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APPENDIX C

WYOMING
ARCHAEOLOGICAL SOCIETY, INC.

October 8, 1973

Dear Fellow Members:

Once again here we are facing fall after an all too short summer.

For those of you who were unable to make the summer meeting in Hyattville, let me say you missed a good time.

Dr. Frison and Charlie Love presented a brief resume of the activities that had taken place during the summer. The trenches were still open and it was fascinating to be able to view the culture levels and note the geological activities that had taken place over the years.

Following the lecture the group made an archaeological survey on the mountain with members of the North Big Horn Chapter acting as guides.

The evening session began with a most delicious dinner prepared and served by the Ladies Guild of the Methodist Church.

Margaret Powers donated an authentic clay pot estimated at 900 - 1500 years old. This created some competitive bidding with Bill Barlow being the successful bidder. The proceeds were donated to the Wyoming Archaeological Foundation. At the present time there is $2,420.00 in the Foundation Account. It is growing thanks to the support of the Society members.

After dinner the school board rescued us from a rainy and wet open air pavilion for dancing by opening their new bus garage. We all had a good time dancing to music provided by a small group of "The Old Time Fiddlers" from Powell with George Moore of Cody as the caller.

A special thanks to all who helped make our meeting a big success. As always there are many details to be attended to and contributions of time and ideas are sometimes overlooked. But I want you to know I appreciate your help.

We will be unable to have a fall meeting this year because Dr. Frison is on a Sabbatical. He has finished writing a book entitled "Casper Site", soon to be published by Seminar Press.

I have set the dates for the spring meeting as April 5th, evening, April 6th, all day, and April 7th, morning, with the sixth as the annual business meeting date. It will be held at the Ramada Inn this year. This information may help some of you in scheduling your time so you can attend. So far many of my plans are still tentative but if they work as I think they will it should be a most interesting and educational meeting. More details later.

Have a nice fall.

IMOGENE HANSON
President

APPENDIX D

SEPTEMBER, 1973 CONTENTS

Editor's Notes

It must have been a busy summer at the Hyattville Site. Besides the full crew there were the following visitors:

Eenâki San Martin, a colleague of F. Bordes.

Bruce Bradley, who will be returning to Cambridge for his PhD. Bruce was also shown many of the quarry sites as well as Spanish Point in the Big Horns.

Dennis Stanford of Smithsonian, who directed the Jones-Miller site excavations, 10 miles south of Laird, Colorado. This was a paleo-site similar to Casper's Cal-Data.

Chuck and Sandy Reher, who have also been working on the Jones-Miller site. They will be doing field survey work for University of New Mexico this fall in the Chaco Canyon area and by Christmas will be back to Albuquerque.

Preston Holder from University of Nebraska.

Larry Loendorf from North Dakota State.

E. Miles Gilbert from University of Missouri who has just published a new book on Osteology.

Ray Wood also from Missouri, who is the present Editor of Plains Archeologist.

Report on the whereabouts of the following:

John Lobdell is now instructor of Anthropology at Anchorage Community College, 2533 Providence Avenue, Alaska 99504.

Mike Wilson back at Laramie after making a summer survey of the Buffalo Bill Reservoir area.

George Ziemens will be back in Laramie working on Masters.

Charlie and Karen Love are back teaching at Rock Springs Jr. College and researching sites in Red Desert.

John Lytel working on PhD at Kansas University.

Joanne Mack back working on PhD at Oregon.

Helen Schuster also working on Doctorate at Seattle and may be reached at 2016 NE Ravenna Blvd., 98105.

George and June Frison, rating a sabbatical leave, will visit Ann Arbor in October and November, then Washington, D. C. before returning to Laramie. George did additional work this summer on sites at Big Goose Creek, Shell Canyon and Casper. The latter report should soon be published.

Under the direction of Floyd W. Sharrock, the University of Montana has been making an archaeological survey in Campbell County for the Amax Coal Company.

THE SCOGGIN SITE: AN EARLY MIDDLE PERIOD BISON KILL

by

John E. Lobdell

A Thesis

Submitted to the

Department of Anthropology and

the Graduate School of the University

of Wyoming in Partial Fulfillment of Requirements

for the degree of

Master of Arts

University of Wyoming

Laramie, Wyoming

April, 1973

ABSTRACT

Lobdell, John E., The Scoggin Site: An Early Middle Period Bison Kill, M.A., Department of Anthropology, April, 1973.

The Scoggin Site, located near Sinclair in south-central Wyoming, is an Early Middle Period Bison kill consisting of a carefully planned approach, jump, and trap. The high use of bone tools is speculated and specific food processing areas are discussed. This site offers a unique opportunity to study two different stylized points from a single component.

The purpose of the paper is to report the preliminary investigations at the site and to consider analytically and report adequately the large deep side-notched projectile points that are the major variation found. Such a two-fold intent is used to document a previously rarely occurring projectile point type in the context of typological variation.

ACKNOWLEDGMENTS

The writer gratefully acknowledges the help received during both the excavations and the writing of this report. Noteworthy was the help of many dedicated members from several chapters of the Wyoming Archaeological Society. The help of many students, both graduate and undergraduate, is also appreciated.

The writer is especially grateful to George Ziemens, Danny Walker, Michael Wilson, Mark Miller and Jim Durkee for their aid in analysis of components unfamiliar to the writer. The help of John P. Albanese for the geologic field work and interpretations is very much appreciated. Drs. George Frison, Anne Slater, and George Gill are thanked for their help and guidance, not only on this report but during the two years of this student's graduate program.

William E. Scoggin, discoverer of the site has requested that it be named after his uncle Charles R. Scoggin, 1917-1944. Charles was killed in action on Anzio beachhead, Italy, February 2, 1944.

Charles R. Scoggin was greatly responsible for the success of "The Arch, A Monthly Survey of Amateur Archeology" and the society that created the publication. In 1936 he began work at the famed Lindenmeier Site in northern Colorado on summers off from Colorado University at Boulder. By the final field season in 1940, he was in sole charge of the Lindenmeier field activities. From 1939 to 1941 he did extensive survey field work at Dinosaur National Monument. From this comes his best recognized work, "Preliminary Report of the Archeological Field Work of the University of Colorado Museum in Yampa Canyon, 1939-1940." This manuscript is one of the best ever sent to the Smithsonian Institution in compliance with the permit regulations of the Antiquity Act and might well serve as a model for many professionals.

From the above and other works and accomplishments it is clear that Charles R. Scoggin was a very capable and dedicated man. His interest in archeology was so overwhelming that it was difficult to hold him to any routine not connected with it. Had he been permitted to continue his career he probably would have left an even larger mark in the field of American archeology (Roberts 1944:198-201). It is in the tradition of the professional dedication shown by Charles R. Scoggin that the site is named.

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CHAPTER I

INTRODUCTION

Site Location and Environment

The Scoggin Site is a combination Bison jump-trap. It could be described instead as a pound since the trap was most likely man made, resembling in part a structure reported elsewhere in Wyoming (Frison 1971:77). However, as the approaches to the trap are in all likelihood natural, the former nomenclature is preferable.

The approximate location of the site, on property owned by the Miller Land Company, is eighteen miles due north of Sinclair, an oil refinery town six miles east of Rawlins on Interstate Highway 80 in Carbon County, Wyoming. The site is reached by traveling north-east on Seminoe Dam Road about eighteen miles and then west by unimproved dirt road about nine miles. Because of past looting at the site, additional site location information will be dispensed only to responsible inquiry through the office of Dr. George C. Frison, Head of the Department of Anthropology, University of Wyoming.

Seminoe Reservoir is twelve miles east of the site. The major feed stream for this reservoir, the North Platte River, flows due north from its headwaters a few miles south of the Wyoming-Colorado border. From its beginnings between the Sierra Madre and Medicine Bow Ranges it runs unobstructed for about seventy miles to Seminoe Dam. At this point the river executes a fairly constant, gradual turn from northeast to southeast for an approximate two hundred mile distance. Passing through the major towns of Casper, Glenrock, Douglas, and Guernsey, the North Platte enters Nebraska just east of Torrington.

The landscape perhaps reflects the importance of the watercourse in earlier times. Though most of the area adjacent to the site is somewhat barren, the North Platte floodplain provided grassland for ranging animals, which was an attraction for herds of Bison. Some stands of cottonwood and willow and potential mud wallows along its banks existed until inundated by Seminoe Dam in the 1930's.

