THE WYOMING ARCHAEOLOGIST

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THE WYOMING ARCHAEOLOGIST

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VOLUME 32(1-2)

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NEWS AND ANNOUNCEMENTS

SARATOGA EDUCATOR HONORED BY NEH

WASHINGTON D.C. -- Saratoga teacher Roderick Laird has been chosen Wyoming's National Endowment for the Humanities/ Reader's Digest Teacher-Scholar, the NEH recently announced.

Laird will receiver $27,500 to replace his salary so that he may spend a year studying archaeological theories about the first people on this continent.

He is the author of "How to Make and Use the Atlatl, Ancient Weapon of the Ice Age Hunters," and has taught in Carbon County School District #2 since 1980.

During his research, he also plans to "create teaching materials that may be used as supplements to history textbooks," the NEH announced.

A total of 53 teachers, one from each state, the District of Columbia, Puerto Rico, and the U.S. Virgin Islands, were chosen for the program by the NEH.

WYOMING ARCHAEOLOGICAL FOUNDATION
MINUTES
October 21, 1988 -- 4:30 P.M.
Comfort Inn, Rawlins, Wyoming

Presiding: George Brox

Present: Carolyn Buff, Deborah Chastain, George Frison, June Frison, Alan Korell, Harley McKinney, Mark Miller, George Zeimens.

Absent: Milford Hanson

Motion by A. Korell, second by G. Frison to adopt a resolution to accept the warranty deed from Ruth M. Gorman and Glen Gorman, Celestina Testolin and Dante Testolin, Lucy Vannelli and Louie P. Vannelli, and Agnes M. Howshar and Thomas H. Howshar, Jr., to property described in said warranty deed, a copy of which is on file with the Wyoming Archaeological Foundation. Carried.

Motion by C. Buff, second by G. Frison that the Wyoming Archaeological Foundation designate the above-described property as the site for construction of the archaeological resource facility and interpretive display center pertinent to the development of the Hell Gap site. Carried.

Motion by M. Miller, second by G. Frison that the regularly-scheduled meetings of the Wyoming Archaeological Foundation shall be held quarterly, and that the Board of the Wyoming Archaeological Foundation may conduct extraordinary business by voice vote of a quorum of the Board by telephone by designation of the President of the Board. Carried.

A special meeting will by held at Crazy Tony's (later moved to the VFW) in Guernsey on Friday, October 28 at 7:00 P.M. to host the donors of the land at the Hell Gap site.

H. McKinney announced that work has commenced on the Hell Gap site in the form of cleanup, tours, tokens, etc.

G. Frison has obtained the Hell Gap collection and it is now at the University of Wyoming.

Motion by A. Korell, second by D. Chastain to accept a $20,000 donation from an undisclosed source. Carried.

Adjourn: 6:45 P.M.

(signed)
Carolyn M. Buff
Secretary

(signed)
George Brox
President

WYOMING ARCHAEOLOGICAL FOUNDATION
MINUTES
November 19, 1988 -- 1:00 P.M.
J.B.'s Restaurant, Laramie, Wyoming

Presiding: George Brox

Present: Carolyn Buff, Kip Buff, Deborah Chastain, Bob Chastain, Alan Korell, Mark Miller, Terry Paterson, George Zeimens.

Absent: George Frison, Milford Hanson

Discussion centered on how to proceed with expending the $20,000 donation fro the Hell Gap site. Three priority areas were determined: construction, research, and public outreach.

Motion by A. Korell, second by D. Chastain to contact someone to either occupy the property or hire someone to winterize and check the electrical system. Carried.

Motion by A. Korell, second by M. Miller to approve the expenditure of $5,000 for maintenance and general upkeep for the Hell Gap site, to include winterization, electrical system, etc. Carried. A committee composed of Alan Korell and George Zeimens to proceed.

The discussion then returned to the priorities as listed above: construction and upkeep of the buildings as cited; research, to include expenses in acquiring the remainder of the Hell Gap collection, expenses for analysis of the collection, and expenses to do the geomorphic studies; and public outreach to include a video presentation, etc. Motion by M. Miller, second by A. Korell that expenses for these priorities are not to exceed the balance of the $20,000 grant. Carried. More specific amounts to be spent can be voted on through a conference call.

The Board then discussed how the video should proceed and how to acquire additional funding. It was decided that the Foundation needs more support from the chapters of the Wyoming Archaeological Society to donate funds, and that the chapters need to be made more aware of what is being done and get them involved. It was also decided that additional pictures of the site and artifacts are needed.

The site name recommended by the Board is "The Fredrick Research Center at Hell Gap."

The meeting was adjourned.

(signed)
Carolyn M. Buff
Secretary

(signed)
George Brox
President

NEWS FROM THE HIGH PLAINS CHAPTER

by
Dennis Eisenbarth and Harry Earl

Our chapter has been involved in a number of projects this year which have kept us all busy and generally out of trouble. As you might expect, the archaeological record along the North Platte Valley in eastern Wyoming is rich. The sheer number of sites here, both historic and prehistoric, is of a magnitude that is positively mind-boggling. Many of the sites are subject to severe damage from erosion, looting, and land-altering projects. This chapter is not in a position, financially or academic-

ally, to become involved in long-term research projects, but by virtue of our interest in archaeology and our concern for the resource, we feel that we have an obligation to do something about the plight of the resource in this area. In that regard, there are a number of things that we can and are doing.

First of all, we are pushing for more educational programs through our local community college and in the public schools. Probably the most productive thing that can be done is to educate the younger generation about archaeology and the significance of the data base in this area. Sometimes it is difficult to convince the older generation that the sites and objects that they have grown up around are of much value. We have been very successful in influencing local educators, and we are finding that there is a fast growing group of individuals of all generations in this area with a genuine interest in archaeology.

Secondly, we are working hard for the development of a research center at Hell Gap. Such a facility would be the best thing that could happen when it comes to creating an awareness for the need for historic preservation locally and in the Rocky Mountain/High Plains area generally. One of the projects we developed to stimulate support for the research center is a historic tour. Since we are being constantly asked by people to take them to some of the site, especially Hell Gap, we decided to formalize the process. To date, over 500 people have taken the tour either on an individual basis, as a family activity, or as a member of some other group. We feel that the tour is doing a lot to build support for the Hell Gap project and for our historic preservation efforts. Hopefully, Eastern Wyoming College will eventually take over the tour. This would be a good opportunity for the college to provide summer jobs and training for several students.

A third activity we are pursuing is to actually take steps to stabilize or preserve several sites. One example of this kind of project is the old Meyers Homestead site. The homestead consists of a seven-room, log house and several out-buildings which date to before the turn of the century (Figure 1). The buildings rest on top of a stratified prehistoric site. We have fenced off the main building to keep livestock out and plan to fix the roof and generally stabilize deterioration of the structure next year (Figure 2).

Another structure which we intend to preserve in the same manner is the old Dr. Brownrigg home and hospital located just north of Hell Gap. The first story of this building consists of a rock-lined dugout. The second story is made of large, hand-hewn logs. The building will topple soon if corrective measures are not taken.

An example of a historic structure that recently escaped our efforts is the main building at the old headquarters of the Frederick Ranch. This old building was one of the first ranch buildings in the area and served as a home, store, post office, polling place, etc. The building fell over last year and probably cannot be salvaged.

In addition to physically preserving these sites, we are collecting what documented history about them that still remains, and are taking numerous photographs, etc.

We are also trying to piece together as much information as we can about several sites that have already been destroyed. One example here is the site of the Torrington Man find in 1935 (Agogino 1963, Figgins 1935, Howells 1938, Wormington 1957, Wedel 1961). Torrington Man was once thought to be an example of Early Man skeletal remains which later proved to be of more recent vintage. Regardless of the final outcome, this is an interesting story and we have been able to track down many of the artifacts that were originally discovered at the site in 1935.

Yet another site that has been totally lost is the Table Mountain burial mound. During the early 1960s, the Wyoming Game and Fish Department constructed a bird refuge on Horse Creek near Table Mountain. During construction, a small hill located near the

Figure 1: The Meyers Homestead main building.

Figure 2: Fencing crew at the Meyers Homestead.

project was used as fill in the dam. As it turned out, the hill was an artificial feature which contained over 30 prehistoric graves. Apparently, attempts were made at the time of discovery to notify the University of Wyoming, but the correct contacts were not made. Much of the site was excavated by souvenir hunters and the remainder was hauled off for fill in the dam. The mound no long exists, but can be seen on old aerial photographs and topographic maps. We have recovered some of the human bones and artifacts from the site, but still have a lot of detective work to do (Figure 3).

A fifth project is to photograph and systematically collect artifacts from the surface of several eroded sites. This is a time-consuming, but worthwhile effort.

Finally, and as a last resort, we are excavating and obtaining small samples from several sites. As mentioned earlier, we don't have the resources to do a lot of digging, but our "poor boy" efforts are better than turning our backs to the problem and letting important data wash down the draw. We are fortunate in that we have a professional archaeologist in residence to direct these efforts. One exciting site that we worked on last year is located at the east edge of area 2 at the Korell-Bordeaux site (Zeimens et al. 1987). This appears to be a trash midden situated in a cultivated field (Figures 4 and 5). Much of the site has been destroyed by land leveling and plowing. Some portions remain intact, but have been badly crushed immediately below the plow zone. Other areas rest far enough below the plow zone that they will probably remain safe for a number of years. This is a single component site and so far has produced large quantities of debitage, a variety of stone and bone tools, and numerous butchered bones consisting mainly of bison, deer, dog, and beaver. Projectile points and pottery are also represented. We have obtained one radiocarbon date courtesy of Charles Reher (Beta-28874: 1150±90 yrs BP). It is generally believed that the Bordeaux Trading Post is located across the highway a few meters north of this area. We have made arrangements with Geo-Recovery Systems, Inc., from Denver to make a ground penetrating radar investigation of the area.

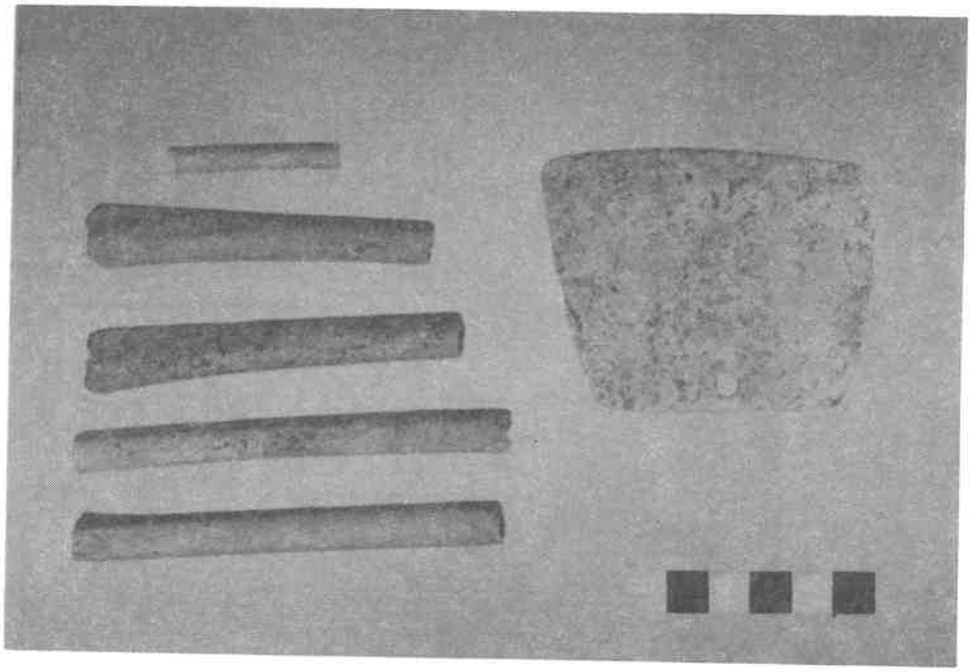

Figure 3: Bone and shell artifacts from the Table Mountain site.

Figure 4: Looking northwest across the Korell-Bordeaux site. The Bordeaux Trading Post was behind the trees in the background.

Figure 5: Exposed area of the prehistoric trash midden at the Korell-Bordeaux site, area 2.

The Fisher site is another resource in dire need of professional attention. We can document from old photographs and topographic maps that erosion has destroyed over 5000 sq m of this site just since 1955. Fisher is situated on the left bank of Cottonwood Creek between Guernsey and Fort Laramie (Figure 6). This is a stratified ceramic site overlain by a historic component near the surface (Figure 7). The historic level (or levels) is probably associated with the Ten Mile Stage Station, which was in the immediate vicinity. Two of the four ceramic bearing levels have been dated at 590 ± 60 yrs BP (Beta-28875) and 720 ± 80 yrs BP (Beta-27029) (Figures 8 and 9). Whether or not pre-ceramic components are present remains to be determined.

We salvaged one fire pit found eroding out of a cut bank on the Spring Canyon Ranch between Lingle and Fort Laramie (Figures 10 and 11). No date is available yet from this feature. Numerous fire pits are present in this general area and several prehistoric graves have been found nearby. Several lithic quarries are also present in this area, where milk-colored cherts and a variety of different colors of quartzite from the Arikaree Formation were harvested prehistorically. Also, further up the same draw is a steep canyon known as Maiden's Lane. Hundreds of names have been carved into the soft rock of the canyon walls, some of which date to before the turn of the century. We are in the process of documenting these names photographically, as many are fast becoming obscure.

We have also been working in a strat-

Figure 6: Eroded bank at the Fisher site.

Figure 7: Excavation of stratified deposits at the Fisher site.

Figure 8: Pottery sherds from the Fisher site.

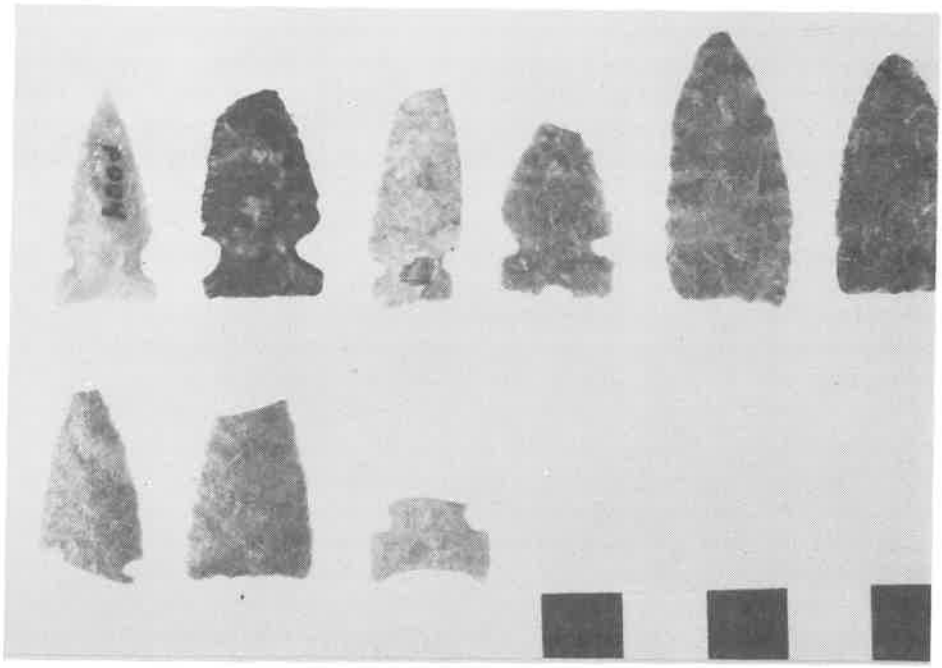

Figure 9: Projectile points from the Fisher site.

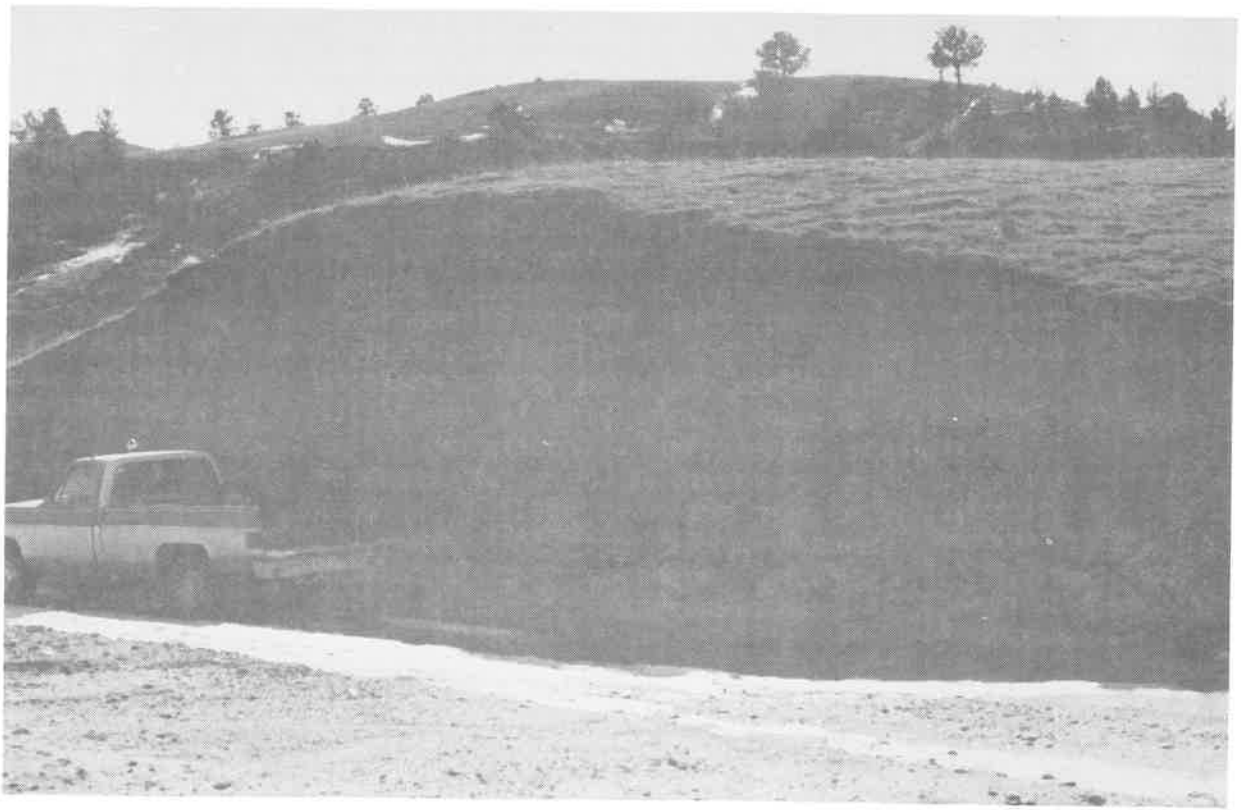

Figure 10: Cut bank with exposed fire pit on the Spring Canyon Ranch.

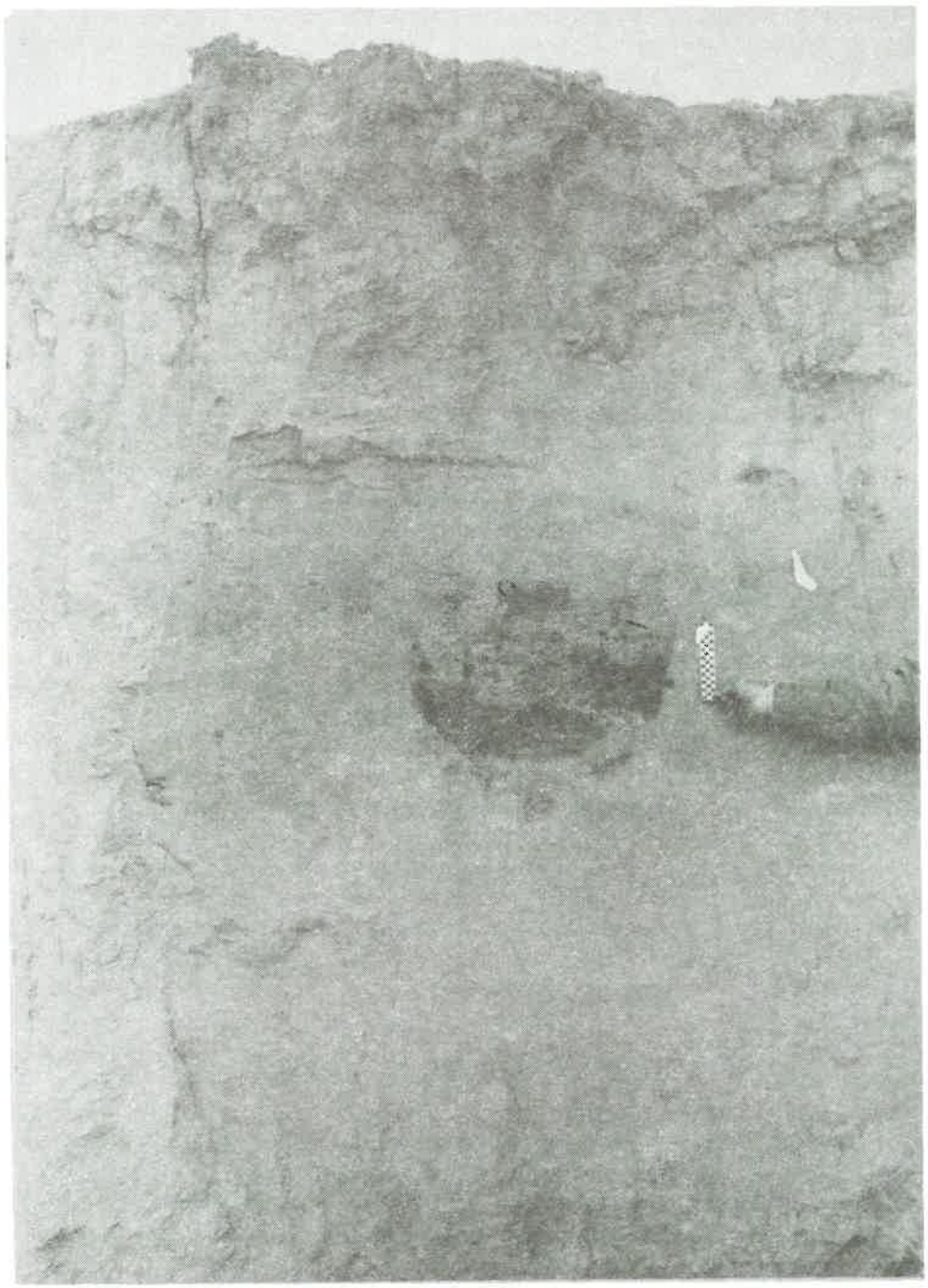

Figure 11: The Spring Canyon fire pit in profile.

ified cave in the northern end of the county. The cave, known as Bass-Anderson Cave, appears to have been used as a hunting camp and contains numerous projectile points ranging in age from 10,000 yrs to the Middle Archaic. The oldest point is a Hell Gap base. Cody Complex and Late-Paleo specimens are also represented (Figures 12 and 13). Several Early Archaic side-notched points were found in good stratigraphic context below the Middle Archaic level (Figures 14 and 15). So far we have received the following radiocarbon dates from Bass-Anderson Cave: 4410 ±100 yrs BP (Beta-22991), 4490 ± 170 yrs BP

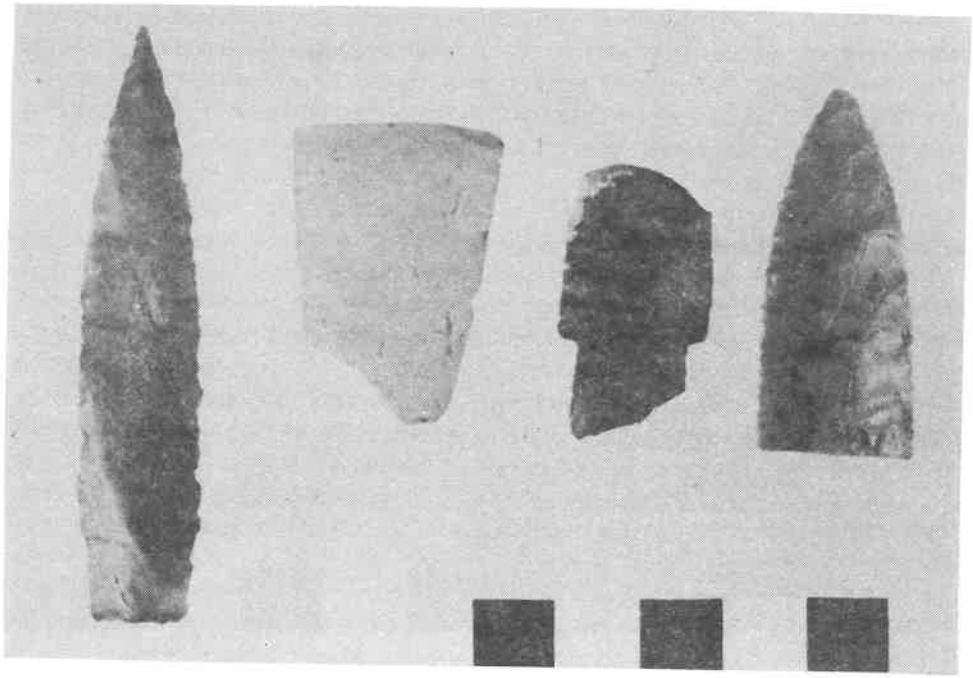

Figure 12: Paleoindian projectile points from Bass-Anderson Cave.

