-1742. This attempt failed, primarily due to low water in the Canadian River. Even so, the French desire for economic advantage by way of trading with the Spanish settlements continued to exist.

> "The trade with the Spaniards at Taos and Santa Fe longed for in 1740 was built up rapidly in the succeeding years. The Canadian River was traveled by French voyageurs and Spanish traders. The route from Santa Fe to The Illinois was gradually established. The commerce was not advertised to Mexico City .. . . . Yet by 1750, French influence among the Indians made New Mexico almost helpless in the commercial rivalry among the tribes and dependent on the French. The French had made routes across the south-west, and, except during the interruptions of Indian wars, the knowledge and use of them was continuous" (Brebner 1955:288).

One interesting suggestion about the Deer Creek site artifact sample may be made at this point. As the French traders traveled to New Mexico, they bore French trade goods. On their return trip it is conceivable that they would also bring back some trade items to their Indian allies along the return route. If so, they would probably be items of interest or value, and probably not of Spanish origin as such introduction to another country's trade goods might detract from their trade relationships with their Indian allies. However, it is conceivable that they would bring back native items from the Southwest region. If French traders crossing overland back to the Illinois country did practice trading on their return trip, it would explain the presence of several elements in the Deer Creek site artifact sample which probably originated from the Southwest (none of these items have yet been reported from Bryson). First, there are two obsidian flakes from the Deer Creek site (Sudbury collection). Second, the University of Oklahoma collection from the Deer Creek site contains six Southwest trade sherds as reported in an inventory and discussion of the collection (Wyckoff 1965:13, 15). Third, several sherds of indigenous pottery are consistent in all their features with other indigenous sherds from the site except they have black designs on them (Sudbury collection). This appears to represent a resident attempt to imitate design techniques like those found on Southwestern trade wares. Of course, direct trade with peoples of the Southwest, or even acquisition of war spoils from Southwest people, cannot be ruled out. But the possibility of French influence through returning traders also exists. Southwest trade sherds have been reported from two Lower Walnut focus sites in Cowley County, Kansas, and are believed to represent a time period of about 1525-1650 (Wedel 1959:363). Bastian (1969:122) notes the occurrence of a sherd very similar to one of Wedel's at the Tyler site in Haskell County, Oklahoma. Thus, it is conceivable that the Deer Creek's Southwest trade wares originated from Indian trade or even Spanish trade (although other Spanish artifacts have not been noted). However, it is also possible that the Southwest materials at Deer Creek result from French traders using the overland route back to the Illinois country from the Southwest.

"For the period between the expedition of La Harpe and the middle of the eighteenth century little is known of the movements and whereabouts of the Wichita tribes, but there seems to have been a general movement southward, though Jumano continued to live on the Arkansas. But trade with the Wichita tribes seems to have been conducted freely from the Nassonite and Arkansas posts, while an occasional French trader or deserting soldier made his way through their country to the Comanche and to New Mexico" (Bolton 1914:46).

The Spaniards use the terms "Jumano or Jumanes" to refer to the Wichita.

"...The Wichita were 'known to the Siouan tribes as Black Pawnee (Paniwasaba, whence 'Paniouassa,' etc.) to the early French traders as Pani Pique, 'Tattooed Faces', and are designated in the sign language by a sing conveying the same meaning... from their abundant tattooing they were designated preeminently as the 'tattooed people' in the sign language" (Mooney as cited by Wedel 1959:63).

"While the French had early in the eighteenth century established a firm hold on the Pawnee and Jumano tribes, neighbors of the Comanche, until near the middle of the century, their hold on the Comanche does not seem to have been as strong, the principal reason being the hostility of the Comanches toward the other tribes named. Nevertheless, there was some contact between the Comanche and the French..... About 1746, friendly relations of the French with the Comanche were greatly facilitated through the peace which the latter tribe made with the Jumano of the Arkansas Country and with the Pawnee of the Platte. Now French traders, hunters, and deserters, guided by Jumano and Pawnee, began to make their way to the Comanche in considerable numbers, some of them even going to Santa Fe. Thus in 1748 a party of thirty-three Frenchmen are reported to have been in El Quartelejo[1] trading with the Comanche. Again in 1749, three Frenchmen of a party of twelve deserters and traders who passed through Jumano country to the Comanche reached Santa Fe. The other nine had remained among the Comanche. Shortly after, in the year of 1750, there arrived at Santa Fe a Spaniard named Felipe Sandoval, who had made his way from Louisiana with six companions up the Arkansas to the Comanche. While he was among this tribe he saw a French priest and several French traders bartering weapons and other merchandise for skins, horses, and slaves" (Bolton 1914:58-59).

Felipe de Sandoval also left another 1750 record about his trip to Santa Fe:

"A Spaniard who in 1749 passed through the Jumano villages on the Arkansas River on his way to New Mexico, with a party of Frenchmen wrote that these Indians were all well supplied with firearms by the French traders, possessed a French flag, and had just received a bountiful supply of presents in the name of the French King" (Bolton 1914:47).

A 1750 account of an earlier Spanish venture into the Arkansas valley is also available:

"Sometime before 1750 a party of Spanish soldiers from New Mexico, in pursuit of Comanche and led by Lieutenant-General Bernado de Bustamanto y Tagle, had gone down the Arkansas River to the neighborhood of the Jumano villages, learning of the beauties and bounties of the country ' which Divine Providence created for the support of the savages and the greed of Frenchmen.' But the governor of New Mexico, writing in the year named, could cite no other instance of Spanish advance down the Arkansas, and he frankly admitted that the Jumano were under the control of the French, while he depended for information regarding them on reports brought up the Arkansas from Louisiana" (Bolton 1914:48).

Thus, although some Spanish contact was probably made with the Jumano in the Arkansas valley, it was not in the form of a trading enterprise, and thus it would not be expected to exhibit itself in the trade goods of the period.

In 1763, the period of French political dominance in Louisiana ended. France ceded all of Louisiana west of the Mississippi River to Spain at the termination of the French and Indian War. "Unable to hold it for herself, France realized that Spain would be a more congenial sovereign for the Frenchmen in the valley than Great Britain...." (Brebner 1955:315). France

1. Wedel (1959:25-26) proposes a western Kansas location for this settlement.

still had the trade advantages in Louisiana due to the report they had established with the tribes over a period of 40 to 80 years. Thus,

> "After about five years of awkward readjustment, Spaniards and Frenchmen combined in a new and vigorous exploitation... Spain was wise enough to use French agents and gradually an uneasy equilibrium was achieved...Then there were reopened for peaceful commerce all the old trails and routes which France and Spain had established west of the Mississippi (Brebner 1955:316).

In 1800, Spain agreed to return Louisiana to France, and in 1803 the United States bought the territory of Louisiana from France.

Immediately following the acquisition of Louisiana, President Jefferson implemented a series of systematic explorations of the new territory in an effort to identify its resources and inhabitants and to establish its limits. Several of these reconnaissance expeditions passed near or through Kay County, Oklahoma. First was the 1806-1807 expedition of Lt. Zebulon M. Pike. Although Pike did not traverse the Arkansas River in Oklahoma, a detachment of his party under Lt. James B. Wilkinson did do so (Quaife 1925:62-63). The next expedition involving this region was led by Major George C. Sibley in 1811. Sibley's expedition evidently traversed the region west of the Deer Creek site. No definite report is made regarding Wichita-affiliated tribes along the Arkansas River although Osages were encountered, probably in south-central Kansas (Sibley 1922, 1927; Wedel 1959:42). The next expedition was that of Major Stephen H. Long who went to the Rocky Mountains in 1819-1820. On his return trip his party divided in Kansas, and half, under Captain Bell, descended the Arkansas River. Bell's detachment traveled through Kay County in August, 1820. However, they traveled down the north bank of the Arkansas and did not report any native tribes on the south bank. Several habitations were noted in Cowley County, Kansas, and these are presumed to be Osage (James, Vol. 3, 1823:85-100).

Although the Kay County region of the Arkansas basin was explored during the early 19th century, there are no direct references to the Deer Creek site. However, several items of interest are documented. Pike relates encountering Frenchmen several times as well as a French hunting camp and a small settlement of 10 French houses (Quaife 1925:10, 23, 51). In Long's journal we are informed (James 1823:Vol. 2--255, Vol. 3--29-30) that the Pawnee Piquas resided along the Red River. Pawnee Picts, Panipiques, etc. were names of the Taovayas, Wichita, and Waco Indians (Bell, Jelks, and Newcomb 1967:332-339).

Wedel (1959:63-68) provides an extended summary of the documented locations and evident movement of the Wichita-related peoples from the mid-16th to the late 19th century. Their migration was generally a southward one, evidently retreating - at least in the 18th century - from "the documented hostility of the Apache on the west and the Osage on the east" (Wedel 1959: 67). Beginning with Coronado's expedition, it seems the Wichita were located in south-central Kansas or north-central Oklahoma. Through the middle and late 17th century, the Paneassa are south and west of the Osages and north and east of the Arkansas River. By 1719 or so, some of the tribes had moved far enough south to be found by La Harpe on what was apparently the Canadian River, and reference is made to related groups 40 leagues north-northwest in the Arkansas basin. "By the latter half of the 18th century, most or all of the Wichita tribes seem to have been on the Red River and southward on the upper Brazos, Trinity, and other river valleys of north-central Texas (Wedel 1959:66). They continued in this region on into the 19th century.

> "In 1805, the Wichita proper and the Tawehash were reported to be living in two villages on Red River about 800 miles above Natchitoches. Subsequent moves took them to the North Fork of Red River west of the Wichita Mountains in present Kiowa County, Okla., where they were visited in 1834 by the United States dragoons under Dodge and accompanied by Catlin; to the east end of the Wichita Mountains in the vicinity of present Fort Sill; to Rush Creek in the Washita drainage, where Marcy found them in 1852; and ultimately, in 1859, to lands assigned them further up the Washita in present Grady and Caddo Counties" (Wedel 1959:67).

In 1863, the Wichita fled to Kansas and set up their town at the site of present-day Wichita. In 1867, they were returned to the area of Anadarko, Oklahoma, where they continue to reside (Wedel 1959:67-68).

The preceding discussion of Spanish, French, and American influence is taken primarily from W. R. Wedel (1959), M. M. Wedel (1971, 1972, 1973), Brebner (1955), McRill (1963), Bolton (1914), and Thoburn and Wright (1929). For a discussion of the map evidence relating to the tribes inhabiting the specific regions of the Deer Creek and Bryson sites, in addition to Wedel (1959:63-68), the reader is referred to Appendix I of this paper.

In summary, the Appendix shows the Paniassa in the general Arkansas region by around 1680, and shows them northeast of the Arkansas River on several unnamed tributaries to the Arkansas in about 1725. Approximately 1750, they have changed to the west bank of the Arkansas near the mouth of one of the northerly tributaries, and by about 1780, their presence in this region is no longer indicated. Later maps label the tributary they were opposite as the White River; no streams in this region currently carry this name. The appendix continues this study by noting the appearance of "Ferdinandina" on maps sometime between 1830 and 1850 at seemingly the same location as the earlier Paniassa village. This name is carried on the maps until ca. 1882 when it last appeared. Other documentary references relating to the occupants of and the date of occupation of the site of Ferdinandina are currently unknown. Several possible origins of the name Ferninandina are considered in Appendix I.

A brief examination of the 19th century record of the Indian tribes most directly involved with this region will facilitate this later discussion (Thoburn and Wright 1929). Soon after the Louisiana Purchase (1803), the suggestion of removal of the eastern Indian tribes to west of the Mississippi River was made by President Jefferson. In March, 1804, Congress formed two territories out of Louisiana and appropriated funds to begin the necessary negotiations for Indian removal although there were no immediate results. The first "Oklahoma" land purchase with the intent of Indian removal was in 1818. In 1820, the first land cession--to the Mississippi Choctaws--was made; the tribe began their migration about 10 years later. President Monroe encouraged additional treaty negotiations. In 1817, part of the Cherokees ceded their eastern lands and moved to a reservation in Arkansas. In 1828, these Cherokees moved from Arkansas to their new lands, a region north of the Arkansas River, west of present-day Arkansas state, and east of the 96° longitude. In addition, they also received the Cherokee Outlet which ran westward from their land to the Oklahoma panhandle. However, by 1835 many Cherokees still remained in North Carolina, Georgia, Tennesse, and Alabama. These remaining Cherokees signed a treaty in 1835 in which they agreed to move west and join the western Cherokees. Their forced westward removal occurred during the winter of 1838-1839. At this time, Indian Territory was a region extending from the north border of Nebraska to the Red River. In 1854, the Kansas-Nebraska Act limited Indian Territory to what today is primarily Oklahoma.

The Osages were removed to Oklahoma in 1872. Their assigned land was from the western border of the Cherokee Nation to the Arkansas River. This region had previously been the eastern portion of the Cherokee Outlet. In 1873, the Kaw (Kansas) Indians were placed on a small reservation in the northwest corner of the Osage Nation adjacent to the Arkansas River. On March 19, 1893, the Cherokee Nation ceded their claims to the Cherokee Outlet to the United States. September 16, 1893 was the opening of the unassigned portion of the Cherokee Outlet to White settlement. This was the fourth, and the largest, land run to take place in Oklahoma. From the time of the initial establishment of the Cherokee Outlet until its sale to the United States, the land that the Deer Creek and Bryson sites are on was under the ownership of one tribe--the Cherokees. In the 1870's, the Osages and then the Kaws lived immediately across the Arkansas River from the site. Thus, it is conceivable that any one of these tribes could have occupied or traversed the Deer Creek site. In addition, strict boundaries as we interpret them were not recognized by the Indians, especially during the earlier part of the removal period. Thus, any one of the many tribes represented could have been at the site at one time or another during this period.

The recorded history of the site locale indicates that in the 18th century the Arkansas basin region containing the Deer Creek and Bryson sites was occupied almost exclusively by Wichita people. In the 19th century, the site was in the Cherokee Outlet which was owned by the Cherokee Nation. In addition, it was very near the Osage and Kaw Reservations. Indian occupation probably did not occur after the Cherokee Outlet Land Run in 1893.

In 1914, Mr. Wilson Fletcher introduced Dr. Joseph B. Thoburn to the Deer Creek site (McRill 1963:143). At this time, a small portion of the site was under cultivation. The site consisted of 65 low, circular mounds which varied in diameter from 25 to 50 feet and from 1 to 2½ feet in height. One additional feature which was noted was a horseshoe-shaped trench of about 240 feet in diameter (McRill 1963:143-145). Thoburn (McRill 1963:145-146) reports having excavated at Deer Creek: " 'In one of the smaller mounds which were dissected by the writer (Thoburn) in company with Dr. Fred Stearns of Harvard University, in the summer of 1917....' ". Evidently at least one mound, and quite possibly several, was excavated by Thoburn in 1917. A later comment (McRill 1963:149) about the " 'finding of similar (storage) pits beneath the floors of such ruins (ruins are the mounds, assumed to be house mounds) on the Deer Creek Village site...' " also indicates that more than one mound was dug at this site. However, to date, the location and extent of these excavations is not known; a check with Dr. J. P. Brain (1974, correspondence), Peabody Museum (Harvard), did not reveal information about Dr. Stearns

or 1917 archeological activity in Kay County, Oklahoma. Thoburn suggested that a blacksmith shop was probably present in the village, but his evidence for this seems very tenuous. He did recover trade materials which were assigned to a mid-18th century, French trade origin, and he also noted the prolific number of large scrapers. Additional artifacts mentioned include native-made double-cone pipes of clay, metates, and stone hoes. He suggests that the site is the location of Ferdinandina, thus implying an 18th century origin to this name and its association with the French traders (McRill 1963:145-146). Thoburn assumed that Ferdinandina was a trading post (McRill 1963:142).

Additional excavations at the Deer Creek site were evidently planned by the 1926 Marland Archeological Expedition. However, the land owner would not permit excavations, so the focus of the expedition was shifted to the nearby, and related, "Buffalo Cliff Village Site" [Ka-5, the Bryson site] (McRill 1963:146; Otto Spring, correspondence, 1974). Since that time the presence of the mounds, and perhaps the publicity created by the Thoburn work, has contributed to the considerable amount of potholing now evident in a number of the mounds.

The pasture portion of the Deer Creek site has never been plowed. The field that includes the site's western portion has been in continuous cultivation since prior to 1917. Mr. Samuel Michial Miller, grandfather of Clark Miller, participated in the 1893 Run, and he homesteaded the section immediately south of the Deer Creek site. Beginning in 1935, Carl Miller began to lease the site area from Mrs. Jennie Seltzer, and he continued to lease it until 1960. Then Clark Miller began leasing the site, and he continued to do so until 1971. At that time the U.S. Army Corps of Engineers purchased the land as part of their acquisition program for construction of the Kaw Dam and Reservoir. Clark Miller was allowed to lease the property from the government, but he no longer cultivates the field. The Deer Creek site is a designated National Historic Landmark. This status involves a Federal government prohibition against unauthorized collecting of any kind from the site under penalty of fine and/or imprisonment (Figure 4, 4).

The significance of the Deer Creek site cannot be overestimated. Wyckoff (1965:19) writes:

> "excavations might provide important data concerning the actual ethnological identification of the natives who occupied the site as well as data on early White-Indian contact on the Plains, the effects of this contact on the native way of life, and the beginnings of Plains Indian acculturation. Also, the question concerning the nature of the site, whether an Indian camp or a fortified French trading post, could be resolved".

The fact that the site is relatively undisturbed and in an excellent state of preservation is also noteworthy. Apparently the site either supported a dense population or a long occupation, or both; there is a large amount of cultural debris present. Wyckoff (1965:11) comments, "This particular site represents one of the most intensely occupied areas within the future confines of the reservoir". The large yield of native and European artifacts expected from this site should greatly increase our knowledge of the artifacts present at this time period as well as the interrelationships of certain artifact types and their historical significance.

This site will be preserved from destruction by the future reservoir. Its significance is underlined by its selection as a National Historic Landmark. As soon as funds become available and an excavation permit is granted the University of Oklahoma plans to excavate at the site. Larry Banks, archeologist for the U.S. Army Corps of Engineers, relates (1974 correspondence) that the site is being "planned and developed as a recreational, educational resource for the entire public". The exact mode in which the site will be "displayed" is still uncertain and will remain so until after the excavations. It will most likely be an interpretive park with the site itself, a collection of materials recovered from it, and a discussion of their meaning and significance being available for public observation. The site is being developed in perspective with other reservoir features.

The Trade Goods

The native-made artifacts from the Deer Creek site--primarily from the author's collection--are briefly described in Appendix III. The White contact trade goods from three private collections are described in detail in this section. Although some artifacts, such as tinklers, are actually native-made, they are described with the trade materials. This is because the original material source was through White trade. The private collections described herein are those of Norman Hiatt, Walt Rosborough, and the author. Unfortunately, the bulk of Norman's trade beads

could not be located at the time of this study. Other than that, this report encompasses three entire trade materials collections from the Deer Creek site. The specimens described in this report were returned to their owners. To aid any interested party who wishes to further examine a particular specimen, the initials of the owner appear in the artifact description (NH, Norman Hiatt; WR, Walt Rosborough). When no initials are present, the specimen(s) under discussion is in the author's collection. The only exceptions to this are the WR beads which Walt generously donated to the author's collection.

The trade goods are grouped into four major divisions. These are: gun parts, tools, ornaments, and miscellaneous trade goods. The description of these artifacts follows.

Gun Parts

Gun parts have the potential to convey a great deal of information about the sites where they are found. The study of gun parts from archeological sites is just beginning to grow out of its infancy. During the past two or so decades, this artifact class has received increasing attention as indicated by the greater amount of literature devoted to the examination of various gun part samples. With this increase in analyses and reporting, both by the archeologist and the student of the history of the gun, many gun parts in an archeological collection are now able to tell their part of the story about the site they represent.

The history of White trade in the Louisiana Territory, particularly in the present state of Oklahoma, is primarily one of French dominance. From the first Spanish explorations in the New World, occasional excursions were made into this region by the Spanish. However, it appears that the Spanish were reluctant to supply the Indian with firearms (Harris et al. 1965:316). English penetration in this region seems to have been rare, and French influence and trade remained dominant. Thus, it is logical to concern ourselves primarily with French guns.

Russell (1957:22-23) conservatively estimates that 200,000 French "muskets" were traded to the Indians prior to the time France's position as a political power in the New World ended in 1759. At present, no complete French trade gun of this period is known to have survived (Harris et al. 1965:316). Only in recent years has a basic knowledge of these poorly understood guns been gained; this has been exclusively through the careful analysis of archeological specimens. As the volume of carefully documented and reported specimens grows, an understanding of this previously "unknown" gun is evolving.

It is important to note that some of the trade guns coming through the French trade were possibly manufactured in other countries. Thus, the French trade gun parts referred to in this report were most likely traded by the French, but they were not all necessarily of French manufacture (Harris et al. 1965:316-318).

The majority of gun parts in this sample as well as those from a number of other sites seem to represent the fusil class of weapon. The fusil was a light weight variety of flintlock introduced in the last half of the 17th century; this was opposed to the heavier musket and carbine (George 1947:72). The French word fusil actually means "non-military sporting gun" according to Held (1970:105). Peterson (1956:40) relates that the fusil "was a light military arm patterned after the heavier musket." The major portion of Indian trade guns seem to have been this class of light-weight flintlock weapon.

As many people are not well acquainted with the terminology and the mechanism of action of the flintlock, Jay C. Blaine has graciously consented to allow his plates on the French trade fusil and the flintlock mechanism to be reproduced here (Plates 5, 6). Examination of these illustrations will give the reader needed background to properly picture the location and function of the discussed parts in the flintlock.

Excellent published discussions of gun parts found on several sites in the central United States readily lend themselves to comparison with the Deer Creek sample. The specific "Gun Type" assignments made regarding items of gun furniture are based on the preliminary work by T. M. Hamilton (1968), Early Indian Trade Guns: 1625-1775. In this excellent volume, Hamilton has assimilated data on a mass of archeological trade gun specimens and set about classifying these parts into gun types through their associations and characteristics. The overall classification scheme, and especially the dates which are presented, are tentatively proposed pending additional data; at present, both appear to be accurate.

In several instances, comments are made regarding the Bert Moore collection which is now

housed at the Oklahoma Historical Society Building in Oklahoma City. In 1963, Muriel H. Wright (McRill 1963:152-153) wrote

> "The acquisition of the Bert Moore collection, privately owned by Mrs. Bert Moore at Winfield, Kansas, was arranged and the collection became the property of the Oklahoma Historical Society in 1956. Many of the relics from the Ferdinandina site found by Mr. and Mrs. Moore during a period of fifty years . . ."

T. M. Hamilton (1968:6,7,12,14,15) examined the Bert Moore collection and included some of the specimens in his preliminary book on Indian trade guns. Hamilton (1968:6) presents these materials as having been "surface collected by Bert Moore on the Arkansas River near Deer Creek." This wording is used because the specimens had not been catalogued, and, as indicated above, "Ferdinandina" was their presumed site of origin. Thus, it is thought these specimens did come from the Deer Creek site, but it cannot be positively confirmed. The specimens described by Hamilton are included in this gun section. Knowledge of their precise origin is not definite although they are thought to have come from the Deer Creek site.

A description and analysis of the various gun parts from the Deer Creek site follows. The artifact inventory includes gun barrels, gunlock parts (sear spring, tumbler bridle, upper vise jaw), trigger assembly parts (trigger floor plate, triggers), furniture (butt plates, side plates, trigger guards, ramrod guides), and related items (gunflints, gunflint patch, lead bullets, lead shot, touch hole cleaner).

Gun Barrels (2 fragments)

Hamilton's (1968) preliminary report is based on known gun specimens from various sites and indicates some of the common characteristics of trade gun barrels which are summarized below.

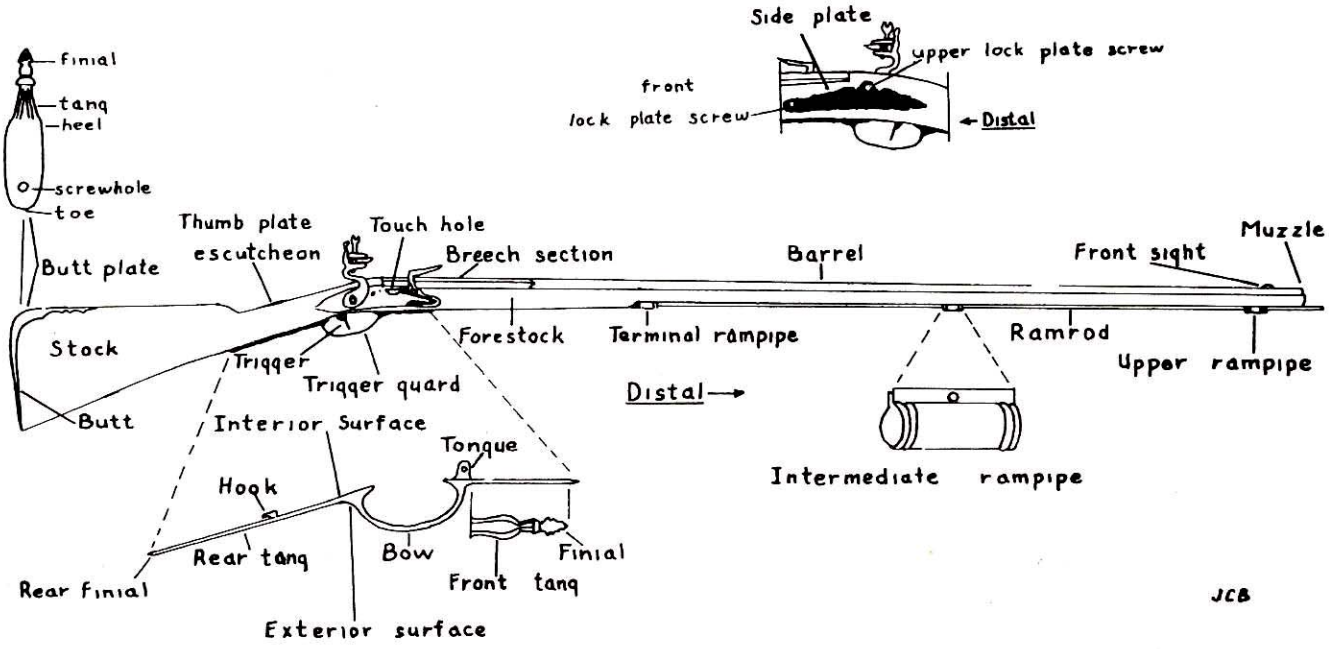


Figure 5. Sketch showing the parts of a French trade fusil (courtesy of Jay C. Blaine).

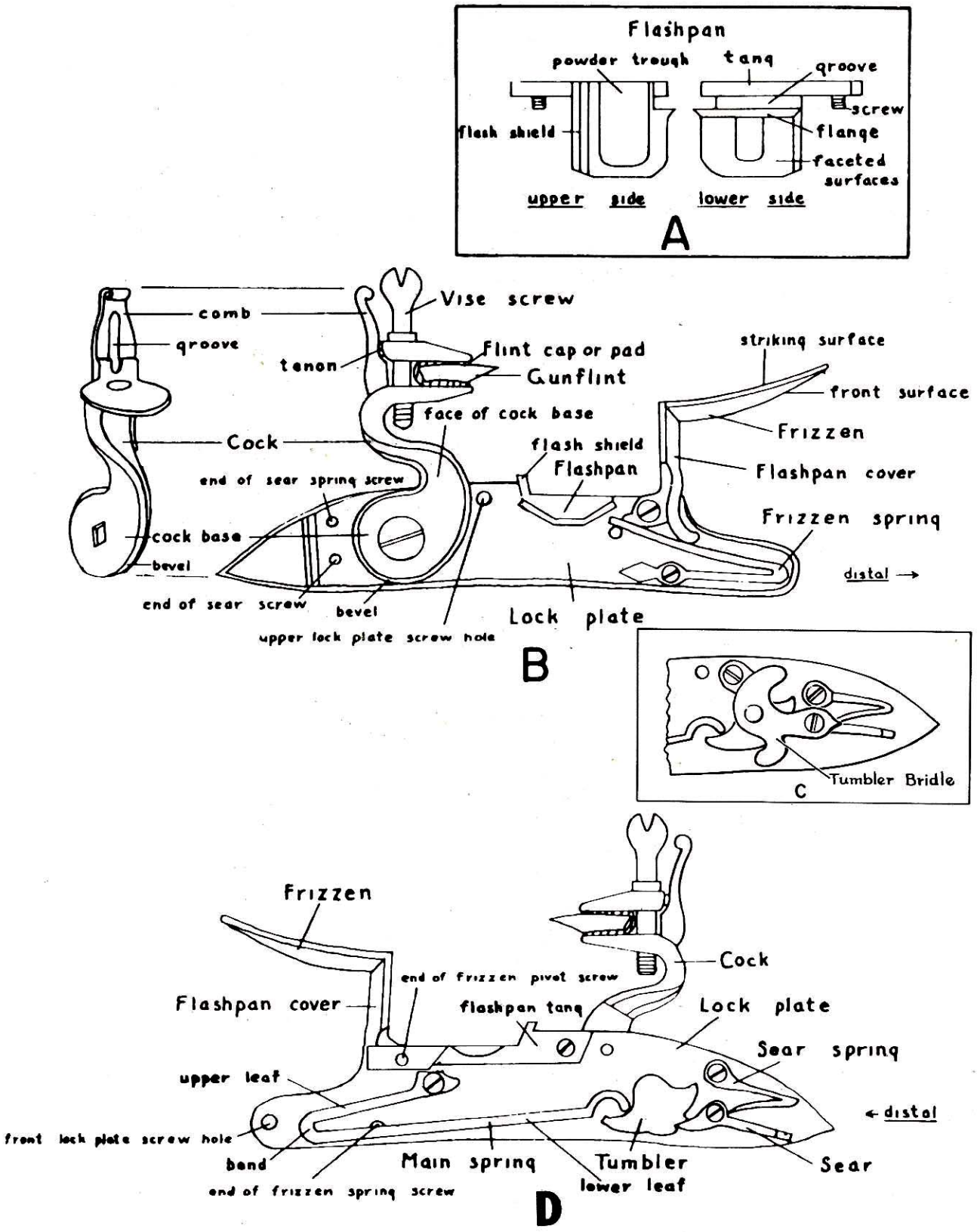


Figure 6. Sketch showing flintlock mechanism of a French trade fusil (courtesy of Jay C. Blaine).

French fusil barrels of the 1680-1730 period ranged from 36 3/4 - 53 inches in length with octagonal breech sections from 9-12 inches long, with a measure across the flats of the breech of 1/8 - 1 11/32 inches, and a bore of .50-.62 inches (Hamilton 1968:3, 7, 19). A round English gun barrel (1625-2650) 49½ inches long with a breach diameter of 1¼ inches has been reported; it is about .59 caliber (Hamilton 1968:21). Two English gun barrels (1725-1770) measuring 47 5/8 - 48 inches with a 9-10 inch octagonal breech, measuring 1 inch across the breach, and with a bore of .56 - .68 inches are also described (Hamilton 1968:15, 27-30). Early Dutch flintlocks (1625-1685) are reported (Hamilton 1968:21, 23, 27) with barrels 53½-63½ inches long, some with an octagonal barrel (20-24 inches), measuring 1 7/32 - 1½ inches across the flats of the breech, and with a bore range from .56-.68 inches. Thus, in examining 18th century gun barrels, we may expect roughly four foot barrels, often with an octagonal breech section. Also, the movement towards on inch or less across the flats of the breech occurs by about 1750 or a little later.

Two fragmentary gun barrels were found at the Deer Creek site:

Gun barrel no. 1 (WR) (Figure 7, 1): This octagonal breech section has the breech plug in place. The tang of the breech plug has been broken. The remainder of the tang was evidently beaten from the butt end as some flaring is evident. The muzzle end of this barrel has been broken off; the remaining portion shows evidence of flattening. R. K. Harris cleaned this specimen; no makers marks were detected.

The breech section is 6.97 cm. long, and the overall specimen is 8.42 cm. long. The center of the touch hole is 1.75 cm. from the breech end. The diameter across the flats is 2.85 cm. (2.92 cm. before cleaning). The inside diameter of the barrel at the touch hole is 1.57 cm. (.62 caliber) (.60 caliber before cleaning).

"The breech section is broken away approximately 2½ inches forward of the breech butt and is laterally mashed at the broken area. This is a good indication the barrel was broken intentionally, probably to secure metal for other uses. The breech is octagonal with the lower three facets slightly rounded, as is common. This fragment is too short for determining whether it is from a pistol or fusil. The position of the touch hole is somewhat unusual in that it enters 1/8 of an inch ahead of the face of the breech plug. This touch hole position is further forward than is common. I have no idea why this is so. Possibly a longer breech plug was initially employed in, or intended, for this breech. The maximum diameter of the breech is approximately 1 1/8 inches as measured across opposite flats. The caliber appears to be approximately .62 inches" (Jay C. Blaine, correspondence, 1974).

Gun barrel no. 2 (NH) (Figure 7, 2): This 15.6 cm. long barrel has been completely flattened. As it is fairly thick (1.42 cm. average), it is thought to be from near the breech end of the barrel. Its width ranges from 3.41 to 4.39 cm.

Discussion: The Womack Site (Harris et al. 1965) yielded nine gun barrel sections, eight of which were medial sections. The ninth is an octagonal breech section with the breech plug intact. The breech measures 1.125 inches across. This barrel was .58 caliber. "We believe bores of caliber .58 and .60 [when the breech diameter is greater than one inch] represent the French trade gun of a slightly later period ca. 1750" (Harris, et al. 1965:333-334). Two other barrel sections were .55 caliber.

The Gilbert site yielded 23 gun barrel fragments. Three sections relate to this discussion: a round muzzle section, .60 caliber; an octagonal breech section with breech plug intact, .55 caliber, 3.0 cm. across the breech at the flats; and an octagonal breech section of .58 caliber, measuring 2.9 cm. across the flats. Six breech plugs were recovered; two have breech diameters of 2.9 cm. Both are thought to have been for use with a bore of .55 caliber. It was concluded "these breech sections would seem to be from French or English trade guns, probably dating near 1750" (Blaine and Harris 1967:59-61).

One Deer Creek site gun barrel has a measurement of greater than one inch across the breech flats and a measurable bore of .62 caliber. R. K. Harris (personal communication, 1973) commented that the 1 1/8 inch breech measurement "indicates that this barrel would fall in the period previous to 1750". Jay C. Blaine (1974 correspondence) comments:

"What we have compares well in all respects with mid-eighteenth century fusil specimens used in the French trade. The quality suggested would again be that of a trade weapon. An English source cannot be ruled out since we do not presently have a good

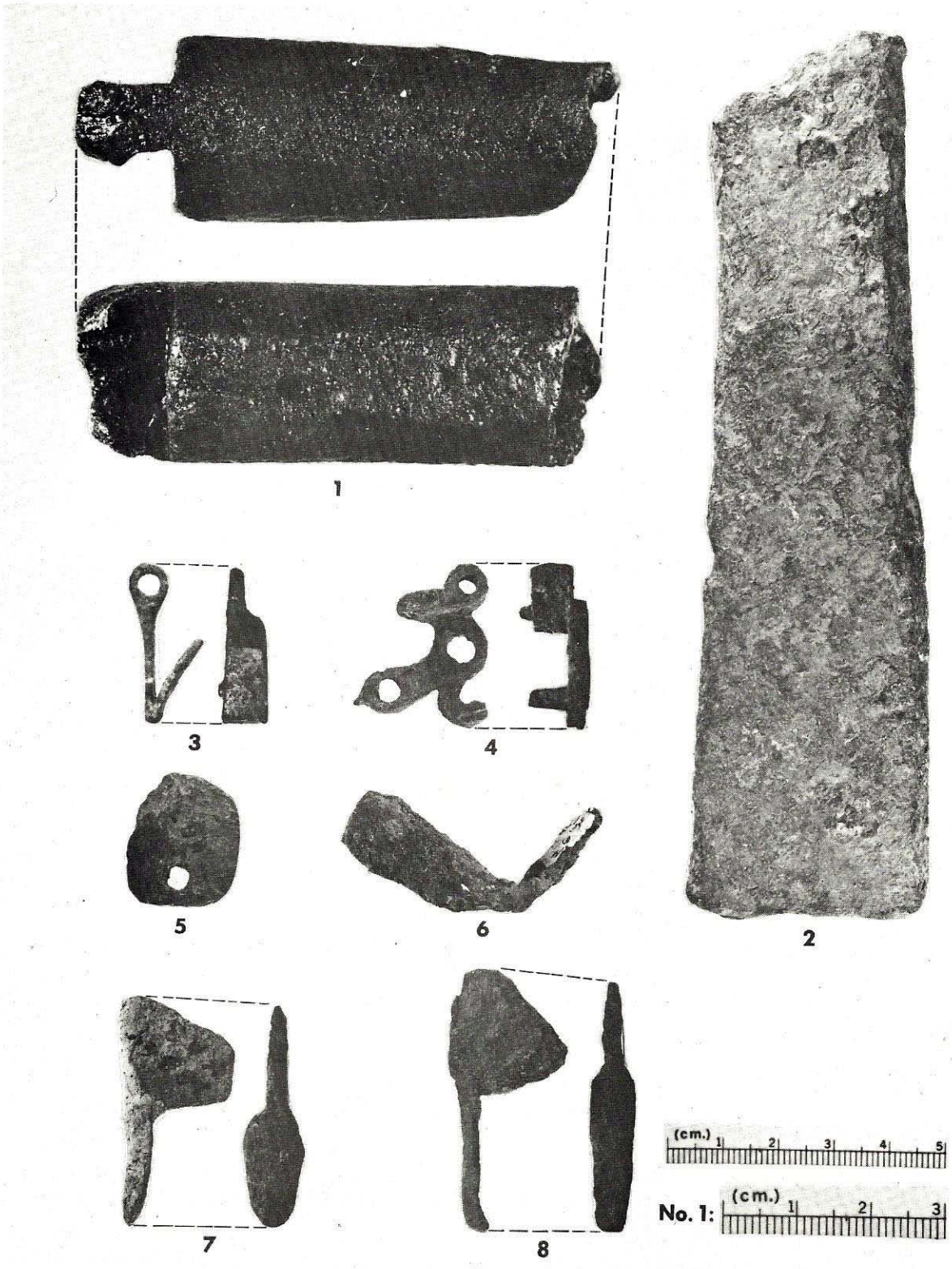


Figure 7. Ka-3 (Deer Creek Site) Gun Parts: 1. Gun barrel no. 1 (enlarged as indicated). 2. Gun barrel no. 2. 3. Sear Spring. 4. Tumbler bridle. 5. Upper vise jaw. 6. Trigger floor plate. 7. Trigger no. 1. 8. Trigger no. 2.

body of comparative data on the eighteenth century English trade gun."

See also the discussion on calibers in the lead bullet section.

Sear Spring (1 specimen (NH), Figure 7:3)

The sear spring served to limit the movement of the sear when engaged by the trigger. This complete sear spring was used with a vertical action sear. The length of its upper branch (or leaf) is 2.52 cm., and the length of its lower leaf is 1.76 cm. A small stud is located on the inner edge of the upper leaf 0.49 cm. from the apex of the bend connecting the two leaves.

The sear spring screw hole on this specimen is essentially centered on a line continuing from along the upper leaf. This differs from the Gilbert site specimen where the screw hole deviates slightly away from the lower leaf axis (Blaine and Harris 1967:39, 42). Illustrations in Steele and Harrison (1883:212-215) indicated that the shape exemplified by the Deer Creek site sear spring is that of a side-action (bar-lock) spring. The Gilbert site spring is also probably of this same side-action spring variety. It was also indicated that specimens very similar to the Gilbert site specimen were actually used in back-action locks instead of side-action locks. The greater relative length of the lower leaf of the Gilbert specimen also indicates the possibility that is was used with a back-action lock according to the description. The authors don't indicate whether or not the back-action lock was ever employed in the flint-lock. Thus, it is uncertain whether or not this structural difference noted in the late 19th century is applicable to 18th century trade guns.

Tumbler Bridle (1 specimen (NH) (Figure 7:4)

In the mid-17th century, English guns were beginning to be produced with a reinforcing bridle on their tumbler, and after 1700 the bridle was in common use except on the very cheapest of guns (George 1947: 79-81, 102-103). The tumbler was "supported and held in position by a steel bridle, or bearing which serves to prevent the tumbler from being pressed by the main-spring against the inside of the lock-plate, and also affords a second bearing for the screw upon which the scear of the lock is pivoted" (George 1947:81). The bridle helped keep the motion of the tumbler in perfectly vertical rotation (Held 1970:110).

George (1947:82,117) uses sketches to illustrate English bridles in use at about 1715 and 1775; the 1715 variety is simple and plain whereas the 1775 illustration indicates the bridle was much more elaborately and gracefully shaped. The Deer Creek tumbler bridle is rather graceful in form, being similar in appearance to the bridle reported from the Gilbert site (Blaine and Harris 1967:39, 41-42). The design (shape) of the Gilbert specimen indicated to the authors that it was possibly of French origin. The Deer Creek specimen, as was the Gilbert specimen, is very similar to the French bridle illustrated in the article "Arquebusier" in Denis Diderot's Encyclopedia, Paris, 1751-1765 (Held 1970:115).

The three holes in the Deer Creek specimen are for the bridle screw, the tumbler pivot, and the sear screw (from top to bottom when in situ). There is also a stud or pivot located next to the bridle screw hole and a brace extending from the interior surface of the lower forward extension to the lock-plate. All of the bridles mentioned in this discussion have this same basic hole pattern. A century later (1883), as illustrated by Steele and Harrison (1883: 240), a fourth hole--for a second bridle screw--was normally present, and the bridle was once again very plain.

The country of origin of the Deer Creek specimen is not known. It is of the same graceful form as that utilized on French and English bridles in the 18th Century. It is especially similar to a French style illustrated as being used during the 1751-1765 period.

Upper Vise Jaw (1 specimen (NH), Figure 7:5)

This badly weathered upper vise jaw was for use with a wide combed cock. It is generally round, and has a wide flat base where a small portion of a tenon is still discernible. The two sides and front edge on the dorsal face are beveled. The thickness from the front edge to the back edge gradually increases to 0.53 cm. The ventral face is flat except for the front edge which has been bent, yielding a slightly concave surface. This specimen is 2.08 cm. wide, and 2.46 cm. long.

Harris (personal communication, 1973) relates the general characteristics of English vs. French vise jaws of the 18th century fusil. English specimens normally have a narrow slotted

base for fitting around a narrow combed cock. French upper vise jaws are made for wide combed cocks, and the jaw normally has a tenon which rides in a groove in the comb.

The Womack site yielded one flintlock cock which had the upper vise jaw in place. It is a grooved wide comb cock, and the upper vise jaw has a tenon which rides in the groove. It was concluded that this cock "is probably from a French trade gun which dates between 1700 and approximately 1750" (Harris et al. 1965:320-322).

The Gilbert site yielded 3 gunlocks (one with an upper vise jaw), 10 cocks one of which still had the upper vise jaw in place, and 3 other upper vise jaws. Of the four upper vise jaws in decent shape, only one was definitely for use with a wide-combed cock. Ten of the 13 cocks are wide-combed and grooved; the other three are narrow and ungrooved. However, due to other distinguishing characteristics of these three cocks, they are not thought to be of English origin. After considerable discussion, it was concluded that the cock sample as a whole probably represented guns used in the French trade in the mid-18th century (Blaine and Harris 1967:43-53).

Based on these two samples, the Deer Creek upper vise jaw appears to be from an 18th century, French trade gun.

Trigger Floor Plate (1 specimen (WR), Figure 7:6)

This iron trigger plate has parallel sides for the first 3 cm. from the muzzle end before beginning to taper to a rounded point. The overall length of this plate was originally about 5.6 cm.; it has been bent in the middle. The muzzle end is thickest (.70 cm.) and has a screw hole in it for passage of the breech tang screw. This raised platform on the muzzle end was inlaid into the stock; its four edges are all undercut. The remainder of the plate is of relatively uniform thickness (2.1-219 cm.), being thickest at the muzzle end. Its edges are not beveled. Looking at the ventral surface (muzzle end up), the trigger slot is slightly off-center to the right. No major cleaning was performed.

The two plates from Gilbert are dissimilar from this one in that they do not have a region of parallel sides and their muzzle end is not as thick. One Gilbert trigger slot is centered, and the other is offset to the left (Blaine and Harris 1967:53-54).

One of the trigger floor plates illustrated in the Michilimackinac report appears similar to the Deer Creek specimen; however, it does not have a region with parallel sides (Maxwell and Binford 1961:120). The Stansbury site specimen also lacks the parallel region (Stephenson 1971: 97-99).

This plate has similarities to known 18th century floor plates. It also has stylistic differences which distinguish it from other reported specimens.

Triggers

When a flintlock is on full cock, pulling the trigger elevates the arm of the sear which disengages the tip of the sear nose from the full cock notch on the tumbler. This enables the tension on the mainspring to rotate the tumbler which is connected to the cock. The rotating cock with the gunflint in the cock jaws strikes the gunflint against the frizzen. The resulting sparks fired the priming powder, and thus the powder charge. Two triggers are represented in the Deer Creek site collection:

Trigger No. 1 (NH) (Plate 7:7). This complete iron trigger is 4.13 cm. long. The trapezoidal part which fits inside the gun is 2.1 cm. by 2.0 cm. The exterior portion is slightly curved in side view and is an elongate egg-shape in front view (1.17 cm. wide).

Trigger No. 2. (Plate 7:8). This gracefully shaped iron trigger is 4.65 cm. long. The interior portion is triangular; it measures 2.13 cm. by 2.3 cm. The exterior portion of the trigger is slightly curved, and then recurves at 2/3 its length.

Discussion: Comparable specimens to these two triggers are not in the Womack or Gilbert samples. Triggers more similar in form to the Miller specimens, especially to No. 2, are illustrated in the Fort Michilimackinac report (Maxwell and Binford 1961:120).

Butt Plates

The butt end and rear part of the comb of the gun stock were covered with a piece of metal

known as the butt plate. Three fragmentary butt plates are present in this sample:

Butt plate No. 1 (NH) (Figure 8:3): This cast brass specimen is a butt plate tang. No finial was ever present on this specimen. It has been broken straight across near the butt plate heel. After tapering inward (from 2.44 cm. in the heel region), the sides of this tang run nearly parallel, tapering slightly from 1.55 cm.; at 4.30 cm. from the break, they meet in a rounded end.

There are several noticeable things about this plain undecorated tang. Both of its surfaces are flat, and the edges (0.14-0.18 cm. thick) are perpendicular to both of these faces. The edges exhibit file marks. There is a hole located 1.14 cm. from the rounded end of the tang. This hole is squarish (generally square with somewhat rounded corners) indicating it was for a square nail or a small spike. Screws rather than nails were used in fastening French butt plates to the stock. The use of nails or spikes tends to be an English trait (Harris et al. 1965:337).

Even more noticeable on this specimen is the presence of a maker's mark. This mark, a dot over the letters RW, is very deeply stamped on what appears to be the underside of the plate above the nail hole. The letters RW have been seen before on gun parts but not on a butt plate, and never in conjunction with a dot. More will be said about this in the ensuing discussion.

Butt plate No. 2 (WR) (Figure 8:1): This fragment is the heel of a cast brass butt plate. The tang and the toe portion have been broken off and the rough edges smoothed down. The high places at the tang break have been smoothed off approximately perpendicular to both faces; the tang break is straight across. The toe end has been shaped to leave a low pointed protrusion; the two edges making up this protrusion are strongly beveled on their exterior face to form what could have been used as a scraping edge. This fragment averages 0.20 cm. thick, is 5.67 cm. long, and 4.75 em. wide.

Butt plate No. 3 (Figure 8:2): This specimen of cast brass is the toe of a butt plate which has been broken across the screw hole. It shows no evidence of other alterations. The screw hole is about 0.58 cm. in diameter, and its edge is located 3.85 cm. from the toe. The maximum width of this specimen is 4.90 cm. Its present length is 4.30 cm., and it is 0.15 cm. thick.

Discussion: According to Hamilton (1968:13-15), the Bert Moore collection contains several butt plate specimens. The type E French trade gun which has been assigned a tenative date of 1733-1760 is represented by one butt plate finial and one butt plate tang. A cipher present on the finial was identified as that of "the Controller Desjardins who was appointed to the Maubeuge Armory in 1718 and served as controller until May, 1755, the date of his death." The finial itself was presumably made for a French Model 1733-34 musketoon. One complete butt plate finial and tang representing the Type F French trade gun (tenatively assigned the 1735-1760 period) was also noted. This specimen, the only Type F gun fragment currently known, also has the cipher of Desjardins on it.

Butt plate No. 1 in the present study collection is an extremely interesting piece. RW could well be the initials of R. Wilson, a London gunsmith listed by George (1947:335), who is thought to have worked in London from 1730-1780. George also lists three other London gunsmiths with the initials R.W.

The initials RW have been reported by Hamilton on two English gun types. On one Type G gun

> "barrel, the London proof marks introduced in 1702 with the makers mark between the letters, 'RW' beneath a rosette can plainly be read. . . This is the mark of R. Wilson, a London gunsmith who flourished according to George (1947), from 1730-1780. On the top flat, between the rear site and the breech, is stamped 'LONDON'" (Hamilton 1968:15).

This gun type is assigned a date of 1725-1770.

The Type J English gun (1730-1760) also displays the RW mark. Following are Dr. Donald Baird's (Princeton University) comments which he made to Hamilton (1968:19-21) regarding his former Type J gun specimen:

> "'In its styling this is a typical 18th Century English fowling piece, resembling a Brown Bess in miniature, and fullstocked in walnut with a slim wrist and flaring butt. The cast-brass mountings are decorated by flat-chasing, a cheaper process than engraving. The 30½ inch barrel (originally one to three inches longer) is .60 caliber

and is octagonal up to the first of the three retaining pins; its breech thickness is slightly over one inch. Its top flat is marked (((LONDON))) and its upper left flat is stamped "R*W" between the oval "viewed" and "proved" marks of the London Gunmaker's Company. Under the breech are stamped the initials T.W. and a small raised cross in a square incuse, like a four paned window sash.

The six-inch lock is convex faced and is decorated with chased floral scrolls and double borders; forward of the frizzen-spring screw its edge is sharply beveled. WILSON is engraved below the pan. This lock is provided with a tumbler bridle and a safety half-cock notch.

Details of the brass mountings can be seen in the photographs. The eight-armed "snowflake" design appears on many 18th Century English (especially London-made) guns, e.g. on the Type J buttplate from Alabama, the Type G. escutcheon and a "Northwest" Indian fusil by P. Bond illustrated by Russell (1957, Figure 22,e). The wrist escutcheon has an outline identical to that of a butt inlay on the same P. Bond gun. The sideplate which has WILSON cast on its inner surface) is a crude facsimile of the sideplates in form of martial trophies which were popular on British fowling pieces in the 17th Century, and the buttplate tang has the same affinities.

The maker of this gun is difficult to identify precisely, as several generations named R. Wilson made guns in London between 1681 and 1780. The R*W mark appears on a small-bore fowler of the Queen Anne period as well as on the Type G barrel and other trade guns. Hudson's Bay Company contracts were awarded to Richard Wilson and his successors between 1730 and 1833. For the present, a tentative dating of 1730-1760 seems reasonable.'"

Thus, there were several generations of R. Wilson. Even more confusing is that the Deer Creek specimen has a dot, and not a rosette, over it! Also, the plain tang is not nearly as ornate as the Type J buttplate tangs illustrated. As of yet, a Type G butt plate had not been identified.

Several comments have been made regarding this Deer Creek site RW butt plate specimen. Regarding R. Wilson, Hamilton (1974 correspondence) states

"My guess is that there were at least two of them, if not three who carried on the family business through the generations from about 1680-1780. Consequently, his or their mark . . . could be on many different styles of guns made through those years. The RW touchmark looks like Wilson's, but I never saw it before with a dot. Your specimen shows what I would assume to be another variation of the RW mark. The only definite dates I have on this type of buttplate are Michilimackinac English occupation, 1760-1781, and Spaulding's Lower Store in Florida, which was occupied from 1763 to 1783. I also know that this type was widely used on the early Northwest gun around 1800."

This specimen appears similar to the tang illustrated by Hamilton which came from 21Vel, an Osage site in Missouri. This site is known to have been occupied during the 1790-1815 period (Hamilton 1960b:120, 137).

Jay C. Blaine (1974 correspondence) relates, "Unfortunately, there are at least four R. Wilson names to be found during the 17th and 18th centuries and involved with trade guns. The best I could estimate is middle to late 18th century English trade for this piece."

R. King Harris (1974 correspondence) had this to say about the dot over RW butt plate:

"This piece may be a finial from a Northwest butt plate which may date from the middle of the 18th century to the late 18th century. It appears to be English in style. At first thought the initials RW may stand for R. Wilson, an English gunmaker. But there are other gunmakers in England and the U. S. with the same initials. The dot over the RW on your specimen appears to be a dot and not a rosette. This may indicate that this gun was a forgery of the English maker by another country. Belgium gunmakers are known to have made many guns in the English Northwest style and forged the makers' marks."

Thus, although a makers' mark is present, it appears that the variation (a dot and not a rosette) from previously reported guns with RW on them prevents positive identification of the

maker. This specimen is English in style; use of a nail instead of a screw also supports this. According to the above comments, it is likely that this butt plate is from a gun produced in the last half of the 18th century, possibly as late as 1800.

The other two butt plate specimens in the Deer Creek sample are not diagnostic as to country or time of origin. Neither do they pose the novel problems of the first specimen. Specimens of their nature would be expected from an 18th century French contact site. The two gun types represented by butt plate specimens in the Hamilton report (1968:13-15) are both French in origin and have been tentatively assigned a time range of 1733-1760. It is fairly certain that the Type E gun was manufactured sometime between 1733 and 1760.

In summary, the three Bert Moore specimens seemingly indicate an occupation in the middle third of the 18th century. The RW butt plate, which is most likely of English origin, could possibly be from this time period. The Northwest gun is generally thought to have appeared in the United States in about 1775 (Hamilton, correspondence, 1974). If this butt plate is from a Northwest gun, it must date post-1775. Thus, it could date from the last portion of the French trade period (which is the occupation indicated by the bulk of the trade materials from the site). However, it is even more likely that it represents an occupation date as late as 1800. If this is the case, it is suggestive that the Deer Creek site was occupied longer than previously thought, or it could have supported a second occupation.

Side Plates

The side plate was located opposite the lock-plate and received the upper and front lock-plate screws. Often, the side plate was ornamental in nature, being gracefully shaped and/or decorated on its exterior surface. Four fragmentary side plates are present in this Deer Creek site sample:

Side Plate No. 1 (WR) (Figure 8:4): This fragment of flat cast brass is the rear half of a side plate which has been bent and broken transversely. The upper lock plate screw hole has been broken but is present. Both surfaces are flat, and the edges are perpendicular to the surfaces. The thickness ranges from 0.16 cm. to 0.20 cm. The specimen is 5.64 cm. long and has a maximum width at the upper lock-plate screw hole of 2.27 cm.

An engraved leaf-scroll type design is on the exterior surface. It is primarily parallel to, and confined near, the edges and leaves the central region of the plate relatively free of design elements. A "crown over R" laying on its front side is present below the screw hole on the exterior surface of this specimen.

Side Plate No. 2 (NH) (Figure 8:5): This flat cast brass specimen is the pointed posterior end of a side plate broken transversely behind the upper lock-plate screw hole. Both surfaces are flat with the exterior surface near the edges being slightly beveled. Also, the edges are very slightly undercut. Four parallel cut marks are on the interior surface along one edge near the tip.

The exterior surface has been engraved with an Acanthus-scroll design. This specimen is part of a Type D gun side plate as defined by Hamilton (1968:10-13). Hamilton (correspondence, 1974), upon examining this specimen, concluded that this Type D side plate is from a pistol. It is 2.52 cm. long, has a current maximum width of 1.43 cm., and ranges from 1.50 to 1.85 cm. thick.

Side Plate No. 3 (NH) (Figure 8:6): This fragment of flat cast brass is an oval-shaped escutcheon out of the center of a side plate. It has been broken transversely on each side of the escutcheon. The unbroken edges have an elevated rim on them, and the center of the escutcheon is plano-convex in cross section. The specimen is 1.96 cm. high, and has a maximum thickness of 0.19 cm.

This specimen appears to be of a Type B or C gun as defined by Hamilton (1968:3-8). Hamilton (correspondence, 1974) relates, "The centershield from a Type C sideplate, or something similar to the Type C. There are various designs using this centershield."

Side Plate No. 4 (Figure 8:7): This flat cast brass fragment is a portion of the front end of a side plate. It has a transverse break at its posterior end, and part of the screw hole is present at its anterior end. The edges approaching the former front lock-plate screw hole have been trimmed down so as to intersect the hole. The specimen is 2.45 cm. long, a maximum width of 1.37 cm., and a thickness ranging from 1.2 to 2.0 cm.

The engraved design begins 1.05 cm. from the edge of the screw hole. It consists of two parallel lines 0.17 cm. from each edge of the specimen. Small ticked triangles pointing towards the center of the plate are situated on each line. These two lines are joined by a convex arc which follows the general shape of the remaining portion of the screw hole. The central region's design element consists of two lines forming a central "V" with the open end intersecting the break; the remainder of this element is

missing due to the break. Hamilton (1974 correspondence) reports this specimen resembles the front end of a Type D side plate or something similar to Type D.

Discussion: Hamilton (1968:6) illustrates one side plate of French origin in the Bert Moore collection which is thought to have been found at Deer Creek. It is from either a Type B or a Type C gun and has been assigned a tentative date of 1680-1730.

The Womack site collection contains 15 side plates (Harris et al. 1965:327-332). Five appear to be from Hamilton's Type D gun and at least four are from Type B or C guns.

The Pearson site yielded two side plates (Duffield and Jelks 1961:55-56). Both appear to be off Type D guns.

The Gilbert site field work yielded nine side plates (Blaine and Harris 1967:68-71). Seven seemingly fit into Hamilton's Type D gun classification, and one is from a Type G gun. One serpent (dragon) side plate was found and is thought to be of French origin prior to 1770.

The Guebert site yielded two specimens of Type D side plates (Good 1972:139-140. There is, also, one of a Type B and C side plate.

Specimen No. 1 from Deer Creek has a "crown over R" mark as do some of Hamilton's Type D gun side plates and butt plates. However, its design is totally unlike those of the Type D side plates, and Hamilton (correspondence, 1974) indicates this specimen is from an entirely new gun type, probably of French origin.

Specimens 2 and 4 from Deer Creek appear to be Type D side plates which have tentatively been assigned a date of 1730-1760 (Hamilton 1968:13). Harris (correspondence, 1974) believes the time period for Type D guns should be 1700-1760 based on evidence from Period 1 (1700-1740) and Period 2 (1740-1767) sites.

Specimen No. 3 is either of a Type B or Type C gun. It has been tentatively assigned (Hamilton 1968:3-7) a date of 1680-1730 and is believed to be of French origin.

The Moore specimen supports, but does not enlarge on, the Deer Creek data in the present sample. Specimen No. 1, due to its similarity to Type D guns (i.e., the "crown over R") is conceivably from the same general time range as Type D guns. The two Type D side plates indicate a date of 1700-1760, and the Type B or C side plate allows inference of a date of 1680-1730. These specimens are thought to all be of French origin. The ratio of Type D to Type B or C side plates at the above mentioned site is: Womack, 5:4; Pearson, 2:0; Gilbert, 7:0; Guebert, 2:1; and Miller, 2:1 (2:2 including the Moore specimen). Guebert's long occupation provides poor comparison in this analysis. The Womack ratio is nearest Miller, and the later sites lack Type B or C side plates. It is thought (Harris et al. 1965:360) the major occupation at Womack occurred from about 1700 to 1730. Thus, although a maximum time range of 1680-1760 is possible, the occurrence ratios of side plates suggests a more restricted time range, 1700 to 1730. However, two iron side plates were also recovered from Womack; no comparable specimens are known for Deer Creek. The period from 1730-1750 is relatively blank for reported Norteño sites; Gilbert and Pearson occupations begin about 1750-1760. It seems plausible the Deer Creek occupation could well fall in the 1720-1760 period when Type B and C guns were being phased out.

Although there is general agreement that Type D guns were coming through French trade, their actual manufacture source remains to be conclusively demonstrated. John Mathey (Hamilton 1968:13) suggests they were made at the French armouries of Maubeuge and St. Etienne. This might clarify why two types of crowns are present in the known "crown over R" speicmens. But it doesn't indicate what the R signifies. Harris (1974, personal communication) believes there is no overwhelming evidence against their having been produced at the armoury in Rippol, Spain. But this doesn't explain the two different crown styles. As support for this interpretation, Harris (1974, personal communication) mentions the R could stand for Rippol and that the crown does not appear to be the conventional French crown style.

Trigger Guards

The trigger guard was fastened to the underside of the stock. The two tangs were against the stock and had perforated tenons on their interior face which were inserted into the stock, being secured there by means of pins or screws. The bow of the guard was in the region of the lock bed and served to protect the trigger from accidental movement. Four fragments are present in the Deer Creek sample:

Trigger guard No. 1 (Figure 8:8): This front tang finial is broken across its juncture with the front tang. This cast brass specimen is plano-convex in cross section and has a maximum thickness of 0.24 cm. Its length is 2.90 cm., and its maximum width is 1.35 cm.