Cary (1917) placed the area that includes the site in the eastern-most environmental influence of the Red Desert. In general, it is a region of extremely arid plains, the monotony of the landscape being broken by low hills and bluffs along dry washes. There are many dry depressions and the soil is high in alkaline compounds, making it, therefore, unsuited for agriculture. Permanent surface water, often saline or alkaline, is rare. The soils also limit the number of wild plants that can survive under alkaline conditions. The site is closest to Coal Creek, exemplary as a typical ephemeral stream not noted for human consumption purposes but used to water livestock (Miller 1973). In short, the area has been described as dilute Upper Sonoran Zone (Cary 1917:20). Dominant vegetation is desert shrubbery that includes the saltbrushes (Atriplex spp.), white sage (Eurotia lanata), Kochia (Kochia americana), greasewood (Sarcobatus vermiculatus), grayia (Grayia spinosa), the rabbit brushes (Tetradymia spp.), and the sagebrushes (Artemisia spp.). Occasional stands of desert juniper (Juniperus spp.) are present on high bluffs. Other conspicuous herbaceous plants and grasses, including some edible varieties possibly exploited by early transient peoples, are prickly-pear cacti (Apuntia spp.), yellow cleome (Cleome lutea), stanleya (Stanleya spp.), some alkali-resistant members of the goosefoot (Chenopodium spp.) and pigweed (Amaranthus spp.) families, the wheat grasses (Agropyron spp.), and the rye grasses (Elymus spp.). As mentioned before, some trees were isolated to the immediate banks of the North Platte River such as cottonwoods (Populus spp.), willows (Salix spp.), and box elder (Acer negundo) (Cary 1917:20-62)(Harrington 1972:82).

Small rodents make up the largest percentage of fauna in the area. Kangaroo rats (Perodipus ordii), ground squirrels (Spermopholis spp.), pocket gophers (Thomomys spp. or Geomys spp.), prairie dogs (Cynomys spp.) and pocket mice (Perognathus spp.) are quite common (Cary 1917:20-26). Cottontail rabbits (Sylvilagus spp.) and black-tailed jack rabbits (Lepus californicus) are present in the area. On one occasion a coyote (Canus c f. latrans) was viewed. There are many species of reptiles including the plains rattlesnake (Crotalus confluentus). Toads (Bufo spp.), frogs (Rana spp.), and salamanders (Amlystoma spp.) can be found in seasonal ponds near the North Platte and its tributaries. Some aquatic birds annually present include teal (Querquedula spp.), coots (Fulica americana), and great blue herons (Ardea herodias). Other birds observed in the site area include sparrows (Amphispiza cf. nevadensis) and many birds of prey. Eagles are very much in evidence.

Three large game mammals are known from the site and adjacent land. Antelope (Antilocapra americana) are numerous in the open areas sloping east to the North Platte River. Hunters in recent years have obtained trophy mule deer (Odocoileus hemoinus) on Wild Horse Mountain, a mile south of the Scoggin site (Miller 1973). Most important to this author, the site has yielded bones of Bison (Bison cf. bison).

Seasonality and scheduling obviously would have affected prehistoric visitors to the area. The aforementioned edible plants and game animals can only be obtained or be used for food at seasonal times of the year. It is doubtful that such a harsh environment permitted year-round land use.

Climate must be mentioned as another possible limiting factor in the exploitation of areal resources. In this area it can best be described as extreme. Midsummer (July) temperatures are often in the mid nineties with temperatures over one hundred degrees occasionally reported. Winter low readings sink to minus twenty degrees with temperatures to minus forty and below recorded in some areas. There are few days of the year when little or no wind is present, the strongest gales being recorded in the mid winter months. Combined with sub-zero still air temperatures, the wind chill factor is often computed below minus fifty degrees.

Precipitation in the area varies. The heaviest snow and rain fall is in March and September respectively. Often making up half the precipitation, these two months boost the total to approximately 12.5 inches recorded at nearby Seminoe Dam. This figure usually exceeds those reported from stations farther west in the Red Desert (U.S. Weather Bureau 1959-1969). The heavy spring snows are more beneficial to vegetation than summer rains which are lost through rapid evaporation or, in the case of occasional heavy showers, quickly run off the barren slopes and flood the dry arroyos (Cary 1917:20).

In general, the summers are short and hot and the winters extremely cold and moderately long. It should be mentioned that the autumn months, the time of suspected Bison procurement, are pleasant. September and October temperatures are in the sixties and fifties respectively, although an unseasonal blizzard or early frost may occasionally occur at this time of the year (U.S. Weather Bureau 1959-1969).

To conclude these basic environmental remarks, the area is somewhat barren, and probably much of the year was unsuitable for the transient peoples of earlier times. The plant and animal resources could be exploited on a seasonal basis. However, the chief value of the area recognized today, other than mineral resources, is as winter forage. Drifted snows provide water, and the winds keep browsing areas clear of snow enabling range stock to get at the alkali-resistant shrubs and plants. Sheep, which spend summer months in high country pastures, are the major domesticate (Cary 1917:21).

Geology and Topography

The geology of the kill site is indeed noteworthy. The Scoggin Site is located a few feet east of a second order ephemeral stream that flows southward into Coal Creek. The site is positioned on the south flank of the O'Brien Springs Anticline. Plunging to the east, it is a major east-west trending anticline.

The kill area is located near Upper Cretaceous outcroppings. Specifically, this is Mesaverde Formation which consists of beds of sandy shale, grey to tan sandstones and some coal beds. The Pine Ridge sandstone member is at the top.

Important geomorphic features are the cuestas that ring the O'Brien Springs Anticline. In the vicinity of the site their average strike is North 40 degrees East and the dip 6 degrees Southeast. One such cuesta served Bison procurement as the jump part of the complex.

Two Holocene terraces are noted along the tributary stream (Albanese 1973) adjacent to the kill area (Fig. 1). The site is found on the upper and, therefore, oldest level. This higher terrace is approximately four and a half feet high and is underlain by slope wash material and colluvium. This material consists of fine and coarse-grained sands with fine and medium-grained sandstone pebbles occurring in relatively thin lenses.

The layer of cultural material is located about two and one-half feet beneath the surface of this upper terrace. It consists of sandstone slabs in fine-grained sands intermixed with the deposit of Bison bones and artifacts.

A younger or lower terrace is present five feet below terrace number one. It is underlain by gravel with some thin interbedded layers of sand. The gravel consists of angular sandstone pebbles, averaging one inch in diameter. Some sandstone slabs of large size are present in this sequence. Although the average measures one foot in length, some are three to five feet long. These slabs of large size were probably transported during periods of flash flood. This type of deposition can still occur today in this region (Albanese 1973).

A modern arroyo cuts into the lower terrace. Its present depth is about six feet below terrace II.

Both terraces of the tributary stream adjacent to the kill site are manifest along the Coal Creek Drainage. As mentioned earlier in the chapter, Coal Creek is another ephemeral stream common to this arid region. Running from west to east, it terminates at Seminoe Reservoir. It is obviously an underfit watercourse. During Pleistocene times it cut a 200-300 foot deep canyon through the southeast dipping uplift Mesaverde Formation outcrops just east of the excavated area. This canyon is the bisecting feature that today separates Wild Horse Mountain to the south from Coal Creek Rim, the northern physical feature.

A cross section of the Coal Creek terraces has also been determined. An arbitrary station #1 was set up just under a mile downstream from the site (Fig. 2). At this locale the lower terrace consists of very fine-grained sands and some silts in even beds. Erosion of the terrace is marked along the arroyo banks. The bottom of the arroyo has both sand and sandstone slabs and is barren of vegetation.

It is the above mentioned physical features that are of importance to this writer in terms of control, handling, and trapping of buffalo. Topographic land formations served as part of the total complex procurement system (Fig. 3).

