

COBBLE TOOLS AND SMALL SITES IN LYON COUNTY

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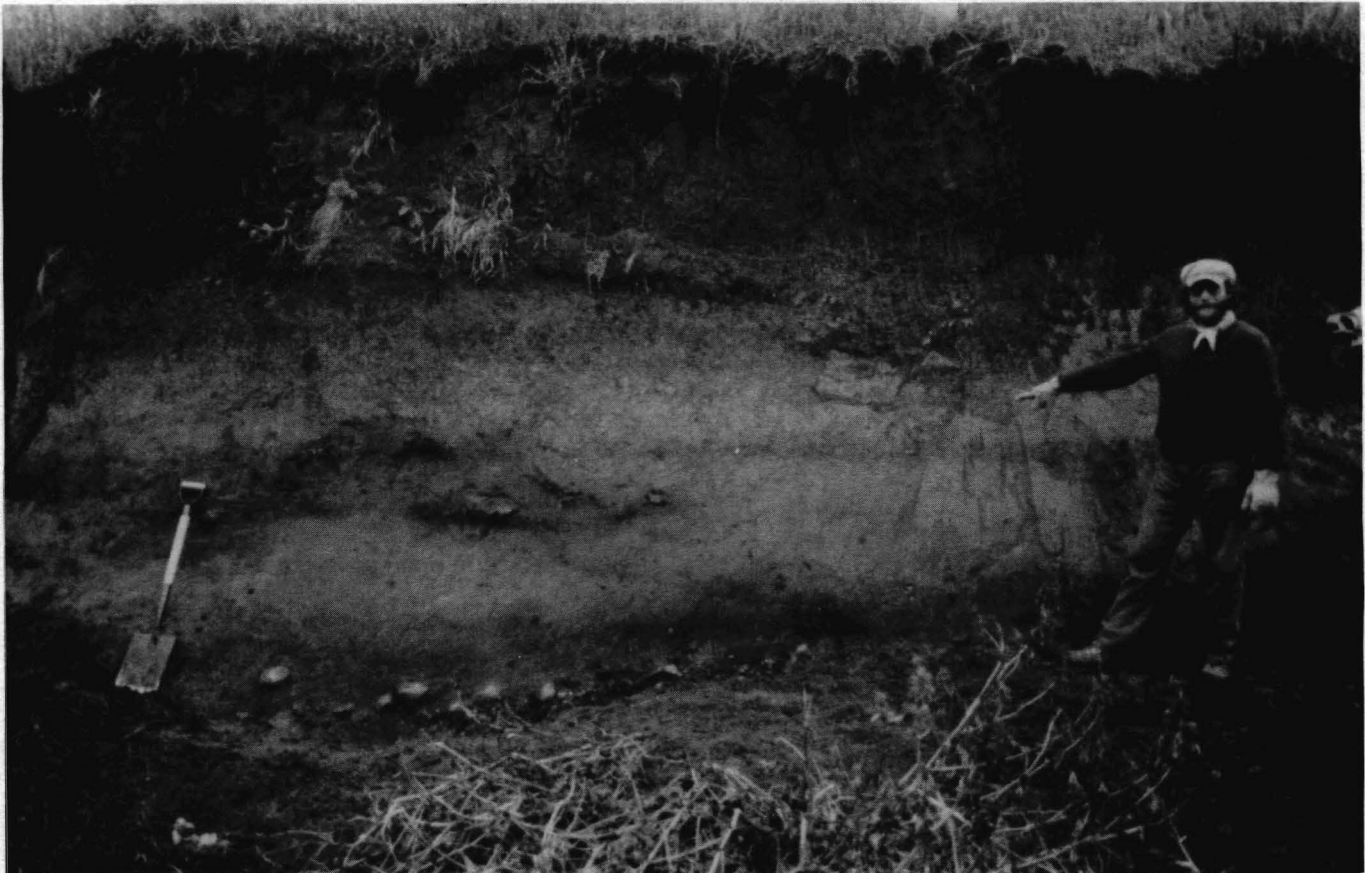


Figure 1: First author, Dave Stanley, points to a hearth and associated bones and fire-cracked rocks in the alluvial fill at 13LO126; this possible bivouac site was radiocarbon dated at 7195±120 B.P. (Beta-20835).