This finial is badly worn but still exhibits elements of the design. This is the Acanthus leaf design (Harris 1973, personal communication); "potted plant" finial is the descriptive term used by Hamilton (1968:7-9). Hamilton (1974, correspondence) confirmed this finial was of the "potted plant" design. It is probably from a regular Type C grade gun (Hamilton 1968:7-9).

Trigger guard No. 2 (Figure 8:9); This cast brass, front finial is also broken across its juncture with the front tang. Hamilton (1974, correspondence) believes this "potted plant" finial is also probably from a Type C trade gun. The Acanthus leaf design is very difficult to see due to extreme surface wear.

This specimen is plano-convex in cross section and has a maximum thickness of 0.26 cm. It is 3.07 cm. long and has a maximum width of 1.47 cm.

Trigger guard No. 3 (Figure 8:10): This cast brass, plain finial has wide exterior bevels and a trapezoidal in cross section. This finial was cut at its junction with the tang, probably the rear tang. Hamilton (1974, correspondence) comments that due to its small size, he believes this finial is possibly from a pistol trigger guard. He also suggests it is probably from a Type C or D trade gun. The maximum measurements are: width, 1.17 cm.; length, 2.65 cm.; and thickness, 0.19 cm.

Trigger guard No. 4 (Figure 8:11): This is a cast brass segment of a tang which includes a perforated tenon that was inserted into the stock and pinned in position to secure the guard in place. Jay C. Blaine (1974, correspondence) notes:

> "This specimen is from the rear tongue of a trigger guard from a fusil, and is broken across the tang, immediately before and after the tongue. This piece is typical of the French trade fusil and similar to those found on brass trigger guards from the late 17th through the mid-18th centuries".

The drilled pin hole of this specimen is beveled. The specimen has not been cleaned but is roughly 1.4 cm. long and 1.2 cm. wide.

Discussion: The Womack site yielded 17 trigger guard specimens with two finials being represented (Harris et al. 1965:324-327). These two finials don't resemble those from Deer Creek. The Gilbert site yielded 29 trigger guards (Blaine and Harris 1967:71-81). Among these were 8 finials with 3 of iron; only 2 Acanthus leaf finials were present in the remaining 5 specimens. A single Spanish finial was described (Stephenson 1970:97-101) for the Stansbury site. The Guebert site sample consisted of 8 trigger guards with 1 finial being represented. This finial was designated (Good 1972:140-141) as coming from a Type C French trade gun, dating 1685-1730.

Hamilton (1968:10-13) illustrates one trigger guard from the Bert Moore collection. It consists of a trigger guard bow and tang section; the bow is decorated with leaf scroll and flower design. This cast brass specimen is included in French Trade Gun Type D and may date between 1730 and 1760. Other Type D gun fragments are reported (Hamilton 1968:10-13) for Michilimackinac, Fort St. Joseph, Pearson, Womack, Millsey-Williams, Brown, and Guebert sites.

An earlier date of 1685-1730 is considered for Type C guns. These guns are also of French origin and have been found at Angola Farm, the Grand Village of the Natchez, the Childersburg site, and Guebert (Good 1972:140-141; Hamilton 1968:7-9).

From the above information it is suggested the 2 Type C finials ("potted plant") may date from 1685-1730. The Type D specimen increases the maximum possible time range for the Deer Creek sample to 1685-1760. Considering the history of the area, I believe the trigger guards relate best to a date of 1720 to 1760.

Ramrod Guides

Ramrod guides had upper edges which were glanged and inserted to the gun's forestock where they were pinned in place. Their function was to guide the ramrod to its point of entry into the stock and to help hold it in place. Two ramrod guides are from Deer Creek:

Ramrod Guide No. 1 (NH) (Figure 9:1): This cast brass specimen is a terminal ramrod guide and was afixed to the forestock by only one pin. One of the two flanges inserted into the forestock has been broken off. The body of the guide is cylindrical or tube-shaped with an outside diameter of about 1 cm. The proximal end of the cylinder gives rise to a long tapering tang which suggest (Harris et al. 1965:334) that it "was

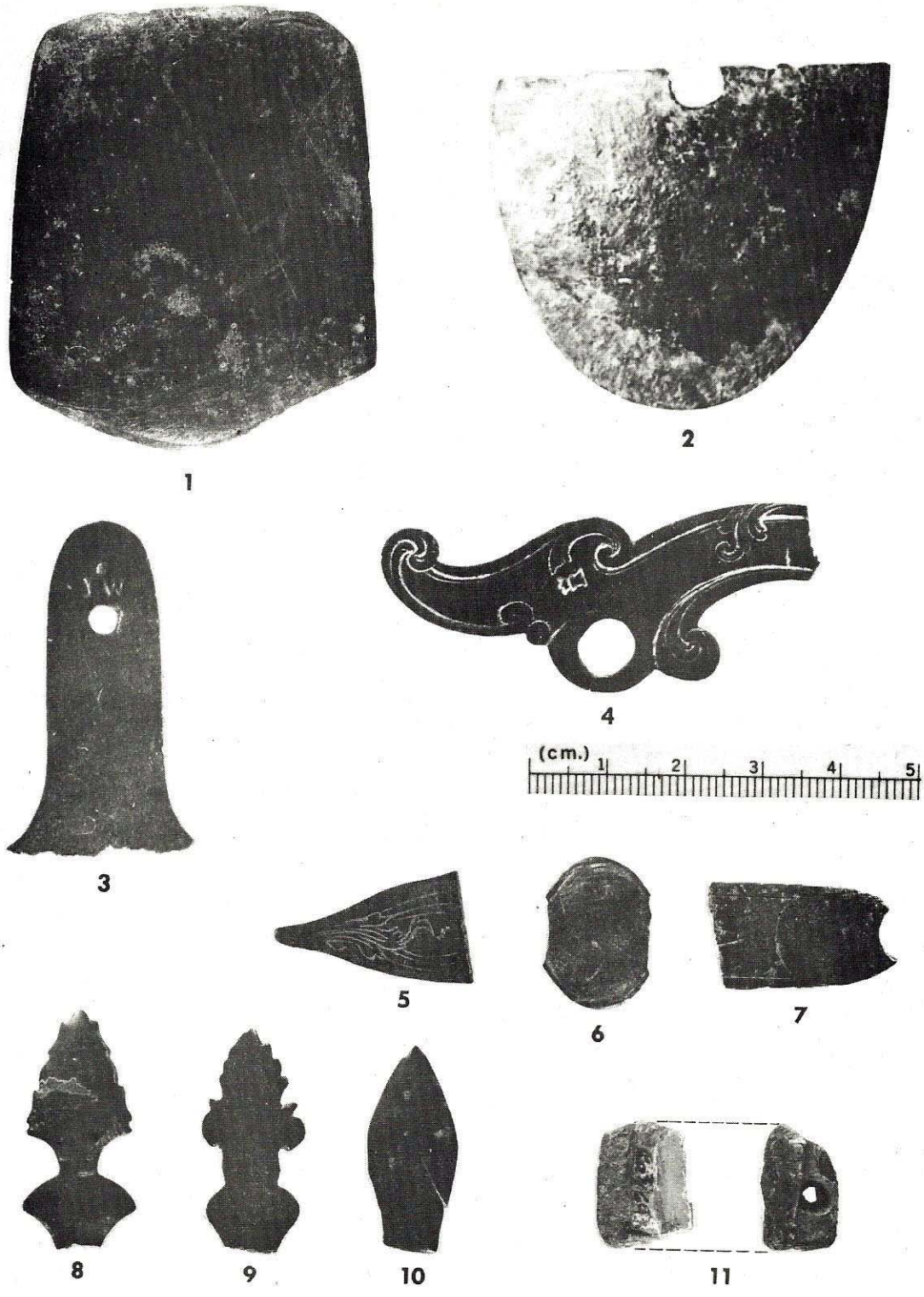


Figure 8. Ka-3 (Deer Creek Site) Gun Parts: 1. Butt plate no. 2. 2. Butt plate no. 3. 3. Butt plate no. 1. 4. Side plate no. 1. 5. Side plate no. 2. 6. Side plate no. 3. 7. Side plate no. 4. 8. Trigger guard no. 1. 9. Trigger guard no. 2. 10. Trigger guard no. 3. 11. Trigger guard no. 4.

probably inlaid into the lower surface of the forestock." The tang progressively becomes thicker, the tip being the thickest part (0.19 cm.). When found, the tang had been bent about 150 degrees towards the flange, it is thought to have originally been straight.

The distal rim of the tubular portion is perpendicular to the long axis of the guide whereas the proximal end is not. The proximal end is slanted and gives rise to the tang. Four decorative grooves are present on this guide. One follows the slanting proximal end of the guide proper just distal to it. The other three are rings. One is just proximal to the distal end, and the other two are next to each other and are at the proximal end of the flange. The upper surface of the guide lateral to each flange exhibits scratching or file marks running parallel to its long axis. The two edges at the flanges are not joined.

This specimen is 3.17 cm. long (it was about 5.8 cm. long prior to being bent). The brass in the tubular portion is about 0.1 cm. thick with the tang being progressively thicker.

Ramrod Guide No. 2 (Figure 9:2): This intermediate or upper ramrod guide is made of undecorated rolled sheet brass. It is either off of a much cheaper gun than Specimen No. 1, or it could conceivably represent a native repair job. The flanges are continuations of the wall of the tube and are the same length as the tube (2.25 cm.). Two holes are near the upper lip of each flange, one at each end. The edges were apparently lined up, flanged, and the holes were punched through both flanges at once. One of the holes penetrated the edge of one of the flanges. This specimen has been distorted so the original diameter is unknown. The brass is 0.50 cm. thick.

Discussion: The Womack site (Harris et al. 1965:333-335) yielded three ramrod guides, two of which were complete. One was of cast brass and had recurved lateral edges on the tang. The other, of sheet brass, had numerous external ribs, and one interior rib. These two were assigned the date of 1720 and the 18th century respectively; they differ markedly from the Deer Creek specimens.

Sixteen ramrod guides were found at Gilbert (Blaine and Harris 1967:53, 56-58). Three terminal cast brass guides with tangs which taper to a point were found. Six sheet brass intermediate or upper guides were found; these were all made for only one pin. Iron specimens were also reported. Also, the comment is made that "the ramrod guides found at Gilbert were probably used in a combination of three to a gun--one upper guide, one intermediate guide, and one lower or terminal guide" (Blaine and Harris 1967:58).

Four ramrod guides were found at Stansbury (Stephensen 1970:100-101). The two illustrated are upper or intermediate guides, each with a hole for only one pin.

The upper or intermediate sheet brass guide from Deer Creek could be of European origin or of native manufacture. I tend to feel that it is of native origin. The cast brass terminal guide from Deer Creek seems to best correlate with the Gilbert specimens even though comparable iron guides have yet to be reported from the Deer Creek site. The primary occupation at Gilbert has been reported as 1740-1767 (Harris and Harris 1967:130), and as principally from 1750-1775 (Jelks et al. 1967:244). From this data, a time period of 1740-1770 for the Deer Creek specimen is plausible.

Gunflints

Twelve gunflints of European origin, as identified by R. King Harris (personal communication, 1968, 1973) are present in this study collection. This identification is based on the mode of manufacture and not on the apparent flint type since some of the native Texas flints are very similar in macroscopic characteristics to materials of European origin.

Two gunflint types are represented in this sample: the spall gunflint and the conventional gunflint. Both of these types were used in the same manner. The gunflint was "mounted in a cockvise and, when the cock was released by the trigger, [the gunflint was] struck against the striking surface of the frizzen, thus producing a spark to ignite the priming powder in the flashpan" (Harris et. al. 1965:341). The priming powder was connected to the powder charge in the barrel via a stream of powder in the touch hole. Thus, ignition of the priming powder led directly to firing of the powder charge.

SPALL GUNFLINTS: "Spall gunflints are wedge-shaped [in cross section]. They are thick on the back side and taper to a thin edge along the front. The back, or heel, and the sides have

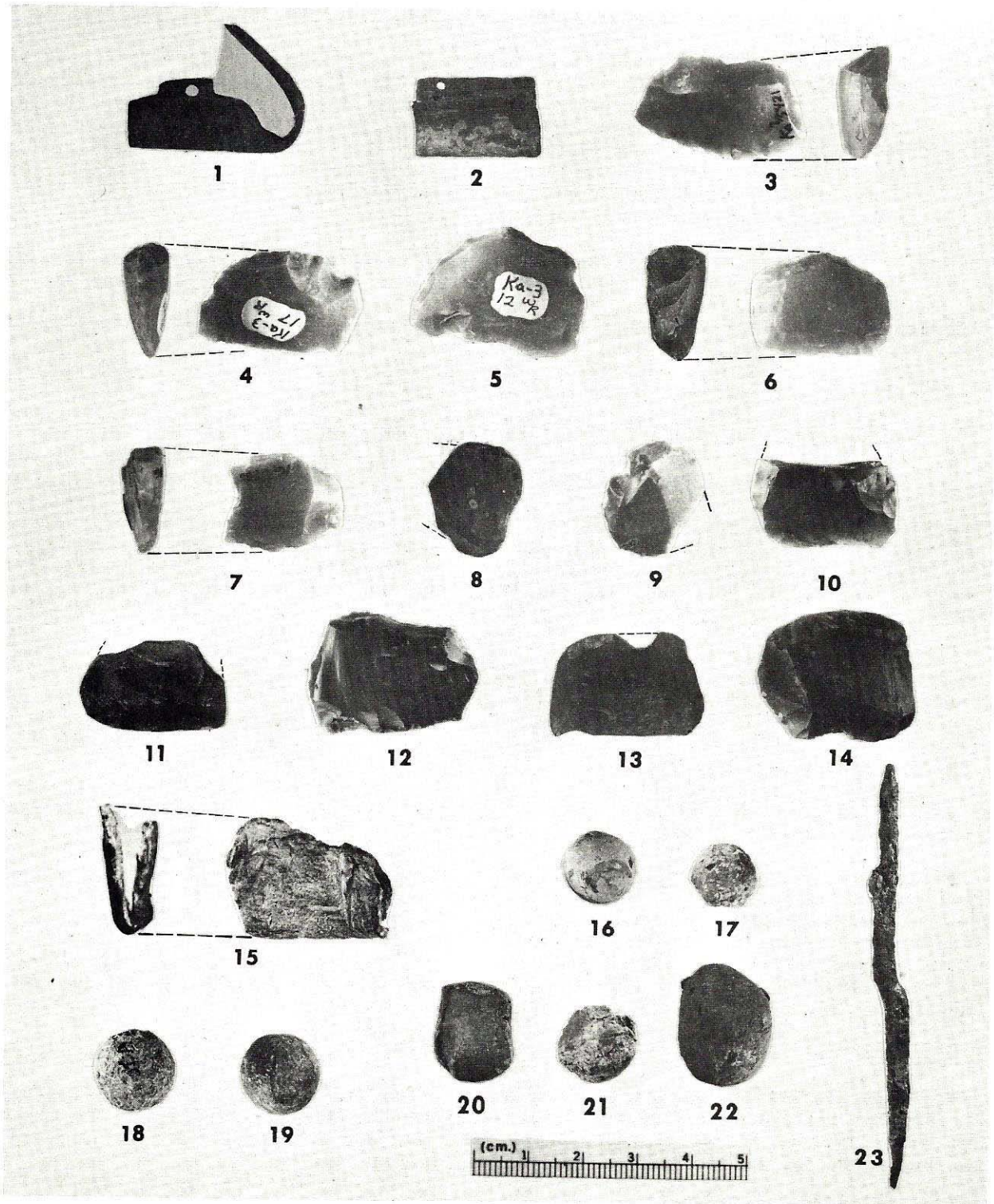


Figure 9. Ka-3 (Deer Creek Site) Gun Parts: 1. Ramrod guide no. 1. 2. Ramrod guide no. 2. 3-12. Spall gunflints no. 1-10 respectively. 13. Conventional gunflint no. 1. 14. Conventional gunflint(?) no. 2. 15. Lead gunflint patch. 16-22. Lead bullets no. 1-7 respectively. 23. Touch hole cleaner.

been trimmed with secondary chipping. The front edge also was trimmed straight across when necessary" (Blaine and Harris 1967:81-82).

Ten gunflints believed to be spall gunflints are present in this collection. Their individual descriptions follow.

Spall gunflint No. 1 (Figure 9:3): This gunflint is made of Float flint and exhibits moderate useage as a gunflint. The heel shows evidence of usage with a strike-a-light. The bulb of percussion is present, and the heel is intact with some retouching. Both sides have also been retouched. The striking platform makes a 125° angle with the ventral surface (surface with the bulb of percussion) and a 45° angle with the dorsal surface (this surface was the outer surface of a prepared core). The maximum measurements are: width, 3.12 cm.; length, 1.82 cm.; and thickness, 0.56 cm.

Spall gunflint No. 2 (WR) (Figure 9:4): This gunflint is made of Float flint and has been extensively battered through useage as a gunflint. Both sides have been slightly retouched. The part of the heel with the bulb has been broken off. The angle between the remaining portion of the striking platform and the ventral surface is 125°; the angle with the dorsal surface is 50°. The maximum measurements are: width, 2.79 cm.; length, 1.85 cm.; and thickness, 0.76 cm.

Spall gunflint No. 3 (WR) (Figure 9:5): This gunflint is made of Float flint and exhibits moderate useage as a gunflint. It also exhibits regions of extensive use as a strike-a-light on both the edge and the heel. The striking platform, comprising the heel, consists of two faces oriented 145° from each other with the bulb of percussion located at their junction on the ventral surface. The heel makes a 128° angle with the ventral face of the spall and a 60° angle with the dorsal surface. The maximum measurements are: width, 3.09 cm.; length, 2.18 cm.; and thickness, 0.74 cm.

Spall gunflint No. 4 (Figure 9:6): This example is of Float flint and has been extensively battered through useage as a gunflint. This specimen also exhibits slight use with a strike-a-light. The lateral sides have been retouched, and the heel has been backed. Only one very small area remains which appears to be from the original striking platform. It makes a 120° angle with the ventral surface and a 65° angle with the dorsal surface. The maximum measurements are: width, 2.58 cm.; length, 1.90 cm.; and thickness, 0.78 cm.

Spall gunflint No. 5 (Figure 9:7): This example of Float flint exhibits extensive battering from use as a gunflint as well as evidence of useage with a strike-a-light. The heel has been backed, and both sides have been reworked (one of which is partially broken). The maximum measurements are: width, 2.14 cm.; length, 1.80 cm.; and thickness, 0.63 cm.

Spall gunflint No. 6 (Figure 9:8): This gunflint of Float flint shows evidence of extensive useage as both a gunflint and strike-a-light. One complete side and parts of the heel and edge are missing. The heel has been almost entirely backed, but the bulb of percussion and a small portion of the prepared striking platform are present. The angle between the striking platform and the ventral surface is 120°; the angle with the dorsal surface is 65°. The maximum measurements are: width, greater than 1.80 cm.; length, 2.16 cm.; and thickness, 0.65 cm.

Spall gunflint No. 7 (Figure 9:9): This example of Float flint shows extensive use as a gunflint. Both sides have been retouched; part of the edge and one side have been broken off. The other side has been reworked to curve around and blend in with the edge. Part of the heel is present; it has been extensively reworked. The maximum measurements are: width, greater than 2.00 cm.; length, 2.04 cm.; and thickness, 0.57 cm.

Spall gunflint No. 8 (Figure 9:10): This Float flint specimen exhibits some useage as a gunflint. Both sides have been retouched, and the heel has been broken off. The maximum measurements are: width, 2.66 cm.; length, greater than 1.80 cm.; and thickness, 0.70 cm.

Spall gunflint No. 9 (Figure 9:11): This gunflint of Float flint was used very extensively. Both sides and the edge have been extensively reworked, and the heel has been broken off. The maximum measurements are: width, 2.76 cm.; length, greater than 1.70 cm.; and thickness, 0.67 cm.

Spall gunflint No. 10 (WR) (Figure 9:12): This gunflint is made of a very fine smooth dark gray flint; the flint type has not been postively identified. The edge shows extensive battering from use as a gunflint, and both sides show retouching. The heel has been backed. As the flint does not appear to be from a known European source, it is possible that this spall represents a native attempt to duplicate the European method of spall manufacture. Gunflints from Womack seem to indicate (Harris et al. 1965:296-298) that the Indians tried to copy the French spall gunflint. The maximum measurements are: width, 3.05 cm.; length, 2.25 cm.; and thickness, 0.90 cm.

Discussion: The first nine spall gunflints described are of Float flint and exhibit what is considered to be a French form of manufacture. Specimens 8 and 9 are interesting in that this form of Float flint looks very similar to the dark translucent chocolate brown flint from the Edwards Plateau region of Texas. Number 10 remains an enigma as to positive to source of origin, but the knapping technique is similar to that of the French spall gunflint.

Specimens 1 through 7 are all the same grayish-tan variety of Float flint (this stone is actually a chert). Parts of the original striking platforms are present on five of these specimens, and the angle made with the plane of the dorsal surface ranges from about 45° to 65°. These five specimens were struck from prepared cores as were the specimens reported from the Gilbert and Womack sites. The Womack site yielded three French spall gunflints, and they were made from prepared cores (Harris et. al. 1965:341-2). The Gilbert site yielded 32 spall gunflints; 14 retained the original striking platform indicating use of a prepared core in their manufacture. Their angles of the platform with the dorsal surface average 60° (Blaine and Harris 1967:82-3). The Deer Creek spall gunflints appear similar to those reported from these two sites.

CONVENTIONAL GUNFLINTS: Two gunflints which appear to be of the French conventional gunflint type are in this study collection.

Conventional gunflint No. 1 (Figure 9:13): This gunflint, apparently of French manufacture, is made of honey colored flint which is possibly from a deposit in Loir-et-Cher, France. This gunflint was originally D-shaped with a rounded back and a straight edge. It exhibits heavy battering from useage as a gunflint and also exhibits slight useage with a strike-a-light. The maximum measurements are: width, 2.78 cm.; length, 1.83 cm.; and thickness, 0.61 cm.

Conventional gunflint No. 2 (WR) (Figure 9:14): This gunflint appears to be a large conventional gunflint made of Float flint. Its original shape is not discernible. It has three major dorsal facets and one ventral. Due to the extensive retouch, and an incomplete side, it cannot be positively identified as a conventional gunflint. The maximum measurements are: width, 2.87 cm.; length, 2.46 cm.; and thickness, 0.85 cm.

Discussion: Three of the four French conventional gunflints recovered from the Womack site were of blond flint, and the fourth was of a grayish-white flint (Harris et. al. 1965:343). The Gilbert site yielded thirteen French conventional gunflints all of honey yellow flint (Blaine and Harris 1967:83). Conventional gunflint No. 1 from the Miller site is of French origin. Number 2 cannot be postively identified; it is possibly a French Conventional gunflint.

Background on gunflints

The term gunspall was originally introduced into the literature by T. M. Hamilton (1960a: 73-79). Harris (Harris et al. 1965:341) used the term spall gunflint to refer to the same gunflint type. Harris contends that these gunflints were often made of Float flint. Float flint occurs as nodules in shallow, sub-surface deposits in parts of France. In regions where cultivated land is underlain by chalk beds, nodules may be dislodged and found on the surface. This phenomenon occurs in regions such as Loir-et-Cher, and Indre, France (Smith 1960:52-53. Witthoft (1966:25-28) has proposed renaming spall gunflints Dutch gunflints, and he contends that the source of origin of the raw material is the Riss glacial outwash. This locale, in Belgium and Holland, is where the northern (Scandinavian) and southern (Alpine) terminal moraines meet (Witthoft, personal communication, 1974). At present, there is not total agreement in this name and origin controversy. Hamilton now endorses use of the "Dutch" terminology (Good 1972:137). However, Carlyle Smith (1974, correspondence) feels that the so-called Dutch gunflints are from a different origin than those which are made of Float flint.

The spall gunflint was made from a wedge-shaped flake struck from a cobble, core remnant, or a "prepared" core (Harris et al. 1965:341). Harris contends that the earlier spall gunflints--those made from cobbles--in addition to being manufactured differently, were generally thicker at the bulb than the later spall gunflints which were made from a rudimentary prepared core. Harris also suggests the possibility that these prepared core spall gunflints bridge a technological, and possibly a chronological, gap between Hamiltons' pebble gunspalls and the conventional gunflints. The conventional French gunflints were made by snapping blades, which had been struck from a prepared core, into sections of the desired length; the broken ends were then "shaped and blunted by a vertical percussion retouch (Witthoft 1966:28). The finished prismatic gunflint still showed signs of its blade origin.

It is generally believed that the spall gunflint first appeared around 1650 (Hamilton 1965: 52; Witthoft 1966:25-28). It is also the general concensus that their usage terminated by 1770-

1775 (Hamilton 1965:53; Harris, personal communication, 1973; Witthoft 1966:28). "According to Witthoft (cited in Hamilton 1965:52), the spall gunflint is the predominant European form found in Indian sites dating between 1650 and 1750" (Blaine and Harris 1967:83). After 1750, the conventional gunflints began to predominate. On French-Indian War sites the numbers of the two gunflint types were about equal, but on American Revolution sites there are essentially no spall gunflints present while British gunflints are not yet present (Witthoft, personal communication, 1974).

Hamilton (1965:54-55) believes the French conventional gunflints "were first introduced into the Western hemisphere about 1680". Witthoft (1966:34) notes that among the dates proposed for the beginning of the "French [conventional gunflint] industry, 1719 seems to fit the archaeological evidence best". Witthoft (1966:28) also states that French conventional gunflints weren't an ordinary commerce article until after 1740. In commenting about the English gunflint industry at Brendon, Witthoft (1966:34-36) relates:

> "Most authors have favored the early seventeenth century for the beginnings of the British works at Brandon with 1686 being one of the latest specific suggestions (Hamilton 1960:29). The archaeological evidence is overwhelmingly against the existence of any British gunflint industry prior to 1780".

On the military sites of the War of 1812, the British gunflints are showing up in noticeable numbers although the French prismatic flints still predominate (Witthoft, personal communication, 1974).

Hamilton (1965:54-55) primarily based his estimated 1680 production beginning for French conventional gunflints on a sample (gunspalls, 4; French conventional, 3) from the Fatherland site (1682-1729). Referring to northeastern sites he had studied, Hamilton (1965:52-54) notes:

> "up to 1675 [Marsh and Dann sites] all flints of European origin that can be identified, are gunspalls. There are twenty-four gunspalls predating 1675, but after that the picture begins to change. The village sites known as Boughton, Rochester Junction, Kirkwood, and Beal, having occupation dates from 1675-1687, produce forty-two gunspalls, and six [conventional] gunflints. The period from 1687 to 1750 is a blank, but the Avron site, occupied from 1750 to 1779, produces ten gunspalls and four gunflints; the Tonowanda site, dated from 1779 to 1820, shows up with only four gunflints".

At the Womack site (1700-1729), 23 native-made and 8 European gunflints were found. These include: 3 spalls, 4 French conventional, and 1 English; the latter was evidently not considered in establishing the occupation date (Harris et al. 1965:341-343). A burial at Angola Farm is believed (Harris et al. 1965:341-343) to date about 1720 and contained 8 spalls and 1 honey-colored gunflint.

The Guebert site yielded 47 native-made, 91 spalls, 49 French conventional, and 2 British gunflints (Good 1972:137). The site was occupied from 1719 to 1832, but its major occupation ended about 1790 (Good 1972:31-62).

The Gilbert site, occupied primarily between 1750 and 1775, yielded 69 native-made, 32 spall, and 13 French conventional gunflints (all of honey-yellow flint; Blaine and Harris 1967: 81-84). The Stansbury site yielded 9 gunflints, 2 of European origin (one each of French conventional and British). These were found near the floor of a house thought to date from 1750 to 1775 (Stephenson 1970:88-89, 106).

The total lack of British gunflints at Deer Creek is interpreted to indicate an occupation prior to 1800. The spall gunflints could relate to an occupation period from 1650 to 1775. Assuming one continuous occupation, the presence of a French conventional gunflint helps to further narrow the range, possibly to 1675-1775. This dating is also supported by the spall gunflints being of a later variety. The preponderance of spall to conventional gunflints (definitely 9:1, possibly 5:1) seemingly indicates a date prior to 1750, before the common occurrence of conventional gunflints. Thus, a time range of 1675 to 1750 is conceivable.

Available documents on this time period don't indicate an attempt at commerce in this region until 1770. This date is generally accepted as the earliest possible for established trade in this region (Harris, personal communication, 1973). In summary, the written records and gunflints allow inferring a time range of 1700-1750 for the Deer Creek occupation.

Additional note. Deer Creek's native gunflints show an interesting phenomenon. There are 58 in the sample. Only 20 (34%) are of Kay County flint and 13. (65%) show some chipping indicative of use as gunflints. The remaining 38 include specimens representing 14 exotic, but probably regional, flint materials; 17 (45%) show evidence of usage as gunflints. These figures are very interesting given the occurrence of Kay County flint outcrops within three miles of this site.

All of the sample's French gunflints show moderate to heavy usage. The Kay County percentage is nearly identical to that of French flints, but exotic native gunflints outnumber Kay County nearly 3:1. Thus, it appears that French trade gunflints were the most highly prized gunflint. If French gunflints were unavailable, it was perhaps more desirable (more status ?) to have a native-made gunflint of exotic material than of local flint. If gunflints were in very short supply, Kay County flint might be used and was so used. Although this proposed explanation is only a theory, it does fit the intriguing occurrence and utilization evidence seen in the native-made gunflints.

Gunflint Patch (Figure 9:15)

A single gunflint patch or "cap" is made of sheet lead. Though folded in the middle, it has a roughly trapezoidal shape. Such a patch would have been wrapped around the gunflint before placing it between the cock jaws. The patch helped hold the gunflint securely in place. This specimen weighs 15.24 grams and is thicker in its middle than around its edges. From these two observations it is conceivable the specimen was made from a lead ball. It has a maximum width of 3.10 cm.; a length (folded) of 2.25 cm.; and a maximum thickness of 0.2 cm.

Discussion. The Womack site did not yield any such patches. The Gilbert site had one native gunflint with a thin lead cap still wrapped around it (Blaine and Harris 1967:84). While lead caps were sometimes used, Caldwell (1960:198) indicates leather pads were more common.

Two "flint sheaths" or caps of lead were found at Guebert (Good 1972:152-154). Both are roughly rectangular in shape and have a more regular outline than the Deer Creek example. Also, the Guebert specimens are only about half the planar dimensions of that from Deer Creek. Three lead patches were recovered in Fort Michilimackinac excavations (Maxwell and Binford 1961:121). They are described as oval, flattened musket balls which were wrapped around gunflints to help secure the flint to the hammer jaws. This site was occupied from around 1715 to 1780 (Maxwell and Binford 1961:113).

The lack of lead patches at Womack seemingly indicates that such patches did not come into use until after 1740. Gilbert data indicates they were definitely in use by 1750-1770. Long occupations at Guebert and Fort Michilimackinac inhibit refinement of their initial occurrence.

It should be mentioned that lead patches for gunflints are fairly uncommon. Therefore, the sparse evidence currently available cannot be considered complete. Lead patches were in use by 1750. They could have been used earlier since lead was available and the extant firing mechanisms operated better with some type of patch.

Lead Bullets

Seven lead bullets are in this study collection; four have retained their spherical shape. Data on them is presented below. Two other lead artifacts found at the site are the gunflint patch (15.24 grams) and a lead bead (24.36 grams). These two specimens are described elsewhere in this report. It is conceivable that they were made from bullets.

Bullet No. 1 (NH) (Figure 9:16): This bullet is unfired and heavily patinated. It has several light miscellaneous cuts on its surface; one resembles a small hourglass (0.25 cm. high), and another is circular (it is opposite the sprue). Measurements: diameter, 1.29 cm. (.51 in.); weight, 12.55 g. (193.3 g.); calculated diameter, 1.28 cm. (.50 in).

Bullet No. 2 (NH) (Figure 9:17): This unfired bullet is roughly spherical and has been extensively chewed. It is heavily patinated. Measurements: diameter, about 1.16 cm. (.46 in.); weight, 8.93 g. (137.5 gr.); calculated diameter, 1.14 cm. (.45 in).

Bullet No. 3 (NH) (Figure 9:18): This unfired bullet is moderately patinated, and has been chewed. Measurements: diameter, about 1.47 cm. (.58 in); weight, 17.11 g. (263.4 gr), calculated diameter, 1.42 cm. (.56 in).

Bullet No. 4 (NH) (Figure 9:19): This unfired bullet has moderate patina and has several random superficial cuts on its surface. Measurements: diameter, 1.45 cm. (.57 in.); weight, 17.69 g. (272.4 gr.); calculated diameter, 1.44 cm. (.57 in.).

Bullet No. 5 (Figure 9:20): This heavily patinated bullet has been fired and deformed. One face appears to be a portion of the original bullet surface. Measurements: weight, 13.96 g. (214.9 gr.); calculated diameter, 1.32 cm. (.52 in.).

Bullet No. 6 (Figure 9:21): This bullet has a moderate patina and a flattened surface which results from its having been fired. A small area appears missing where the ball was scraped by plowing. The remainder of the original surface has been mutilated. Measurements: weight, 12.40 g. (191.0 gr.); calculated diameter, 1.40 cm. (.55 in.).

Bullet No. 7 (Figure 9:22): This bullet was fired, is deformed and has heavy patina. It is shaped like a small mushroom button. Measurements: weight, 16.12 g. (248.3 gr.); calculated diameter, 1.40 cm. (.55 in.).

Comments: Values were also calculated for the original ball diameters of the lead gunflint patch and the lead bead since they were both probably made from bullets. These calculated diameters are: lead patch, 1.36 cm. (.54 in.); lead bead, 1.62 cm. (.64 in.).

The estimated diameters given above were obtained from this formula:

$$r = \sqrt[3]{(0.00136)\ (x)}$$

where r=ball radius in cm.
x=ball weight in grains (when x is in grams, the formula $r=\sqrt[3]{(0.021)\ (x)}$ should be used).

These formulas were derived from the definition of density (D=MV; Nebergall, et al. 1968:8), the formula for volume of a perfect sphere ($V=\frac{4}{3}r^3$; Thomas 1969:738), the molecular weight of pure lead (207.19 grams per mole; Weast 1969:3-120), and the density of lead (11.34 g. per $cm.^3$; Weast 1969:3-120). As is apparent, a number of assumptions were made in deriving these formulas (such as the purity of lead, a perfect sphere, etc.). Application was made of this formula to the data for the 23 complete spherical bullets with measurable diameters given by Good (1972: 145-147). In this empirical test of the formula, for only one bullet ("Many knife marks. Battered. Flat cut on one side of ball.") was the calculated diameter more than 0.01 inch from the actual measurable diameter. Thus, the affect of the above assumptions on the resulting values obtained seems very small (essentially negligible). Additional variables with seemingly the same importance are the patina present and minor cut marks.

If a fired ball retained its mass even though it was deformed, the same formula would equally apply. However, this assumption of no weight loss can not be made due to the probability of substantial impact abrasion. The two variables limiting the application of this formula are losses by impact abrasion and whether or not the ball was originally complete. The fired ball could have always been a half ball as those described by Good (1972:145-147). The only possible way to tell whether the ball was complete or not is by noting any telltale evidence present. Also, the losses by impact abrasion cannot be determined. Certainly, some degree of loss occurs; the problem is interpreting this amount of loss. Lee Good (correspondence, 1974) comments that weight loss resulting from impact abrasion of a bullet depends on many variables including: powder charge, flight distance, angle of impact, specific surface and object of impact; any value obtained in experimentation for one bullet would apply only to that ball under that special set of circumstances. Thus, the specific weight loss apparently can not be accurately determined through experimentation.

Let us theorize for a moment about a typical unfired 252.5 gr., .550 in. diameter ball such as the one reported by Good (1972:145-147). Using the above formula, the calculated diameter of this ball would be 0.551 inches, certainly close to the measured value of 0.550 inches. If we then fired such a ball, how would its weight loss (upon impact) affect a new calculation of its original diameter? The results of such calculations are presented in Table 1. If this ball lost 30% of its original mass upon impact, it would calculate to be only 0.063 in. smaller than its original calculated diameter. This is not much apparent diameter change considering a 30% weight loss! A 10% weight loss only results in a 0.016 in. apparent diameter change. I personally feel it doubtful that a ball would lose 10% of its weight upon normal impact. Perhaps 5% loss would be more reasonable. It is obvious that the exact original diameter of the ball cannot be determined once a loss has occurred. My point is that this loss is probably so minimal

Table 1. Calculated diameter value correlated with weight loss for a 252.5 grain, .550 inch spherical lead bullet.

% Loss	Weight,Grains(x)	(0.00136)(x)	Radius,cm.	Diameter,cm.	Diameter,inches
0	252.5	.343	.70	1.40	.551
5	239.88	.326	.69	1.38	.543
10	227.25	.309	.68	1.36	.535
20	202.00	.275	.65	1.30	.512
30	176.75	.240	.62	1.24	.488
40	151.50	.206	.59	1.18	.465
50	126.25	.172	.56	1.12	.441
60	101.00	.137	.52	1.04	.409
70	75.75	.103	.47	0.94	.370
80	50.50	.069	.41	0.82	.323
90	25.25	.034	.32	0.64	.252
99	2.53	.003	.14	0.28	.110

that the data from deformed bullets can still be useful. At 5% loss, including the small margin of error due to the assumptions made which were considered extremely minor (0.01 inch), would give a calculated diameter less than 0.02 in. from the correct original diameter. This is the beauty of the inverse square relationship. A large loss in the mass of a sphere is reflected in a proportionally small loss in its diameter. It should be noted here that the smaller the initial ball, the greater the diameter loss per percent unit weight change. By the same token, the larger the ball, the smaller the diameter change per unit weight loss.

Application of this formula to unfired balls that have been chewed, and thus hard to accurately measure, should yield an diameter as accurate or even more accurate than possible to obtain by direct physical measurement. The degree of accuracy upon application of this formula to deformed balls remains to be proven, but the empirical evidence suggests that it would be reasonable accurate. For this reason, the value for the calculated diameter for each of the Deer Creek bullets is presented. Hopefully, future experimentation to determine the range of weight loss experienced by bullets on impact will be performed. At present, it seems reasonable to assume that the calculated diameter of a fired bullet is within .03 in. less than the original diameter of the bullet, and chewed bullets are within .01 in.

Discussion. The approximate calibers of five balls from the Womack site have been reported: .49-.50 caliber, 1; .53-.55, 3; and .55-.58, 1 (Harris et al. 1965:343-344). Mention is also made of finding 11 .58 caliber balls at Angola Farm (ibid.).

Bullets reported (Blaine and Harris 1967:84-85) from the Gilbert site include: .44-.45 caliber, 2; .50-.53 caliber, 2; .53-.55, 2; .55, 3; and .58, 1. These investigations suggest the .44-.45 specimens could have been for a rifle, but no rifle barrels have yet been found there. Six bullets reported (Duffield and Jelks 1961:56) for the Pearson site have these calibers: .43, 1; .52, 2; .56, 2; and .69, 1.

Of the 315 musket balls from Michilimackinac, 214 (68.5%) are between .54 and .59 caliber. Among the remaining 101 balls, there were 6 (2%) at .41, 11 (4%) at .50-.51, and 12 (4%) at .68-.69 caliber (Maxwell and Binford 1961:106-107).

Good (1972:149) lists 60 bullets from Guebert at these calibers: .47, 1; .48, 8; .51, 2; .53, 10; .54, 4; .55, 8; .56, 2; .57, 5; .58, 4; .59, 3; .61, 1; .62, 2; and .61-.62, 6. Thirty-six (60%) of the Guebert balls are between .53 and .59 caliber. With this data plus a suggestion (Hamilton 1960:128-132) that there was a .02 in. difference between bullet caliber and bore caliber, Good (1972:148-151) undertakes an analysis of known 18th century guns to determine what known guns could have been used with the bullets in question. Except for the .61-.62 caliber balls at Guebert, Good (1972:148-151) concludes, "If, as previously suggested, the Indians preferred a ball which was approximately .02 in. undersized, the military musket balls and carbines are eliminated". The 9 .61-.62 balls could conceivably have been used with one of several .65 caliber guns of the late 18th century: American fusil musket, American carbine, or a British carbine (Good 1972:148-151).

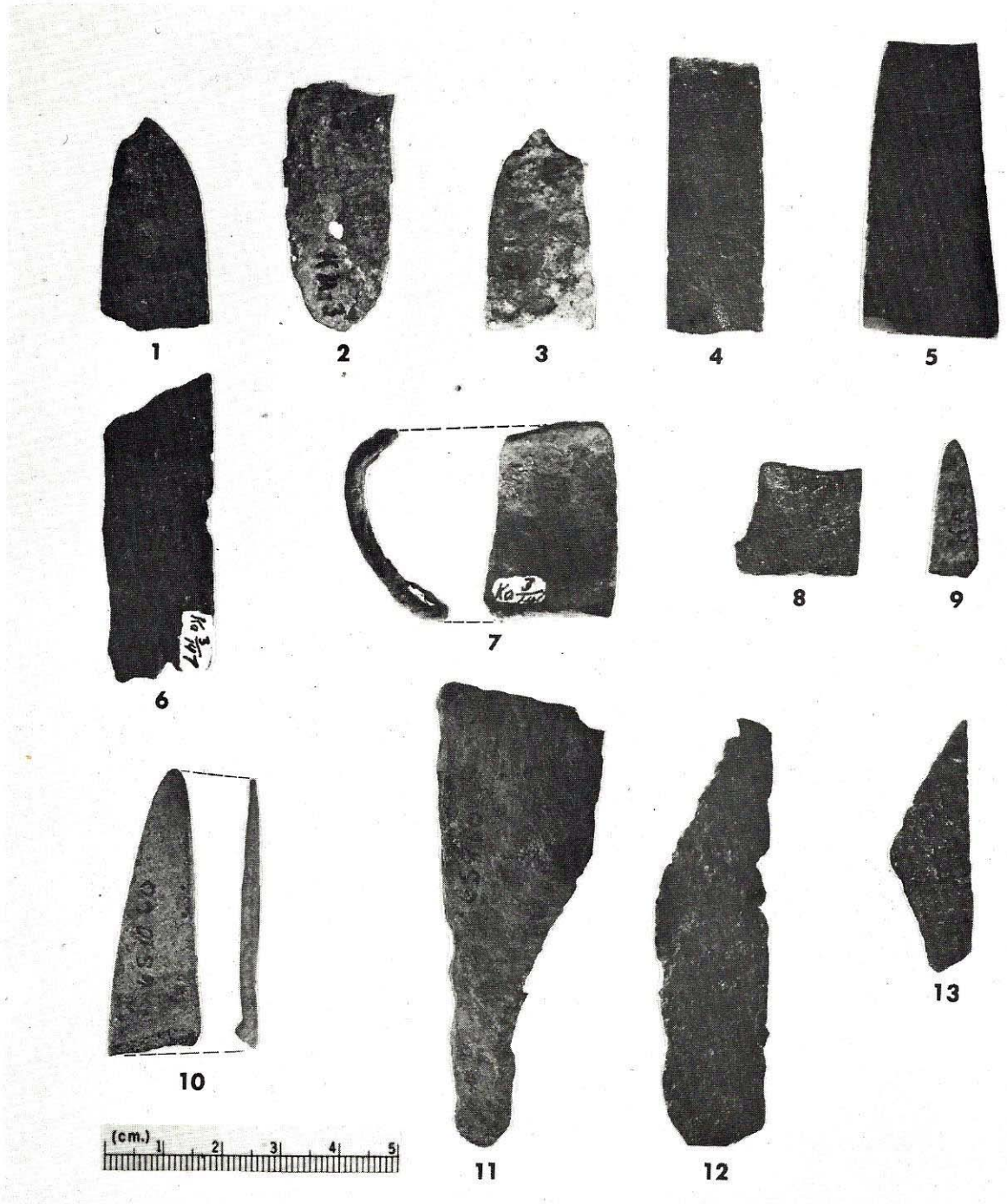


Figure 10. Ka-3 (Deer Creek Site) Knives: 1-13. Knifes sections 1-13 respectively. Cutting edges on 1, 5, 7, and 10 are to the left.

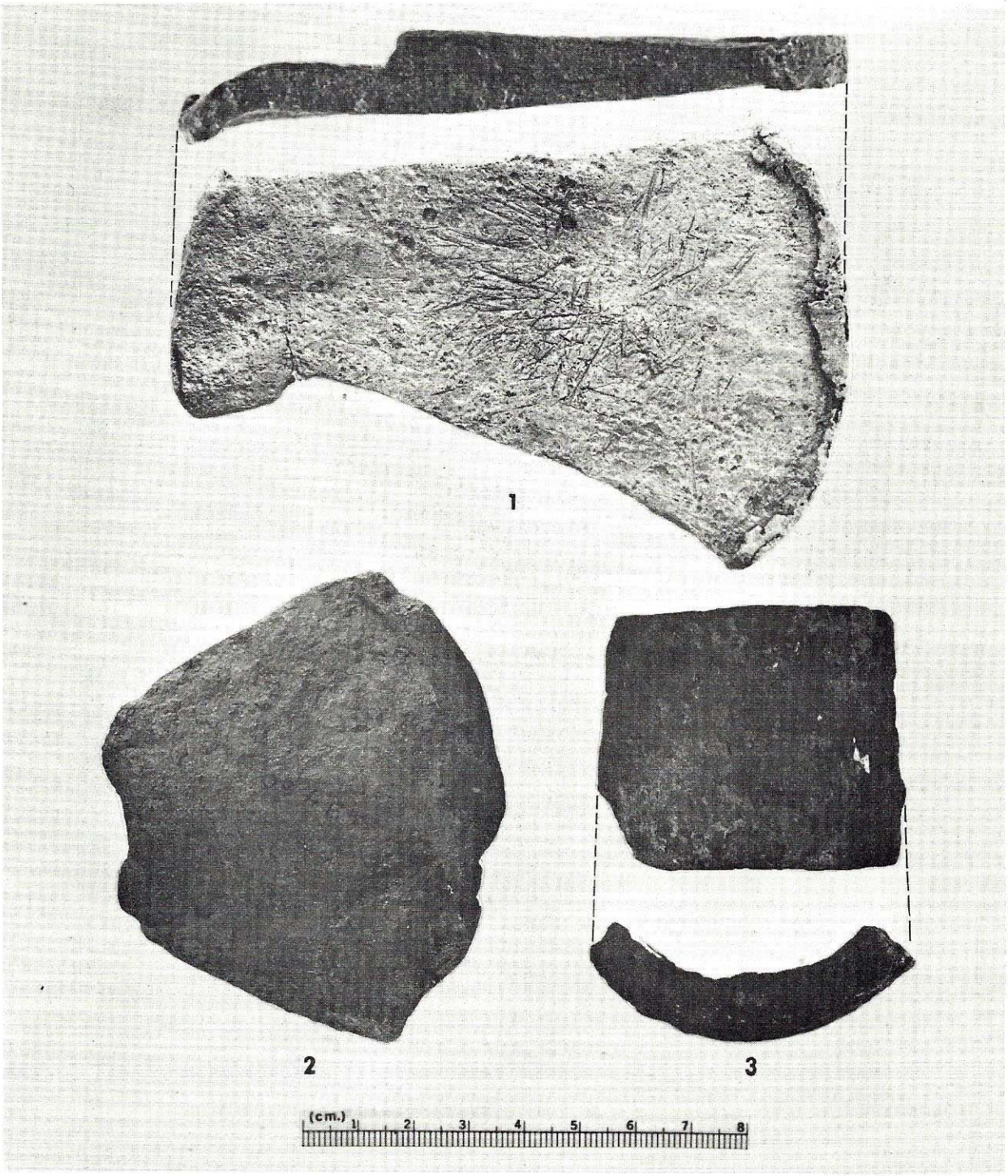


Figure 11. Ka-3 (Deer Creek Site) Axe and Hoes: 1. "Camp" axe. 2. Hoe fragment no. 1. 3. Hoe fragment no. 2.

Hamilton (1960:129, 208) suggests that French trade guns of the 1650-1750 period used a bore of .45, .50, and .53 caliber, possibly even .55. He (ibid.) also states he feels the .55 caliber bore is an intermediate size used before the .58 and .62 caliber bores (Jelks 1967:61) common in 19th century trade guns.

If the lead bead from Deer Creek was, in actuality, made from a bullet (such as .64 caliber), it could represent any one of a number of fusil muskets or carbines (French, English, or American) used during the 18th century (Good 1972:150-151). The other 7 balls (and patch made from a ball) fall in the accepted range of 18th century, French trade guns. The .45 caliber bullet could represent an early trade gun or a later rifle ball. The 2 .50 caliber balls probably represent Hamilton's early trade gun. The other 5 specimens (.52-.58) are within the range most common at Womack, Pearson, Gilbert, Michilimackinac, and Guebert. These were possibly used with a .58 or .60 bore firearm and may, thus, be assigned an approximate date of around 1750.

Lead Shot

Seven specimens of lead shot were found at Deer Creek. These were all found on the section of the road in the pasture near the river. Although some exhibit heavy patination, it is presently not possible to ascertain whether all result from the Indian occupation or whether some are intrusive from more recent hunting activities on the site.

An early table of shot sizes (first published in 1825) was made by Ezekial Baker, a gunmaker who worked in London in the 1780-1825 time range (George, 1947:330). This table has been reproduced by George (1947:211-212). In the following descriptions, the shot size (based on the average no. of shot per ounce) is given as indicated by this source.

Shot specimen No. 1: Weight: 0.491 g.; 7.57 gr.
Calculated No. per ounce: 57.7; Shot size designation: B
Description: One side is slightly flattened; this side exhibits the most patination. The rest of the surface is unaltered.

Shot specimen No. 2: Weight: 0.183 g.; 2.82 gr.
Calculated No. per ounce: 154.9. Shot size designation: #4
Description: This very heavily patinated specimen has not been flattened due to target impact. It does have six small flattened areas on its surface. This could be due to the shot choking in the gun. In subsequent descriptions, the result of this surface altering phenomena will be referred to as "dimples".

Shot specimen No. 3: Weight: 0.150 g.; 2.31 gr.
Calculated No. per ounce: 188.7. Shot size designation: #5
Description: One side has been flattened and exhibits heavy patination. The remainder of the surface is relatively clean and exhibits 5 dimples.

Shot specimen No. 4: Weight: 0.187 g.; 2.88 gr.
Calculated No. per ounce: 151.4; Shot size designation: #4
Description: One side has been flattened and exhibits heavy patination. The remainder of the surface exhibits moderate patination and five dimples.

Shot specimen No. 5: Weight: 0.156 g.; 2.41 gr.
Calculated No. per ounce: 181.1. Shot size designation: #5
Description: It has moderate patination and seven dimples.

Shot specimen No. 6: Weight: 0.174 g.; 2.68 gr.
Calculated No. per ounce: 162.9; Shot size designation: #4
Description: One side is flattened and is heavily patinated. The remainder of the surface is clean and exhibits eight dimples (these are much deeper than those on the other specimens).

Shot specimen No. 7: Weight: 0.077 g.; 1.19 gr.
Calculated No. per ounce: 366.0. Shot size designation: #8.
Description: This specimen is round, has a fairly clean surface, and exhibits numerous small dimples.

Discussion: It seems fairly reasonable to assume that the heavily patinated specimens (Nos. 1, 2, and 4) are definitely from the Indian occupation of the site. Although it is likely that the other four specimens are also from the occupation, it is conceivable that they are intrusive.

In the Womack site report, two lead shot specimens were reported: #1 shot (5.1 gr.), and Duck shot (13.0 gr.)(Harris et al. 1965:344). At the Gilbert site, 23 lead shot specimens were found, one of which had deep dimples. The types of shot reported are: large buck (1), small buck (1), musketgrape (1), BB (3), B (1), #1 (4), #2 (4), #3 (2), #4 (1), #5 (2), and #8 (2)

(Blaine and Harris 1967:85-86). Thus, the Gilbert collection contains all of the shot sizes found at Deer Creek plus a number of others. The Deer Creek collection is rather small, so it is conceivable that a larger sample would indicate additional homologies with the Gilbert materials.

This entire shot sample is possibly from the site's occupation. This is believed indicated by the degree of patination and by the finding of equivalent shot sizes in features at the Gilbert site, dating 1740-1770.

Touch Hole Cleaner

A single bi-pointed iron specimen has an offset center. The central region is square in cross section with the two tapering ends becoming round in cross section about 1.5 cm. from each end. One end is pointed, and the other appears to have been bluntly rounded. The specimen is 7.8 cm. long and has a maximum thickness of 4.6 cm. (uncleaned).

Lehmer and Jones (1968: 45, 98, 154-155) illustrate a "center-offset iron awl" from the Buffalo Pasture site which has been assigned occupation dates of 1740-1795. This specimen appears to be a touch hole cleaner.

R. K. Harris (personal communication, 1973) indicates that several touch hole cleaners of this type have been found at Spanish Fort. He also comments that they are a fairly uncommon artifact since they would long outlast a gun, and thus were probably not traded in as large numbers as some of the more common artifacts.

Nine tools of this form are described as awls in the Fort Michilimackinac report (Maxwell and Binford 1961:88). The provenience in which these particular specimens were found indicates they were first used at that site after about 1760.

Some type of touch hole cleaner has been in use since the first days of the flintlock. This particular style was evidently used in the last half of the 18th century and was possibly used over a much wider time range.

Tools

The tools of European origin found at the Deer Creek site are described in this section. The tools are knives, an axe, hoes, scrapers (iron and glass), arrowpoints (Benton Types A and B, triangular metal, and a glass Fresno), an iron punch, an iron wedge, and an iron awl.

Knives

Only 2 of the 13 knife sections found at the Deer Creek site can be tentatively identified as to type. The author cleaned six medial blade sections in search of makers marks, but none were found. In describing these specimens, positive differentiation between iron and steel was not made.

Knife section No. 1 (WR) (Figure 10:1): This knife tip is from a knife of European origin. This section is 3.6 cm. long and has a maximum width of 1.88 cm.

Knife section No. 2 (NH) (Figure 10:2): This knife section is the butt end of a case knife. Only one of the pin holes is present. Country of origin cannot be determined from such an incomplete specimen. This specimen is 4.4 cm. long, and has a maximum width of 1.89 cm.

Knife section No. 3 (NH) (Figure 10:3): This knife tip is of European origin. It has a length of 3.36 cm. and a maximum width of 1.86 cm.

Knife section No. 4 (Figure 10:4): This specimen is a medial section of a knofe of European origin. The two edges are nearly parallel, changing width only 0.13 cm. the length of the section. This specimen is 4.7 cm. long and has a maximum width of 1.67 cm.

Knife section No. 5 (Figure 10:5): This specimen is a medial section of a knife of European origin. The blade width changes 0.75 cm. through the section length of 5.3 cm. The cutting edge curves whereas the back edge is straight. The maximum width is 2.35 cm.

Knife section No. 6 (Figure 10:6): This is a medial section of a knife blade of European origin. The blade width is relatively constant (1.85 cm.), and the specimen is 5.2 cm. long

Knife section No. 7 (Figure 10:7): This medial section of a European manufactured knife blade is bent as if the blade had been partially wrapped around a stick. It has a maximum width of 2.20 cm. and a length of 3.2 cm. (original length before bending was about 4.2 cm.).

Knife section No. 8 (Figure 10:8): This medial fragment appears to be from a knife blade of European origin. The back edge is not present on this specimen. Its present width is 2.2 cm., and it has a length of 2.0 cm.

Knife section No. 9 (NH) (Figure 10:9): This section is an unclassifiable knife tip of European origin. The narrow tip has a straight back and a curved edge. Its present length is 2.35 cm., and it has a maximum width of 0.85 cm.

Knife section No. 10 (NH) (Figure 10:10): This section is probably a knife tip of European origin. This section has a nearly straight back and a curved edge. It is bent at the break. It is 4.87 cm. long and has a maximum width of 1.57 cm.

Knife section No. 11 (NH) (Figure 10:11): This section is the complete tang and part of the blade of a native-made iron knife. This knife was probably used with a slotted handle. The tang (5.1 cm. long) begins from a rounded end at about 1.0 cm. wide and gradually expands to full blade width (2.46 cm.). The specimen is 7.8 cm. long and has a maximum blade width of 2.80 cm.

Knife section No. 12 (Figure 10:12): This blade section is of a native-made iron knife. The base, tip, and portions of the edges are missing. The cutting edge was straight, and the back paralleled it until 2.9 cm. from the present tip end where it turned and pursued a straight course for the tip. Its maximum width is 1.96 cm., and it has a length of 7.3 cm.

Knife section No. 13 (Figure 10:13): This specimen is a relatively complete blade of a small native-made (?) knife. The basal portion has been broken off. The cutting edge is straight; the back edge expands (from 0.80 cm. to 1.37 cm.) from the basal end until half of the blade length. Then it begins a linear approach towards the cutting edge and forms the tip. Its present length is 4.4 cm.

Discussion: Knife sections No. 1 and 3 appear to be from a Type 2 French clasp or case knife as defined by Harris (Harris et al. 1965:348-350). The identity of the other eight European knife blades could not be determined due to their fragmentary condition. Both case and clasp knives are probably represented. Harris (et al. 1967:22) notes that French clasp knives first began occurring as a trade item in Texas about 1700 and continued to be an important trade item as long as the region's French influence continued.

Only two of the ten European knife blade fragments from the Deer Creek site were tentatively identified. These Type 2 French knives could have been acquired anytime during the 18th century. The three knives of native manufacture suggest that these resulted from native use of available scrap iron.

Axe (NH) (Figure 11:1)

One fragmentary iron axe is in this Deer Creek sample. It "is of the camp or belt (i.e., light) "type of axe which was defined by the Harrises and Blaines (1965:345-347). This particular specimen has been severely used and abused. The major portion of the eye is missing. The remaining portion of the eye shows evidence that an attempt was made to cut through the axe with a chisel or similar object (from the underside at the junction of the blade and the eye). The back of the remaining portion of the eye has been flared, indicating some sort of pounding activity after the eye was removed. The bit of the broad swept-back blade has been so dulled that a sharpened bit edge is no longer evident. The bit edge is thicker than the adjacent blade. This is because the edge flared out due to pounding, and the protruding metal was then flattened against the blade. This specimen also exhibits numerous random cut marks on both surfaces. It has been suggested (Harris and Blaine 1965:345-347) that cut marks such as these are the result of the specimen having been used as an anvil along with a wedge in metal cutting activity.

This specimen shows the bilaminar blade characteristic of this axe type. As expected, it has the broad swept back blade with one lateral edge flared (Harris and Blaine 1965:345-347). Its present length is 12.2 cm., and its bit edge ranges from 0.54 cm. to 0.92 cm. thick. The maximum blade width is 8.22 cm., the maximum eye width is 4.44 cm., and the constriction at the blade-eye junction is 3.74 cm. wide.

R. K. Harris indicates that this type of axe is not a particularly good time indicator as axes of this same general type have been continuously been manufactured up through the 20th century. Two axes of this type, one of which is complete, are described and illustrated in the Womack report (Harris and Blaine 1965:345-347). Two axes of this type were reported from the Gilbert site (Harris et al. 1967:25-26). One camp axe was reported from the Pearson site (Duffield and Jelks 1961:57-58). From this data, it would seem that, at least as far as 18th century sites in Texas are concerned, this axe type is associated with sites which received primarily French trade. It also appears that the starting date for the use of this type of axe was around 1700.

Hoes

Four possible hoe sections are present in this sample. They are of either iron or steel. None have been cleaned.

Hoe No. 1 (NH) (Figure 11:2): This specimen is a very battered hoe bit. It was broken at the eye as indicated by the increase in thickness (1.60 cm.) and by the break location. The original bit edge was worn away; the remaining portion has been split and splayed through battering. This specimen is 7.12 by 8.39 cm.

Hoe No. 2 (Figure 11:3): This fragment is a section from the eye or either a hoe or axe. It is 4.50 cm. high and 0.80 cm. thick. The eye diameter was originally about 4.7 cm.

Hoe No. 3: This specimen appears to be the bit of a hoe, possibly an axe. The edge is curved and rounded in cross section. It measures 7.7 by 2.63 cm. and is roughly 0.4 cm. thick.

Hoe No. 4: This specimen is a portion of the bit of either a hoe or axe. It is 4.1 by 3.9 cm.

Discussion: Hoes seem to be a rather infrequently reported item in the literature. Their presence does allow inference of a village economy which involved horticulture as well as gathering for sustenance.

Iron Scrapers

Occasionally, thin rectangular pieces of iron have been sharpened on an end or side. These could have been used as scrapers. R. K. Harris (personal communication, 1973) reports having found such a specimen at Spanish Fort; cloth impressions allowed suggesting it had been hafted. Three possible iron scrapers are in the Deer Creek sample:

Scraper No. 1 (WR; Figure 12:1): This well made, iron specimen is 5.53 cm. long and has a maximum (in middle) width of 2.12 cm. It tapers gently to slightly convex ends. The specimen is of relatively uniform thickness except for one sharpened end. Two sides and the other end are thick and have a bluntly rounded edge. It averages .35 cm. in thickness.