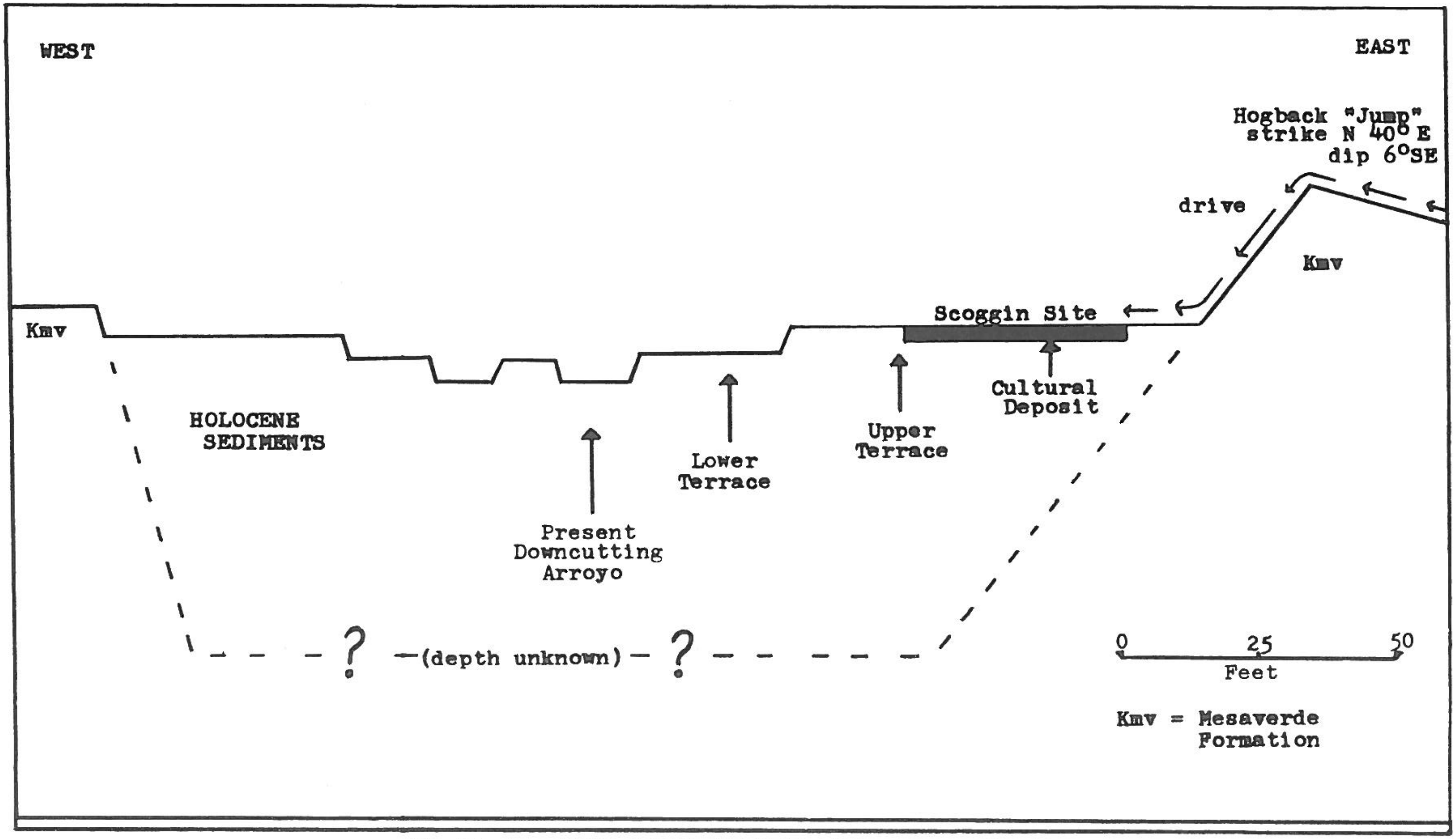

Figure 1. Site Cross Section (After Cross Section by John P. Albanese)

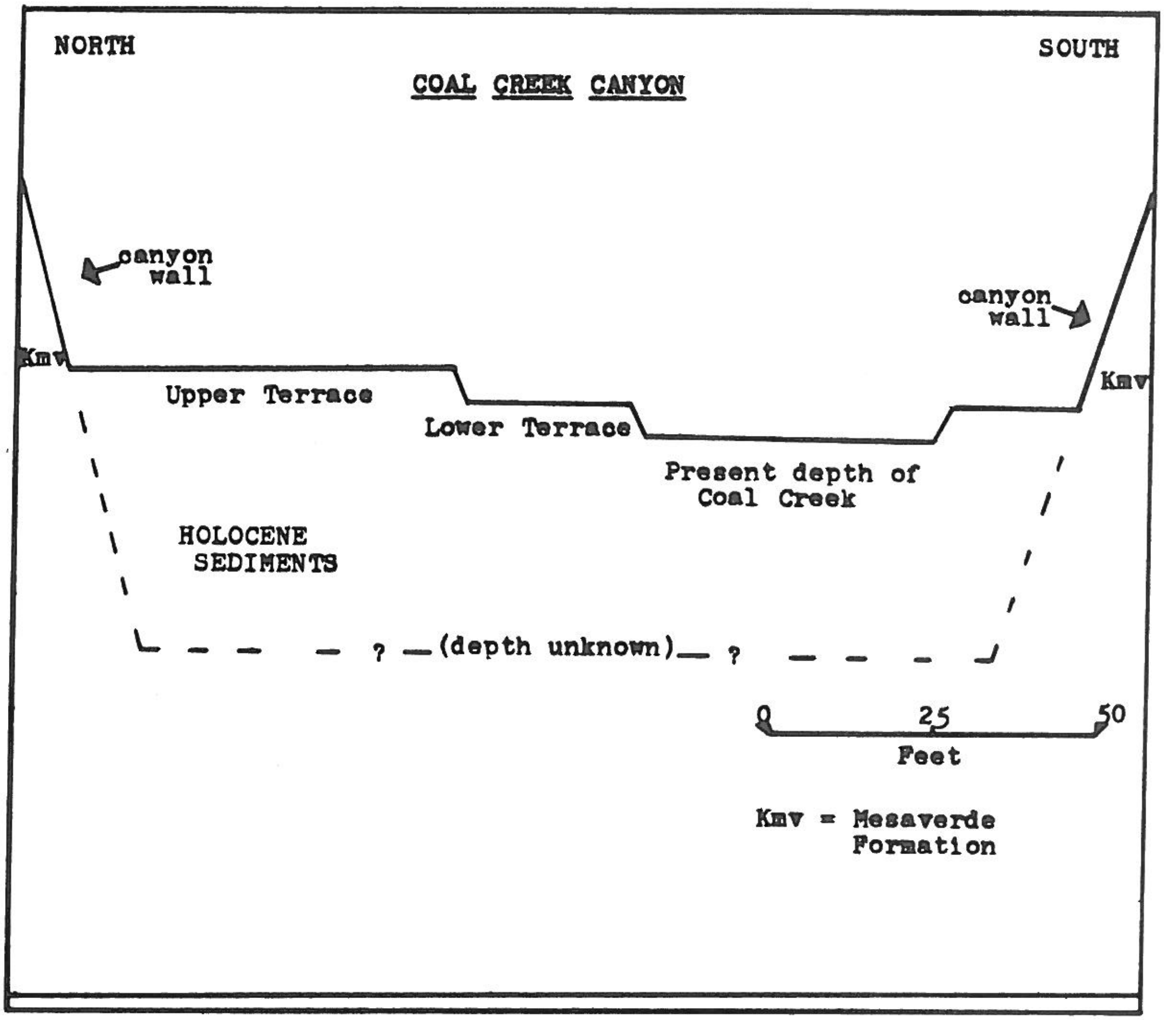

Figure 2. Station #1 Cross Section
(After Cross Section by John P. Albanese)