The problem of how to interpret small, culturally anonymous prehistoric sites has troubled archaeologists for many years. The advent of contract archaeology has not really solved the problem, because large numbers of small sites have been discovered with no regional context to assess their cultural meaning or significance. Federally funded survey and planning grants are a good mechanism to study this problem. This source of funding enables surveyors to cover large

acres and many small sites, so that site patterning can be studied in a regional context.

In 1986 the writers undertook a 10,700 acre survey on the east side of the Big Sioux River in Lyon County, northwestern Iowa (Benned. 1987). This work was part of the state planning process for cultural resources being conducted and funded by the Bureau of Historic Preservation, State Historical Society in Des Moines. A total of 97 prehistoric archaeological sites was

recorded during the course of this survey. Aside from a few mound groups and multicomponent village sites, the vast majority (90%) of the sites turned out to be small-size or thin scatters of a few types of tools -- the kinds of sites aphoristically termed "flaker" or "cracked rock" sites. We collected everything but the fire-cracked rock from these scatters and analyzed the artifacts for the types of material, technology and macroscopic use-wear. Even the fire-cracked rocks were counted and carefully

Tool Types Found

examined for use-wear before being left in the field. What emerged from this study was a general pattern of resource procurement which represented the basic economic adaptation to the prairie environment of northwestern Iowa. That economic pattern is the subject of this report.

The prairie procurement system was part of a generalized economic pattern among prehistoric hunting and gathering cultures on the eastern plains and midwestern prairies of North America. The basic subsistence pattern involved hunting large game (e.g. bison, elk, deer, antelope) and foraging for small mammals, birds, mussels and fish as well as collecting seeds from wild plants. This subsistence base was an ancient tradition with sophisticated bison procurement extending back more than 10,000 years (cf. Frison 1978) and broad-spectrum foraging being nearly that old. During the late prehistoric and historic periods in the Northwest Iowa Plains region the basic subsistence pattern had evolved to support semi-sedentary villagers with a combination of gardening, intensive bison hunting and wild resource collecting (cf. Lehmer 1971).

The settlement patterns associated with all the periods of hunters and gatherers in northwestern Iowa encompassed several types of sites. The sites of lengthy occupations have high archaeological visibility because they contain structural evidence and dense debris scatters. These sites are called "base camps" because they were the loci of daily activities and places for the storage of tools and resources. By all historic accounts and archaeological evidence, most base camps were situated within valleys or on the bluffs above major valleys. Through time (i.e. from Paleo-Indian to Great Oasis and Oneota periods), base camps evolved from seasonal habitations to places of permanent occupation.

The remainder of the settlement pattern included a variety of bivouacs and resource procurement stations. These are distinguished by limited inventories mostly composed of expedient (i.e. several fire-cracked rocks) and a tool inventory limited primarily to processing tools (e.g. end scrapers, hammers, cores, flake tools) and weapon maintenance (e.g.

projectile fragments). Some bivouacs are small and contain a single hearth locus (Figure 1), while larger ones with several loci might have been multi-component or the temporary campsites of several (family?) units. Resource procurement sites tend to be smaller and have fewer materials than bivouacs. Fire-cracked rock is absent or rare (i.e. 2-4 fragments). Instead, procurement sites are composed of tools for primary resource processing, such as flake knives, choppers, hammers and cores. Raw materials for procurement site tools seem to have been obtained from nearby outcrops of glacial till.

Base camps and temporary sites on the east side of the Big Sioux River are linked by a common technology, i.e. a tool kit predominantly geared toward the killing and processing of large game animals and other prairie resources. Site variability resides in the seasonal and functional nature of the site types. Taken together, all of the sites represent patterned behavior -- a hunting and gathering system with chronological depth and cultural continuity (tradition). Looked at individually, the information from any of the small sites is redundant and relatively meaningless because it lacks cultural context and associations within a functioning human system.