Scraper No. 2 (WR; Figure 12:2): This rectangular specimen is 5.9 cm. long, 2.02 cm. wide, and averages 0.19 cm. thick. Part of its base has been broken off. The other end is convex and has been sharpened. This appears to be native-made from scrap iron.

Scraper No. 3 (Figure 12:3): This example is roughly rectangular in shape and is slightly bowed along the long axis. It measures 4.70 cm. long, 2.77 cm. wide, and averages 0.16 cm. thick. One side intersects a countersunk screw hole. The scraping edge is a convex end. It, also, appears native-made from scrap iron.

Discussion: The Gilbert site yielded three rectangular scrapers made from scrap iron (Harris et al. 1967:27-28). Spanish Fort also yielded the specimen described above. Possible iron scrapers with flaring edges were reported (Duffield and Jelks 1961:59) for Pearson. These examples compare favorably to those from Deer Creek and appear to have been in use by 1740-1750.

Glass Scraper (NH, Figure 12:4)

One scraper made from crown glass is known for the surface collection. This specimen is fan-shaped with the strongly convex edge serving as the scraping edge. The two straight edges are essentially unmodified. The glass is clear with a very faint pink or lavender tint to it. It measures 4.50 cm. by 3.30 cm. and has a maximum thickness of 0.50 cm.

Arrowpoints

Four types of arrowpoints made from European trade materials are represented at Deer Creek. These are diamond-shaped metal, triangular metal, a sharpened trigger guard finial, and one of glass. None of the iron specimens were cleaned, so their thicknesses are not recorded. The iron used in most cases was fairly thin.

Diamond-shaped Metal Points

There are 6 examples:

Specimen No. 1 (WR; Figure 12:5): This specimen is made of 0.060 cm. thick sheet brass. It is 2.8 cm. long with a maximum width of 1.44 cm. The stem is 0.50 cm. longer than the blade. The stem has been bent and restraightened. Both blade edges have been sharpened.

Specimen No. 2 (NH; Figure 12:6): This thick iron point measures 4.85 cm. long, 3.37 cm. wide, and has a stem longer (0.4 cm.) than the blade. Both blade edges have been sharpened.

Specimen No. 3 (Figure 12:7): This thick iron specimen measures 3.55 cm. long and 1.65 cm. in maximum width. One stem edge is straight; the other is very convex. The blade (2.3 cm.) is nearly twice as long as the stem. Both blade edges have been sharpened.

Specimen No. 4 (Figure 12:8): This thin iron point is 2.48 cm. long and 1.43 cm. wide. The blade (1.75 cm.) is more than twice as long as the stem. At least one blade edge of this badly deteriorated specimen has been sharpened.

Specimen No. 5 (Figure 12:9): This thin point is 1.95 cm. long and 1.16 cm. wide. The blade (1.4 cm.) is nearly three times as long as the stem. Both blade edges were sharpened.

The above five specimens represent the type designated (Harris, Harris, and Woodall 1967:30-32) as Benton Type A.

Specimen No. 6 (NH; Figure 12:10): This specimen of 0.10 cm. brass appears to be an unfinished point. It is 4.67 cm. long and about 1.80 cm. wide. One edge of the 2.70 cm. long blade has been sharpened. On the same side the stem has been cut but not sharpened, and the stem has not been cut out. This point has been bent and restraightened just distal to the blade-stem junction, possibly indicating the specimen was used in its present form.

This sixth specimen appears to be an unfinished Benton Type B as defined by Harris and Harris (ibid.).

Discussion: The proposed chronology for Benton Type A and B points has been estimated (Harris et al. 1967:32) as the mid-18th to mid-19th century.

Seven such points were recovered at Gilbert (ibid.). The Spanish Fort sites (estimated occupation dates: 1759-1820) have yielded a number of Benton points (Harris and Harris 1967: 133, 161): Longest-17 Benton A (3 brass, 14 iron) and 8 Benton B (1 brass, 7 iron); Upper Tucker-3 Benton A (1 brass, 2 iron) and 5 Benton B (all iron). Harris (Harris et al. 1967:32) notes:

> "observations of the authors indicate that the Benton arrowpoint is found in significant quantities in Norteño Focus sites of the southern plains on the Arkansas, Brazos, Red, Sabine, and Trinity Rivers and their tributaries in Texas, Oklahoma, and Louisiana".

At present, no Benton metal points have been reported (Appendix II) from the Period I Bryson site. No Benton points were found at Womack (Harris et al. 1965:352-353), Pearson (Duffield and Jelks 1961:1-83), or Guebert (Good 1972:67-69). Presently available data seems to support the above comments regarding time, spatial, and cultural distribution of this type. The presence of the 6 Benton type metal points at Deer Creek seems to indicate a possible usage date from the mid-18th to mid-19th centuries.

Triangular Metal Points

Specimen No. 1 (Figure 12:11): Both blade edges show evidence of sharpening but one is slightly convex while the other is slightly concave. The base is straight and unsharpened. This iron specimen measures 1.45 cm. wide and 2.19 cm. long.

Specimen No. 2 (Figure 12:12): This iron specimen is 1.05 cm. wide and 1.74 cm. long. The base and one edge are slightly convex. The other edge is noticeably concave. Both edges show evidence of sharpening, and the base has been partially thinned.

Specimen No. 3 (Figure 12:13): This example is 1.76 cm. wide and 2.93 cm. long. The base and one edge are slightly concave. The other edge is essentially straight. The edges have not been sharpened. It is thought that this iron piece might be a triangular point in the process of manufacture.

Discussion: These points are all in a poor preservation state, so the exact status of their bases (thinned vs. unmodified) cannot be determined positively. Good (1972:67-69) reports sheet brass triangular points with and without a central perforation. Good (ibid.) also cites two other perforated triangular points: one from Kaskaskia (Deuel 1958:53) and one from the Bell site (Wittry 1963:18-19) which is thought to date from 1680-1730. Witthoft (1966:21) illustrates a sheet brass triangular point without central perforation. A similar point was also reported (Lehmer and Jones 1968:44) from the Buffalo Pasture site.

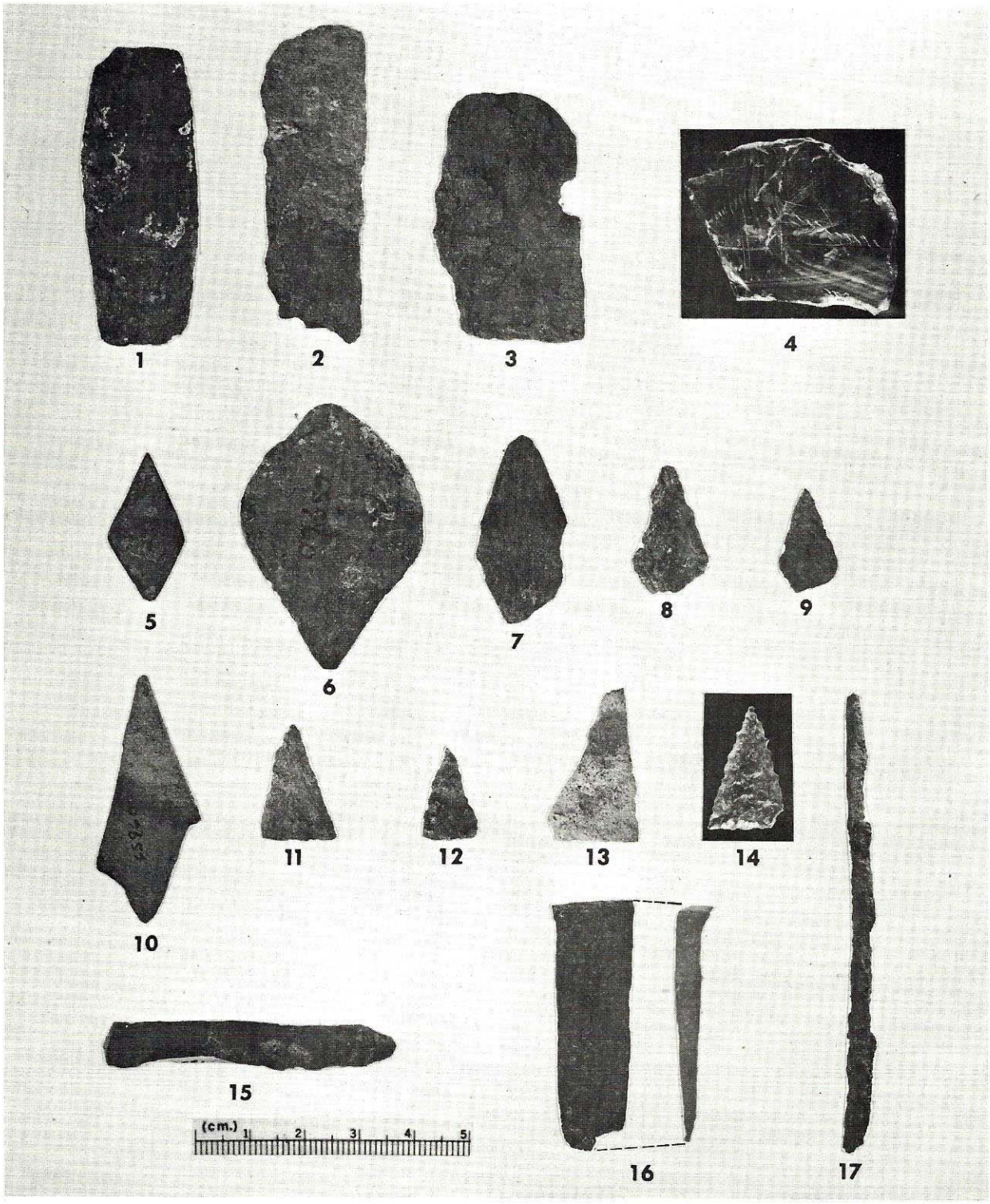


Figure 12. Ka-3 (Deer Creek Site) Tools: 1. Iron scraper no. 1. 2. Iron scraper no. 2. 3. Iron scraper no. 3. 4. Glass scraper. 5-9. Benton Type A metal points 1-5 respectively. 10. Benton Type B blank. 11. Fresnoid metal point no. 1. 12. Fresnoid metal point no. 2. 13. Fresnoid metal point no. 3. 14. Glass Fresno. 15. Iron punch. 16. Iron wedge. 17. Iron awl.

The triangular form of metal arrowpoint seems to be appearing more and more in the literature. Also, as indicated by the sources above, it appears to have a wide distribution. However, triangular metal points are relatively unknown from Norteño sites in Texas. R. K. Harris (correspondence, 1974) does not have a single triangular metal point in his collection and does not remember having seen any from Norteño sites in Texas. The Womack site, dated 1700-1730, has not produced any metal points of any type (Harris et al. 1965:352-353). However, later sites have yielded metal points including those of the Benton Type (see preceding section on Benton Points). The Bryson site, Ka-5, has yielded two triangular sheet brass points (Plate 27:15,16) but no Benton points (Appendix II). It is believed by this author that the Bryson site is slightly earlier than the Deer Creek site (Appendix II).

During the Plains Indians' acculturation process, it appears that an evolution in projectile points occurred. I wish to propose the following theoretical sequence. The pre-contact peoples of the same culture as represented at Deer Creek, as well as other cultural groups, used stone projectile points. The Deer Creek and Bryson stone arrowpoints are essentially all of the Fresno type. At some later point, suggested (Harris et al. 1967:32) as about 1750, the Benton metal points became prominant, particularly on Norteno sites. The Benton point type was based on some 600 specimens from numerous sites on the Southern Plains (Perino 1968:10-11). However, the intervening gap between the non-metal point, Womack occupation and the later Benton point-bearing sites has not been elucidated. I propose that the initial metal points manufactured were most likely copies of the predominant flint point in use, the Fresno. After this start in metal point manufacture, the Benton point was later developed, considered a superior point type, and then displaced the Fresno-like metal points. If this theory is correct, triangular metal points should be found in other sites in the 1720-1750 time range, and possibly earlier in other parts of the country. As additional data becomes available this theory will be refuted or confirmed.

The three Deer Creek triangular points are not good examples of this type as they are of iron and their bases are not distinct. For this reason, the validity of calling them points could be questioned. However, the two Bryson specimens clearly have prepared bases (Plate 27: 15, 16). A definition of this Fresnoid point should probably be as follows:

> "This small point is triangular in outline and is made of thin metal. Both blade edges and the base show evidence of intentional cutting and/or shaping. The size range normally falls in the range of Fresno points (5/8-1½ inches [Bell, 1960: 44-45]). This point type seemingly represents a native attempt to manufacture his standard point type (Fresno) on a new raw material in the early years of post-White contact."

At present relatively few specimens of this point form have been reported. Should additional data support the above developmental theory, I propose that a new point type be established based on the above definition. Also, should this type be accepted and established in the future, I propose that it be named the Miller Point in honor of Mr. and Mrs. Clark Miller of Newkirk, Oklahoma.

Cast Brass Arrowpoints (Figure 8:10)

This specimen has previously been described as a rear triggerguard finial. However, this piece also appears to have been used as an arrow point. It was either cut or broken and then ground nearly smooth across the neck of the rear tang. The underside of the finial shows sharpening on both edges from its widest point down to its tip. The Gilbert site yielded one arrowpoint made from an engraved brass butt-plate finial (Harris et al. 1967:31-32).

Glass Arrowpoint (NH; Figure 12:14)

One small triangular, glass arrowpoint is present. The edges and base are essentially straight with some serrations. This well-made point of clear glass has flake scars which cover both faces. This specimen is 2.37 cm. long and has a maximum thickness (center) of 0.33 cm. One corner is missing, giving a measurable width of 1.45 cm.; the estimated original width is 1.55 cm.

This point is of the Fresno Type (Bell 1969:44-45). This type was used as late as 1750 before its replacement with metal points. Many chipped points of similar form but made from native flint have also been found at this site.

Iron Punch (Figure 12:15)

One iron punch of native manufacture was found. It is made from a straightened section of

round kettle bail. This specimen is 5.36 cm. long and has an average diameter of 0.75 cm. The pointed end tapers from the shaft and is 0.8 cm. long; the tip appears broken off. At the base the original bail continued making a sharp acute angle with the existing specimen; the bail was broken at this point. The butt end of the finished object has a flattened triangular striking surface; this is made from what originally was the side of the bail. Some flaring resulting from pounding is evident at the base.

Wedge (NH; Figure 12:16)

One thin iron wedge occurs. This is the wedge type which was driven into the end of an implement handle to spread the end so the mounted tool would not move or come off. It is rectangular in front view, triangular in side view, and tapers gently to its pointed edge. It measures 4.63 cm. long, 1.43 cm. wide, and has a maximum thickness of 0.65 cm. at its flared basal end.

Large heavy wedges used for cutting metal scrap have been reported from a number of sites. However, handle wedges like the Deer Creek specimen are not mentioned in reports examined while preparing this manuscript. R. K. Harris (personal communication, 1973) reports that similar handle wedges are common at Spanish Fort.

Iron Awl (Figure 12:17)

A single, badly deteriorated iron piece might be the remains of a straight iron awl. It is 8.44 cm. long. An original end is not present, and the original cross section is not discernible.

The Womack site yielded one iron awl (Harris et al. 1965:349-351). Gilbert yielded nine awls, and only four are thought to be of European manufacture (ibid.). The Deer Creek specimen could be of either native or European manufacture.

Ornaments

In this section, the trade goods classified as ornaments are described. These include the glass trade beads, a lead bead, a circular sheet brass disc, sheet brass cylinders, sheet copper cylinders, sheet brass tinklers, sheet copper tinklers, a silver tinkler, brass rings, a sleigh bell, and a hawk bell.

Glass Trade Beads

Glass trade beads are a very significant part of any historic site artifact sample. Due to structural, stylistic, design, and color changes which occurred over a period of bead manufacturing, specific well-defined bead types can yield important information about the site they represent. An in-depth pilot study of this situation, specifically considering beads which were recovered from Wichita sites, has been made. This study made use of 106,354 glass beads from various collections which represented 18 different sites in Louisiana, Oklahoma, and Texas which are believed to have been occupied by Wichita peoples. By comparing the respective bead types from each site, a schedule of the time range of occurrance as well as the time of most prevalent usage was derived for each of the 184 glass bead types present. It was determined that some bead types were present for the entire time period (1700-1850) while others were in use for only a restricted time period as evidenced by their presence on sites of one period and absence on sites of other periods (Harris and Harris 1967:129-162, Figures 52 and 53). Thus, based on this work, it is possible to identify some bead types which are good time indicators. As long as additional data is being amassed, this definitive work (ibid.) will be subject to needed additions and revisions. However, based on the extensive sample which it is, the dates may be considered reliable.

In this study, the 1700-1850 time period was broken down into five segments as called for by the time of occupation of sites under consideration and by the changes noted in the bead types. These periods are:

Period 1: 1700-1740
Period 2: 1740-1767
Period 3: 1767-1820
Period 4: 1820-1836
Period 5: 1836-1850 (Harris and Harris 1967:130)

The same period designations are used in the present report. Period 5 bead documentation is somewhat incomplete as only one site of this period was represented in the bead sample (ibid.:158).

The presentation of the bead sample from Deer Creek does depart somewhat from the Harrises' presentation. The sample is presented and analyzed on its own merits. Thus if two similar types of beads appear to be distinct groupings based on physical characteristics, they are presented as such. It is realized that there are size and shape variations within bead types resulting from the manufacturing process. With a larger bead sample perhaps these "clusters" of distinct bead types would disappear; however, based on the present sample they are evident and are therefore presented as separate entities. This presentation is based on the empirical facts and not on the supposition of what a more complete sample might indicate. This is the reason that, on occasion, two different Deer Creek types represent the same "Wichita Type" as defined by the Harrises. The description given is not meant to conform to established definitions, but to fully and accurately describe a bead sample from a previously unreported site. Whenever the Deer Creek bead type is comparable to a type defined in the Wichita bead report, this is noted and the assigned date is given.

In some instances, the term "subtype" is used. This term denotes that the various beads are, so far as known, identical in all aspects other than size. Thus, subtypes are different sizes of the same bead type; they are designated by the same bead type number followed by a small letter. The size designations and the diameters which they represent, based on Harris and Harris (ibid.:139), are:

extra large:	over 10.00 mm.
large:	6.05-10.00 mm.
medium:	4.05-6.00 mm.
small:	2.05-4.00 mm.
extra small:	0.00-2.00 mm.

The size of a bead generally had a correlation with its use. In the Womack report, we are told that "documentary evidence (Du Pratz--quoted in Swanton 1911:56) suggests that the larger beads were used mainly on necklaces, while the small and medium-sized ones were used principally on skins, garters, and the like" (Harris et al. 1965:307).

The dimensions of the beads within each type are given. These are presented in the form of a size range (smallest and largest of each measurement) and the average dimensions (when more than two specimens are present). These values are presented in the order of bead diameter, bead length (or height), and hole diameter.

In the bead descriptions, other physical characteristics are also described. One of these is the method of manufacture. A brief summary of the various techniques used in producing the beads in this sample is given here; more extensive descriptions are available in the literature (Kidd and Kidd 1970:45-70; Good 1972:95-97; Harris and Harris 1967:134-138). The majority of beads in the Deer Creek sample were made by a technique referred to as the hollow cane method. In this procedure, a mass of molten glass with a central air bubble was drawn into a long slender rod. Upon cooling, this cane was cut into short sections of the desired length. Often, these beads were tumbled to give them a more spherical shape; this process also served to smooth down the rough cut ends. Additional variations of this method included layering a second type of glass on top of the first to form a compound bead, or inlaying slender glass rods of varying colors in the surface to yield the stripes of a complex bead. A second method of bead manufacture represented in the Deer Creek bead sample is the mandrel wound technique. In this method, the bead is formed by winding a molten thread or rod of glass around a mandrel (wire) which was later removed. Beads of this type could be further modified by pressing them into desired shapes, a process referred to as molding.

As indicated, three structural complexities are recognized (Duffield and Jelks 1961:40-41). Simple beads are composed of one single homogeneous unit of glass. Compound beads have at least two structural components in the form of layer(s) of glass superimposed over the original layer. Complex beads are beads which consist of one or more layers of glass which have glass rods pressed into the outside layer of glass forming stripes.

Having considered Good's (1972:98) comments, use of the Munsell Book of Color (1957) as a color reference seemed desirable. However, due to its lack of general availability, it was decided to use a more readily accessible standard color reference. Thus, the colors given in the bead descriptions are taken from Bustanoby (1947:28, and Plate 8).

Bead shape is also an important physical parameter used in this presentation. The shape of a bead is determined by examining the bead perpendicular to its axis (hole) [most of the beads are round in cross section]. The particular nature of the Deer Creek site bead sample seems to necessitate a deviation from previously used descriptive shape terminology. The set of

Table 2. Definitions for terms used in describing the Deer Creek trade bead sample.

Tubular: a bead with straight parallel sides, and a length at least two times its diameter, (Plate 13:2).

Spherical: a bead with strongly convex sides which form a continuous curve with the ends (i.e., circular), (Plate 13:8a, 8b).

Olive-shaped: a bead with its greatest diameter in the middle, and which gently constricts towards both ends, (Plate 13:6).

Elongated Olive-shaped: an olive-shaped bead in which the medial section possesses a parallel-sided region as if it was an olive-shaped bead that have been stretched in the middle, (Plate 13:1).

Doughnut-shaped: a bead, with diameter greater than height, which is flat and disc-like in appearance. The ends and sides merge in a continuous unbroken curve, (Plate 16:66). Note that the ends are not distinctly flattened.

Cylindrical: a bead with relatively straight and parallel sides. At the point where the sides merge with the end of the bead, there is an abrupt angular change. The length to diameter ratio is less than 2:1, (Plate 15:48D).

Barrel-shaped: a bead with flattened ends, and weak to strongly convex sides (no straight region). The transition from side to end is not as sharp as in the cylindrical bead. Due to the range of side curvatures, each type will be descriptively designated as weakly (Plate 13:17), moderately (Plate 13:18), or strongly (Plate 13:7) convex.

(These last two shape entries are each subdivided into three subgroups:

elongate: length noticeably greater than diameter,

symmetrical: length and diameter nearly equal, and

short: length noticeably less than diameter.

to give enhanced descriptive terms such short barrel-shaped, symmetrical cylindrical shaped, etc.)

terms used in this report are defined above (Table 2) and a good illustration of each shape is referenced. Hopefully, this greater specificity in terminology will enable the reader to better visualize the bead's shape.

In an attempt to further clarify the bead descriptions, additional photographs have been provided. A representative specimen of each bead type is illustrated by four different photographs. The first one, located in column A, is a perspective view showing both the end and side view of the bead. This shot is reproduced at actual size, and is to illustrate the size and general shape of the bead. Columns B, C, and D are two times actual size, and are presented to give more detail of the particular specimen. B is an end view, C is a side view (the hole is horizontally situated), and D is another angle shot like A.

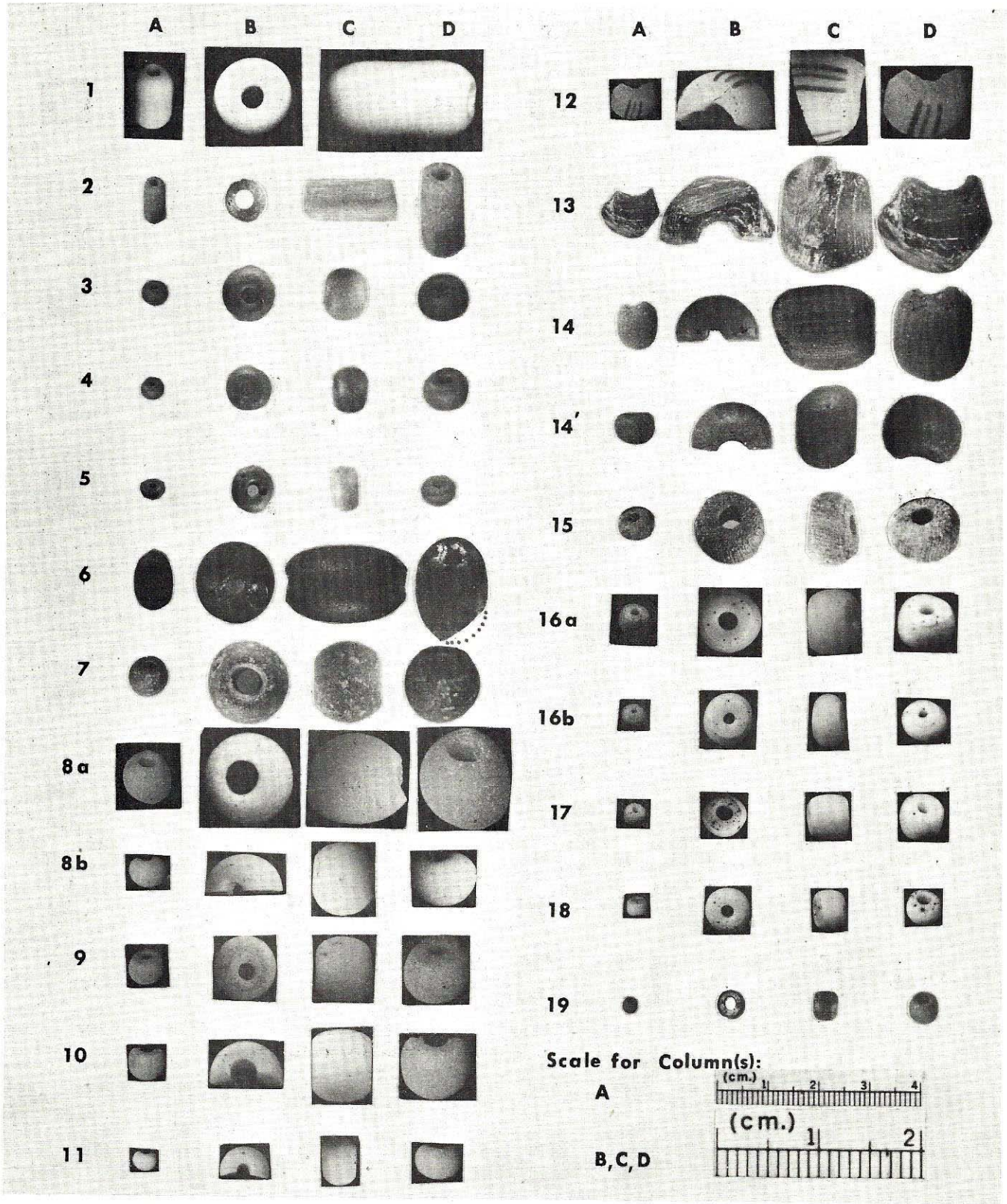


Figure 13. Ka-3 (Deer Creek Site) Glass Beads: 1-19. Bead Types 1-19 respectively. Small letters represent subtypes, and apostrophe represents a second specimen of the same type. Column A is actual size, and columns B, C, and D are two times actual size.

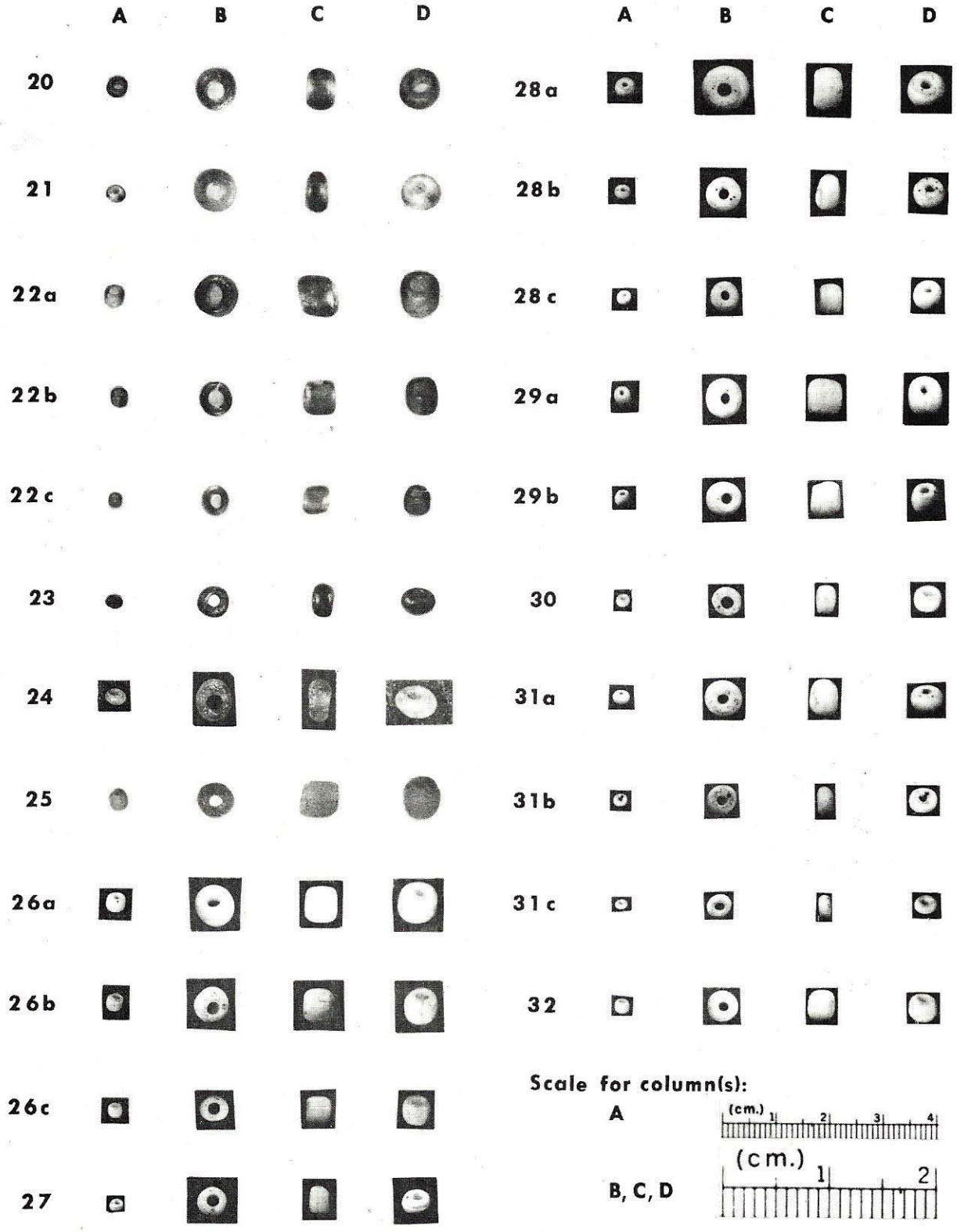


Figure 14. Ka-3 (Deer Creek Site) Glass Beads: 20-32. Bead Types 20-32 respectively. Small letters represent subtypes. Scales as indicated.

The following abbreviations are incorporated into this bead description. Most of the beads are of Hollow Cane (HC) construction. T represents Tumbled in which the ends of the beads were smoothed down; UT means UnTumbled. WBTN refers to the Wichita Bead Type Number assigned the bead type by Harris and Harris (1967:139-155); the dates presented are also from this source.

Following is the description of the 229 beads found at the Deer Creek site. Three small white beads are so deteriorated as to be unclassifiable, and one Copenhagen Blue bead has been melted into a shapeless glob. The other 225 beads are described in the following 75 bead types.

Bead Type No. 1 (Figure 13:1): 1 specimen, 1 fragmentary specimen (NH)
Dimensions: 7.80, 15.20, 2.00-8.00, 13.10, 2.20 mm.
Description: This large opaque white bead of simple construction is elongated olive-shaped and has a porcelain-like texture. One of the specimens is constricted in the middle. (HC, T). WBTN 2; this type was used predominantly from 1700-1740, and continued to occur in small numbers through Period 2.

Bead Type No. 2 (Figure 13:2): 1 specimen
Dimensions: 4.00, 8.40, 1.70 mm.
Description: This small opaque Brittany Blue bead is of simple construction. The middle of this tubular bead is slightly constricted. The glass has a fine fibrous texture. (HC, T). WBTN 56; the primary date of occurrence of this type seems to be Period 1 with some examples occurring through Period 2.

Bead Type No. 3 (Figure 13:3): 5 specimens (1NH)
Dimensions: 4.85, 2.80, 0.80-5.30, 3.85, 1.40; 5.30, 3.30, 1.20 mm.
Description: These medium opaque Gobelin Blue beads are of simple construction. They are short barrel-shaped with strongly convex sides. (HC, T). WBTN 15; this type was predominant in Period 1, but continued to be used through Period 2.

Bead Type No. 4 (Figure 13:4): 4 specimens
Dimensions: 4.25, 2.40, 1.00-4.80, 3.00, 1.60; 4.45, 2.80, 1.25 mm.
Description: These medium opaque Gobelin Blue beads are of simple construction. They are short barrel-shaped with strongly convex sides. (HC, T). This type differs from No. 3 only in being a cluster of beads of different size; after this type, beads with this relationship will be classed as subtypes. WBTN 15; this type was predominant in Period 1, but continued to be used through Period 2.

Bead Type No. 5 (Figure 13:5): 3 specimens (1WR), 1 fragmentary specimen
Dimensions: 3.20, 1.70, 1.00-3.90, 2.00, 1.40; 3.55, 1.85, 1.20 mm.
Description: These small opaque Gobelin Blue beads are of simple construction. They are very short barrel-shaped with strongly convex sides. These are slightly lighter in color than No. 3 and 4. (HC, T). WBTN 47; these were primarily traded during Period 1 although their trade continued through Period 2.

Bead Type No. 6 (Figure 13:6): 1 specimen (WR)
Dimensions: 7.30, 11.30, 2.00 mm.
Description: This large translucent Bluebird Blue olive-shaped bead is of simple construction. (HC, T). WBTN 13; this type was predominant in Period 1, but continued to occur until the end of Period 2.

Bead Type No. 7 (Figure 13:7): 1 specimen (NH)
Dimensions: 7.70, 6.20, 2.50 mm.
Description: This large slightly translucent Pimento bead is of simple construction. It is short barrel-shaped with strongly convex sides. It was made by the mandrel wound technique. This bead type has not been previously reported. R. K. Harris (personal communication, 1973) suggests that this new type is probably related to the early mandrel wound pieces and will probably be found to occur in Period 1, possibly in Period 2.

Bead Type No. 8a (Figure 13:8a): 1 specimen, 2 fragmentary specimens
Dimensions: 9.10, 9.70, 3.00 mm.
Description: This large opaque white bead is of simple construction. It is spherical in shape, and has a porcelain-like texture. (HC, T). WBTN 3; this type was used predominately during Period 1 but continued to occur in smaller quanities until the end of Period 3.

Bead Type No. 8b (Figure 13:8b): 3 fragmentary specimens
Dimensions: 7.00, 6.30, 1.90-7.30, 7.90, 2.10; 7.15, 7.10, 1.95 mm.
Description: These are large opaque white beads of simple construction. They are spherical and have a porcelain-like texture. A rounded protrusion is present on an end of one specimen. This is probably due to the glass cane breaking imperfectly, with tumbling smoothing down the projection. This type is identical to No. 8a in every way except for size. (HC, T). WBTN 3; this type was used predominately in Period 1, with some usage continuing through Period 3.

Bead Type No. 9 (Figure 13:9): 2 specimens
Dimensions: 6.50, 5.70, 1.70-8.20, 7.60, 2.20 mm.
Description: These large white opaque beads are of simple construction. They are short barrel-shaped with strongly convex sides, and are porcelain-like in texture. (HC, T). WBTN 3; this type was used predominately in Period 1 although limited use continued through Period 3.

Bead Type No. 10 (Figure 13:10): 1 fragmentary specimen
Dimensions: 7.20, 5.90, 2.40 mm.
Description: This large opaque white bead is of simple construction. It is short barrel-shaped with moderately convex sides. Its outer surface is covered with striations, and it has a porcelain-like texture. (HC, T). WBTN 3; this type was used primarily in Period 1, with its occurrence continuing through Period 3.

Bead Type No. 11 (Figure 13:11): 1 fragmentary specimen
Dimensions: 4.70, 3.30, 1.20 mm.
Description: This medium opaque white bead is of simple construction. From the end, it appears pseudo-compound; however, examination of its interior shows its simple construction. It is short barrel-shaped with strongly convex sides. (HC, T). According to R. K. Harris (personal communication, 1973), even though it is of smaller size this bead also falls in WBTN 3 which was used primarily in Period 1 but which continued to be present in reduced numbers through Period 3.

Bead Type No. 12 (Figure 13:12): 1 fragmentary specimen
Dimensions: 8.90, ?, 2.40 mm.
Description: This large bead is of complex construction. Its opaque core has a light Turquoise tint, the outer layer of glass is an opaque (very slightly bluish) white, and the stripes are Bluebird Blue. Two complete sets of three stripes are represented as well as part of a third set. Originally, there were three sets of three stripes on this fragmentary olive-shaped bead. The stripes are not deeply set and may be felt protruding above the surface. This bead is porcelain-like in texture. (HC, T). Beads of this type were found at the Guebert site (Good 1972:124, color plate 6). Good (correspondence, 1974) informs me that the color of the stripes on the Deer Creek specimen is identical to the color on the Guebert specimens. Harris (personal communication, 1973) includes this type in WBTN 23. This type was prevalent in Period 1, and continued to appear in small numbers until the end of Period 3.

Bead Type No. 13 (Figure 13:13): 1 fragmentary specimen
Dimensions: 11.00, 8.90, 3.80 mm.
Description: This extra large simple translucent Copenhagen Blue bead is of mandrel wound construction. It originally had eight pressed facets, and it has flattened ends. This bead appears identical to WBTN 40 (Bluebird Blue), and has been assigned a date of primary occurrence during Period 1 with occasional examples being seen through Period 3.

Bead Type No. 14 (Figure 13:14,14'): 14 fragmentary specimens (4NH, 2WR)
Dimensions: 6.80, 5.80, 1.90-8.10, 9.80, 2.40; 7.25, 7.30, 2.15 mm.
Descriptions: These large opaque beads of simple construction range from Turquoise to Peacock Blue in color. These beads are all barrel-shaped and range from short to elongate with side curvatures ranging from weakly to strongly convex. These beads all have a fibrous texture and are badly weathered; their quality of manufacture also seems to have been quite variable. (HC, T). WBTN 10; this type was most prominant in Period 1, but continued to be traded through Period 4.

Bead Type No. 15 (Figure 13:15): 5 specimens
Dimensions: 4.40, 3.00, 1.40-6.90, 4.80, 2.10; 5.50, 3.80, 1.60 mm.
Description: These medium opaque Peacock Blue beads are of simple construction. They are short barrel-shaped with strongly convex edges. They have a very fibrous texture with the fibers running lengthwise along the bead. (HC, T). WBTN 11; this bead type was primarily present in Period 1, but continued to be traded through Period 4.

Bead Type No. 16a (Figure 13:16a): 1 specimen
Dimensions: 6.50, 4.30, 1.70 mm.
Description: This large opaque white bead is of compound construction. It has an opaque white core and a thick outer layer of clear glass which appears frosted, probably due to age. This specimen is short barrel-shaped with strongly convex edges. (HC, T). WBTN 4: this type first appeared in Period 1 when it occurred in very large numbers. It was present in Periods 2-4 in reduced numbers.

Bead Type No. 16b (Figure 13:16b): 3 specimens (1WR)
Dimensions: 4.90, 2.90, 0.90-5.30, 3.30, 1.20; 5.05, 2.80, 1.05 mm.
Description: These medium opaque white beads are of compound construction. They have an opaque white core, and an outer layer of clear glass which is fairly thick; this layer appears frosted, probably due to age. These beads are short barrel-shaped with strongly

convex sides. (HC, T). WBTN 5: This type appeared in Period 1, was present in reduced numbers in Period 2, and continued to be present in very small numbers through Period 4.

Bead Type No. 17 (Figure 13:17): 1 specimen
Dimensions: 4.40, 3.90, 1.20 mm.
Description: This medium opaque white bead is of compound construction. It has an opaque white core and a clear outer layer which appears frosted, probably due to age. It is short barrel-shaped and has weakly convex sides. (HC, T). WBTN 5; this type was most prominant in Period 1, present in reduced numbers in Period 2, and continued to be present in very small numbers through Period 4.

Bead Type No. 18 (Figure 13:18): 2 specimens
Dimensions: 4.20, 2.90, 1.40-4.70, 2.50, 1.70 mm.
Description: This medium opaque white bead is of compound construction. It has an opaque white core and a thin outer layer of clear glass which is frosted, probably due to age. These beads are short barrel-shaped with moderately convex sides. (HC, T). WBTN 5; this bead type was most prominant in Period 1, present in reduced numbers in Period 2, and present in very small numbers through Period 4.

Bead Type No. 19 (Figure 13:19): 2 specimens
Dimensions: 3.10, 2.30, 1.00-3.30, 2.50, 1.00 mm.
Description: These small opaque beads are of compound construction consisting of three layers of glass. The thick inner Surf Green layer is translucent, the middle Brick Red layer is opaque, and the very thin clear outer layer is transparent. This bead type is short barrel-shaped with weakly convex sides. (HC, T). WBTN 51: This bead type, referred to as a small "Cornaline d'Aleppo", is present in rather high numbers in Periods 1 through 3, and in very high numbers in Period 4.

Bead Type No. 20 (Figure 14:20): 12 specimens
Dimensions: 2.80, 1.95, 1.00-3.90, 2.60, 1.50; 3.35, 2.30, 1.20 mm.
Description: These small translucent Bluebird Blue beads are of simple construction. These beads are short barrel-shaped with moderate to strongly convex sides. (HC, T). WBTN 48; this bead type was present in large numbers from Periods 1 through 3, and in very large numbers in Period 4 before disappearing from trade at the end of Period 4.

Bead Type No. 21 (Figure 14:21): 9 specimens (1 WR)
Dimensions: 3.00, 1.30, 0.90-4.00, 2.40, 1.50; 3.60, 2.00, 1.15 mm.
Description: These small translucent Bluebird Blue beads of simple construction are doughnut-shaped. (HC, T). WBTN 48: This bead type appeared in quantity in Period 1 and continued to be present through Period 4 when it was present in larger quantities.

Bead Type No. 22a (Figure 14:22a): 2 specimens
Dimensions: 3.80, 3.20, 1.50-3.80, 3.70, 1.10 mm.
Description: These small translucent Bluebird Blue beads are of simple construction. They vary from symmetrical to short cylindrical. (HC, T). WBTN 48; these beads were present in Periods 1-3 in large numbers and occurred in Period 4 in even larger numbers.

Bead Type No. 22b (Figure 14:22b): 7 specimens
Dimensions: 3.10, 2.50, 1.10-3.50, 3.35, 1.40; 3.30, 2.75, 1.30 mm.
Description: These small translucent Bluebird Blue beads are of simple construction. These specimens range from symmetrical to short barrel-shaped with weakly convex sides. (HC, T). WBTN 48; this type was present in large numbers in Periods 1-3 and was present in even larger numbers in Period 4.

Bead Type No. 22c (Figure 14:22c): 2 specimens
Dimensions: 2.70, 2.30, 0.90-2.70, 2.50, 0.90 mm.
Description: These small translucent Bluebird Blue beads are of simple construction. They range from short cylindrical to short barrel-shaped with weakly convex sides. (HC, T). WBTN 48; this bead type was present in large numbers in Periods 1-3 and was present in even larger numbers in Period 4.

Bead Type No. 23 (Figure 14:23): 1 specimen
Dimensions: 3.20, 1.90, 0.90 mm.
Description: This small doughnut-shaped bead is of simple construction. The ends near the hole are slightly depressed. This specimen appears to be opaque black; in strong light, it is a very dark wine color. (HC, T). This appears to be the same as WBTN 50; these beads are present in Period 1-3 sites in large numbers and are most numerous in Period 4 sites.

Bead Type No. 24 (Figure 14:24): 1 specimen
Dimensions: 3.40-4.00, 2.10, 1.30 mm.
Description: This small doughnut-shaped bead is of simple construction. It is clear although it appears frosted due to age. As indicated by the dimensions, this bead is somewhat oblong. (HC, T). WBTN 49; this bead type is present from Period 1 in large quantity with the largest quantity being present in Period 4.

Bead Type No. 25 (Figure 14:25): 2 specimens (2WR)
Dimensions: 3.20, 2.90, 1.20-3.50, 3.50, 0.90 mm.
Description: These small opaque Peacock Blue beads are of simple construction. They are symmetrical barrel-shaped with weakly convex sides. They have a fibrous texture. (HC, T). WBTN 46; these beads are most predominant from Period 4 sites although they were quite common in Periods 1-3 as well.

Bead Type No. 26a (Figure 14:26a): 2 specimens (2WR)
Dimensions: 3.60, 3.20, 1.00-3.60, 3.30, 1.10 mm.
Description: These small opaque white beads are of simple construction. These beads, and the other two subtypes in this grouping, are all pseudo-compound in that they appear to have two layers. Close examination indicates that the bead is simple and appears compound due to abrasion (as the result of wear) on the ends. These beads are short barrel-shaped with weakly convex sides and have a porcelain-like texture. (HC, T). WBTN 44; this type occurred in large numbers in Periods 1-3, and was present in largest numbers in Period 4.

Bead Type No. 26b (Figure 14:26b): 1 specimen
Dimensions: 3.10, 2.80, 1.10 mm.
Description: This small opaque white pseudo-compound bead is of simple construction. It is short barrel-shaped with moderately convex sides and has a porcelain-like texture. (HC, T). WBTN 44; this bead type was present in large numbers in Periods 1-3, and was present in largest numbers in Period 4.

Bead Type No. 26c (Figure 14:26c): 3 specimens (2WR)
Dimensions: 2.60, 1.50, 0.80-2.90, 2.30, 1.00; 2.70, 2.05, 0.90 mm.
Description: These small opaque white pseudo-compound beads are of simple construction. They are short barrel-shaped with weakly convex sides and have a porcelain-like texture. (HC, T). WBTN 44; these beads occur in large numbers in Periods 1-3 and are in the largest numbers in Period 4.

Bead Type No. 27 (Figure 14:27): 2 specimens
Dimensions: 2.70, 1.80, 1.00-3.15, 2.00, 0.90 mm.
Description: This small opaque white bead type is of simple construction. It is short barrel-shaped with moderately convex edges. (HC, T). R. K. Harris (personal communication, 1973) places this type in WBTN 44, which was introduced in Period 1, continued in large numbers through Period 3, and was used in very large numbers in Period 4. The Deer Creek specimens seemingly differ from this type in that they are not porcelain-like.

Bead Type No. 28a (Figure 14:28a): 4 specimens
Dimensions: 3.70, 2.30, 1.00-4.20, 2.60, 1.15; 3.90, 2.50, 1.05 mm.
Description: These small opaque white beads are of compound construction. They have an opaque white core and an outer layer of clear glass which appears to be fairly thick. This outer layer appears frosted, probably due to age. These specimens are short barrel-shaped with moderately convex sides. (HC, T). WBTN 45; this bead type appeared in Period 1, occurred in large numbers through Period 3, and occurred in largest quantities in Period 4.

Bead Type No. 28b (Figure 14:28b): 5 specimens
Dimensions: 3.10, 1.70, 0.70-3.30, 2.50, 0.90; 3.20, 2.05, 0.80 mm.
Description: These small opaque white beads are of compound construction. They have an opaque white core and a fairly thick clear outer layer which appears frosted, probably due to age. These beads are short barrel-shaped, and have strongly convex sides. (HC, T). WBTN 45; this bead type appeared in Period 1 and continued in large numbers through Period 4 where it occurred in the largest numbers.

Bead Type No. 28c (Figure 14:28c): 4 specimens (2WR), 1 fragmentary specimen
Dimensions: 2.40, 1.60, 0.60-2.80, 2.60, 0.80; 2.65, 2.05, 0.70 mm.
Description: This small opaque white bead type is of compound construction. It has an opaque inner core and a clear outer layer which appears very thick. Three of these beads still have a noticeable surface luster. These beads are short barrel-shaped with moderately convex sides. (HC, T). WBTN 45; this bead type appeared in Period 1 and continued in large numbers through Period 4 with the largest number being present in this last period.

Bead Type No. 29a (Figure 14:29a): 3 specimens (1NH)
Dimensions: 3.30, 3.20, 0.80-3.60, 3.30, 1.30; 3.45, 3.25, 1.05 mm.
Description. These small opaque white beads are of compound construction. They have an opaque white core and an outer layer of clear glass that appears frosted, probably due to age. This type approaches being symmetrical barrel-shaped and has moderately convex sides. (HC, T). WBTN 45; this type first appeared in Period 1 and continued to be present in large numbers through Period 3: but it is present in largest numbers in Period 4.

Bead Type No. 29b (Figure 14:29b): 6 specimens (1WR)
Dimensions: 2.70, 2.25, 0.60-3.10, 2.70, 1.00; 2.90, 2.50, 0.85 mm.
Description: These small opaque white beads are of compound construction. They have an opaque white core and a clear outer layer which appears frosted, probably due to age. This bead approaches symmetrical barrel-shaped and has moderately convex sides. (HC, T). WBTN 45; this bead type was introduced in Period 1, continued to be present in high numbers through Period 3, and was present in largest numbers in Period 4.

Bead Type No. 30 (Figure 14:30): 2 specimens
Dimensions: 2.70, 1.60, 1.00-2.70, 1.70, 0.90 mm.
Description: This small opaque white bead type is of compound construction. It has an opaque white core and a thin clear outer layer which appears frosted due to age. It is short barrel-shaped with moderately convex sides. (HC, T). WBTN 45; this bead type was present in high numbers in Periods 1-3 and was present in highest numbers in Period 4.

Bead Type No. 31a (Figure 14:31a): 1 specimen
Dimensions: 3.40, 2.40, 0.80 mm.
Description: This small opaque white bead is of compound construction. It has an opaque, off-white core, and a moderately thick clear outer layer. It is short barrel-shaped, and has strongly convex sides. (HC, T). WBTN 45; this type first appeared in Period 1 and continued through Period 3 in large numbers; it was present in Period 4 in even larger numbers.

Bead Type No. 31b (Figure 14:31b): 10 specimens
Dimensions: 2.50, 1.10, 0.40-2.90, 1.70, 0.90; 2.70, 1.45, 0.75 mm.
Description: This small opaque white bead type is of compound construction. It has an opaque white inner core and a moderately thick clear outer layer which appears frosted, probably due to age. It is very short barrel-shaped and has strongly convex sides. (HC, T). WBTN 45; this bead type occurred in large numbers in Periods 1-3 and in even larger numbers in Period 4.

Bead Type No. 31c (Figure 14:31c): 1 specimen (WR)
Dimensions: 2.20, 1.10, 0.80 mm.
Description: This small opaque white bead is of compound construction. It has an opaque white inner core and a moderately thick clear outer layer which appears frosted, probably due to age. This bead is short barrel-shaped with strongly convex sides. (HC, T). WBTN 45; this bead type occurred in Periods 1-3 in large numbers and in Period 4 in even larger numbers.

Bead Type No. 32 (Figure 14:32): 11 specimens
Dimensions: 2.60, 1.55, 0.60-3.00, 2.20, 1.00; 2.85, 2.00, 0.80 mm.
Description: These small opaque white beads are of compound construction. They have an opaque white inner core and a clear outer layer which appears frosted, probably due to age. These beads are short barrel-shaped with weakly convex sides. (HC, T). WBTN 45; this bead type occurred in large numbers in periods 1-3 and in even larger numbers in Period 4.

Bead Type No. 33 (Figure 15:33): 1 specimen
Dimensions: 4.10, 12.2, 1.60 mm.
Description: This medium opaque bead is of compound construction consisting of three layers of glass. The thick translucent inner layer is Jade Green, the middle layer is Brick Red, and the thin clear outer layer is transparent. This tubular-shaped bead has a few striations running its length on its outer surface. (HC, T) WBTN 57; this is the large variety of "Cornaline d'Aleppo". This bead type is primarily associated with Period 2 although some do occur during Period 3.

Bead Type No. 34 (Figure 15:34): 4 specimens
Dimensions: 3.55, 11.50, 1.60-4.00, 14.60, 1.90; 3.80, 12.75, 1.80 mm.
Description: This small opaque bead is of compound construction and consists of three distinct layers of glass. The thick translucent inner layer is Jade Green, the opaque middle layer is Brick Red, and the thin transparent outer layer is clear. These tubular-shaped beads have varying numbers of striations on their external surface running from part way to the entire length of the bead. (HC, UT). WBTN 57; this type is primarily associated with Period 2 although it continued to be used in reduced numbers in Period 3.

Bead Type No. 34 is very similar to Bead Type No. 33 in nearly all ways. The 0.1 mm. difference in size was not the divisive criterion especially considering that the small and medium size limits are arbitrarily set. The distinction noted was the fact that No. 33 was tumbled and No. 34 was not. One possible reason for this difference is indicated by the presence of long unbroken canes as well as short tumbled tubular beads of the same type at some sites. This phenomenon is illustrated by Pratt (1961:10-13, plates). Thus, it is conceivable

that longer than bead-length sections of cane could have been either traded to the Deer Creek site occupants who later broke the canes into shorter beads, or canes of this particular style could have been the stock which the traders had available to them. One specimen from the Guebert site, Bead Type No. 125, also seems to be an example of this phenomenon (Good 1972:121, Color Plate 5).

Regarding date discrepancies between the work of Pratt and of the Harrises, R. K. Harris (personal communication, 1973) feels that both renderings are accurate. The difference is in the area of the country due to (1) trade in the Arkansas and Red River valleys did not begin until about 1700 and (2) there was a time lag between introduction of beads in the east, as opposed to the far west.

Bead Type No. 35 (Figure 15:35): 1 specimen
Dimensions: 3.80, 12.90, 1.90 mm.
Description: This small tubular translucent Gobelin Blue bead is of simple construction. (HC, UT). WBTN 61 is the tumbled variety of this specimen; it is most prevalent in Period 2 although a few specimens occur in Period 3.

Bead Type No. 36 (Figure 15:36): 1 specimen
Dimensions: 4.20, 2.60, 1.70 mm.
Description: This medium opaque white bead is of simple construction. It is pseudo-compound. It is short barrel-shaped with strongly convex sides. (HC, T). WBTN 78; this bead type first appears in Period 2.

Bead Type No. 37 (Figure 15:37): 2 specimens
Dimensions: 3.10, (0.13-0.16), 0.13-3.20, (0.07-0.18), 0.12 mm.
Description: These small opaque Sky Blue beads are of simple construction. They are very short barrel-shaped with strongly convex sides. (HC, T). WBTN 79; this bead type was present in Periods 2-4 in fairly constant numbers.

Bead Type No. 38 (Figure 15:38): 1 specimen
Dimensions: 2.30, 2.00, 1.00 mm.
Description: This small translucent Emerald Green bead is of simple construction. It is barrel-shaped with moderately convex sides. (HC, T). WBTN 83; this bead type appeared in the trade in Period 2 and continued through Period 4 when it was in greatest numbers.

Bead Type No. 39a (Figure 15:39a): 1 specimen
Dimensions: 3.50, 2.20, 0.80 mm.
Description: This small slightly translucent Peacock Blue bead is of simple construction. It is short barrel-shaped with strongly convex sides. (HC, T). WBTN 80; this bead type first appeared in Period 2, and is most common in Period 4.

Bead Type No. 39b (Figure 15:39b): 1 specimen (WR)
Dimensions: 2.60, 1.60, 0.80 mm.
Description: This small slightly translucent bead is of simple construction. It is short barrel-shaped with very strongly convex sides. It is turquoise instead of Peacock Blue and in this way as well as size differs from No. 39a. It is probably of the same WBTN 80 though; this first appeared in Period 2, and was most abundant in Period 4. (HC, T).

Bead Type No. 40 (Figure 15:40): 3 specimens (1WR)
Dimensions: 2.80, 1.80, 0.80-3.40, 2.10, 1.00; 3.05, 1.95, 0.85 mm.
Description: This small opaque white bead is of compound construction consisting of three layers: a thin outer clear layer, a thin opaque white middle layer, and off-white opaque core. This bead type is short barrel-shaped with moderately convex edges. (HC, T).

Bead Type No. 41 (Figure 15:41): 1 fragmentary specimen
Dimensions: 8.30, 10.00, 2.00 mm.
Description: This large opaque olive-shaped bead is of compound construction. It has an inner core of white glass overlain by an outer layer of translucent glass. The inner layer has a fine fibrous texture. This bead is porcelain-like in texture.

Bead Type No. 42 (Figure 15:42): 1 specimen, 1 fragmentary specimen
Dimensions: 6.30, 5.70, 2.00-?, 5.90, 2.30 mm.
Description: These large opaque white beads are of compound construction. It has a clear outer layer, an opaque white middle layer and an opaque off-white core. This bead type is short barrel-shaped with weakly convex edges. (HC, T).

Bead Type No. 43 (Figure 15:43): 1 specimen
Dimensions: 2.30, 2.10, 0.70 mm.
Description: This small opaque Turquoise bead is of simple construction. It has a fibrous texture and is symmetrical cylindrical in shape. (HC, T).

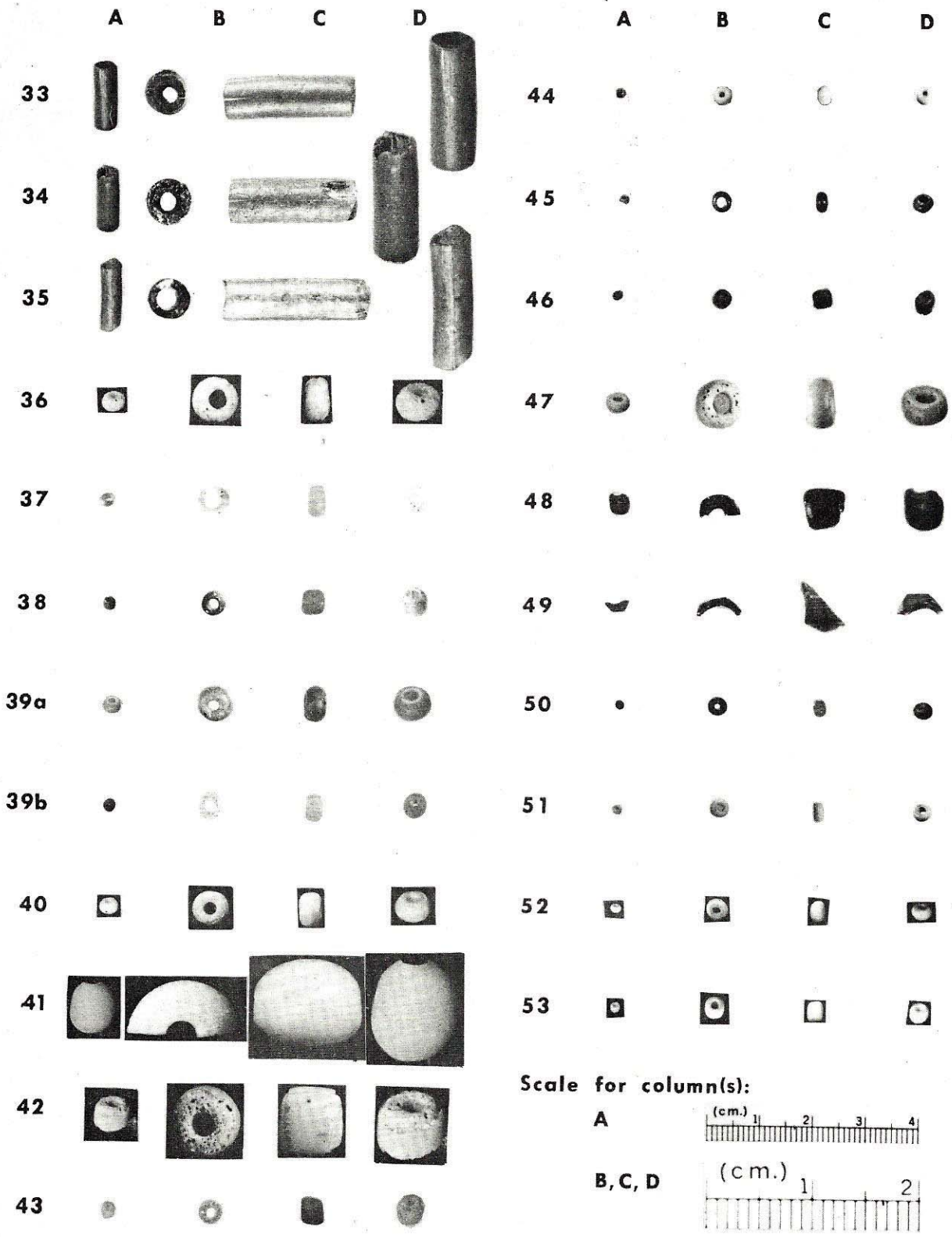


Figure 15. Ka-3 (Deer Creek Site) Glass Beads: 33-53. Bead Types 33-53 respectively. Small letters represent subtypes. Scales as indicated.

Bead Type No. 44 (Figure 15:44): 7 specimens (7WR)
Dimensions: 1.80, 0.90, 0.50-2.00, 1.30, 0.80; 1.90, 1.20, 0.65 mm.
Description: These extra small opaque Peach Blossom beads are of simple construction. They are doughnut-shaped, and the surface of three of these beads still have a high surface luster. (HC, T). WBTN 177; these Baby Pink beads appeared in Period 3 and 4, but are present in very large numbers in Period 5.