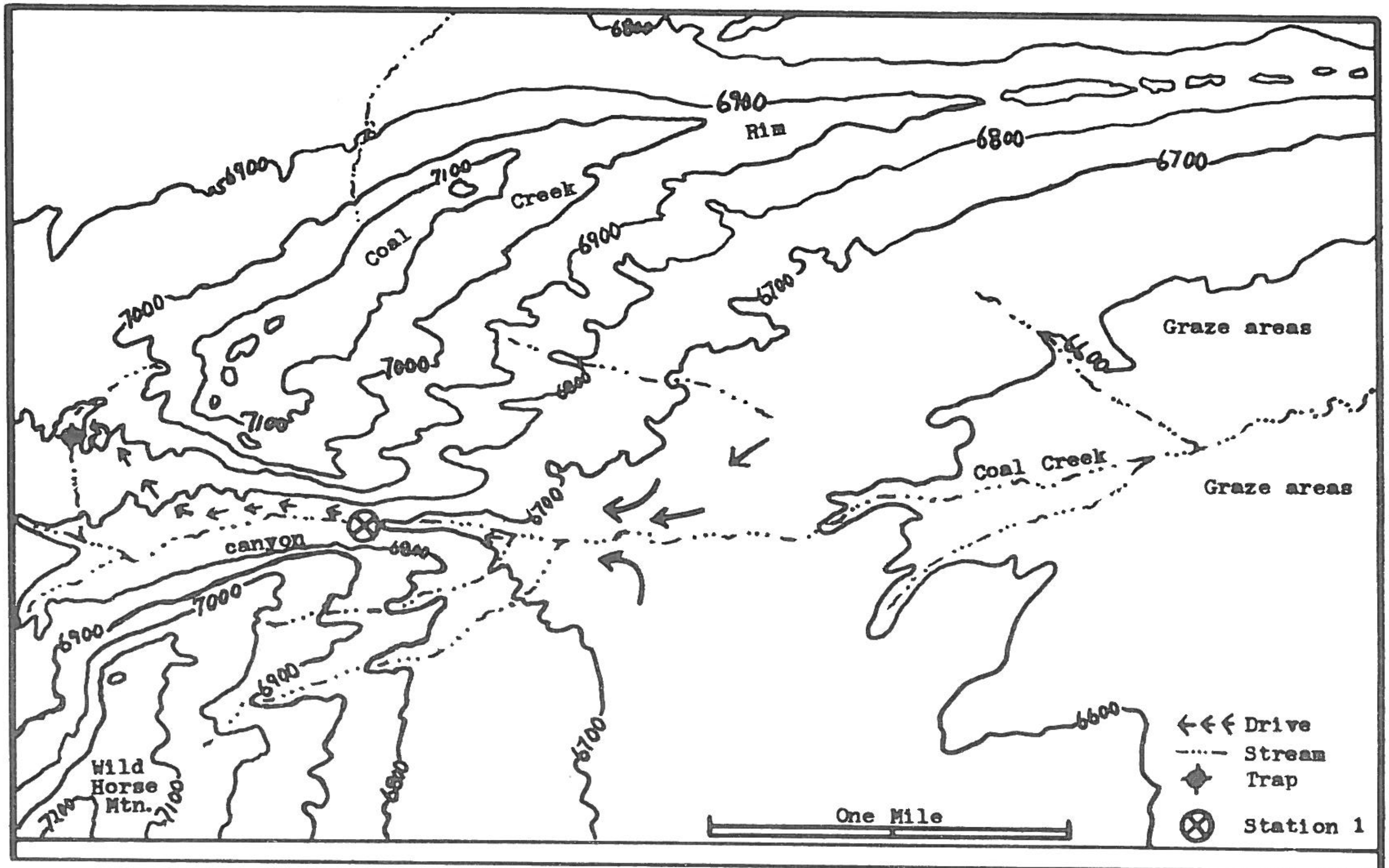

Figure 3. Topographic Map

The nature of the site reveals that procurement was not an incidental activity, but required cooperation, careful planning and execution. The most favorable Bison grazing areas were located close to the flood plain or bottomlands of the North Platte River, some ten miles east of the kill. It is most likely that Bison also fed on grasses along stretches of Coal Creek. Today there is good graze up to a point about four miles east of the site as evidenced by the few cattle that utilize it. As one nears the entrance to the canyon, the sage takes over. Grazing groups of Bison would have to be consolidated into larger groups and moved west from graze areas. There is no way that the operations can be viewed as waiting for herds to drift into a favorable position and then stampeding them (Frison 1970b:5). Cautious driving and probable decoying must have been used to channel the herd to a place near the mouth of Coal Creek Canyon where the final drive could be initiated.

The area is quite conducive to a buffalo drive. Coal Creek Rim to the north rises somewhat abruptly and could serve to cut off a northward drift by the herd once the Bison were within four miles of the trap. With drive lines or drivers to the south and east the Bison could be drifted to the canyon. The steep canyon walls provide no escape. The animals could be driven to the trap, probably in a circuitous manner following the ancient stream bed. Handling of the animals in this way would have been easier than a straight-line approach. The herd was forced toward the north away from the main stream bed. The obstructions used in turning the herd probably have been long eroded away by stream action. Although no drive lines have been found, it is likely that the drive used both the terrain and a final sharp right angle turn to the west to conceal the man-made trap from the animals until the last possible moment. At this point the Bison were driven off the cuesta into the trap (Fig. 1). This jump was probably not enough to cause serious harm to the animals but enough to forbid their retreat. In short, the available land forms, behavior of the animals, and the cooperative efforts of man were necessarily all utilized to insure the success of procurement. These necessities have been noted from other sites in the High Plains (Frison 1968, 1970a, 1970b, 1971).

Site Investigations

William E. Scoggin, a dentist and member of the Wyoming Archaeological Society first brought the site to the attention of the Department of Anthropology. Dr. Scoggin discovered the site on May 22, 1971. On June 13 he contacted Dr. Frison. Previously determined summer field priorities delayed any action that season. Dr. Frison first visited the site on February 19, 1972. Fearing loss of the site to looters, a crew was organized and brought in only ten days later (Scoggin 1972).

Work continued on many weekends. Crews consisted of volunteers. Most were either anthropology students, both graduate and undergraduate, or Wyoming

Archeological Society members from several chapters. In brief, many individuals gave of their time and talents under sometimes inclement weather conditions to obtain a preliminary diagnostic sample from the Scoggin Site.

As to methods, a standard grid pattern was employed (Heizer and Graham 1967:31-40). Oriented toward Magnetic North, test sections ten feet long by five foot wide were set up. In some instances later sections only give feet by five feet, usually test additions to an earlier trench, were employed.

An average of 30 inches of overburden was removed by the use of both shovels and picks. Screening proved the overburden to be sterile. The bone layer was troweled and brushed clean. This was done as carefully as possible due to poor bone preservation. Dirt removed from immediately above the bone layer was also carefully sifted. Large clods of this cemented, clayish matrix were broken open and screening continued so as not to miss any cultural material. Identifiable bone and fragments were removed from the screens and saved for later analysis. Photographs were taken of bone in place after each section was cleaned. Slides were also made of important artifacts in situ.

Bone removal posed problems because of both the compact matrix and badly decomposed bone. The few articulated units were extracted and sacked separately. Unfortunately much of the bone was subject to secondary breakage. By treating the bone prior to removal with a three-to-one mixture of water and white glue, an effort was made to save many whole bones, suspected bone tools, and all mandibles. The result was much less breakage during both removal and later transportation to the University. Non-Bison faunal material was separated for later identification. A few of the amorphous but suspicious-looking sandstone rocks found scattered throughout the bone layer were saved for examination.

As was expected, many projectile points were found directly under the bone layer. Those found in situ were measured in place. Again dirt was sifted to ensure that all artifacts would be recovered.

The apparent absence of chipped stone butchering tools triggered the fine-screening of a large sample of dirt. Several screenloads were sifted, but the end results were inconclusive.

The limits of the trap compound were defined through the discovery of soft areas in the freshly-cleaned floor. These soft areas were excavated for their contents (Figs. 4 & 5). Bone and some very small slivers of decayed wood were taken from these postholes (Fig. 6).

Another soft pit a few feet south of the outline, suggested by the postholes was excavated. It was soon obvious that this was a large cooking pit (Fig. 4). In