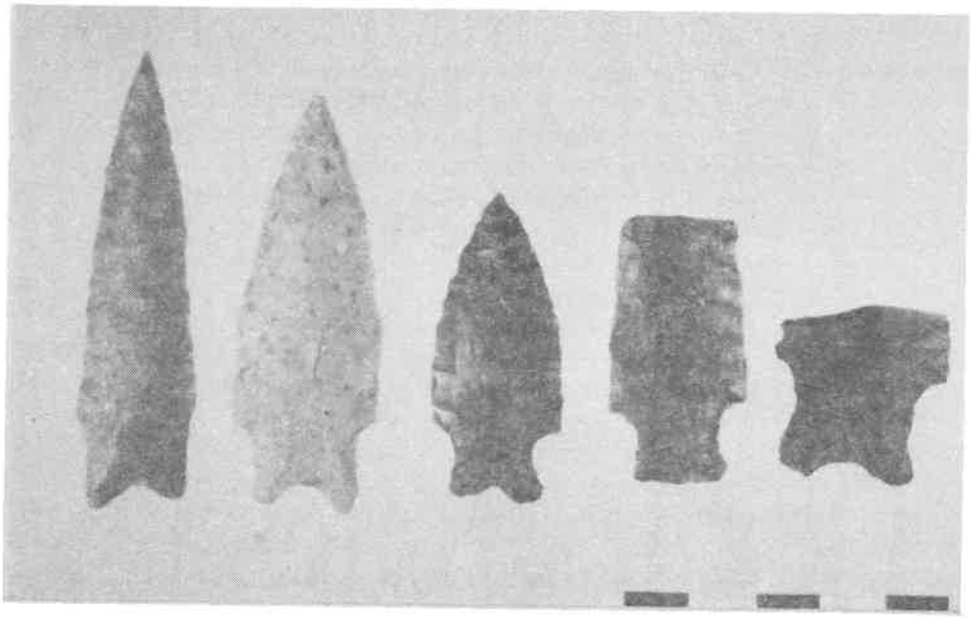

Figure 13: Late Paleoindian projectile points from Bass-Anderson Cave.

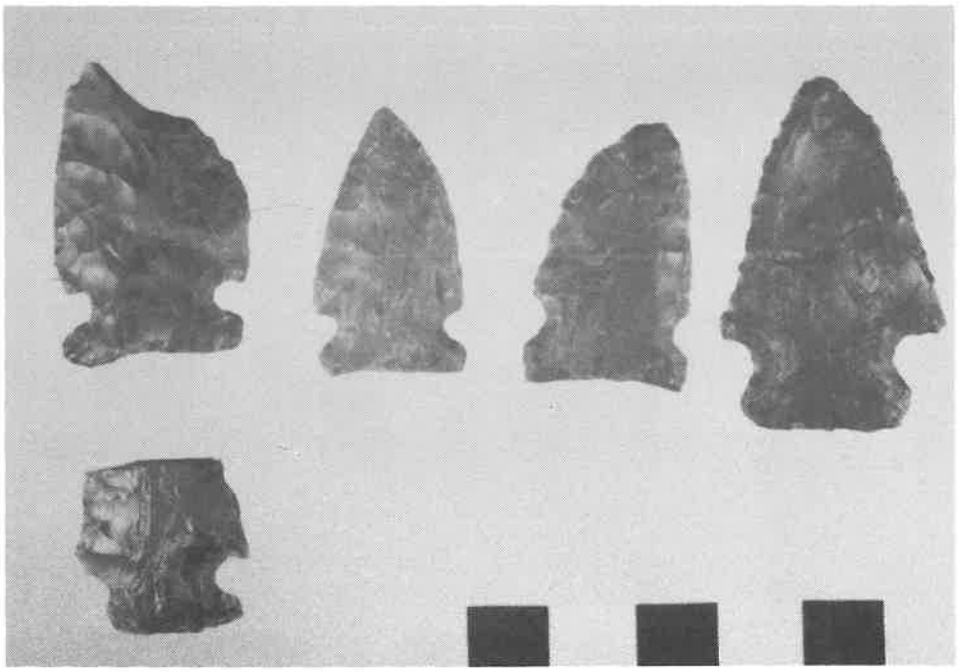

Figure 14: Early archaic projectile points from Bass-Anderson Cave.

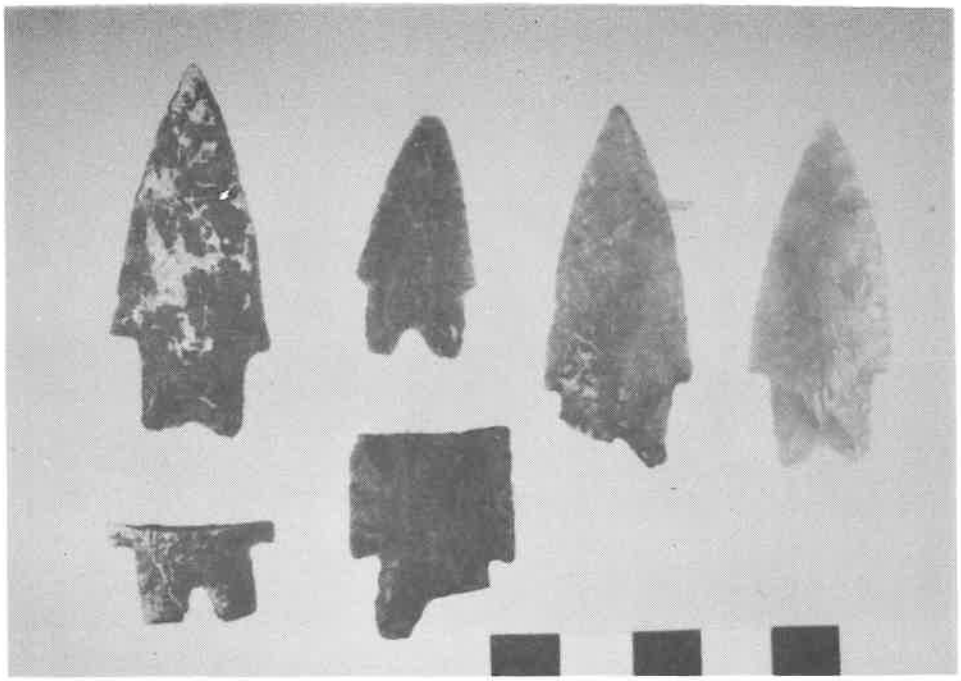

Figure 15: Middle Archaic projectile points from Bass-Anderson Cave.

(Beta-23671), and 8900 ± 210 yrs BP (Beta-28876). Other caves containing cultural deposits are present in the area. Several examples of Spanish Diggings chert and quartzite quarries can be found in the general area.

We recently salvaged portions of a bison kill near Jay Em and are busy curating the bones in our lab at Eastern Wyoming College (Figure 16). The site has been almost entirely destroyed by erosion and is the only known bison kill in this part of the North Platte Valley. No date has been obtained from the site, but the bison bones are comparable in size to Paleoindian bison (Figure 17). No temporally diagnostic artifacts were found in the bone bed, but one complete and several point fragments were found eroding out of the same deposits. A lanceolate point of similar size and style was found below the Middle Archaic component in Bass-Anderson Cave. The kill is in the same drainage where Dr. Paul McGrew excavated mammoth bones in the early 1960s. Late Prehistoric and late Archaic sites are also in close proximity to the bison kill.

Another endangered site that was just recently brought to out attention is a rock shelter located near the National Guard firing range north of Guernsey. Here, several square meters of stratified cultural deposits have recently been vandalized by an unknown party. Screened backdirt piles contain hundreds of flakes, stone tools, and bones. Displayed on the wall of the shelter is a unique pictograph in red ochre (Figure 18). Another pictograph was present but is now almost entirely gone. National Guard personnel have tried in the and are trying again to bring this site to the attention of state authorities. We have been in contact with the State Historic Preservation Office about the site. In the meantime, we intend to record the pictograph before it becomes more obscure, salvage what we can of the vandalized backdirt piles, and try to obtain a sample of the stratified deposits ahead of the vandals' work.

All these activities (and more) keep our chapter busy. We can't begin to keep up with the need to evaluate and record the numerous sites of which we are presently aware, let alone the new sites that are reported to us almost on a daily basis. However, we are committed to doing what we can for the benefit

Figure 16: Excavations at the Red Cloud Bison Kill site.

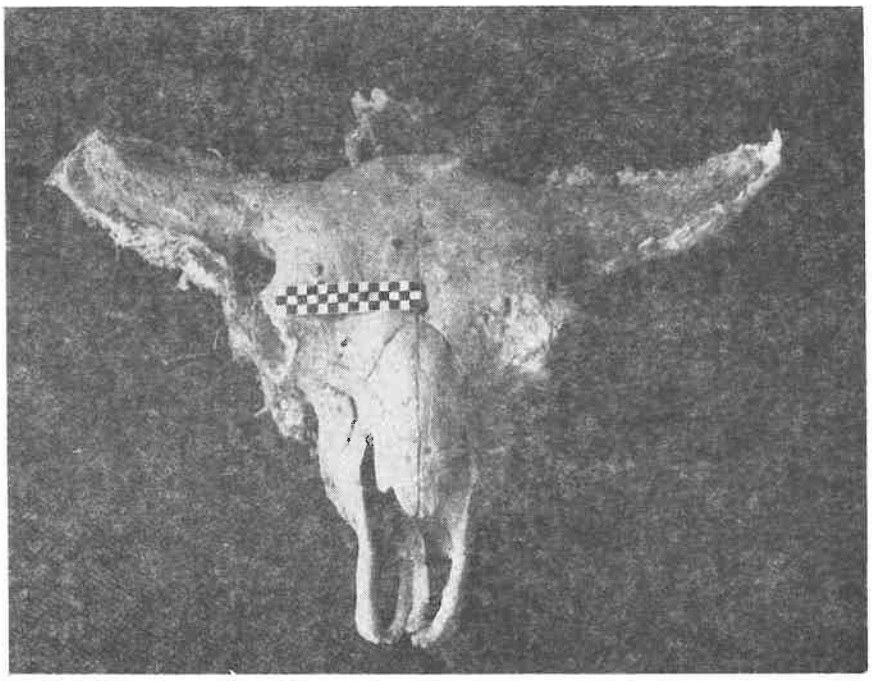

Figure 17: Bison skull from the Red Cloud Bison Kill site.

of the resource in keeping with the philosophy and goals of the Wyoming Archaeological Society. We are all volunteers and no one is paid for their time, including our resident professional. We have an annual junk auction which helps with our supplies and other costs, but for the most part, even those expenses are donated by our chapter members. All this may seem like a lot of hard work, and perhaps it is, but we all enjoy the various projects and generally have a good time working together. Most of all, we all feel a sense of accomplishment and self-fullfillment from our efforts which, after all, are for the benefit of the resource which a part of everyone's heritage.

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Figure 18: Pictograph near the National Guard firing range north of Guernsey.

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THE HIGH PLAINS ARCHAEOLOGY PROJECT: INTERIM REPORT

by
Charles A. Reher

DEDICATION

The High Plains Archaeology Project, including this report on progress made to date, is dedicated to the memory of Joe Moritz, long-time friend and member of the Wyoming Archaeological Society. Joe and other members of the Moritz family have always extended the best sort of hospitality to University archaeology crews working in the Pine Bluffs area. They were especially supportive of our work on their property at the Seven Mile Point site. Joe's active interest in our findings was an inspiration to the writer for over 20 years. A few years back, Joe called with an offer to fund several radiocarbon dates after I had mentioned the difficulty in obtaining financial support for these crucial dates. The dates were subsequently obtained, and they proved to be an important factor in the National Science Foundation grant proposal which resulted in the current large project at Pine Bluffs.

INTRODUCTION

The High Plains Project, centered in the town of Pine Bluffs, has successfully completed the second of three field seasons, and laboratory analysis is well underway. With main support from a National Science Foundation/EPSCoR grant, this project is investigating several sites in southeastern Wyoming, including stratified campsites, stone circle campsites, rockshelters, butte - top defensive sites, kill sites, rock alignments associated with ceremonialism and with the marking of prehistoric trails, burials, early historic Euro-american sites, and other site types. The High Plains Project is a large interdisciplinary project with numerous consultants in the natural sciences. Because of the project's accessibility and the personal proclivities of the principal investigator, we have also spliced in a substantial set of pilot educational and economic development programs. The purpose here is to only to summarize some of the main aspects of the project structure, and highlight some of the results.

The project research design is focused on documenting and explaining the course of prehistoric population movements on the High Plains. It is argued, for a variety of ecological, historical and cultural reasons, that many prehistoric periods may have been punctuated by major episodes of population replacement such as occurred during the markedly dynamic sequence of Late Prehistoric/Early Historic Plains Indian migrations. If so, the High Plains have a lot to tell us about the importance of grassland adaptations in the history of the human race. A voluminous literature on "frontier archaeology" is providing a set of more specific propositions about the way in which people adapt to changing conditions when expanding into new areas.

The project has been fun and productive for the Department of Anthropology. We have been able to take advantage of the talented and exceptionally well trained cadre of archaeology graduate students from our program at the University, calling on them for leadership roles while providing more continuity in employment than is sometimes the case. Undergraduate students with some experience are being promoted into positions of responsibility as the more advanced students move on, and this will go a long way towards making them more competitive for positions on other projects. At the same time, we are also bringing less experienced students along at a steady pace (often directly out of our field school program), providing crucial training and employment. We have also brought the benefits of our program to students from Colorado State University, the University of Nebraska, Rice University in Houston, Texas, and

the University of Leicester, England, as well as students from several other departments at U.W. Several students are using project data for thesis work, and the writer and graduate students have presented numerous papers at regional, national, and international scientific conferences.

FACILITIES DEVELOPMENT

With the help of the Boeing Aerospace Company, the Mayor, City Council and residents of Pine Bluffs, Donald Brown and family, The Dean Fisher family, the Pine Bluffs Masonic Lodge, and many other parties, we have been able to develop the best set of field support facilities yet seen in Wyoming archaeology. This could never have been done without the help of all these parties and we cannot express our gratitude enough. Of course we are now so spoiled that we might never again be able to work out of a tent as we used to!

These facilities include the Boeing Building, which has been turned into a field lab/visitor center-museum complex incorporating over 12,000 sq. ft. of open lab areas, offices, storage bins, sample processing areas, vehicle bays, etc.. Also included are a dining hall, a field camp, a water screening facility, and other facilities. Most of the costs of operating these facilities (e.g. substantial use of water and electricity) are being subsidized by the City of Pine Bluffs. In the sense of a establishing a complex of "research facilities", the Department of Anthropology also has a 20 - year lease on the main excavation site, the Pine Bluffs Site (48LA312, see below).

CULTURAL CHRONOLOGY

A tightly controlled chronology is an important part of the research design mentioned above. The frequency and duration of episodes of increased occupational intensity is a primary tests of the model of periodic migrations. A radiocarbon dated sequence will allow us to put some realistic parameters on the measures of artifact discard rates in stratified deposits that provide the main data sets for testing of the theory, and other radiocarbon dates will allow the integration of single component sites and other site types.

In spite of the important role that Duncan Strong's work at the nearby Signal Butte had in the development of North American archaeology, and in spite of the importance of the High Plains Paleoindian chronology from the Hell Gap Site and other eastern Wyoming sites to the north, there has been not been much recent development of chronologies that can be related to this corner of the state. There is a limited series of dates from several areas not too distant in northern Colorado, and recent work by George Zeimens and the Wyoming Archaeology Society's High Plains Chapter is beginning to provide dated component series in the North Platte Valley/Goshen Hole area.

The High Plains Project has established a series of over 35 dates for the sites mentioned below, including several accelerator dates still under analysis (Table 1). Several dates have also been funded for the High Plains Chapter because of our shared interest in dating ceramic complexes. About 20 more dates will be established by the project after the next field season. Eventually all these endeavors should bring the southeastern chronology up to a state where it is comparable to other areas of North America.

SITE DISCOVERY AND TESTING

The consistent presence in one area has resulted in an unusually active site discovery and testing program. We are hearing about many sites from interested residents of several surrounding counties, and we have been able to follow up on many leads that normally would be unfortunately just "added to the files" for an undetermined length of time. Some of the sites are being confirmed and tested because of specific potential within the framework of the NSF project research design, while work at others is due to a more general attempt to demonstrate the region's research potential for future grant proposals.

Lab #(*)	Site	HPA #	C-14 Age Years B.P.
B-13065	LA312, P.B.Site	TU1/.6	1060±90
B-13066	LA312, P.B.Site	TU1/.8	1620±90
B-13067	LA312, P.B.Site	TU2/1.6	3680±80
B-27032	LA312, P.B.Site	4-1372	4780±80
B-27033	LA312, P.B.Site	27-2329	3860±100
B-27036	LA312, P.B.Site	49-249	5840±110
B-28865	LA312, P.B.Site	29-2324	4320±160
B-28872	LA312, P.B.Site	50-5901	4850±70
B-27030	Muddy Creek Bog	MC-1	130±80
B-27031	Muddy Creek Bog	MC-2	710±110
B-13063	Seven Mile Point	M1993	1300±60
B-13067	Seven Mile Point	M1994	1100±50
B-27038	Seven Mile Point	M1996	930±60
B-27039	Seven Mile Point	M1997	1650±60
B-27040	Seven Mile Point	M2002	1680±100
B-27041	Seven Mile Point	14-03	1250±80
B-27042	Seven Mile Point	70-225	1940±70
B-27043	Sorensen Shelter	9-161	1430±70
B-27045	Sorensen Shelter	13-192	1930±100
B-27046	Sorensen Shelter	23-264	1800±70
B-27047	Sorensen Shelter	23-310	1920±60
B-27048	Sorensen Shelter	27-425	1960±80
B-27049	Sorensen Shelter	32-007	1120±80
B-28863	Sorensen Shelter	12-191	2240±70
B-28866	Petsch Springs	PS1	4340±110
B-28867	Petsch Springs	PS3-1	1510±160
B-28868	Petsch Springs	PS4-8	1660±140
B-28869	Petsch Springs	PS5-10	420±220
B-28870	Petsch Springs	PS9	380±80
B-28871	Petsch Springs	PS10	1670±140
B-28873	Lodgepole Bonebed	T60-54	8700±190

* - all Beta (Beta Analytic) dates

TABLE 1: Recent radiocarbon dates from the High Plains Project.

Sorensen Shelter (48LA1033), a small overhang on the Earl Sorensen ranch in the Horse Creek Breaks north of Albin, was discovered by the writer during reconnaissance of a nearby Paleoindian site with W.A.S. member Harvey Deselms. Subsequent testing revealed a shallow cultural deposit of about 50 square meters, with dense artifactual materials and features. Several test units average three to four hearth features per square meter, in other words the deposit in some areas is almost completely made up of overlapping features. The site has the most intricate and problematical stratigraphy in the writer's experience.