Bead Type No. 45 (Figure 15:45): 4 specimens
Dimensions: 1.90, 1.00, 0.70-2.00, 1.10, 0.90; 1.95, 1.05, 0.80 mm.
Description: These extra small opaque Yale Blue doughnut-shaped beads are of simple construction. The surface of two of these beads still has a high luster. (HC, T) WBTN 179 encompasses this bead type; it was first introduced during Period 3 and was present in largest numbers in Period 5.

Bead Type No. 46 (Figure 15:46): 1 specimen (WR)
Dimensions: 1.70, 1.60, 0.80 mm.
Description: This extra small slightly translucent Wedgewood Blue dark bead of simple construction is symmetrical cylindrical in shape. (HC, T). R. K. Harris (personal communication, 1973) considers this bead as being in WBTN 179; this bead type first occurred in Period 3 and is in very large numbers in Period 5.

Bead Type No. 47 (Figure 15:47): 1 specimen
Dimensions: 4.40, 2.40, 1.90 mm.
Description: This medium opaque bead is of compound construction having an opaque inner core of very light Brittany Blue and a translucent outer layer of light Brittany Blue. This bead is short barrel-shaped with moderately convex sides. This bead type has not been previously reported. (HC, T).

Bead Type No. 48 (Figure 15:48): 1 fragmentary specimen (NH)
Dimensions: 3.80, 3.90, 1.50 mm.
Description: This small very slightly translucent bead is of simple construction. It is a very dark maroon wine-colored when examined under bright light. It is symmetrical cylindrical and has a caney texture. (HC, T).

Bead Type No. 49 (Figure 15:49): 2 fragmentary specimens (2WR)
Description: This medium bead is of simple construction. It is translucent Bluebird Blue, hexagonal in cross section, and also has some facets on one end. It is very thin-walled, and the external face has striations running lengthwise. No. 13 from the Guebert site is of this type (Good 1972:107, Color Plate 3). It is elongated cylindrical shaped.

Bead Type No. 50 (Figure 15:50): 1 specimen (WR)
Dimensions: 1.90, 1.30, 0.50 mm.
Description: This extra small doughnut-shaped bead is of simple construction. The ends near the hole are slightly depressed. In strong light, this black opaque-appearing bead takes on a very dark wine color. Although this specimen is nearly identical in construction to No. 23, this size has not been previously noted; so, it is not certain whether or not the same time period is applicable. (HC, T).

Bead Type No. 51 (Figure 15:51): 1 specimen (WR)
Dimensions: 1.80, 0.90, 0.70 mm.
Description: This extra small opaque light Gobelin Blue doughnut-shaped bead is of simple construction. (HC, T).

Bead Type No. 52 (Figure 15:52): 3 specimens (3WR)
Dimensions: 2.00, 1.20, 0.50-2.20, 1.30, 0.70; 2.10, 1.25, 0.60 mm.
Description: These extra small opaque white beads are of compound construction. The opaque outer layer is thick and white, and the opaque inner layer is an off-white. These beads are doughnut-shaped. (HC, T).

Bead Type No. 53 (Figure 15:53): 2 specimens (WR)
Dimensions: 1.75, 1.30, 0.70-1.80, 1.40, 0.70 mm.
Description: These extra small opaque white beads are of compound construction. They have a thin inner white layer, a middle off-white layer, and an outer white layer. There is a low concentric ridge on each end in the middle layer. These could be mold marks. These beads are short barrel-shaped with weakly to moderately convex sides.

Bead Type No. 54 (Figure 16:54): 1 specimen
Dimensions: 2.00, 1.20, 0.90 mm.
Description: This extra small opaque white bead is of compound construction. It consists of at least four layers of opaque white glass of about equal thickness. The inner layer is white; the next two layers are different shades of off-white; and the outer layer is white. This bead is doughnut-shaped. (HC, T).

Bead Type No. 55 (Figure 16:55): 1 specimen (WR)
Dimensions: 2.90, 2.00, 1.30 mm.
Description: This small opaque bead is of simple construction and is a light bluish shade of Turquoise. It is short barrel-shaped with weakly convex sides. (HC, T). WBTN 140; this bead type is a late one, first appearing in Period 4.

Bead Type No. 56 (Figure 16:56): 2 specimens (2WR)
Dimensions: 2.00, 1.10, 0.70-2.10, 1.20, 0.70 mm.
Description: These small opaque Turquoise beads are of simple construction. They are doughnut-shaped, and still have a high surface luster. These specimens are fused together or "twinned", which possibly occurred during the tumbling process. (HC, T). WBTN 140; this bead type first appeared in the trade in Period 4.

Bead Type No. 57 (Figure 16:57): 1 specimen (WR)
Dimensions: 1.90, 1.00, 0.90 mm.
Description: This extra small opaque Turquoise doughnut-shaped bead is of simple construction. This specimen is unusual in that it has a low concentric ridge around the hole on each end. The method of manufacture is not certain; it is possibly mold-made, the ridges conceivably being the mold marks. A large Sky Blue opaque bead with similar ridges was described by Harris and Harris as WBTN 159. It was suggested that it was possibly of pressed construction. This large bead type came into trade during Period 4.

Bead Type No. 58 (Figure 16:58): 1 specimen (WR)
Dimensions: 2.00, (0.30-1.30), 1.10 mm.
Description: This extra small translucent Emerald Green bead is of simple construction. It is doughnut-shaped and was evidentally improperly cutt off of the cane as one side consists of what is essentially a glass thread. (HC, T). WBTN 166; this bead type appeared in Period 4.

Bead Type No. 59 (Figure 16:59): 7 specimens (7WR)
Dimensions: 1.90, 1.20, 0.50-2.10, 1.60, 0.70; 2.00, 1.35, 0.60 mm.
Description: These extra small doughnut-shaped beads are of compound construction. They have a thin opaque white core and a thick translucent Harvard Crimson outer layer. These beads still have a high surface luster. (HC, T). WBTN 174; this bead type was introduced in Period 5.

Bead Type No. 60 (Figure 16:60): 1 specimen (WR)
Dimensions: 1.80, 1.10, 0.60 mm.
Description: This extra small opaque Gobelin Blue bead is of simple construction. It is doughnut-shaped, and its surface still has a high luster. (HC, T). WBTN 178 seems to encompass this bead type; this bead type first appeared in Period 5.

Bead Type No. 61 (Figure 16:61): 1 specimen (WR)
Dimensions: 1.60, 0.70, 0.80 mm.
Description: This extra small opaque Turquoise doughnut-shaped bead is of simple construction. (HC, T). R. K. Harris feels that this type should also be included under WBTN 178 which appeared in Period 5. This specimen is very different in color and dimensions from No. 60.

Bead Type No. 62 (Figure 16:62): 1 specimen (WR)
Dimensions: 1.90, 1.40, 0.80 mm.
Description: This extra small opaque Sunflower bead is of simple construction. It is doughnut-shaped, and still has a high surface luster. (HC, T). WBTN 175; this type first appeared in Period 5.

Bead Type No. 63 (Figure 16:63): 1 specimen (WR)
Dimensions: 2.10, 1.30, 0.60 mm.
Description: This small opaque Colonial Yellow doughnut-shaped bead is of simple construction. (HC, T). WBTN 175 also includes this specimen; this type was first introduced in Period 5.

Bead Type No. 64 (Figure 16:64): 2 specimens (2WR)
Dimensions: 2.10, 1.50, 0.90-2.30, 1.50, 0.80 mm.
Description: These small slightly translucent Yale Blue beads are of simple construction. They are very short barrel-shaped with strongly convex sides; they approach being doughnut-shaped, but they are flattened on the ends. They exhibit some surface luster. (HC, T). This type seems to fall in WBTN 180; this type first appeared in Period 5.

Bead Type No. 65 (Figure 16:65): 3 specimens (3WR)
Dimensions: 1.80, 1.00, 0.60-2.30, 1.20, 0.90; 2.00, 1.15, 0.80 mm.
Description: These extra small translucent Yale Blue beads are of simple construction. They are doughnut-shaped and exhibit a high surface luster. This type also differs from No. 64 in that the beads are more translucent. (HC, T). WBTN 180; this bead type was introduced in Period 5.

Bead Type No. 66 (Figure 16:66): 1 specimen (WR)
Dimensions: 6.00, 3.60, 2.40 mm.
Description: This medium translucent bead of simple construction is Wedgewood Blue Dark in color. It is doughnut-shaped, and its surface has a high luster. (HC, T). R. K. Harris (personal communication, 1973) suggests that this bead is probably representative of one of the later periods.

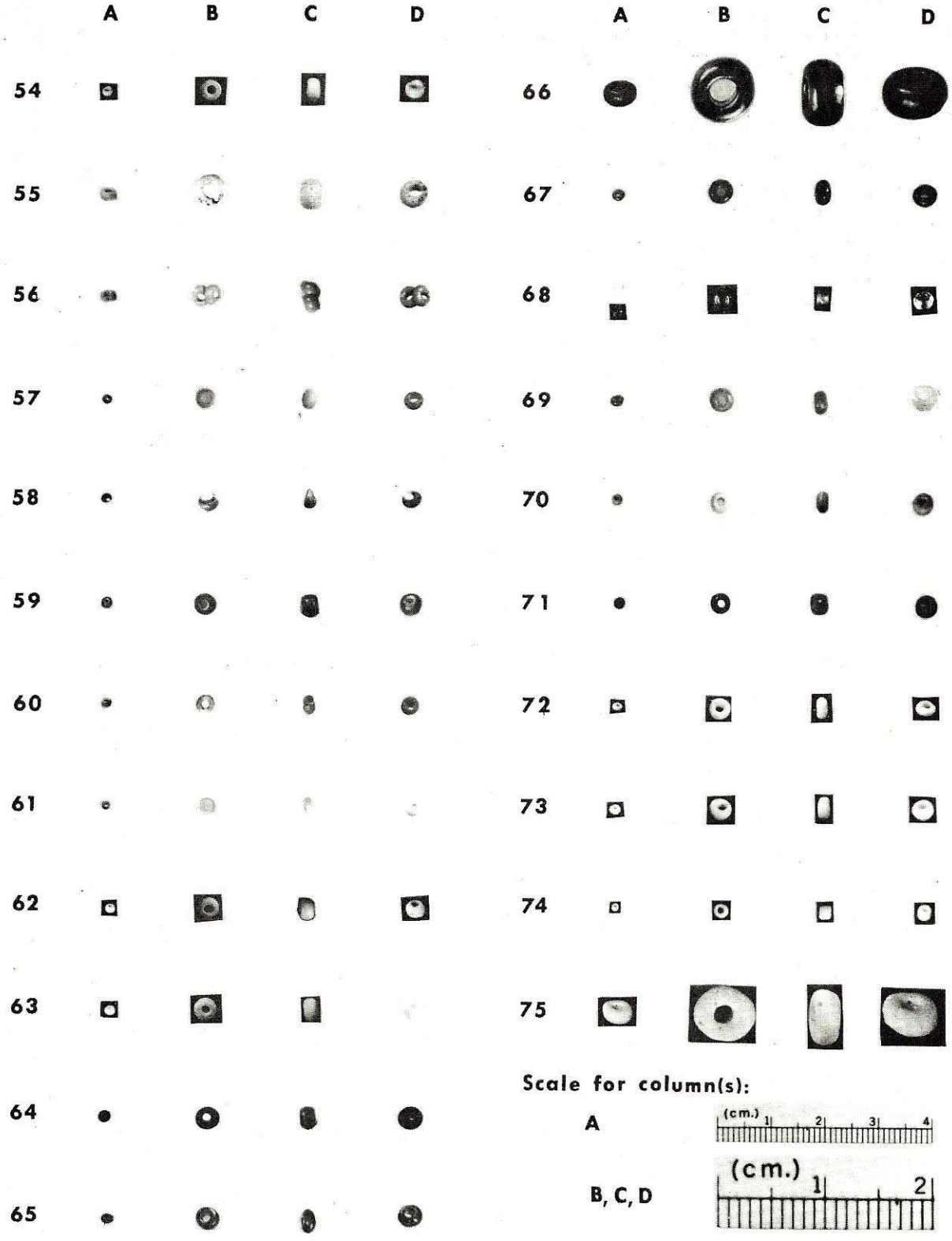


Figure 16. Ka-3 (Deer Creek Site) Glass Beads: 54-75. Bead Types 54-75 respectively. Scales as indicated.

Bead Type No. 67 (Figure 16:67): 2 specimens (2WR)
Dimensions: 2.10, 1.10, 0.90-2.30, 1.20, 1.00 mm.
Description: These small slightly translucent Wedgewood Blue Dark beads are of simple construction. They are doughnut-shaped, and have a high surface luster (the high surface luster appearing on a number of beads is suggestive that these beads are of later origin (i.e., Period 4 or 5). (HC, T). This bead type has not been previously reported from the Wichita sites.

Bead Type No. 68 (Figure 16:68): 1 specimen (WR)
Dimensions: 1.80, 1.10, 0.60 mm.
Description: This extra small translucent Dandelion bead is of simple construction. It is doughnut-shaped and has a high surface luster. (HC, T). This type has not been previously reported from the Wichita sites.

Bead Type No. 69 (Figure 16:69): 1 specimen (WR)
Dimensions: 2.30, 1.20, 0.90 mm.
Description: This small slightly translucent Peacock Blue bead is of simple construction. It is doughnut-shaped, and its surface has a high luster. This bead type has not been reported from the Wichita sites. Since this bead has a luster which is sometimes seen in some Period 4 or 5 beads, it is possibly from one of these late periods.

Bead Type No. 70 (Figure 16:70): 1 specimen (WR)
Dimensions: 2.00, 1.10, 0.70 mm.
Description: This extra small opaque bead is of compound construction having an opaque inner core of very, very light Brittany Blue and a slightly translucent outer layer of light Brittany Blue. The bead is short barrel-shaped with strongly convex sides, and still has surface luster. This bead type has not been previously reported. (HC, T).

Bead Type No. 71 (Figure 16:71): 1 specimen (WR)
Dimensions: 22.00, 1.60, 0.80 mm.
Description: This extra small bead of simple construction is slightly translucent in strong light. It is a very dark blackish-wine color. It is short barrel-shaped with moderately convex sides and has a high surface luster. (HC, T).

Bead Type No. 72 (Figure 16:72): 1 specimen (WR)
Dimensions: 2.00, 1.00, 0.70 mm.
Description: This extra small opaque doughnut-shaped bead is of compound construction. It has an opaque white inner core, a thick off-white very slightly translucent middle layer, and a thin white opaque outer layer. It has a high surface luster. (HC, T). This type has not been previously reported from the Wichita sites.

Bead Type No. 73 (Figure 16:73): 1 specimen (WR)
Dimensions: 2.10, 1.10, 0.70 mm.
Description: This small opaque white doughnut-shaped bead is of simple construction. This bead type has not been previously reported from the Wichita sites although it is similar to WBTN 128. (HC, T).

Bead Type No. 74 (Figure 16:74): 1 specimen (WR)
Dimensions: 1.40, 1.15, 0.55 mm.
Description: This extra small opaque white bead is of compound construction. It has an opaque white inner core and an off-white outer layer. It is short barrel-shaped with weakly convex sides and has a high surface luster. This type has not been previously reported from the Wichita sites although its surface luster suggests that it is a rather late bead type. (HC, T).

Bead Type No. 75 (Figure 16:75): 1 specimen
Dimensions: (5.20-5.65), 2.60, 1.70 mm.
Description: This medium opaque white bead is of compound construction. It has an opaque off-white inner core and an opaque white outer layer. This badly weathered specimen is short barrel-shaped with strongly convex sides. (HC, T). This bead type has not been reported from the Wichita sites.

Discussion: The dates of usage presented for each of these 75 bead types is summarized in Table 3. Bead types 1-6 were restricted to a 1700-1767 period of useage. This would indicate that the Deer Creek site occupation began prior to 1767. Bead types 55-58 indicate an occupation of the site during Period 4 (1820-1836), and bead types 59-65 indicate an occupation in Period 5 (1836-1850). The answer to the question of Period 3 occupation is not elucidated by the bead data as all types used in Period 3 (types 8a-44) were also used in earlier and/or later periods. There are several possible interpretations of this data. It is conceivable that the site was continuously inhabited through all five periods. There is not strong support for this theory in the historical record or in the other artifacts. It is conceivable that there were several successive occupations of the site. This second proposal seems the most reasonable possibility.

Table 3. Dates of occurance of bead types found at the Deer Creek Site.

Deer Creek Bead Type No.	Number of Specimens	% of Sample	WBTN[a]	P-1[b]	P-2[c]	P-3[d]	P-4[e]	P-5[f]
1	2	0.87	2	xxx[g]	xx			
2	1	0.44	56	xxx	x			
3	5	2.18						
4	4	1.75 3.93	15	xxx	xx			
5	4	1.75	47	xxx	x			
6	1	0.44	13	xxx	xx			
7	1	0.44	-	?[h]	?			
8a	3	1.31						
8b	3	1.31						
9	2	0.87 4.37	3	xxx	xx	x		
10	1	0.44						
11	1	0.44						
12	1	0.44	23	xxx	xx	x		
13	1	0.44	40	xxx	xx	x		
14	14	6.11	10	xxx	xx	x	x	
15	5	2.18	11	xxx	xx	x	x	
16a	1	0.44	4	xxx	xx	x	x	
16b	3	1.31						
17	1	0.44 2.62	5	xxx	xx	x	x	
18	2	0.87						
19	2	0.87	51	xx	xx	xx	xxx	
20	12	5.24						
21	9	3.93						
22a	2	0.87 13.97	48	xx	xx	xx	xxx	
22b	7	3.06						
22c	2	0.87						
23	1	0.44	50	xx	xx	xx	xxx	
24	1	0.44	49	xx	xx	xx	xxx	
25	2	0.87	46	xx	xx	xx	xxx	
26a	2	0.87						
26b	1	0.44 3.49	44	xx	xx	xx	xxx	
26c	3	1.31						
27	2	0.87						
28a	4	1.75						
28b	5	2.18						
28c	5	2.18						
29a	3	1.31						
29b	6	2.62						
30	2	0.87 20.96	45	xx	xx	xx	xxx	
31a	1	0.44						
31b	10	4.37						
31c	1	0.44						
32	11	4.80						
33	1	0.44						
34	4	1.75 2.19	57		xxx	x		
35	1	0.44	61		xxx	x		
36	1	0.44	78		xx	?		
37	2	0.87	79		xx	xx	xx	
38	1	0.44	83		x	xx	xxx	
39a	1	0.44 0.87	80		xx	xx	xxx	
39b	1	0.44						
40	3	1.31	-		?	?		
41	1	0.44	-		?	?		
42	2	0.87	-	?	?	?		
43	1	0.44	-		?	?		
44	7	3.06	177			x	x	xxx
45	4	1.75 2.19	179			x	x	xxx
46	1	0.44						
47	1	0.44	-			?	?	?
48	1	0.44	-			?	?	?
49	2	0.87	-			?	?	?
50	1	0.44	-		?	?	?	?
51	1	0.44	-			?	?	?
52	3	1.31	-			?	?	?
53	2	0.87	-			?	?	?
54	1	0.44	-			?	?	?
55	1	0.44						
56	2	0.87 1.31	140				xxx	
57	1	0.44	159				xxx	
58	1	0.44	166				xxx	
59	7	3.06	174					xxx
60	1	0.44						
61	1	0.44 0.87	178					xxx
62	1	0.44						
63	1	0.44 0.87	175					xxx
64	2	0.87						
65	3	1.31 2.18	180					xxx
66	1	0.44	-				?	?
67	2	0.87	-				?	?
68	1	0.44	-				?	?
69	1	0.44	-				?	?
70	1	0.44	-				?	?
71	1	0.44	-				?	?
72	1	0.44	-				?	?
73	1	0.44	-				?	?
74	1	0.44	-				?	?
75	1	0.44	-	?	?	?	?	?

a. WBTN, Wichita Bead Type Number
b. P-1, Period 1, 1700-1740
c. P-2, Period 2, 1740-1767
d. P-3, Period 3, 1767-1820
e. P-4, Period 4, 1820-1836
f. P-5, Period 5, 1936-1850
g. "x" is used to signify relative frequency of occurence of one particular bead type in the various Periods. xxx, high occurence; x, low occurence; xx, intermediate occurence. These are relative, not absolute. A blank indicates that bead type was not present.
h. "?", suggested possible data of occurence.

In considering this situation, a comment should be made about the localized results of surface hunting at the Deer Creek site. It is conceivable that a sampling error has occurred. Walt Rosborough (personal communication, 1973) relates that nearly all of his small beads (which included all of the late bead types) were found on the short eastern portion of the pasture road adjacent to the river (Figure 3:3). At least 75% of the author's small beads were also from this section of road whereas the rest are from the west part of the pasture road adjacent to the field. Thus, it is conceivable that the occupation represented by Bead Types 55-65 (possibly 28, 66, & 74?) was confined to the east edge of the site. As the majority of the other trade goods are from the field, the general lack of non-bead artifacts representing the later occupation could be due to a sampling error if the later occupation was confined to the east edge of the site. Thus, the lack of other diagnostic historic artifacts assignable to the later occupation implies it was a very minor occupation, but this cannot be known for certain due to the sampling problem.

The Deer Creek site glass trade bead sample indicates that there were probably two historic occupations, one encompassing at least portions of Periods 1 and 2 and another during Periods 4 and 5. It is conceivable that the initial occupation also ran through the early part of Period 3. In the concluding Discussion of this paper, the bead data along with other artifacts and the historical data will be considered. Based on this assimilated information, reasonable proposals about the site's occupations will be made. It should be noted that perhaps a Period 6, 1850-1875, will later be found to encompass some of the late bead types listed as not having been reported before.

Lead Bead (Figure 17:1)

This olive-shaped lead bead is 2.18 cm. long and has a maximum diameter of 1.40 cm. It weighs 24.359 grams (375.1 grains). The perforation runs length-wise, and there is an engraved groove near each end. There are small random cuts and scratches on the surface. Also, there are two regions on opposite sides of the bead which have 12-15 diamond-shaped impressions on them; these appear to be teeth marks resulting from the use of some sort of tool such as pliers used in forming this bead. In addition, what appears to the remnant of a seam is located between these two sets of impressions. This specimen is not a modern fishing sinker. It does belong to the occupation at the Deer Creek site. Both Don Wyckoff and R. K. Harris have examined this bead and concur with my opinion (personal communication, 1973).

One bullet, flattened on two opposing sides, which was perforated for use as a bead is reported in the Pearson site report (Duffield and Jelks 1961:47, 51). One nearly spherical lead bead was reported from the Gilbert site (Harper et al. 1967:98). R. K. Harris (personal communication, 1973) relates having seen similar "pliers" marks on lead wire used in making bracelets.

The lead bead from the Deer Creek site is unusual both in its olive shape and in its engraved decoration. Both of these traits make it unlike other specimens reported from the region.

Sheet-brass Disc (Figure 17:2) (WR)

One roughly circular, perforated sheet-brass disc was found at Deer Creek. It is about 1.6 cm. in diameter and is made of 0.055 cm. sheet-brass. The hole was punched into the brass and is slightly off center. The very irregular outer edge of the bead is also evidence that the bead is of native manufacture; the material source was probably scrap kettle brass.

A sheet copper disc nearly twice the size of this specimen was reported from the Guebert site (Good 1972:87, 89). It is also related that three circular sheet brass discs were found in the skull region of an infant burial suggesting their use was either as hair ornaments or ear decorations (Morrell 1965:20, 45, 47, 61). Thus, the term "disc-bead" often applied to such specimens is apparently inaccurate.

Sheet-brass Cylinders (Figure 17:7-13) (NH, 8)

Number of specimens: 16; 14 complete; 2 broken.

Sixteen sheet brass cylinders, commonly referred to as cylindrical beads, were found at the Deer Creek site. Rectangular and trapezoidal blanks are represented about equally in this sample. The thicknesses of sheet brass present are: 0.035(2), 0.040(1), 0.045(1), 0.050(3), 0.055(1), 0.060(3), 0.065(1), 0.070(3), and 0.085(1) cm. The complete specimens range from 1.8 to 8.3 cm. long and up to 1.3 cm. in diameter. Fifteen sheet brass cylindrical beads were reported from Womack (Harris et al. 1965:305-306). The Gilbert site yielded five sheet brass cylinders (Harper et al. 1967:93-95). The Guebert site yielded large and small brass cylinders. Good (1972:87,

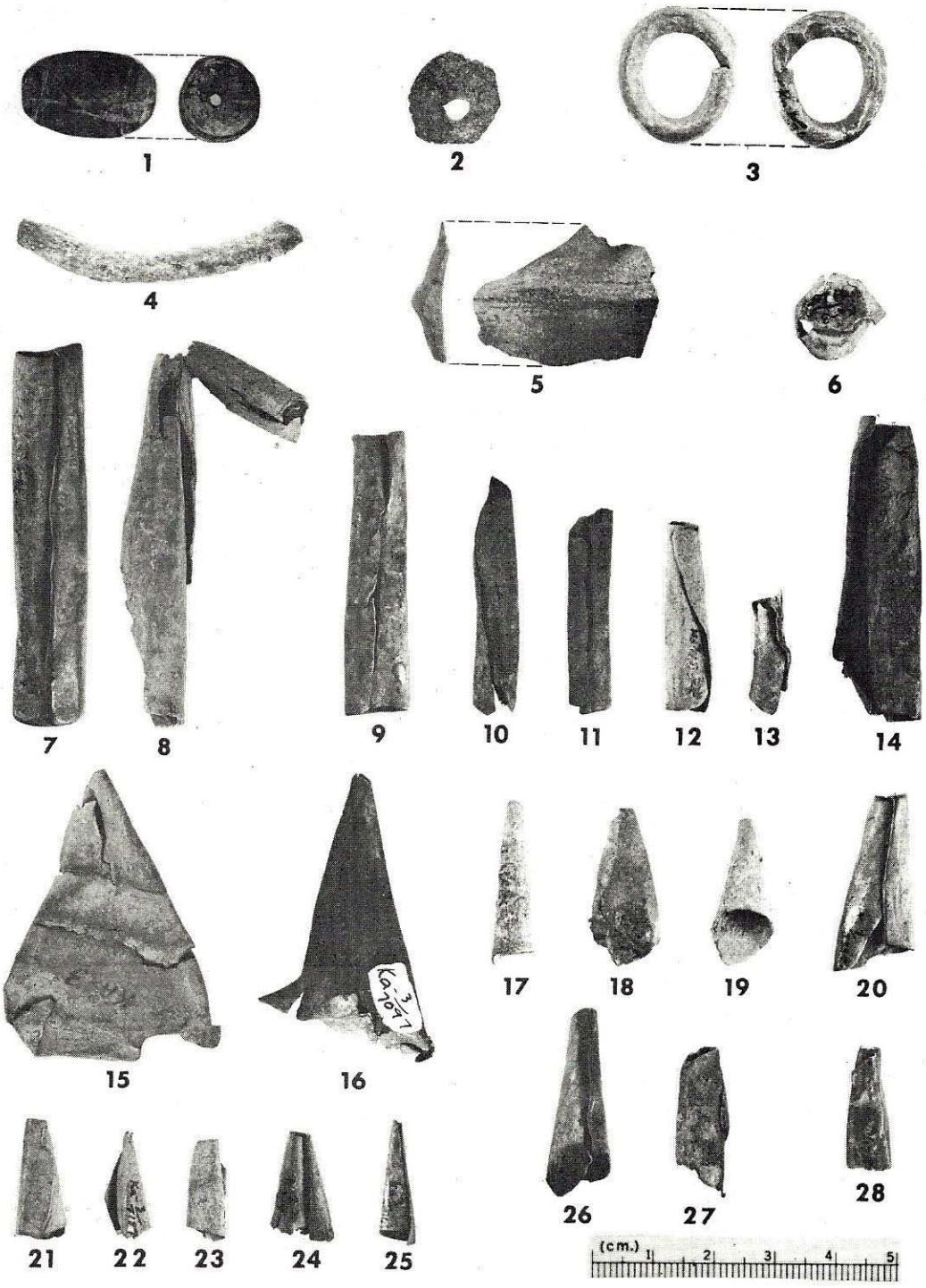


Figure 17. Ka-3 (Deer Creek Site) Ornaments: 1. Lead bead. 2. Sheet brass disc. 3. Brass ring. 4. Brass wire. 5. Sleigh bell fragment. 6. Hawk bell. 7-13. Sheet brass cylinders. 14. Sheet copper cylinder. 15-25. Sheet brass tinklers. 26-27. Copper tinklers. 28. Silver tinkler.

89, 90) comments that the small cylinders were used for beads whereas the larger cylinders could have served as beads or hair pipes.

Sheet-copper Cylinders (Figure 17:14) (WR, 1)

Four sheet copper cylinders were found at the Deer Creek site. Three appear to have been made from rectangular blanks. Their copper sheet thicknesses are: 0.055(2), 0.060(1), and 0.065(1) cm. One specimen appears to have been partially deformed by heat.

One tubular copper bead was reported from the Pearson site (Duffield and Jelks 1961:51). Copper cylinders were possibly found at the Guebert site (Good 1972:87).

Brass Tinklers (Figure 17:15-25) (NH, 5; WR, 3)

Tinklers are ornaments made by rolling prepared sheet metal blanks into the desired conical shape. Tinklers

> "...are common to historic Indian sites throughout most or all of the plains, including sites of the Norteño Focus. They were attached to garments or other articles by passing a thong or cord through the opening at the small end of the cone and knotting the end so that the cone would not slip off" (Harper et al. 1967:92).

Two basic forms of tinklers have been recognized: "(1) a cone with a point projecting downward from one side of the base..., and (2) a cone with a base which is in a single plane..." (ibid.).

Twenty-five sheet brass tinklers were found at Deer Creek. Nine of these are of the pointed base form and have thicknesses (cm.) of 0.030 (2), 0.035 (2), 0.040 (1), 0.050 (1), 0.065 (2), and 0.080 (1). The other 16 are of the planar base form and have the following thicknesses: 0.025 (1), 0.035 (3), 0.040 (2), 0.045 (2), 0.050 (1), 0.060 (2), 0.065 (2), 0.075 (1), and 0.080 (2). The frequency of occurrence of sheet brass in various thicknesses is similar in the pointed and planar base forms. Three each of the pointed and planar base forms appear to be made from rectangular blanks whereas the remainder of the blanks are roughly trapezoidal. Thus, no correlation is evident between blank shape and tinkler shape.

At the Womack site it was generally noted that rectangular blanks were used to make planar base tinklers, and trapezoidal blanks were used to make pointed base tinklers. Seventy-seven tinklers made of sheet brass were reported. Note was also made that the tinklers from Angola Farm and Womack are loosely rolled whereas they are tightly rolled when found on later historic sites (Harris et al. 1965:305-307). At the Gilbert site, 46 tinklers and 12 blanks of sheet brass were found. The pointed base and planar base forms were both present although the correlation noticed at Womack between blank shape and tinkler form was not present (Harper et al. 1967:91-92). The Guebert site yielded 48 brass tinklers and 8 blanks (Good 1972:87). Six brass tinklers were reported from Pearson (Duffield and Jelks 1961:60), and 15 sheet brass tinklers were found at the Stansbury site (Stephenson 1970:103). Tinklers were a widely used ornament of the historic period and, as such, do not offer much potential for dating purposes. However, the Deer Creek tinklers are generally loosely rolled which Harris (et al. 1965:307) indicates is an early trait. In addition, R. K. Harris (personal communication, 1973) comments that along about 1780 iron tinklers began to occur. The lack of these two traits in the Deer Creek tinklers suggests a pre-1780 occupation.

Copper Tinklers (Figure 17:26-27)

Number of specimens: 10; WR, 1.

Two of these tinklers, both of 0.035 cm. sheet copper, are fragmentary and the shape of their original blank is indeterminate. Two of the tinklers were made from rectangular blanks (0.030 and 0.055 cm.), and the remaining six seem to be made from trapezoidal blanks (0.030(1), 0.035 (1), 0.050 (2), 0.060 (2), and 0.070 (1). Although a number of the tinklers made from trapezoidal blanks seem to have some degree of the pointed base observed by Harris (et al. 1967: 305-307), one of the two rectangular blank tinklers was also of this form. The blank shape-tinkler form reported (ibid.) does not hold for the Deer Creek specimens.

Good (1972:87) reports 11 copper tinklers and 4 copper blanks from the Guebert site. It is interesting that no copper tinklers have been reported from Gilbert (Harper, et al. 1967:91-92), Womack (Harris, et al. 1965:305-307), Stansbury (Stephenson 1970:103), or Pearson (Duffield and Jelks 1961:60). R. K. Harris (personal communication, 1973) relates that Spanish brass has a higher copper content than the yellow French brass and thus appears reddish. It is conceivable

that copper tinklers from these sites (if they do exist) and/or Spanish brass tinklers were included in the sheet brass tinkler discussion of these other reports.

Silver Tinkler (Figure 17:28)

One small silver tinkler has been found at the Deer Creek site. The blank was trapezoidal in shape and has been rolled to form a loose cone-shaped tinkler. The bottom of this cone is planar. Three edges exhibit cut marks. The fourth appears to be an original edge of the object from which silver scrap was taken. It is slightly convex, and the edge is rounded off in cross section. On one face, an engraved line parallels this original edge. This specimen is 2.05 cm. long, and 0.78 cm. wide. The silver used in this specimen averages 0.060 cm. thick.

The Pearson site (Duffield and Jelks 1961) and the Womack site (Harris et al. 1965) did not yield any sheet silver artifacts. The Gilbert site yielded a sheet silver pendant and two scraps of thin sheet silver (Harris and Tunnell 1967:92-94, 110). Stansbury site silver artifacts consisted of one possible bracelet segment (Stephenson 1970:103). The Guebert site yielded silver items in the form of a triangular ornament and a willow-leaf shaped piece (Good 1972:86-87), but no silver tinklers were found. The Devil's Canyon site, occupied bytthe Wichitas from about 1820-1836 (Harris and Harris 1967:134), has yielded a number of sheet silver artifacts (Harris, personal communication, 1974).

The above archeological data indicates that possibly 1750 would be an acceptable starting date for the availability of sheet silver in trade goods to the natives in the central United States. Silver was available and in use by at least 1750 and perhaps earlier. Silver availability and usage evidentally extended well into the 19th century. The Deer Creek silver tinkler appears to be of mid-18th to 19th century origin.

Brass Rings (Figure 17:3, 4)

One complete brass ring was found at Deer Creek. It is made of heavy solid, brass wire (Figure 17, 3). One end has been cut or sawed essentially smooth; the diameter of the wire at this end averages 0.40 cm. About half way to the other end the wires becomes slightly flattened. Near the end the wire has several angular indentations in it from being pressed, and it is nearly rectangular in cross section. The end has been cut or drawn to a point, and it is nearly in contact with the other end. The outside measurements of the ring are 2.27 cm. by 1.95 cm.

One heavier piece of brass wire, about 5 cm. long and squarish in cross section (0.53 cm. diameter), was also found (Figure 17, 4). This curved wire piece, apparently cut at both ends, could conceivably represent either a ring in the process of manufacture or a section of a bracelet.

The Gilbert site yielded a ring made from a flat metal strip of brass with and iron core and a bracelet made of 5 mm. diameter brass wire (Harper et al. 1967:95-98). Several brass wire, or rod, fragments (possibly bracelet fragments) and a possible ring were found at the Stansbury site (Stephenson 1970:99-104). Two bracelets of heavy guage brass wire were also recovered from the Guebert site (Good 1972:130-132). The findings at these sites suggests that heavy guage brass wire was a general trade item during the 1750 to 1800 period.

Sleigh Bell (Figure 17:5)

One fragment identified by R. King Harris as part of a large sleigh bell has been recovered from the Deer Creek site. Harris (personal communication, 1973) suggests that this piece is probably made of bell metal which he relates has a higher silver content than regular brass. This undecorated piece is made of cast brass. It is from the junction of the two hemispheres which is marked by a raised ridge (.36 cm.) which ran around the bell. The hemispheres proper of the bell were much thinner, ranging from 0.08 to 0.15 cm. thick when not adjacent to the interhemispheric ridge.

R. K. Harris relates that the only complete sleigh bell found to date is from the Iscani area of Spanish Fort. Fragments have also been found at Gilbert, Fort St. Louis at Texarkana, and all of the Spanish Fort sites. Currently, not enough data is available to know whether or not sleigh bells were a trade item used during a restricted time period. Evidentally, they were available through white trade as early as about 1750.

Hawk Bell (Figure 17:6)

This plain sheet brass (0.030 cm. thick) specimen is the lower hemisphere, or "obverse face",

of a hawk bell. It is from a soldered bell in which the edges had evidentally been flush. Two circular holes have been cut in this hemisphere, and they are connected by a slit.

Two hawk bells of this type were reported from the Guebert site (Good 1972:130). In the Gilbert report, a comprehensive analysis of hawk bells was given (Harper et al. 1967:87-90). Thirteen hawk bells of sheet brass were reported from the Gilbert site. All of the obverse faces present had two circular holes cut in them which were connected by a slit. The reverse portions had eyes made of strips of brass bent into loops; these strips were passed through a small hole, bradded, and soldered in place. The only complete specimen contained an iron pellet. Eleven of the hawk bells were of the flush edge form; one each of the flanged-edge and lapped-edge forms were also found. The flush edge specimens were 16-21 mm. in diameter, had holes in the obverse face 3-4 mm. in diameter and 7-11 mm. apart, and had an attachment eye of 4-5 mm. in diameter (ibid.).

Although deformed, it appears that the Deer Creek specimen was a small bell falling in these dimensions. The holes in the obverse face are 3 mm. in diameter and 7 mm. apart. The bell diameter appears to have originally been 15-16 mm. The only difference from the 11 Gilbert specimens is that they "have two or three parallel lines impressed into the surface, just back from the edge" on both hemispheres (Harper et al. 1967:88).

After discussing known specimens, the following summary regarding this form of hawk bell was given:

> "Hawk Bells of the 18th and early 19th centuries were of oblate spheroid shape. Most were made with a hole and slit design cut through the obverse face, and the attachment eye was made from a narrow strip of sheet metal. The two halves of the body were joined by either a flanged edge or a flush-edge seam." (ibid., 90).

Miscellaneous Trade Goods

The miscellaneous trade goods described in this section are: kettle bails, a kettle rim, scrap kettle brass and copper (with rivet holes), rivets, spoon or fork handles, an unidentified circular brass object, a lamp wick holder, mirror sherds, wine bottle sherds, miscellaneous glass sherds, scrap metal, and miscellaneous debris thought to be of post-occupational origin.

Kettle Bails

Brass and copper kettles had iron handles. Each bail passed through a bail perforation in a kettle bail ear which in turn was riveted to the kettle. The Gilbert site example of kettle bail had a small loop bent into each end which held on the kettle bail ear (Harris and Tunnell 1967:107).

The six iron rods described below are thought to be fragments of kettle bails. A seventh specimen was made into an iron punch and is described under that heading. None of these specimens have been extensively cleaned.

Bail No. 1 (WR)(Figure 18:4): This 8.6 cm. long iron bail section has been straightened. Although somewhat pitted and corroded, it appears to have originally been hexagonal in cross section; it has an average thickness of 0.64 cm. Both ends appear to have been cut, possibly with a saw.

Bail No. 2 (NH)(Figure 18:6): This iron bail section is still curved, and both ends have been broken. Although badly corroded, this specimen appears to have been hexagonal in cross section. It is 6.9 cm. long and averages 0.78 cm. thick.

Bail No. 3 (NH)(Figure 18:5): This 8.43 cm. long, straight iron rod is circular in cross section. It has been broken at both ends. It has two different diameters: the larger averages 1.13 cm. while the terminal 1.4 cm. is 0.86 cm. in diameter. This diameter difference may represent an attempt to thin the bail end down to make a tool.

Bail No. 4 (Figure 18:15): This 21.1 cm. long, iron bail is still curved. One end is more sharply curved, possibly indicating it is near the bail's terminal loop. This corroded specimen appears to have originally been hexagonal. It averages 1.1 cm. in thickness. Both ends have been broken.

Bail No. 5: This 7.28 cm. long, straight section of iron has a cross section of indeterminate shape. It averages 0.79 cm. in diameter. It is badly corroded. Both ends appear to have been broken.

Bail No. 6: This 6.4 cm. long, curved section of iron bail appears to have been cut on one end. It is badly corroded; it appears to have been hexagonal in cross section.

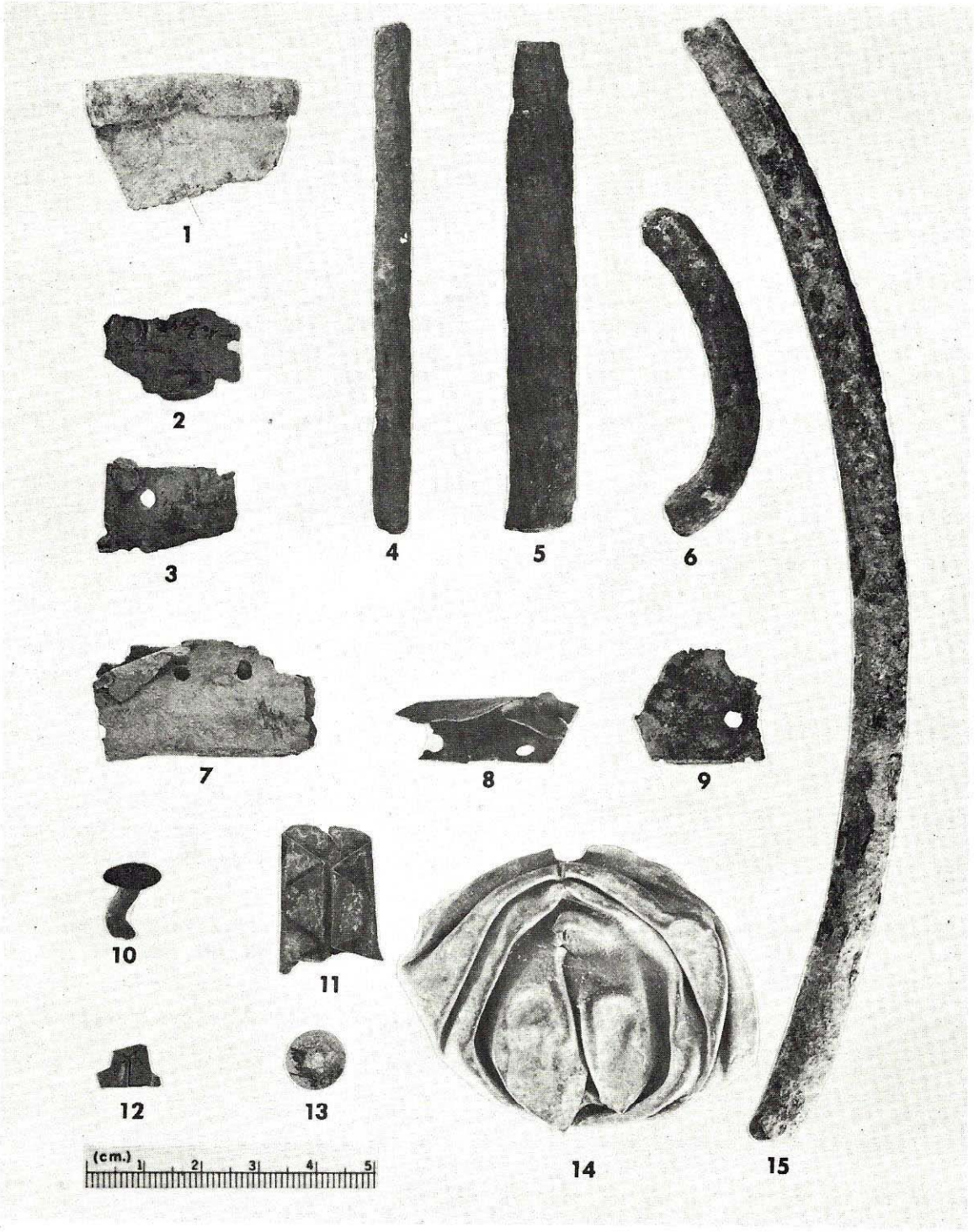


Figure 18. Ka-3 (Deer Creek Site) Miscellaneous: 1. Copper kettle rim. 2. Two pieces of sheet brass held together by two rolled sheet brass rivets. 3. Sheet brass with two rolled sheet copper rivets in place. 4. Kettle bail no. 1. 5. Kettle bail no. 3. 6. Kettle bail no. 2. 7. Sheet copper with rivet holes. 8. Sheet brass with cut rivet holes. 9. Sheet brass with punched rivet holes. 10. "Nail-like" copper rivet. 11-12. Folded sheet brass rivets. 13. Unidentified brass object. 14. Brass wick holder from a lamp. 15. Kettle bail no. 4.

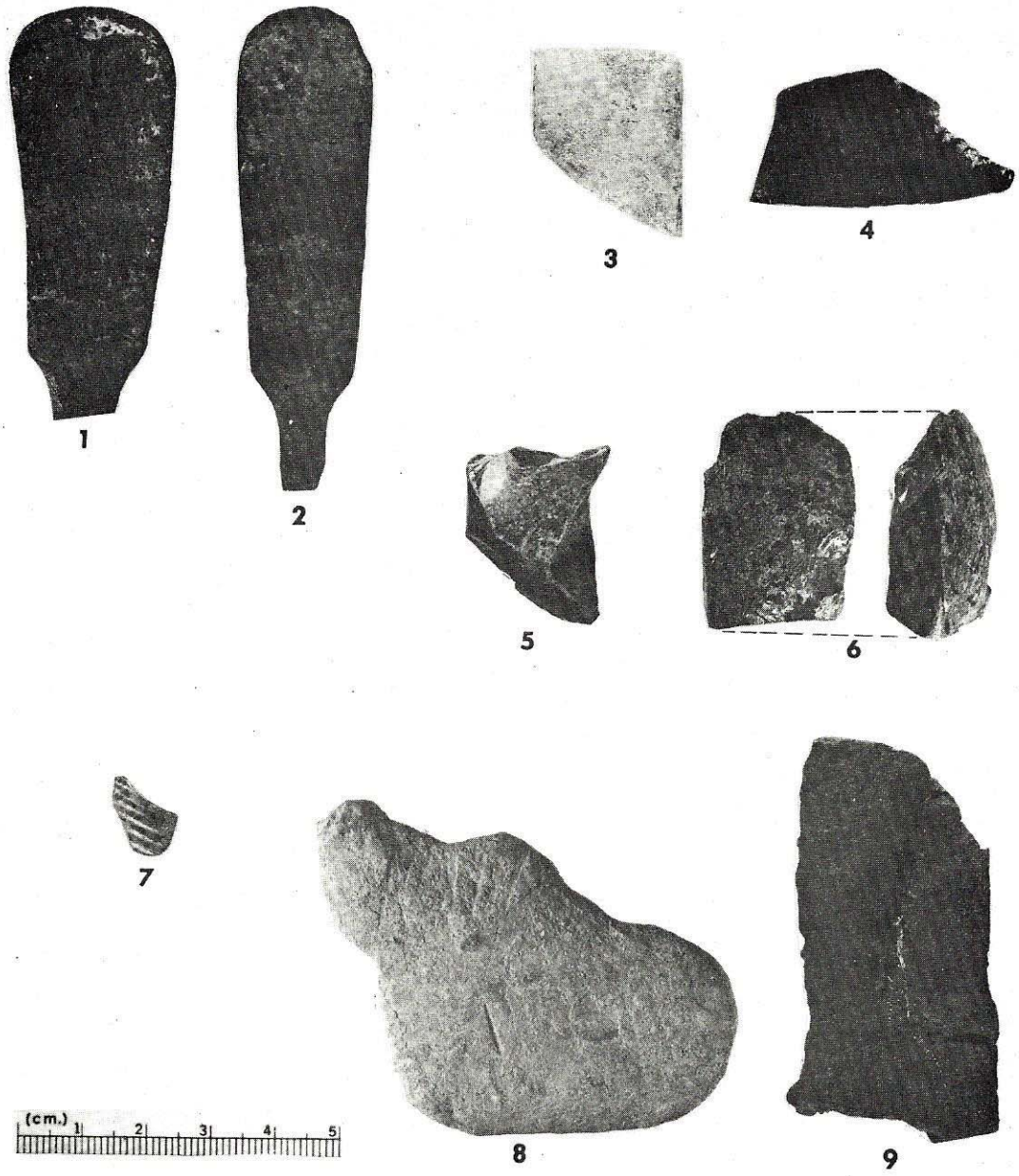


Figure 19 Ka-3 (Deer Creek Site) Miscellaneous: 1. Spoon handle no. 1. 2. Spoon handle no. 2. 3. Corner of a mirror. 4. Flaked wine bottle sherd. 5-6. Wine bottle kick sherds. 7. Glass sherd. 8. Lump from molten brass. 9. Iron scrap exhibiting cut marks.

Discussion: These six bail sections (plus the round iron punch) are all in a poor state of preservation. However, careful examination of their surfaces seems to indicate use of bails with both hexagonal and round cross section. The kettle bail from the Gilbert site was evidently round and was much smaller (0.5 cm.) than any of the Deer Creek specimens (Harris and Tunnell 1967:107).

Kettle Rim (NH)(Figure 18:1)

One fragment from a kettle rim is in this sample. This sheet copper rim was doubled by folding the metal over inward giving a thickened rim about 0.7 cm. high and 0.25 cm. thick. The average thickness of the copper in this specimen is 0.12 cm. This specimen is slightly curved and measures 3.83 cm. by 2.48 cm.

Scrap Kettle Brass and Kettle Copper (with rivet holes) (WR, 1)

Number of specimens: 8.

Six sheet brass and two sheet copper fragments with rivet holes were found. These are presumably pieces of kettle scrap. Most are roughly rectangular in shape and have at least one cut edge. One copper specimen has four circular rivet holes and has been folded in half, leaving three rivet holes on one side (Figure 18:7). The metal in this piece is 0.50 cm. thick. The other copper specimen has one rolled metal (pewter?) rivet still in place and is 0.035 cm. thick. Three of the scrap brass fragments have hole(s) punched in them (thicknesses of 0.045; WR; Figure 18:9), 0.045, and 0.035 cm.). Two of the scrap brass fragments have hole(s) which appear to have been cut in the metal (thicknesses of 0.045; Figure 18:8); the other is undeterminable). The 0.035 cm. specimen has three rivet holes, two of which still have rolled sheet copper rivets still in place (Figure 18:3). The sixth brass specimen consists of a piece of 0.055 cm. thick brass riveted to a piece of 0.045 cm. thick brass (Figure 18:2). Three rivet holes are evident; two still have rolled sheet brass rivets in place.

The use of rolled sheet metal rivets was noted in kettle patches at the Guebert site (Good 1972:166-169). These homemade rivets were used in repairing kettles with holes in them. At the Gilbert site, examples of kettle patching have also been reported. However, the primary rivet type there consists of strips of folded sheet brass (Harris and Tunnell 1967:110).

Rivets (WR, 1)

Number of specimens: 4.

Two types of rivets, in addition to the rolled cylindrical sheet metal rivets described with the kettle patches, were found at the Deer Creek site. One type is of European origin and is represented by two specimens (Figure 18:10). This "nail-like" rivet is made of copper. It has a round head (1.03 cm. in diameter) which is flat on top and is slightly conical on the underside with the shank in the center of the cone. The shank is 0.355 cm. in diameter, 1.10 cm. long, and has been kinked. The shank was either cut or sheared off as indicated by parallel striations on its flat surface. This specimen is 1.22 cm. long. The second specimen (WR) which appears to be of this type is also copper. It is holding two fragments of sheet brass together (0.060 and 0.035 cm.). The head and presumed terminal shank portion are both pressed tightly against the brass. Their original shapes are not determinable. The sheet brass has been cut out, suggesting that this specimen was probably discarded while the remainder of the sheet brass was kept for other purposes.

The other type of rivet is native-made, and is represented by two specimens of sheet brass (Figure 18:11, 12). These two specimens are constructed in the same way; their only difference is in the size and shape of the original blank from which they were made. The smaller specimen (1.13 x 0.75 x 0.030 cm.) was made from what was essentially an elongated pentagonal blank. The larger specimen (2.65 x 1.84 x 0.035 cm.) was made from what was essentially an elongated octagonal blank. Both were divided into thirds along their long axis and the two ends folded towards each other. Where the middle portion of these two ends met, they were again folded which left the terminal portion of these two ends adjacent to each other and projecting upwards. These pointed projections were then inserted through holes made in the metal pieces to be riveted together (i.e., such as in patching a kettle) and then bent over holding the patch in place. The smaller rivet appears similar to the rivets made of strip brass illustrated in the Gilbert report (Harris and Tunnell 1967:110). The larger specimen, although it is of identical construction, appears much wider than those illustrated.

Solid nail-like rivets of European origin were noted at the Guebert site (Good 1972:166-169). This rivet type is also illustrated in the Gilbert report (Harris and Tunnell 1967:106). Although

the lengths of these European rivets are not reported, it seems that rivets of this style were used on copper and brass kettles to secure the bail ears to the kettle in at least the 18th century. Also, native-made rivets were seemingly in use at this time.

Spoon or Fork Handles (NH, 2)

Two iron or steel spoon or fork handles with flat stems were found at Deer Creek:

Handle No. 1 (Figure 19:1): This specimen is widest near its rounded base and gradually tapers toward the bowl. Shoulders are present part way down the handle, and the specimen is broken immediately below these shoulders. A simple raised pattern is present at the very base of the handle. Three narrow elements of the raised area extend down the handle for a short distance, one down each side and one in the middle. The bases of the side elements curve to meet the central one, forming an odd-shaped "3" which is the boundary of the raised design area.

The length of this specimen from base to shoulders was originally equal that of Handle No. 2. However, No. 1 has been bent and therefore appears shorter in the illustration. It has a maximum width of 2.63 cm. and is 6.5 cm. long.

Handle No. 2 (Figure 19:2): This specimen is identical to No. 1 except that it is narrower and is in a worse state of preservation. This specimen is broken just below the shoulders. The stem (0.62 cm. wide) is narrower than that of No. 1 (0.85 cm.). The widest point, 2.23 cm., is also narrower than Specimen No. 1. This specimen is 7.63 cm. long.

Discussion: A relatively complete record of changes in tableware styles through time is available in records regarding silver tableware. It seems reasonable to assume that stylistic changes occurring in basic silver patterns over the years would be reflected in utensils made of other materials.

The Deer Creek spoon or fork handles' general pattern is present on "Old English pattern table silver", 1730-1757, and was even more pronounced by around 1770 (Ramsey 1962:1276, 1270). However, the Old English handle is slender and tapering, and the central element ran the length of the handle.

> "The first sign of the fiddle pattern occurs with the Old English. This was about 1775 when some of the Old English spoons....assumed the small angular shoulders near the bowl; these being one of the features with the fiddle pattern of the nineteenth century" (Ensko and Wenham 1937:81).

The drawings accompanying this discussion show the slender tapering Old English, the Old English with shoulders near the bowl, and the 19th century fiddle pattern which has a handle like the Deer Creek specimens. Several 1825 spoons illustrated by Ensko (1948:142) have this same general handle shape with a slightly blunter base.

R. K. Harris (personal communication, 1973) relates that trade forks of the 18th century were often set in bone handles. Although many of the forks of this period in the above cited silver books have handles like the spoons, Wenham (1949:146) comments that, even at the end of the 19th century, steel forks with bone, ivory, or porcelain handles were in fairly common use. Thus, it is likely that the two Deer Creek specimens are spoon handles. The particular basal pattern of the Deer Creek spoon handles could well be a carry-over from the Old English pattern sometime after 1775, and the handle shape (fiddle pattern) first appeared by about 1825. This suggests that the two handles from Deer Creek are most probably of post-1800 origin.

Specimens of spoons and/or forks have previously been reported from several archeological sites. Two iron handles were reported from the Pearson site although their relationship to the site occupation was uncertain (Duffield and Jelks 1961: 55, 59). Mrs. Dorris Olds (correspondence, 1974) compared the Deer Creek specimens with those present in the University of Texas Archeological Research Laboratory collection of the Gilbert site and reported that they were not similar. Mrs. Olds also noted that retinned steel spoons and iron spoons were available in the Montgomery-Ward 1894-1895 catalogue.

The bowl of a pewter spoon was found at the Guebert site (Good 1972:131, 157). Two two-tine forks (bond handles) and part of a pewter spoon handle were found at Michilimackinac and are thought to be of post-1770 origin (Maxwell and Binford 1961:110, 130). One complete pewter (?) spoon, one iron spoon fragment, and one brass spoon fragment were found at the Posey site which is thought to have been occupied in the 1830's (Wyckoff and Barr 1968:37, 39, 84-84).

The spoon reported (Burton 1971:73-74) from the Harvey site is unlike the Deer Creek specimens. Three metal (iron or steel ?) spoons were found with two historic Choctaw burials at the E. Johnson site which is thought to date in the late 1850's or early 1860's (Wyckoff 1967:176-179). However, the one illustrated is unlike the Deer Creek specimens.

Illustrations of two specimens have been found which are very similar to the Deer Creek specimens. One tableware ("Silverware") handle thought to be of pewter was found at the Pate-Roden site, Ch-90 (Rohrbaugh et al. 1971:120-122). The size and shape of this handle section is similar, but not identical, to the narrower Deer Creek specimen. In addition, three spoon bowls (two iron and one copper) were also reported from Ch-90 (ibid.). The Pate-Roden site is thought (ibid.:137) to have been occupied by Choctaws immediately after resettlement, the suggested time range being 1831-1850. The second specimen similar to those from Deer Creek was found at Fort Stevenson (Smith 1960:221, Plate 53). This silver-plate, serving spoon had "Rogers & Son ◄ Greenfield, Mass." die-stamped on the reverse (ibid.). The composition of the core is not given, but it was possibly brass. Requests for information regarding the specimen's provenience and core composition have not been answered. The pattern on this North Dakota specimen is identical to that on the Deer Creek examples. The Deer Creek handles are the same length as that from Fort Stevenson, but the latter is intermediate in maximum width to those from Deer Creek. The similarity between these specimens is striking. R. K. Harris (correspondence, 1975) cleaned the two Deer Creek specimens and reports that no maker's marks were present. Fort Stevenson served as a military post from 1867-1883 and as an Indian school from 1883-1894 (Smith 1960:167). It is not currently known by this author to which occupation the spoon relates.

Examination of silver tableware literature indicates that the Deer Creek spoon handles are of post-1800 manufacture. Several spoons of similar style have been previously reported from 19th century sites. However, identical specimens are not currently known. The similar specimens represent a potential time range of origin of 1831-1894. Presumably the Deer Creek specimens could also have originated from this period. Whether the two Deer Creek specimens could also have originated from this period. Whether the two Deer Creek examples are the result of a 19th century Indian occupation or are intrusive from later Euro-American activity at the site cannot be determined from the currently available information.

Unidentified Circular Brass Object (Figure 18:13)

This circular brass object is not of native manufacture. It is 1.110 cm. in diameter and is made of 0.030 cm. thick sheet brass. In the center of this piece, on one side, is a short, slightly tapering brass cylinder--0.27 cm. in diameter at the base--which is continuous with the brass disc. At 0.15 cm. above the disk, the cylinder is split yielding four leaves or ears which are folded outward parallel with the disc. The center of the cylinder is filled with what appears to be solder.

This piece is not oxidized as heavily as most of the other brass from the site, so it could conceivably be intrusive in nature. R. King Harris (personal communication, 1973), assures me that it is not part of a button. The identity of this specimen remains unknown.

Lamp Wick Holder (Figure 18:14)

Number of specimens: 1.

This lamp wick holder was identified by R. K. Harris (correspondence, 1974). It is made of brass and has been flattened. It was originally hemispherical and had three step-like indentations encircling it between its lower rim and its upper slot where the wick was held. Two half circles are cut out of opposing sides of the lower edge of the rim. Holders of this general type are used in kerosine lamps. As kerosine was first discovered and used in the 1850's, this specimen is probably too late to belong to the Indian occupation of the site.

Mirror Sherds

Thirteen flat glass sherds thought to be from mirrors are present in the artifact sample. One specimen (Figure 19:3) deserves special mention. This fragment, 0.180 cm. thick, evidentally is the corner of a rectangular mirror. The back is flat along one edge and strongly beveled along the other edge. Both edges on the front of the sherd are gently beveled. The edge adjoining the flat portion of the back is very sharply beveled from the front, but it is not quite perpendicular. The second edge (0.050 cm. thick) is perpendicular to both primary mirror faces. The corner of the specimen is missing, so it is not known whether the corner was square or slightly rounded.

The other 12 specimens appear to also be fragments of mirrors. Thicknesses of the 11 measurable pieces are: 0.130, 0.150, 0.185, 0.230, 0.235, 0.260, 0.270, 0.275, 0.290, 0.340, and 0.355 cm. Two of these very small fragments have several parallel lines cut into one face. Two other fragments exhibit an attempt to thin by chipping along one or more edges. One fragment has a small concave area chipped on one broken edge. Another fragment has been chipped around a corner, and there is evidence of utilization flakes along an adjacent edge. Possibly this piece functioned as a scraper. No silvering remains on any of these specimens. These specimens are all of crown glass.

The Gilbert site (Harris and Tunnell 1967:110-111) yielded 44 flat glass sherds of varying thickness thought to be mirror sherds. Two probable mirror glass fragments were found at the Womack site (Harris et al. 1965:356). Nine flat glass sherds though to be mirror fragments were reported from Guebert (Good 1972:183).