The approach used to relate the small sites with base camps in a broad, adaptive pattern involves analysis of stone technology and tool functions. Some of these aspects are illustrated in the following paragraphs.

STONE TOOL TYPES

We recognized four classes of stone tools during the Big Sioux survey: fire-cracked rocks, ground stone, flaked cobble tools, finely-chipped tools.

Fire-cracked rocks are tools defined as having been thermally altered by humans, presumably for the purpose of heat retention. "Fire-cracked rock" is generalized terminology for rocks with flat-angular, unweathered fractures which lack features associated with external application of force (e.g. bulbs of percussion, ripple marks, hinge, step, or feathered distal terminations, etc.). Discoloration due to thermal oxidation is generally observ-

able on the cortical surfaces. Colors tend toward red or black. Sometimes fire-cracked rocks, especially granites, are crumbly. One of the criteria separating utilized rocks from glacial till in northeastern Iowa is whether the rocks occur on loess (i.e. wind-blown) deposits or in fine grained sediments of Holocene alluvial fills.

The groundstone tool class includes grooved mauls, axes, manos, metates and abrading stones. These were manufactured from natural granite and diorite cobbles rounded by aqueous or eolian actions or glacial transport. They have been shaped into useful forms by humans using abrading and/or pounding motions. The key difference between the groundstone cobble tools and the flaked cobble tools (next class) is the method of production. Groundstone was manufactured by pecking and grinding, whereas the flaked cobble tools were shaped by carefully oriented percussion flaking. Obviously, the considerable labor invested in shaping groundstone tools meant that they tended to be curated tools; they were not discarded after initial use.

Lyon County sites also yielded a distinct stone tool industry that produced bifaces, flake tools and heavy cutting tools as well as waste flakes and cores from cobbles made of coarse grained materials (Figure 2). Sioux quartzite seems to be the most widely used raw material for percussion flaking, followed by basalt and andesite. These tools are produced primarily by hardhammer percussion. Evidence of bipolar percussion has not been observed but may exist. Flakes often have distinct bulbs of percussion and striking platforms because of the hardhammer percussion that was applied to make the flake blank. Platform preparation and feathered distal terminations occur as well, just as these traits are common in assemblages of cherty materials. Cobble tools functioned as flake knives, perforators, gravers, fleshers, hiderscrapers, choppers and digging tools.

Many of the cobble flake tools are retouched or appear to be prepared flakes. Prepared flakes were detached in a manner similar to the Levallois technique associated with Old World