Diagnostics and carbon dates (Table 1) indicate an occupation span from late Archaic through late in the Late Prehistoric, with the main components coming from the early Late Prehistoric Plains Woodland period. The site appears to have been used as a processing area and small camp by task groups such as hunting parties, instead of a base camp. A winter occupation is likely, since the west-facing white limestone overhang heats up to over 140 degrees F. every afternoon.

The Lodgepole Creek Bonebed was brought to the writer's attention by Mr. Mac Vowers and permission to test the site was graciously extended by the Bill Mueller family. It was apparent from the frequency, size and state of preservation of the bison bone eroding from an arroyo bank that it was likely a cultural manifestation of late Pleistocene age, and that the edge of a sizeable, multiple-animal "bone bed" was being exposed. The geologic context indicated that this could be the back edge of a bone bed that had mostly eroded away, but there was some chance that would extend back into the bank for some distance.

A testing program was initiated in June, and later in the summer we were joined by Dr. Larry Todd, who is now analyzing the bone at Boston University. We recovered over 600 bone elements in unusually good shape, some of which were from among the largest animals recovered by the Department of Anthropology kill site research program. Unfortunately, the bone bed was apparently the remnant of a larger site, and no definite artifactual materials were recovered. From indirect evidence of nonrandom element sorting, possible butchering, and a carbon date of Cody complex age (Table 1), we are convinced of its cultural derivation and will continue excavation on the bone bed area and additional exploratory trenching this summer. The site will be useful in researching bonebed formation processes in any case.

Three other kill sites were located in the Horse Creek breaks on the Tom Hunter ranch. One was discovered by the Hunter family in the bottom of a deep plunge pool caused by a flash flood. The bison bone was in good shape, with cut marks and other evidence of butchering, but it is going to be some time before we can come up with the resources to test this bonebed, portions of which appear to be close to 6 meters below ground. Two other bonebeds were ones which the writer was told about by Lou Steege over two decades ago and recently relocated by Lou and Harvey Deselms. Testing of one of these in the fall after the main field season revealed a shallow, poorly preserved bone bed about 100 square meters in extent, with projectile points that appear to be Late Archaic in age. Both sites are at the foot of small cliffs and could be either a jumps or pounds. Several other leads indicate that there may be yet a fourth bonebed buried near the first one mentioned.

The existence of the Baltensperger Rock Alignment site was located and verified just south of Bushnell, Nebraska, thanks to the efforts of Salma Hammond and the Baltensperger family. This turned out to be an arc-shaped feature about 20 meters across made from carefully spaced, flattish boulders some of which were over a meter across. The large feature is adjacent to a tipi ring site and has the "feel" and configuration of the foundation for some sort of ceremonial structure (e.g a Sun Dance Lodge). It is similar in size and shape to another arc made up of smaller, widely spaced stones at the Gross Tipi Ring Site near Pine Bluffs.

Two other linear rock alignments on the Baltensperger ranch are thought to be trail markers. Such markers could be of real use in such dry, relatively featureless portions of the High Plains. A similar, long alignment of small stones (ca. 150 meters in length) on the Ed Zimmerman ranch north of Pine Bluffs was also discovered and mapped as a result of work in the area. This "Chivington Draw Rock Alignment" appears to relate to a trail which would have crossed the uplands from the Lodgepole Creek valley to the breaks above Horse Creek.

In doing so, it crossed from the South Platte drainage to the North Platte drainage, and the writer is proposing that the alignment could have incorporated some specific information about a major prehistoric upland trail. Work with Deselms and a whole series of most cooperative landowners has confirmed the presence of an unusually concentration of small sites along the proposed trail corridor.

These are just a few of the sites that have been located or tested as a result of the High Plains project. A variety of other tipi ring sites have been mapped and tested, as have other small rockshelters, open camps and early historic sites. Work has continued at the Gurney Peak Fortress Irvin Petsch ranch, including production by Dr. Jim Grady and Associates of an exceptionally fine contour map based on aerial photographs of this complex, Upper Republican-era (ca. A.D. 1100-1300) butte-top defensive site (48LA305). Access to the site is gained only by clambering up a series of handholds and footholds on the sheer side of this butte. Excavation at some of the main sites such as Seven Mile Point (see below) and reconnaissance in the Goshen Hole area has confirmed the consistence presence of other Upper Republican occupations on and around such buttes, occupations that are thought to be symptomatic of hostilities on a prehistoric frontier. We have clearly established the potential for a long term research presence in the extreme southeast corner of the state, and more significant sites are being located each field season.

MAIN SITE EXCAVATIONS

Work has continued at the main site of Seven Mile Point (48LA303) and at the Pine Bluffs Site (48LA312). The writer has conducted work at the Seven Mile Point Site for over 20 years, with the strong support of the Joe and Bernie Moritz families. Seven Mile Point a vast site containing small rockshelters, tipi ring areas, burials, and open camps. Stratifed deposits in some of the camp areas on top of a large butte (ca. 100 meters high and 50 meters wide by 150 meters long) contain levels ranging from Early Historic to Middle Archaic in age. The Upper Republican and Plains Woodland components contain some of the densest lithic accumulations in the area. Analysis of in-situ and water screened aggregate samples is revealing debitage counts of over 500 items in a 5 cm. level of a 1 m. unit.

The second summer of work at the Pine Bluffs Site saw the completion of a large excavation block (ca. over 3 meters deep and ca. 3 by 4 m. in size) in the main site area. This block incorporates a sequence ranging from the Early Historic old town dump deposit (ca. 1870-1915), with Plains Indian trade beads immediately below, to the Paleoindian era (Table 1, accelerator dates from Paleoindian levels are still under analysis). Several diagnostic projectile point forms and have been recovered, including Woodland, Late, Middle and Early Archaic, Scottsbluff, Hell Gap, and a small, out-of-place Folsom point fragment. Item densities in the main components tend to be "low to medium" (e.g a few items up to an average of ca. 40 or 50 per 1m. by 5 cm. level), but this well spaced sequence is the linchpin of the whole attempt to study the timing of occupational events in the southeast corner of the state. A new area of the site tested during the last field season revealed an exceptionally dense Woodland midden with item frequencies that will apparently exceed the high densities just mentioned for Seven Mile Point.

The second season also saw the start of a mapping and excavation project at the other main cultural and paleoenvironmental site, the Petsch Springs Site (48LA303). This site has several components, including, at least, Dismal River (probable Plains Apache, ca. A.D. 1500-1600), Upper Republican, Plains Woodland, and Late Archaic) (Table 1). The site may contain Middle Archaic and Paleoindian components as well. The excavations were done primarily to obtain charcoal for the first suite of dates from the site, and to initiate

soils work. The exposure of close to 10 meters of soil sequences makes this perhaps the best paleoenvironmental research station in this part of the state. The site is part of a soils research project by Dr. Rick Reider of the U.W. Dept. of Geography, including thesis research by John Anderton, a graduate student in that department.

Site excavation in the first two years of the project recovered material from excavation of about 75 cubic meters of sediment. This involved documentation by close to 2000 individual field forms, for something on the order of 600 5 cm. levels in 2000 50 cm. by 50 cm. quad units. Over 75 major site maps and profiles have been compiled, including the main sites, the tested sites, and many outlying sites where mapping has been the main form of documentation.

LAB ANALYSIS

Lab analysis on a project of this scope is a long, drawn out process. With current recording procedures, analysis can be said to begin with data formats recorded during excavation. Curation and cataloging and some basic analysis continues in the field lab in Pine Bluffs, and extends throughout the winter in the labs back at Laramie. As of this date, analysis of assemblages and samples from the main sites involves over 8500 artifacts, or bulk and aggregate samples recovered with in-place control. This is accounted for by over 8500 data format lines on field documentation forms, which translates to the ongoing computer entry of 15 multiple column data fields on each line, or over 127,000 individual computer entries. With the addition of surface artifacts, upgrading of older project data, and the site testing program, cataloging and curation entry on over 11,000 items with 10 data fields translates into another 110,000 data entries.

Processing, sorting and analysis of aggregate water screening and flotation samples involves a complex sequence of procedures that is recovering an estimated 21,000 pieces of debitage, 13,000 tiny bone fragments, and 20,000 soil gastropods. These procedures have incorporated over 1700 matrix samples, with 24 data entries on processing forms or 40,800 entries completed, associated lab analysis forms with 18 entries or another 31,100 entries completed, and continued analysis forms with 8 entries and 13,600 computer entries in progress. Also involved were over 1600 flotation samples with 9 data fields, or 14,400 entries completed. Over 500 bulk samples (soil, charcoal, etc.) have required completion of up to 25 data fields for certain sample types, or an estimated additional 5800 data entries. Continued basic analysis such as counts, weights, etc. and further advanced stages of analysis translates out to several hundred thousand more future data entries before the project is done. The third field season can be expected to add from 10 to 30% to these totals, and this accounting does not include the variety of cataloging, curation, and analysis tasks that do not take the form of data format entries.

EDUCATIONAL PROGRAMS

Since its inception, the High Plains Archaeology Project has had a strong commitment to the use of archaeology for educational purposes. Although outside the purview of a strict field research orientation, the location of some of the sites and the field lab in and near the town of Pine Bluffs was too good of an opportunity to pass up, both in facilities for housing and training university students and in a public outreach effort. A public orientation could only result in good public relations for the National Science Foundation and the University of Wyoming; however, actual support for such from either of these entities was nonexistent or minimal, for the understandable reasons that NSF grant that was the mainstay of the project was strictly for research, and that the University is undergoing hard times along with the rest of the state. It should be pointed out that the developments at Pine Bluffs, research-oriented or otherwise, are only possible because of the cornerstone presence of the

National Science Foundation project, and that numerous parties throughout the University have been favorable of the idea of associated educational endeavors.

Establishment of a pilot education program took enormous amounts of time by the writer (who, truth-be-known, had plenty to do with directing the project and continuing the usual "several other jobs" normally associated with faculty responsibilities). The program that did result would not have been possible without the dedication of the students who make up the research crews, and the direct support of the mayor, town council, and employees of the city of Pine Bluffs, as well as several other key individuals.

The educational program is still being developed, but at this point the program has included, for example:

a) a Department of Anthropology archaeological field school (Anthropology 615);

b) an Internship in Public Archaeology for project members (Arts and Sciences 640; this class provided invaluable experience to our students as they worked in the museum and interacted with several thousand summer visitors);

c) an evening extension class in Plains Archaeology for project members and residents of Laramie County and surrounding areas (Anthropology 616; offered through the U.W School of Extended Studies; this class was especially effective, involving hands-on work in the lab and at the excavation sites as well as lectures and slide series);

d) a summer field research program for Wyoming high school science teachers (Natural Science 877; offered in cooperation with the U.W. Science and Mathematics Teaching Center);

e) an avocational public interaction program, ranging from extensive individual volunteer stints in excavation and lab to workshops and tours during the summer meeting of the Wyoming Archaeology Society;

f) numerous public lectures and presentations in the area, ranging from a weekly public lecture series to single evening presentations for local civic organizations in several area towns;

g) establishment of museum displays in the field lab complex, including over 100 feet of table-top artifact displays and over 150 feet of bulletin board poster/photograph displays;

h) guided tours of lab and excavation areas for civic groups and for casual visitors;

i) development of a set of 15 painted tipis which are erected near the excavations and used as outdoor interpretive exhibits (developed with the high school art department and several far-sighted volunteers);

j) use of the High Plains educational program as a model for initiating a similar system at the Territorial Prison Archaeology Project in Laramie (in cooperation with the State Archives, Museums and Historical Department);

ECONOMIC DEVELOPMENT

The research and educational activity at Pine Bluffs has provided the basis for an experimental economic development program. Archaeological sites have, of course, been developed into major tourist attractions in other states. Several prehistoric and historic sites in Wyoming have been developed and interpreted to varying extents. However, in no case has the true potential of these sites for public education been realized. This is gradually changing with projects such as the intensive Recreation Commission/State Archaeologist Legend Rock study, with the Archives, Museums and Historical Department/University of Wyoming Territorial Prison archaeological project, and other studies.

We believe that the Department of Anthropology can provide the most effective lead for economic development of archaeological sites because we have the most advanced research and educational capacity in the state, and thus we can provide the maximum amount of information and activity. This statement is based on the assumption that what Wyoming lacks in the way of giant "Mesa Verde" style complexes can be made up

for with the activity and educational opportunities provided by having research crews on view and ready to give tours and answer questions, and by developing field labs into museum/visitor centers. This is especially true in a few unique situations such as Pine Bluffs, or the Vore Buffalo Jump near Sundance, because of their proximity to the several million people that travel down the Wyoming's interstates every year.

At Pine Bluffs, the Department of Anthropology is determined to put something of the state-of-the-art on view, and not the watered-down version that is usually presented. We are more interested in developing an awareness of the goals and methods of scientific archaeology than on setting out brief sketches of regional prehistory for a "tourist attraction." Much of what goes on is implied in the above discussions (e.g. the guided tours and indoor and outdoor exhibits), and we are having some success in reaching several thousand visitors every summer.

The "economic development" comes from several aspects of the project in addition to Interstate visitors. The educational systems, the facilities, and the pilot economic development programs can be used to open "nontraditional" sources of funding for excavation crews, which translates into more research. The consistent presence of crew of any kind in small Wyoming towns such as Pine Bluffs or Sundance translates out as a small but definite economic development. Spending at the grocery stores, hardware stores, and other businesses can pump thousands of dollars into the local economy. With continued development of facilities and other logistic and educational facilities comes construction work and local employment.

As is also implied above, local residents are benefited by educational opportunities (evening classes, tours and other activities for school children, etc.) that cannot be measured in dollars. While economic agendas are providing much of the support for the research station concept, we really do believe that the proposed developments are the best way to "have something for everybody."

And of course, back to the dollars which come from seasonal visitors -- plenty of studies exist which show how even short term visits translate into increased spending, in the area and on down the road due from slowed travel rates. We believe a high quality experience, instead of another tourist trap, is important in making people more aware of the historical resources in this state, and more amenable to stopping at such developments.

The Pine Bluffs program is now providing much of the ammunition for initiatives to develop funding for additional pursuit of economic and educational goals. It should be pointed out that University faculty responsibilities do not allow one to devote the time needed for such a campaign, and some of the effort is going towards getting support to allow this release time. As of this writing, a bill sponsored by Senator Turner and Representatives Dickey and Plant which will support a detailed study of economic development at Pine Bluffs and the Vore Site is winding its way through the ambushes and pitfalls of the legislative process. The University of Wyoming does not intend to get into the "tourist business", but we would like to see archaeological research stations with a public aspect, if we can maintain control over the quality of this aspect.

THE 1989 SEASON

The coming summer will see continued excavations at the Pine Bluffs Site, Seven Mile Point, Petsch Springs and Sorensen Shelter, along with mapping and testing programs at other sites. The field lab and visitor should be in full swing, although we are still scrabbling for funds for these latter endeavors; the scale of public interaction that we are trying to uphold is still a "luxury" on a research project and outside funds must be garnered for most of the activities. The educational program should also be all the above and more.

As always, Wyoming Archaeological Society members have an open invitation to come on down and get involved. Any interested parties should check ahead of time on schedules and other arrangements. The Cheyenne Chapter has indicated an interest in sponsoring another summer get-together, and we will try to put on the City sponsored cream can feast, the High Plains pancake breakfast, the evening social hours, the workshops and site tours that made last summer's festivities a success.

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GOSHEN COUNTY HISTORIC SITES

The search for two Goshen County historical sites is underway. A group of four Denver, Colorado, men are donating their time and equipment to make sub-surface ground scans in an attempt to locate remnants of the Bordeaux Trading Post and Fort William. Bordeaux's Post was located near the Grattan Massacre site west of Lingle, and Fort William was an 1830s trading post situated near the confluence of the Platte and Laramie Rivers west of the town of Fort Laramie.

Twenty-five members of the High Plains chapter of the Wyoming Archaeological Society and other volunteers were on hand recently to assist in the search for a particular feature of the Bordeaux site: a cellar that was located under the trader's store.

George Zeimens, local archaeologist, said "Although the surface area has been badly disturbed here, I feel the cellar may still be intact."

Dennis Eisenbarth, WAS chapter president, said "Due to the offer of help from two geologists and two geophysicists from Denver, we can attempt to locate this significant historic feature.

"These men from Colorado are here on their own time using ground radar equipment valued at $75,000," Eisenbarth said. "Their normal fee for this work is #3000 per day. Without their generous contributions, it's doubtful if these sites could be found.

"Local landowner cooperation was also necessary to make this happen," said Eisenbarth. "Greenwald Farms allowed us to go into their field to do this search. All of us interested in this project thank them for their consideration."

The Bordeaux site was explored Saturday and on Sunday, work began at Fort William. The search for this site is directed by personnel from the Fort Laramie National Historic site.

John Burns, chief of visitor services and resource management at Fort Laramie said, "The plan here is to identify the exact location of the old trading post, the original Fort Laramie; there were three of them in all. Fort William was used from 1834 to 1841.

"We would like to locate the subsurface cultural remains, stake them out, possibly do some test digging, expose some artifacts, and come up with a plan for visitor access," Burns added.

"The information we hope to gain here would enable us to better interpret the early fur trade in this area," Burns said. "We really don't feel we do enough in that phase of local history at this time.

"It would also provide more viewing for the more than 100,000 visitors the Fort attracts every year," Burns explained.

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THE BUTLER-RISSLER SITE: PLAINS WOODLAND OCCUPATION ALONG THE NORTH PLATTE RIVER, WYOMING

BY

MARK E. MILLER AND BRIAN R. WAITKUS

ABSTRACT

Recent archaeological investigations have uncovered an intact Plains Woodland camp on a Holocene terrace of the North Platte River in central Wyoming. The component dates to about 1700 years ago, and contains Woodland pottery and stone artifacts reminiscent of Besant. A diverse inventory of terrestrial and aquatic fauna also was recovered. The site is presently interpreted as a summer residential camp logistically placed to exploit freshwater mussels and riparian resources. This evidence is compared to other Woodland-Besant manifestations in Wyoming and elsewhere on the Northwestern Plains.

INTRODUCTION

This report documents results from analysis of a portion of the archaeological record at the Butler-Rissler site (48NA1000) in Natrona County, Wyoming. The site is a Late Prehistoric Plains Woodland camp along the North Platte River about 33 km (20 mi) southwest of Casper, Wyoming (Figure 1). Test excavations were conducted at the site between 1985 and 1987 by the Office of the Wyoming State Archaeologist and members of the Wyoming Archaeological Society.

The Butler-Rissler site is a single archaeological component embedded in a buried A horizon approximately 35-40 cm below a Holocene terrace surface. The archaeological zone averages 10-15 cm in thickness. Recovered material includes firecracked rock, valves and fragments of mussel shell (Lampsilis cf. ovata ventricosa), burned and unburned bone fragments from several animal species, stone tools, debitage, cord-roughened ceramics, and one intact fire pit. The context of this assemblage strongly indicates co-occurrence of Plains Woodland pottery with Besant dart points.

In recent decades, an increasing number of Northern Plains sites have been recorded that contain both Besant projectile points and cord-marked pottery (Kehoe 1964; Wood and Johnson 1973; Johnson 1977; Reeves 1983). Much of this research has focused on the importance of a bison hunting economy to groups using Besant technology between 1300 and 1900 years ago. This approach contrasts with Middle Woodland research further east which strongly emphasizes ceramic technology and mortuary sites (see Neuman 1975). More recently, some investigators

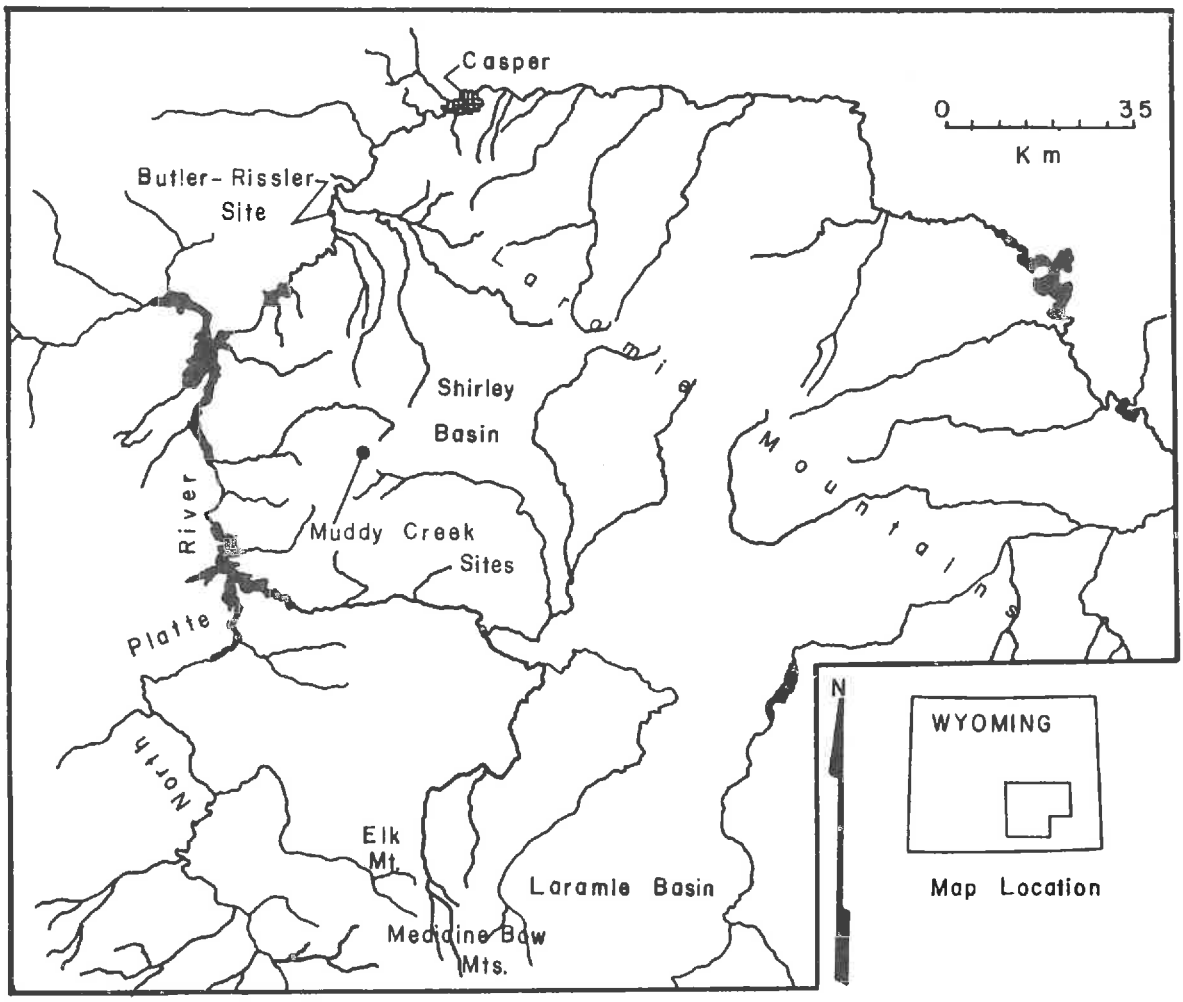

Figure 1: Location of Butler-Rissler site in North Platte River valley.

have tried to synthesize a large database from this time period and postulate cultural continuity among populations who used Plains Woodland pottery and Besant projectile points (Johnson 1977). It is becoming increasingly important to understand artifact and spatial patterning in these sites because the database is growing even larger as a result of recent cultural resource management studies (e.g., Greiser et al. 1982).