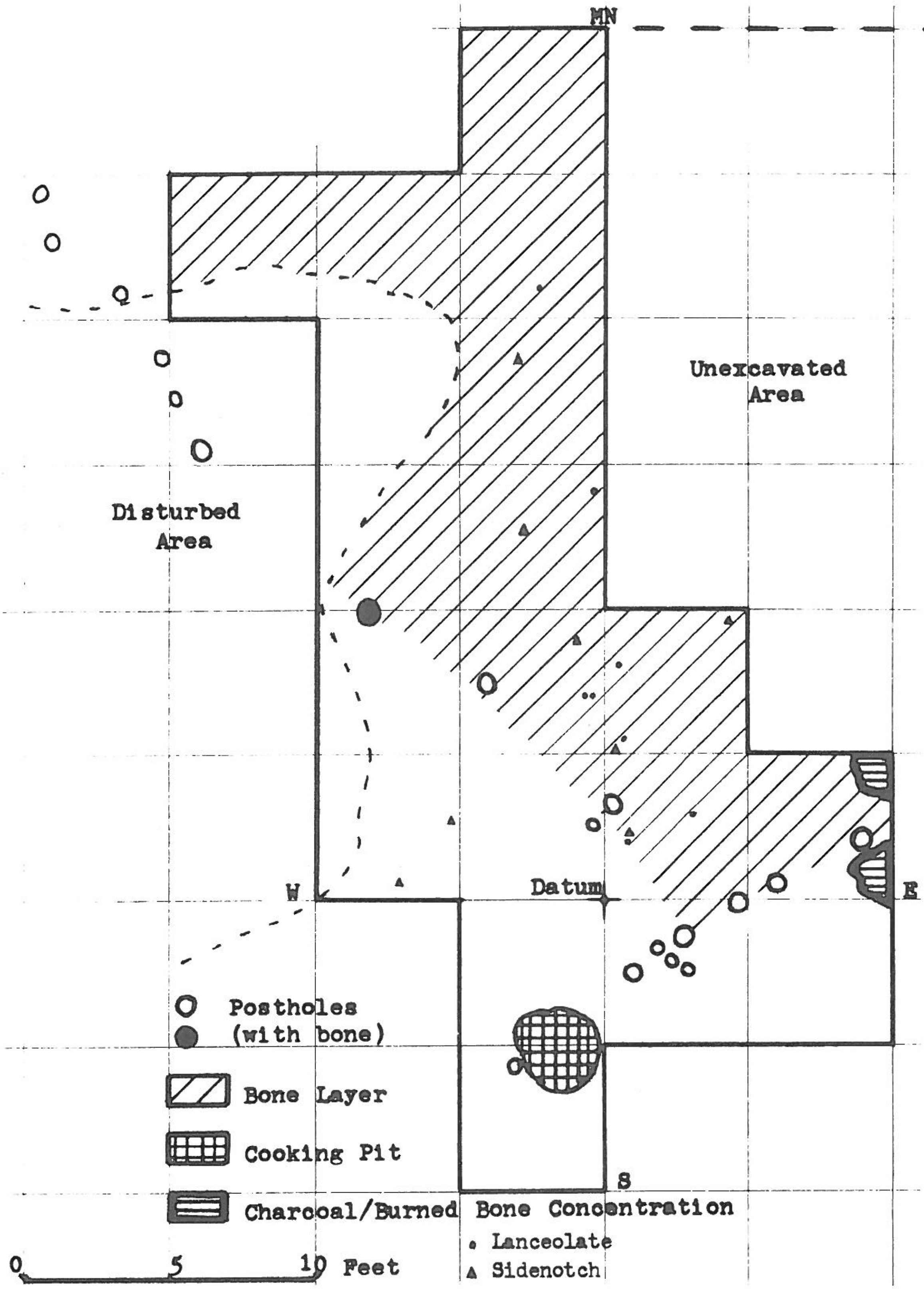

Figure 4. Site Layout

Figure 5. Postholes and bone layer

Figure 6. Posthole with bone prop

order later to study its contents, the entire unit was preserved by the application of a plaster jacket. Photographs were taken both prior to and after the cast was applied.

Tiny flects of charcoal were present throughout the bone layer and, at first, were saved. However, the later discovery of fire-blackened areas provided large amounts of charcoal for analysis. In addition, one such hearth yielded one unburned piece of wood. It has been identified as pine (Pinus spp.) on the basis of extensive resin caniculi (Reeder 1973). Species has not been determined, although I suspect limber pine, since it is found on some nearby ridge tops. As well as serving needs for fires it probably composed the posts of the trap. Limber pine seeds can also be included in the food resources on a seasonal basis.

A north-south trench wall was smoothed and brushed. Photographs were again taken to record soil profile.

To recapitulate briefly, the above description represents a historical summary of excavations to date and the methods employed by the excavators in the hopes of obtaining a viable sample from the Scoggin Site. Work continued until an assessable amount of material was recovered. Because of other demands, work at the site was discontinued. Time and weather permitting, additional investigations should be initiated in the near future.

To date, the results of the above investigations are multifold. The 475 square foot area excavated yielded several elements of importance including processing areas, bone sample, and artifacts, all to be discussed later.

Dating of the Site

The Scoggin Site is comparable to other Early Middle Prehistoric Period manifestations (Mulloy 1958:150). Only a single component is present. It is apparent that the elaborate jump-trap was used only once. One radiocarbon date has been obtained from ample charcoal taken from a hearth found in conjunction with the bone layer. The resultant report cites 4540 ± 110 or 2590 B.C. (RL-174) as the absolute date. Relative to other sites on the High Plains, this date appears to be correct.

CHAPTER II

FAUNAL MATERIAL

Bone Count

An accurate bone count was a difficult task because of the poor preservation of the bone. Both primary and secondary breakage left very few whole bones. An attempt was nevertheless made to determine the number of animals represented (Tables 1 & 2).

It soon became obvious that a paired limb bone count was not the method to be employed. Instead, an interpolated count of most long bones was based on a comparison of fragments. Often the long bones were split lengthwise as well as broken both proximally and distally. Therefore, only an estimation could be attempted. The many long bone fragments were counted at this time. Reconstruction of fragmented long bones was also attempted where major portions could be found and severe warpage, a common element in this sample, was not present in a restrictive amount.

Bones with only one articular end were counted on the basis of that end being present. These include for the most part the badly shattered ribs and scapulae. No attempt was made to tally blade fragments from ribs, scapulae, or vertebrae processes. Such a count of blade pieces would be quite large but of very small significance.

The most reliable figures probably come from an accounting of the carpals and tarsals (Table 2). The astragalus especially is the best preserved of all bones from the Scoggin Site. Although surface preservation was sometimes quite poor, the side of the animal from which each astragalus came could always be determined. In Bison the astragalus is one of the few bones that has only one center of ossification from birth or does not fuse later with some other bone. With no epiphysis this bone has an almost total covering of dense compact bone with no areas weakened by an epiphysis plate. It is a rather rounded bone with no fragile processes protruding that can be easily broken off. The astragalus was thus the most reliable for the purpose of determining the number of animals involved at Scoggin. A total of thirty-five animals are represented by a tally of right astragali (Table 2).

On the basis of skull morphological characteristics the above bone sample is within the limits of modern Bison forms (Bison cf. bison). There is no concrete evidence from the sample that indicates earlier or transitional forms are represented (Wilson 1973).

Only two other types of animals, both rodents, were taken from the site. Gopher (Thomomys cf. talpoides) and ground squirrel (Spermophilus cf. richardsoni) have been

TABLE 1

BONE COUNT

bone	left		right
Long Bones			
Humerus	27		13
Radius	17		23
Ulna	11		21
Femur	14		19
Patella		11	
Tibia	22		17
Long Bone Fragments		522+	
Pelve			
Acetabulum	2		4
Ilium	4		1
Ischium	1		3
Pubis	0		0
Pelve Fragments		9	
Spinal			
Atlas		5	
Axis		3	
Cervical		18	
Thoracic		10	
Lumbar		19	
Sacrum		2	
Caudal		15	
Unclassifiable Centrum		48	
Scapula		25	
Rib		108	
Cranial			
Skull (near whole)		2	
Mastoid	1		1
Occipital		2	
Hyoid		6	
Nasal			1

TABLE 2

BONE COUNT

bone	left		right
Carpals			
Metacarpal	18		23
Fused 2nd and 3rd	23		21
4th	18		11
Accessory		3	
Radial	21		21
Intermediate	13		24
Ulnar	15		15
Tarsals			
Metatarsal	9		19
Fused Centrum	22		26
4th	14		14
5th	4		3
Astragalus	26		35
Calcaneus	16		29
Lateral Maleolus	5		7
Sesamoids			
Proximal		45	
Distal		34	
Phalanges			
Proximal (1st)		196	
Medial (2nd)		139	
Distal (3rd)		43	

identified (Walker 1973). Both the burrowing characteristics of these fauna and the relatively good bone preservation suggests that these rodents are intrusive and not relevant to the site analysis.

Mandible Analysis: Seasonality

All mandibles or mandibular teeth from the Scoggin deposits were carefully saved. Most were treated with the glue and water mixture in the field prior to removal from the matrix.

For an excellent discussion and pictorial explanation of determining the age of buffalo by tooth eruption and wear see Frison and Reher (1970:46-47). These authors have defined seven age categories. The most precise age determinants can be obtained from the first five age group specimens that represent animals still in the process of gaining permanent dentition at time of death. The last two groupings contain several years each as based on wear patterns.

Forty-three ageable specimens were recovered from the Scoggin Site (Table 3). As with most other bones, none were whole. In fact, only the third molar was recovered in many cases. For age determination this is usually sufficient. Based on a comparison of left versus right mandibles, I estimate a conservative figure of twenty-eight animals represented. Such a high number is indeed fortunate considering preservation. It has already been stated that the sample recovered to date represents thirty-five animals, the high figure from counts based on right astragali. Therefore, eighty per cent of the animals counted are represented by the mandible count.

Evidence suggests that the Scoggin kill occurred in the fall of the year. Age determination of the above mandibles supports this idea as the different groupings suggest ages of .5 years, 1.5 years, 2.5 years, 3.5 years, etc. As most Bison calves are born at the end of April or the first part of May, then a period of time ranging from late September to early November can be assumed for the probable time of the kill (Frison and Reher 1970:46).