The mirror fragments from Deer Creek were evidentally a general trade item and were not restricted in their occurrence to any time period. Their presence has previously been reported from a number of 18th century contact sites.

Wine Bottle Sherds (NH, 1)

Five sherds thought to be from wine bottles have been found. One olive green sherd (NH) from the body of a bottle has been partially flaked along two edges, indicating possible use as a scraper (Figure 19:4). A second olive green sherd is unmodified.

Three sherds of light green glass were found; these were completely covered with a film of iridescent brownish-gold patination. The thinnest of these three sherds (0.29 cm. average thickness) is unmodified. The other two are fragments of wine bottle kicks. One, maximum thickness of 0.80 cm., is unmodified (Figure 19:5). The other, 0.975 cm. thick, has been extensively chipped and has one good scraping edge present (Figure 19:6).

No wine bottle fragments were reported from the Womack site (Harris et al. 1965) although 24 green bottle glass sherds were reported from the Gilbert site (Harris and Tunnell 1967:111). The Stansbury site also yielded several wine bottle sherds (Stephenson 1970:95). The Guebert site yielded 408 bottle glass fragments of both French and English origin (Good 1972:178-83.)

The five sherds from the Deer Creek site are rather nondescript. They are not large enough or from the correct regions of the bottle to yield any data about their time or country of origin.

Miscellaneous Glass Sherds

These seven specimens are clear glass sherds. One small sherd (0.085 cm. thick) is apparently from a bottle with a 1.5 cm. outside diameter where it was located in the bottle. It is completely covered with coarse, parallel ripple marks which evidentally spiralled up the bottle (Figure 19:7). Two nondescript sherds are from larger bottles. One complete flake of glass over 1 cm. long was found; its exterior surface was originally flat. Also, one piece of crown glass is present as are two nondescript pieces of flat glass.

Scrap Metal

Numerous pieces of metal scrap of various types have been found at the Deer Creek site. Two types of scrap are present: those which have been broken from larger pieces of metal and those which were either cut from larger pieces of metal or which were trimmed after removal from larger pieces. The scrap metals present are brass, copper, pewter, and iron or steel.

Brass Scrap (5 WR, 11NH): 80 specimens.

Number of specimens: 80.

Six of these pieces of sheet brass are probably either crude tinkler blanks, parts of tinkler blanks, or fragments of tinklers. The thicknesses of these blanks are: 0.080 cm. (2), 0.065 cm. (2), and 0.060 cm. (2; 1 NH). In three specimens (3 WR), one end has been folded over and then the resulting double sheet was rolled up. The significance of this procedure is not known. The thicknesses are 0.035, 0.055, and 0.040 cm. (the 0.040 cm. specimen has a second piece of 0.040 brass rolled up inside it). Three other specimens appear to have been partially melted; only one specimen's thickness is determinable (0.050 cm.). The other 68 pieces, (including six pieces which do not show any evidence of cutting) are probably the result of trimming in the process of

manufacture or are fragments of sheet brass which were too small to be further useful. Their thicknesses are as follows: 0.020 cm. (2), 0.030 cm. (10), 0.035 cm. (10), 0.040 cm. (6), 0.045 cm. (6), 0.050 cm. (6), 0.055 cm. (6), 0.060 cm. (5), 0.065 cm. (6), 0.070 cm. (1), 0.075 cm. (2), 0.080 cm. (4), 0.085 cm. (1), 0.090 cm. (2), and 0.115 cm. (1). The source of this scrap sheet brass was most likely from brass kettles which were no longer serviceable.

Copper Scrap (3WR, 2 NH)

Number of specimens: 24.

Only five of these specimens of sheet copper scrap did not have cut marks on them. Four specimens (3 complete, 1 broken) are rectangular and are cut on all edges. These specimens probably represent blanks for tinklers. Their thicknesses are 0.120 cm., 0.100 cm., 0.090 cm., and 0.070 cm. The other 20 specimens are generally irregular in shape, smaller than the blanks, and have some cut marks evident on their edges. Some of these are conceivably fragments from larger sheet metal items. However, most of these specimens probably result from manufacturing and trimming sheet copper artifacts such as tinklers and arrow points. The thicknesses of these 20 specimens are: 0.150 cm. (1), 0.110 cm. (1), 0.100 cm. (1), 0.095 cm. (1), 0.085 cm. (1), 0.075 cm. (1), 0.065 cm. (1), 0.055 cm. (1), 0.050 cm. (1), 0.045 cm. (3), 0.040 cm. (2), 0.030 cm. (2), 0.025 cm. (2), 0.020 cm. (1), and one specimen of undeterminable thickness. The presumed source of this copper scrap is from discarded copper kettles.

Brass and Copper Deformed by Heat

One copper tinkler, one piece of copper scrap with an undeterminable thickness, and three pieces of brass scrap have been described, all of which appear to have been subjected to heat as evidenced by their deformity. However, as their original form is still determinable, it is most likely that this exposure to heat was accidental--such as being dropped near a campfire, being in a housefire, etc. However, one additional piece of brass was found that has been completely melted down into a shapeless glob (Figure 19:8). This piece is 7.44 cm. long, 4.40 cm. wide, has a maximum thickness of 0.94 cm. and weighs 115.9 g. It is irregular in outline and has one very irregular face. The other face is quite smooth and is reminiscent of the smooth upper surface of a molten pool created by its surface tension. The uneven surface would thus have been the surface against the uneven ground surface. Thus, it is certain that this brass was melted, most likely at the site. The question which needs answering is: under what circumstances did it reach the molten state?

The large size of this piece tends to indicate that this piece resulted from something other than several tinklers melting together in a house fire. The smooth upper surface also indicates that nothing fell on top of it before it had cooled. It seems most reasonable to conclude that this brass globule is the result of intentionally melting a large quantity of brass, and then spilling some molten brass on the ground.

The Guebert site yielded 22 globules formed from molten lead, lead strips, and sprue attachments from gang molds for lead bullets and swan shot and a Catalinite shot mold (Good 1972: 87, 91, 143, 152). Thus, Indians of the 18th century were at least exposed to the process of melting down and casting lead if, indeed, they were not actually doing it themselves. Two irregularly shaped lead bars, possibly ingots used in making bullets, were found at the Stansbury site (Stephenson 1971:100).

Although no bullet molds or strips with sprue attachments are reported in this artifact sample, it seems reasonable to assume that the Deer Creek site occupants were acquainted with the procedures for making lead bullets. The presence of this large globule of brass seems to indicate that they had extrapolated from their knowledge of lead-working and had begun to melt down brass--most likely scrap brass--in order to make it reuseable and to shape it as they wished. Although the melting point of brass is well over two times that of lead. This explanation still seems plausible.

Pewter (NH, 2)

These are the only two specimens of pewter found at the Deer Creek site. One piece of "sheet" pewter was cut along one edge and is 3.2 x 2.4 x 0.10 cm. The other piece shows no evidence of having been cut and has a slight curvature across its long axis. It is 4.2 x 1.23 x 0.115-0.190 cm.

Iron and/or Steel (NH, 1; WR, 3)

Number of specimens: 73.

These pieces of scrap are either iron or steel. The majority are flat and range in shape from rectangular to irregular. The specimens range in size from 9.9 x 4.7 x 0.38 cm. to 0.97 x 0.97 x 0.20 cm. with the average dimensions of 2.62 x 1.34 x 0.22 cm. Sixteen of these specimens show clear cut marks on a surface or edge (Figure 19:9). The rest of the specimens are either too deteriorated to see any cut marks or do not have cut marks.

Miscellaneous Debris

Also found at Deer Creek were a number of glass and metal items which were judged to be of post-occupation origin. Thus, they have not been previously included in this presentation. This inventory of these recent materials is as follows. Twelve pieces of glass (one of which is decorated), two pieces of white glazed stoneware (found near the old cellar at the north end of the site), one piece of plastic, and two fragments of clay pigeons. The recent metal includes 1 bolt, 1 lever with a threaded screw hole--probably off of farm machinery--, 3 pieces of tin cans, 23 pieces of sheet iron (possibly from tin cans), and 4 pieces of unidentified sheet iron. The rest of the recent metal consists of slugs and cartridges: 2 lead slugs, probably from .22 shorts; 1 lead slug, probably from a .22 long; 2 cartridges from .22 longs (one says "HP", other "HI SPEED U"); and the metal portion from a shotgun shell cartridge ("PETERS REFEREE N° 12").

Ka-3, THE DEER CREEK SITE: A DISCUSSION

If the reader has not already done so, it is suggested that he read the accompanying appendices at this time. Throughout this paper, various conclusions have been made about specific portions of the artifact sample and other evidences. At this time, these conclusions will be compiled, interpreted, and their combined significance related. The map evidence indicates that during the 18th century, the Arkansas basin in what is now Oklahoma was saturated with peoples who were members of what later came to be known as the Wichita Confederacy. Two tribes during the 18th century are shown on the west bank of the Arkansas River in the possible vicinity of Deer Creek. These two tribes were both located opposite the mouths of northern tributaries of the Arkansas River. The Ouatchitas ("Wichita," Bell et al. 1967:332-339) are shown on the west bank from about 1707 to 1735. The Paniassa had been located in this region of the Arkansas basin from at least 1670 (a "Paniassa" settlement would be one of either Wichita or Taovayas Indians; (ibid.). Early maps placed the Paniassa near the west bank of northern tributaries to the Arkansas River. Later they moved to the west bank of the Arkansas River immediately south of a northern tributary. Later maps indicate that this tributary opposite the Paniassa was probably the Walnut River. If this is the case, the Paniassa were then located in Kay County, Oklahoma. As no other prominent contact sites of this period have yet been reported from Kay County, it is reasonable to identify the Paniassa settlement evidentally known and reported by traders with the Deer Creek and Bryson sites. Due to the earlier occupation at Bryson than Deer Creek, it is thought that the Paniassa settlement on the 1750 maps refers solely to that at Deer Creek. The Paniassa are carried in this location for about 30 years. Their settlement is designated and "Indian Town and Fort" possibly indicating that the horseshoe-shaped rampart and ditch could well be the remains of a fortification structure. If this is indeed the remains of a fortification structure, it is evidentally of native and not of Euro-American origin (i.e., not a trading post). The presence of a similar structure reported at the earlier Bryson site (McRill 1963: 145-146) also suggests that the resulting earthwork is the remnant of some native structure. The fact that both of these structures actually open toward a ravine makes one wonder what specific form or type of fortification they might represent.

The trade goods found at the site enable us to bracket the Deer Creek site's occupation in time. The gun barrel, tumbler bridle, and bullets indicate a date of ca. 1750. The butt plates (excluding No. 1) also could be expected to occur at about this time. The side plates and trigger guards suggest a date in the 1720-1760 time range whereas the ramrod guides and shot fall into the 1740-1770 time range. The upper vise jaw is assignable to the mid-18th century, and the gunflints relate to a 1720-1750 time interval. Other than the lead bead, which could have been made from a bullet, and the RW butt plate, all of the above items fall into the 1700-1770 time range, and many specifically indicate a French trade source. These artifacts, without exception, are representative of French fusil and pistol parts of the first 60 years of the 18th century. It is interesting to note that the side plates present are more similar to those reported from Womack whereas the ramrod guides and lead shot are more closely related to the Gilbert sample. In view of the dates suggested, these similarities tend to indicate that Deer Creek was occupied intermediate in time between these two Norteño occupations, possibly being contemporary with one or both of them. The RW butt plate tang does not readily fall in this indicated time range or French category. It is assignable to the late 18th or early 19th century and is probably of English origin.

The tools do not lend themselves so readily to dating as the gun parts. The Benton points have been assigned a general time range of 1750-1850. It is postulated that the Fresnoid metal points represent a possible time range of 1720-1750 at the Deer Creek site. The glass Fresno probably represents this same general time range. The other tools are very general items but would be expected on an 18th century French contact site.

The ornaments reveal a great deal about the site's occupation. The glass trade beads best identify an occupation covering Periods 1-2 and Periods 4-5. In light of the documentary and artifactual record, two occupations are indicated. Possible dates for a number of previously unreported bead types have been proposed. Of the other ornaments, the tinklers contribute to understanding and discerning the site's occupations. The lack of tightly rolled tinklers, and the lack of iron tinklers, suggests a pre-1780 date for the Deer Creek site occupation. Also, the lack of these two artifact forms which are common on later Norteno Focus sites suggests that the 19th century occupants were probably not the same as the 18th century occupants. The other ornaments present generally indicate an 18th century occupation.

In the miscellaneous trade goods, the spoons are of interest. The earliest they could date would be 1800-1825. The lamp wick holder is probably too late to be attributable to the Indian occupation. The other trade goods in this section do not aid us in dating the Deer Creek occupations.

The native-made artifacts bear a striking resemblance to the artifact complex attributed to the southern division of the Wichita Confederacy (Duffield and Jelks 1961:60-73). In light of the identification of the Deer Creek site with the Paniassa and the southern migration of Wichita tribes in the late 18th century, it would seem that the Deer Creek site is related to the sites of the Norteño Focus. As it has been suggested that the immediate predecessors of the Wichita Confederacy southern division, at least in part, could have initially resided in Texas (ibid.), the ancestry of the Deer Creek occupants to that of the Norteño Focus is currently not definitely known. The immediate predecessors of the Deer Creek occupants have not been archeologically identified although they are undoubtedly descended from the Great Bend Aspect of Kansas. Wedel indicates that the Wichita lived in the central and south-central Kansas region according to early explorer accounts, and he has identified the Great Bend Aspect as the 16th-17th century Wichita. The inventoried difference between Deer Creek and Wedel's Lower Walnut Focus which Wyckoff pointed out have been reduced by this presentation. Also, a definite relation to the Little River Focus has been indicated. Although the nature and extent of the Deer Creek site's direct interaction with the Norteño Focus currently remains obscure, the occupants of Deer Creek were most probably descendents from the Great Bend Aspect. The Norteño Focus and the Great Bend Aspect are both definitely Wichita and are thus related. An in situ prehistoric development of these two distinct groups has been suggested. However, the initial time and place as well as identity of the cultural unit which underwent division to yield the later distinct north and south divisions of the Wichita Confederacy remains unknown. The Paniassa, who are believed to have occupied Deer Creek, were of indigenous origin and thus distinct from the Norteño Focus. Based on material goods and immediate cultural background, it appears that a new cultural unit, one distinct from those previously described, of the Great Bend Aspect is represented at Deer Creek. A complete, formal definition of this apparent new entity must await excavations which will better delimit assemblage content and feature associations. This site's occupants, definitely of Great Bend Aspect origin, represent the northern division of the Wichita Confederacy while the previously defined Norteño Focus relates to the southern division.

Correlation of the archeological and documentary evidence suggests the following interpretation of the Deer Creek site occupations. There is minor evidence for possible Archaic and Early Village occupations at Deer Creek. Elaboration of these facets of site occupation awaits investigation by excavation. A Late Plains Village occupation by a Wichita group, evidently the Wichita proper, occurred in the mid-18th century. These people were recipients of extensive French trade and developed an extensive hide-processing economy. Their means of support also included horticulture. The trade goods present are typical of those present at Period 1 and 2 sites of the Norteño Focus previously defined in Texas. The Deer Creek village was apparently abandoned near the end of Period 2, of possibly as late as the beginning of Period 3. With the realization that documented changes (i.e., location on maps) occurred after the fact (and possibly with noticeable time lags), a date of 1730-1760 for the occupation at Deer Creek is proposed. This is very close to the dates of 1725-1750 previously proposed by Woodward (Steen 1953:182). This conclusion and the evidence it is based on indicates that the Deer Creek site was established after the 1719 expedition of Dutinse. The earlier (ca. 1720-1740) Bryson site bead sample supports the concept of the Deer Creek site being a post-initial contact site. The question of whether or not the Bryson site was occupied in immediate prehistoric times (as proposed by Neal) cannot be

currently answered conclusively although the Love site seems to fit the transitional period better whereas the Bryson site is probably purely protohistoric.

A second historic occupation, evidentally not related to the Wichita one, occurred in the early 19th century in Periods 4 and 5. This is evidenced primarily in the bead collection, but the spoon handles and possibly butt plate No. 1 may represent this occupation. This is a lot of weight for such a small portion of the artifact sample to bear, but none the less, it is present. Sibley and Long both indicated that the Osage were in the vicinity in 1811-1820. By 1839, the Cherokees had access to this land in the Cherokee Outlet. This minor Period 4-5 occupation is probably attributable to one of these two groups.

CONCLUSIONS

Some distinguishable evidence for Archaic and Early Village occupations exists at the Deer Creek site in the form of projectile points and pottery attributable to these periods. Whether these artifacts are actually evidence of settlement, nomadic hunting activity, or later acquisition by the 18th century protohistoric Late Plains Village occupants at the site is currently uncertain. Evidence of a minor historic 19th century occupation (Cherokee? or Osage?) is also present. The major portion of the cultural material present at the site relates to an 18th century French contact occupation. This occupation was established after initial White contact in the region (ca. 1730) whereas the related Bryson site was established earlier--near the time of initial White contact. After the Bryson site was abandoned (ca. 1740), the occupation at Deer Creek continued to thrive, perhaps as late as 1760. As well as having essentially identical inventories of Euro-American trade goods as the Norteño sites of Texas, the similarity in native cultural materials as well as the presence of Norteño trade sherds suggests an interaction with and a relationship to the Norteño focus. Based on native artifacts and a common cultural identity, the Deer Creek occupants are felt to be directly descended from the Great Bend Aspect peoples of Kansas. It is felt that the Deer Creek occupation represents a new cultural complex in the Great Bend Aspect sequence. As assemblage composition and cultural affinities are difficult to establish through a surface collection, the Deer Creek occupation is tentatively identified as the 18th century protohistoric manifestation of the Great Bend Aspect which represents the northern division of the Wichita Confederacy. It is believed that excavation will uphold this concept, and yield a clear complete inventory of cultural items of this occupation thus leading to an official designation and definition for this cultural entity. Although apparent references to the Deer Creek site by 18th century explorers and traders do not yield irrefutable evidence as to the identity of the tribe occupying the Deer Creek site, map and archeological evidence indicates that they were in all probability the Wichita proper. Only additional investigations of the site will help clarify the exact relationship of the Deer Creek site to the Great Bend Aspect, and further elaborate the relationship of the Deer Creek site occupants to the Norteño Focus.

APPENDIX I

MAP EVIDENCE RELATING TO THE DEER CREEK SITE

Maps of North American have been prepared ever since its discovery. In the first several centuries of North American maps, geographical accuracy was very lacking. With the advent of late 17th and early 18th century explorations of the interior of the present day United States, the west portion of the Mississippi drainage as represented on maps began to show a resemblance to the major geographical features we are acquainted with today. As explorations continued, knowledge of the drainage of the southern and central regions west of the Mississippi River continued to acrue. Even so, great accuracy was still lacking. The main reason for this, other than the lack of sophisticated equipment, was that the sources of information were not completely reliable. Primarily, cartographers relied on explorers accounts of their explorations, but often depended upon their reports of natives concerning untraversed and unexplored regions. Noticeable improvement of maps of the central United States began primarily after LaSalle's 1682 discovery of the mouth of the Mississippi allowed placement of this major river on the maps. Following this revolutionary discovery came the exploration of the western tributaries as indicated in the section on site history. The tributaries were placed on the maps and improvement continued on the maps as familiarity with the region increased through further explorations. However, evan as late as the 19th century, some very geographically distorted maps were produced. Dr. Bell (correspondence, 1974) has summarized the problem with maps of the 18th and 19th Centuries:

> "I place little faith in the early maps as locations are almost impossible to establish with any degree of certainity. The scales are so small that accuracy is not possible; also many of the map makers were not too careful and had no real knowledge of the areas concerned."

Even though a number of inaccuracies are admittedly present, a certain amount of information may be gleaned from the information contained in these old maps. Specifically, the tribes associated within the Deer Creek region can be determined. By using the more accurate data present on later maps to interpret the earlier maps, it will be possible to make a statement about the identity of the site's 18th century occupants. Lastly, 19th century maps indicate a European contact occupation on or near Deer Creek.

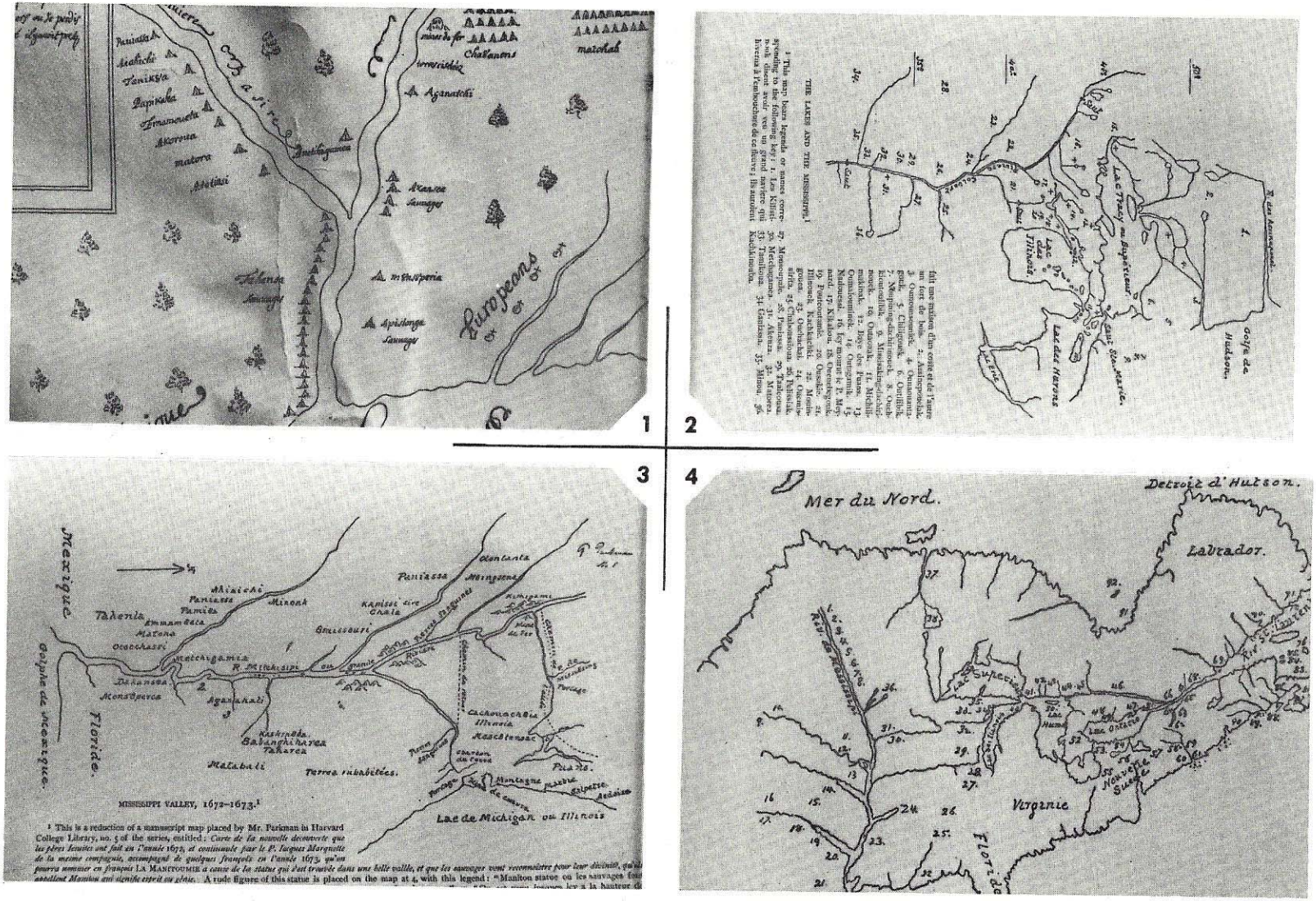
Having examined a number of maps for this time period and region, another source of informational error has become evident. When a map was published, other cartographers relied on its contents for information. Thus, any errors present tended to be propagated until new explorations were reported that disproved the original cartographer's information source. Also, this information was evidentally propagated when new cartographers came on the scene and needed data on which to base their maps. Thus, although some maps of one country which indicate a certain Indian village for a number of years drop it at a certain time, those of other countries may continue to carry it for years after its known occupancy apparently ended. Also, time lags are involved in the removal of sites from maps once their occupation ceases; this is due to the errors previously mentioned as well as the time interval required to observe and report the change and to correlate it with the data recorded on previous maps. With these problems concerning our data source in mind, let us examine the information available about the Deer Creek region from 1670-1884.

Joliet and Marquette traveled down the Mississippi River to a point roughly opposite the mouth of the Riviere Basire (Arkansas River). At this point, they turned around and reascended the Mississippi. In 1674, Joliet prepared a map of the Mississippi and the surrounding region, "Nouvelle De couverte De Plusieurs Nations Dans la Nouvelle France" Darlington Memorial Library Collection; (Figure 20:1). This map places the Paniassa, who later maps indicate were in the Deer Creek region, upstream on the Arkansas. As all of the tribes on tributaries are located on their south banks, this southerly position probably has little significance. Thus, this map tells us that the Paniassa are located in the Arkansas basin region by 1674.

A copy (Figure 20:2) of a approximately 1670 Jesuit map, "The Lakes and the Mississippi," locates the Paniassa (No. 28) between the Arkansas and Missouri Rivers, presumably in the eastern Kansas region (Winsor 1884: 206). A map (Figure 20:0 of the "Mississippi Valley, 1672-1673," is based on Jesuit reports and Marquett's report. It locates the Paniassa both south of the Missouri River, and south of the Arkansas River; this apparently indicates that their range was in the vicinity of and in between these two rivers (ibid.:221). A map (Figure 20:4) of the Mississippi Valley, based on Joliet does not show the Paniassa (ibid.: 218-219). A distorted 1688 Franquelin map (Figure 21:1) of the upper Mississippi Valley shows numerous villages of "Les Paneassa" south of the main southern Missouri River tributaries (ibid.: 231). Another Franquelin map (Figure 21: 2) serves to illustrate how unknown river drainages into the Mississippi were at this time. He locates "Des Paneassa" on and immediately north of the "Riviere des Acancea" (Winsor 1895:77).

Guillaume Del'Isle's maps mark a great advance over previous cartographers as far as an improvement in geological accuracy is concerned. A 1700 map (DAR; Figure 21:3), "L'Amerique Septentrionale," shows a small "R des Acansa" but does not indicate the location of the Paniassa. He does indicate that the Xumanes (Jumanes?, which means Taovayas, or Wichita; Bell et al. 1967: 334-335) are north in the Missouri River basin. Also of interest on this map is the assignment of Quivira north of the Missouri River. A later Del'Isle map (Figure 21:4), first published around 1707, shows "les Paniafsa 4 Village," and "Paniafsa" west of two northern tributaries of the Arkansas River; the Panis appear on the more western tributary in later maps. Also, Ouatchitas ("Wichita", ibid.: 333) are located across the river from the eastern-most of the two tributaries, and "les Mentous" (Mento means Iscani, Toavayas, Tawakoni, Wichita; ibid.: 332-333) are further downstream on a third tributary (Winsor 1886:294-295). The Mentos continue to be located on later maps in this same region for a number of years. This tributary is apparently the Verdigris River or possibly the Grand River. Thus, the Mentos do not play a direct role in the Deer Creek site occupation. The identity of the two northerly tributaries with Paniafsa located on them cannot be definitely determined from this data. One could be the Walnut River which is immediately north of Deer Creek although it is impossible to tell. However, what this map does tell us is that by 1707, when explorations began to turn to this part of the country, the Arkansas drainage was saturated primarily with tribes of what was later considered the Wichita Confederacy. The only tribes shown on the upper Arkansas on this 1707 map are Wichita-affiliated peoples.

Del'Isle's 1718 map, illustrated by Good (1972:128), retains the same arrangement of Wichita tribes and extends the "Riviere des Akansas" farther west and shows the Padocas near its source. Latitude 37° is midway between the two northerly tributaries with Paniassa on them. Thus, either



MISSISSIPPI VALLEY, 1672–1673.[1]

[1] This is a reduction of a manuscript map placed by Mr. Parkman in Harvard College Library, no. 5 of the series, entitled: *Carte de la nouvelle decouverte que les pères Jesuites ont fait en l'année 1673, et continuelle par le P. Jacques Marquette de la meme compagnie, accompagné de quelques françois en l'année 1673 qu'on pourra nommer en françois* LA MANITOUMIE *a cause de la statue qui s'est trouvée dans une belle vallée, et que les sauvages vont reconnoistre pour leur divinité, qu'ils appellent Manitou and signifie esprit ou genie.* A rude figure of this statue is placed on the map at 4, with this legend: "Manitou statue ou les sauvages font

Figure 20. Ka-3 (Deer Creek Site) Maps: 1. Joliet, 1674. 2. Jesuit map, ca. 1670. 3. Based on Jesuit reports and Marquette's report, 1673. 4. Based on Joliet.

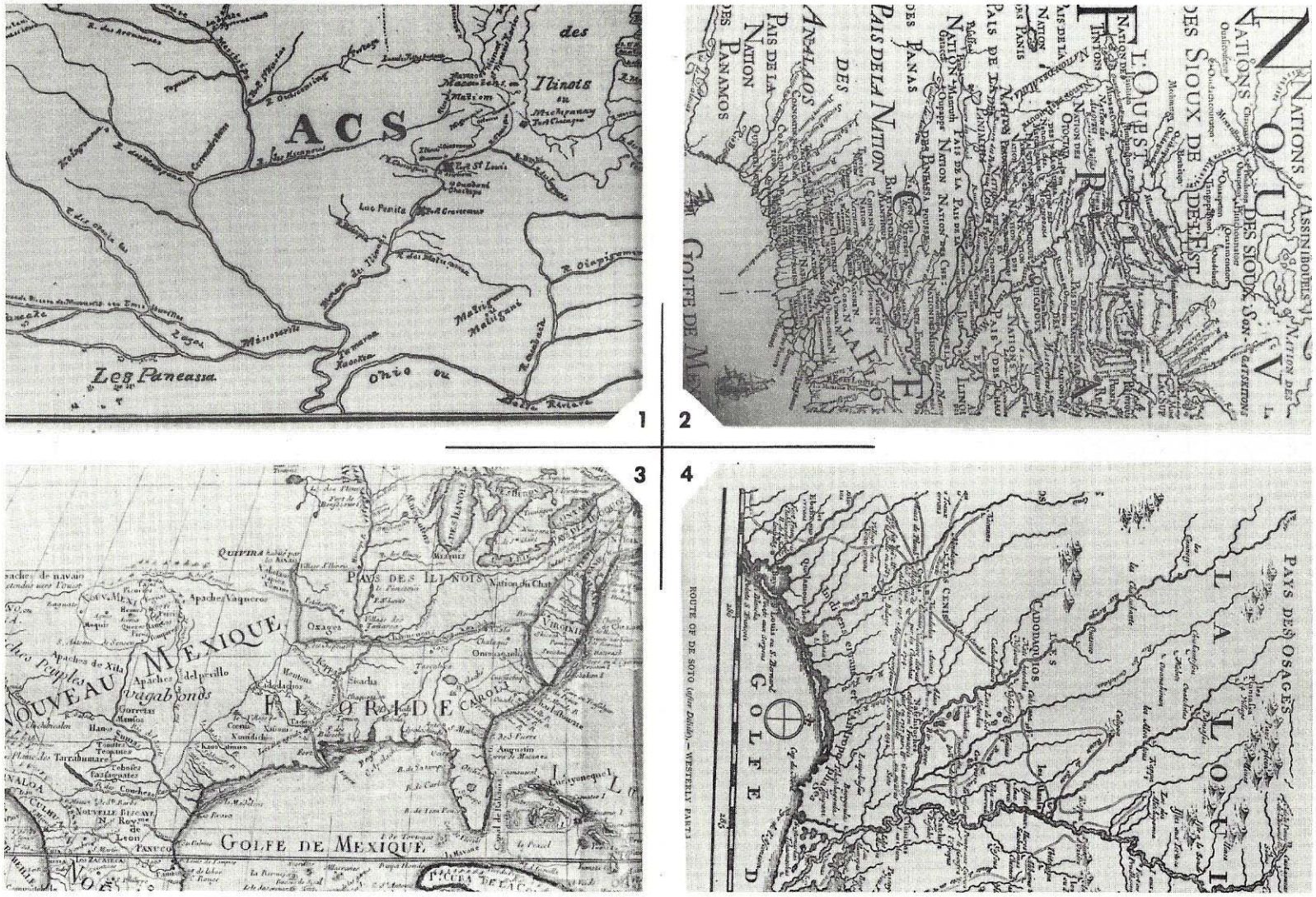


Figure 21. Ka-3 (Deer Creek Site) Maps: 1. Franquelin, 1688. 2. Franquelin. 3. Guillaume Del'Isle, 1700. 4. Guillaume Del'Isle, ca. 1707.

one could conceivably be the Walnut River which is just north of Deer Creek across the Kansas State line (Latitude 37°). The Walnut and Little Arkansas Rivers are the first two large northern tributaries west of the Verdigris River, so it is possible that they could be the two indicated on this map. However, a number of large creeks also occur in this region, so it is virtually impossible to identify the indicated streams. The designated villages were most likely some of the prominent Wichita villages in the region. Being west of northerly tributaries, one could conceivably be the Panioussa visited by Dutinsé; and, being in the Arkansas basin, one could be the Panioussa mentioned by La Harpe. Del'Isle's 1745 map, "Carte de Mexique Et Da La Florida," locates the Panis and Paniassa along the same northern tributaries as his 1718 map (Tooley 1967: Plate XII).

Nicholas de Fer's 1718 map (DAR; Figure 22:1) clearly indicates "les Paniaffa" west of a northern tributary to the Arkansas, and "les Panis" on a northern tributary farther west. The "les Mentous," marking the location of the Verdigris River are also shown. Another group of "Paniaffa" are located on a southern tributary of the Missouri River northwest of the Arkansas Panis.

J. B. Homann's ca. 1730 map (DAR; Figure 22:2) labels de Fer's les Panis as "les Paniafsa," and continues to show the Ouatchitas across the river from the eastern group of the Paniafsas. However, his 1737 map (DAR; Figure 22:3) deletes the Ouatchitas, moves les Mentous somewhat southwest away from the Arkansas River, retains the eastern Paniafsa group, and renames the western group, "les Panis".

Matthew Seutters ca. 1734 map (DAR; Figure 22:4) shows les Mentous still north of "la Riv. Akanfa," the eastern Paniafsa groups is east of the northern tributary, and the "les Panis" are placed south of the Arkansas River. This map, as a number of others, continues to show Paniafsa on a southern tributary of the Missouri River west of the Paniassa on the Arkansas tributary.

Henry Popple, in his 1733 "A Map of the British Empire in America with the French and Spanish settlements adjacent thereto," locates the Paniafsa west of a northern Arkansas tributary, and the Ouachita across the River (DAR; Figure 23:1). "A Map of the French Settlements in North America," by Thomas Kitchin, 1747, continues to show les Paniafsa north of the Arkansas River (Winsor 1895:226-227). A 1755 Huskie map, "A New and Accurate Map of North America . . ." also continues to carry the Paniassa north of the Arkansas River (Fite and Freeman 1926:186). However, these last two maps show the Paniassa nearer the Arkansas River than the previous maps. Huskie's map shows the Paniassa immediately northwest of the mouth of the westernmost northerly Arkansas River tributary.

A 1755 map entitled "A Map of the British and French Dominions in North American with the Roads, Distances, Limits, and Extents of the Settlements," by John Mitchell (DAR; Figure 23:2) locates the "Paniafsas" west of the Arkansas River immediately south of the mouth of an unnamed northerly tributary of the Arkansas which empties into the "River Akansas" at the 36½° latitude. This is the second northerly tributary west of the tributary which the Mentos are situated on, and no other northern tributaries occur for some distance west of the Paniassa. The tributaries in this region are not named on the map, so the location of this tribe is uncertain. As it is possible that all of the major tributaries had not been explored at this time, it is conceivable that the streams on the map are not even the longest tributaries. However, it seems that the northerly tributary located by the Mentos is the Verdigris River. One of the southerly tributaries above the Mentos is probably the Cimmaron. One of the two northerly tributaries above the Mentos is most likely the Walnut River (Cowley County, Kansas). Based on geographic location and distances, the Walnut River appears to be the northernmost of the two tributaries. This locates the Paniafsas village west of the Arkansas, and just slightly south of the mouth of the Walnut River. The omission of the western meander in the Arkansas River in the Ponca City region makes positive assignment very difficult, since the Salt Fork of the Arkansas, Suicide Creek, and the Walnut River cannot be positively identified. To call the northernmost stream the Little Arkansas, on which present-day Wichita stands, seems less likely due to the above reasons. Neither solution conforms to present knowledge of the tributaries.

Mitchell's map has a very interesting legend on it (Figure 23:3). The Paniafsas settlement is designated as an "Indian Town and Fort: whereas two nearby groups indicated are keyed as (small) Indian villages. The Paniassas "town and fort" designation is identical to that of the Mentos farther downstream and of the Osages to the northeast. The distinction between town and fort is not defined. Presumably, as an "Indian Fort" is in conjunction with the "Town", an Indian town may be viewed as a relatively permanent occupation adjacent to and associated with some type of fortification (such as a palisade?) whereas an Indian "village" lacked this added feature and thus might not have been considered quite as permanent. To this author, the geo-

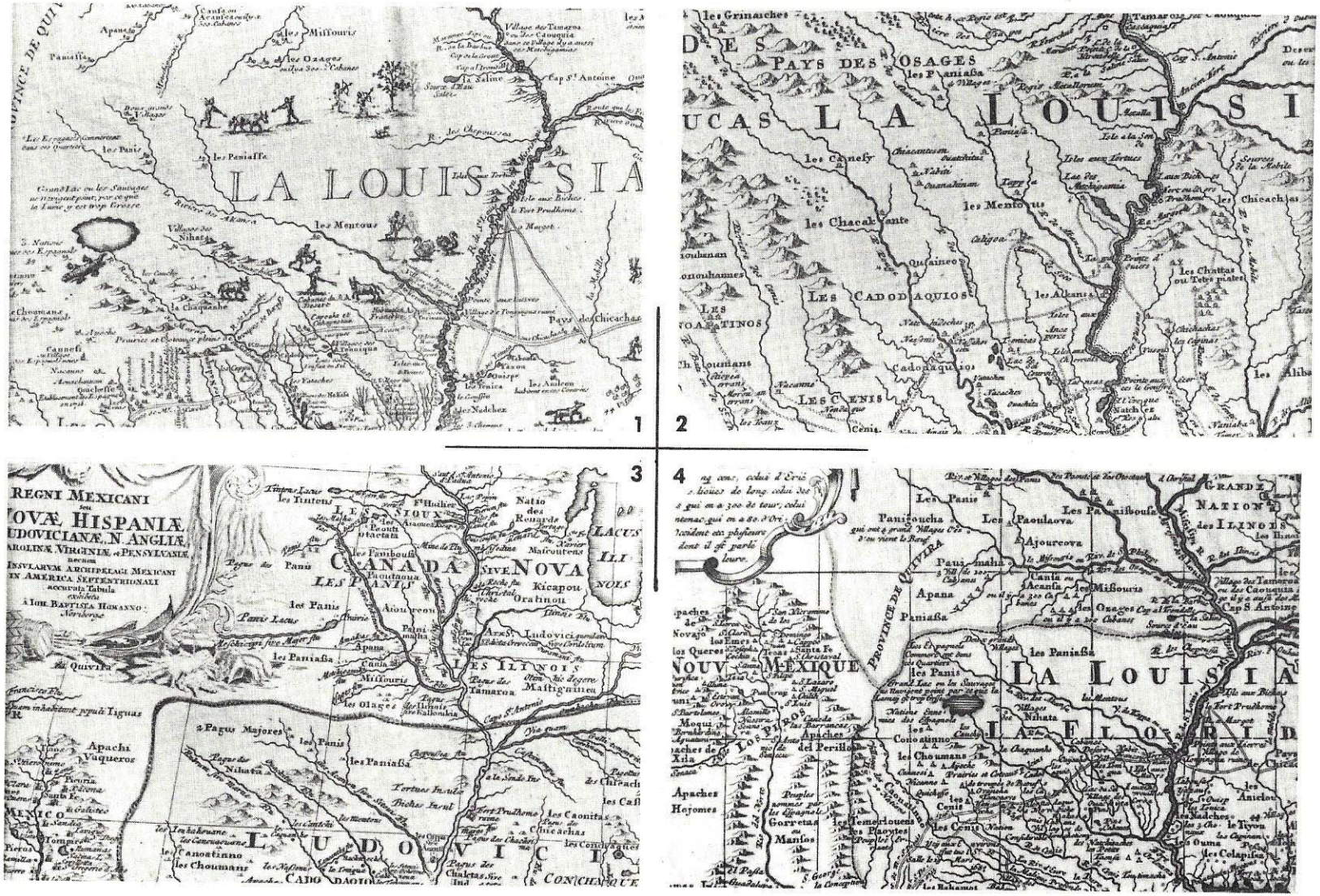


Figure 22. Ka-3 (Deer Creek Site) Maps: 1. de Fer, 1718. 2. Homann, ca. 1730. 3. Homann, 1737. 4. Seutter, ca. 1734.

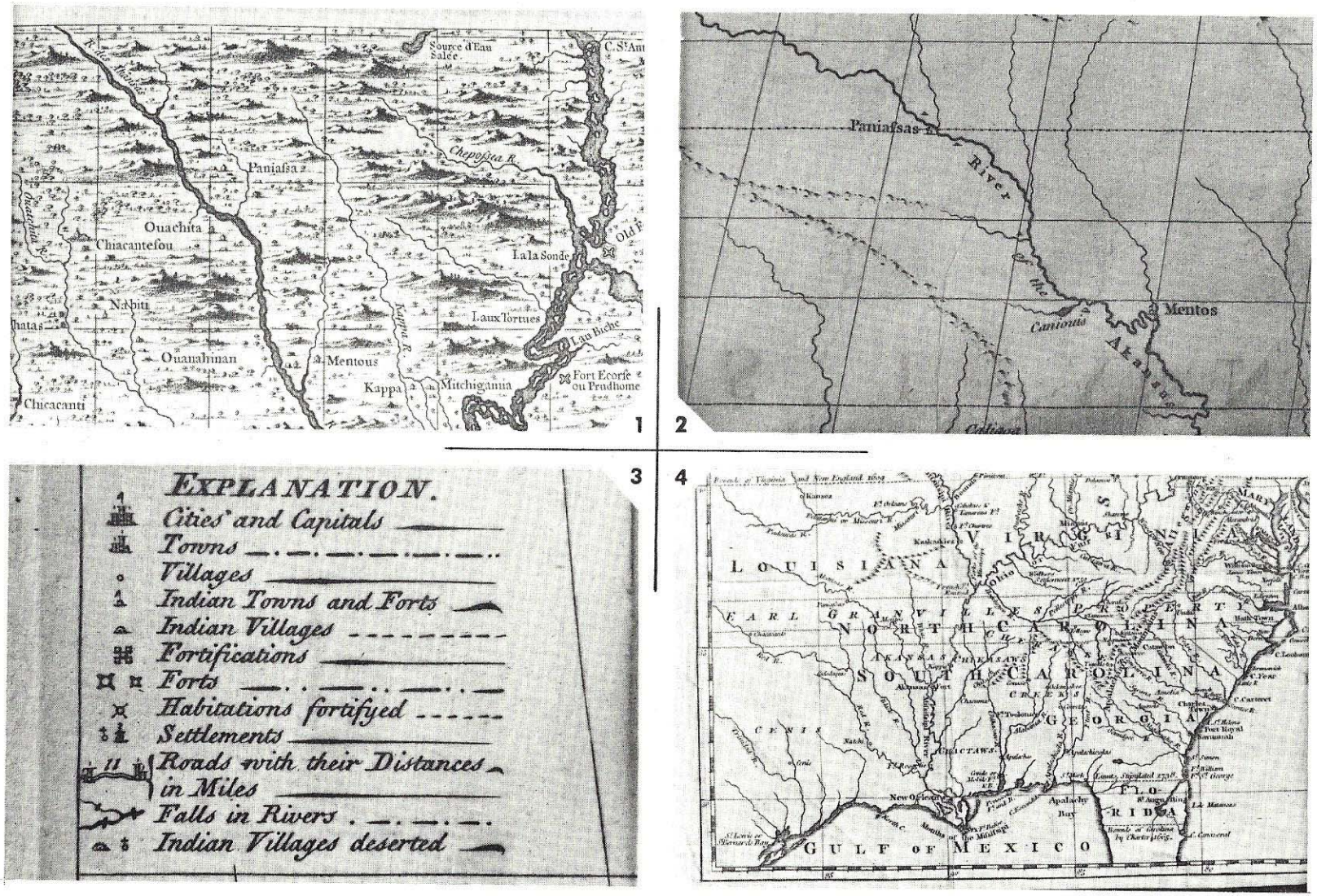


Figure 23. Ka-3 (Deer Creek Site) Maps: 1. Popple, 1733. 2-3. Mitchell, 1755. 4. Spilsbury, 1761.

graphical location of the Paniassa and the map legend of this 1755 Mitchell map strongly support the viewpoint that the Deer Creek site was a fortified Paniassa village and not a French trading post. Although the question of when and for what purpose the Deer Creek site began to be occupied is not answered, this map, the most important map about this site I have encountered to date, indicates an Indian occupation of the site by the mid-18th century. There can be little question, based on this evidence, that the Deer Creek site was occupied by Wichita peoples. The generalization that the Arkansas basin was the center of the Wichita peoples in the early 18th century, and the support of the native-made artifacts which fit the general artifact scheme of Wichita peoples all indicate that the occupation at the Deer Creek site, which appears to be pinpointed on this Mithcell map, was by Wichita peoples. The trade goods present confirm that the site was occupied in the early to mid-18th century.

Other maps of this period such as "A Map of the British and French Settlements in North America," ca. 1755, by J. Lodge also indicate the change in the location of the Paniassa as clearly indicated by Mitchell (DAR; Figure 23:203). Thus, it seems reasonable to assume that the Paniassa located on the northern tributary had moved to the west bank of the Arkansas River across from the mouth of the more westerly tributary.

Several maps from the 1760's are available. The J. Spilsbury map (DAR; Figure 23:4), "A New Map of North America from the Latest Discoveries, 1761," again shows the Paniafsas south of the Arkansas River as does his 1763 map. The site is immediately south of the 36½° line and is apparently the same as that represented by Mitchell. The northern tributaries are not shown. A ca. 1763 map (DAR; Figure 24:1) prepared for Carington Bowles, "North America and the West Indies," shows the Paniafsas in the region west of the Arkansas River and north of what is probably the Salt Fork of the Arkansas. A 1763 map for Bowen and Gibson's "North America" shows the same regional location (Winsor 1895:105). George Bowen in "An Accurate Map of North America", published in 1772, also shows the Paniafsas in this region of the Arkansas Valley (DAR). A 1770 map, sculptured by Thomas Kitchin, shows a settlement of the Paniafsas south of the Arkansas in the same location as Mitchell and Spilsbury (Wynne 1770). "British Colonies in North America," 1777, by William Faden also shows the Paniafsas at this location and very near the mouth of a northern tributary to the Arkansas, presumably the Walnut River (Fite and Freeman 1926:232). " A New Map of North America," 1778, by Carver also locates the Paniafsas near the mouth of a northerly tributary on the west bank of the Arkansas River (ibid.: 274).

On "A New Map of North America," ca. 1779, the Paniassa are no longer shown (Figure 24:2; Anonymous 1780). The situation is the same on J. Cary's "An Accurate Map of the United States of America with Part of the Surrounding Provinces agreeable to the Treaty of Peace of 1783," 1783 which continues to carry the Mentos but deletes the Paniassa (DAR; Figure 24:3). "The United States of America Laid Down from the Best Authorities Agreeable to the Peace of 1783. Published April 30, 1783," by John Wallis also indicates that the Paniafsas are no longer located on the Arkansas River (DAR). "Estats-Unis De L'Amerique Septentrionale . . ." by C. F. Delmarche, 1785, also fails to show the Paniassa along the Arkansas drainage (DAR).

Although Faden (1793) in "The United States of North America with the British Territorieses and those of Spain according to the Treaty of 1784," as well as others still carry the Paniassa in the Arkansas basin, this appears to be a carry-over from earlier information. A definite deviation from the maps of the 1770's is seen by 1783 in the deletion of the Paniassa in the Arkansas basin by a number of cartographers. This seems to indicate that some time prior to 1783 the Paniassa site carried on the maps since at least as early as 1755 was deleted from its established location.

A 1795 A. Arrowsmith map (Figure 24:4), "A Map Exhibiting all of the New Discoveries in the Interior Part of North America," erroneously shows the Paniassas still residing in their 1770 location along the Arkansas River. However, even through this is apparently incorrect, he names the river, the White River, they were located near. Unfortunately, the river no longer carries this name, and it is not the White River of Arkansas State, or the Verdigris River (DAR). Both of these items are repeated in Arrowsmith's 1796 map (DAR); however, here they are shifted somewhat to the northwest. A later A. Arrowsmith map, ca. 1817, of the same title repeats these same Paniassa and White River designations (DAR). Abraham Bradley, Jr., 1804 (?), also repeats these two items, locating the White River-Arkansas River junction northwest of where Arrowsmith originally placed it and shifting the Paniassa northwest of this junction of the west bank (DAR; Figure 25:2). The identity of this river is still unknown. The Walnut River intersects the Arkansas River immediately north of 37° latitude, so the "White River" is still not in the same location as the Walnut River although it is closer to this location. The location of the meanders on the Arkansas River immediately north of 36½° seems to represent the meander located in the Kay, Noble, Pawnee, Osage counties region immediately adjacent to, and south of, Ponca City. If this

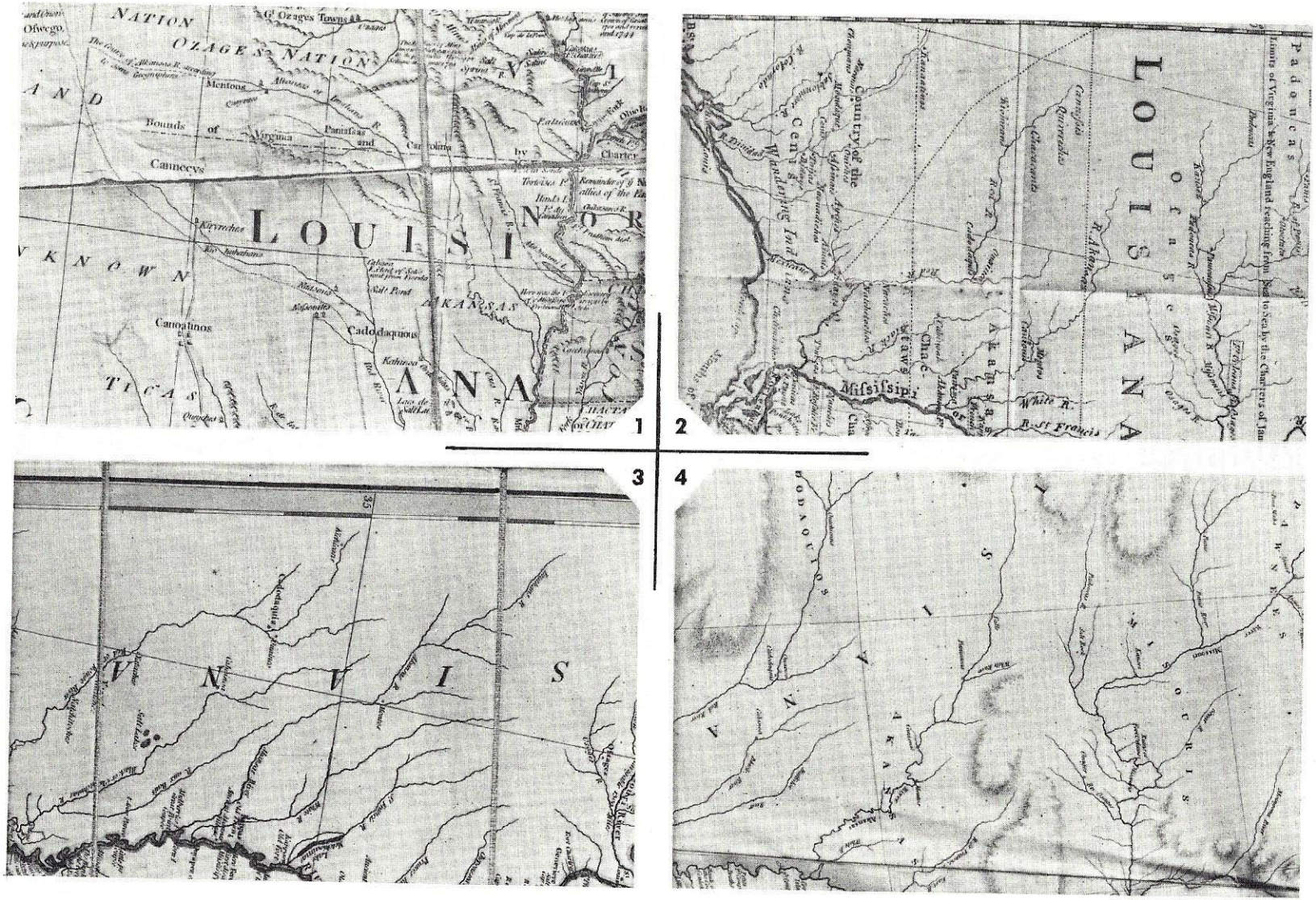


Figure 24. Ka-3 (Deer Creek Site) Maps: 1. Bowles, ca. 1763. 2. Anonymous, 1779. 3. Cary, 1783. 4. Arrowsmith, 1795.

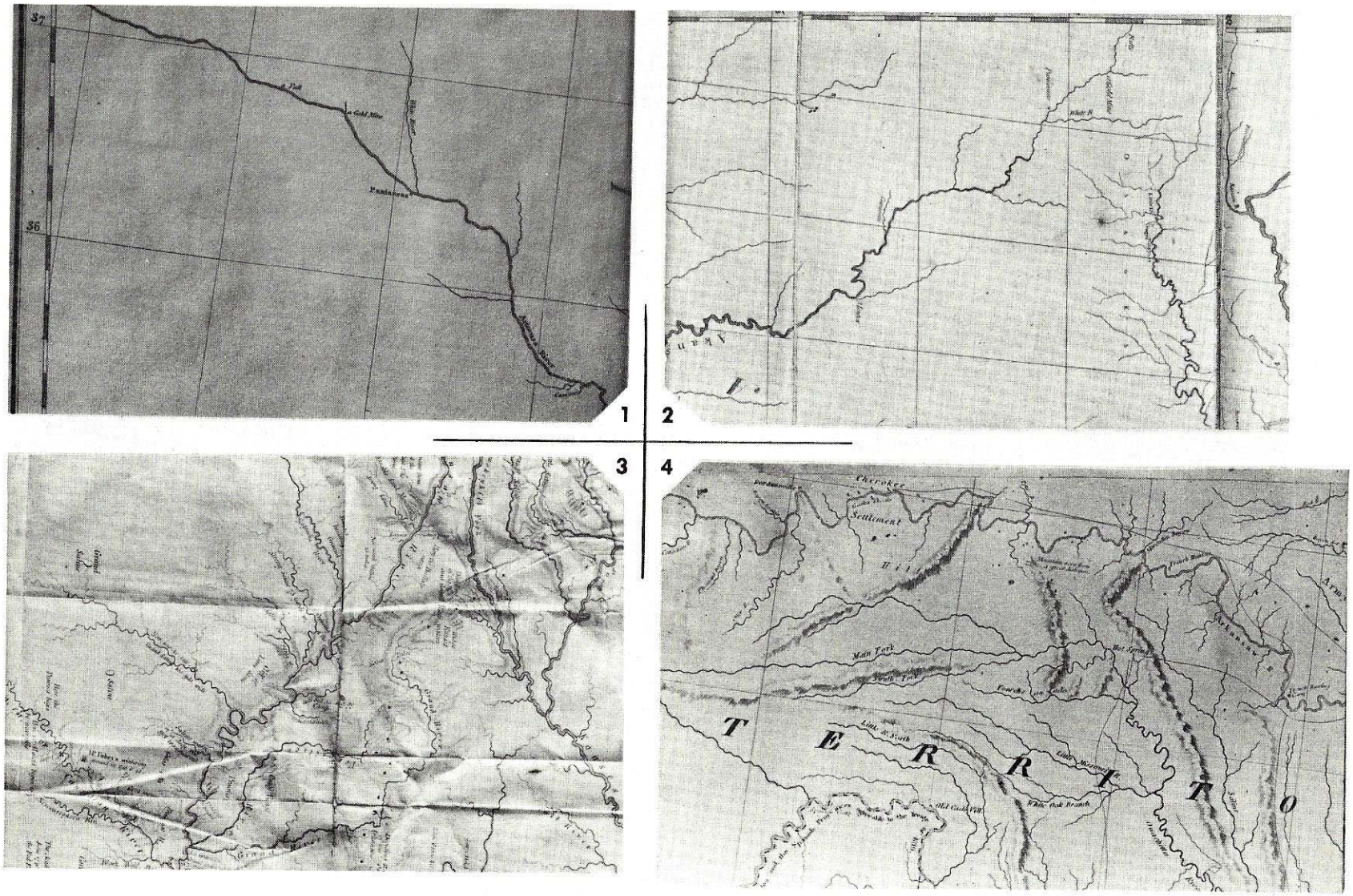


Figure 25. Ka-3 (Deer Creek Site) Maps: 1. Arrowsmith, 1796. 2. Bradley, ca. 1804. 3. Nau, 1810. 4. Lewis, 1819.

is the case, and it appears to be, the White River would represent the Walnut River; the stream between the falls and Gold mine would be the Little Arkansas; and the first northerly tributary east of the White River would be located in Osage County. This Bradley map, in conjunction with the 1755 Mitchell map and the information contained on the maps in intervening years indicating trends, suggest that a tribe of Paniassa were located immediately south of the mouth of the Walnut River on the west bank of the Arkansas by 1755, and they remained at this site until sometime prior to ca. 1775. This occupation most likely represents the one at the Deer Creek site.

"The First Part of Capt'n Pikes Chart of the Internal Part of Louisiana," by Anthony Nau (1810) shows several small southern Arkansas River tributaries north of the Grand Saline (Salt Fork of the Arkansas). One of these quite possibly represents Deer Creek (Figure 25:3). A Lewis map of 1819 of the Arkansas state region of the Arkansas and Red Rivers is of interest as it shows several places that the French occupied at the time on the Arkansas labeled as "French Hunters" and "French Hunting Camp" (DAR; Figure 25:4). Thus, French excursions into Louisiana evidentally continued until at least the second decade of the 1800's. Pike mentioned Frenchmen and French camps several times in his journey along the Missouri and its tributaries (see Historical Section).

A ca. 1830 map showing Fernandina at the area of the Deer Creek site has been reported (see Appendix II). Colton's (1856: No. 50) "Nebraska and Kansas" shows Fernandina on the west bank of the Arkansas, north of where the mislocated Sha-wa-cas-kah River entered the Arkansas River. The Chikaskia River actually empties into the Salt Fork ("Red Fork") of the Arkansas River (Figure 26:1).

McRill (1963:140-141) relates that an 1869 map of North America shows "Ferdinandina" on the west side of a bend in the Arkansas River just south of the Kansas-Indian Territory line. In "Colton's Kansas," Deer Creek is clearly illustrated and labeled (Colton 1876:82). No Indian Territory settlements are identified (Figure 26:2). In Black's (1882:441) "Pacific States including California, Oregon, Utah, Washington, New Mexico, Nebraska, Kansas, Indian Territory, &c." Fernandina is located on the west bank of the Arkansas River north of a misplaced Sha-wa-cas-kah (Chikaskia) River (Figure 26:3). This placement is the same as in Black's 1856 Atlas. As the correct course of the Chikaskia was known by 1876, this 1882 placement is probably an artifact. An 1884 "Map of Texas and Indian Territory," by Gray and Sons (1884:94-95) shows the various tribes associated with the Deer Creek site region at the end of Indian removals (Figure 26:4).

On the basis of Mitchell's 1755 map and by working backwards from landmarks on more recent maps (particularly Bradley's), it appears probable that the Paniassa were known by the cartographer's information source to occupy this specific area of the Arkansas basin during part of the 18th century. The artifacts found at the Deer Creek site indicate its inhabitants were the recipients of European (primarily French) trade. The later 19th century assignment of the name Ferdinandina to what appears to be the Deer Creek site also indicates a European connection with the site. Thus, as the French traders were aware of and had trade relations with the occupants at Deer Creek, it seems reasonable for the traders to have placed the village on the maps. At present, the evidence seems to strongly indicate that the Paniassa were this recipient protohistoric Indian group at Deer Creek.