In synthesizing Woodland-Besant data, archaeologists must be careful not to equate artifact types with specific cultures. Relationships between the two are still poorly understood, and other explanations for patterning must be considered. Frison et al. (1974:111) suggest that projectile point variability may be strictly functional, and morphological differences might reflect particular subsistence preferences. These researchers acknowledge that cultural and functional alternatives are not mutually exclusive, because cultures can vary as a result of different ecological conditions which influence subsistence practices. Ecological conditions also can vary on a seasonal basis, and human groups within a single culture may alter

subsistence practices to exploit different resources.

This perspective suggests a model of flexible hunting and gathering activities where single human populations can utilize a continuum of subsistence practices ranging from specialized big game hunting to generalized foraging (Reher 1979). Plains Woodland adaptations are viewed as part of this continuum.

Theler (1987) recognizes the value of flexible subsistence strategies during Woodland occupation in southwestern Wisconsin and northeastern Iowa. In Theler's study area, Woodland groups participated in an annual cycle of subsistence and settlement composed of at least two seasonal patterns. These were a fall-winter adaptation involving procurement of large game in areas where animals aggregate, and a summer adaptation oriented toward aquatic resources such as freshwater mussels and fish, while still exploiting terrestrial species.

A similar cycle formulates a working model of Woodland-Besant subsistence/settlement on the Northwestern Plains. Differences between Besant and Woodland sites may hinge only on a distinction between fall-winter and spring-summer subsistence practices in the same settlement system. Large, communal bison kills represent a fall-winter adaptation. Ruby (Frison 1971a), Willow Springs (Bupp 1981), and Muddy Creek (Reher 1987) are excellent examples from Wyoming. Campsites in riverine settings, where freshwater mussels and diverse mammalian species were hunted and collected, constitute the spring-summer component of the cycle. However, aquatic resources may not have been used as extensively as in Theler's study area. The Greyrocks site near Wheatland is a good example (Tibesar 1980). Archaeological evidence at the Butler-Rissler site also may represent this portion of the settlement system. As such, the site is a significant data set for helping explain Plains Woodland adaptations.

ENVIRONMENTAL SETTING

The site is situated on the second Holocene terrace above a broad meander of the North Platte River at an elevation of 1609 m (5280 ft). The terrace rises several meters above the river and is the largest Holocene terrace present in the area. Beneath it lies a low, narrow terrace and a small floodplain. The lowest terrace rises from one to two meters above the river, while the floodplain appears as a discontinuous surface at the water's edge on both sides of the river.

Positioned on the east bank of the river, the site location provides an overview of the surrounding region. Casper Mountain is visible to the northeast, the Bates Hole country to the southeast, and Clarkson Hill to the west. The Laramie and Shirley Mountains are visible in the distance. These uplifted areas form the margins of Shirley Basin and Bates Hole, which are intermountain basins in the greater North Platte River Valley.

The on-site vegetation is typical of intermountain river basins in the region. Riparian plant communities line the adjacent floodplain and typical sagebrush steppe vegetation covers the terrace tread.

HISTORY OF SITE INVESTIGATIONS

The Butler-Rissler site (48NA1000) is one of nine prehistoric sites found during a cultural resource inventory of 150 acres adjacent to the North Platte River in 1985 (Reiss *et al.* 1985).

Butler-Rissler and two other sites (48NA543, 48NA999) produced surface finds of cord-marked pottery reminiscent of Plains Woodland. Sites 48NA543 and 48NA1000 also yielded large, side-notched projectile points. The single weapon from 48NA543 was found in 1979 by the Bureau of Land Management and was identified as being similar to the Besant type (Johnson 1979). A similar projectile point found at 48NA1000 in 1985 also was identified as Besant (Reiss et al. 1985:20).

Surface finds of ceramics and projectile points suggest these sites were occupied during the first millennium A.D. In addition, evidence at 48NA1000 indicated that artifacts, bone, shell, and charcoal stained earth were eroding from a buried level in the terrace slope.

A single 1 x 1 m test unit was excavated in 1985 several meters upslope from the exposed cultural level. This unit uncovered numerous interior (tertiary) flakes, so the testing program was expanded. In the summer of 1986, volunteers excavated a five square meter block between the exposed level on the terrace edge and the 1985 test (Miller et al. 1986, Miller and Waitkus 1987, Waitkus 1987). These units were placed adjacent to a dark, charcoal stain in the cutbank identified as a possible fire pit following the initial survey. This feature had eroded away by 1986, but a buried, cultural level was identified.

The Wyoming Council for the Humanities funded a larger excavation effort for the summer of 1987. During a ten day field session, over 20 square meters of the intact level were excavated, and a large, wind deflated area of disturbed sediments was shovel-scraped (Figure 2). Three backhoe trenches were dug later that fall. Results from all these excavations provide the basis for this report.

One additional locality was minimally investigated in 1987. It was a buried stratum exposed in a terrace cutbank approximately 70 m south of the Butler-Rissler excavation. The stratum appears to be a non-cultural remnant of a dark gray to black wetland sediment containing aquatic mollusks. Future study of this locality and its contents may provide clues to the regions paleoenvironment.

FIELD METHODS

Different investigators conducted various phases of the Butler-Rissler project, so field methods vary from one activity to another. The initial survey has been discussed in detail elsewhere (Reiss et al. 1985). Subsequent investigators continued to monitor surface exposures of artifacts and cultural debris. When formalized tools such as projectile points and scrapers were found, they were point plotted in relation to the site datum initially staked by the survey crew, then collected.

On September 13, 1985 a two member crew visited the site to initiate test excavations. Sediments upslope from the exposed cultural remains were tested to determine if a continuous subsurface distribution of items was present. The original 1 x 1 m unit was opened about 6 m north of the exposed level in the terrace cutbank. This unit was later tied into the site grid system oriented to true north (magnetic declination 13.5°). The grid was established from the permanent site datum which was eventually set in concrete 4 m east of the test unit. Site datum was given an arbitrary provenience of North 100 m, East 100 m, and an arbitrary elevation of 100 m (Figure 3). Grid coordinates of the 1985 test are N99-100, E95-96.

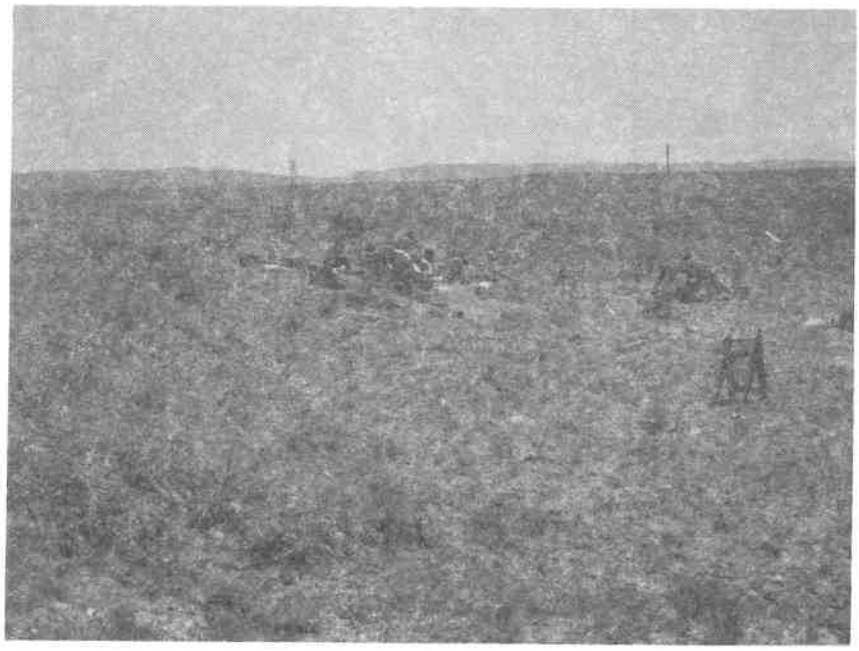

Figure 2: General view of 1987 excavations.

All subsequent excavations were tied into this datum and are identified by southwest corner coordinates. For example, the 1985 test unit is designated N99 E95.

All excavations were by trowel and brush. Ground surface elevation of unit N99 E95 was 99.88 m, so the first arbitrary level was dug 8 cm deep to bring the excavated surface to an even 10 cm level. Excavation continued in 10 cm arbitrary levels designated in depth ranges of 99.80-99.70 m and 99.70-99.60 m. Arbitrary levels were discontinued at 99.60 m when investigators shifted to a single 15 cm level. The unit was terminated at 99.45 m (43 cm below surface). Matrix from each level was dry screened through 1/8" mesh.

Numerous flakes, shell fragments, and a pottery sherd were found, but investigators did not identify a distinct, buried component. In fact, the unit may not have been excavated deep enough to reach intact cultural materials. Consequently, a decision was made to return and open a larger test block adjacent to the exposed level in the cutbank where the darkest stain was noted during survey.

The block of five additional 1 x 1 m units was excavated on August 30, 1986 (Figure 3). Three of these units (N94 E93, N94 E94, N95 E92) intersected the exposed cultural level along portions of their southern boundaries. Excavation and screening procedures followed those used during the 1985 test. However, since these units were closer to the contour from which surface artifacts were believed to originate, arbitrary levels were reduced to 5 cm.

Surface elevations in the excavation block began at about 99.00 m along the southern exposed cutbank and increased northward to about 99.70 m. Average elevation is about 99.60 m. At about 99.20 m in elevation, excavators began uncovering artifacts and associated material in place. The densest vertical distribution of items occurred between 99.20 and 99.10 m

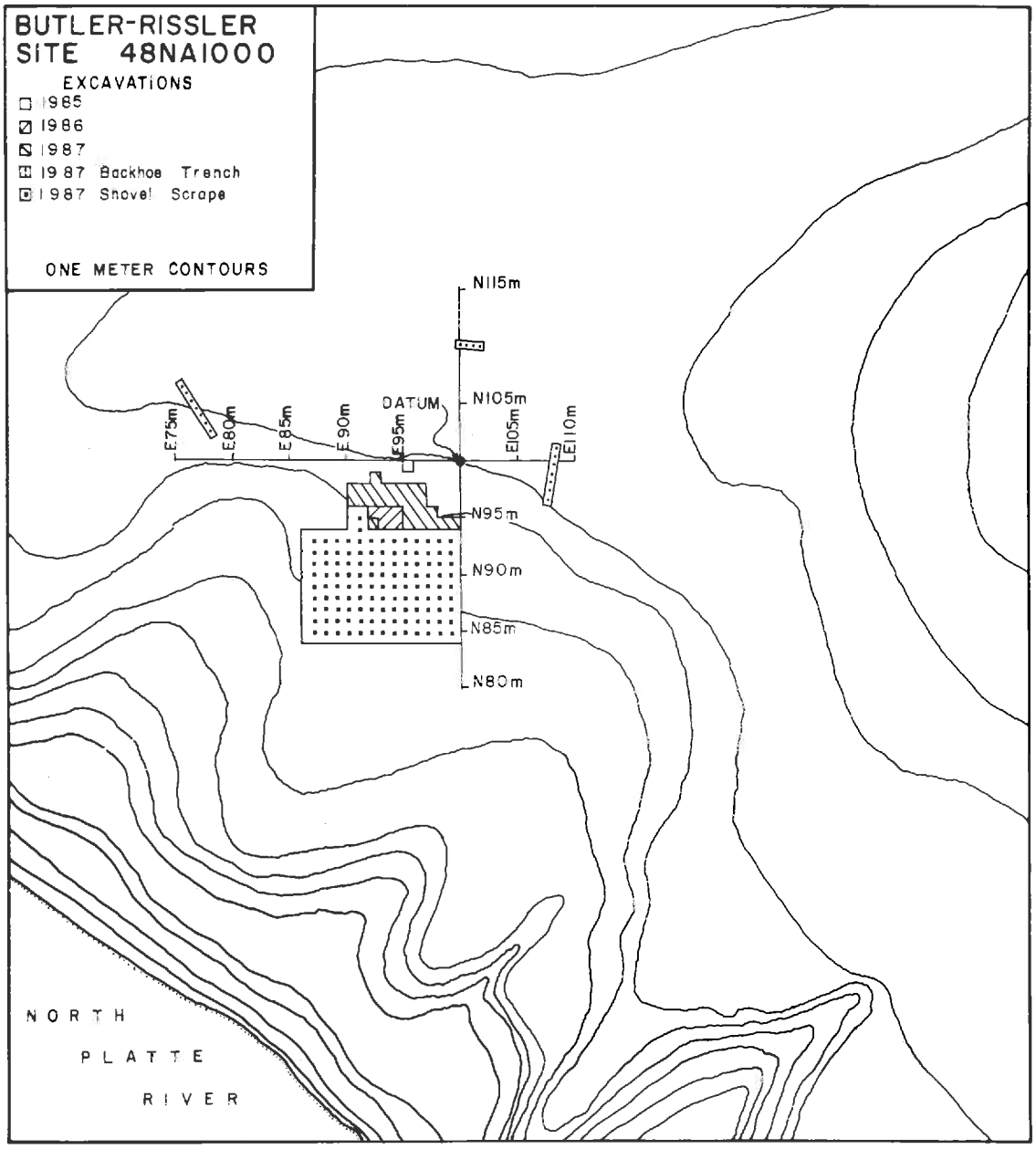

Figure 3: Butler-Risser site (48NA1000) excavation areas.

in elevation. This depth range basically defined the archaeological component, although the cultural level sloped upward slightly toward the north. Some artifacts, apparently displaced by roots, rodents or freeze-thaw, were found above and below these limits. The five units were terminated below the cultural level at an elevation of 99.00 m.

Between August 1-10, 1987, a five member crew, plus volunteers, returned to excavate the large block adjacent to the 1986 test (Figure 3). The purpose was to expose a large contiguous area of the buried component and determine whether or not intact features and activity areas were present. This area included 21 1 x 1 m squares located upslope from the exposed

cutbank where surface items were found.

Field methods employed for these 21 units varied somewhat from previous tests. Excavations above the cultural level were by shovel-scrape, removing the first level to an even 10 cm elevation (e.g., 99.70 m). Shoveling continued in increments of 10 cm until excavators neared the top of the cultural level. Once cultural material was encountered (generally near elevation 99.20 m), arbitrary levels automatically were reduced to 5 cm. Beginning August 4, 1987, all arbitrary levels above the cultural zone also were removed in 5 cm increments to increase provenience control and provide data comparable with that collected from the cultural level itself.

All matrix removed from above the cultural level was dry screened through 1/8" mesh. When the cultural level was encountered, excavation shifted from shovel to trowel and brush. Each 5 cm level was then excavated by 50 cm quad within each 1 x 1 m square. Matrix removed from these quads was screened through either 1/16" mesh waterscreen or 1/16" mesh dry screens.

Trowel excavation was completed usually between 99.20 m and 99.10 m in elevation. The area beneath the cultural level was then shovel-scraped in 5 cm arbitrary levels to the 99.00 m elevation. This matrix was run through 1/8" dry screen for the entire unit. Quads were discontinued below the cultural zone.

Three additional 1 x 1 m squares (N94 E97, N94 E98, and N94 E99) were excavated by trowel, but turned out to be below the exposed cultural zone on the terrace bank. Consequently, they were shallow, steeply sloping, and sterile. Each occurred below 99.00 m elevation.

Most surface artifacts were from a deflated zone downslope and to the south of the excavations. Apparently, wind erosion cut into the terrace and removed fine-grained sediments, leaving behind artifacts and larger pebbles in a 15 cm thick lag deposit on the surface of the blowout. The block shovel-scraped here in 1987 yielded additional diagnostic artifacts that apparently had eroded from the level (Figure 3). The block consisted of 36 2 x 2 m grid squares, comprising 144 square meters of area. Each was shovel-scraped from ground surface to culturally sterile gravels approximately 15 cm below surface. Matrix was screened through 1/4" dry screens, and artifacts were bagged separately for each 2 x 2 m unit.

Final testing at the site consisted of three backhoe trenches excavated on October 9, 1987 (Figure 3). These were opened, notes were taken to document the cultural and natural stratigraphy, then trenches were backfilled. Average depth for the backhoe trench near coordinates N100 E108 was 1.27 m, for backhoe trench near N110 E100 was 1.35 m, and for backhoe trench near N105 E77 was 1.37 m. Inclement weather prohibited further work on the trenches, but they did provide additional information regarding site stratigraphy and spatial limits of the cultural level.

RESULTS OF FIELD INVESTIGATIONS

Stratigraphy

Data recovery methods at the Butler-Rissler site produced evidence for a single prehistoric component embedded in eolian sediments that cap a Holocene terrace in the North Platte River Valley. Deposition and soil formation are fairly straightforward and can be correlated between the hand dug excavation block and the backhoe trenches to give an

indication of site size.

The deepest stratum (Figure 4) excavated at the site consists of fluvial gravels which cap larger river cobbles visible along the terrace tread adjacent to the river. This stratum includes coarse sands mixed with pebbles up to 3 cm in maximum diameter. The sediments and many pebbles are whitish in color, perhaps from adhering calcium carbonates. The surface of this stratum in buried context at N94 E95, lies at an elevation of 98.18 m. The stratum was observed down to an elevation of about 98.00 m. It is the probable source for the majority of pebbles and coarse grained sands in the deflated lag surface south of the excavation block.

A thick C horizon overlies these gravels and consists of loosely compacted, eolian sand. Like some other C horizons (Birkeland 1974:6), it contains some accumulations of carbonates. At N94 E95, this horizon rests on top of the fluvial gravels and extends upward for 35 cm to an elevation of 98.53 m. As profiled (Figure 4), it extends between 98.00 and 98.48 m and includes white sand, tan sand, and compacted tan sand.

A Bk soil horizon in eolian sands overlies this C, and contains root molds that extend into the C. These are filled with the Bk, and have produced an irregular contact between the two horizons. This horizon is whitish gray and heavily compacted with calcium carbonates. At N94 E95, it extends for 36 cm between elevations 98.53 m and 98.89 m. This stratum (separated into Bk1, and Bk2) was profiled between elevations 98.48 m and about 99.10 m (Figure 4).

Stratigraphically above the Bk is a buried A horizon (Ab) containing the archaeological remains, and it is designated the cultural zone (Figure 4). An 8 cm thick discontinuous zone of reddish, loose eolian sand was present at the base of the A horizon in unit N94 E95, and it may have been the remnant of an oxidized, cultural feature. The rest of the buried A horizon is a dark grayish brown unit in eolian sediments. It is somewhat mottled and moderately compacted.

This A horizon derives its coloration both from decomposed organic matter and charcoal staining related to the human occupation. The horizon indicates the terrace surface at the time of site occupation was vegetated, which stabilized the underlying eolian sediments. This stratum is fairly level from west to east (Figure 4), but slopes upward slightly from south to north along a grade similar to the present ground surface, ranging in elevation from about 99.10 m to 99.25 m. The most intact cultural remains lie in the lower half of this horizon, and some items actually rest at its base. In one area, centered at N97.10 E96.50, there is a fire pit (discussed below) associated with the cultural level. Here, the charcoal staining extends downward to an elevation of 99.00 m where the pit feature begins to take form, and it is present throughout the feature fill.

The stratum above the cultural level is a light brown C horizon in unconsolidated, fine eolian sand. Some weak carbonates are present. The stratum begins about elevation 99.25 m and extends upward for about 34 cm to elevation 99.59 m.