Assemblage Includes Groundstone, Flake Debitage

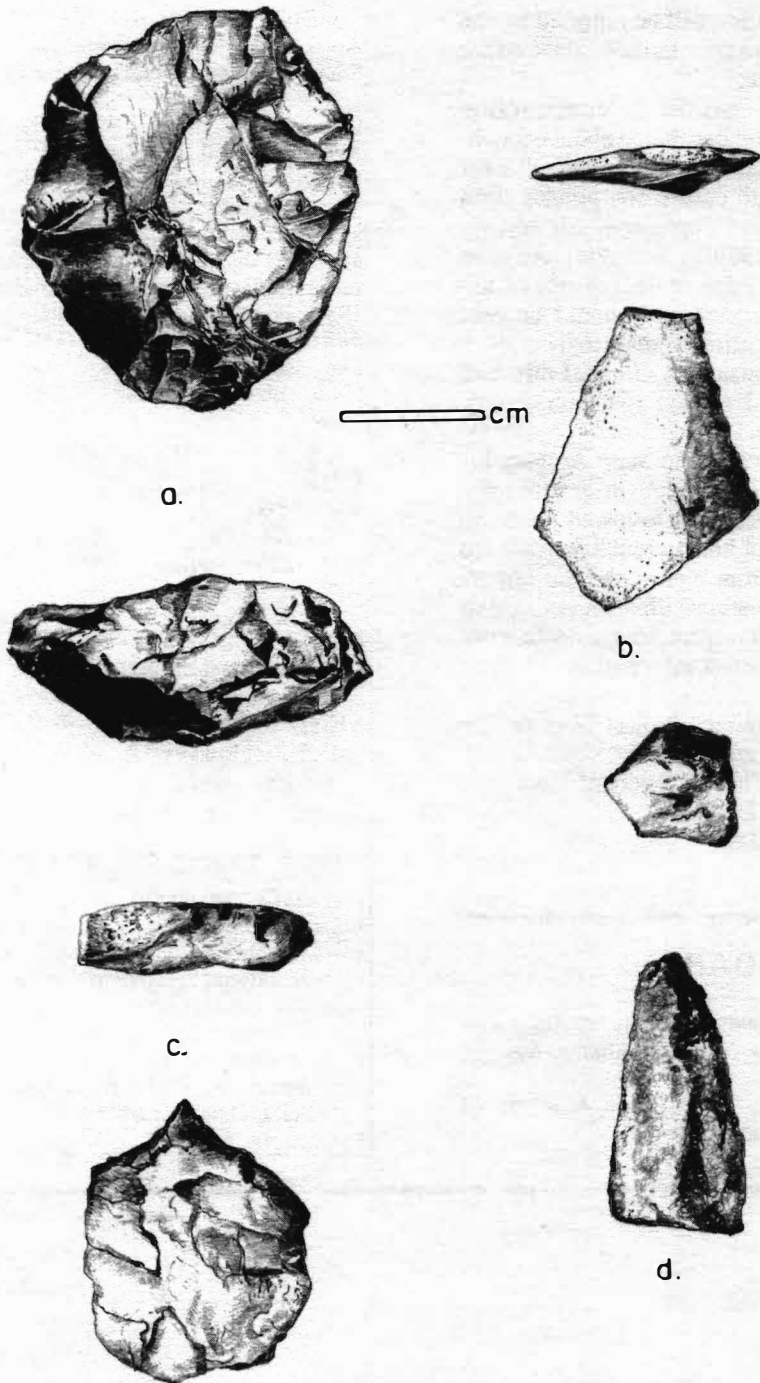


Figure 2: a) Andesite cobble graver (13LO32);
b) bifacial Sioux quartzite chopper (12LO25).

tool assemblages. This technique consists of removing a series of flakes around the circumference of a core in order to detach a single flake of predetermined shape and size. These flake blanks are distinct because the dorsal face displays negative flake scars that meet at the center of the blank but lack proximal ends (cf. Honea 1965). Lev-allois flakes suggest that the cobble

tool industry went beyond the production of expedient tools. For instance, some specimens even appear to have hafting elements.