The source of the name "Ferdinandina" is not currently known. Wright (McRill 1963:159) has suggested that the site was named after King Ferdinand VI of Spain. The nearly one century delay in the appearance of "Ferdinandina" on the maps is also not understood assuming its primary occupation was restricted to the 18th century. Steen (1953:178) has suggested that someone in the 19th century found trade goods at Deer Creek and assigned the site the name Ferinandina. There are several other possible explanations for the 19th century naming of the Deer Creek site. One is that the site was continuously occupied from the time of White contact to the mid-19th century. Although this is possible, it is highly unlikely considering: (1) the documented southern migration of the Wichita peoples, (2) the map evidence indicated that Wichita occupation in the region ceased in the 1770's, and (3) the artifactual evidence suggests that the primary occupation of the site was in the mid-18th century. The possibility that the name applied to a 19th century European trading enterprise also exists. This, too, seems unlikely due to the minor portion of the artifact sample representing the 19th century. Most likely, the delay in the appearance of the name Ferdinandina on the maps until the 19th century was due to a combination of two things: (1) the continued presence of the French in the region in the early 19th century, and/or (2) an oral history of the 18th century importance and occupation of the site carried by the Indians or renewed by the 19th century French traders. This "renaming" could have been in relation to the former site itself or to an occupation currently there.

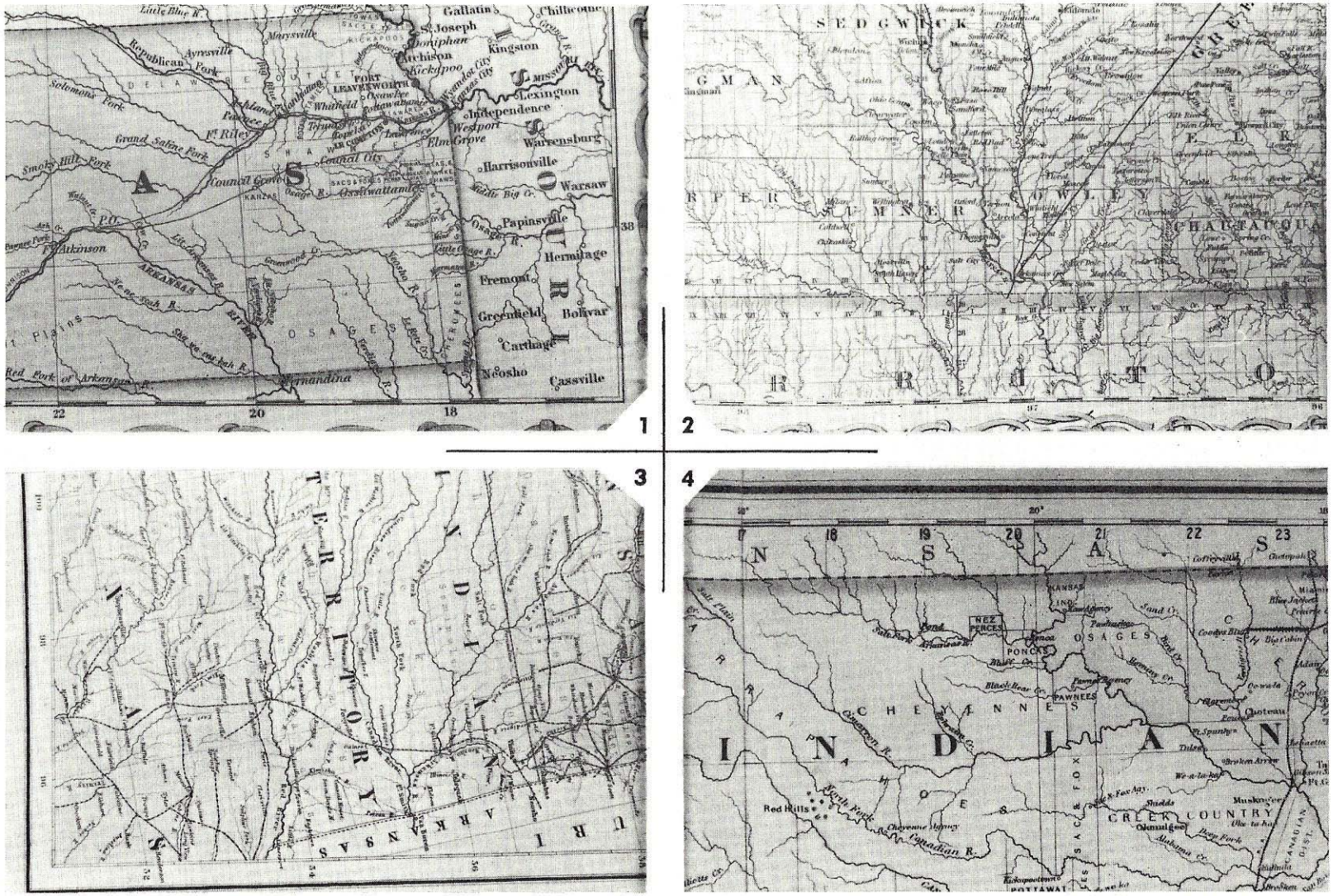


Figure 26. Ka-3 (Deer Creek Site) Maps: 1. Colton, 1856. 2. Colton, 1876. 3. Black, 1882. 4. Gray, 1884.

At this time, the "Historic Landmark" found its way onto the maps where it remained until very late. Unfortunately, no written records of the details of this situation are currently known. However, with the advent of the map evidence, the above seems likely. The fact that the site was (or had been) a well-known place is indicated by the assignment of the name Ferdinandina to it. Although it is conceivable that the French occupied and worked in the region in the 19th century, it is more reasonable to assume that the name had an 18th century origin during the time of its heavy occupation and trade and that the name found its way onto the maps of the 19th century.

This name does not imply that the 19th century trade goods at this site are of French or Spanish origin. The presence of a late (post-1832) pendant written in English found at the Bryson site emphasises this point (see Appendix II). Also, no definite Spanish artifacts have yet been found and identified at the Deer Creek site. In the Wichita bead classification scheme, Period 1 and 2 beads are felt to be of French origin. Period 3 beads are thought to be primarily of French origin with a possible admixture of some English, Spanish, and/or Anglo-American beads. Period 4 is thought to represent trade from these other three sources with the French dropping out of the picture entirely. Period 5 beads are presumed to be primarily of Anglo-American origin (Harris and Harris 1967:156-158). As Period 4 and Period 5 beads are the primary indicators of a 19th century occupation at Deer Creek, it is very doubtful that the name Ferdinandina, apparently first applied to the site no earlier than about 1830, could designate a then-current French or Spanish trade center. It must then apply to the earlier 18th century period when the Deer Creek site was heavily occupied. The reason why the name carried over some 50-100 years after the Deer Creek site had seen its heydey is unknown. The most likely reason would seem to be that the history of the site was known to the 19th century travelers or inhabitants in the region, and the name Ferdinandina was applied to this once-important French contact site.

The map evidence presented here is very suggestive of the identity of the Deer Creek site occupants although direct and absolute evidence to their identity does not exist. The Arkansas valley region of this early 18th century period was apparently saturated with peoples who later formed the Wichita Confederacy. The primary groups consistently shown on the maps are the Mentos, Panis, Ouachita, and Paniassa of which the later two were nearest the Deer Creek site locale. The problem with positively assigning a name to the site occupants is that the two northern tributaries which the recorded tribes are opposite are both out of place, and it is impossible to positively discern which tributary (if either) represents the Walnut River immediately north of the Deer Creek site. Across from the easternmost of the two tributaries, the Ouatchitas are shown from about 1707 to ca. 1735. Across from the second tributary, the Paniassa are located from about ca. 1750 to ca. 1775. The Paniassa located here probably moved from one of the northern tributaries to across from the river mouth earlier in the 18th century. Mitchell, 1755, indicates that this Paniassa settlement was an "Indian Town and Fort." The actual site was most likely occupied for some time prior to appearing on this map. Later maps indicate that this tributary is probably the Walnut River.

The artifactual evidence presented in this paper suggests that the Deer Creek site was still occupied long after the Ouachita site was evidently abandoned by 1735. In this way, the artifact evidence and the presumed palisade at the Deer Creek site support the total map evidence by suggesting that the Paniassa "Town and Fort" located across from the western-most of the two tributaries--and not the Ouachita village--is probably the location of the Deer Creek site, and that this tributary is the Walnut River. The 19th century name Ferdinandina (Fernandina) which was applied to this locale was probably a carry-over from this 18th century occupation.

APPENDIX II

Ka-5, THE BRYSON SITE

The Bryson site (Ka-5) is located about 2½ kilometers north-northeast of the Deer Creek site. It is situated on a north-south ridge on top of a high bluff located ¼ mile west of the Arkansas River (Wyckoff 1964:20). This site has long been considered an early 18th century French contact site and was presumed to be contemporaneous with the Deer Creek site occupation (McRill 1963:146). "Excavations" on this site were conducted by the 1926 Marland expedition headed by Dr. Joseph B. Thoburn. Otto Spring (correspondence, 1973, 1974), who was in charge of the field work, relates:

> "I was in charge of a field party for the Oklahoma Historical Society a year before we worked at old Fernandina [Bryson]. We were there about four months. We did most of the work at the Engelking site (now called the Bryson site) as the owner of the

Deer Creek site would not let us work there. This site is on a hilltop above the river on the west side. It was pasture land and had not been disturbed. It consisted of an oval of some twenty domicillary mounds around a level space about a block long north and south. It was some 200 feet south of the Engelking house. ["There were outlying mounds in most any direction from this main place."]

"We excavated several ["probably six or eight"] of the mounds and found many thousands of artifacts. The most plentiful were so common that we only kept part of them; they were the flint scrapers used to dress buffalo hides. Also quite a number of glass beads . . .a few arrow-heads . . . iron tomahwaks . . . steel blades set in bone handles evidentally used in splitting the hides . . . a lot of gun flints . . . copper kettles which were cut up and made into numerous beads, etc.

"While we were there a fellow from Winfield, Kansas brought an old Loyds ["of London"] map of about 1830 showing Fernandina as the only town in what is now Oklahoma."

This "about 1830" date for the map is confirmed by a Sunday, September 25, 1927 article in The Daily Oklahoman which states: "Fernandino is shown on maps of 100 years ago, . . ." (Wright 1946a: 409). Thus, 49 years ago when seeing the map was still fresh on someone's mind, this "100 years ago" was written. Thus, Mr. Spring's remembering an "about 1830" map seems accurate. The oldest map showing Fernandina in the collections this author examined is dated 1852 (see Appendix I).

Mr. Spring also elaborated on the burials mentioned by Thoburn (McRill 1963:151) as having been sacked by relic hunters. He comments that just across the river along the edge of some low hills were burials which appeared to be of more recent date than the Bryson site. They had ivory beads (Plains Hair Pipes?) and glass beads. The Marland expedition excavated one burial on this low hill, and Mr. Spring still has several beads from that burial (Spring, correspondence, 1974).

The 1926 Bryson excavations yielded a large number of artifacts. The most disheartening thing about this excavation is that the materials and data which was recovered was not properly preserved. Otto Spring (correspondence, 1974) complains that his manuscripts on his field work over the years were for the most part never published. Delia Castor of The Ponca City Cultural Center relates that her research into the missing artifacts indicates that many boxes of materials from these excavations were taken to Marland's studio house, were then kept by another private individual, and were later stored in the Ponca City Library basement. Mr. Spring also took boxes of material to the Capitol for storage. Evidentally, the materials were divided into three portions with Chilocco Indian School, Mr. Marland (and Ponca City), and the Oklahoma Historical Society being the recipients (Spring, correspondence, 1974). While at least some of the boxes, presumably from the Capitol, are currently at the Oklahoma Historical Society Building, the majority of the artifacts said to have been found have not been located. A portion of the artifacts at the Oklahoma Historical Society are currently being unpacked from their original boxes and examined whereas other specimens in their collection have been known about for some time. The location of the other two groups of artifacts is currently unknown. At least a portion of what presumably went to the Ponca City Library is currently on display in The Ponca City Cultural Center. Although the Chilocco artifacts cannot be located, a 1946 inventory of the artifacts on exhibit at the Museum at the Chilocco Indian School is available (Wright 1946b:491-494).

Other collections of Bryson site artifacts also exist. The University of Oklahoma has a small surface collection from Bryson (Wyckoff 1964:20-22), and the Oklahoma River Basin Survey spent four weeks excavating a small mound on the east edge of the site in 1974 (Hartley 1974: 6-7). The Harris and Blaine families of Dallas, Texas, also have collections from the site. In addition, a number of local amateurs have surface collections from the site.

A 1700-1750 occupation for this French contact site has been proposed (Wyckoff 1964:20; McRill 1963:152). However, extensive analysis of the data initially used to arrive at this date has not been presented. Among the Oklahoma Historical Society collections, the Harrises found that the Bryson beads were reliably labeled as to their origin. They incorporated the data from the Oklahoma Historical Society sample with that of the Blaine's collection and their own collection. The Harrises utilized this information in establishing the Wichita bead classification system, the Bryson site being one of the 18 sites represented in the sample (Harris and Harris 1967). At that time, the Bryson site was designated as a Period 1 site (1700-1740; ibid.: 131). R. K. Harris (correspondence, 1974) informs me that, after seven years more data from various sites have been examined, he still feels that Bryson is a Period 1 site as indicated by

the bead types present and their relative numbers. Although the results of the bead analysis were published, the actual data for the Bryson site were not (Harris and Harris 1967). Mr. Harris (correspondence, 1974) has supplied me with the Wichita bead type numbers and the number of specimens of each type which were present in the analyzed Bryson sample. These data are presented in Table 4 along with the corresponding Deer Creek bead data (from this report) for comparison.

Several things are evident upon examining these data and upon comparing them with the complate Deer Creek site data in Table 2. Thirty-two bead types were found at the Bryson site. Nine of the early (3, Period 1; 6, Period 1-2) bead types found at Bryson (28% of the types recovered from Bryson) have not yet been found at the Deer Creek site. All of the 32 bead types present, but one, could have been traded in Period 1. This is in very sharp contrast to the Deer Creek site data. Four Deer Creek types (3 Wichita Bead Types) were restricted to Periods 1 and 2 all of which were found at Bryson; no pure Period 1 beads have been found at Deer Creek to date. Fifteen types found at Deer Creek were not traded in Period 1 at all (44 types including those suspected to be of later origin but without established time of usage data). Eight of these 15 types were traded beginning in Period 2 or 3. Only one bead type which first appeared in trade after Period 1 is present in the Bryson site sample. All of this data indicates that the Bryson site was occupied prior to the Deer Creek site. It is quite possible that there was some overlap in their occupation, but the Bryson site was definitely occupied in Period 1 whereas the Deer Creek site was occupied in Period 1 and 2, and probably late Period 1 as indicated by the lack of many Period 1 beads present at Bryson.

Mention in the literature is made of the Bryson and Deer Creek sites in connection with attempting to establish a sequence of occupation with other sites in the area. Neal notes the possible relation of the Lower Walnut focus of the Great Bend aspect to three Kay County historic sites (Love, Ka-2; Deer Creek, Ka-3; and Bryson, Ka-5). He (Neal 1974:89-91) suggests that the Stockton site (Ka-99) was occupied prior to these three and is possibly related to the Great Bend aspect, and thereby is conceivably related to the three Kay County historic sites. The Love site, located about a mile north of the Bryson site, has yielded blue and white trade beads, flash pans, butt plates, trigger guards, and bullets as well as aboriginal materials, including Fresnos, diamond bevel knives, shell tempered pottery, shell tempered clay elbow pipes, and burned corn grains (Wyckoff 1964:10). As the Love site is geographically intermediate between the Lower Walnut focus sites and the Bryson and Deer Creek sites, Wyckoff (1964:10-11) suggests that possibly the Love site is an earlier contact site than Deer Creek. The near absence of diamond bevel knives from Bryson (1 specimen in the author's collection; 1 illustrated by McRill 1963:150) and Deer Creek (1 specimen, NH) supports this observation. This conceivably could indicate the rapid increase in importance and use of steel trade knives which probably did rapidly replace stone knives when they became available in the early contact period.

The bead data presented in this report for the Bryson and Deer Creek sites enables the proposal of a more detailed sequence for the area. The Bryson site was evidentally occupied prior to Deer Creek as indicated by the Period 1 beads although the last of the Bryson occupation could have overlapped with that of Deer Creek. Also, the Deer Creek occupation conceivably outlasted the one at Bryson as indicated by the five bead types appearing in Period 2 which did not occur at Bryson. I suggest that the Bryson occupation began prior to the Deer Creek site occupation. It is conceivable that the Bryson and Deer Creek site occupants were the same, having moved from Bryson in mass or trickling southward to the Deer Creek site seeking the advantage of being on the river bank instead of being ¼ mile uphill from it. Such a move would have made rendezvousing with traders an easier matter. The occupants of Bryson and Deer Creek do seem to be related in material culture and in time. There is nothing to indicate that they were not the same people, and possibly the same generation. The apparent sequence as indicated by the bead samples indicates that these two sites were very closely related in time, and their overall artifact samples suggest a similarity in culture.

The author's collection of trade goods from the Bryson site includes the following items. There are 16 beads of the following types: 1 Wichita Bead Type No. 23 (a large light bluish-white olive-shaped bead with three sets of three blue stripes spiraling around it), 1 WBTN 13, 3 WBTN 10, 1 WBTN 15, 2 WBTN 47, 3 WBTN 5 (Deer Creek BTN 16b), 2 WBTN 3 (1 DCBTN 9, 1 DCBTN 8b), 1 DCBTN 42, 1 WBTN 45 (DCBTN 29a), and one unidentifiable fragment. There are three gunparts: one badly oxidized cock screw with a slotted head and stripped threads (Figure 27:1), one removable flash pan about which Jay C. Blaine (correspondence, 1974) comments that this shallow V-shaped pan appears typical of ca. 1730-1750 French fusil in shape, and is possibly from a pistol as evidenced by its size: width, 23.2 mm., length, 31.6 mm. (Figure 27:2); and one frizzen spring (dimensions: 32.6 mm. long lower leaf from screw hole to apex of the leaves' bent juncture, 45.6 mm. upper leaf, and 10.8 mm. maximum width). This spring (Figure 27:3), of

Table 4

Correlation of Bryson and Deer Creek Site Bead Samples

	Bryson Site Bead Sample							Deer Creek Site Bead Sample		
WBTN*	No. of Specimens*	% of Sample	P-1	P-2	P-3	P-4	P-5	Bead Type No.	No. of Specimens	% of Sample
16	2	0.27	xxx							
21	2	0.27	xxx							
37	1	0.13	xxx							
6	4	0.54	xxx	xx						
7	3	0.40	xxx	xx						
8	2	0.27	xxx	xx						
9	21	2.82	xxx	xx	x					
12	3	0.40	xxx	xx						
14	3	0.40	xxx	xx						
2	32	4.29	xxx	xx				1	2	0.87
15	14	1.88	xxx	xx				3,4	9	3.93
56	1	0.13	xxx	x				2	1	0.44
47	71	9.52	xxx	x				5	1	0.44
13	2	0.27	xxx	xx				6	1	0.44
1	61	8.18	xxx	xx	x					
53	2	0.27	xxx	xx	x					
26	7	0.94	xxx	xx	x					
3	26	3.49	xxx	xx	x			8a-11	10	4.37
23	5	0.67	xxx	xx	x			12	1	0.44
40	1	0.13	xxx	xx	x			13	1	0.44
10	16	2.14	xxx	xx	x	x		14	14	6.11
11	42	5.63	xxx	xx	x	x		15	5	2.18
4	18	2.41	xxx	xx	x	x		16a	1	0.44
5	17	2.28	xxx	xx	x	x		16b-18	6	2.62
44	21	2.81	xx	xx	xx	xxx		26a-27	8	3.49
45	175	23.56	xx	xx	xx	xxx		28a-32	48	20.96
46	131	17.56	xx	xx	xx	xxx		25	2	0.87
48	11	1.47	xx	xx	xx	xxx		20-22c	32	13.97
49	14	1.87	xx	xx	xx	xxx		24	1	0.44
50	27	3.12	xx	xx	xx	xxx		23	1	0.44
51	6	0.80	xx	xx	xx	xxx		19	2	0.87
57	4	0.54		xxx	x			33-34	5	2.19

* Data courtesy R. K. Harris
a. WBTN, Wichita Bead Type Number
b. P-1, Period 1, 1700-1740
c. P-2, Period 2, 1740-1767
d. P-3, Period 3, 1767-1820
e. P-4, Period 4, 1820-1836
f. P-5, Period 5, 1936-1850
g. "x" is used to signify relative frequency of occurence of one particular bead type in the various Periods; xxx, high occurence; x, low occurence; xx, intermediate occurence. These indicate relative, not absolute, amounts. A blank indicates that the bead type was not present.

the size and shape common to the French fusil, utilized a hidden spring screw, shows no evidence of an anti-friction device, and was most likely used with an unbridled frizzen (ibid.). There are six sherds of glass from Bryson: one is from a mirror (0.130 cm. thick), one is possibly from a mirror (0.285 cm. thick); one pale green sherd is possibly from a wine bottle; and there are also three pieces which are probably of 20th century origin.

Seven tinklers are present. The one copper specimen (0.080 cm. thick sheet copper) is made from a rectangular blank (Figure 27:4). Three of the sheet brass tinklers appear to also be made from rectangular blanks; in thickness, they measure 0.030 cm. (this specimen has one rivet hole), 0.040 cm., and 0.045 cm. (Figure 27:5-7). The other three sheet brass specimens are made from trapezoidal blanks. One, 0.025 cm. thick, has a rolled cylindrical rivet in it (Figure 27:8). A 0.045 cm. tinkler has two rivet holes (Figure 27:9), and the final specimen is 0.040 cm. thick (Figure 27:10). Sixteen pieces of sheet brass scrap are also in my collection, many of which have cut edges. The thicknesses of this scrap is as follows: 0.025 cm. (1), 0.030 cm. (2), 0.035 cm. (2), 0.040 cm. (4), 0.050 cm. (2), 0.060 cm. (1), 0.070 cm. (1), 0.080 cm. (2), and 0.100 cm. (1). One of the 0.040 cm. pieces is folded in half, and has a total of five rivet holes in it (Figure 27:11). A number of pieces of iron scrap are also present. One of these, a rectangular piece has been sharpened on three edges (Figure 27:12); its function is unknown. There are 43 other pieces of scrap iron; five of these pieces are of recent origin.

All of these other trade goods readily fit into the early 18th century category. However, one additional specimen must be considered. The great majority of all of the historic trade artifacts from the Bryson site point to an early 18th century occupation (i.e., Period 1). All who have written of the site from 1926 through the present have been in agreement on this. However, one specimen in the "Ferdinandina Collection" of The Ponca City Cultural Center has seemingly been ignored. This specimen is a dated pendant reading:

"O HOLY MARY EVER VIRGIN AND CONCEIVED WITHOUT SIN

PRAY FOR US WHO IMPLORE THY AID

1830"

This specimen is a Miraculous Medal. These Medals were first struck in 1832 and continue to be made through the present (Dirvin 1967). John W. McClellan (correspondence, 1975) of the Central Association of the Miraculous Medal relates that the first medals struck in France carried a two-line message on the obverse. Modern Medals carry a slightly reworded message in a single line. A number of additional differences between the Medal pictured by Dirvin (1967) and the Bryson specimen are obvious. These include the Bryson specimen being somewhat rounder than the modern "narrow oval" Medals and a number of minor placement changes of various items on both faces. It is assumed that these various changes gradually occurred over the years, making this specimen potentially datable. However, the author has not yet located an authoritative source documenting these various changes. In any event, upon the premise that this medal is of 19th century origin, a post-1832 date is far too late to agree with the rest of the Bryson site historic artifact sample.

So, this particular specimen has remained either unnoticed or ignored by most writers. A 1926 letter present in the Thoburn papers housed in the Oklahoma Historical Society Building indicates that a pendant was found by the Marland expedition at the Bryson site in 1926. The letter, from Otto Spring to Dr. Thoburn, included a shadow rubbing of the pendant indicating

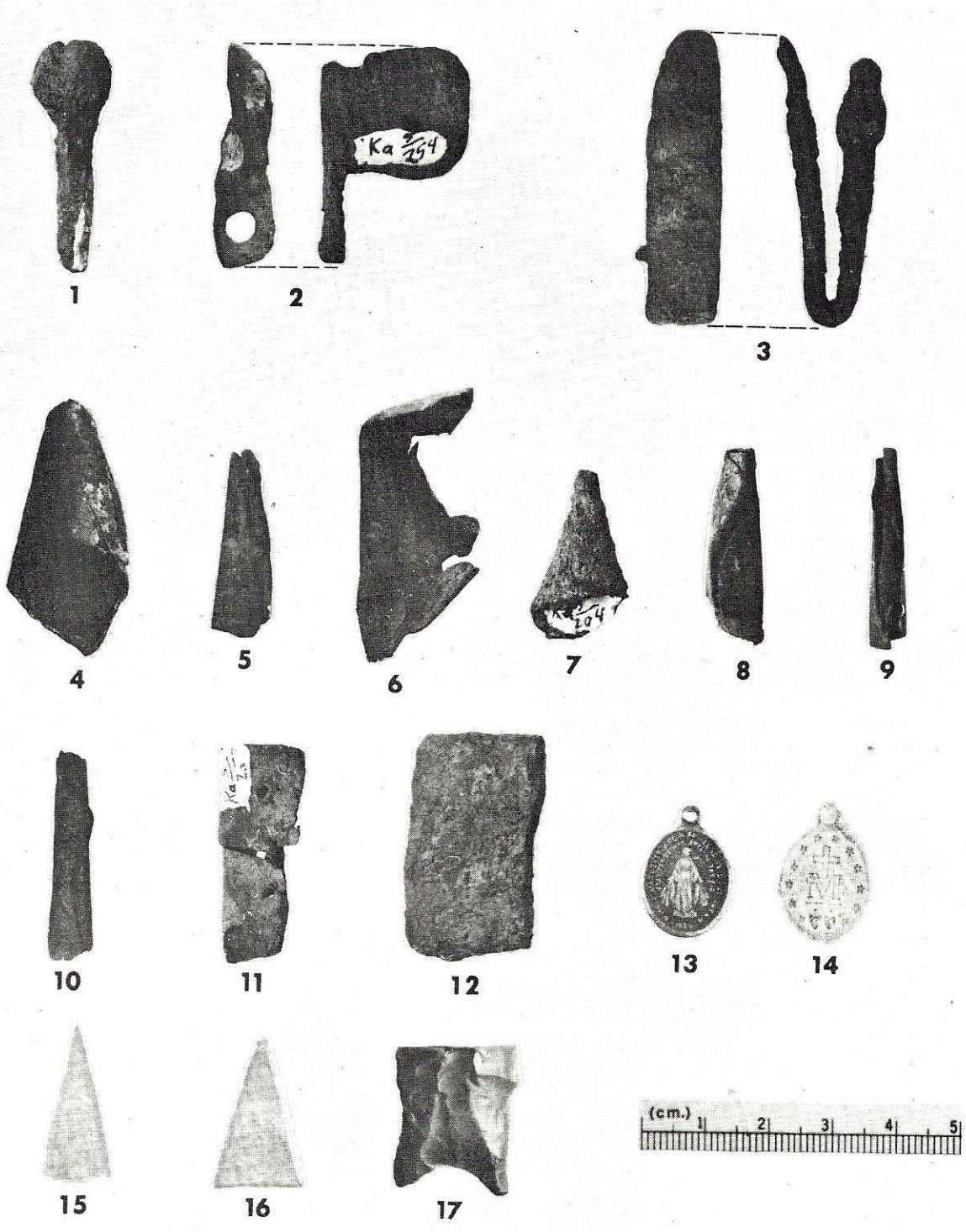


Figure 27. Ka-5 (Bryson Site) Artifacts: 1. Cock screw. 2. Removable flashpan. 3. Frizzen spring. 4. Copper tinkler. 5-10. Brass tinklers. 11. Sheet brass with rivet holes. 12. Unidentified sharpened iron object. 13-14. Miraculous Medal. 15-16. Fresnoid metal points. 17. Dalton. (14. Courtesy of Delia Castor).

that its problematic significance was recognized when it was found. Unfortunately, its specific provenience is not related.[1] This letter does indicate that the Medal was found at the Bryson site, and it also suggests that The Ponca City Cultural Center "Ferdinandina Collection" is in actuality from the Bryson site. This Miraculous Medal is illustrated in Figure 27:13-14.

This late artifact could represent a chance loss by a member of a hunting party, or it could indicate a second minor occupancy of the site during late Period 4 or later. This is the only specimen I have seen indicative of a later occupation at the Bryson site. It could well be a result of the Indian removals which first affected this area beginning in about 1820-1838. However, the major occupation of the site did indeed occur in the first half of the 18th century. Neal (1974:89) has suggested that Bryson (and Deer Creek) "represent occupations from prehistoric through historic times". Although this is possible, the very small number of stone knives and the preponderance of large scrapers found at the sites seemingly indicate: (1) a dependence on some other type of cutting tool (i.e., a steel knife), and (2) the importance of hide preparation to the village economy. Such a need for extensive hide preparation probably came with increased hide demand as a result of the fur trade. Although a prehistoric occupation cannot be ruled out, it seems likely that the site occupation began very near the time of initial White contact. The great majority of the occupational debris present seems to be related to a post-White contact occupation of the site (i.e., the heavy lithic industry at both the Deer Creek and Bryson sites indicates that hide processing was an important component of their economy).

One additional element of The Ponca City Cultural Center "Ferdinandina Collection" should be noted: two triangular sheet metal points (Figure 27:15-16). These two specimens were found at the Bryson site (an unsharpened triangle is also present in this collection). Their presence, as suggested in the Deer Creek triangular metal point discussion earlier in this paper, seems to indicate a pre-ca. 1750 occupation. At present, the author does not know of any Benton metal points from Bryson which, again, would seemingly indicate a pre-ca. 1750 date. This is in contrast to the presence of both Benton and triangular metal points at the Deer Creek site. Although it is conceivable that Benton metal points will be found at Bryson in the future, it is probable that additional triangular metal points will be found. The finding of triangular points at both of these early 18th century sites, and their presence with Benton points at the later Deer Creek site supports the theory regarding the intermediate production of triangular metal points as a technological bridge between triangular stone points and the later Benton metal points.

In Kay County, there are three early historic contact sites within 6½ kilometers of each other on the west side of the Arkansas River. As suggested by Wyckoff (1964:11), the earliest site is possibly the Love site. According to the artifactual data presented in this paper, the Bryson site occupation seemingly began prior to the Deer Creek occupation. The Bryson site was probably occupied sometime during the 1720-1740 time range. In turn, the Deer Creek site occupation probably began after initial White contact (ca. 1730) and continued into late Period 2 or early Period 3 (ca. 1760-1770). Both the Bryson and Deer Creek samples also show some evidence of a minor post-1820 occupation.

APPENDIX III

Ka-3, THE DEER CREEK SITE NATIVE ARTIFACTS

Introduction: The description and analysis of the European trade goods has enabled us to fix the primary Deer Creek site contact occupation in time. The map evidence and historical record has enabled us to identify with fair certainty the occupants as being a Wichita group, in all probability the Wichita proper. Now, an examination of the native artifacts is in order to ascertain the relationship of the protohistoric Deer Creek occupants to previously reported and defined cultural units.

The original objective of this report was to describe and analyze all of the recovered surface materials. However, with 16,000 plus native artifacts (which have not all been processed yet), it is virtually impossible for this author to do so under current time restrictions imposed by educational obligations. As the need to fit the primary Deer Creek site occupation into the established cultural framework exists, such an effort will be made. The presentation will be in the form of an abbreviated survey, taking particular note of the distinctive tool forms and of artifacts of extreme diagnostic importance (i.e., pottery). Other artifacts, such as flake tools,

1. An official of the Oklahoma Historical Society would not allow me to copy or photograph the letter which I examined before learning of the pendant at the Ponca City Cultural Center. However, as best as I can remember, the two specimens are the same.

which would be important in a detailed analytic inventory and study of lithic technology are not presented at this time. The high points of the native artifact sample most critical to a cultural interpretation are presented and examined.

Projectile Points: Of the some 400 projectile points and point fragments, all but 14 are classifiable as arrowheads. Although a number of these arrowheads were incomplete, only four appear to fall outside the Fresno category. Of the 14 non-arrowheads, 3 fit into the triangular dart point category, and the rest are either dart or spear points.

Arrowheads

Fresno (Figure 28:1-28)

The illustrated points were selected in an attempt to indicate the variety of point forms present in this particular point type. Potentially, a number of varieties based on size, base and edge contours, length-width ratio, serrations, etc. could be established. However, it seems that all of these varieties generally represent variations around the mean defined as the Fresno type by Bell (1960:44-45). More than 95% of these specimens are of Kay County flint. Other flint types present in the Fresno sample are Alibates chert, Boone chert, Frisco chert, Arkansas Novaculite, Edwards Plateau (brown), and several unidentified types. Of the Kay County flint Fresnos, roughly 90% are heat treated. Several of the exotic flint types also appear to have been heat treated.

Six worked triangular specimens were found which represent unfinished projectile points. One heat treated Kay County flint specimen (Figure 28:29) is 8 mm. thick; apparently the knapper found this specimen impossible to thin due to a hard spot in the flint and probably discarded it. Five other specimens apparently represent roughed-out preforms (Figure 28: 30-31). One one of these five Kay County flint specimens is heat treated. Essentially, they are flakes that have been bifacially trimmed into a roughly triangular shape. The fact that these arrowhead preforms are not heat treated whereas 90% of the finished points are, gives some indication that possibly point preforms were made before heat treatment and not made from heat treated nodules or cores. This observation awaits confirmation in other related samples or by complete analysis of all lithic materials from the site.

Scallorn (Figure 28:34)

One specimen of dark grey, heat treated Kay County flint of the Scallorn type (Bell 1960:84-85) was found. This specimen is of the Scallorn sattler subtype (Bell, correspondence, 1974). This specimen was most likely manufactured before the 18th century site occupation.

Reed (WR) (Figure 28:35)

One specimen of the Reed type arrowpoint was found (Bell 1958:76-77). Bell (correspondence, 1974) relates that this particular specimen is rather atypical of the type. This specimen is of tan non-heat treated Kay County flint.

Washita (WR) (Figure 28:36)

One fragment of the Washita type was found (Bell 1958:98-99). This specimen is of pink, heat-treated Kay County flint. The Washita is second only to the Fresno in frequency of occurrence of arrowpoints in the general Kay County region. It is particularly prevalent on sites attributable to the time period of the Early and Late Village periods.

Unidentified Arrowpoint Section

One thick serrated parallel-sided arrowpoint section was found. It cannot be identified, but it is definitely not from a Fresno.

Comment: The Fresnos are attributable to the protohistoric occupation under primary consideration in this paper. The other three point types could represent specimens found by the protohistoric occupants, chance losses by earlier hunting parties, or possible a minor earlier occupation(s) at the site. Washita and Scallorn have been found together at a number of sites in the region, such as the Bowling Alley site (Sudbury 1968:108-110). The Reed type seems to be somewhat less common in the vicinity. Reed, Washita, and a possible Scallorn have been found at the Boettcher site (Ka-139, personal observation).

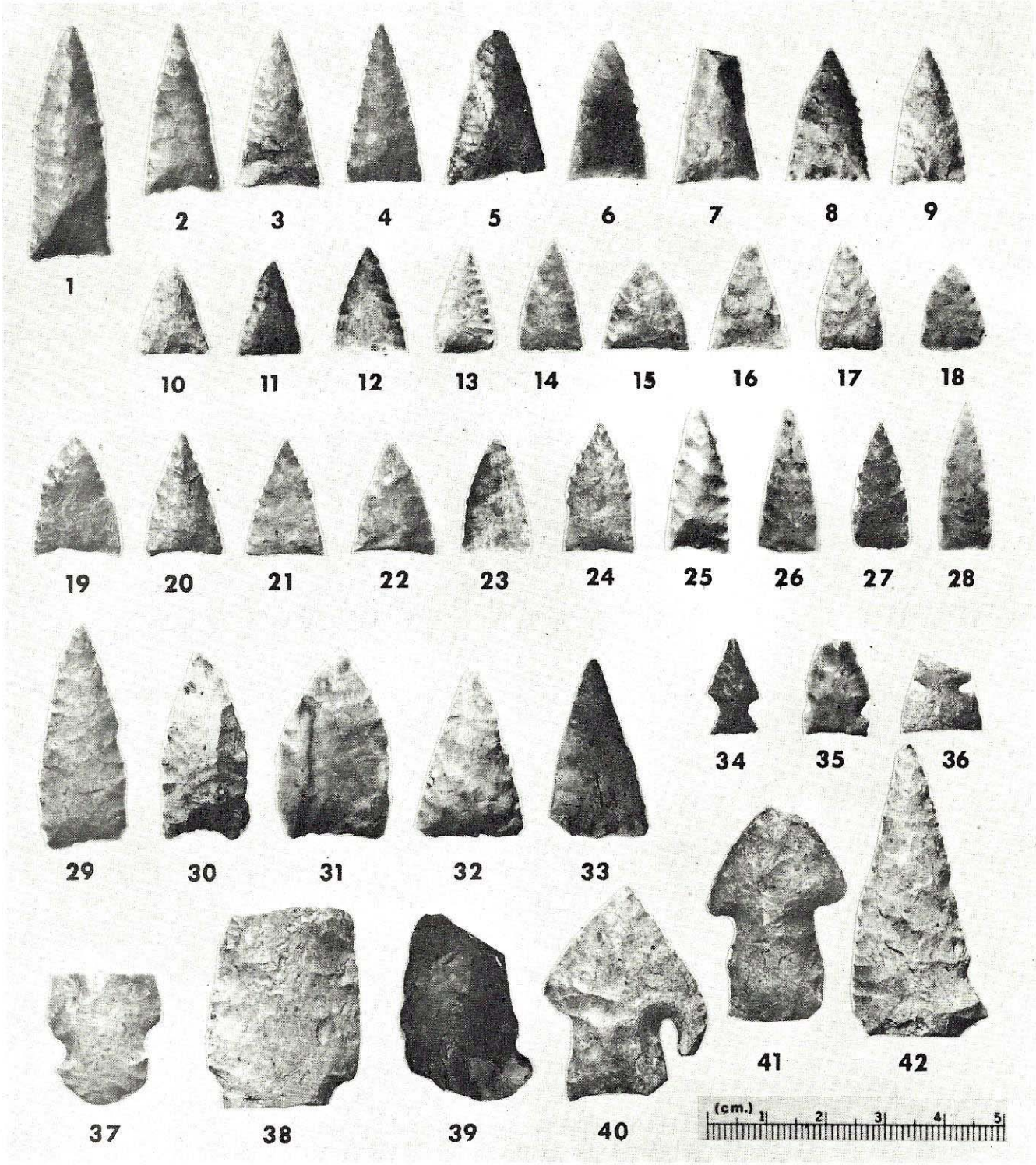


Figure 28. Ka-3 (Deer Creek Site) Projectile Points:
1-28. Fresno points. 29-31. Point Preforms. 32-33. Triangular dart points.
34. Scallorn sattler point. 35. Reed point. 36. Washita point. 37-42. Dart points.

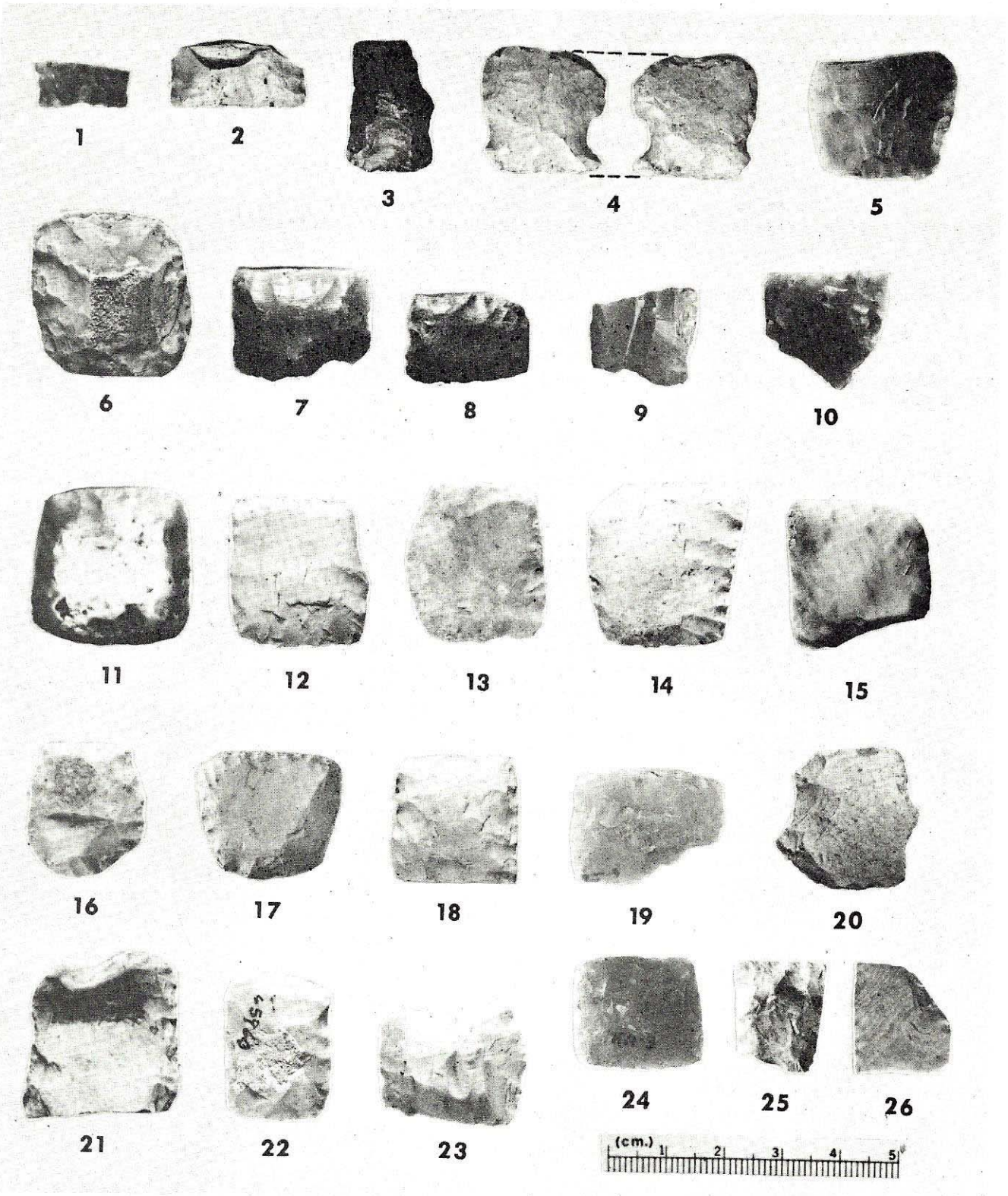


Figure 29. Kq-3 (Deer Creek Site) Projectile Points and Gunflints:
1-3. Dart points. 4-5. Dart points reworked into gunflints.
6-26. Native gunflints.

These three Deer Creek specimens are of Kay County flint and have no discernable river polish. As such, they must have been lost at the site by either an earlier group, or by the protohistoric occupants (who found the previously lost point).

Dart Points

Triangular Dart Points (Figure 28:32-33)

This classification of Ka-3 points was previously noted by Wyckoff (1964:13, 15). These three points appear to be large Fresnos in the illustrations, but they are much too thick for use as arrowpoints. They could conceivably represent large points manufactured by the protohistoric occupants. All are of heat treated Kay County flint.

Ensor (Figure 29:4)

One basal fragment of what appears to be an Ensor point (Bell 1960:34-35) has been found at the site. This particular specimen of pink heat treated Kay County flint is roughly square and exhibits noticeable battering along three edges indicative of serve as a gunflint.

Other Dart Points (Figure 28:37-42; Figure 29:1-3, 5)

Ten other dart (or spear) points are present in this sample. Due to either reworking or their fragmentary nature, positive identification of these specimens is not possible. One specimen (Figure 29:5) appears to have been the rectangular base of a dart or spear point. The edges of this specimen have been reworked, probably to prepare this piece for use as a gunflint. Several other reworked specimens appear to have been basal notched points (Figure 28:40, 41). Positive identification is not possible, but they could conceivably be something along the line of the Marshall point (Bell 1958:44-45). Another unidentifiable point section makes the Gary type (ibid., 28-29) come to mind (Figure 28:42). Another fragment (Figure 29:2) with ground edges and base and exquisite workmanship brings to mind Scottsbluff or some related type, although, again, positive identification is not possible. A "guestimate" on the identification of the five remaining point sections is not possible. Only one specimen of all of these dart points is river polished (Figure 29:3). This specimen was probably a point resharpened down to a drill and then discarded. Light patination is present on several specimens. Five specimens show no evidence of reworking (Figure 28:37, 39; Figure 29:1-3).

Comment: The triangular dart points were most likely made by the protohistoric occupants. That the other dart points (at least some of them) were probably found and used by this occupation is suggested by the reworking of these points. This is confirmed by the presence of two gunflints made from dart points. However, the question of whether the points were found during earth-working activity at the site, or by some other means away from the site remains to be determined. It is not inconceivable that such on-site occurrence was the source of these points. The answer to this question, as well as the explanation of the presence of the Washita, Reed, and Scallorn points, must await investigation by excavation. At present, the possibility of minor Archaic and Early Village occupations at the Deer Creek Site should be noted.

Gunflints: A total of 58 native gunflints were found at the Deer Creek site (14WR, 6NH). The predominant flint type used was Kay County flint although a large number (66%) of specimens of exotic flints were found. Of these 38 gunflints made of exotic flint, the following flint types have been identified: 6 of Amarillo chert (Figure 29:15), 4 of exotic material or possibly of a variety Florence flint (Figure 29:11), 3 of either Boone or Peoria chert (Figure 29:12, 17, 18), 3 of Arkansas novaculite (Figure 29:19), 2 probably of Bolivar chert, 1 of Boone chert, 1 possibly of Keokuk, 1 possibly of Frisco, 3 of Edwards Plateau blue-grey material (Figure 29:7), 1 of Edwards Plateau dark brown material (Figure 29:10), 1 of heat treated Cresswell chert, 1 of Woodford chert,11 of Shidler flint, and 10 unidentified (Figure 29:9, 24). Of the 20 Kay County flint specimens, 6 were non-heat treated (Figure 29:6, 16, 20, 22, 26), and the rest were heat treated (Figure 29: 8, 13, 14, 21, 25). Some of the used gunflints showed evidence of use with a strike-a-light as well as a gunflint.

Knives: Five knives and knife fragments were found (Figure 42:14-16). Two of these appear to have been made from scraper bits (Figure 42:14). Eleven bifacially worked fragments were also found which could be dart point, knife, or preform sections. One notched beveled knife, of the type characteristic of the Great Bend Aspect (particularly of the Little River Focus; Wedel

1959:342, 378, 576) has been illustrated and is from either the Deer Creek or Bryson site (McRill 1963:150). A crude beveled knife was noted in Norman Hiatt's Deer Creek collection.

To be sure, artifacts classifiable as flake knives and core knives are recognizable in the Deer Creek sample. The important point is that knives, especially the predominant Great Bend Aspect knife form, seldon (if ever) appear at the Deer Creek site. The apparent relationship of Deer Creek to the Great Bend Aspect (to be discussed later) makes the native knife situation at the Deer Creek site noteworthy. One interpretation of these observations is that this supports the proposal that the 18th century Deer Creek protohistoric occupation was a post-contact occupation; flint knives of a type in common use in late prehistoric times were no longer important in the tool inventory as evidenced by a low frequency of occurrence. This observation can be explained if one considers that metal knives available through traders, being markedly superior to their stone counterparts, rapidly replaced stone knives.

Scrapers (Figures 30, 31, 32)

Scrapers are numerous at the Deer Creek site. The best known type are the large roughly shaped plano-convex end scrapers with a variety of outlines, including circular, oval, triangular, rectangular, and elliptical. These scrapers are somtime referred to as snub-nose scrapers (due to their steeply beveled scraping edge) or as turtle-back scrapers (due to their shape). The vast majority of these scrapers are made from large, non-heat treated flakes of Kay County flint. Often they appear to have been made from large flakes struck from the outer portion of flint nodules and may retain some cortex (Figure 30). The bulb of percussion is often preserved (on complete specimens), and the striking platform is often visible. Generally, the bit is opposite the striking platform. These scrapers characteristically have a steep scraping edge and range from 35 to 105 mm. long, 25 to 70 mm. wide, and 10 to 45 mm. thick. The appearance of these large scrapers gives the general impression that they are crudely made; however, Kay County flint flakes well, and these scrapers are of reasonable quality. The care apparently taken in executing a number of the finer tools such as arrowpoints is not readily evident in the large end scrapers.

This general scraper type seems to be common on most Norteño sites and is listed as one of the basic Norteño focus traits (Duffield and Jelks 1961:71). One of the scrapers at Pearson was made of Kay County flint (ibid., 25). A recently proposed cultural unit in west central Oklahoma has been briefly characterized and is referred to as the Wheeler complex. A small amount of trade material has been noted from these sites, suggesting a protohistoric occupation. "Large end scrapers of Kay County flint are considered (Bell and Bastian 1967:124-125) somewhat diagnostic of the Wheeler complex" (Wyckoff 1973:143). Plano-convex end scrapers of this type also occureed in the Lower Walnut Focus, but tended to be smaller (Wyckoff 1964:14).

Other scraper types were noted at Deer Creek, including side scrapers, pointed scrapers, concave scrapers (plain, or in conjunction with gravers, or with plano-convex end scrapers), as well as flake tools possibly used for scraping.

Ground Stone Artifacts

Four types of ground stone artifacts (exclusive of pipes and ornaments described elsewhere) were found at Deer Creek. Of 10 fragmentary manos found only three were of sandstone. The others are of a fossiliferous limestone (Figure 33:1). Of the 3 limestone mano fragments intact enough to display both faces, all were unifacial. Twelve longitudinally grooved arrowshaft smoothers of at least 4 distinct types of sandstone have been processed to date (Figure 33: 2, 3, 5, 8). Two sandstone awl sharpeners were also found. Two other sandstone pieces have multiple grooves and apparently served as both shaft smoothers and awl sharpeners (Figure 33: 6, 7). The final ground stone artifact class is pigments. Most noteable are 4 pieces of heavily scraped and striated hematite (Figure 33: 9, 10). Also found were several pieces of limonite showing evidence of scraping.

Stone Ornaments

Two types of stone ornaments were found. One fragmentary specimen of very fine-grained limestone appears to be from a pendant (Figure 33:4). A hole, drilled from both sides, is near the point. The edge closest to the hole is pointed in cross section whereas the other edge forming the point is flat and has two sets of fine engraved lines--one pair along the edge and one in the center (both sets each form a "V"). The maximum thickness is 9.5 mm. Opposite the point near the perforation, there is a larger hole which runs through the widest part of the pendant. The pendant is broken at this hole, and several other small fragments are missing as well.

Figure 30. Ka-3 (Deer Creek Site) Plano-convex End Scrapers.

Figure 31. Ka-3 (Deer Creek Site) Plano-convex End Scrapers.

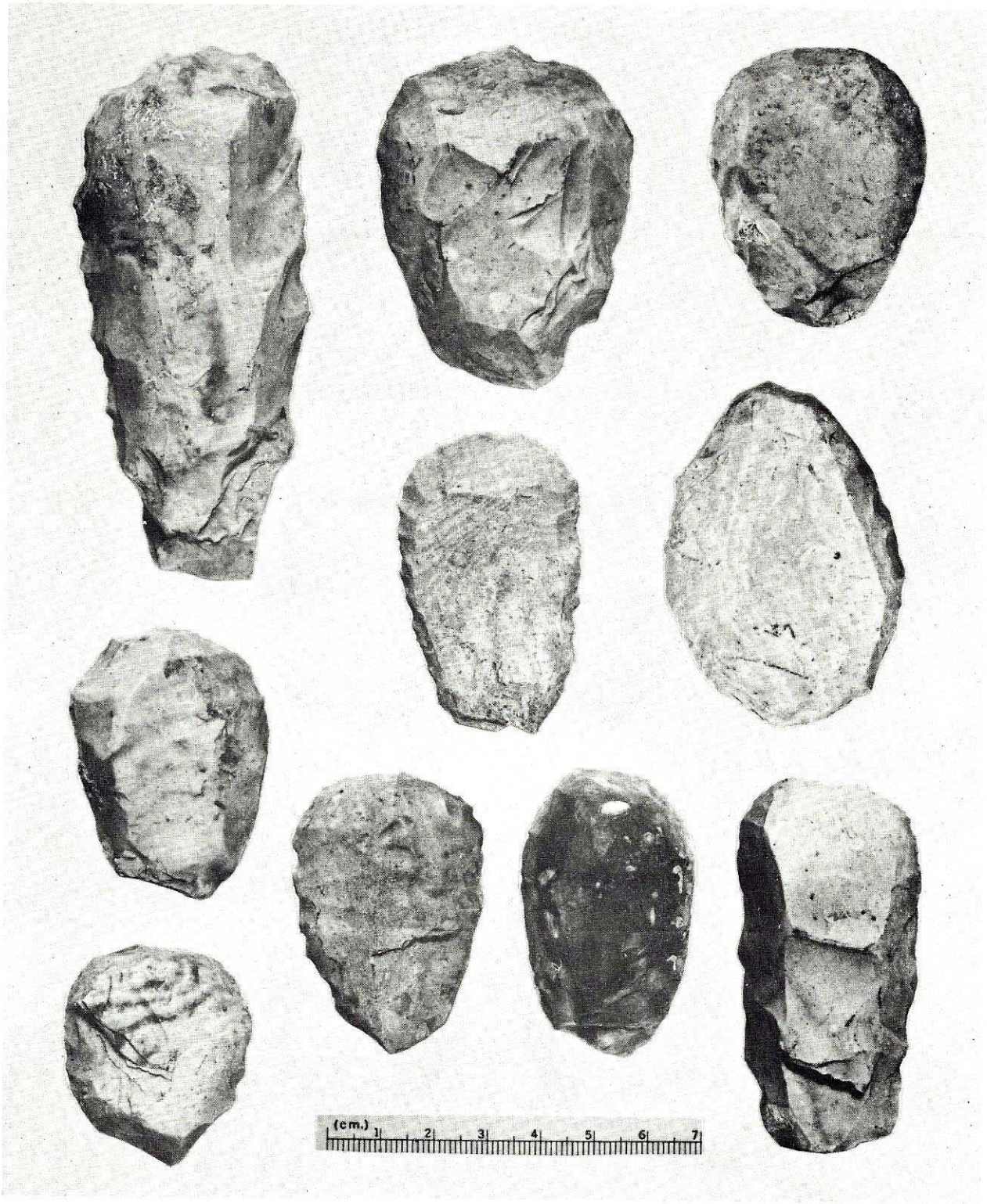


Figure 32. Ka-3 (Deer Creek Site) Plano-convex End Scrapers.

The second type of stone ornament, the crinoid stem bead, is represented by 10 specimens, each of which consists of one or two columnals. No positive evidence of wear or polish is detectable. The specimens are weathered, and all have central (natural) perforations. These specimens could well have served as beads. R. K. Harris (personal communication, 1973) notes that beads of this type are often found on Norteño focus sites.

Bone and Shell Tools and Ornaments

A large quantity of scrap bone was found at the Deer Creek site. Although species identification has not yet been undertaken, the majority appears to be bison bone. Deer bone represents a distant second, and other species are represented in small quantities. Bone preservation is generally quite good whereas the occasional recovered shall (mussel) is in poor condition.

Only a portion of the faunal material found has been examined. A number of tool forms and ornaments have been noted in the processed material. The largest tool number is represented by blade fragments from at least 8 bison (?) scapula hoes (Figure 34: 3, 4; Figure 35: 2). One such fragment appears to have the letters "PA" rusted on it (Figure 35: 2). The bone is flaky here, and it is possible that part of the rust has flaked off leaving these "initials". The significance of this "mark" is not known; no instance is known to this author in which lettering on an iron tool is reversed (mirror image), it is assumed that the resulting apparent letters are a freak accident. Several other scapula fragments appear to have served as knives (Figure 34: 1, 5). Knives of this form are referred to as squash knives (Wyckoff, personal communication, 1973). Awls made of bison neural spine were also found at Deer Creek (Figure 34: 2). The Norman Hiatt collection contains a section of a bison rib rasp.

One distal section of a deer cannon bone is highly polished, suggestive of possible use as a shaft wrench. One large deer(?) antler shaft has been cut at both ends, and the larger end shows extensive wear (Figure 35: 1). This piece probably served as a baton used in flint knapping. Part of a thin (2 mm.) bone pendant--possibly made from a rib--was found (Figure 35: 7). One very small cylindrical bone bead, probably made from a rodent bone, was found (Figure 35: 6). Other bone artifacts were also recovered with cut marks or other modifications.

One mussel shell scraper occurs (Figure 35: 3). An Olivella shell, the spire of which had evidentally been removed to facilitate use as a bead, is represented (Figure 35:5). The Norman Hiatt collection contains several Olivella shell beads and a mussel shell pendant with two small perforations near the end. One other worked shell fragment, apparently of marine shell, was also recovered.

Human Skeletal Remains (Figure 35:4)

One human bone, a fragmentary right femur, was found. Both ends of this well-developed femur have been broken exposing the central medullary cavity. The distal end is broken just proximal to the epiphyseal plate. The lesser trochanter is present and is fused to the shaft without a detectable epiphyseal line. The greater trochanter is missing, exposing the epiphyseal plane. The neck of the femur is short, and its angle with the shaft is roughly 120°. The upper part of the head and neck are missing, exposing the axis of the neck. The remnant of the femoral head is joined to the neck with a barely detectable epiphyseal line. The articular surface of the head fragment is smooth. The linea aspera is clearly marked without osteophytes. The suggested bone age of this individual (based on a European Caucasian population) is just greater than 18-19 years old (Warwick and Williams 1973:364). As both ends are broken, an accurate measurement of the length of this bone is not possible. However, this femur is extremely short for an individual of this age. No pathology is evident. Several light striations (cut marks?) are present immediately below the neck.

Miscellaneous Artifacts

A number of less distinctive artifact forms were also found at Deer Creek but will not be described in any detail. Some of these other forms are mentioned here. Two drill fragments, one of the expanded base variety, were found (Figure 42:17-18). The presence of a number of scraper types has been noted. Also recovered were cores, chopper fragments, perforators (Figure 42:13), and a wide variety of flake tools (both intentionally worked and incidentally flaked). A charred corn cob fragment, and corn grains were found; these will be described in a later presentation. Clay items included small lumps of baked clay, several small pieces of daub, and several probable figurine fragments.

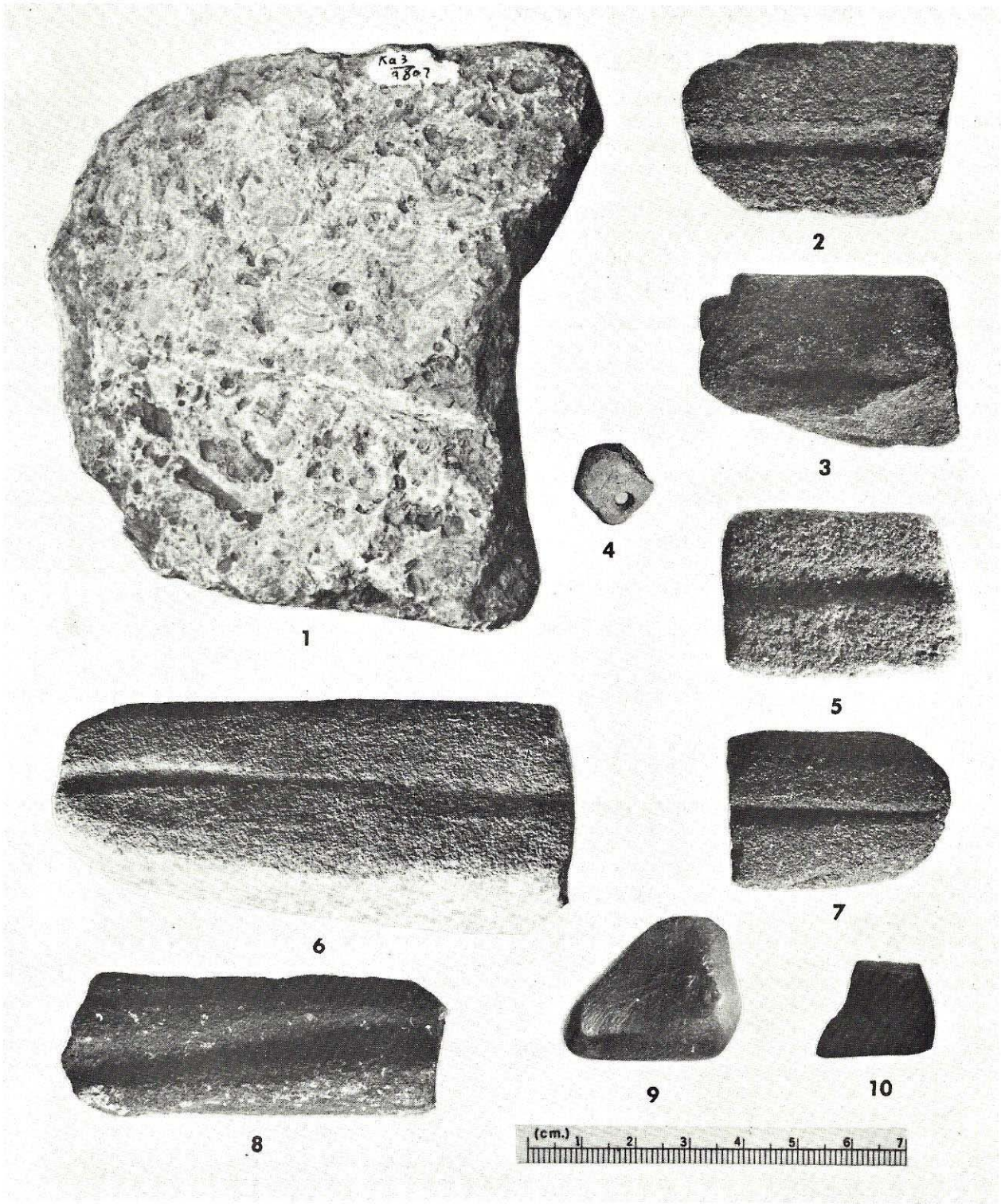


Figure 33. Ka-3 (Deer Creek Site) Ground Stone Artifacts:
1. Mano section. 2,3,5,8. Shaft smoothers. 4. Pendant fragment.
6-7. Shaft smoother and awl sharpener. 9-10. Scraped hematite.