Resting on top of this C horizon is the modern A horizon of the extant vegetation presently stabilizing the site sediments. It is dark gray and is largely comprised of decomposing organic matter and fine, unconsolidated sands. This A horizon forms an irregular ground surface which undulates between elevations 99.45 m and 99.70 m in the excavated

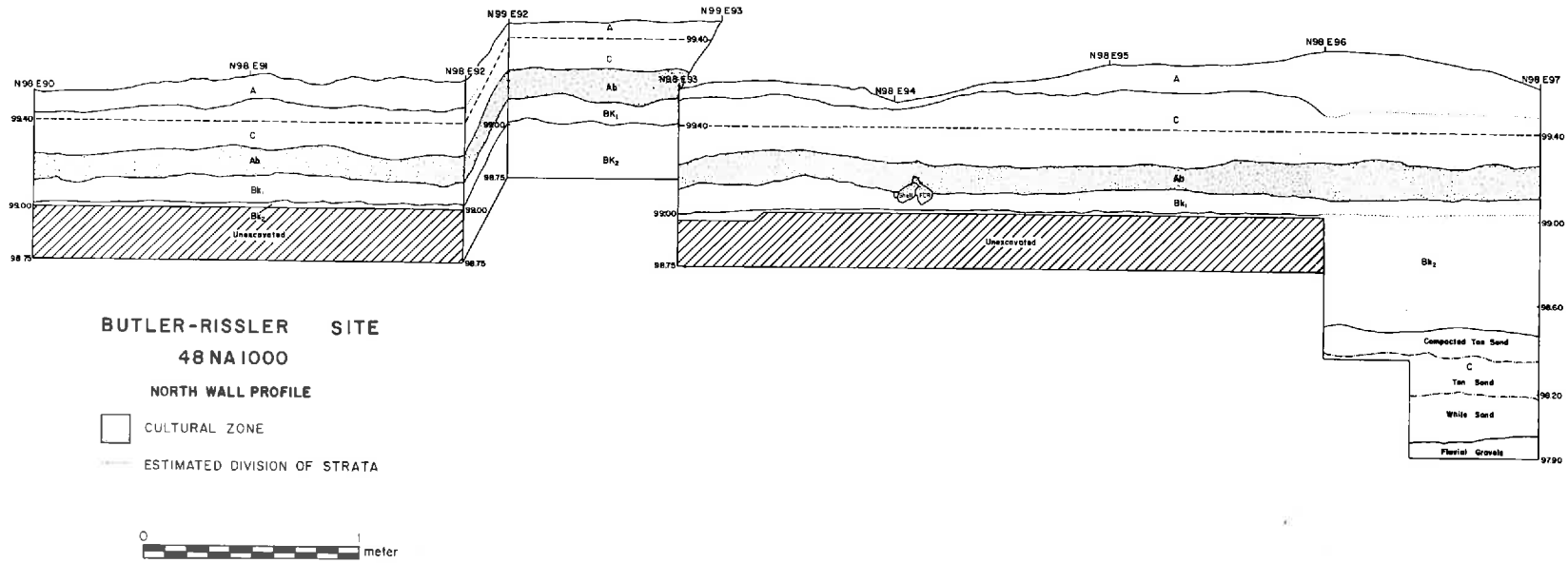

Figure 4: Profile of north wall of excavation block at Butler-Rissler site. Dashed line at elevation 99.40 m is line level location for stratigraphic mapping.

Class	Count
Projectile Point	12
Drill	2
Biface	23
End Scraper	13
Retouched Flake	41
Utilized Flake	32
Graver	1
Other Formal Tool	1
Core	4
Debitage	5140
Flake Shatter	8
Cobble Chopper	1
Grooved Maul	1
Grinding Slab	10
Mano	2
Ocher	1
Pottery	3419
Bone Bead	2
Decorated Shell	1
Total	8714

Table 1: Item counts for whole and fragmentary artifacts from the Butler-Rissler site.

areas.

Similar stratigraphy was noted in two of the three backhoe trenches. This depositional sequence and cultural remains in the buried A horizon appear to continue into the terrace at N100 E108 and N110 E100. This expands the site limits at least 10 m north and 8 m east. Buried cultural remains also extend several meters west, but apparently not to the area exposed in the backhoe trench at N105 E77. Here, only brown compacted eolian sands were encountered below the modern A horizon. This could be the original surface on which a portion of the site was located since some surface finds were made in this vicinity. The buried A horizon and associated cultural level could occupy a low saddle or terrace depression east and south of this trench. At any rate, additional backhoe work and stratigraphic correlations are warranted.

Lithic Analysis

The sample of cultural remains constitutes a large inventory of items. Most are small pieces from picked waterscreen concentrate, although they do add to the site inventory and help clarify spatial patterns. A total of 8,714 whole and fragmentary artifacts has been cataloged, including two bone bead fragments and one decorated piece of shell. The balance of the faunal remains total 30,799 whole and fragmentary specimens.

A total of 5,294 stone items was catalogued from the Butler-Rissler site (Table 1). These include chipped, ground, pecked, and polished artifacts. The chipped stone assemblage consists predominately of tools and flakes from locally available cherts and quartzites. Cherts represent well in excess of 90% of the assemblage, and probably are from Mississippian age Madison limestone outcrops at the base of uplifts around the margin of Shirley Basin and Bates Hole, and from local conglomerates. Source analysis is difficult since many materials also could come from cobbles in river beds and terraces, that ultimately derived siliceous stone from primary formations elsewhere.

Projectile Points

Twelve bifacially flaked artifacts have been classified as side- notched projectile points and fragments (Figure 5). All were manufactured from Madison limestone cherts. Most of these were found either on the site surface or in redeposited lag materials below the terrace exposure. Only three were found in buried context in the terrace sediments, but none were *in situ*. One (NA1000-540) was complete, and came from above the cultural zone on the slope of the terrace where it may have been displaced by trampling. Either cattle movement or our activities

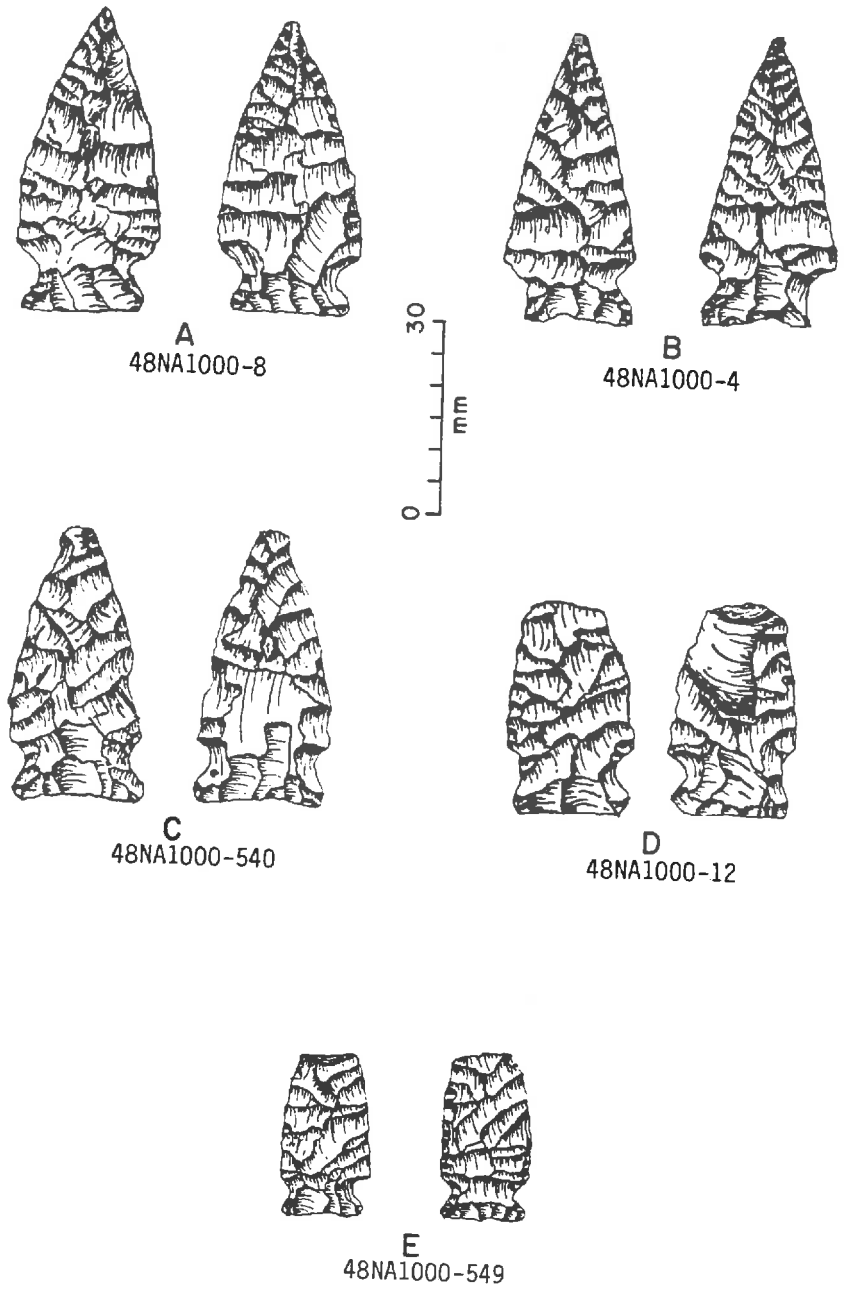

Figure 5: Besant projectile points from Butler-Rissler site.

could have dislodged items shallowly buried in the loose eolian sediments. Two haft element fragments (NA1000-182, NA1000-541) were from screen concentrate removed from the cultural level during excavation. One (NA1000-541) is a basal fragment that broke across the artifact between the notches. The other is a portion of the basal edge and proximal margin of a notch. It is too small to measure, but complete enough to compare favorably with similar portions of more complete artifacts. Similar fragmentation exists on contemporary weapons from other sites (Frison 1978:219; Benn 1981:155).

The entire assemblage, with one exception (NA1000-549), resembles Besant projectile points

described elsewhere (Wettlaufer 1955; Johnson 1970). However, there exists a similarity between Besant and some Early Plains Archaic assemblages (Frison et al. 1974:115). Artifact NA1000-549 resembles a smaller projectile point type called Samantha by some investigators (Reeves 1983), which is considered a Besant variant (Figure 5E). Other than size, the point is technologically similar to the rest of the assemblage. Metric measurements of these items (Table 2; Figure 6) compare favorably with Besant and Samantha artifacts from other sites (e.g., Wettlaufer 1955; Johnson 1970; Hughes 1981).

Projectile points from Butler-Rissler are serially flaked to produce thin, lenticular blade element cross-sections, perhaps for maximum penetration. Careful blade thinning is reminiscent of the Muddy Creek assemblage, a site only a short distance to the south (Hughes 1981) (Figure 1). Proximal portions of the blade element are mostly thinned by comedial flakes although some exhibit parallel oblique scars. In most cases, flake scars carry past the projectile point midline to thin the blade. Distal portions are prepared by oblique flakes initiated from the distal end of the blade and removed diagonally across the

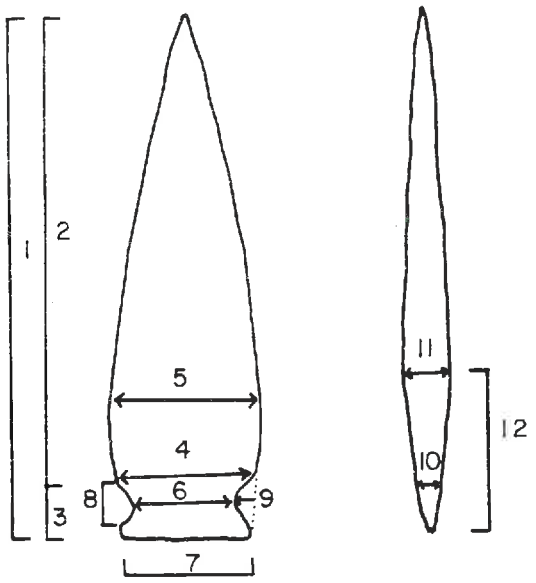

Figure 6: Location of measurements described and listed in Table 2.

Catalog Number	Measurement (to nearest 0.1 mm) 1											
	1	2	3	4	5	6	7	8	9	10	11	12
Projectile Points												
NA1000-8	46.2	37.0	09.2	21.2	21.8	14.6	18.5	08.1	02.8	03.8	05.6	29.9
NA1000-12	46.8'	36.4'	10.4	19.4	19.5	14.5	17.8	07.5	02.8	04.7	04.9	12.0
NA1000-14	45.2	35.3	09.9	20.8	20.8	14.0	17.0'	07.7	03.0	03.8	04.4	11.9
NA1000-540	45.9'	36.7'	09.2	20.4	20.4	16.0	19.8	07.1	02.2	05.0	06.1	23.7
NA1000-541	--	--	--	--	--	16.2	22.0	--	02.0	04.7	--	--
NA1000-545	--	--	09.2	23.4	24.4	16.3	22.0	07.3	03.3	05.0	05.6	15.4
NA1000-546	--	--	--	--	--	14.8	18.1	--	02.0	04.1	--	--
NA1000-549	33.4'	27.4'	06.0	13.6	13.7	10.8	13.6	05.2	01.6	03.4	04.3	09.3
NA1000-550	--	--	07.8	--	--	--	--	05.8	02.7	03.5	04.3	10.5
NA1000-552	--	--	09.2	21.9	--	16.9	21.2	07.7	02.4	05.1	--	--
NA1000-553	--	--	09.8	16.8	--	14.6	18.8	06.8	02.3	04.8	--	--
Drills												
NA1000-302	40.9	32.9	08.0	08.0	09.0	16.1	20.9	--	02.1	05.0	05.3	18.5
NA1000-544	34.4	25.6	08.8	20.6	21.6	15.6	18.9	06.8	02.4	03.8	04.9	25.6

1 Measurement descriptions: 1) maximum length; 2) maximum blade length; 3) maximum haft element length; 4) maximum shoulder width; 5) maximum blade element width; 6) haft element neck width; 7) maximum base width; 8) average notch width; 9) average notch depth; 10) maximum haft element thickness; 11) maximum blade element thickness; 12) maximum blade thickness length (distance from basal edge). Position of measurements is illustrated in Figure 6.

2. Estimates for nearly complete attributes are marked by dot (') superscript following the measurement.

Table 2: Projectile points and drills from Butler-Rissler site.

blade surface toward the proximal end. This produces a chevron pattern of flake removals. Blade margins are convex to nearly straight.

Haft elements were thinned by a flaking series running from the basal edge toward the tip and parallel to the long axis of the projectile point. Basal edges are heavily ground. Side-notches are broad, somewhat shallow, and positioned on lateral margins near the basal edge.

Several haft elements exhibit a distinct pattern of basal thinning. A flake was removed from the edge where one notch eventually would be positioned, and carried over halfway across the artifact face parallel to the basal edge. A second flake was removed from the opposite margin near the second notch position, intersecting the first scar. This pattern regularized the surface, reduced basal thickness between the notches, and may have provided a more secure haft.

Breaks on fragmentary specimens suggest impact fractures and bend breaks sustained during use as projectiles (Figure 5D). Fragments typically are proximal portions separated from blade elements by breaks across the haft element. This pattern is to be expected if weapons were being brought back to camp for rearmament after a hunting trip, because they may have remained hafted to projectile shafts or foreshafts.

Judging from overall size, Besant projectile points probably were used to tip darts (Frison 1971a, 1978) propelled by atlatls. Some, however, may have been used on thrusting spears (Frison 1971a). Differences of opinion exist regarding methods of propulsion and ballistics for Samantha projectile points. Reeves (1983:98) suggests Samantha side-notched projectiles were used as arrow points and represent early acceptance of bow and arrow weaponry. Gregg (1987:15.6), on the other hand, argues that Samantha projectiles tipped lightweight, high speed atlatl darts, and served as a component of the same weaponry system which also contained the large, heavy impact Besant darts. Either alternative is plausible, but experimentation with large and small side-notched projectile points on darts and arrows might shed more light on technological capabilities.

Drills

Two drills made from Madison chert were found (Figure 7). Each shares haft element attributes with Besant projectile points, and distinctive blade element retouch. They easily could be drills made from projectile points. In fact, haft element and thickness measurements are similar between the two artifact classes (Table 2).

One specimen (NA1000-544) (Figure 7D) was collected from the blowout during shovel-scraping of lag deposits. Only the distal half of the blade element has been retouched comedially into a narrow drill-type point. A postulated drilling function for the tool is supported by evidence for light polish and unifacial scalar flake scars noted under 10X magnification. The proximal half of the blade element exhibits a flaking pattern similar to the projectile points.

The second drill (NA1000-302) (Figure 7A) was found *in situ* in the cultural level. It has been comedially retouched along the entire blade and into the side-notches on the haft element. This artifact resembles what Reeves (1983) has termed T-butt drills in Besant phase assemblages. A hinge fracture on the tip of the specimen may have resulted from penetrating and twisting motions during drilling.

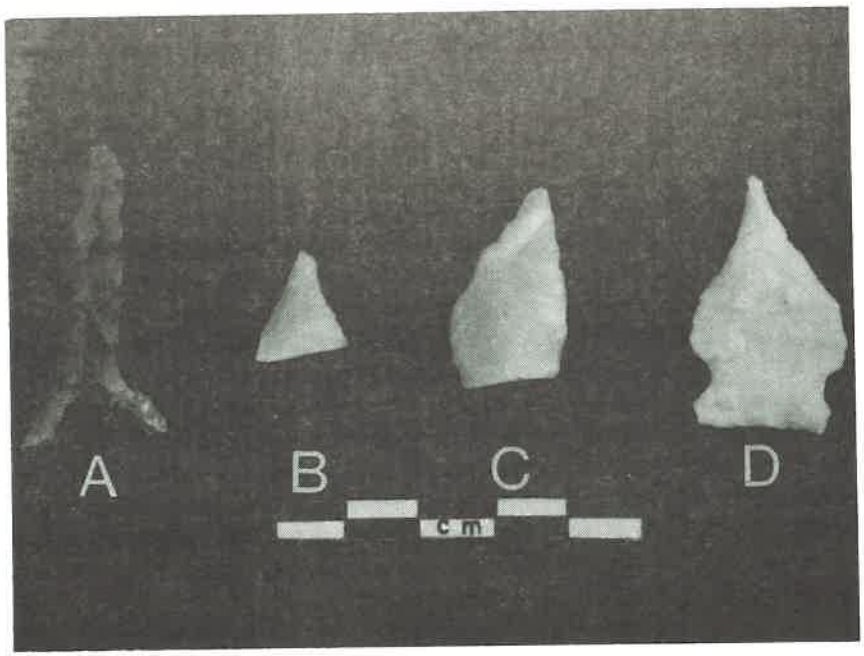

Figure 7: Drills (A,D) and retouched flakes (B,C) from Butler-Rissler site. Scale in centimeters.

Other Bifaces

Twenty-three other bifaces were collected. Most are fragmentary and appear to have suffered bend breaks, perverse fractures, and snaps during manufacture. Larger fragments resemble midstage preforms with regularized margins and at least one completed series of thinning that has removed cortex evidence. At least one distal fragment (NA1000-1124) may be a projectile point tip. One other (NA1000-270) is a complete triangular biface that may be a late stage preform for a small projectile point. Bifaces have not been viewed under magnification for use wear. Macroscopic evidence for edge modification could be the result of preparation for flake removal during manufacture.

All but two specimens are made from locally available cherts like the projectile point sample. This may indicate projectile points were made from Madison Formation raw materials, used during hunting, and discarded at camp during rearmament. Stock materials from the same sources were then used to fashion new weapons, and some preforms broke in the process. Continued use of identical raw materials for manufacturing episodes, separated by periods of use, maintenance and discard, could suggest either sustained long term occupation or repeated occupation of the region by residents of the Butler-Rissler site.

The other two specimens are made from quartzite. These are fragmentary and also resemble midstage preforms. Quartzites also could derive from local sources such as river gravels, terraces and conglomerates.

End Scrapers

Thirteen whole and fragmentary end scrapers were found (Figure 8). All were made from what appear to be Madison Formation cherts. Complete specimens typically exhibit extensive dorsal thinning by removal of a series of comedial

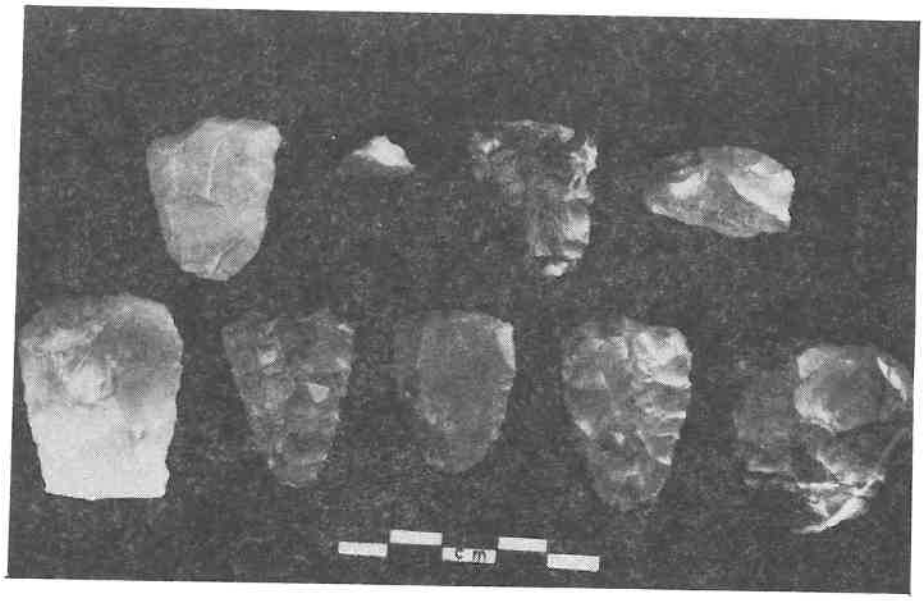

Figure 8: End scrapers and fragments from Butler-Rissler site. Scale in centimeters.

flake scars that carry to, or slightly past, the midline. This produced a thin, regularized, plano-convex cross-section that might have facilitated seating the implement in a haft. Similar flaking patterns have been noted at several Woodland (Neuman 1975) and Besant (Reeves 1983) sites.

Convex, distal working edges on these specimens are steeply retouched and exhibit extensive polish and rounding. These attributes argue for continued reuse and maintenance. Such use-wear may result from hide working or other domestic activities at the site.

Fragmented end scrapers consist of both proximal and distal portions. All fractures appear to be bend breaks from implements that may have snapped near their juncture with a haft element while in use. Apparently, scrapers were pulled or pushed across worked surfaces with sufficient pressure to induce breakage. Fracture surfaces indicate breaks that initiated ventrally and terminated dorsally in a rounded hinge, as well as breaks that originated dorsally and terminated ventrally. No fragments currently refit, but the presence of proximal and distal portions argues for use and breakage on-site.

Retouched and Utilized Flakes

Forty-one retouched and 32 utilized flakes were identified by macroscopic analysis (e.g., Figure 7 B-C). These tools could have been used for a variety of tasks including cutting and scraping of both hard and soft materials. These items represent the largest tool category. The expedient, utilized flakes are nearly as frequent as the retouch flakes which, by definition, have been maintained following at least one use period. Flake platforms and scar patterns on many of these suggest occupants were using prepared flakes from core reduction and biface thinning. Several larger flakes in particular may represent the intended product, rather than incidental selection from available debitage.

Only one of the retouched flakes and three utilized flakes were made from quartzite. The

slight difference in frequency between utilized and retouched quartzite flakes may indicate less need to retouch tools from grainier, siliceous materials; or it may be the result of collection bias.