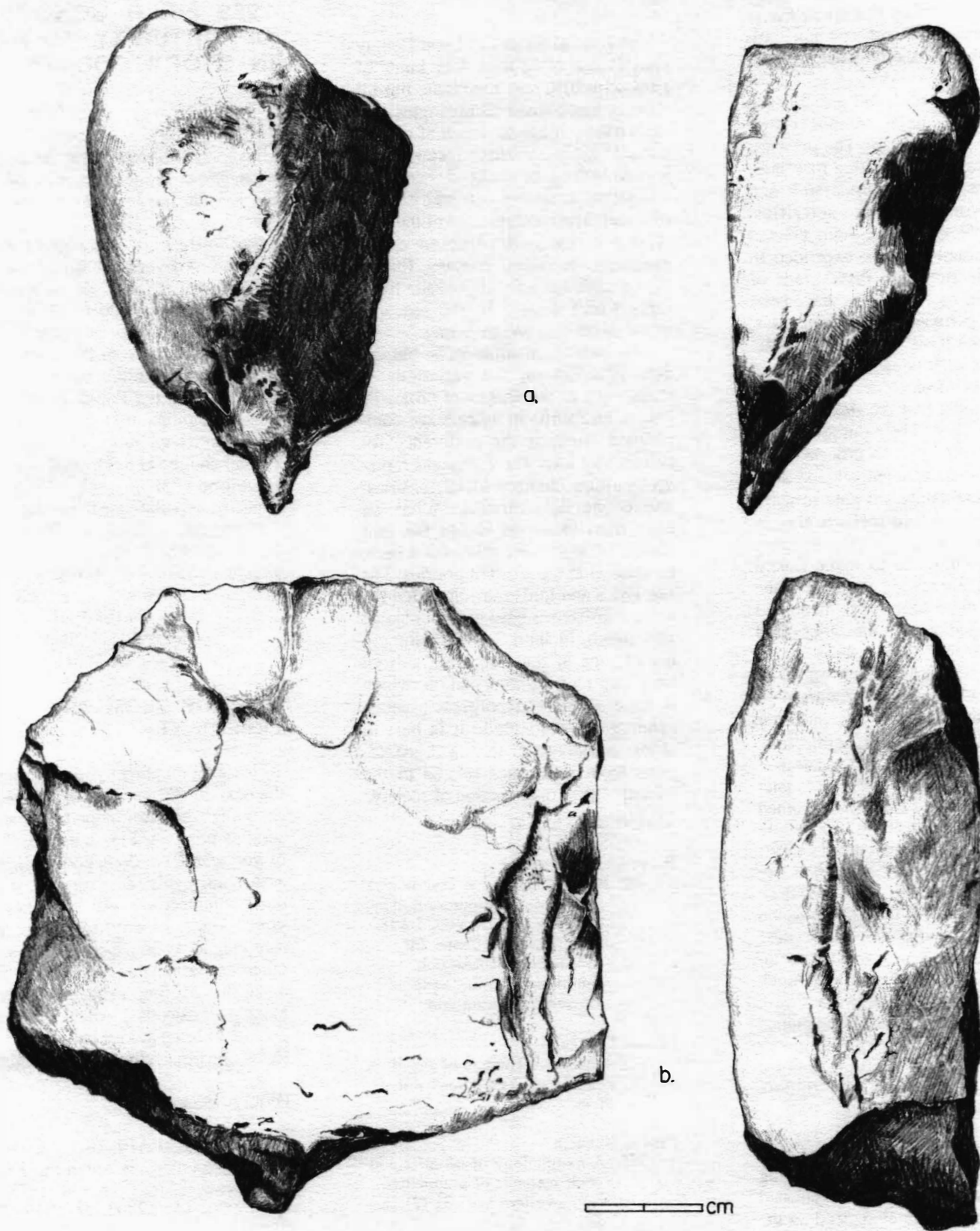
Cobble cores generally have multiple striking platforms or are pyramidal cores with a single striking platform. Double-platform cores are present but not frequent.

Some cobble flake tools, including both end and side flakes, lack evidence of shaping or resharpening but have obvious evidence of use. The latter takes the form of rounded and abraded edges, a contiguous series of tiny bifacial or unifacial flake scars along an edge that display other attributes associated with working edges (e.g. low edge angles, sharp edges, etc.), and in some cases polish is evident. The contention that these artifacts represent tools, not just naturally occurring broken cobbles, is supported by the presence of other artifact classes on the site and by their occurrence in naturally stoneless deposits.

Finely-chipped stone is a class of tools found on most midwestern sites. A wide range of fine and coarse grain material used to manufacture the Lyon County tools, including chert, jasper, Tongue River silica, quartz and chalcedony (Figure 3). Most of this material came from local glacial tills, but some probably was imported. The tool types include projectile points, hide scrapers, all of the stages of biface manufacture, spokeshaves, graters, unifaces and a variety of flake tools. The detachment techniques employed to produce these artifacts include hard- and soft-hammer percussion, with emphasis on the latter, as well as pressure flaking. Some of the specimens appear to have been manufactured directly from small raw nodules. The evidence indicating this technological approach include tools and/or cores with cortex remnants on both faces, and small decortication flakes with low striking platform angles, some of which were detached by soft-hammer percussion. A variety of cores are represented, including pyramidal, multi-, single and double platform cores. The cores are generally small and most were probably used to produce flake blanks used directly as tools (e.g. utilized/retouched flakes). Nonetheless, some of the cores could easily be transformed into bifacial or unifacial tools.