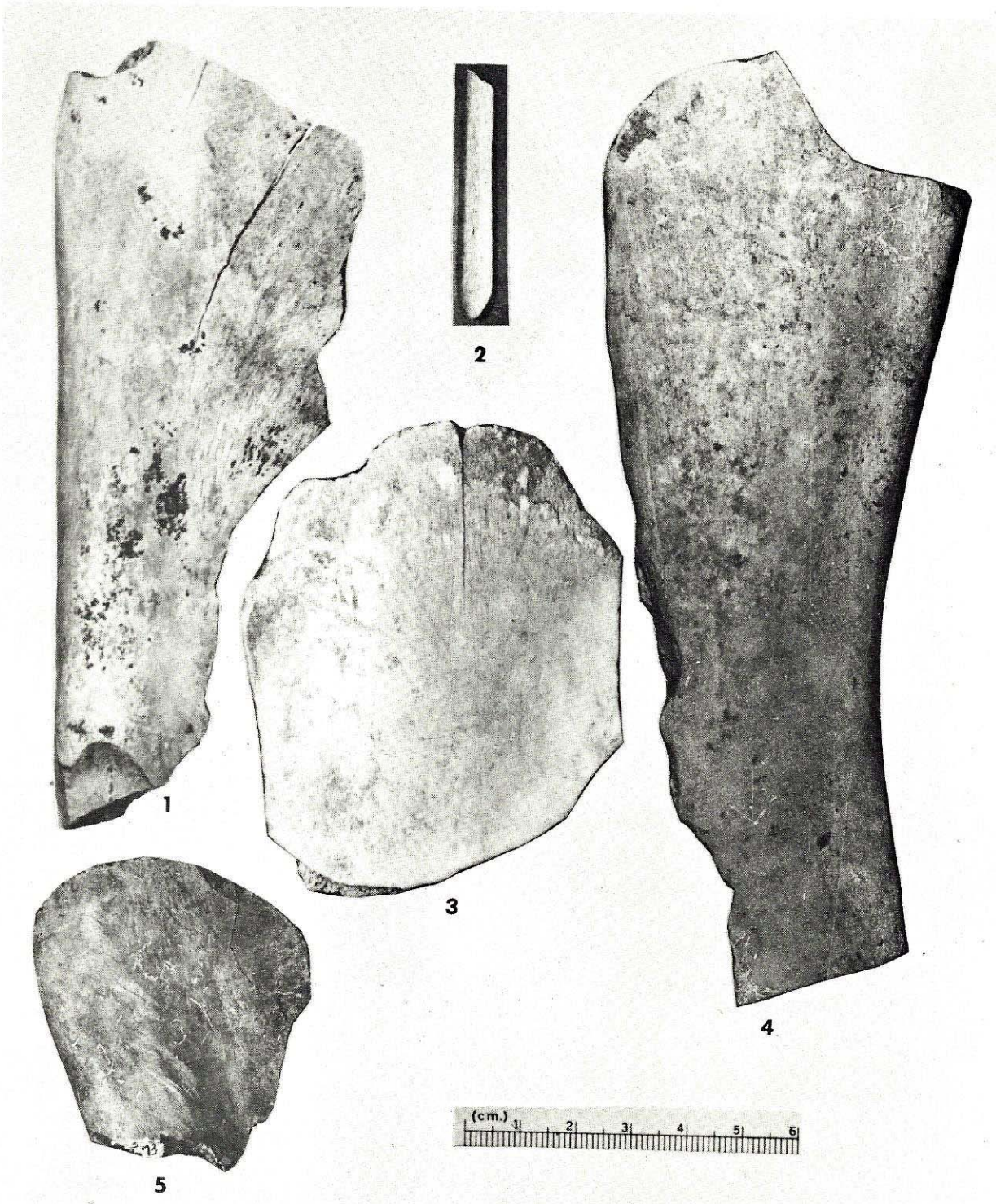


Figure 34. Ka-3 (Deer Creek Site) Bone Tools:
1,5. Squash knife sections. 2. Bison neural spine awl section.
3,4. Scapula hoe sections.

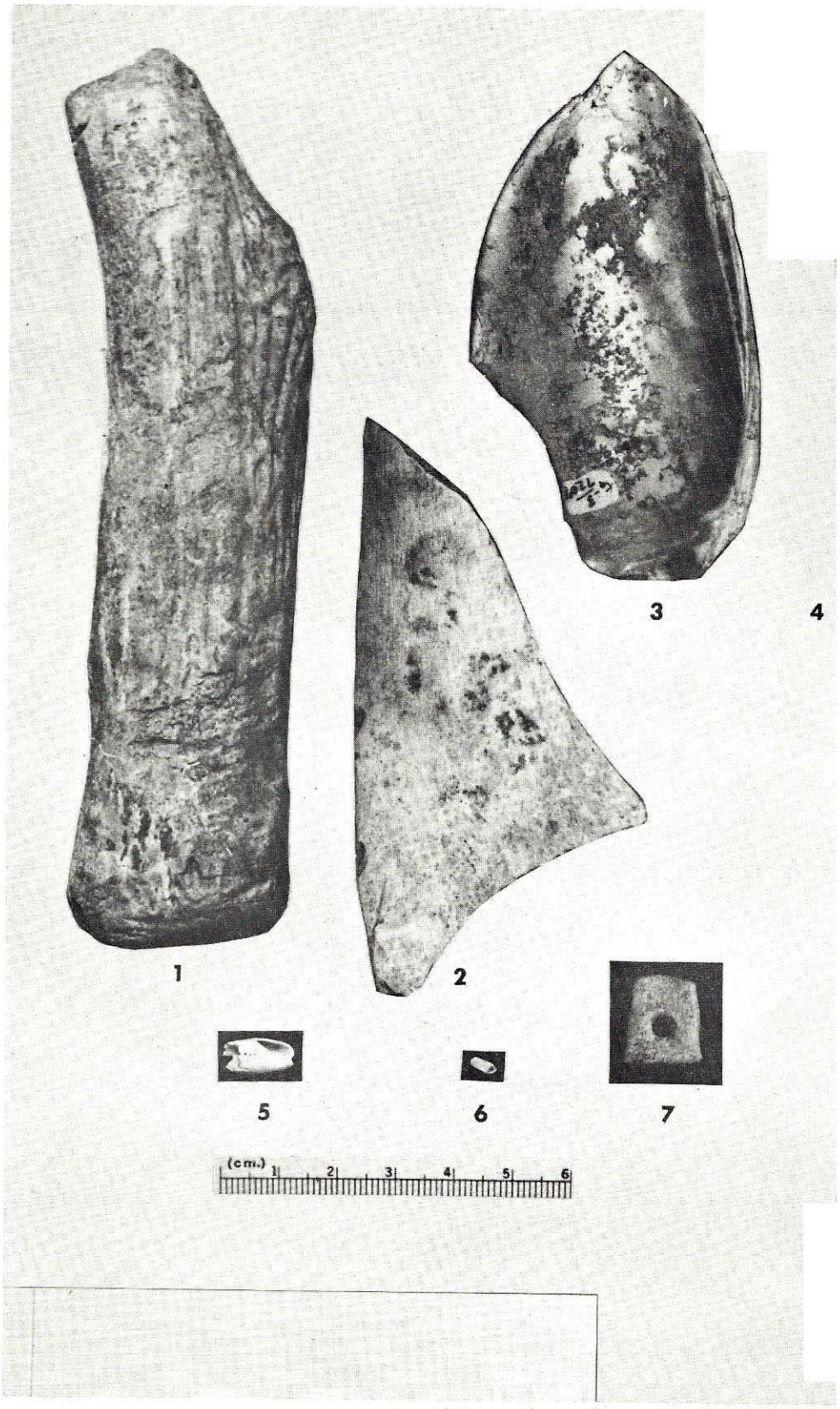


Figure 35. Ka-3 (Deer Creek Site) Bone and Shell Artifacts:
1. Antler flint knapping baton. 2. Scapula hoe section.
3. Shell scraper. 4. Human femur. 5. Olivella shell bead.
6. Cylindrical bone bead. 7. Bone pendant section.

Lithic Debris

A large number of flint types were found at Deer Creek, several of which I could identify. Other identifications were made by Don G. Wyckoff and John D. Hartley, with a large number being made by Larry Banks. A representative sample of exotic flints was separated from the remainder of the artifact sample and flake debris and submitted for identification. Thus, tabulations of relative frequency, and of occurrence in various artifact types, are not made. Also, it is conceivable that additional types will be recognized in the future. By far the most prominent stone type present is Kay County flint. It occurs in both heat treated and non-heat treated forms, and makes up at least 85-90% of the lithic material at the site. Also, other related varieties from the Flint Hills were noted. Perhaps the material farthest from its source is represented by two pieces of obsidian.[2] Exotic cherts and flints of the following types have been identified: Alibates, Boone (heat treated and non-heat treated), Shidler, Peoria, Frisco, Knife River, Woodford, Cresswell chert (heat treated, Winfield Formation), Bolivar chert, Arkansas novaculite, Edwards Plateau (blue-grey), Edwards Plateau (dark translucent chocolate brown), Tecovas jasper, Neva chert, Smoky Hills jasper, Lowrance flint (gray), Keokuk(?), New Braunfels chert(?), agate, quartz, quartzite, silicified wood, and materials from the river gravel. Other stone types noted were galena, malachite, catlinite, hematite, limonite, limestone, and sandstone.

Several times during the native artifact description, observations pertaining to the general lithic technology at Deer Creek--particularly as it pertains to the use of Kay County flint--have been made. Primarily these comments have to do with heat treatment of Kay County flint, a problem which has received increased attention in the past few years primarily to to Oklahoma River Basin Survey activity in the Kaw Reservoir area. Although no extensive tabulations of traits of various artifact and flake forms have been prepared, some general comments pertaining to the Deer Creek site occupants' utilization of Kay County flint will be made based on observations of this Kay County flint sample. Scrapers tend to be large and numerous at Deer Creek. The vast majority of the large Kay County flint scrapers have not been heat treated. Frequently (perhaps 50%), these so called "turtle-back" scrapers have residual cortex on their back (Figure 30). A noticeable number of the scrapers without cortex have a large flake scar(s) on their dorsal aspect suggesting that the cortex was removed (Figure 32). The majority of scrapers, both with and without cortex, are non-heat treated. Fully 90% of the Kay County flint Fresno points from Deer Creek are heat treated. Four out of 5 of the point preforms are not. The few distinct cores examined are non-heat treated.

In general, the larger flake debris tends to be non-heat treated whereas the smaller is about half and half. Cortex is present on a number of these small flakes; the trend in these flakes is non-heat treatment. In non-cortical small flakes, the number of non-heat treated vs. heat treated specimens appears to be roughly even. In this discussion, these observations are not exclusive sweeping statements; they are impressions received upon a cursory examination of thousands of artifacts and flake debris.

Briefly, what suggestions can be made regarding the Kay County flint knapping technology at the Deer Creek site based on the above observations? First, it is conceivable that some Kay County flint nodules were used in the manufacture of scrapers, and others for small, more finely flaked tools. Although the Kay County flint quarries are close, such a process seems somewhat questionable. There are at least two other possibilities which seem more practical.

Hide scrapers are common at Deer Creek, and most are non-heat treated. Seemingly, they were turned out rapidly, and little care was taken in their manufacture. One possible explanation for the apparent overall heat treatment pattern is that Kay County flint nodules were brought from the quarries to the site. Then, the outermost layer was removed, and the large resulting flakes--with cortex on their outer surface--were used to make hide scrapers. Thus, the scrapers and coarse cortical flakes were non-heat treated. Then, the remaining nodule heart, or flakes struck from it, could be heat treated and used as raw material for finer worked pieces such as projectile points, knives, and gunflints. An alternative possibility is that the nodules could have undergone processing at the quarry, and this possibility is supported by the vast amount of debitage present at various quarry sites. There is no way to guess whether such a method would result in bringing finished scrapers and "nodule heart" cores to the site or perhaps just the rough useable large outer flakes and innermost core or useable flakes. In any event, by these suggested explanations the small non-heat treated cortical flakes would most likely be the result of either scraper manufacture or resharpening. It appears probable that only flakes and/or

2. A small amount of obsidian was found on Great Bend Aspect sites (Wedel 1959:577).

blanks were heat treated and not cores. Definitely, it appears that entire nodules were not heat treated.

Potsherds

Resident Potsherds

Resident pottery is that pottery felt to have been made at the site from local clay sources. A total of 3645 sherds from the Deer Creek site are felt to fit in this category. All but 15 of these sherds are predominantly shell tempered, occasionally having a small amount of sand present, and are believed to be of 18th century manufacture. Although these 15 specimens are quite unlike the bulk of the resident sample, the fine compact paste appears the same so these are included in the resident category (the paste actually appears slightly more compact which is probably due to the lack of heavy shell tempering). One sand tempered rim sherd, ranging from 8 to 11 mm. thick, was found. Judging from the curvature of the lip and rim, this was probably a neckless vessel with a profile oriented as illustrated (Figure 36:1, 2). Horizontal incised lines are present immediately below the lip on interior and exterior surfaces. The sherd surface is covered by diagonal lines which have been partially smoothed over. These lines could be "comb" marks or possibly heavy brush marks; the sherd is not cord-marked. Two sand tempered body sherds with the same surface finish were also found (Figure 36:3, 4). Another thick (12 mm.) compact paste sherd with sand temper was recovered. Its exterior surface exhibits light brush marks. The color of these sherds ranges from grey to black. One very thick sherd (10.5-17 mm.) with the same paste and coarse sand temper was also found. The exterior of this sherd is smooth, and the sherd is probably part of a base.

The sixth is a dark grey body or basal sherd. It is somewhat friable and has an irregular outer surface (8-10 mm. thick). This piece has heavy sand tempering as well as a few pieces of limestone. A small amount of shell is present; this is unusual in that all the recognizable fragments are from snail shells. Four other sherds have a very small amount of shell temper present, and are predominantly fine sand tempered. Interiors and exteriors range from black to orange. The sherds are from 5 to 8 mm. thick. Two other sherds with very compact paste and a minute amount of shell temper have black interiors and cores and an orange (fireclouded) exterior which appears to have been slipped. These sherds are 5 to 6 mm. thick. The thirteenth specimen has smooth grey surfaces, grey core, and is sand tempered. Another specimen is a 6 mm. thick fine sand tempered rim sherd with light diagonal incisions across the round lip. The final specimen is a very small, shell tempered cordmarked sherd.

The other 3630 sherds are all predominantly shell (mussel) tempered with occasional sand inclusions. The general vessel form description is based on a sample of 203 rim sherds (not including rim sherds with handles intact), 84 other sherds including the vessel neck, 65 handles, handle fragments, and handle attachments, and 94 basal sherds. General vessel form appears to be globular to amphora-like with constricted neck and vertical to flaring rim. Rim height varies from at least 12 to 40 mm. The neck and body are roughly the same thickness with rim thickness gradually tapering down toward the lip. The lip varies from expanded to the same thickness to tapered, and lip cross section varies from slightly pointed to rounded to flat. A variety of rim profiles representative of the general sample are given (Figures 36, 37). Of the recognizable basal sherds, all but 7 are flat. These 7 are slightly convex. Interior and exterior surfaces range in color from dark grey to buff with some sherds being oxidized to an orange color; the buff and greys predominate. Cores are grey to black; the paste is generally fine and compact, and the surfaces are occasionally chalky to the touch. Wyckoff (1964:14) relates that 10 to 50% of the paste is shell. Of the 65 handles, handle fragments, and points of handle attachment, 19 are too incomplete to be diagnostic about shape. Of the remaining 46 pieces, 7 appear to be from loop handles, and the rest are from strap handles. Two types of strap handles are present. The two complete specimens (Figure 38:1, 2) are of the tapering strap handle variety (where the handle narrows considerably between where it arises at the lip or rim, and its point of attachment below the neck). In the other strap handle variety, the strap remains essentially constant in width. At least 27 of the 39 strap handle sections are of the tapered variety. Of the 12 rim sections with handles attached only 2 handles did not arise from the lip. Their origin was immediately below the lip on the rim (Figure 38:4). The handles are welded to the lip (rim) and riveted at the shoulder.

The surface finish employed on the vessel body often did not extend higher than the neck. Of the 3184 body sherds, 259 were too badly weathered or too fragmentary to accurately determine exterior surface finish. Generally, interior surfaces of all of the sherds were either roughly smoothed, brushed or scraped. Nine different exterior surface treatments were recognized. These treatments and the number of body sherds representing each were: plain (1682; 57.5% of diagnostic

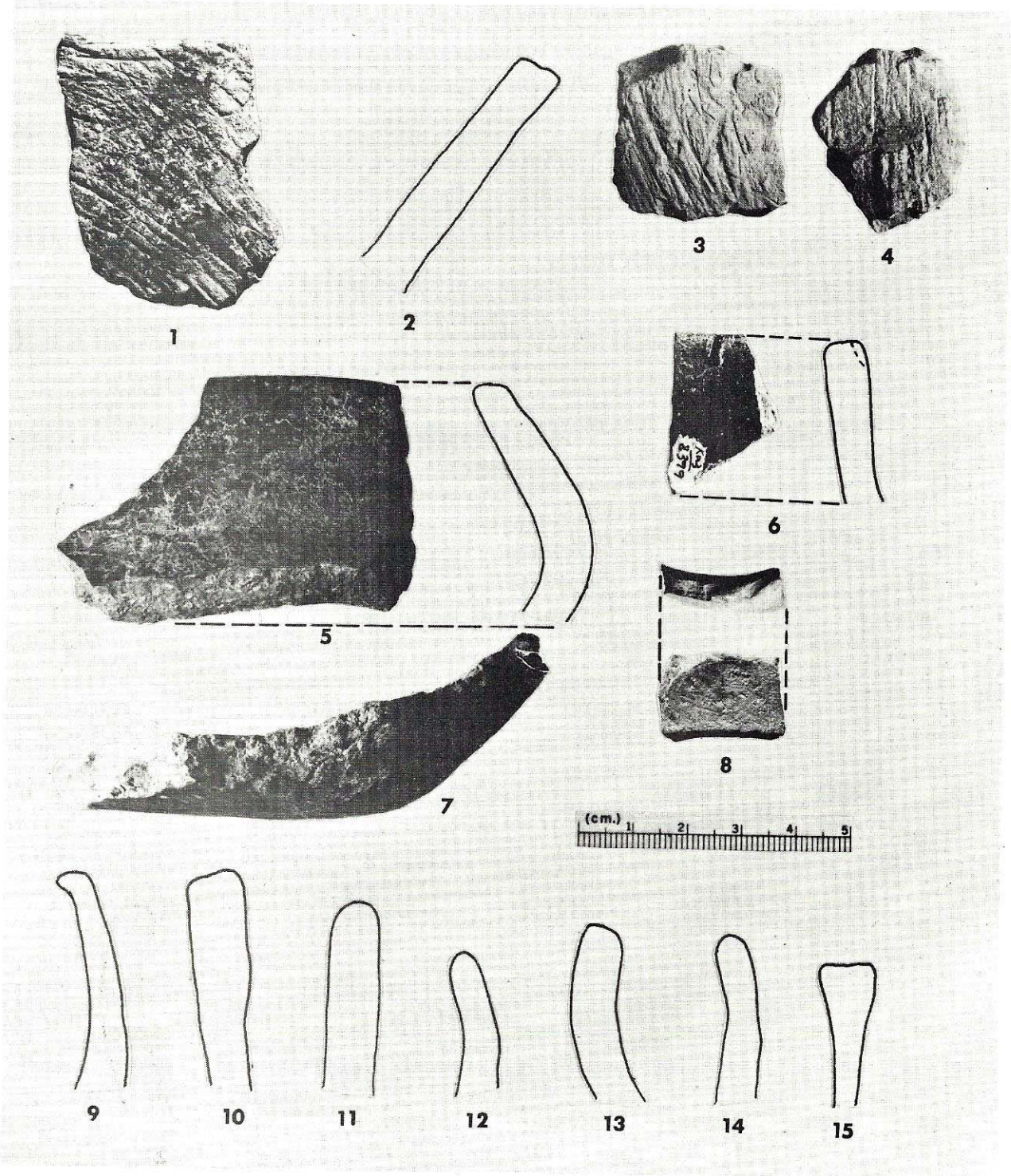


Figure 36. Ka-3 (Deer Creek Site) Potsherds:
1,3,4. Combed(?) surface treatment. 2. Profile of 1. 5. Plain rim sherd. 6. Punctated rim sherd (interior). 7. Basal sherd. 8. Punctated rim. 9-12. Profiles of plain rim sherds. 13-15. Profiles of brushed rim sherds. (exterior sherd surface to left in profiles)

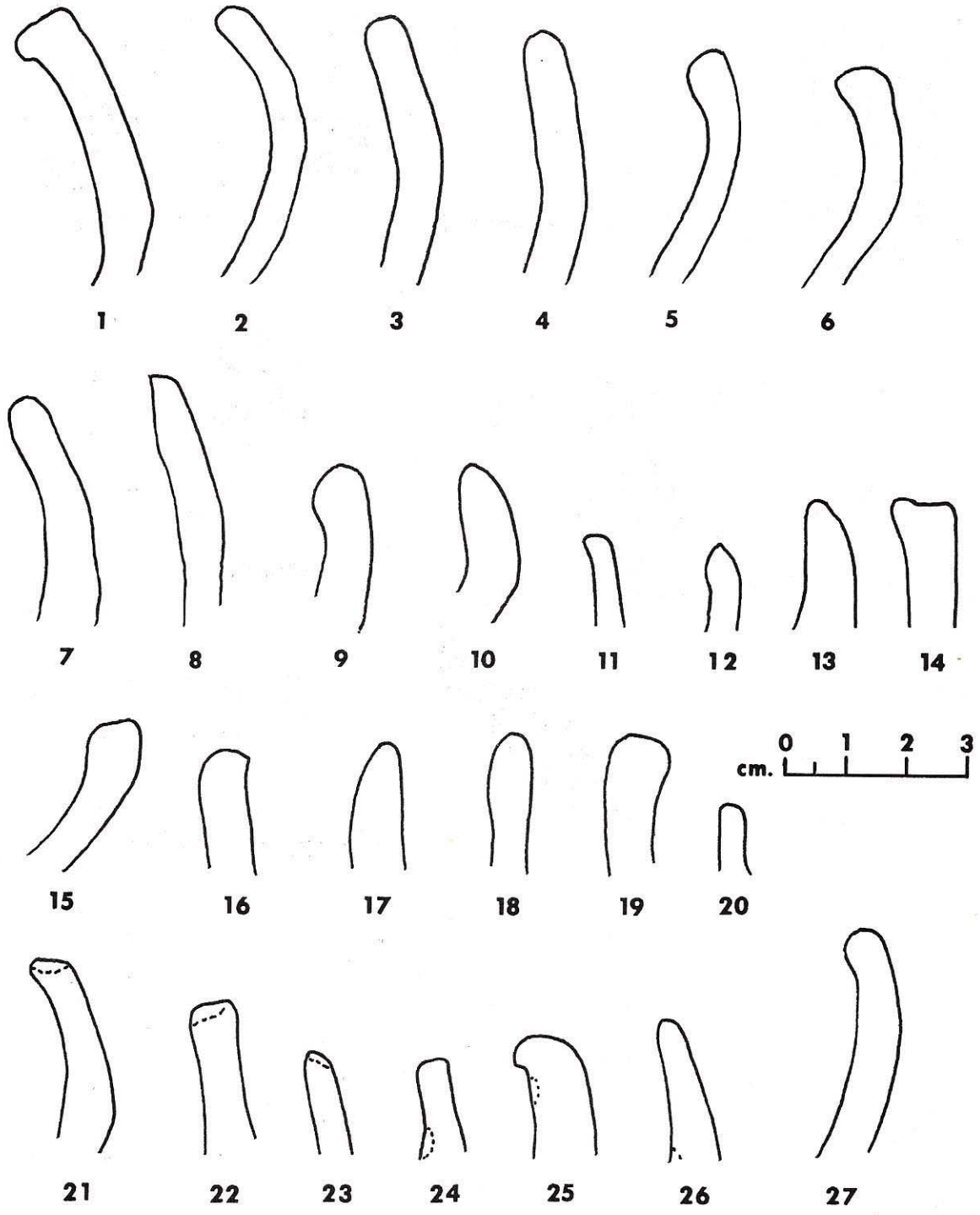


Figure 37. Ka-3 (Deer Creek Site) Rim Sherd Profiles:
1-12. Brushed. 13-14. Smoothed. 15-16. Simple Stamped. 17-20. Slipped.
21-23. Fingertip Indented. 24-26. Punctated. 27. Textured. (exteriors to left)

body sherds), brushed (469; 16.0%), smoothed (305; 10.4%), simple stamped (282; 9.6%), slipped (62; 2.1%), punctate (2; 0.1%), "painted" (49; 1.7%), incise (22; 0.8%), and texture (51; 1.7%). Based on the total sherd sample available, it appears that the majority of surface treatments were applied to the same general vessel form. The only deviation of form possibly present appear to be several small neckless bowls (Figure 36:13; Figure 37:17, 19). One other surface treatment noted on one specimen was appliqued (Figure 41:5). This sole specimen is too fragmentary for comparison to currently established types.

A plain surface finish is the predominant finish (57.5%) on Deer Creek body sherds (Figure 36:5, 7, 9-12). Also, 86 rim sherds (42.4% of the rim sherds), 21 neck sherds (25%), and 48 basal sherds (51.1%; 3 round, 45 flat) have a plain surface finish. The range of thickness of these sherds is: body (5-10 mm.), rim (4.5-9 mm.), neck (4.5-10.5 mm.), and base 5-16 mm.). The general plain vessel description taken from the general sherd sample is very similar to Cowley Plain as described by Wedel (1959:359-362). The primary differences are seen in the handles; these are, the higher incidence of strap handles, the tapering strap handles, the lack of angular nodes, and the practice of attaching the handles to the lip on Deer Creek site vessels. The basic similarity of Deer Creek plain sherds to Cowley Plain was previously noted by Wyckoff (1964:14). However, due to the above differences (as well as the presence of other surface finishes not noted at Lower Walnut Focus sites), this common Deer Creek vessel type is currently considered a distinct form from Cowley Plain.

Brushed sherds represent another common form of exterior surface treatment seen at Deer Creek. The illustrated specimens are extreme examples of this finish, since the more numerous but less obvious examples don't reproduce well (Figure 39:1, 2). This surface treatment was noted on 16% of the body sherds and was also present on 81 (39.9%) of the rim sherds, 40 (47.6%) of the neck sherds, and 24 (25.5%; 22 flat, 2 round) of the basal sherds. The range of thickness of these sherds is: body (5-11 mm.), rim (5.5-9 mm.), neck (4-9 mm.), and base (flat, 6-15 mm.; round, 7-10 mm.). Also, 12 handle fragments or points of handles attachments (representing all three handle types) have been brushed. This surface treatment occurs occasionally over some of the other surface treatments described later. Vessels employing this surface treatment were evidently of the same form as the plain wares. One possible bowl was noted (Figure 36:13).

Smoothing was the third surface treatment noted. This technique was observed on 10.4% of the body sherds, 7 (3.4%) of the rim sherds (Figure 37:13-14), 5 (6%) of the neck sherds, and 17 (18%; 15 flat, 2 round--one of which is over simple stamped) of the basal sherds. The range of thicknesses of these sherds is: body (4-12 mm.), rim (5-10 mm.), neck 6-9.5 mm.), and base (round, 12-13 mm.; flat, 5-15 mm.). Also, several neck and rim sherds categorized as brushed were noted to have smoothed bodies. One tapering strap handle is smoothed although this could well represent use polish. Perhaps polished would be a better descriptive term here although "smoothed" is used in order to distinguish between this treatment and that seen in the trade sherds. The trade sherds are slick and have a high gloss. The smoothed sherds under discussion here have been noticeably smoothed down and are capable of reflecting some light. Considered alone, these resident sherds would be considered polished. Compared to the trade sherds, they are appreciably smoothed.

Simple stamped sherds accounted for 9.6% of the body sherd sample at Deer Creek. A similar surface finish was noted on a Gilbert site shell tempered vessel (Story et al. 1967:150-152). This surface treatment was previously noted and described by Wedel (1959:237-239) in his description of Geneseo Simple Stamped. The Little River Focus sherds of this type were all sand tempered (ibid.:233). On the three restored vessels, the corrugations extended to the lip in two cases and terminated at the neck on the third vessel (ibid.:237). At Deer Creek, this surface treatment was noted on 3 (1.5%) rim sherds (Figure 37:15-16) where it extended to 10-15 mm. from the lip, and on 12 neck sherds (14.3%) where the corrugations stopped at the neck on only two. Thus, it is conceivable that some of the plain or even brushed rim sherds actually belong to this particular vessel type. Four body sherds with handle attachments are simple stamped; on one with a rim the corrugations extend only to the neck. The corrugations on the neck and rim are generally perpendicular to the lip. Five flat basal sherds are corrugated, four having corrugations perpendicular to the base. With the exception of brushed, smoothed, and one punctated specimen, all the other handle sherds are of plain finish. Again, illustrated specimens of this surface finish are extreme examples (Figure 39:3-13; Figure 40:1-4). The corrugations on most of the specimens are not nearly so obvious. The range of thicknesses for these simple stamped sherds is: body (4-11 mm.), rim (6-9 mm.), neck (6-11 mm.), and flat base (7-12 mm.).

Sixty-two sherds (2.1%) are slipped. These body sherds range from 4 to 11 mm. thick, and have an orange to reddish-orange slip on their exterior surface (Figure 40-16). This slip is

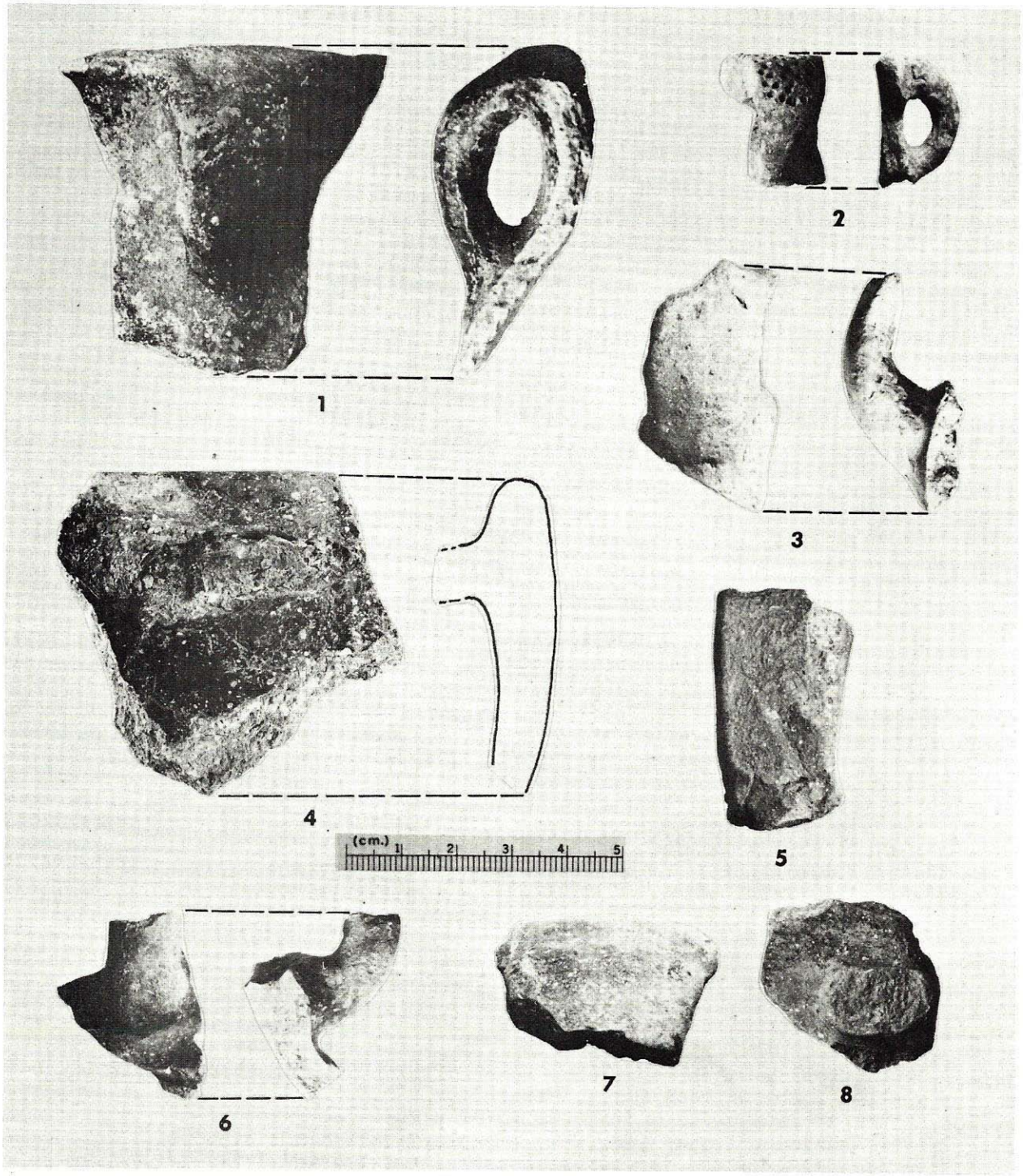


Figure 38. Ka-3 (Deer Creek Site) Pottery Handles:
1,2,7. Tapered strap handles. 3-5. Strap handles. 6,8. Loop Handles.
(exterior surface to left in 2, 6; to right in 1,3,4)

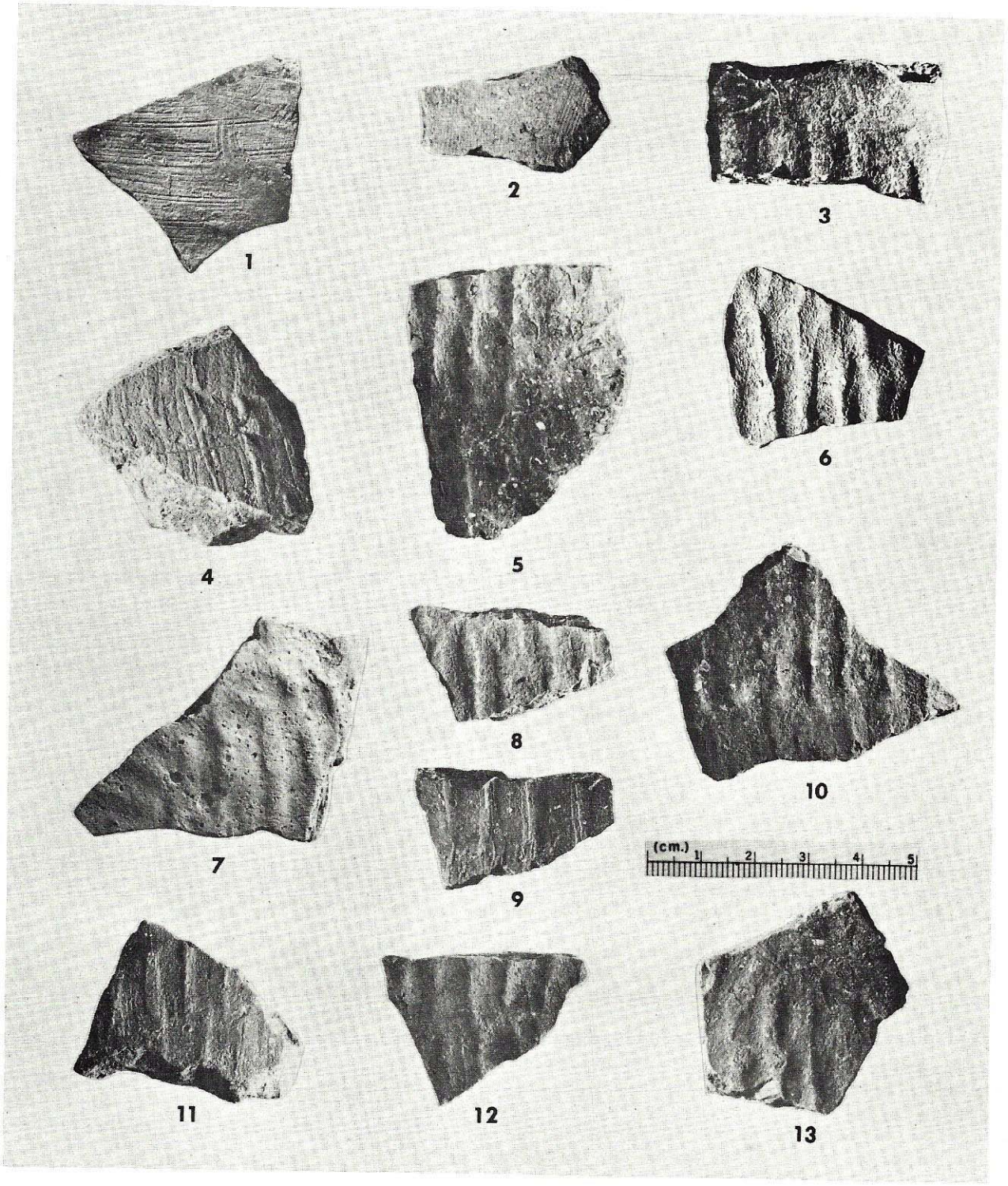


Figure 39. Ka-3 (Deer Creek Site) Potsherd Surface Finishes:
1-2. Brushed. 3-13. Simple Stamped.

generally rather thick although several specimens were noted where it is a thin film. Identification is somewhat difficult as some resident sherds have been oxidized to roughly the same orange color. Plain, brushed, smoothed, and textured surface finishes have been applied on the slip. Nine (4.4%) slipped rim sherds, (with a maximum thickness of 11 mm.), were found (Figure 37:17-20), several of which are also slipped on the interior of the rim. In general, these slipped rim sherds appear to be somewhat shorter and thicker than those of other surface treatments. Four neck sherds, (ranging from 6.5 to 11 mm. in thickness) were found. Two handle fragments, one loop and one undiagnostic, were found. Vessel form is uncertain although neck and handle sherds suggest a relationship to the previously described general Deer Creek vessel form. However, several rim sherds are suggestive of small neckless bowls (Figure 37:17, 19). A sand tempered red filmed vessel type designated Geneseo Red Filmed noted on Little River Focus sites has been described (Wedel 1959:241). The type Avery Engraved has a red film (Suhm and Jelks 1962:1-4), and several Avery Engraved sherds were found at the Womack site (Harris et al. 1965: 301). While the Deer Creek sherds are definitely of resident manufacture, the origin of the slipped treatment is uncertain although its roots probably lie to the north.

A total of 20 sherds employing 7 distinct varieties of punctation were found. Only 2 of these were body sherds (0.1%), and they have fingernail punctations. Both have a series of individual punctations oriented parallel to each other in a linear array (Figure 41:3). On one specimen a second set of punctations meet the first at roughly a 60° angle. Three fingernail punctated sherds from one feature were found at a Lower Walnut focus site: the one illustrated had multiple rows of punctations and was believed to be an exotic sherd (Wedel 1959:363-364). Several fingernail punctated rim sherds were noted on Little River focus sites (ibid.: 239, 304, 341). One rim sherd with fingernail punctations around the neck was found at Deer Creek (Figure 41:1). A second sherd, apparently from the same vessel, also has a row of punctations at the neck (Figure 41:2). The last mentioned sherd has a maximum thickness of 12.5 mm. These specimens are all shell tempered and have a paste very similar to the resident sherds. Whereas in the other resident sherds the visible shell particles are practically all oriented parallel to the vessel surface (except where the handles are riveted and welded), the shell temper orientation in these two sherds in random. Also, the broken edges are much more irregular than the general resident sample. The presence of shell tempered pottery with fingernail punctations around the neck quickly brings to mind Emory Punctated (Harris, et al. 1965:299-301; Story et al. 1967: 136-139). Not enough diagnostic sherds were found at Deer Creek to determine if incising was associated with this form of decoration. Several very small body sherds with fingernail punctations were also noted. As I have never personally examined Emory Punctated sherds from a Norteño site, I can't conclusively say if these four sherds are resident Deer Creek sherds or similar appearing trade sherds. I tentatively assign them to a resident manufacture, and suggest that they may represent evidence of Norteño influence on resident potters at Deer Creek.

A second form of fingernail punctated ware was also noted. This technique was applied to the rim. The punctations are not as sharp as in the previous type. They are generally parallel to the rim, and the fingernail appears to have been drug slightly leaving a shallow elongated oval depression. On the three rim sherds exhibiting this treatment, the punctations occur in groups of 5 to 9 which form a gentle arc (convex side up). On one, the two ends of each arc are connected by a linear sequence of the punctations. The ends of adjacent arcs are up to 6 mm. apart, and the arcs themselves range roughly from 35 to 50 mm. long.

Punctation was the most common form of rim decoration employed by the 18th century potters at Deer Creek. Another form of punctation noted consisted of small round punctations. This decoration was noted on one rim sherd (Figure 41:4) and one complete tapering strap handle (Figure 38:2). Vessel form of the rim sherd is uncertain although it may represent a small bowl. The handle is from a plain finished vessel. A single specimen, apparently from a small vessel, exhibits broad diagonal punctations across the lip (Figure 36:8). Three small rim sherds have short broad diagonal punctations beginning 7 to 21 mm. below their lips on the exterior surface (Figure 37:24-26). Four rim sherds and 2 handle sherds with rims still attached exhibit fingertip indentations of the lip (Figure 37:21-23). One rim sherd has a wide vertical punctation on the inner aspect of the lip and rim (Figure 36:6).

Forty-nine (1.7%) body sherds have a painted surface finish. These sherds range from 4.5 to 9 mm. in thickness and have been painted over plain, brushed, smoothed, and simple stamped surface treatments (Figure 40:5-13). All have resident paste and appear to have had a black pigment applied to their exterior surface. The black areas are distinct from fire clouding. Most examples are weathered, and the sherds are too small to determine what design (if any) was used. Although the possibility of contact and stain from decaying organic matter cannot be excluded, it appears that these are resident sherds which were painted. The dark areas vary from fine lines and triangular projections to large shapeless blobs. It is possible that these

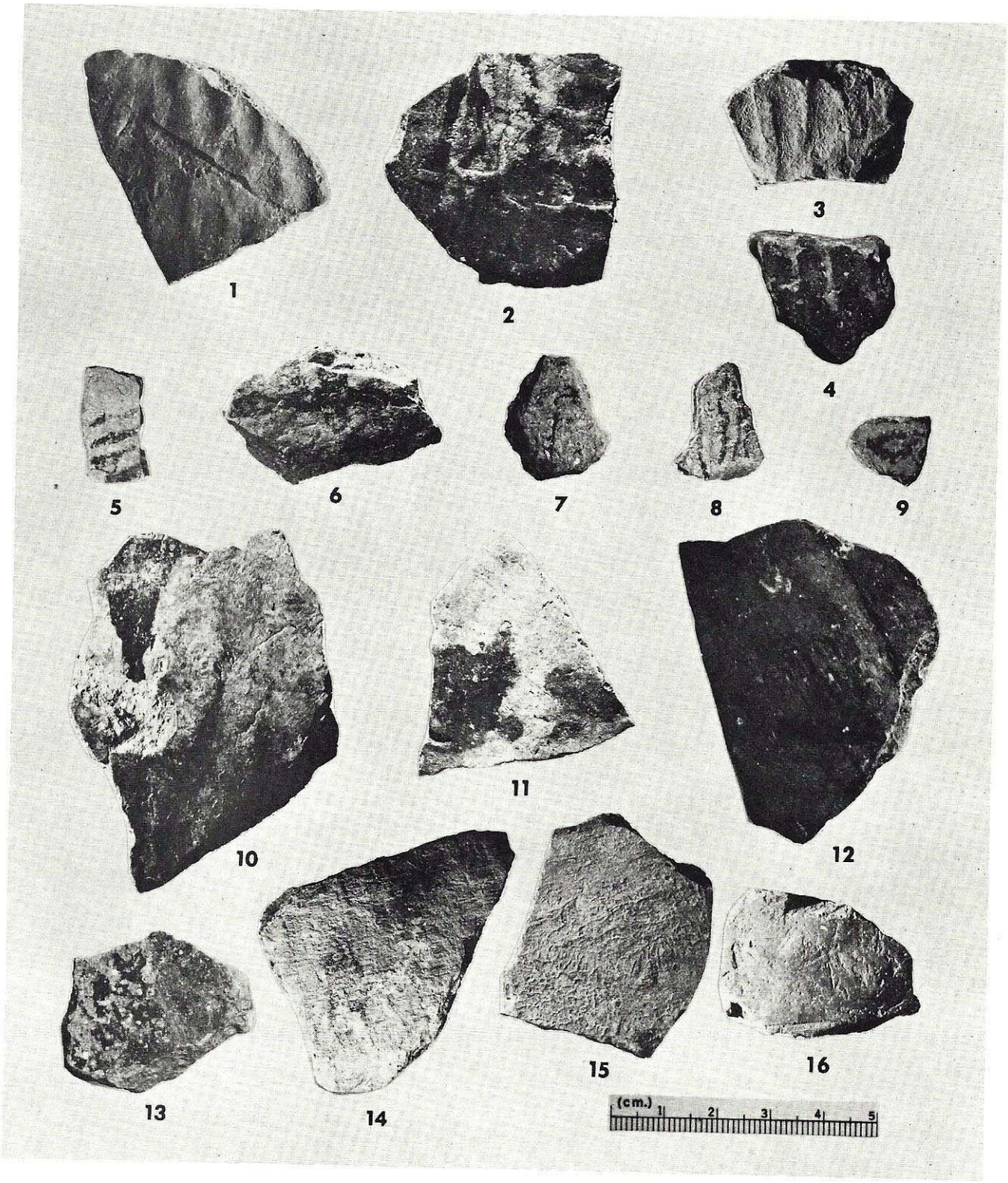


Figure 40. Ka-3 (Deer Creek Site) Potsherd Surface Finishes:
1-4. Simple Stamped. 5-13. Painted. 14. Brushed over Simple Stamped.
15. Textured. 16. Slipped, smoothed.

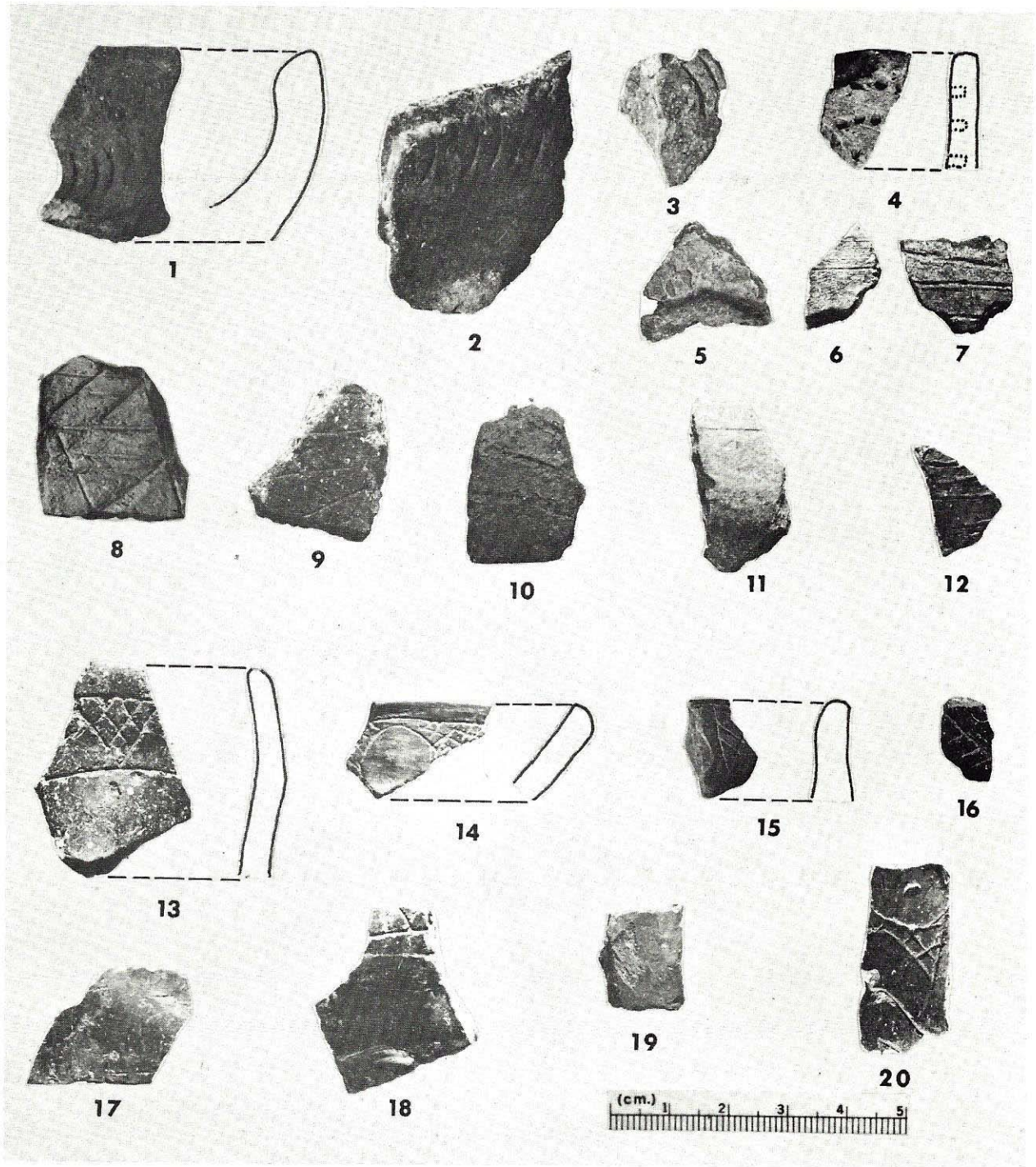


Figure 41. Ka-3 (Deer Creek Site) Potsherds:
1-3. Fingernail punctated. 4. Punctated. 5. Appliqued. 6-12. Resident incised. 13-18. Womack Engraved (trade) sherds. 19. Polished (trade?) sherd. 20. Engraved trade sherd from water bottle neck.

sherds conceivably represent influence of southwest contact on the resident potters. One possible example of painting, a brown line and spots on a vessel interior, was noted for a Great Bend Aspect site (Wedel 1959:243). Also, "'dabs and smears' of black" have been noted on sherds from 18th century Texas Mission sites (ibid., 506). This pottery type, designated Rockport Black-on-gray, has been described (Suhm and Jelks 1962:131-132) and shares a number of similar traits with the Deer Creek sherds. The definite relationship between these two samples is uncertain. It should be noted that the origin of Rockport Black-on-gray is not known although it appeared by A.D. 1400. The painting on these specimens was done with asphaltum.

Twenty two (0.8%) miscellaneous incised body sherds (ranging from 4 to 10 mm. thick) were recovered (Figure 41:6-12). In all cases, the incised elements are lines, and these are usually parallel when more than one occurs per specimen. These lines range from narrow and deep to wide and shallow. Identification of these sherds with established pottery types is not currently possible. Incising is almost exclusively restricted to the vessel body. One rim sherd with a non-descript profile has shallow incisions across the lip.

Texturing, the final surface treatment recognized, was noted in 1.7% of the body sherds, as well as on 8 (3.9%) of the rim sherds (Figure 37:27) and 4 (4.8%) of the neck sherds. Rim sherd thickness varies from 6 to 8 mm.; neck sherd thickness varies from 8 to 11 mm.; and body sherd thicness varies from 7 to 11 mm. By "texturing" the surface finish indicated is the same as that achieved in modern day with textured wall paint. On pottery, the result was a basically smooth surface with numerous raised peaks and/or thin ridges of clay (Figure 40:15). Examples of this surface finish are also evident on some simple stamped sherds (Figure 39:6; Figure 40:3) as well as plain or brushed sherds. Texturing as a surface treatment was probably not intentional but an unsolicited by-product of the paddle and anvil technique of manufacture. Presumably clay of the proper consistency would tend to adhere to the paddle as it was lifted from the vessel surface yielding the textured surface effect. Thus, although a distinctive surface treatment when noted, texturing does not appear to be indicative of a different vessel type.

Trade Sherds

Seven sherds definitely attributable to a southern origin--presumably the Red River region--were found. These sherds are fairly thin (4-6 mm.) with varying amounts of shell temper. They are well made, have a compact past, and exhibit a high degree of surface polish. Six of these sherds are specimens of Womack Engraved (Duffield and Jelks 1961:36-39). Two rim sherds appear to be specimens of engraved design A (Figure 41:13 (WR), 15) as do 2 body sherds (Figure 41:16, 18). One rim sherd of engraved design B was also found (Figure 41:14). The sixth sherd has no design but is highly polished and is probably from an undecorated portion of a Womack Engraved vessel (Figure 41:17). The identity of the seventh trade sherd is uncertain. It appears to be from a water bottle neck with a design which is probably Hudson, or possibly Natchitoches, Engraved (Figure 41:20; Suhm and Jelks 1962:81-82, 133-114). An eighth sherd is somewhat thicker than the others (9 mm.), and not quite as well made; however, it has a very highly polished surface, and may be a trade sherd (Figure 41:19).

At least 29%, and possibly as much as 72% of the Womack site sherd sample was of the Womack Engraved type. Several specimens of Hudson and Natchitoches Engraved were also noted (Harris et al. 1965:299-303). It should also be noted that Emory Punctated was present at Womack, and sherds representative of this type were noted in the Deer Creek resident sherd collection. Emory Punctated, Womack Engraved, and Natchitoches Engraved were also noted at the Gilbert site (Story et al. 1967).

Discussion of ceramics: The 15 resident sherds not believed to be of 18th century affiliation do not appear to correspond to Wedel's description of either Little River or Lower Walnut foci sherds. Thus, they are considered to represent a minor prehistoric occupation at Deer Creek. The other resident sherds appear to represent a distinct ceramic tradition and are being relegated to an 18th century manufacture. The primary vessel form, although absolute shape cannot be determined since restorable vessels weren't found, appears to fall in the range of those noted for the Great Bend Aspect. Perhaps indicative of Deer Creek vessel form are several globular vessels reportedly from Bryson and now located in the Ponca City Cultural Center collection. Rims are vertical to slightly flaring with lips usually rounded although flat or pointed specimens are occasionally seen. Handles, normally attached to the rim, of both strap and loop varieties occur with tapered strap handles predominating. Bases are generally flat. All are crushed mussel shell tempered, occasionally with sparse sand inclusions. Also, several small bowls were noted. A number of surface treatments were employed. Several of these are distinctive; based on the discussion at the close of this appendix, it is believed these distinct pottery types do not correlate with previously defined samples from recognized cultural entities.

The above cited differences from established types seemingly warrant recognizing several new ceramic types. Perhaps most distinctive are the simple stamped sherds with shell temper. This ware has not been previously defined in the literature, and the name Deer Creek Simple Stamped might be proposed. Attribute descriptions are given above, but these will undoubtedly be improved and, perhaps, enlarged once an excavated sample has been obtained. Obviously an excavated sample will be most integral, since, it will, hopefully, come from contexts that will better provide the temporal-cultural relationships for this ware.

There is also a distinctive plain ware at Deer Creek. It has handle variations from Cowley Plain and also has association with distinctive surface finishes (such as Deer Creek Simple Stamped) not reported from Lower Walnut Focus sites. The Deer Creek variety might be called Deer Creek Plain but a formal definition awaits recovery of an excavated sample from more tightly associated contexts.

Although the slipped sherds are certainly distinctive they are too small and incomplete to allow discernment of vessel form. They might, also, eventually be found to comprise a distinct pottery type. But actual definition must await additional findings with more informative contexts.

The fingernail punctate sherds seem to correspond to the Emory Punctate type. The incised and painted varieties must await additional specimens for interpretation. Although the painted sherds are similar to Rockport Black-on-Gray, these two samples' actual relationship remains to be determined. Other surface treatments noted at Deer Creek are not quite as distinctive, and the extent of their application to vessels is uncertain. These include the other punctate and "indented" specimens as well as brushed and smoothed. Punctating is almost exclusively restricted to the rim and occurs with plain, brushed, and smoothed surface treatments. All of the punctated variations may eventually be found to relate to one basic decorative type. Texturing is believed to be a by-product from paddle-anvil manufacture. These various sherd characteristics seem to represent an aggregate of Lower Walnut Focus and Little River Focus traits with some possible evidence for outside influence. The engraved trade sherds are indicative of contact with Wichita peoples in the Red River region. Also, sherds of Southwest trade wares have been reported (Wyckoff 1964:14) from Deer Creek.

Clay Pipes

Two hundred and forty-five pipe fragments were found on the Deer Creek site. The surface finish descriptive terms (plain, smoothed, and polished) defined in the pottery section are used here, but in this context polished does not imply a trade pipe. Although this distinction in pipe sherd surface finish provides a convenient breakdown for descriptive purposes, it is not certain how important these characteristics are due to the gradual gradations between specimens in the pipe sherd sample and the mixture of surface finishes noted on some specimens. No micmac pipes were found. All but one of the 245 clay pipe fragments appear to be from pipes of the so called "double-cone" or elbow form. There were two bowls, one to hold the smoking mixture and one which presumably received a reed stem insert. No complete pipes were found. Decoration is uncommon. Bowl shape varied from bulbous to conical with a slight flare at the lip; conical varieties are the most common. Lips are usually flat (73%), although occasionally rounded or pointed lips were noted. Bowl wall thickness (at the lip) varied from 2.5-19 mm. on different specimens, and a large variance in bowl diameter is also indicated. The majority of sherds are shell tempered and have a paste comparable to that seen in the resident potsherds. Only occasional specimens with no apparent temper and a more compact paste were noted. Surface color on all of these specimens ranges from buff (most common) to black, and several specimens have been oxidized to a bright orange.

Forty-one pipe fragments are polished. The paste in all but one specimen is the same as in the pottery. No temper is apparent in the other specimen. Of the 22 fragments with lips present, 20 have flat lips (cross section). Wall thickness (near the lip) ranges from 4-13 mm. in these specimens with most specimens falling between 5 and 10 mm. Only one polished specimen has any form of decoration (Figure 42:6). This specimen has a shoulder or a slanted platform upon which the upright bowl appeared to "sit." This shell tempered specimen is exceptionally hard and well fired. It could conceivably be a trade pipe. Of the four elbow sherds, one is right angle and gently rounded. Two others have a rounded protrusions projecting above the pipe surface (Figure 42:8). The fourth is a slightly acute angle rounded elbow (Figure 42:5).