Other Chipped Stone Tools

One graver, an unclassified flake tool that may or may not have been retouched, and a cobble chopper complete the inventory of chipped stone tools. Although few in number, these items increase tool diversity in the site assemblage. The graver may have been used for perforating hides or decorative incising materials, while the chopper probably functioned to break up bone, providing access to marrow.

Manufacturing Debris

Four cores of local cherts were recovered. Cores are far less frequent than anticipated considering 5,148 pieces of debitage were recovered (including eight specifically classified as flake shatter). Apparently, the bulk of flake removal was during biface manufacture and tool maintenance, rather than core reduction.

The debitage is almost exclusively tertiary (interior) flakes, which would be expected if midstage biface production and tool retouching predominated the activities. Fewer than 80 flakes (less than 1.6%) exhibit cortex. Platforms on most flakes were well prepared and often exhibit facets from earlier flake scars. These attributes also suggest flake removal from either advanced stage bifaces or finished tools.

Ground, Pecked, or Polished Stone

Ten grinding slab fragments were recovered from both surface and buried contexts. They range from definite pecked and polished fragments to less distinct pieces of possible tools. All but one were made from sandstone. The exception is classified only as a possible tool (NA1000-1772) and is made of a quartzite material. This count includes a complete basin-shaped grinding slab refitted from fragments found next to an intact fire pit (see below).

Two manos made from cobbles were found. One of these was located adjacent to the refitted grinding slab. Ground stone tools suggest intensive pulverizing of food products. This activity could involve breaking up seeds or other plant parts, grinding meat or bone meal, or a variety of other tasks.

One grooved maul (NA1000-39) came from the site surface. It is made from a quartzite river cobble and measures 150.0 mm long, 105.2 mm wide, and 83.9 mm thick. The groove position is about 19.0 mm from the center of the maul and extends around the entire circumference. The groove has been pecked and ground to a depth of about 2.3 mm, and averages 17.1 mm wide. Each end of the maul has been battered, and exhibits flattening and impact crushing. One end displays what appear to be impact flake removals.

A piece of red ocher was discovered in the buried cultural level. It appears to have been rubbed or ground, but it is too small to positively determine origin and use.

Ceramics

A total of 3,419 pottery sherds comprise the Butler-Rissler ceramic assemblage. Most are small core fragments or exfoliated body sherds less than 5 mm in maximum dimension recovered during water screen operations. Twenty-five are rim sherds. At least two vessels are represented based on rim and lip morphology. Both have extensive, exterior cord-roughened surfaces and resemble Plains

Woodland wares that have been described by numerous researchers (Hill and Kivett 1941; Champe 1946; Neuman 1975; Wood and Johnson 1973).

The first vessel (Figure 9) shares several attributes with pottery identified elsewhere as being associated with the Valley focus (see Hill and Kivett 1941:173-181). Paste was analyzed under 10X magnification and includes subangular sand. Temper is primarily granite crushed into particles averaging 2-3 mm in maximum dimension. Temper particles are evenly distributed throughout the core. Granitic river cobbles occur frequently near the site and could have supplied raw material for tempering.

The pottery core has a laminar structure probably resulting from a paddle and anvil method of manufacture. No coil junctures were observed. A tool wrapped with two-ply, Z-twisted cordage was used to prepare the exterior surface during final construction. Cord markings are spaced about four strands per centimeter, and these impressions run vertically to slightly diagonal on the vessel, extending to a point just below the lip. Either wear or subsequent surface treatment has partially obliterated cord-marks on some sherds. The vessel interior has been smoothed. Sherd hardness ranges from 5-8 on Moh's scale.

Core color is gray, while interior and exterior surfaces range from light tan or buff to red, gray, and black. This varia-

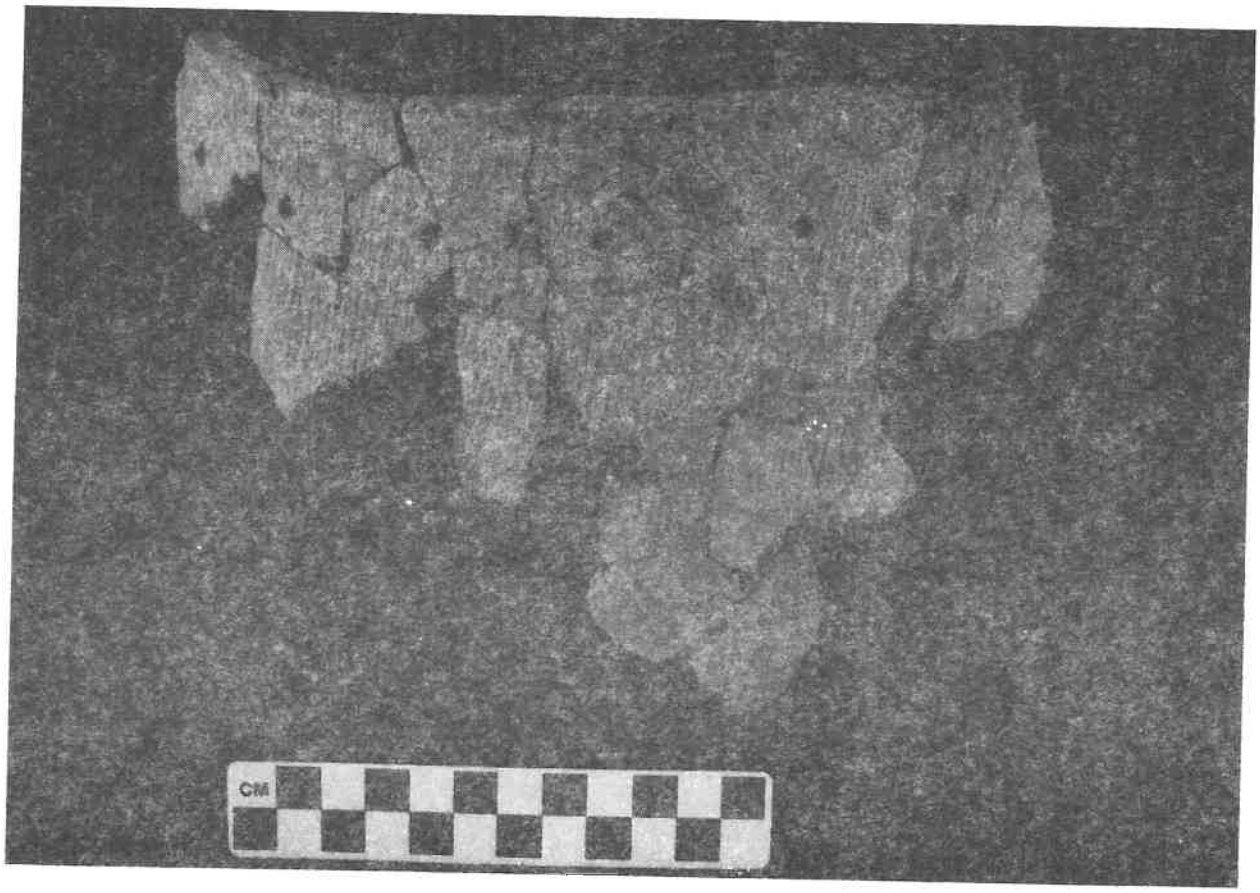

Figure 9: Partially reconstructed vessel number 1 from Butler-Rissler site. Scale in centimeters.

tion may be due to both differential heat exposure and surface weathering. Some blackened sherds apparently were exposed to charcoal staining.

Diameter of the vessel orifice is approximately 26 cm. A pronounced lip protrudes outward from the orifice and ranges between 6 and 11 mm in thickness (see Miller et al. 1987:421). The rim is flat and the neck is nearly vertical on the vessel interior. Body sherds within a few centimeters of the rim indicate a straight to slightly constricted neck. Body sherds range between 3.9 mm and 11.0 mm in thickness, and average between 7 and 8 mm. The base has not been reconstructed, but comparisons with other Woodland assemblages suggest the vessel may have been conoidal. The lack of basal sherds may be due to greater friability from prolonged heat exposure during vessel use.

A single row of punctates decorate the vessel neck about 27.0 mm below the rim. Eleven punctates are visible, and are arranged in groups of three. Punctates within each group are positioned about 15.0 mm apart, and each group is separated by gaps approximately 40.7 mm apart. Individual punctates average 3.2 mm in diameter and are deep enough to produce clear, negative impressions or bosses on the interior surface.

One sherd exhibits a hole drilled through the wall at a point just below the row of punctates. The perforation is biconical in cross-section with the largest opening of 11.0 mm on the exterior surface. Similar perforations have been noted on Plains Woodland vessels elsewhere (Champe 1946; Johnson 1977; Gill and Lewis 1977). These may have been used either in patching fractures with fiber strands, or as holes for a carrying strap (Frison 1971b).

The second ceramic vessel (Figure 10) is also cord-marked, but is represented by fewer sherds. It displays a pinched rim, which contrasts with rim morphology of vessel 1 (Figure 11). Average vessel thickness is 3.8 mm at a distance of 2 mm below the rim. Eight rim fragments range in thickness from 2.2 m to 4.8 mm. Body sherds range in thickness from 4.0 mm to 8.5 mm.

The core has a laminar structure, indicating a paddle and anvil method of construction similar to the first vessel. Core color is gray, while interior and exterior surfaces range from light gray to dark gray or light buff.

No punctates or other decorative elements were observed on this vessel. Whereas cord-markings on the first vessel are parallel and sometimes largely obliterated, those on the second are only slightly smoothed over. Vessel 2 cord marks run both vertically and diagonally. Some deeper impressions indicate that two-strand, S-twisted cordage was used on at least portions of the vessel.

Vessel interior is unevenly scraped and rougher than the interior of vessel 1. Portions of the interior also exhibit what may be finger impressions or other striations. This second vessel is too fragmentary to estimate its original shape.

Other Artifacts

Only three other artifacts have been identified. Two are refit fragments of what may be a small, bone bead. The third is an incised freshwater mussel valve (Figure 12). Nine shallow incisions 1.0 mm wide and perhaps 0.2 mm deep have been cut into the interior surface of the ventral margin of the shell. They range in length from 3.2 mm to 4.8 mm and are each about 3.0-4.0 mm apart. The shell fragment exhibits a steep, cleanly broken fracture that

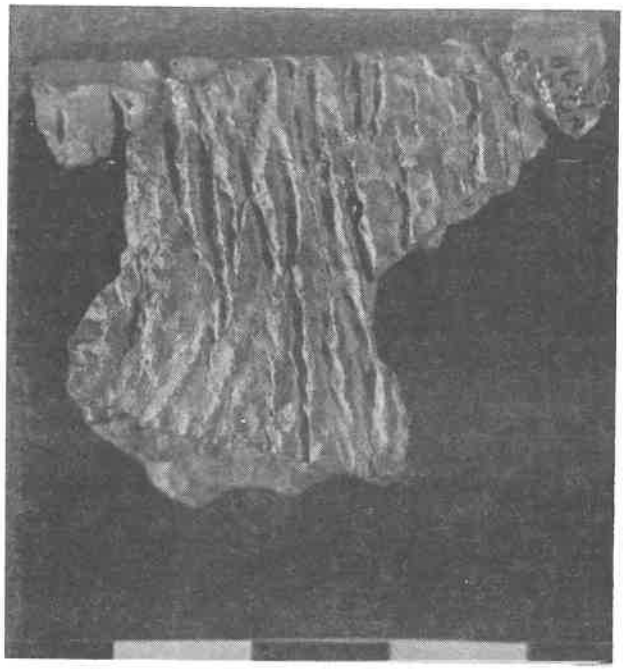

Figure 10: Rim sherds from vessel number 2 from Butler-Rissler site. Scale in centimeters.

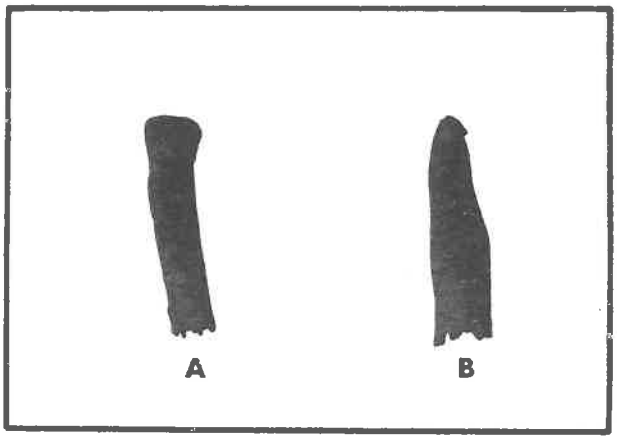

Figure 11: Rim profiles from vessel 1 (A) and vessel 2 (B) from Butler-Rissler site. Vessel exteriors to right. Size = 93% of actual size.

may have occurred when the mussel was still fresh. This item may have been a decorative pendant or other body ornament similar to those present at other Woodland sites (see Kivett 1970). But some authors (see Benn 1981) suggest shells may have been used as tools for a variety of tasks including implements for pottery manufacture. However, clear evidence for use as tools is currently lacking in the Butler-Rissler assemblage.

Faunal Analysis

The buried component contained remains of both terrestrial and aquatic fauna. Whole and fragmentary bones (N=25,821) were tabulated by element. Shell (N=4,978) was tabulated by combined count of all valves and valve pieces (Table 3). Together, shell and bone provide a sample of 30,799 specimens.

Bone Remains

Almost the entire faunal assemblage had been extensively fragmented. Consequently, we seldom could identify either species or element. Due to the fragmentary nature of the sample and difficulty in establishing species, neither minimum number of individuals (MNI) nor number of identified specimens (NISP) for species was attempted. Over 90% of the bones are less than 1/4" (6 mm) in maximum diameter. This fragmentation, which appears to have occurred while the bone was fresh, suggests intensive processing for bone grease (Vehik 1977). Many fragments are either charred or calcined from burning, suggesting use as a fuel in an open fire. Extensive burning would not be expected if they were only boiled to extract grease. Weathering cracks are visible on the skyward surface of larger, unburned fragments, indicating some surface exposure prior to burial.

Some of the larger fragments are probably from bison or bison-sized animals. Vertebrae, rib fragments and long bone fragments in particular suggest bison (Bison bison) comprises part of the assemblage. Unfortunately, teeth were too few and fragmented for either species identification or estimation of seasonality.

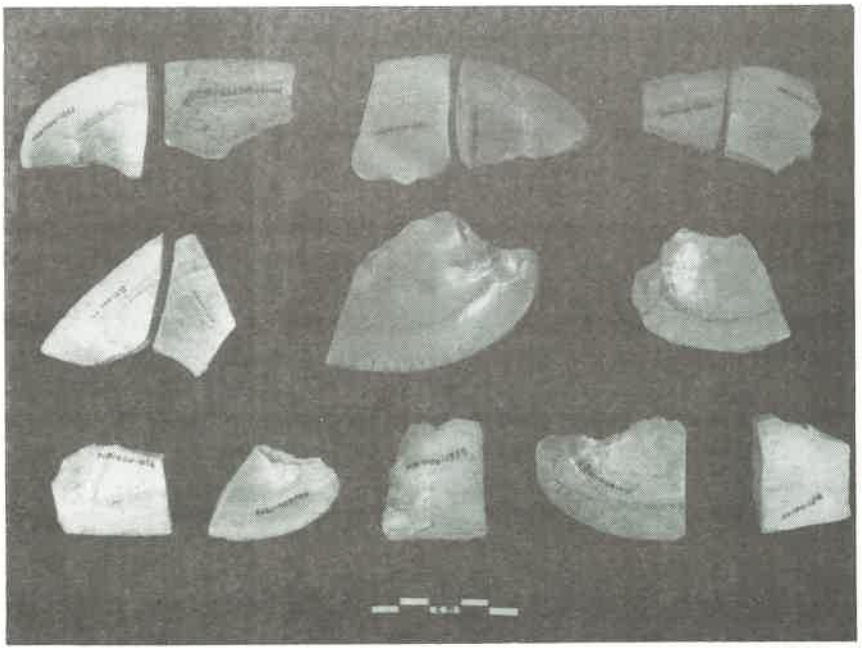

Figure 12: Snapped shell fragments and incised shell ornament (center) from Butler-Rissler site. Scale in centimeters.

Element/Item	Count
Unidentifiable Bone	24,939
Long Bone	84
Flat Bone	684
Cancellous Bone	13
First Tarsal	1
Cranium	1
Tooth Fragment	48
Unidentified Tooth	3
Rib	32
Vertebra	5
Innominate	1
Femur	5
Tibia	2
Metatarsal	1
Calcaneus	1
Third Phalanx	1
Shell	4,978
Total:	30,799

Table 3: Element and fragment counts for terrestrial and aquatic fauna from Butler-Rissler site.

Several other mammalian and amphibian species are also present. At least one specimen each has been identified for frog (Rana?); cottontail rabbit (Sylvilagus sp.); pocket gopher (Thomomys talpoides); deer mouse (Peromyscus sp.); vole (Microtis sp.); a large canid perhaps wolf (Canis sp.); and pronghorn (Antilocapra americana). One calcaneus gnawed by carnivores is pronghorn. One metatarsal is a deer/pronghorn sized artiodactyl. At least two postcranial fragments and numerous pieces of tooth enamel also may be deer or pronghorn. Pocket gopher probably is intrusive, as several rodent burrows were detected during excavation.

Between August 3-6, 1987, Dr. Walker set a 210 trap grid in the site vicinity in an attempt to capture extant, small, non-game animals for comparative purposes. His efforts documented the presence of deer mouse (Peromyscus maniculatus), kangaroo rat (Dipodomys ordii), northern grasshopper mouse

(Onychomys leucogaster), and western harvest mouse (Reithrodontomys megalotis). Except for deer mouse, none of these species were found in the archaeological sediments at the site.

Shell Remains

Shell remains also are highly fragmented. Over 90% of the sample is exfoliated plates at least as small as most bone fragments. Apparently, shell weathering proceeds at a different rate than cracking and drying of bone, because some shells are largely intact within the cultural level. Five nearly complete valves from the buried component were sent to the Illinois State Museum for species identification.

Dr. Robert E.Warren identified the specimens as Lampsilis cf. ovata ventricosa (Table 4). Both Lampsilis ovata and Lampsilis vertricosa are considered Pocketbook mussels (see Parmalee 1967:70; Theler 1987:21). Warren's classification, however, is preliminary because so little is known about Wyoming mussels. No comparative specimens from local, modern habitats were available, and the Butler-Rissler specimens differ somewhat from the Illinois comparative sample. Nonetheless, based on his assessment and the likelihood that Wyoming mussels from this portion of the North Platte are similar to those in downriver states, it is possible that all of the mussels from the site are of the same species. This is strengthened by the fact the only identifiable valve from a non-cultural context near the site (Table 4) was also identified as the same species. This valve came from a gravel pit where it may have been recently dredged from river sediments.

Most valves and shell fragments show no modification other than differing degrees of weathering exfoliation. This could indicate mussels were used primarily as a food source rather than raw material for ornamentation. The moderate to strong currents in the river meander may have provided an ideal habitat which could be regularly exploited for mussels (Parmalee 1967). Several other areas along this portion of the river used to contain shell middens (John Albanese, personal communication, 1987), suggesting a major prehistoric use of this area was mussel collecting. Lampsilis ventricosa averages about 80 grams of meat per animal and can be harvested in an economic manner (Theler 1987 21:50-54). Bivalves are opened for meat extraction most

Catalog Number	Taxon	Valve	Sex
48NA1000-415	Lampsilis cf. ovata ventricosa	Right	Male
48NA1000-425	Lampsilis cf. ovata ventricosa	Left	---
48NA1000-434	Lampsilis cf. ovata ventricosa	Left	Male
48NA1000-538	Lampsilis cf. ovata ventricosa	Right	Female
48NA1000-539	Lampsilis cf. ovata ventricosa	Right	Female
Surface, extant	Lampsilis cf. ovata ventricosa	Left	Male

Table 4: Freshwater mussels from Butler-Rissler site, Wyoming.

easily by steaming or baking (Theler 1987:54-55). This process also softens shells, allowing access to meat without breaking the valves.

In addition to the incised, decorative shell described above, 42 shell fragments have been broken across the valve by fractures running between the dorsal and ventral margins (Figure 12). Several more exhibit this type of fracture, but were considered too small for detailed analysis. These fractures generally are smooth and run perpendicular through the long axis of the shell plates, unlike the parallel plate separation characteristic of exfoliation weathering. These fractures are believed to have been culturally produced to shape shell fragments for use as pendants or other ornamentation.

Many flake tools found at the site originally were suspected to have been used to cut shells into fragments, but no unique forms of use wear were detected to indicate such activities. Experiments were conducted with stone tools on mussel shells acquired from a local food store. In each case, the shell was cut along the axis believed to represent the area where most Butler-Rissler shells had been fractured. The results argue convincingly that the archaeological specimens were not cut. Stone tool edges produce a V-shaped incision in the shell before the cut gets deep enough to facilitate snapping the valve in two. The top of this incision was often several millimeters across; the intervening shell having been destroyed by sawing action. However, archaeological specimens are not V-shaped, but have straight fracture edges perpendicular to the exterior surface. These edges meet the interior and exterior surfaces at clean, undisturbed junctures. In fact, a few prehistoric shells have been refit along these fractures, and exhibit no evidence for broad, V-shaped cuts.

A second series of experiments was undertaken to determine if the fractures were induced by snaps rather than cuts. At first, snaps were attempted on cold, dry shells which were stiff and hard. It was difficult to exert enough pressure to break them, but when they did fracture, breaks were irregular and again did not resemble the archaeological specimens.

Three shells were then immersed in boiling water for 20 minutes, which softened the shells probably as much as steaming. Shells were then snapped while still very hot. Two were fractured by pressing from the exterior to interior, and one was pressed from interior to exterior. These breaks are smooth, regular, and closely approximate fracture morphology in the archaeological sample. On this basis, it is argued that mussels at the Butler-Rissler site were first steamed to open valves and remove meat. Several were taken while still hot and snapped into fragments. This may have been part of the manufacturing process for ornaments. Undecorated fragments may have been discarded during this process because they did not meet all the required attributes for ornamentation.