The idea of a fall kill season, hypothesized for the majority of High Plains sites, is also supported by other factors (Frison 1970b:5). At this time of the year the animals are in their most desirable physical condition. Behavior of the cows is more predictable; they are not as defensive or protective of their half-year old calves that by then are able to run along with the rest of the herd. The rut is over and the older bulls leave the herds for solitary grazing, thereby removing their possible disruptive leadership. Fall average temperatures are less likely to cause the severe meat spoilage that might accompany earlier summer weather (Frison 1970b:5). It has already been mentioned (Chapter 1) that the most pleasant temperatures recorded at nearby Seminoe Dam occur during these fall months.

TABLE 3

Age Determination From Mandibles

AGE GROUP		SIDE left	right		Maximum number by side comparison
I.	.5 years	1		=	1
II.	1.5 years	1		=	1
III.	2.5 years	4	9	=	9
IV.	3.5 years	2	2	=	2
V.	4.5 years	0	0	=	0
VI.	5.5 to 9.5 years (Mature)	6	9	=	9
VII.	10.5 to 13.5+ years (Old age)	6	3	=	6
		20 total	23 total		28 estimate animals

Mandible Analysis: Population Dynamics

Population dynamics refers to the balance between births and deaths and to the age distribution within a natural population. These parameters can be condensed into life tables, survivorship curves and other media to demonstrate the workings of life processes within any given species. For an excellent appraisal of the population dynamics of a Bison kill site see Reher (1970:51-55).

While the sample from Scoggin is small and fragmentary, it still renders useful information. Since there were no whole mandibles, mandible sizing was impossible. Therefore, no attempt was made to determine sex ratios from the sample. (Measurements of the metapodia may yield more useful information of this nature.)

Despite the above limitations, the available sample can be compared to an expected generalized catastrophic mortality curve (Reher 1970:53). The Scoggin sample is not congruent to the generalized death curve. One would expect more young and less aged animals. At Scoggin (Table 3) the reverse is apparent. Fifty-four per cent of the sample represent mature or old animals. In age group V no animals are represented at all. The number of calves and long yearlings tallied is only one for each group (Age groups I and II). Groups I and II would be the groupings where the greatest number of animals should show up.

Perhaps the incongruity to a generalized catastrophic mortality curve is a sign of the population numerical dominance of the aged and mature animals of this particular herd. Until all recoverable mandibles from the site can be analyzed, such judgments are speculative and serve no accurate purpose. However, preservation might be highly differential, especially for fragile bones like mandibles. If differential preservation eventually proves to be correct then any population graphs interpolated for Scoggin would in all likelihood be invalid.

Differential treatment of calves and yearlings is another possibility. Younger animals might have been removed to a different area for butchering. Their removal would then explain their absence from the sample.

In brief, the mandibles recovered give very little and probably unreliable data as to population dynamics of the Scoggin animals. Never-the-less, the hypothesis that the trap indicates a seasonal procurement activity is validated.

Skull Analysis

Only two skulls in a recognizable condition were recovered. There were many small fragments in the bone layer itself, but the nearly complete skulls came from the cooking depression just south of the datum point (Fig. 4). One appeared

TABLE 4
SKULL MEASUREMENTS
Based on Skinner and Kaisen (1947:145)

Key to measurements		Scoggin Individual (in millimeters)
1)	Spread of horn-cores, tip to tip (left side x 2).	e 620
2)	Greatest spread of cores on outside curve (left side x 2).	e 640
3)	Core length on upper curve, tip to burr.	e 230
4)	Core length on lower curve, tip to burr.	e 250
5)	Length, tip of core to upper base at burr.	e 192.5
6)	Vertical diameter of horn core at right angle to longitudinal axis.	86
7)	Circumference of horn-core at right angle to longitudinal axis.	275
8)	Greatest width at auditory openings.	268
9)	Width of condyles.	128.5
10)	Depth of occipital crest to top of foramen magnum.	118
11)	Depth of occipital crest to lower border of foramen magnum.	148.5
12)	Transverse diameter of core at right angles to longitudinal axis.	91
13)	Width between bases of horn-cores (left side x 2).	e 250
14)	Width of cranium between horn-cores and orbits (left side x 2).	e 288
15)	Greatest postorbital width (left side x 2).	e 330
16)	Anterior orbital width at notch.	253
17)	Width of skull at masseteric processes above M1.	189.5
18)	Rostral width at maxillary-premaxillary suture.	
19)	P2 - M3, alveolar length.	Not available
20)	M1 - M3, alveolar length.	Not available
O-P)	Length, over all, occipital crest to tip of premaxilla.	560
F-P)	Length, basilar, foramen magnum to tip of premaxilla.	515
O-T)	Length, occipital crest to tip of nasals.	455
O-N)	Length, occipital crest to nasal frontal suture.	235
M-P)	Length, beyond P2 to tip of premaxilla.	e 147
N-T)	Length of nasal.	220
21)	Angle of posterior divergence of horn-core.	e 60°*
22)	Angle of proximal horn-core depression.	e 15°*

*Some twisting of horn-core may render these angle measurements inaccurate.

(e) Indicates close estimate.

to be that of a female and the other a large bull. After stabilization with glue and water both were removed from the plaster-casted cooking pit.

Both skulls were almost intact except for the fragile palate bones and the right horn cores which were completely missing. In the case of the large bull the maxillary teeth had also been destroyed. Since frontals, nasals, and occipitals were undamaged, it is evident that brain and sinus extraction was not part of the butchering process.

It was hoped that measurements taken on the bull would shed some light as to the species represented. Skinner and Kaisen (1947:145) have stated criteria for the measuring of male skulls. These various measurements were employed for this study in Table 4. Measurements obtained were compared to indices tabulated for Bison bison bison (Table 5) (Skinner and Kaisen 1947:162). It has been advised that this one bull probably represents a very large animal of the above nomenclature (Wilson 1973) although there is considerable overlap with indices tabulated for Bison bison athabascae (Skinner and Kaisen 1947:164). There is little overlap with figures for Bison bison occidentalis (Skinner and Kaisen 1947:170), which is suspected to be a form that had disappeared before the time period of the Scoggin procurement.

When the large skull horn core was uncovered it was thought that the size and non-modern looking angle were suggestive of the occidentalis form. It is now the conclusion that any deviance in horn core angle was caused by twisting due to the settling weight of the matrix. The Scoggin skull is probably a modern form of Bison. It is possible that this skull is indicative of the athabascae form. This relationship seems remotely feasible as the site location is close to the eastern-most range recognized for this group (Skinner and Kaisen 1947:158). Many indices overlap for both bison and athabascae in the tabulated measurements. Measurements 18 and 15 (Table 5) are in excess of the maximum for bison. It should be noted that measurement 15 is still smaller than the minimum for athabascae. Therefore, I agree with the initial conclusion; the skull represents a very large Bison bison bison. Yet, it appears possible that some relationship with athabascae should not be entirely ruled out.

However, the question of determining sub-species is a difficult one in this case. At least it is obvious that the skull represents a modern Bison form. To determine emphatically anything more than the previous statement on the basis of only one skull would likely be invalid. The possible relationship to athabascae is never-the-less interesting.

Pathological Bone

One left mastoid process seems to have pathological bone formation. The amount of excess bone is not so great as to be pronounced, but in comparison to other mastoid processes from the skulls of several sites the specimen from Scoggin appears hypertrophied and misshapen (Fig. 7).

TABLE 5
COMPARISON TO GENERAL BISON INDICES

Measurement Key	Scoggin Skull	*Bison bison bison* (Skinner and Kaisen) Minimum	Average	Maximum
1	e620	485	581	662
2	e640	534	612	687
3	e230	140	186	250
4	e250	170	233	313
5	e192.5	135	168	210
12	91	68	78	95
6	86	64	74	91
7	275	208	235	279
14	e288	242	264	290
15	e330	271	317	343
17	189.5	171	187	210
8	268	222	258	275
9	128.5	113	125	135
O-T	455	388	437	470
O-N	235	211	241	268
11	148.5	139	150	163
F-P	515	454	480	503
O-P	560	491	541	570
19	N/A	129	147	157
20	N/A	82	91	98
M-P	147	120	138	151
18	120.5	92	107	119