There are 68 smoothed pipe fragments. Of the 37 with lips, 29 are flat, 6 are round, and 2 taper to a rounded point. Lip thickness varies from 3-14 mm. with most specimens falling in the 6-9 mm. range. One bowl fragment has longitudinal striations on it. Another has light,

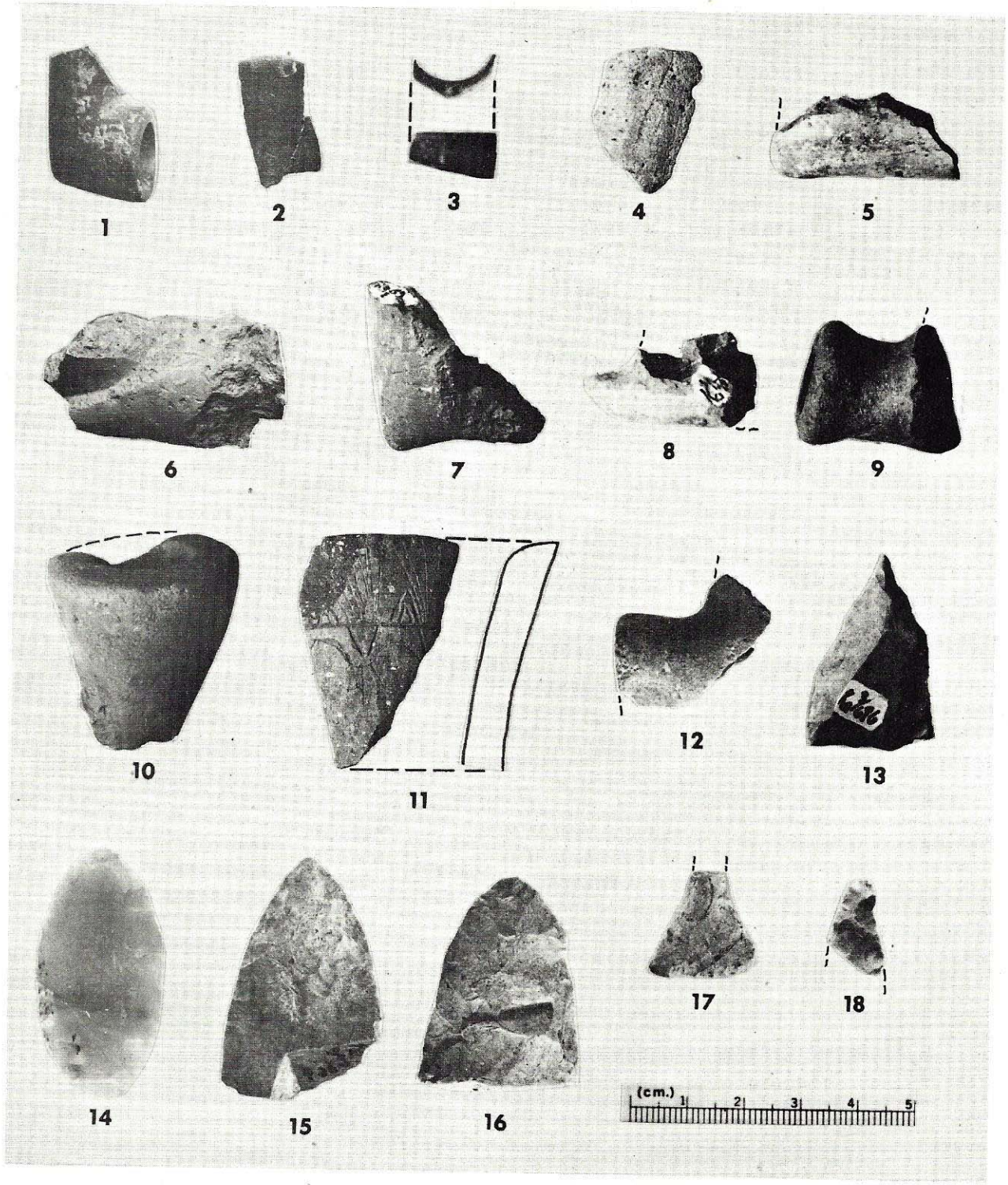


Figure 42. Ka-3 (Deer Creek Site) Miscellaneous Artifacts:
1-3. Catlinite pipe fragments. 4. Limestone pipe fragment.
5-12. Clay elbow pipe sections. 13. Perforator. 14-16. Knives.
17-18. Drill sections.

wide, engraved vertical lines and is possibly from a pipe bowl with a round rim and flat sides. On one other bowl, 11 mm. thick at the lip, the top 8 mm. is slightly thicker than the rest of the bowl with an abrupt step down at the transition. Five elbows are present. One has a distinct heel running across the bottom of the pipe at the elbow. The other four have low conical protrusions in the area of the bowl juncture (Figure 42:7). All specimens appear to be of paste like the resident potsherds.

There are 136 plain surface finish, pipe sherds present (Figure 42:9, 10, 12); 88 have lips intact. Of these, 60 have flat lips, 27 have rounded lips, and one lip is pointed. Lip thickness varies from 2.5-19 mm. with most specimens falling in the 5-12 mm. range. One incised pipe bowl fragment was found; the paste suggests that this pipe was of local manufacture (Figure 42: 11). One thick sherd appears to have been from a four-sided bowl and has two 1.5 by 4 mm. punctations on the side. One bowl sherd exhibits a row of light, fine, diagonal incisions around the lower portion of the bowl. The remnants of one pipe found crushed in the pasture road deserve special mention. This pipe is rather small, and the two bowls are roughly conical in shape with flat lips. No temper is evident. The upright bowl is castellated, having one point centered over the stem bowl and the others spaced at 90° intervals. Of the 7 elbow sherds present, 1 forms a rounded obtuse angle, 2 form rounded right angles, 1 forms a large (13 mm. diameter, 11. mm. height) pointed conical spur, 2 form pointed heels forming at the lower bowl juncture, and the other forms a large knob on the bottom bowl adjacent to the elbow. One specimen with a minimal amount of shell tempering and a very compact paste was found. This sherd, believed to be from a pipe, is not of the common elbow variety. This light brown specimen is not complete enough to demonstrate a stem hole. This sherd appears to be a section out of a rectangular (cross section) pipe stem which is tapering towards the terminal stem end. Two large circular punctations (for inlays?) are aligned along the axis on one of the surfaces.

Discussion: Pipes of this general elbow variety were not found on sites of the Great Bend Aspect. The general clay elbow form was common on Norteño sites, being the primary pipe type used. However, the incidence of decoration on Norteño focus pipes was higher than at Deer Creek. Only 7 of 27 pipes at Womack were plain (Harris et al. 1965:303). The incidence of engraved and/or incised design was noticeably lower at the Gilbert and Pearson sites (Harris et al. 1967: 188-190; Duffield and Jelks 1961:40). One explanation of this decreased incidence of decorated pipes at these two sites is their later date of occupation. This trend is also apparent in the pottery sample from these sites (particularly in the Womack Engraved sherd incidence), and the possibility of a decrease or cessation in manufacture of these types has been noted (Story et al. 184-185).

Stone Pipes

Seven stone pipe fragments were found. One bowl fragment of an off-white very porous limestone(?) was found. This specimen appears similar in shape to the clay pipes (Figure 42:4). The other six fragments are believed to be of catlinite. The most complete specimen consists of the elbow with one intact bowl and one broken bowl (Figure 42:1). The complete bowl is small; this pipe is not polished and most likely was never completed. The start of a drill hole is present on the outside of the complete bowl near the lip. There is a flat surface running along the bottom of the broken bowl from the elbow to the break. The presence of an apparently unfinished pipe suggests the possibility that the Deer Creek occupants made their own pipes on the site. The second catlinite specimen is well polished and appears to be a bowl fragment. This piece, originally from a six-sided bowl, was cut from the remainder of the bowl (Figure 42:3). Two other catlinite fragments fit together and are fragments of a four-sided bowl (Figure 42:2). Two other small nondescript, catlinite pipe bowl fragments were found; one is rough and the other has been polished.

R. K. Harris (personal communication, 1973) relates that pipes of white to grey limestone, or marl, are common to most Norteño sites. Soft grey limestone pipes and a catlinite specimen were recovered from the Lower Walnut Focus sites (Wedel 1959:374-375). L-shaped catlinite pipes were found in the Little River Focus, some of which are particularly similar to the most complete Deer Creek specimen if the complete bowl was actually the stem bowl (ibid. 285-289, Plate 45). One catlinite elbow pipe was reported from Womack (Harris et al. 1965: 297-298). Previously, a redstone [catlinite?] pipe from either the Deer Creek or Bryson site has been illustrated (McRill 1963:147). As Thoburn relates no complete catlinite pipes were found at Bryson (ibid.: 151), either the illustrated specimen is not catlinite or possibly it was found by Bert Moore at Deer Creek. The general shape of the specimen, except for the different orientation, is remarkably similar to the Rice County specimens illustrated by Wedel (1959: Plate 45). Seemingly then, at least three stone pipe types are present at the Deer Creek site. One appears to be the L-shaped Little River Focus form. Another consists of relatively thin-walled slender

pipes with multi-sided bowls; overall shape of this form is uncertain due to the incompleteness of the specimens. The other shape appears to be similar to that seen in the clay elbow pipes.

Discussion of the Deer Creek Site Native Artifacts

No direct native artifact evidence was discerned for the 19th century occupation suggested by the trade beads. However, the possibility of several prehistoric occupations was noted. Projectile points indicative of several possible Archaic occupations were found. Their presence is only suggestive, since a number were reworked and their time and mode of original deposition at the site is uncertain. Four non-Fresno arrowpoints were found as were 15 sherds apparently not of 18th century origin. It is possible that these represent a minor Early Village occupation at Deer Creek. The vast majority of the native artifacts appear to be a result of the major occupation at the site which occurred in the 18th century. Most characteristic of this occupation were triangular unnotched arrowpoints, large snub-nose end scrapers (predominantly of Kay County flint), native gunflints (many of exotic lithic material), shell tempered vessels (with a variety of surface finishes), clay elbow pipes, stone pipes, trade sherds from the Red River region, bone tools (including scapula hoes and knives and bison neural spine awls), as well as a host of less notable tool forms. This occupation is assigned to the 18th century based on the presence of trade goods described previously.

The basic tool inventory as well as the presence of Norteño trade sherds tends to indicate that Deer Creek should be included in the Norteño Focus. The shell tempered plain Deer Creek sherds (Deer Creek Plain) are similar to the Nocona Plain type noted on Norteño Focus sites (Duffield and Jelks 1961:72; Suhm and Jelks 1962:115-116). Other than several Norteño pottery types absent at Deer Creek and several Deer Creek pottery surface finishes missing from the Norteño Focus--their inventories are indeed quite similar. In addition, they shared in and were receptive to French trade at roughly the same time and are both of Wichita stock. However, at present, this author feels that the Deer Creek occupation is distinct from and should not be included in the Norteño Focus. That contacts between these groups existed is readily apparent in the trade sherds and strongly implied by the clay elbow pipes. However, they appear to be distinct--although related--cultural units. The bulk of this discussion will be devoted to this problem.

The status of knowledge about the historic Wichita's antecedents has been recently reviewed (Richards 1971:78-79). Wedel (1959:587) has identified the Great Bend Aspect, which was thriving in central south-central Kansas in the 16th and 17th centuries, with the Wichita. The generally accepted view, until 1961, seems to have been that a slow, forced southern migration of the Wichita to the Oklahoma-Texas region occurred early in the 18th century, and this alone accounted for the appearance of the Wichita in this region (ibid.: 62-67; Bolton 1914:46; Richards 1971:78-79; Duffield and Jelks 1961:73-75). In 1961, the Norteño Focus was defined and identified as the ". . . tribes who, in the 18th and early 19th centuries, comprised the southern division of the Wichita Confederacy" (Duffield and Jelks 1961:67-75). The focus definition was based on a series of artifacts from seven north-central Texas sites where native artifacts were found in association with European trade goods. The trait list given for the Norteño Focus includes the most distinctive artifacts common to most of these sites. Based on documentation and similar material traits, these sites were all interpreted to have been occupied by Wichita peoples. The immediate predecessors of the Norteño Focus are not known. General suspicions had been that all the Wichita peoples migrated from the Kansas region in the early 18th century although Duffield and Jelks lean towards an in situ development of the southern Wichita element known as the Norteño Focus. A good case is presented for the pre-1700 presence of Wichita in Texas (ibid.). One likely indigenous source of the Norteño Focus suggested is the Henrietta Focus (ibid.). This question has not yet been resolved although an indigenous source certainly seems plausible. The Norteño Focus is viewed as having a material culture that is ". . .largely a mixture of Plains and Caddoan elements" (ibid.).

The Great Bend Aspect, who were the 16th and 17th century Wichita in Kansas, is thought to have had its origins in a southern direction (Wedel 1959:582-3, 632-3). Although similarities to numerous defined cultures have been noted, the actual antecedents of the Great Bend Aspect remain unknown. Richards (1971:79) discusses this problem and concludes that the data are presently too scanty to definitely tie the Great Bend Aspect to an earlier, currently defined cultural unit. A number of suggestions were made, but it was (and still is) impossible to make any conclusive identifications. Thus, the "Northern Wichita" can be definitely related to the Great Bend Aspect whereas the southern division is postulated to have developed in situ, possibly from the Henrietta Focus. Assuming the in situ development of the Norteño Focus to be correct, it would be expected that the ancestors of the Norteño Focus and the Great Bend Aspect could be traced back to a common point in the not too distant past. Although these two Wichita

groups are related, the point in time of their divergence, and their common cultural origin remains speculative. Presumably, the Plains traits seen in the Norteño Focus are a direct result of this common ancestory whereas the Caddoan elements were acquired at some time after the divergence.

The Great Bend Aspect, a ". . . distinctive manifestation of native culture. . ." (Wedel 1959:633), is comprised of the Little River and Lower Walnut Foci. The Little River Focus sites investigated have the singular distinction of being identified as the earliest White contact sites in the region. Wedel (ibid. 585, 587, 617) believes these sites represent 16th century "Quivira" visited by Coronado in 1541. These two foci of the Great Bend Aspect are defined and discussed by Wedel (ibid.:210-379, 571-589, 630-633). Great Bend Aspect sites have low refuse mounds, and these often overlie or are interspersed by storage pits (ibid.:573), a description which sounds remarkably similar to the observations regarding "domiciliary mounds" excavated by Thoburn at Bryson and Deer Creek (McRill 1963:149-154). The mound size is also comparable to those seen on the Kay County sites. In addition, depressions suggesting house ruins were noted (Wedel 1959:573) which were also noted at Deer Creek (Wyckoff 1964:11). Features referred to as "council-circles," whose function remains obscure, were noted at Little River Focus sites and not at Lower Walnut Focus sites. A maximum of one per site was noted on the sites investigated. These were described by Wedel (1959:574):

> ". . . a wide shallow ditch some 30 to 60 yards in diameter with a mounded center. In some cases . . . the ditch appears to have been continuous, with a present depth of 12 to 18 inches and a width of 12 to 15 feet, and with a well-marked raised center consisting in part of ash and refuse. In others . . . the ditch is discontinuous, consisting of a roughly circular arrangement of five or six shallow elongate depressions of varying length and without visible central elevations."

Although the Kay County features were "open circles" (i.e., horseshoe-shaped instead of complate circles), there is no mistaking the similarity of this distinctive Little River Focus feature to the wide horseshoe shaped ditch and rampart present at Deer Creek and reported for Bryson. Various identities for these Kay County features have been suggested: trading post stockade, Indian palisade, corral, and a series of trash mounds. The purpose of similar features noted by Wedel could not be determined, so it is conceivable that none of the above suggestions are correct. The central area of the Deer Creek ditch and rampart ("discontinuous circle?") does not appear elevated.

As I have not had access to the Deer Creek site to examine the earthwork since learning of the Great Bend Aspect earthern features, I will rely on the ca. 1917 measurements and discription made by Thoburn (McRill 1963:145):

> ". . . a circular or horseshoe-shaped trench, varying in depth, from two to five feet, twelve to fifteen feet wide, and with a radial distance of approximately 125 feet from the center of the enclosed area to the inner edge of the trench. The open part of this 'horse-shoe' lies in a north north-west direction from the center. The encircling trench enclosed the head of a small ravine which falls northward into Deer Creek."

The following description is provided for the similar feature at the Bryson site:

> "A ravine, or upland water course heads in the slope at the south end of a hill. Around the head of this depression, are to be found the traces of a circular trench, horse-shoe shaped in outline, with the opening extending across the source of the same, similar to the one already described at Deer Creek Village site" (McRill 1963: 1947-148).

Although the dimensions given by Thoburn indicate that at least the Deer Creek feature is larger than those reported by Wedel, there can be little doubt but that these circular features are patterned after those found at, and unique to, the earlier Little River Focus. Their function remains unknown.

At this point, a diversion is required in order to comment on the suggestion made regarding the 1755 Mitchell map described in Appendix I. This map designated a Paniassa "Indian Village and Fort" which was felt to refer to the Deer Creek site. If Deer Creek does represent this site, the actual nature of the fortification remains uncertain although a palisade cannot be totally excluded from consideration. This is simply a question that can't be resolved until excavations are conducted. However, it should be noted that at least one other site (Mentos)

on the Mitchell map also keyed as "Indian Village and Fort" as of yet, to this author's knowledge, has not been located. Thus, it is likely that fortification remains-whatever they might be--are not readily detectable.

The low mounds and depressions noted for the Little River Focus and the Lower Walnut Focus both appear at Deer Creek whereas a circular earthwork similar to those of the Little River Focus also appears. In general, artifact material of the Great Bend Aspect was considered abundant (as at Deer Creek) with good stone working and mediocre quality pottery. Wyckoff (1964:14) commented on the similarity of the Deer Creek artifact inventory to that given by Wedel for the Lower Walnut Focus. In his list of 13 primary traits present at Lower Walnut Focus sites and absent at Deer Creek, all but 4 are now known from Deer Creek (bone tubes, celts, shaft polishers, cup stones--and the difference in size of the end scrapers). To those items listed as occurring at Deer Creek but not in the Lower Walnut Focus inventory can be added Olivella shell beads, Norteño Focus trade sherds, squash knives, and several different surface finishes found on resident shell tempered pottery. The small Deer Creek site resident pottery sample described by Wyckoff (ibid.) is misleading. Indeed, as described, it is very similar to the Cowley Plain ware of the Lower Walnut Focus. However, a number of other surface treatments have now been noted, the most diagnostic of which are the 308 (9.6%) shell tempered, simple stamped sherds. Simple stamping was noted on sherds from the Little River Focus sites, and a type named Geneseo Simple Stamped was described (Wedel 1959:237-239). However, all of these simple stamped sherds were sand tempered. At the Tobias, Thompson, and Malone sites, simple stamping respectively occurred on 12.5%, 10.4%, and 31.7% of the sherds; whereas the frequency of occurrence of shell tempered plain ware on these same three sites was 2.2%, 2%, and 6.9% (ibid.: 234-237, 304-305, 330). Simple stamping on shell tempered sherds has not been reported from either the Little River Focus or the Lower Walnut Focus and to my knowledge has been reported twice previously--once from the Gilbert site (Story et al. 1967:152) and the second time to be discussed later. In the Gilbert specimen, if it is actually simple stamped, the linear pattern is oriented horizontally and diagonally. The Gilbert site occupation lasted longer than that at Deer Creek and apparently was thriving at about the time the Deer Creek occupation ceased.

Overall, the Deer Creek artifact assemblage is very similar to that of the Lower Walnut Focus and suggests definite relations to the Great Bend Aspect. Thus, we are confronted with an interesting situation. Although the Little River Focus and the Lower Walnut Focus are by no means identical (Wedel 1959:571-599), they are quite evidentally related and are both presumed to be Wichita. Their artifact inventories are not identical, and that of the Little River Focus is much more complete. There are several distinct differences which are particularly important in learning the Deer Creek site occupants' identity as it relates to the Great Bend Aspect. These are the circular earthern structures and the pottery. Circular earthworks are reported at Little River Focus sites. It appears probable that the Deer Creek (and Bryson) horseshoe-shaped trenches represent a variation of this structure, and thus a very direct relationship to the Little River Focus is strongly indicated. However, the Deer Creek shell tempered plain pottery bears a striking resemblance to the Cowley Plain ware which comprised 98% of the Lower Walnut Focus sherd sample and which was present in very small amounts (3.7%) on Little River Focus sites. In addition, simple stamping, which didn't occur at Lower Walnut Focus sites, and of which sand tempered sherds composed roughly 18% of the Little River Focus sherd sample, appeared as 9.6% of the Deer Creek sample. Without exception, these simple stamped Deer Creek sherds were shell tempered. These traits, which some 75 to 150 years previously were distinctive cultural indicators, are no longer valid at the time of the 18th century Deer Creek occupation. The names Deer Creek Plain and Deer Creek Simple Stamped have been proposed for these two distinctive Deer Creek pottery types. In addition to the change in the pottery, the predominant Great Bend Aspect knife form (beveled) has become quite uncommon.

Let us pause to reassert that the Great Bend Aspect sites' (Wedel 1959:587, 632-633) and Deer Creek site occupants were Wichita (as defined in this paper; also, Bell and Baerreis 1951:91; Bell and Bastian 1967:119; Wyckoff 1964:19; Richards 1971:78-79). All lines of evidence available support this conclusion. Knowing this common background aids in our evaluation of this situation. First, some general comments.

Simple stamping did not occur at the investigated Lower Walnut Focus sites, and shell tempered plain sherds occurred only infrequently on Little River Focus sites. Therefore the presence of shell tempered simple stamped sherds at Deer Creek is interpreted to indicate that both foci continued to exist separately later than those Great Bend Aspect sites investigated in order for these composite sherds to appear in a later related group. Thus, at some later time (post-ca. 1600?) either simple stamping was applied to shell tempered pottery or shell temper replaced sand temper. Either way, both foci existed independently later than the latest

site investigated by Wedel. This observation indicates Wedel's (1959:587) proposal that possibly a southern migration of the Little River Focus led to the Lower Walnut Focus is most likely incorrect. Also, it seems probable that transitional sites incorporating all of these previously distinct pottery features should be present, most likely in the Kay-Cowley counties area. As suggested earlier, the dramatic decrease in frequency of beveled knives at Deer Creek (and Bryson) is possibly a result of the availability of metal knives. Also, as previously suggested, the large number of scrapers seemingly indicates the importance of hide processing to the economy. Likewise, the increase in size of the scrapers at Deer Creek (and Bryson) over those found at Great Bend Aspect sites could be an outgrowth of the same situation. Both of these appear to be changes from traditional ways stimulated by European trade. Additional changes that might be suggested are the dramatic decrease in the number of bone beads at Deer Creek and the lack of bone projectile points compared to the Great Bend Aspect sites. Apparently, when better, more suitable materials became available or when new needs arose or economic priorities changed, in a very short time long standing traditions were changed. Perhaps the large number of stone projectile points at Deer Creek indicates increased hunting activity with an uncertain supply of shot and powder (or even guns). Certainly, there is an abundance of native-made artifacts present; however, that makes the artifact forms which have been altered (size or frequency) even more obvious. These apparent cultural adjustments, if indeed attributable to White trade, tend to indicate that the Deer Creek site wasn't occupied from prehistoric to protohistoric times as some prehistoric artifact forms are practically non-existent. Seemingly changes occurring in the protohistoric period are expressed by rapid changes in lithic inventory and technology. We are observing the effect of many new needs superimposed on the previous prehistoric subsistence pattern and artifact inventory. Continued similarities to the Norteno Focus inventory shouldn't be surprising as these groups had a common ancestory and were being exposed to common developmental stresses. In addition a rapid adaptation to and dependence on trade is apparent.

Based on apparent shared cultural identity, as well as very similar artifact inventories and visible surface features, it clearly appears that the Deer Creek site occupants were direct descendents of the Great Bend Aspect. Overall, the Deer Creek inventory appears as a blending of previously distinct Great Bend Aspect traits. However, sites exhibiting artifact inventories transitional between the forms considered to distinguish and identify the Lower Walnut Focus and Little River Focus, and the composite of these traits seen at Deer Creek, have not been recognized, studied, and described. One site which may someday be noted to fill this role is the Love site. Based on its geographically intermediate location and a similar artifact inventory including early (French?) trade goods, Wyckoff (1964:11) suggests that Love may possibly predate the Bryson and Deer Creek site occupations. The occurrence of beveled knives and small snub nose end scrapers in the Love site's inventory tends to support this theory although the detailed analysis required for a conclusive interpretation has not yet been carried out. It has been suggested that the late prehistoric occupation at the C. H. Stockton site, Ka-99, predated that of the Love, Bryson, Deer Creek sequence and was a part of the Great Bend Aspect (Neal 1974:89-91). Although lithic similarities are evident, the distinctive ceramic differences from that of the earlier Great Bend Aspect and later manifestations of the Great Bend Aspect (i.e., Deer Creek) would now seem to suggest that the late Plains Village occupation at Stockton was not directly related to the Great Bend Aspect as it is currently defined. Although the ancestors of Deer Creek have been identified, the hiatus noted by Bastian is still present as transitional related sites remain to be conclusively identified. Also, the link to the region's currently defined village horizons remains obscure, primarily due to the presumed southern origin of the Great Bend Aspect ancestry.

One other site worthy of mention is that known as "Neodesha Fort" (Wedel 1959:93-94, 526-534, 617, 633, Plate 93). Here a large horseshoe-shaped embankment with borrow pits (discontinuous trench?) opening to the east was noted in association with "lodge sites" (i.e., mounds) to the south and southwest. A smaller horseshoe-shaped embankment was also noted nearby. In the early 1900's, artifacts from this site were reputedly placed in a museum, but only four specimens can not be located. Cultivation and construction at the site had nearly destroyed all vestiges of earthworks 20 years ago. Wedel was able to collect a small amount of surface material including unnotched triangular points, end scrapers, and shell tempered potsherds. Reputedly found earlier at the site were White trade goods and a variety of aboriginal items. The site, with its apparent probable Great Bend Aspect background, was of particular interest to Wedel as its location appealed as a satisfactory site--based on description--for the location of the Panioussa villaged visited by DuTinsé in 1719. His objections to this village being the Deer Creek site are well founded, and a later interpretation of the DuTinsé record adds further weight to this viewpoint (Wedel 1973:152-156). Unfortunately, the scanty artifactual evidence at the Neodesha Fort site defies detailed comparison with the sample reported for the Deer Creek. However, several features of the pottery sample described by Wedel are particularly noteworthy. The three handles (heavily shell tempered) examined appear to have been of the tapered strap

variety. Although tapered strap handles are a characteristic of some sites of the Oneota Aspect (Wedel 1959:609), the specimens from both Deer Creek and Neodesha give absolutely no evidence of Oneota decoration and thus more likely represent a local development possibly arrived at by combining strap and loop handle traits common in the earlier Great Bend Aspect. Of particular interest are two shell tempered simple stamped sherds found at the site by Wedel. Although a meager artifact sample was available, Wedel's impression of the materials reputedly found and at hand, as well as the DuTinsé record, led him to postulate that possibly the Neodesha materials ". . . correlate more closely with the Chilocco [Deer Creek-Bryson] complex than with the Lower Walnut" (ibid.: 533). Certainly the Neodesha materials are too scanty for a definitive statement, but an apparent relation to the Deer Creek and Bryson occupations is clearly suggested. If this is the case, this site could quite conceivably be contemporaneous with the Bryson and/or Love sites and would also probably be descended from the Great Bend Aspect.

Little River Focus sites in Kay County could be represented by the series of distinctive late sites situated along Bois d'Arc Creek. Bone preservation on these sites along the bottomlands and terraces is poor, and pottery is fairly scarce, fragmentary, and often badly weathered. No earthworks are known to have existed, and these sites have been heavily cultivated for years. Similarities with the Little River Focus are triangular side-notched and unnotched arrowpoints, small and very small ("thumbnail") plano-convex end scrapers, beveled knives (often of exotic materials, such as Amarillo chert, or occasionally Boone chert; usually unnotched and diamond-shaped in form), occasional expanded base drills and grooved mauls, and plain sand (fine to coarse grained) tempered pottery. Surface preservation of the potsherds is extremely poor, and I have never observed any attempt at decoration. Notched, beveled knives seem to occur more frequently on somewhat earlier sites, often with similar artifact inventories (occasionally bone tempered pottery). Perhaps it is no coincidence that two of these late Bois d'Arc sites, Hartshorne and Gordy, have shown possible fleeting evidence of early White contact (mentioned earlier). No direct correlation with the Little River Focus can currently be made although similarities are evident.

Transitional sites between sites of the Great Bend Aspect and the Deer Creek site have not been positively identified. The Deer Creek inventory suggests that a coalescence of previously distinct and slightly earlier Great Bend Aspect foci traits occurred by the 18th century. Whether the Deer Creek occupation descended from primarily one focus or represents a mutual consolidation of these two groups awaits determination. Several features, specifically the L-shaped catlinite pipes, simple stamped sherds, and circular earthworks, are suggestive of Little River Focus influence and/or ancestory. Although simple stamping is considered a general northern plains trait (Wedel 1959:592), its occurrence at Deer Creek is felt to be exclusively of Little River Focus extraction. Shell tempering, use of strap and loop handles and the Deer Creek Plain vessel type (which is very similar to Cowley Plain) are indicative of Lower Walnut Focus influence. Although not yet fully substantiated, this author believes that the Deer Creek occupation consisted of a mixture of peoples of these two previously distinct entities. The material culture evidence contains distinctive Little River and Lower Walnut Focus traits as well as a number of shared traits. Perhaps consolidation was initiated by the advant of European trade. Regardless, the Wichita proper who are believed to have occupied Deer Creek, and probably Bryson, are the first and currently only defined 18th century Wichita group of definite northern origin. A number of shared traits appear in many contemporaneous groups in this region of the Plains, but similarities in material culture were often dictated by common environmental conditions as well as acquisition and exchange with neighboring cultural entities.

The history of the Wichita peoples may be briefly summarized as follows. Apparently prior to the 16th century, the ancestral Wichita cultural unit, believed to have resided in the general Oklahoma-north Texas region, underwent a division which evidentally resulted in the formation of at least two new distinct, but related, cultural units. By the 16th century one group was located in the Great Bend area of Kansas, is archeologically identified as the Great Bend Aspect, and was composed of at least two distinct subunits. The second major known group apparently remained in (or moved to) the north Texas region, incorporated traits denoting Caddoan influence (primarily ceramic) into their previously "Plains tradition" material culture, and in protohistoric times became distictly identifiable as what is known as the southern division of the Wichita Confederacy. Its northern counterpart appears in protohistoric times as the material culture present at Deer Creek, Bryson, and probably Love and Neodesha Fort. With virtually no evidence to the contrary, it seems appropriate to consider Deer Creek and Bryson as distinct elements of the northern division of the Wichita Confederacy. Identification of the descendent Deer Creek occupants as Wichita serves to confirm Wedel's identification of the Great Bend Aspect as Wichita. It tends to substantiate the claims of an 18th century southerly withdrawal of the Wichita from their recent ancestoral homeland (Wedel 1959:633). It, also, suggests some coalescence of previously distinct cultural units which emerged in historic times as the Wichita proper.

In the early 18th century, the mixed Great Bend Aspect foci influence in the material culture of the northern division as represented at Deer Creek is distinct. For this reason, a cultural entity distinct from the southern Norteño Focus is indicated. As the previously distinct foci of the Great Bend Aspect evidentally merged by the 18th century as suggested by the evidence at Deer Creek, seemingly a term denoting this distinct new entity of the Great Bend Aspect is warranted. However, as this study is based on surface collections some question could be raised about the possibility of a two phase occupation of the site by several temporally distinct groups. It is for this reason (i.e., the lack of definite associations due to the nature of the sample) that an identifying term and a detailed descriptive trait list are not presented in this paper. Also, postponement of assigning the apparent transitional phase--suggested as possibly being evident at the Love site--is necessitated until an adequate description becomes available.

The position of the proposed Wheeler complex, and of later historic occupations, such as Spanish Fort, in this cultural framework remains to be positively ascertained. Occurrence of small scattered prehistoric sites with apparent relations to protohistoric Wichita sites in native material culture, such as Assemblage B at Lowrance (Wyckoff 1973), is perhaps suggestive that Wichita peoples were scattered throughout the region between the two currently recognized strongholds of protohistoric Wichita culture. The Wheeler complex is perhaps another indication of this phenomenon. As defined, the protohistoric cultural unit present at Deer Creek apparently represents the 18th century protohistoric manifestation of the Great Bend Aspect. Currently, the only historic tribal group definitely identified in this group is the Wichita proper. Should future investigations indicate that some other historic tribal entity(ies) of the Wichita Confederacy is(are) of northern Great Bend Aspect extraction, they may also be included in this unit which is not necessarily restricted to the Wichita proper. Whether later southern historic sites of northern ancestory will remain distinctly related to the Great Bend Aspect and thus still be elements of the northern division or whether they will merge inperceptibly with their southern relatives remains to be determined.

Presumably, the northern Wichita's southerly migration applied to the assemblage present at Deer Creek. Trade with the Norteño Focus sites is evident at Deer Creek although these artifact forms are in the minority. However, it cannot presently be determined if this trade is a result of contact maintained after the presumed prehistoric division or if it was trade induced by the activities of 18th century White traders. [One probable engraved Norteño sherd, and four Deer Creek Simple Stamped sherds have been noted at the Bryson site (personal observation from a collection of 272 sherds).] Perhaps the answer to the problem of maintained southern division contact will be answered upon investigation of the earliest protohistoric sites (Love?) and/or other transition sites. Trade sherds, Emory Punctated-like sherds, painted sherds, Edwards Plateau lithic material, clay elbow pipes, and possibly incising and smoothing of pottery are suggestive of Norteño contact.

After continued southern migration it would seem probable that a merger of traits of these two distinct north and south foci might have occurred. Whether such occurred, whether it will be recognizable if it did occur (if it happened, the earliest phases should be distinct), and whether distinct northern Wichita sites will be discovered south of Kay County remains to be determined. As the northern division moved south in the 18th century, evidence of their presence is implicated, but discernment is another problem. Perhaps examination of pottery collections from sites such as Spanish Fort for traits such as simple stamped sherds would help illuminate this situation. It is of particular interest that the suggested date for termination of the Deer Creek site occupation, ca. 1760, corresponds very closely to the appearance of references to the Taovayas group in the vicinity of Spanish Fort in 1759 (Duffield and Jelks 1961:69; Harris and Harris 1967:133). Bell has indicated his feeling that the Spanish Fort occupation ". . . should be identified with the Taovayas groups who previously inhabited the Deer Creek site" (Richards 1971:79). R. K. Harris (personal communication, 1974) concurred in this opinion. Perhaps Gilbert, although distinctly an element of the Norteño Focus, received some northern Wichita contact which would explain the presence of a simple stamped vessel. This question, as a number of others posed in this paper, is currently unanswerable although future research should aid in understanding the situation.

Southwest influence is suggested at Deer Creek by the presence of Southwest trade sherds (Wyckoff 1964:14) and obsidian. Unfortunately dates for the Southwest sherds reported were not obtained although late sherds were noted elsewhere in the Great Bend Aspect (Wedel 1959:245, 363). A Southwest trade sherd was also found at the Tyler site (Bastian 1969:122) but no evidence of White contact was present; a radiocarbon date for this Tyler feature was A.D. 1500 ± 110. Obsidian in Kay County has previously been noted at Von Elm, a Plains Woodland site, and the Hudsonpillar and Hammons sites (Hartley 1974:23, 128). It is impossible to relate the origin of the Southwest trade sherds, but at least three possibilities are apparent: (1) direct native

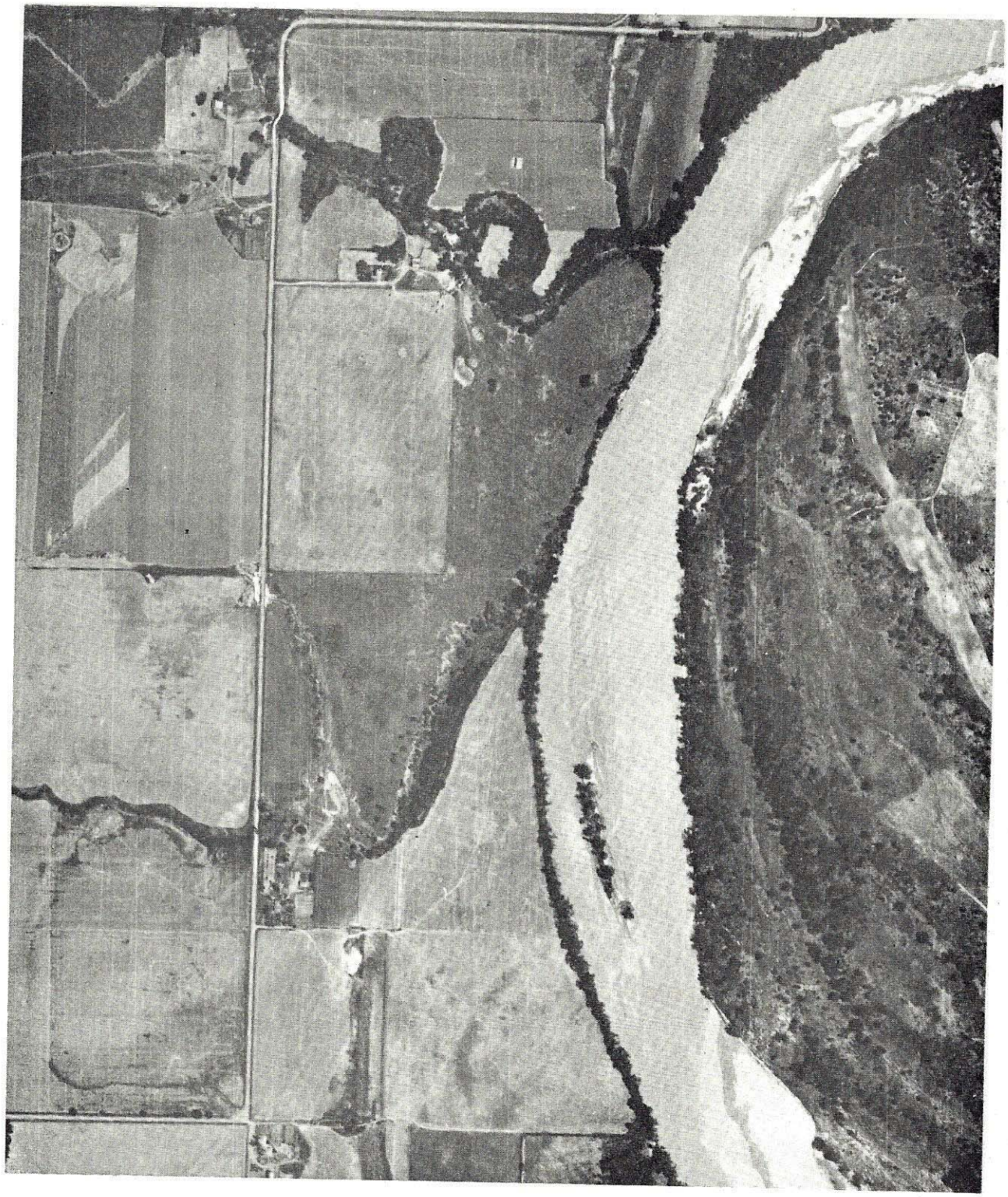


Figure 43. A 1938 aerial photograph of Ka-3, The Deer Creek Site, showing an occupied house on the site and several large soil disturbances.

initiated prehistoric contact which could have continued through protohistoric times, (2) 16th century Spanish induced contact, and (3) contact with refugee Southwest Indians who fled to the Plains. Evidence that the initial contact of the Plains Indians with the Southwest in the early 1500's has been noted in some Southwest collections (Wedel 1959:583-584, 634-635). Whether this contact was maintained through the 18th century is not known. The origin of Deer Creek's Southwest trade sherds is not known, but their presence is explainable. They do not necessarily require a prehistoric occupation unless they are dated and indicate such.

Summary

Although a number of unanswered questions have been posed, my personal interpretation of the data presented is as follows. Multiple occupations at the Deer Creek site are indicated. The primary occupation, a protohistoric 18th century French contact occupation, was responsible for the surface features and the bulk of the artifactual material noted. This site was not a trading post and apparently was not a transitional prehistoric to protohistoric village. This site is an 18th century protohistoric manifestation of the Great Bend Aspect embodying distinctive trains of both the Little River Focus and the Lower Walnut Focus, and I believe it is a cultural entity distinct from these two previously defined foci. The culture is Wichita, and the tribe was evidentally the Wichita proper. Diagnostic artifacts include triangular unnotched arrowpoints, gunflints, large snub-nose end scrapers of Kay County flint, a variety of less significant stone tools forms, use of some exotic flints in a primarily Kay County flint lithic industry, shell tempered pottery (with a variety of surface finishes), evidence of sustained French trade contact, and possibly trade contacts with the Norteño Focus and/or the Southwest. The Bryson site is included in this focus, and it is likely that the Love and Neodesha Fort sites are also components. It appears that the Bryson occupation slightly predates that at Deer Creek, and it is further indicated that the Love site may well predate Bryson and may actually be a prehistoric-protohistoric transition site. The Neodesha Fort seemingly bears a close cultural similarity to the Kay County site series described herein and may well be contemporaneous with Love and/or Bryson. The dates proposed for the Deer Creek site occupation are ca. 1735-1760. The suggestion has been made that the Deer Creek occupants may have moved to Spanish Fort by 1759.

Additional Comment

Since completing this manuscript, a July 9, 1938, aerial photograph of the Deer Creek site has been obtained from the National Archives, Record Group 145, Records of Agricultural Stablization and Conservation Service (Figure 43). A house, apparently then still occupied, was located on the northwest perimeter of the site. The cellar and house foundation still remain at the site. Additional information regarding these structures has been obtained from Clark Miller. Tom Atterbury is thought to have homesteaded the site. He first lived in a dugout, and later built the house, shown in Figure 43. The land was purchased by Mrs. Jennie Seltzer in about 1932, and her son lived in the house until the early 1940's. The house was then leased for occupancy until 1947 and was unoccupied when it burned in 1949. The lamp wick holder and spoon handles described in this report could conceivably be intrusive from this occupation.

Upon examination of the photograph, several large distinct soil disturbances in the pasture will be noted. Although it seems rather unlikely that such obvious evidence of Thoburn's 1917 work would have remained after an interval of 21 years, the presence of these disturbances should be noted, and this possible origin considered. Preservation of earlier soil disturbances could have been aided by the Dust Bowl of the 1930's.

REFERENCES CITED

Allen, G. L., Jr., P. Allen, J. F. Cochran, L. F. Duffield, and others
1967 "Stone Tools", in The Gilbert Site, edited by E. B. Jelks. Bulletin of the Texas Archeological Society, Vol. 37, pp. 191-211. Dallas.

Anonymous
1780 An Impartial History of the War in America. London: printed for R. Faulder, bookseller, New-Bond-Street; and J. Milliken, bookseller, Carlisle.

Arrowsmith, A.
1795 "A map Exhibiting all the New Discoveries in the Interior Parts of North America". London.
1796 "A map of the United States of North America". London.
ca.1817 "A map of the United States of North America". London.

Bastian, T.
1969 The Hudsonpillar and Freeman Sites, North-Central Oklahoma. Oklahoma River Basin Survey, Archeological Site Report, No. 14. Norman.

Bell, R. E.
1960 Guide to the Identification of Certain American Indian Projectile Points. Oklahoma Anthropological Society, Special Bulletin, No. 2. Oklahoma City.
Bell, R. E. and D. A. Baerreis
1951 A Survey of Oklahoma Archaeology. Bulletin of the Texas Archaeological and Paleontological Society, Vol. 22, pp. 7-100. Lubbock.
Bell, R. E. and T. Bastian
1967 Survey of Potential Wichita Archeological Remains in Oklahoma. A Pilot Study of Wichita Indian Archeology and Ethnohistory, assembled by R. E. Bell, E. B. Jelks, and W. W. Newcomb, pp. 119-127. Dallas.
Black, A. and C. Black
1856 Atlas of North America. Edinburgh.
1882 Black's General Atlas of the World, New and Revised Edition. Edinburgh.
Blaine, J. C. and R. K. Harris
1967 "Guns", in The Gilbert Site, edited by E. B. Jelks. Bulletin of the Texas Archeological Society, Vol. 37, pp. 33-86. Dallas.
Bolton, H. E.
1914 Athanase de Mezieres and the Louisiana-Texas Frontier, 1768-1780. Cleveland.
Bowen, E.
1772 "An Accurate Map of North America". London.
Bowles, C.
ca.1763 "North America and the West Indies...". London.
Bradley, A., Jr.
1804 "Map of the United States Exhibiting the Post-roads, the Situations, Connections, and Distances of the Post-Offices, Stage roads, Counties, and Principal Rivers". Washington.
Brebner, J. B.
1955 The Explorers of North America, 1492-1806. Cleveland: Meridian Books, The World Publishing Company.
Brown, J. A. (editor)
1961 The Zimmerman Site. Illinois State Museum, Report of Investigations, No. 9. Springfield.
Burton, R. J.
1971 The Archaeological View from the Harvey Site, Sq-18. Oklahoma River Basin Survey, Archeological Site Report, No. 21. Norman.
Burton, R. J., T. Bastian, and T. J. Prewitt
1969 The Tyler Site, Hs-11, Haskell County. Oklahoma River Basin Survey, Archeological Site Report, No. 13, pp. 52-93. Norman.
Bustanoby, J. H.
1947 Principles of Color and Color Mixing. New York: McGraw-Hill Book Company, Inc.
Caldwell, W. W.
1960 Preliminary Notes on Fragments of Firearms and Related Objects from Fort Atkinson, 1820-1827. The Missouri Archaeologist, Vol. 22, pp. 192-200. Columbia.
Cary, J.
1783 "An Accurate Map of the United States of America with Part of the Surrounding Provinces agreeable to the Treaty of Peace of 1783". London.
Colton, G. W. (compiler)
1856 Colton's Atlas of the World, illustrating Physical and Political Geography: Vol. 1, North and South America. New York: J. H. Colton and Company.
1876 Colton's General Atlas of the World. New York: G. W. and C. B. Colton and Company.
Culver, J. R.
1967 Soil Survey of Kay County, Oklahoma. Washington: U. S. Government Printing Office.
Delamarche, C. F.
1785 "Estats-Unis De L'Amerique Septentrionale...". Paris.
Del'Isle, G.
1700 "L'Amerique Septentrionale". Paris.
Deuel, T.
1958 American Indian Ways of Life. Illinois State Museum, Story of Illinois, No. 9. Springfield.
Dirvin, J. I.
1967 Miraculous Medal. New Catholic Encyclopedia, Vol. 9, pp. 894-895. New York: McGraw-Hill Publishing Company.
Duffield, L. F. and E. B. Jelks
1961 The Pearson Site, A Historic Indian Site in Iron Bridge Reservoir, Rains County, Texas. Department of Anthropology, University of Texas, Archaeology Series, No. 4. Austin.
Ensko, S. G. C.
1948 American Silversmiths and Their Marks III. New York: R. Ensko, Inc., Gold and Silversmiths.

Ensko, S. G. C. and E. Wenham
1937 English Silver, 1675-1825. New York: R. Ensko Incorporated.
Faden, W.
1793 "The United States of North America with The British Territories and Those of Spain according to the Treaty of 1784". London.
deFer, N.
1718 "Partie meridionale de la Riviere de Missisipi et ses Environs...". Paris.
Fite, E. D. and A. Freeman
1926 A Book of Old Maps Delineating American History from the Earliest Days Down to the Close of the Revolutionary War. Cambridge: Harvard University Press.
George, J. N.
1947 English Guns and Rifles. Harrisburgh: The Stackpole Company.
Good, M. E.
1972 Guebert Site: An 18th Century, Historic Kaskaskia Indian Village in Randolph County, Illinois. Central States Archeological Societies, Inc., Memoir, No. 2.
Graebner, N. A., G. C. Fite, and P. L. White
1970 A History of the American People. New York: McGraw-Hill Book Company.
Gray, O. W.
1884 The National Atlas Containing Elaborate Topographical Maps of the United States and the Dominion of Canada, with plans of Cities and general maps of the World. Special Edition. Stedman and Brown, Publishers.
Hamilton, T. M. (compiler and arranger)
1960 Indian Trade Guns. The Missouri Archaeologist, Vol. 22. Columbia.
Hamilton, T. M.
1960a Additional Comments on Gunflints. The Missouri Archaeologist, Vol. 22, pp. 73-79. Columbia.
1960b Some Gun Parts from 18th Century Osage Sites. The Missouri Archaeologist, Vol. 22, pp. 207-209. Columbia.
1960c Concluding Comments and Observations. The Missouri Archaeologist, Vol. 22, pp. 207-209. Columbia.
1965 Recent Developments in the Use of Gunflints for Dating and Identification. Diving into the Past, edited by J. D. Helmquist and A. H. Wheeler, pp. 52-53. St. Paul: Minnesota Historical Society.
1968 Early Indian Trade Guns, 1625-1775. Museum of the Great Plains, Contributions of the Museum of the Great Plains, No. 3. Lawton.
Harper, L. and R., R. K. and I. M. Harris, E. B. Jelks, and J. N. Woodall
1967 "Ornaments:, in The Gilbert Site, edited by E. B. Jelks. Bulletin of the Texas Archeological Society, Vol. 37, pp. 87-104. Dallas,
Harris, R. K. and I. M. Harris
1967 Trade Beads, Projectile Points, and Knives. A Pilot Study of Wichita Indian Archeology and Ethnohistory, assembled by R. E. Bell, E. B. Jelks, and W. W. Newcomb, pp. 129-162. Dallas.
Harris, R. K., I. M. Harris, J. C. Blaine, and J. Blaine
1965 A Preliminary Archeological and Documentary Study of the Womack Site, Lamar County, Texas. Bulletin of the Texas Archeological Society, Vol. 36, pp. 287-363. Dallas.
Harris, R. K., I. M. Harris, and J. N. Woodall
1967 "Tools", in The Gilbert Site, edited by E. B. Jelks. Bulletin of the Texas Archeological Society, Vol. 37, pp. 18-32. Dallas.
Harris, R. K., E. B. Jelks, C. Nemec, B. Vance, and L. Wilson
1967 "Tobacco Pipes", in The Gilbert Site, edited by E. B. Jelks. Bulletin of the Texas Archeological Society, Vol. 37, pp. 188-190. Dallas.
Harris, R. K. and C. D. Tunnell
1967 "Miscellaneous European Trade Goods", in The Gilbert Site, edited by E. B. Jelks. Bulletin of the Texas Archeological Society, Vol. 37, pp. 105-111. Dallas.
Hartley, J. D.
1974 A Report of the 1974 Field Season of the Oklahoma River Basin Survey in the Kaw Reservoir. Newsletter of the Oklahoma Anthropological Society, Vol. 22, No. 7, pp. 6-7. Oklahoma City.
Hodge, F. W.
1910 The Jumano Indians. Proceedings of the American Antiquarian Society, N.S. Vol. 20, pp. 249-268.
Homann, J. B.
ca.1730 "Amplissimi regionis Mississipi Seu Provinciae Ludovicianae..." . Norumbergae.
1737 "Regni Mexicani Seu Novae Hispania, Ludovicianae, N. Angliae, ...". Nurnberg.
James, E.
1823 Account of an expedition from Pittsburgh to the Rocky Mountains, performed in the years 1819-20...under the command of Major Stephen H. Long. Three volumes. Philadelphia.

Jelks, E. B. (editor)
1967 The Gilbert Site. Bulletin of the Texas Archeological Society, Vol. 37. Dallas.

Joliet, L.
1674 "Noevelle De couverte De Plusieurs Nations Dans la Nouvelle France". (19th century reproduction).

Kidd, K. E. and M. A. Kidd
1970 A Classification System for Glass Beads for the Use of Field Archaeologists. National Historic Sites Service, National and Historic Parks Branch, Department of Indian Affairs and Northern Development, Canadian Historic Sites, Occasional Papers in Archaeology and History, No. 1, pp. 46-89. Ottawa.

Lehmer, D. J. and D. T. Jones
1968 Arikara Archeology: The Bad River Phase. Smithsonian Institution River Basin Surveys, Publications in Salvage Archeology, No. 7. Lincoln.

Lewis, S.
1815 "A New and Correct Map of the United States of North America...". Philadelphia.
1819 "A New and Correct Map of the United States of North America...". Philadelphia.

Lodge, Jr.
ca.1755 "A Map of the British and French Settlements in North America". London.

Margry, P.
1886 Exploration des affluents du Mississippi et decouverte des Montagnes Rocheuses (1679-1754). Decouvertes et establissments des Francais dans 1'ouest et dans le sud de 1'Amerique Septentrionale (1614-1754). Memoires et documents originaux, Pt. 6. Paris.

Maxwell, M. S. and L. H. Binford
1961 Excavations at Fort Michilimackinac, Mackinac City, Michigan, 1959 Season. Michigan State University, Publications of the Museum, Vol. 1, No. 1.

McRill, L. A.
1963 Ferdinandina: First White Settlement in Oklahoma. Chronicles of Oklahoma, Vol. 41, No. 2, pp. 126-159. Oklahoma City.

Mitchell, J.
1755 "A Map of the British and French Dominions in North America with the Roads, Distances, Limits, and Extents of the Settlements". London.

Morrell, L. R.
1965 The Woods Island Site in Southeastern Acculturation, 1625-1800. Florida State University, Notes in Anthropology, Vol. 2. Tallahassee.

Munsell Color Company
1957 Munsell Book of Color. Baltimore: Munsell Color Company, Inc.

Nau, A.
1810 "The First Part of Capt'n Pikes Chart of the Internal Part of Louisiana...". N.P.

Neal, L.
1974 Archaeological Investigations at the C. H. Stockton and Jim Butterfield Sites, Kay County, North-Central Oklahoma. Oklahoma River Basin Survey, Archeological Site Report, No. 27, pp. 77-110. Norman.

Nebergall, W. H., F. C. Scymidt, H. F. Holtzclaw, Jr., and J. C. Bailar, Jr.
1968 College Chemistry with Qualitative Analysis, 3rd Edition. Lexington: D. C. Heath and Co.

Newcomb, W. W. and W. T. Field
1967 Appendix I: Synonymy. A Pilot Study of Wichita Indian Archeology and Ethnohistory, assembled by R. E. Bell, E. B. Jelks, and W. W. Newcomb, pp. 332-339. Dallas.

Perino, G.
1968 Guide to the Identification of Certain American Indian Projectile Points. Oklahoma Anthropological Society, Special Bulletin, No. 3. Oklahoma City.

Peterson, H. L.
1956 Arms and Armor in Colonial America, 1526-1783. New York: Bramhall House.

Popple, H.
1733 "A Map of the British Empire in America with the French and Spanish Settlements Adjacent Thereto". London.

Pratt, P. B.
1961 Oneida Iroquois Glass Trade Bead Sequence, 1585-1745. Indian Glass Trade Beads, Color Guide Series, No. 1. Syracuse: Onondaga Printing Sompany.

Quaife, M. M. (editor)
1925 The Southwestern Expedition of Zebulon M. Pike. Chicago: The Lakeside Press.

Ramsey, L. G. G. (editor)
1962 The Complete Encyclopedia of Antiques. New York: Hawthorn Books.

Richards, M. K.
1971 The Lee Site, A Late Prehistoric Manifestation in Garvin County, Oklahoma. Bulletin of the Oklahoma Anthropological Society, Vol. 20, pp. 1-82. Oklahoma City.

Rohrbaugh, C. L.
1973 Kaw Reservoir--The Southern Section. Report of Phase II Research of the General Plan for Investigation of the Archaeological Resources of Kaw Reservoir, North-Central Oklahoma. Oklahoma River Basin Survey, Archaeological Site Report, No. 25. Norman.
1974 A Summary of Phase II and Phase III Research in the Southern and Central Sections of Kaw Reservoir, Kay and Osage Counties, North-Central Oklahoma. Oklahoma River Basin Survey, Archeological Site Report, No. 27, pp. 159-170. Norman.

Rohrbaugh, C. L., R. J. Burton, S. S. Burton, and L. J. Rosewitz
1971 Hugo Reservoir 1. The Description of the Archaeological Sites Excavated During the 1970 Field Season Including Ch-1, Ch-43, Ch-70, Ch-75, Pu-82, and Ch-90. Oklahoma River Basin Survey, Archaeological Site Report, No. 22. Norman.

Russell, C. P.
1957 Guns on the Early Frontiers. Berkeley: University of California Press.

Seutter, M.
ca.1734 "Accurate Delineation Celeberrinae Regions Ludoviciana vel Gallice Louisiane...". Augsburg.

Sibley, G. C.
1922 From a journal to the Pawnee and Kansas Villages, undertaken by an officer of the Factory of the Missouri. Nebraska Historical Publication, Vol. 20, pp. 5-11. Lincoln.
1927 Extracts from the diary of Major Sibley. Chronicles of Oklahoma, Vol. 5, pp. 196-218. Oklahoma City.

Smith, C. S.
1960 Two 18th Century Reports on the Manufacture of Gunflints in France. The Missouri Archaeologist, Vol. 22, pp. 40-72. Columbia.

Smith, G. H.
1960 Archeological Investigations at the Site of Fort Stevenson (32ML1), Garrison Reservoir, North Dakota. Bureau of American Ethnology, Bulletin, No. 176, River Basin Surveys Papers, No. 19. Washington.

Spilsbury, J. (sculpturer)
1761 "A New Map of North America from the Latest Discoveries, 1761". N.P.
1763 "A New Map of North America from the Latest Discoveries, 1763". N.P.

Steele, J. P. and W. B. Harrison
1883 The Gunsmith's Manual. Republished (1945) by T. G. Samworth. Plantersville.

Steen, C. R.
1953 Two Early Historic Sites on the Southern Plains. Bulletin of the Texas Archeological Society, Vol. 24, pp. 177-188. Abilene.
1962 National Survey of Historic Sites and Buildings form: filled out for the Deer Creek site. On file with the National Park Service.

Stephenson, R. L.
1970 Archeological Investigations in the Whitney Reservoir Area, Central Texas. Bulletin of the Texas Archeological Society, Vol. 41, pp. 37-286. Dallas.

Story, D. A., B. Barber, E. Barber, E. Cobb, and others
1967 Pottery Vessels, in The Gilbert Site, edited by E. B. Jelks. Bulletin of the Texas Archeological Society, Vol. 37, pp. 112-187. Dallas.

Sudbury, B.
1968 Ka-131, The Bowling Alley Site: A Late Prehistoric Site in Kay County, Oklahoma. Bulletin of the Oklahoma Anthropological Society, Vol. 17, pp. 87-135. Oklahoma City.

Suhm, D. A. and E. B. Jelks (editors)
1962 Handbook of Texas Archeology: Type Descriptions. Texas Archeological Society, Special Publication, No. 1, Texas Memorial Museum Bulletin, No. 4. Austin.

Swanton, J. R.
1911 Indian Tribes of the Lower Mississippi Valley and Adjacent Coast of the Gulf of Mexico. Smithsonian Institution, Bureau of American Ethnology, Bulletin No. 43. Washington.

Thoburn, J. B. and M. H. Wright
1929 Oklahoma, A History of the State and Its People. Two volumes. New York: Lewis Historical Publishing Company, Inc.

Tooley, R. V.
1967 French Mapping of the Americas, the Del'Isle, Bauche, Dezauche Succession (1700-1830). The Map Collectors Circle, No. 33. London.

Thomas, G. B., Jr.
1969 Calculus and Analytical Geometry. Reading: Addison-Wesley Publishing Company

Wallis, J.
1783 "The United States of America Laid Down from the Best Authorities Agreeable to the Peace of 1783, published April 30, 1783". London.

Warwick, R. and P. L. Williams (editors)
1973 Gray's Anatomy. Philadelphia: W. B. Saunders Company.

Weast, R. C. (editor)
1969 CRC Handbook of Chemistry and Physics. Cleveland: Chemical Rubber Company.
Wedel, M. M.
1971 Jean-Baptiste Benard, Sieur de la Harpe: Visitor to the Wichitas in 1719. Great Plains Journal, Vol. 10, No. 2, pp. 37-70. Lawton.
1972 Claude-Charles DuTisné, A Review of His 1719 Journeys, Part I. Great Plains Journal, Vol. 12, No. 1, pp. 4-25. Lawton.
1973 Claude-Charles DuTisné, A Review of His 1719 Journeys, Part II. Great Plains Journal, Vol. 12, No. 2, pp. 147-173. Lawton.
Wedel, W. R.
1959 An Introduction to Kansas Archeology. Smithsonian Institution, Bureau of American Ethnology, Bulletin, No. 174. Washington.
Wenham, E.
1949 The Practical Book of American Silver. Philadelphia: J. B. Lippincott Company.
Winsor, J.
1886 Spanish Explorations and Settlements in America from the Fifteenth to the Seventeenth Century. Narrative and Critical History of America, Vol. 4, Pt. 1. New York: Houghton, Mifflin and Company.
1895 The Mississippi Basin: The Struggle in America Between England and France, 1697-1763. New York: Houghton, Mifflin and Company.
Winsor, J. (editor)
1884 French Explorations and Settlements in North America and Those of the Portaguese, Dutch, and Swedes. Narrative and Critical History of America, Vol. 2, Pt. 1. New York: Houghton, Mifflin and Company.
Witthoft, J.
1966 A History of Gunflints. The Pennsylvania Archaeologist, Vol. 36, Nos. 1-2, pp. 12-49.
Wittry, W. L.
1963 The Bell Site, Wn-9: An Early Historic Fox Village. The Wisconsin Archaeologist, Vol. 44, No. 1, pp. 1-58.
Woodward, A.
1960 Some Notes on Gunflints. The Missouri Archaeologist, Vol. 22, pp. 29-39. Columbia.
Wright, M. A.
1946 Pioneer Historian and Archeologist of the State of Oklahoma. Chronicles of Oklahoma, Vol. 24, No. 4, pp. 396-413. Oklahoma City.
Wright, M. A. (editor)
1946 Exhibit of Objects Discovered by the Marland Archeological Expedition in 1926. Chronicles of Oklahoma, Vol. 24, No. 4, pp. 491-494. Oklahoma City.
Wyckoff, D. G.
1964 The Archaeological Survey of Kaw Reservoir, Kay and Osage Counties, Oklahoma. Oklahoma River Basin Survey, General Survey Report, No. 6. Norman.
1967 Archaeological Sequence in the Broken Bow Reservoir. Joint Publication of the Stovall Museum of Natural History and the Oklahoma River Basin Survey. Norman.
1973 The Lowrance Site of Murray County: 1969 Excavations by the Oklahoma Anthropological Society. Bulletin of the Oklahoma Anthropological Society, Vol. 21, pp. 1-155. Oklahoma City.
Wyckoff, D. G. and T. P. Barr
1968 The Posey Site (Wg-19): A Historic Site in the Three Forks Locale, Eastern Oklahoma. Oklahoma River Basin Survey, Archaeological Site Report, No. 10. Norman.
Wynne, J. H.
1770 A General History of the British Empire in America, Vol. 1. London: printed for W. Richardson and L. Urquhart under the Royal-Echange.

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