Features

A possible fire pit was observed eroding from the terrace cutbank during initial surface inventory at the site. This feature was a dark concentration of charcoal staining about 8 m southwest of site datum. Unfortunately, it had completely eroded away prior to the 1986 test excavations. Consequently, it was neither recorded nor classified as a fire pit or other formal feature.

One definite fire pit was found at the base of the cultural level in 1987. The center of the feature was located at N97.10 m and

E96.50 m. It had a round opening, oxidized around the rim, with an overall diameter of 60 cm. It was filled with burned/stained sand, firecracked sandstone and cobble fragments, pieces of burned bone, shell and pottery sherds. Some layering of fill was apparent. The firecracked rock and artifacts occurred mostly in the upper half of the fill. The middle portion of the fill was darkly stained. The lower section (about 15% of the total area) contained a lighter gray zone which did not appear to be ash, but rather an area where staining was absorbed into the surrounding sand. The pit had been dug to a depth of 58 cm below the base of the cultural level.

Several edible, and otherwise economic, plant species were identified from the light fraction removed through flotation of the feature fill (Guernsey 1988). The entire sediment fill (38.5 liters) was floated, and it produced 46 charred seeds (Table 5). Guernsey (1988) identified the wood charcoal as either Salix sp. (willow) or Populus sp. (cottonwood). Two additional fragments may be charred Opuntia polyacantha (prickly pear cactus) epidermis.

These species indicate prehistoric use of both riparian and sagebrush/grassland communities similar to the extant site setting. Guernsey (1988) also noted that goosefoot and prickly pear, from the upland plant communities at the site, are two of the three most common plant taxa in prehistoric fire pits in Wyoming. She suggests they may have been "staple foods" in spite of the abundance of economically viable riparian species present on site. The season of seed maturation for those species that could be determined, indicates a possible late summer/early fall site occupation.

Dating the Site

Few large charcoal pieces were found in the buried archaeological component, but many smaller pieces were present, and two radiocarbon dates were obtained. Each is from small samples dated by the Accelerator Mass Spectrometer (AMS) method. The first was run in 1987 on charcoal embedded in the punctuates on vessel 1. It produced a corrected age of 1660 ± 90 years B.P.: A.D. 290 (Beta-17830) (Miller et al. 1987:421). The second date is from a composite sample of charcoal collected during the 1987 season. These charcoal flecks were combined from the fire pit fill and the cultural level. The corrected radiocarbon age of this second sample is 1800 ± 100 years B.P.: A.D. 150 (Beta-25271; Eth-3782).

Both of these dates fall within the range of other Woodland-Besant sites on the Northern Plains (Miller et al. 1987). There is an overlap of 50 years when the

Plant	Count
Elocharis sp. (spikerush) (or Fimbristylis sp.)	1
Scipus sp. (possibly validus) (bullrush)	3
Carex sp. (sedge) (or Scivpuss sp.)	1
Chenopodium sp. (goosefoot)	28
Chenopodiaceae	5
Unknown taxa	8
Total	46

Table 5: Identified seeds from feature fill at Butler-Rissler site

standard deviation of each is taken into account, suggesting the two dates may be contemporary. The average date is 1730 B.P., which can be taken as the probable age of occupation.

Spatial Analysis

A benefit of excavation and mapping in place all items down to 1 cm in maximum dimension is that distributional patterns in block excavations can be illustrated and discussed. The technique is not new and has been successfully employed at other archaeological sites (see Binford 1983; Todd et al. 1985). This examination was possible for the Butler-Rissler site block area from the 1986 and 1987 excavations (Figure 3). Bone and shell weathering, the lack of large charcoal flecks, and the intact nature of the fire pit all provide clues to the nature of site formation. It is postulated that the occupation surface was exposed for a brief time following abandonment while bones dried and cracked, and winds dispersed the charcoal. The occupation surface then was buried before extensive erosion deflated features and activity areas, destroying site integrity. Consequently, distributional patterns seen in the data may be partially the result of purposeful human activities at a residential camp.

Size, orientation, and distribution of all mapped items in relation to the fire pit can be illustrated (Figure 13). Two distributional tendencies are apparent. First, there are four areas of fairly high artifact density. These include a cluster of large items in the western portion of the excavation area, two clusters south and southeast of the fire pit, and a grouping in the feature itself. Areas between these clusters generally contain dispersed scatters of smaller items. Second, there is a total lack of items adjacent to the fire pit on its western and southwestern margins.

These distributions suggest several possibilities. First, clusters outside the feature may represent specific dump areas away from centralized activities at the fire pit. The west cluster may actually be a specialized activity area unrelated to the feature. The cluster in the feature is composed principally of firecracked rock which may have been heated here for later use in boiling for bone grease extraction or mussel steaming. The culturally sterile areas west and southwest of the fire pit may be where occupants actually sat while working around the fire pit. From this position, they may drop small items and purposefully toss larger ones, a discard pattern noted at other sites (Binford 1978). This low density area is upwind from the feature judging from modern prevailing wind patterns. If prehistoric wind patterns were similar, it is the logical work place for avoiding fire smoke.

Distributions become more meaningful when compared to specific artifact classes. Stone tool, debitage, and firecracked rock proveniences are examples (Figure 14). Apparently, large firecracked rock fragments were either carried or tossed some distance from the feature. They appear in a radial pattern around the southeast margin of the feature about 1.5 m away. The highest density of stone tools and debitage also is located in the southeastern portion of the excavation. No attempt had been made to conjoin flakes to tools, but this southeastern area may represent a drop zone of items related to tool manufacturing and maintenance. The large stone items just north of the feature are a mano and grinding

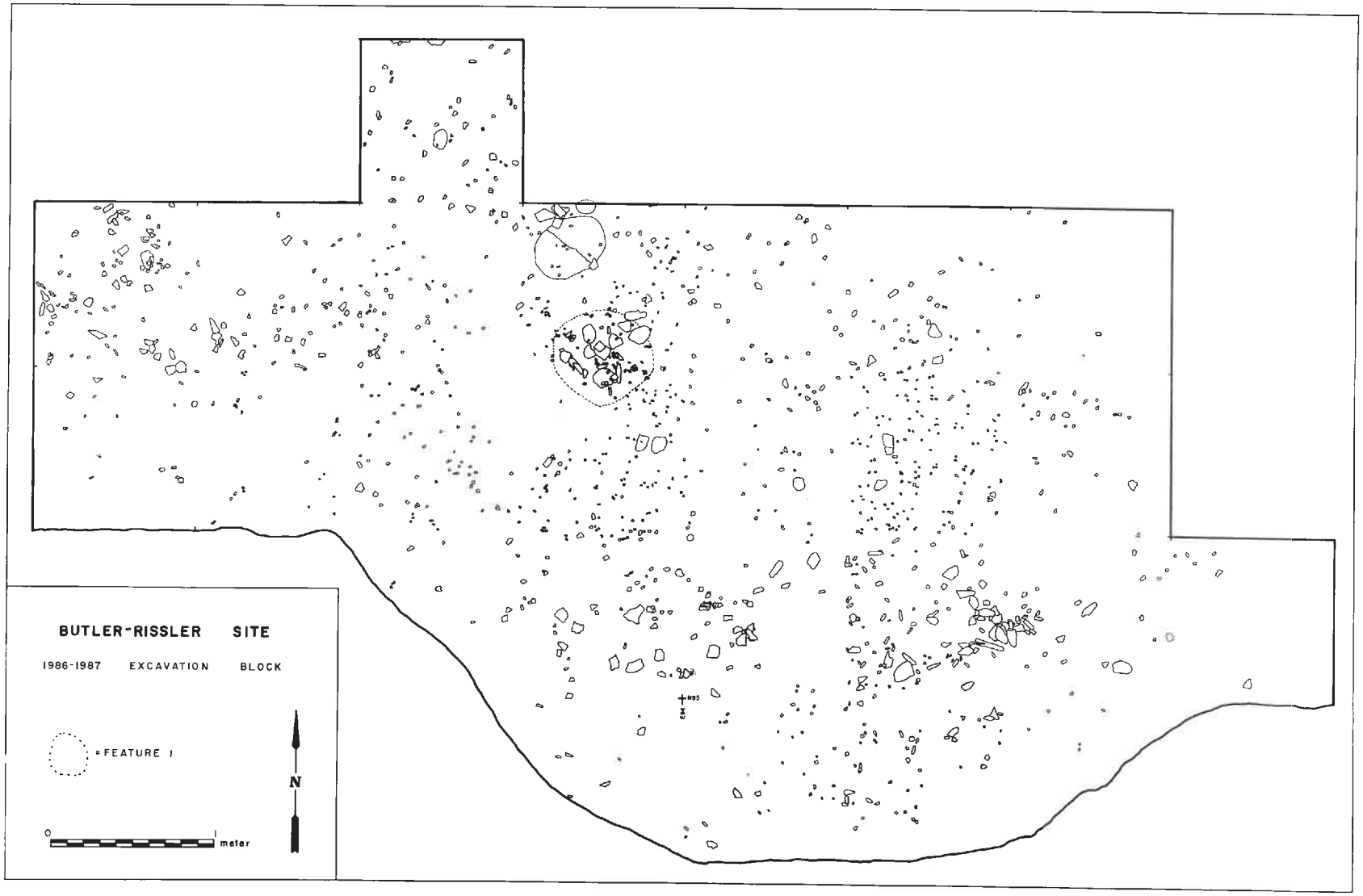

Figure 13: Butler-Rissler site excavation block, illustrating distribution of all mapped items. Grid corner N95/E94 is labeled for orientation in lower central portion of block.

slab. These appear to have been abandoned where last used, and could indicate food processing activity adjacent to the fire pit.

The total sherd distribution drops off in every direction from the feature approximately 1.5 m away (Figure 15). Numerous ceramic refits were made for this assemblage, and three clusters may represent separate toss or discard zones away from the fire pit.

The largest cluster represents the partially reconstructed vessel 1 (see Figure 9) from the south-central portion of the excavation just north of grid corner N95 E94. Sherd attributes suggest two possible episodes of breakage. The first is fragmentation and dispersal of large sherds (generally greater than 3 cm) from the central portion of the cluster to areas as far as two meters away. Some of these sherds clearly separated before oxidation and may represent the breakage episode that caused the vessel to be discarded. Post-breakage oxidation of some sherds could result from exposure to fire following discard.

The second possible episode of breakage is in the central portion of the cluster, and it involves smaller, less dispersed sherds. These also are more uniform in color. Some broken edges appear less weathered than on larger sherds. This suggests the central cluster once contained a few large sherds that broke at the same time other dispersed sherds were broken. Later, sherds in the central cluster broke into smaller, less scattered fragments. This second episode of breakage may post-date site abandonment, or even be post-depositional modification.

The second ceramic cluster involves several body sherds in the southeast portion of the site, about a meter east of the first cluster. Although these have not presently been refit to sherds in the first cluster, they probably are from the same vessel and may represent a separate, but contemporary episode of discard.

The third ceramic cluster involves the few refits in the northern portion of the excavation, northwest of the feature. Three sherds here represent portions of vessel 2 near its rim. From this scanty evidence, it seems vessel 1 was discarded primarily south of the fire pit and vessel 2 northwest of the feature, both outside of the upwind "seating area".

One set of refits (probably from vessel 1) deserves special note. It involves two sherds, one of which was found in the fire pit fill and the other in the cultural level about 1 m to the southeast (Figure 15). These sherds help establish the association of items in the level to those in the feature fill. The refit suggests that final filling of the feature, whether intentional or a result of natural processes, consisted of items from the adjacent cultural zone and not from some unrelated occupation.

The final distribution plot includes bone and shell (Figure 16). Three clusters of large bone fragments are apparent. These are in the extreme western portion, the southeastern edge, and the fire pit fill. Clusters outside the feature are unburned bone, and primarily include rib fragments and long bone shaft portions from bison or bison-sized animals. Small, unidentified bone fragments are dispersed throughout the level in areas between these clusters.

The western cluster (Figure 16) consists almost entirely of unburned, bison-sized postcranial fragments. They may represent a discard area for butchering activities in preparation for removal of bone marrow and bone grease. A tighter cluster in the southeast involves similar unburned fragments

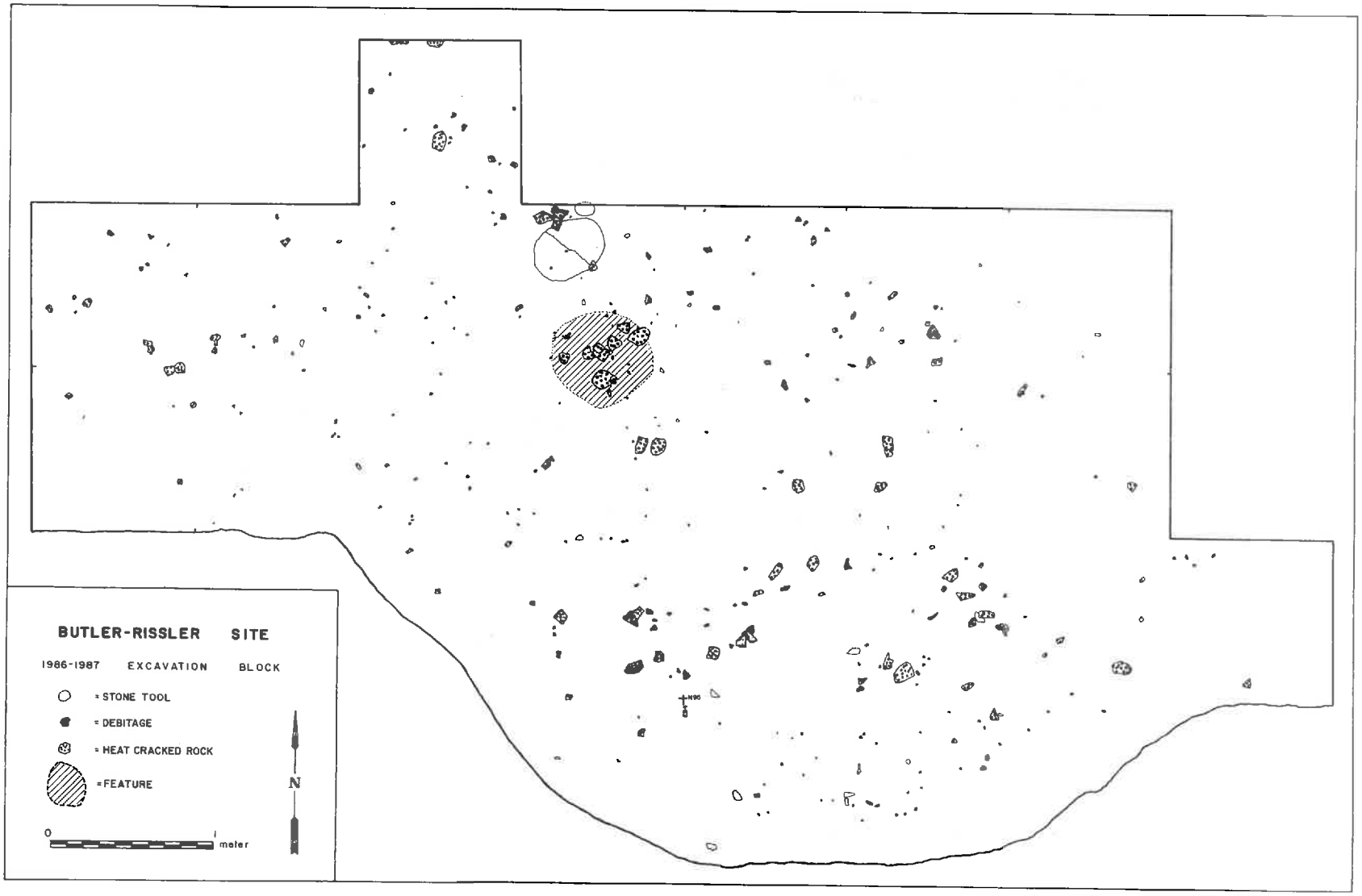

Figure 14: Butler-Rissler site excavation block, illustrating distribution of stone items. Grid corner N95/E94 is labeled for orientation in lower central portion of block.

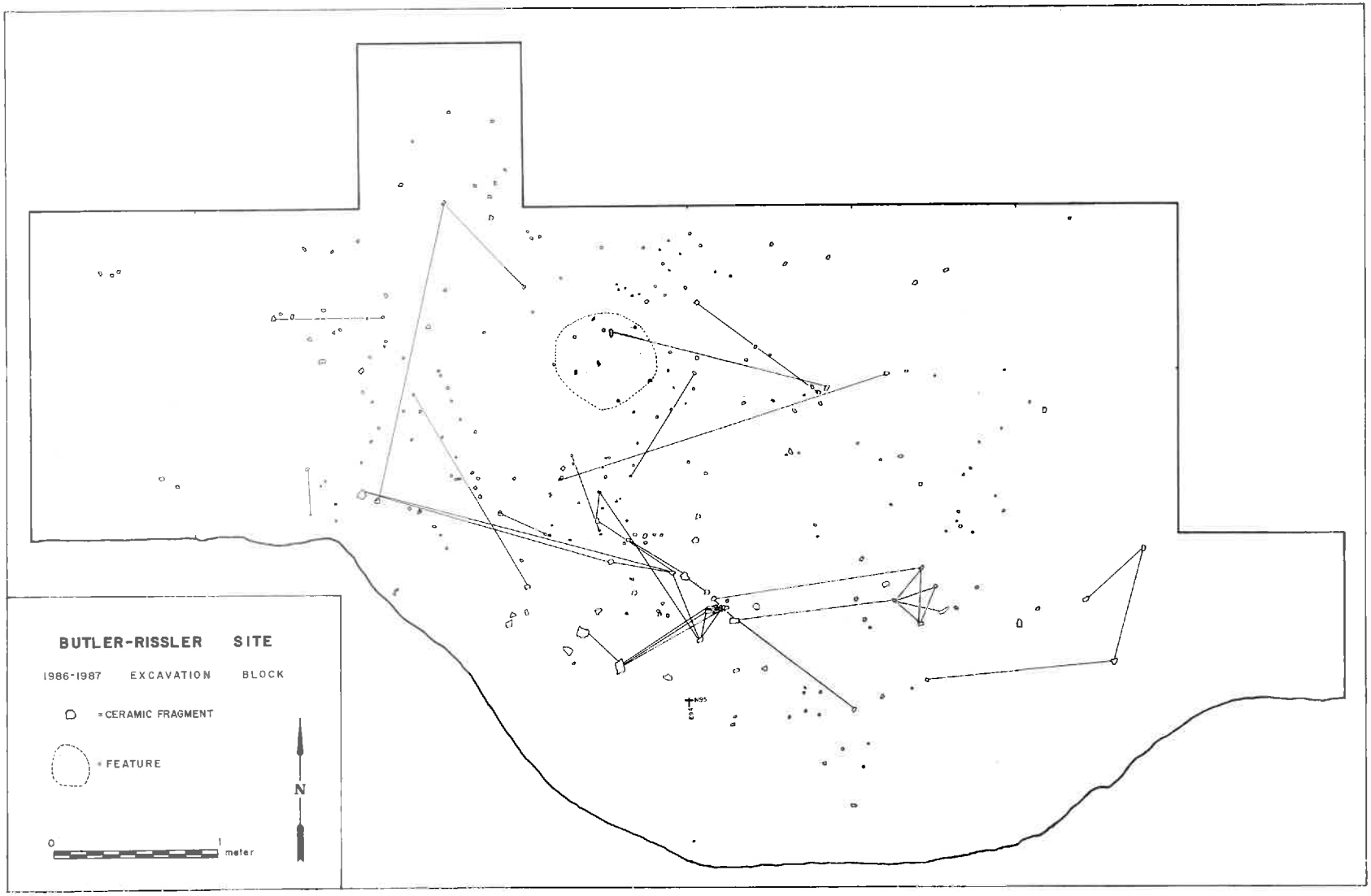

Figure 15: Butler-Rissler site excavation block, illustrating ceramic distribution and refits (connected by lines). Grid corner N95/E94 is labeled for orientation in lower central portion of block.

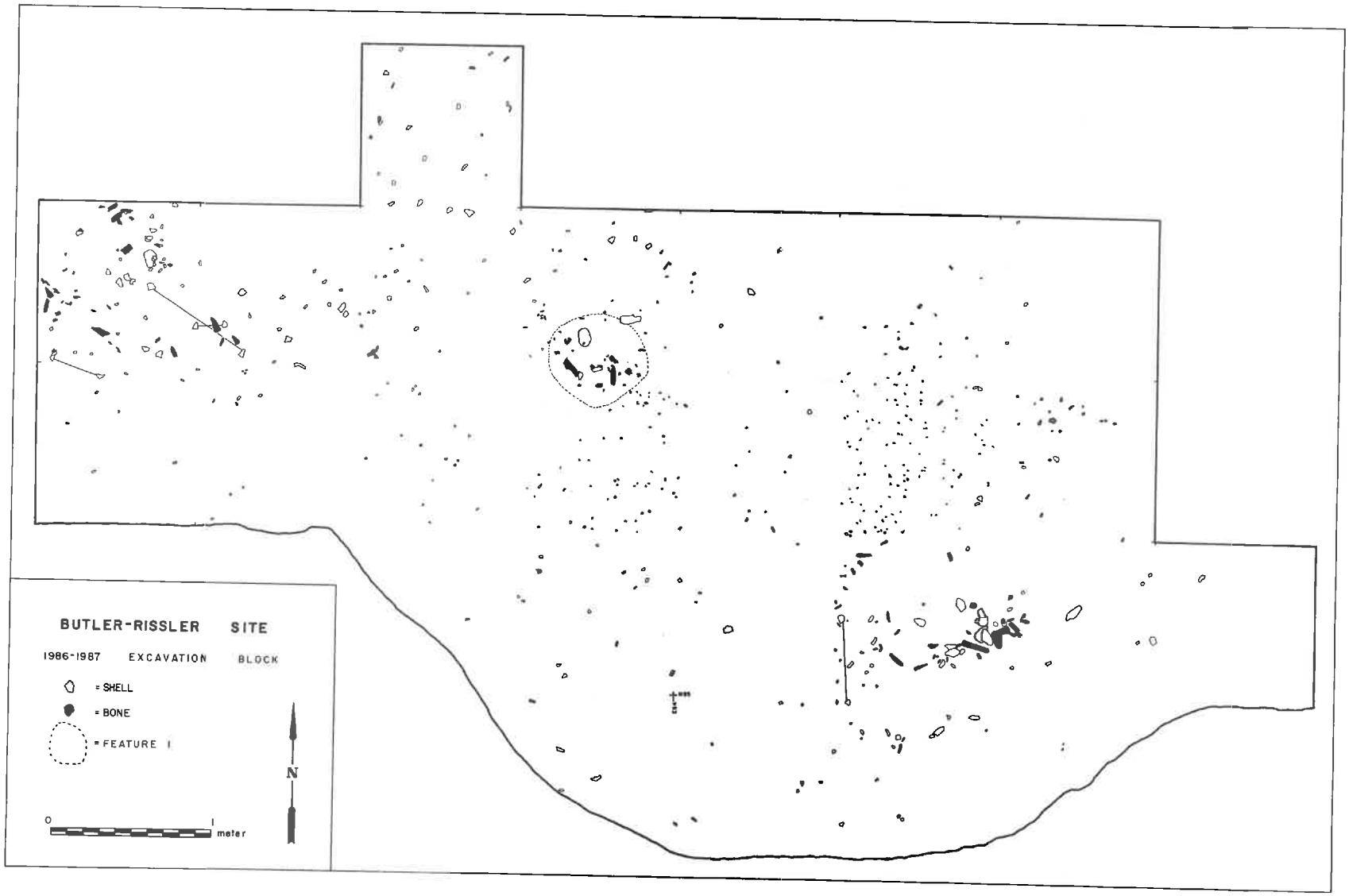

Figure 16: Butler-Rissler site excavation block, illustrating shell and bone distribution, and snapped shell refits (connected by lines). Grid corner N95/E94 is labeled for orientation in lower central portion of block.

with some burned specimens. These may represent a dump or toss pile following boiling for grease removal. Bone fragments in the fire pit are extensively burned and may have been fuel, discards from roasting, or dropped during bone grease processing elsewhere on site.