(e) Indicates close estimate
(N/A) Indicates not available

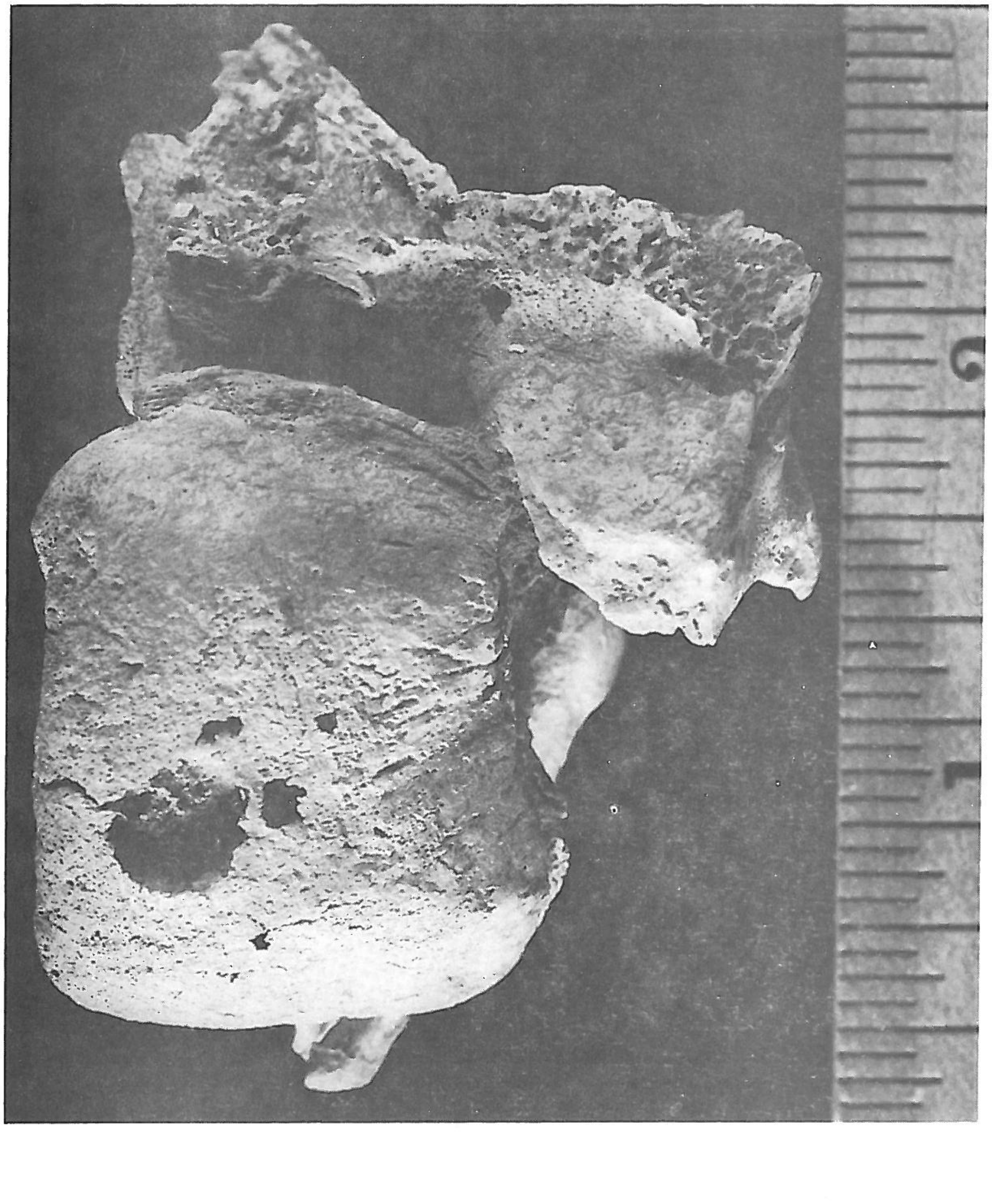

Figure 7. Mastoid process pathologically misshaped

Butchering

Inferences drawn from the bone material regarding butchering process are disappointing. Cut mark evidence and obvious chopped bones, data that has been used successfully in determining the ordered butchering process (Frison 1970b:1-25), are nearly non-existant because of preservation. From the scattered in situ location of each bone (Fig. 8) it can be assumed that the carcasses, after removal of the hide, were dismembered and fleshed. The small number of articulated units also support the idea of dismemberment, a phenomemon not uncommon in Bison kills (Wheat 1967:44-52). A step-by-step account of probable butchering techniques would be so speculative as to be invalid.

Poor preservation also drastically limited the number of crush marks available for analysis. It is my opinion that the many sandstone chunks found in situ and obviously out of a natural geologic setting (Fig. 8) were used in the butchering process (the tools themselves will be discussed later). These rocks could have been used to cleave bone and would leave crush marks rather than clean cut marks. Such crush marks have been found and determined as original breakage. One good example of a depressed fracture occurs on a transverse process from a lumbar vertebra fragment (Fig. 9).

On the basis of the above it can be speculated that for complete utilization of the animals, these stone cleavers were used to knock off the various processes so that the meat (especially of the spinal column) could be easily stripped off. The breaking up of the bones may have also aided the employment of marrow extraction. Such procedure would have also hindered the later bone analysis attempt. This speculation probably lends support to the reasons for a high tally of carpals, tarsals, and phalanges. Since the ankle and hoof are seldom used, then one might expect to find the above bones in numerical superiority. As stated before, this was indeed the case (Table 2).

The recovery of butchering tools for meat removal was equally disappointing. Chipped stone cutting tools are rare. Bone tools were probably used in the de-fleshing process. Other than the few identifiable bone tools to be reported in the following chapter, most bone tools have obviously become victims of preservation factors.

Food Processing Areas

Charcoal was interspersed throughout the bone layer in varying amounts but definite food processing areas could be recognized. Two particular concentrations of burned bone and charcoal signify possible roasting areas (Fig. 4). Unfortunately, these were unearthed on the last day of excavations and their extent will not be known until the initiation of more field study.