TOOL ASSEMBLAGES

Fine flaking debitage associated with the entire lithic reduction sequence was recovered from base camps. Since these were sites of multiple activities, a wide range of debitage would have been produced. The few items of debitage at the single bivouacs and the re-



a.

b.

1 cm

Figure 3: a) Tongue River silica double-platform core (13LO89); b) Bijou Hills quartzite flake knife (13LO419); c) Sioux quartzite flake graver (13LO90); d) Sioux quartzite wedge (13LO419).

FIELD SCHOOL OPPORTUNITY; ANNUAL MEETING APRIL 1-2

source procurement stations usually consisted of thinning flakes and shatter -- the products of resharpening tools and of flake blank production, respectively.

Fire-cracked rock and groundstone tools were common components of base camp assemblages. The presence of large amounts of heating rock indicate extensive food processing and heating for domestic activities. Groundstone tools have value created by the amount of labor expended in their production, and these kinds of tools would be expected to have been curated at permanent base camp sites. Groundstone tools are not part of the inventories of bivouacs and resource procurement sites.

For the most part the flaked cobble tools are bulky. Their durable edges were probably used to process large mammals, such as bison, elk and deer. Tools of this nature are able to withstand heavy use and resharpening in coarse (butchering) applications. Since the rock types used to make flaked cobble tools are readily available in the till plains, these tools were made and used in expedient circumstances and were discarded at the same spots. Flaked cobble tools appear on many bivouac and resource procurement sites; sometimes, they are the only formal tool type in the site collection. These tools also occur at base camps.

The finely-chipped stone tools tend to be manufactured from finer grained materials and are relatively small. They require greater maintenance, particularly resharpening, and the procedure for obtaining suitable raw materials may have been more complicated than that for igneous cobbles. Because of their intrinsic character, the members of this tool class have much sharper working edges. As a result, they are well suited for more detailed work, such as clothing or tent manufacture, cutting and whittling, and for projectiles points and end (hide) scrapers. Except for flake knives, finely-chipped stone tools rarely appeared on bivouac and resource procurement sites. Only resharpening debitage and an occasional exhausted core or scraper were evidenced on the temporary sites, whereas finely-chipped tools were common on base camp sites.

CONCLUSION

The general pattern of Lyon County sites is one of at least four kinds of sites with different functions, but all sharing basic stone technologies that were used throughout much of prehistory. These basic stone technologies existed because of a relatively constant adaptation to the western prairie environment. The combinations of the four classes of tools--fire-cracked rocks, groundstone, flaked cobbles, finely-flaked tools are indicative of site functions which related to the seasonal round of hunting and gathering.

Also present in stone tools, but not discussed herein, are variations in form, such as the shapes of projectile points, and shifts in assemblage composition, such as the preference for certain tool kits. These changes represent culture change--social, political and economic evolution. What we have tried to reveal is that the four classes of tools were made for a basic adaptation to the western prairies. The site types and tools that supported the basic subsistence base did not change very much. In short, tool function did not change at the same rate as tool form and tool kit composition, which include social and political aspects. From this we conclude it is best to separate analysis of technical adaptations from influences related to the socio-political organization of society.

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1989 FIELD SCHOOL OPPORTUNITY TO BE IN STORY COUNTY

John Bower, professor of Anthropology at Iowa State University, will conduct archaeological excavations at the Buchanan site (13 SR 153) during June and the first two weeks of July, 1989. The site is located on the northeast edge of Ames, and the excavations will focus on Middle to Late Archaic occupations (approximately 7000 to 4000 years ago). Preservation is excellent in these levels, and data from them are being worked into a collaborative research program with the Polish Academy of Sciences, aimed at comparing prehistoric hunter-gatherer adaptations in Poland and the U.S. For this reason, at least one Polish archaeologist is expected to participate in the dig.