Shell valves and fragments cluster in the same areas as the bones (Figure 16). This suggests activities associated with mussel processing and shell discard were conducted alongside activities related to other animal processing. Four shell refits have been detected (Figure 16). Each of these involves conjoining pieces along fresh, snap fractures induced by intentional breakage. Three refits are in the western area, which could have been a location for ornament manufacture and bison butchering. The other shell refit occurs in the cluster southeast of the fire pit that also produced the decorated shell artifact. These fragments could have been intentionally dumped here to remove debris from main activity areas. However, they also may represent an activity area where bivalves were separated following steaming.

SUMMARY AND CONCLUSIONS

The Butler-Rissler site (48NA1000) is the remnant of a residential camp used by Plains Woodland groups on the North Platte River about 1700 years ago. The excavated area is part of a larger component that extends at least 10 m back into the terrace. Primary activities in this portion of the site involved extensive processing of bison-sized and smaller deer/-pronghorn-sized animals, perhaps for bone marrow and bone grease extraction. Freshwater mussels were opened, meat extracted for consumption, and shells modified for ornamentation. Spatial distributions of items indicate a sitting area upwind of an intact fire pit, small item drop zones nearby, and large item discard/toss zones south and southeast of the feature. Most burned bone was discarded downwind of this feature. Activities that may or may not be related to use of the fire pit include a lithic manufacturing and maintenance area to the southeast, and an area of faunal processing on the western margin of the excavation. Most of the unburned bone seems to come from this latter area.

Unfortunately, faunal materials were too fragmentary to estimate season of site occupation. However, if the mussels were collected on site, which is the most likely explanation based on the location, then the camp probably was occupied between mid-spring and mid-fall when the river was not frozen, and the mussels were more easily obtained. Results from botanical analysis of the feature fill corroborate the argument for a summer occupation (Guernsey 1988).

The archaeological record at Butler-Rissler adds important new information to a growing body of evidence for human adaptations on the Northwestern Plains during the Late Plains Archaic/Late Prehistoric interface. It is one of several known Woodland-Besant sites on the High Plains, including the southern Canadian provinces, Montana, the Dakotas and Wyoming (Wood and Johnson 1973; Johnson 1977; Good and Hauff 1977; Tibesar 1980; Kehoe 1964; Neuman 1975; Reeves 1983; Quigg 1986). Many of these are Besant localities discovered during CRM investigations (Greiser et al. 1982) and have been only minimally investigated. Other Besant sites are highly sophisticated bison kills with wooden corral-pounds and associated ceremonial features (Frison 1971a; Bupp 1981; Reher 1987). Some, like

Butler-Rissler, are open camps with intact, buried deposits (Tibesar 1980).

By about A.D. 250, and before the introduction or widespread use of the bow and arrow, Woodland-Besant populations had expanded into eastern Wyoming including the Powder River Basin in the north and the North Platte River Valley in the south. The variety of site types such as bison kills, open campsites, burial cairns, and actual villages, indicates a well-adapted hunter/gatherer society. Economically, these groups were not only the most sophisticated bison hunters yet to appear in the area, they were also generalized collectors whose diet included large and small game from terrestrial and aquatic habitats, mussels and wild vegetable products. Resources must have been abundant during this period allowing widespread occupation of the region and sustained yield from the environment.

Sites with Woodland and Besant assemblages overlap spatially and temporally. Woodland pottery co-occurs with Besant dart points at sites such as Butler-Rissler (Miller et al. 1986, 1987; Miller and Waitkus 1987; Waitkus 1987) and Greyrocks (Tibesar 1980) in Wyoming, Whiskey Hill in Montana (Johnson 1977), High Butte in North Dakota (Wood and Johnson 1973), and Sonota Complex sites in South Dakota (Neuman 1975).

From one standpoint, Woodland and Besant sites are considered as part of the same Plains Woodland cultural tradition (Johnson 1977). Prior to this synthesis, Woodland and Besant sites were treated separately because archaeologists focused attention on different technologies present in them. Ceramics received the most attention on eastern sites, and projectile points on western sites. But beyond this, their potential role in a model of Plains Woodland subsistence and settlement should be recognized. Theler (1987) has proposed a useful model for Woodland occupation in the Driftless Area of southwestern Wisconsin and northeastern Iowa, which can serve as a starting point for similar studies on the Northwestern Plains.

In Theler's model, Woodland settlement and subsistence consists of an annual cycle of activities involving at least two distinct, seasonal components. First, there exists a fall-winter segment involving aggregation of dispersed human groups to hunt and harvest large game animals in the dissected upland areas where herds were prevalent. In Theler's study area, the animals were primarily white-tailed deer. Second, a summer adaptation involved collecting and processing aquatic resources from riverine environments along the Mississippi River. Freshwater mussels and fish were predominant resources, but some reliance continued on mammals. This binary cycle apparently was present by Archaic times and extended into Woodland times in Theler's study area.

A similar model is proposed here to represent Plains Woodland occupation in Wyoming and the Northwestern Plains. This includes what previously have been characterized as Late Plains Archaic Besant sites and Late Prehistoric Plains Woodland sites. Besant bison kills, such as Ruby (Frison 1971a, 1978), Willow Springs (Bupp 1981), and Muddy Creek (Hughes 1980; Frison 1978; Reher 1987) are communal activities that took place in the fall of the year. They required seasonal gatherings of human groups in High Plains regions where large game (bison) aggregated during the rut, and where animals primed-up in preparation for winter. These areas were good shortgrass habitats where water and forage were readily available.

These are essentially kill sites with additional evidence of bison processing. Besant projectile points are a frequent artifact type. Ceramics, which may have had little or no value in these activities, are generally not represented, although a single Plains Woodland sherd was reported from a camp site near the Muddy Creek bison kill (Reher 1987). Besant bison kill sites may represent part of the fall component of an annual cycle of Plains Woodland settlement and subsistence. Other activities at this time may have included either communal hunting or individual procurement of pronghorn or deer, although no kill sites of this nature are known in Wyoming.

River valleys would have been prime site settings during the summer when riparian vegetation and aquatic resources were abundant. Terraces overlooking major drainages would be ideal residential camp locations for small or large family groups. Freshwater mussels, aquatic and terrestrial fauna (including bison) were exploited during this season. Numerous domestic activities around fire pits are more common at these residential sites, compared to large meat/bone processing pits and associated butchering activities at or near kill sites. Greyrocks (Tibesar 1980) and Butler-Rissler are examples of this seasonal component of the settlement/subsistence cycle.

Summer sites may have been occupied longer than kill sites primarily because they are residential and resources are brought to them for processing and consumption. Kill sites are special use localities from which occupants are expected to return to camp following completion of procurement, butchering and processing tasks.

The comparison of the Wyoming sites to Theler's (1987) model is not intended to imply that no differences exist between the two regions. Significant differences do exist. For instance, bison was emphasized in the west and white-tailed deer in the east. There also appears to have been greater species diversity of mussels further east and greater use of other aquatic resources. The comparison, however, is intended to show that a subsistence/settlement model can be used to account for differences between Besant kill sites and Woodland residential sites. These differences may be variations in seasonal adaptations by culturally homogennous groups on the Northwestern Plains. Certainly, more than two components to this annual cycle are expected. As future investigations continue, this model can be refined or discarded.

One problem facing future investigations is the general lack of Woodland-Besant manifestations west of the North Platte River and in the Bighorn Basin. The North Platte River and Bighorn Mountains may be considered a boundary, or broad ecotone, between the shortgrass plains to the east and the intermountain semi-desert basins to the west. Perhaps the distribution of Woodland-Besant sites reflects the westward extent of big game hunters adapted to shortgrass environments during this period. Another possibility is that archaeologists simply have not yet found sites west of this area. However, an avocational archaeologist recently reported a discovery of Woodland pottery near the town of Dad, west of the Sierra Madre Mountains in southern Wyoming (Milford Hanson, personal communication 1988).

These Woodland-Besant manifestations may be considered an early Plains Woodland complex that constitutes an extension of the Middle Woodland occupation of the eastern United States. In fact, the movement eventually might be

explained by the actual peopling of the High Plains by groups who left agricultural areas in the east, moved west along major river systems like the North Platte, and adopted a hunting and plant collecting economy. The similarity in rugged, physical traits of human skeletons between Late Plains Archaic populations in Wyoming and Woodland populations in Nebraska is a line of evidence that further strengthens biological links between the two areas. For example, Gill and Lewis (1977) consider a Plains Woodland male in Nebraska a member of the same biological population as Wyoming's Late Plains Archaic skeletal sample.

Further work is needed at the Butler-Rissler site to better define activity organization and assemblage content. In order to resolve some of the research questions concerning Woodland-Besant occupation, other sites in Wyoming also need further study. The processing area at Ruby, for example, may yield patterns of food processing and resource distribution following a communal kill. This, in turn, could produce clues to the social organization of the groups involved. If ceramics are present at Ruby, they would most likely occur in areas where food was processed, rather than in the kill site.

Problems still exist with the classification of cultural materials from this period that are not easily resolved. For example, projectile point attributes from Besant and Woodland assemblages have not been quantified to the extent they can be shown to be components of the same technology. But the most important research priorities are to excavate intact components that might help establish the technological association of dart points and ceramics, reconstruct patterns of annual resource utilization, and ultimately refine the model of settlement/subsistence on the Northwestern Plains during this period.

ACKNOWLEDGEMENTS

Archaeological excavations at the Butler-Rissler site were made possible by cooperative efforts from a variety of sources. In fact, so many individuals were involved with various aspects of the project that we may have inadvertently missed some people here. We regret any omissions.

First of all, we are deeply grateful to William Butler of Casper who gave us permission to excavate on his land. Without the generosity of private landowners in Wyoming, significant sites such as Butler-Rissler might never be studied.

Several staff members of the Office of the Wyoming State Archaeologist (OWSA) were either formally part of the crew or volunteered their time to help excavate. These people include Richard Blatchley, David G. Eckles, Dr. Julie E. Francis, David Reiss, James A. Truesdale, and Dr. Danny N. Walker. Eric E. Ingbar (University of New Mexico) and Marcel Kornfeld (University of Massachusetts, Amherst) also gave generously of their time and expertise on site.

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Back at the lab, Karin Guernsey (OWSA) analyzed the botanical contents of feature fill. Dr. Danny Walker and David Eckles identified species in the non-bison fauna. Dr. Walker also photographed the pottery in Figure 9. Dr. Robert E. Warren of the Illinois State Museum identified the freshwater mussels. Mary Lou Larson (University of California, Santa Barbara) and Eric E. Ingbar supplied expertise in database management.

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BOOK REVIEWS

Stylistic Boundaries among Mobile Hunter-Foragers. C GARTH SAMPSON. Smithsonian Institution Press, Washington, D.C., 1988. 186 pp. $31.50 (cloth).

This book is the most recent step in what began thirty years ago as Sampson's visceral, school-boy reaction to the war in which his countrymen exterminated the South African Bushmen. Fulfilling a childhood vow to learn more about the now extinct Bushmen, he examines via the archaeological record how they organized themselves on the land. His goal is to discover band territorial boundaries through analysis of ceramic design, and then extrapolate from that information to examine questions about style versus function in lithic tools.

The academic or intellectual justification for the project undoubtedly outweighed childhood nostalgia in Sampson's successful acquisition of National Science Foundation funding. A Professor of Anthropology at Southern Methodist University, Sampson was disillusioned with stone artifact typology and the debate on style in Paleolithic technology. He also felt that the seasonal round and environmental explanations which ignored band level territoriality were inadequate.

Sampson decided that a "sufficiently large and complete map of stylistic traits . . . would capture the edges [emphasis original] of trait distributions" (p. 10). Definition of boundaries would add detail to the interpretations of seasonal foraging rounds, and allow study whether variations in style represent function or social groups.

Style and function can be easily confused in stone artifacts. Sampson focused on pottery decorations as being non-functional with potential to yield the desired information. The result is a framework of ceramic stylistic boundaries interpreted as resulting from band territories. These boundaries create a framework within which to seek variations in style of Bushman chipped stone artifacts, which will be Sampson's next phase of research.

To accomplish his goals, Sampson took an archaeological team to South Africa to document the abundant archaeological record left by the Bushmen. The mechanics of the survey will awe anyone ever involved in surface reconnaissance. Between the years 1979 and 1981, 5000 sq km were explored and 16,000 sites recorded. About half were Bushman sites. In 1982 and 1984, teams returned to the higher elevations of the project area, ca. 6500 feet (1981 meters), to collect pot sherds from 1000 Bushman cams. This smaller project area was still 2000 sq km, roughly the size of the state of Delaware.

In this book, Sampson examines the distribution of decorative motifs on ceramics recovered from 1000 surface sites in the semi-desert Zeekoe(also Sea Cow, meaning hippopotamus) River Valley. The model tested is that each motif was distributed by members of a single band. The distribution of each motif should then be restricted to within the band's territorial boundaries, barring minor deviations resulting from theft, trade, etc. These boundaries should be delineated in the archaeological record by the fall-off rate for that motif.

The first three chapters of the book are introductory to the project, the environment, South African Bushmen (not to be confused with Kalahari Bushmen) archaeology, and Bushman ceramic manufacturing technology. The fourth chapter defines the methods used in sherd collection and classification.

Most of the book, chapters five through twelve, define the different decorative motifs recovered. They are categorized by the instruments used to create the various markings found in the clay, and the designs themselves. This information is clearly presented. The descriptions are augmented with 142 maps, 92 photographs and seven drawings.

As Sampson postulated, the various styles appeared in restricted areas. On that basis, and in the absence of ethnographic or other significant data, Sampson defines the bands' territorial limits. Sampson argues the restrictions occur because specific motifs were passed on only to young members of the same band, and thus perpetuated only in that band's territory. Their seasonal rounds would have been limited to the area where that style of decoration appears, i.e., the band territory. Within these boundaries, it should become possible to examine the meaning of style in other artifacts, including lithics, in the quest to separate style and function.

This study should be of particular interest to Wyoming archaeologists. The Wyoming environment is similar to that of the study area. At least some of the nomadic hunter-gatherers that exploited the resources of the High Plains made and used ceramics. In spite of the massive number of sites recorded by CRM projects, the ceramic data base is still comparatively small however, and lacks the resolution to pick up minor changes in style across the region. The best classification we have so far is a large-scale separation (e.g., Crow, Shoshone, Upper Republican, etc.). We do not yet, and possibly never will, have the ability to recognize band differences.

Attempting to duplicate the study would probably not help define tribal boundaries or add to our understanding of seasonal migrations in Wyoming. The plains cultures were extremely dynamic and were not the prolific ceramicists that the Bushmen were. Competing groups often ranged into the same areas during the historic period, and often moved to entirely different regions of the West (e.g., from the Missouri valley to the High Plains). Nevertheless, Stylistic Boundaries Among Mobile Hunter-Foragers makes interesting, thought-provoking reading, and may have some theoretical applications here as more ceramic sites are recorded and interest in them continues to grow.

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Social Theory and Archaeology. MICHAEL SHANKS and CHRISTOPHER TILLEY. University of New Mexico Press, Albuquerque, New Mexico, 1987. 243 pp., Appendix, Suggestions for Further Reading, References, Index. $15.95 (paper).

This is an exciting time for archaeology! Not "because archeology is still the most fun you can have with your pants on," but because this is the first time since the 1960s that paradigms, theories, and the fundamental concepts of the field are being questioned vehemently. We are seeing a revolution against the reactionary and revisionist reproachments, which co-opted much of the "New Archeology" of two decades ago. Such a revolution is necessary, because the interim complacency threatens to entrench theoretical sterility. However, the new directions remain the subject of many debates.

For Shanks and Tilley, the isolation of the past from the present (p. vii) is a fundamental problem. Consequently, their goal is to present an advanced introduction of how the past is to be reinscribed into the present (p. vii). A book of this sort is necessarily critical of past archaeological prac-

tice. Social Theory And Archaeology draws together many post-processualist critiques scattered over a dozen years, numerous journals and several continents. Even those who disagree with Shanks and Tilley will find this critique useful.

To reach their goal, Shanks and Tilley lead us through a critique of archaeology as it is practiced. In chapter 1 a general critique of archaeology is presented (i.e., the way of doing site reports, syntheses and synopses). In chapter 2 a more specific critique of previous social archaeologies is presented. The main problem with social archaeology, as it has been practiced, boils down to its use of the "logic of necessity," a specification of things necessary for a society to exist (p. 55). The "logic of necessity" gives priority to general over particular, totality over fragment, society over individual, and so on (p. 57). The alternative that will get social archaeology out of this rut is the "logic of contingency," which boils down to a metaphysical statement "Nothing exists . . .," least of all society.

In chapter 3, Shanks and Tilley ask how archaeologists dig up "people" and address related questions about the nature of archaeological data and the individual. They find the individual to be at once an actor, interpreting and creating social interaction, and a pawn, constrained by social structures. This is a balancing act in which Shanks and Tilley depend on Faucault's study of discipline and individualization. For Faucault, power is central to all social life, and capitalist relations of production create a particular type of subjectivity (i.e., subject or people that we dig up). The point is that subject-object relations are power relations, which are particular to our capitalist relations of production.

In chapter 4 is a discussion of how to give meaning to and relate material culture to the social. Many old debates are reviewed here (e.g., Spalding-Ford, Kreiger, Binford-Bordes, Sackett, Wobst, Hodder). Shanks and Tilley favor the view that material culture is active and encoded with symbolic meaning. However, this chapter is not without problems. In the conclusion (p. 117), Shanks and Tilley state that interpretation does not aim at "the recovery of original meaning." However, if the meaning of material culture patterning 'worked' in some past social context, how can we interpret that context without the recovery of the original meaning?

Chapter 5 on "Time and Archaeology" is an indictment on the inadequate attention paid to time. With few exceptions, time has not been considered problematic in archaeology. The notion of time in nearly all archaeological studies is co-opted from our own social system (i.e., time is money) and inscribed onto the past. As anthropologists we should be aware of cultural (social, ethnic or whatever) differences in the conception of time. Yet a critical perspective on time is lacking in archaeology and even Shanks and Tilley devote the shortest chapter to this topic! Ironically, this may be just the concept sought by the authors to unite the past and the present.

In chapter 6, "Social Evolution and Societal Change," the authors present a critique of evolutionary theory in archaeology. The ethnocentrism of the notion of progress is reiterated. Although general evolution is not questioned, its applicability to social change is denied. The problem with the apparent inevitability of history (i.e., the presentation of history as if it couldn't have happened any other way) and one alternative, the dialectic is discussed. "All societies are contradictory totalities" (p. 183) and it is such internal contradictions that are the causes of change. The contradictions are not between Marx's categories of forces and relations of production from his "Critique of Political Economy." But herein lies the problem as well, the contradictions reside in different institutions in different societies. Without some constraints, this can become a very particularistic

endeavor!

In the final chapter "Archaeology and The Politics of Theory," Shanks and Tilley concentrate on the implications of archaeology to modern political and thereby also social systems. These are important considerations, science (i.e., archaeology) is not neutral. Science can support those in power or those out of power. Science was an important ally of theories fighting the notions of Aryan superiority and Nazism, but science must be critical and self-conscious, otherwise it can be co-opted by anyone, for any purpose! Science must be made useful, that is, applied if it expects to continue receiving public support.

This book is difficult to read. This is partially because of the writing style. In the discussion of signs, for example, the authors state: "Meanings of signs are always elusive, for if a sign is constituted by what it is not, by difference from other signs, there can be no final relationship between one signifier and something that it signified, as the signified is always already a signifier of another signified" (p. 101). A clearer way of saying this might be: "The meanings of signs are elusive because the meaning of a sign is dependent on its relationship to other signs." It is a serious problem when a science which aims at making clear the social reality actually contributes to mystifying it, not because it misunderstands that reality, but because of the way it chooses to transmit ideas. The editing of the book is not well done either. Punctuation, grammar and style could have been improved.

Unfortunately this book is not going to be of interest to most members of the Wyoming Archaeological Society, but it should be! WAS has supported archaeology in Wyoming for some 30 years. The uses, abuses and relevance of archaeology to our society is an important debate. Since WAS is likely to continue lobbying for legislation enhancing Wyoming archaeology, the current fundamental debates in archaeology are extremely relevant. One can agree or disagree with all or parts of this book, but one should be well aware of its arguments.

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