Figure 8. Enlarged section of bone layer

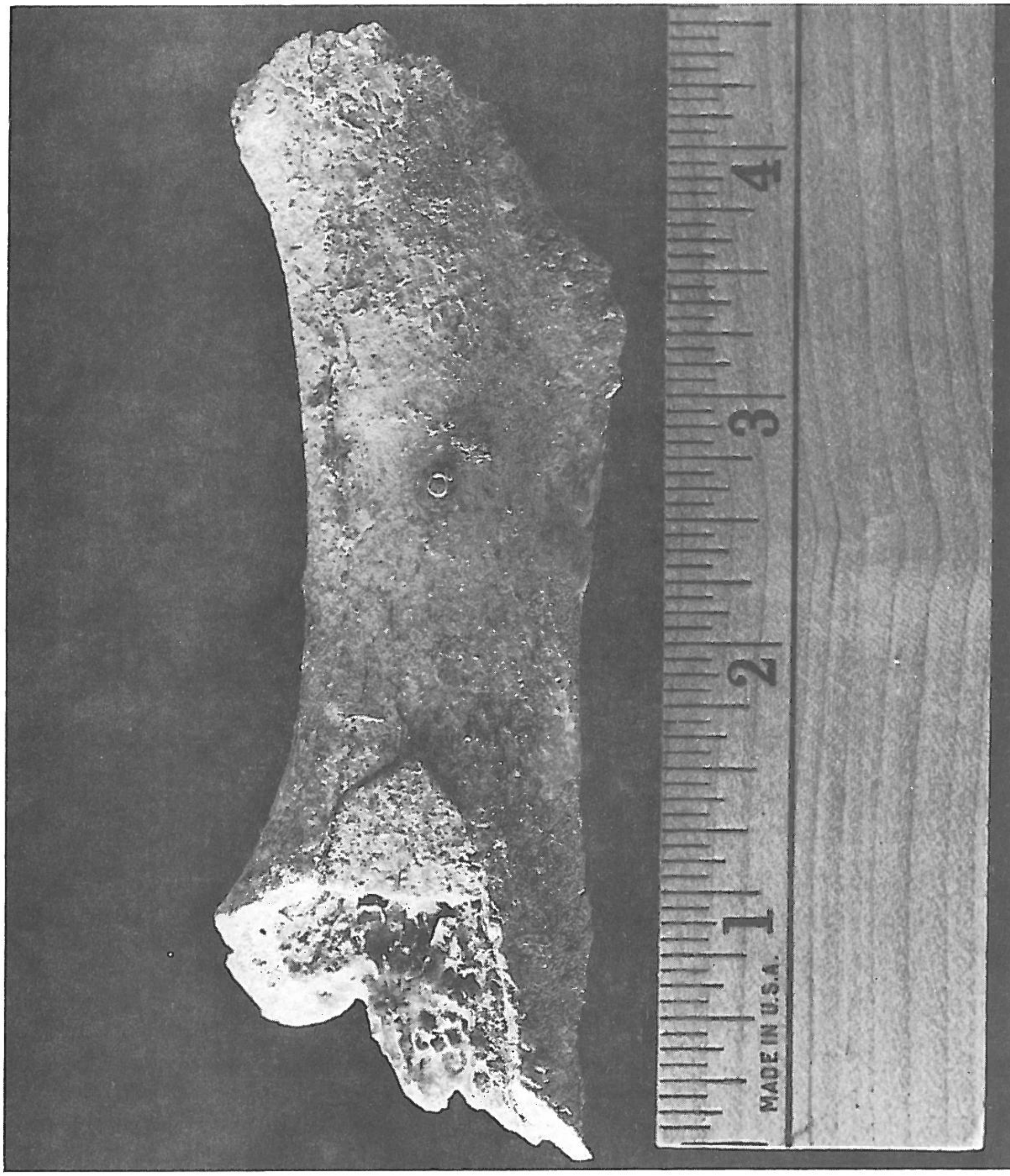

Figure 9. Depressed fracture on a lumbar vertebra fragment

A very interesting site feature mentioned briefly in Chapter 1 is the apparent boiling/cooking pit (Fig. 10). The contents of this soft pit were pedestalled and jacketed with plaster to withstand a trip back to the laboratory where a thorough examination could take place (Fig. 11). The bone material includes two fragmented humeri, two left ilia, eleven lumbar vertebrae in four articulated units with one sacrum included with one unit, two articulated thoracic fragments, one scapula, two rib articular ends, one metapodial fragment, one proximal phalanx, one medial phalanx, one distal sesmoid, and one fragmented occipital, as well as the two near complete skulls previously discussed. Although preservation of this material was by far the best in the site, glue and water applications were still necessary before the bone could be removed.

The cooking pit probably tells more about the butchering process than the bone layer itself. Stylistic preparation is suggested by the four articulated lumbar units. For cooking purposes it appears that whole sections of spinal column were removed selectively and cooked for what meat they could yield.

Location of the cooking pit (Fig. 4) is just south of the datum and outside the trap compound. The proximity of the pit to the trap compound perhaps indicates the desire to be preparing food at the same time the butchering process was taking place.

Boiling of the meat was probably completed by the use of such a pit as lined with a fresh Bison hide the pit became a watertight container. Heated stones could then be dropped in to bring water to a boil and added continuously until the meat was done. Stones taken from the pit are again the common sandstone congruent to Mesaverde Formation members. It is difficult to determine if these rocks show fire-cracking. The natural carbonate cement in the sandstone may have been affected by acids in rain or snowmelt; these factors could hasten the breakdown of the sandstone surface with the possible result of no recognizable evidence for firing. When considering the time span to time of site discovery, this obliteration is quite likely (Boyd 1973).

A large sample of both charcoal and wood was recovered from the boiling pit. Some fragments are both charcoal and unburned wood, which indicates that some coals were dropped into the water in conjunction with hot stones. Combination charcoal and wood pieces also support the hypothesis that this was a boiling type of preparation device and not one for roasting.

The abundance of the above wood and charcoal provided another opportunity for wood identification. It was the hypothesis that some of this charcoal was likely to be sage (Artemisia spp.) due to its abundance at the site locale. This hypothesis proved to be incorrect as again pine (Pinus spp.) was the identification determined by microscopic examination (Brown and Panshin 1934:166-169). As earlier stated, the wood is probably limber pine.

Figure 10. Excavated cooking pit

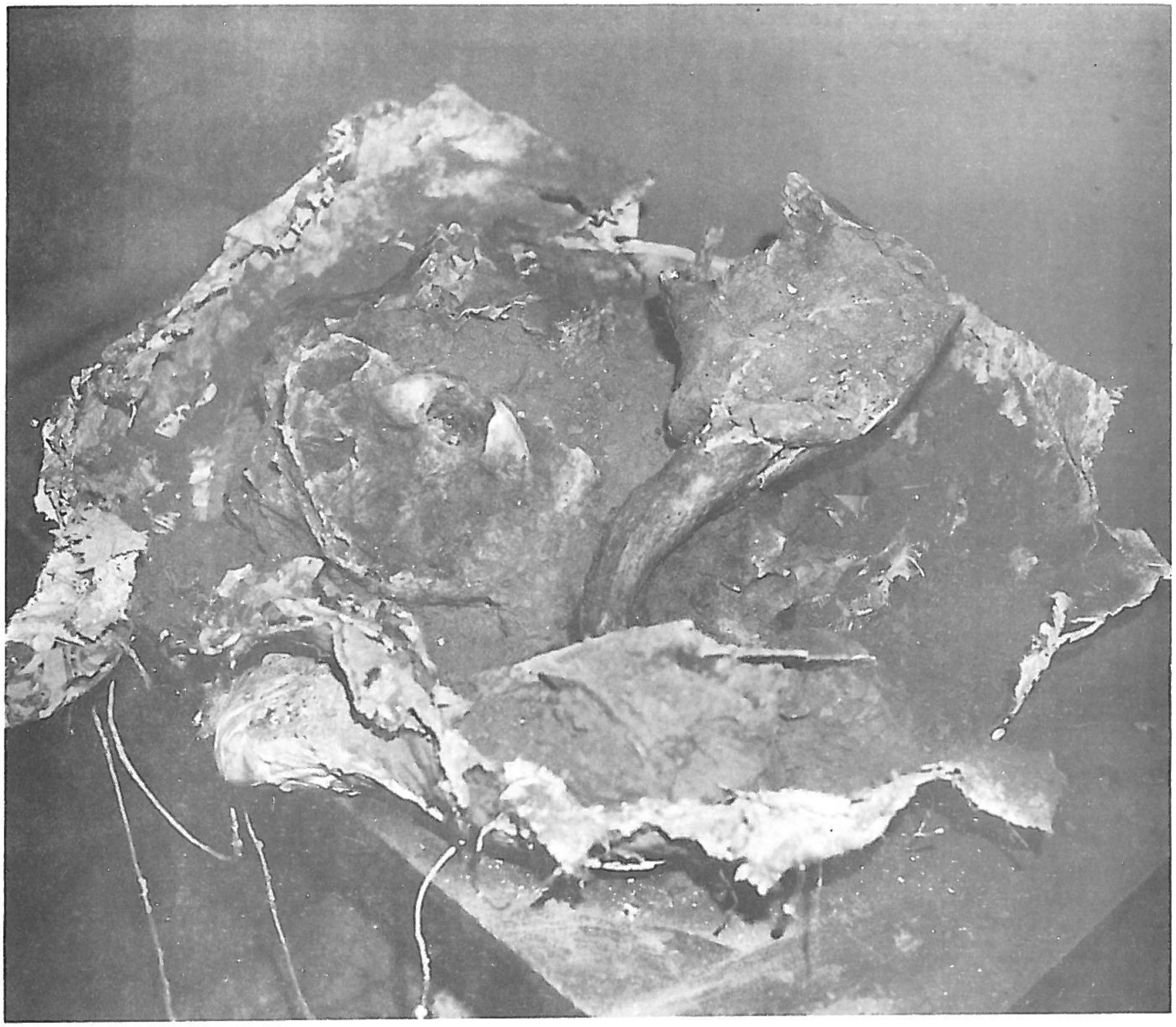

Figure 11. Cooking pit during plaster cast removal

It is apparent that all the wood used for trap construction and for firewood was pine, although other wood resources were more easily obtainable. The exclusive use of pine is interesting, from a cultural standpoint, because this evident preference probably required that wood procurement be carried out at the stands of limber pine at the high ridges ringing, but not close to, the site. This difficulty of wood procurement is just another indication that buffalo procurement was a carefully conceived activity. As far as firewood is concerned, pine is a better fuel than the sage adjacent to the trap, because the former is denser, rich in volatile resins, and therefore capable of burning both longer and hotter. One charred specimen could be identified as a one inch limb section. The specimen leads to the suspicion that small pine trees may have been taken directly to the proposed trap. Confinement posts were then fashioned from the trunks and the remaining branches saved for fuel.

Floatation, the process used in recovery of light-weight, fragile evidence, was employed for the matrix taken from the boiling pit. It was suspected that some plant matter might have also been prepared in such a preparation pit. The evidence would have been manifested in some identifiable seeds, but none were found. Approximately ten per cent of the matrix was sampled and no items of great interest were discovered. Maggot casings, a feature of the entire bone layer, were the most numerous items recovered. Prior to floatation maggot casings were found in high concentrations in the orifices of both skulls. Floatation produced more of these casings. The thorax casing of a possible beetle (cf. Eleodes spp.) (Wilson 1973) was also removed at this time. Other than the above mentioned insects, the results of the floatation process proved to be fruitless.

In brief, preparation of meat was a stylized process at the site. It seems obvious that preparation techniques were varied with both roasting and boiling evidence left in the archaeological record. It is projected that more boiling pits may be uncovered in future excavations at the Scoggin Site.

To be continued in December Issue.......