IAS members interested in working at the Buchanan site next summer should write or call Professor Bower at:
Anthropology Program
319 Curtiss Hall
Iowa State University
Ames, IA 50011
(515) 294-8033

MESSAGE FROM THE PRESIDENT

Please let me direct your attention to the next annual meeting of our IAS. I encourage the submission of papers as soon as possible. Please notice, those of you who have done good things in archaeology this past year, that if you don't volunteer we will be calling on you! Also, I would appreciate receiving ideas on papers, exhibits and other activities that you know will make the meeting a rousing success. Mark your calendar, write a friend and prepare to bring stories and artifacts to share with your fellow archaeologists.

Ferrel Anderson

CALL FOR PAPERS! Twenty minute presentations, submit to Ferrel Anderson, 1923 E. 13th St. Davenport, IA 52803. Tel.(319)324-0257.

[Editor's note: Watch for a mailing after the first of the year giving many more details. Ken Farnsworth of the Center for Archaeological research in Kampsville, Ill. will be the banquet speaker.]

ANCIENT BURIALS PROTECTED; CALENDAR

HUMAN REMAINS ARE PROTECTED IN IOWA

By Shirley Schermer

The Office of the State Archaeologist is a state agency administered by The University of Iowa. Among its responsibilities, the OSA is charged with the investigation, interpretation, and preservation of ancient burial grounds, and when necessary, the recovery and reburial of ancient human skeletal remains. Ancient burial grounds and ancient human skeletal remains are those older than 150 years. These responsibilities are detailed in Chapter 305A of the Iowa Code. Legal protection of burials in Iowa was extended in 1976 to include prehistoric burial mounds and unmarked cemeteries. The Office of the State Archaeologist works closely with the Indian community through an Indian Advisory Committee to enforce this law.

Any individual who has found a possible ancient burial site or skeletal material he or she suspects may be human should contact the Office of the State Archaeologist for evaluation and identification. If the bones are determined to be human, they will be examined by a physical anthropologist in an attempt to determine cultural affiliation. A report will be written and submitted to the Department of Health. If the remains are over 150

years old, they will be reburied in one of three state cemeteries established for that purpose.

Anyone considering construction activities and concerned about encountering burials may contact the OSA for assistance to ensure compliance with Iowa law and to preserve our non-renewable cultural heritage. Anyone with knowledge of disturbance of ancient human remains should contact OSA. Intentional disturbance of a burial is considered criminal mischief in the third degree (Chapter 716.5, Iowa Code).

The Office of the State Archaeologist is willing to explain in more detail the procedures followed upon the discovery of human remains, what we can learn from bones, and the importance of treating human remains and burials with respect. Please contact our office for further information.

Shirley Schermer, Project Director
Burials Program, OSA
Eastlawn, The University of Iowa
Iowa City, IA 52242
319-335-2400

CALENDAR:

April 5-9, 1989 - Society of American Archaeology meetings, Atlanta, GA.

April 21-22, 1989 - Iowa Academy of Science, Storm Lake

April 1-2, 1989 - Iowa Archeological Society Annual Meeting, Cedar Falls.

October 13-15, 1989 - Midwest Archaeological Conference, hosted by the Office of State Archaeologist and The University of Iowa. Abstracts for symposia (and all symposium paper abstracts) due August 4, 1987; abstracts for contributed papers due September 8, 1989. For further information, please contact William Green or Stephen Lensink, OSA, Eastlawn, University of Iowa, Iowa City 52242; 319/335-2389.

ANNUAL MEMBERSHIP DUES

VOTING:

- | | |
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| 1. Active | \$10 |
| 2. Household | \$17 |
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NON-VOTING:

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|-----------------------|------|
| 1. Student (under 18) | \$7 |
| 2. Institution | \$10 |

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Deb Zieglowsky
310 Haywood Drive
Iowa City, IA 52240-1051

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The Newsletter is published four times a year. All materials for publication should be sent to the editor:

Sheila Hainlin, 1434 44 St., Des Moines, IA 50311

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