THE WYOMING ARCHAEOLOGIST

VOLUME 39(1-2)

SPRING 1995

THE WYOMING ARCHAEOLOGIST

VOLUME 39(1-2), SPRING 1995

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WYOMING ARCHAEOLOGY WEEK, 1995

Governor Jim Geringer signs the proclamation declaring February 18-25, 1995 to be Wyoming Archaeology Week while sponsor representatives look on. From left to right, Mike Massie, Wyoming Council for the Humanities; Gerald Clark, Bureau of Land Management; Steve Sutter, State Historic Preservation Office; Sandra Shelley, Bureau of Land Management; Jay Meyer, State Historic Preservation Office; Ranel Capron, Bureau of Land Management; Mike Devine, American Heritage Center; John Naylor, Bureau of Land Management; Julie Francis, Wyoming Department of Transportation; Tim Nowak, Bureau of Land Management; Mary Hopkins, State Historic Preservation Office; Mark Miller, State Archaeologist's Office; Dave Peck, Wyoming Department of Commerce Parks and Cultural Resources Advisory Commission; John Keck, Wyoming Department of Commerce.

PROCLAMATION

WHEREAS, prehistoric and historic archaeological resources are part of Wyoming's rich cultural heritage; and

WHEREAS, some of Wyoming's archaeological sites are among the most important discoveries in the United States; and

WHEREAS, the research and educational value of these properties generate the greatest public benefit; and

WHEREAS, public awareness of the value of these resources will help ensure their study, use and preservation.

NOW THEREFORE, I, JIM GERINGER, Governor of the State of Wyoming, do hereby proclaim February 18-25, 1995, to be

"WYOMING ARCHAEOLOGY WEEK"

in Wyoming and urge that the people of Wyoming take part in the activities planned to enhance public awareness of archaeology.

IN WITNESS WHEREOF, I have hereunto set my hand and caused the Great Seal of the State of Wyoming to be affixed this 25th day of January, 1995.

Jim Geringer
Governor

Diana J. Ohman
Secretary of State

NATIONAL MUSEUM of
NATURAL HISTORY
SMITHSONIAN INSTITUTION

2/15/95

Mary Hopkins
Wyoming Archaeology Week Coordinator
State Historic Preservation Office
Department of Anthropology
University of Wyoming
P.O. Box 3431
Laramie, Wyoming 82071

Dear Mary,

Thank you very much for the Wyoming Archaeology Week poster. I think its great and we put it by the door of my research lab. I wish you the best of luck with your events ---the program looks real exciting with lots of good educational programs. It should be a great success.

Cheers,

Dennis Stanford
Chairman, Department of Anthropology

CRAIG THOMAS
WYOMING

United States Senate

WASHINGTON, DC 20510-5003

March 28, 1995

Mary M. Hopkins
Coordinator
Wyoming Archaeology Week
University of Wyoming
Post Office Box 3431
Laramie, Wyoming 82071

Good morning Mary...

I wanted to take this opportunity to let you know how delighted we were to receive the great 1995 posters for Wyoming Archaeology Week. I understand the week was quite a success! I too share your pride in the resources of Wyoming and wish you continued success.

Again, thank you for the great posters and I look forward to seeing you in Wyoming.

Best regards,

Craig

Craig Thomas
United States Senator

CT:jgn

CALL FOR C14 DATA

We would like to update the data base for C14 dates for the State of Wyoming. This data base was initially compiled by the University of Wyoming Anthropology Department and has been previously published in the Wyoming Archaeologist, (Craigie, 1987, 1989). In 1990, the Cultural Records Office of the Wyoming SHPO entered all of the existing dates into a DBase III+ file. We would like to add any dates that might be missing from this list. Please review your records and submit the actual laboratory correspondence obtained to:

Cultural Records Office
410 S. 3rd Street
Laramie, Wyoming 82070
307-766-5324

Included on the laboratory sheet should be the following information:

County
Smithsonian Number
Laboratory
Lab number
Date (Conventional C14 Age, state whether or not corrected and how)
Deviation
Comments (i.e. feature 1)
Reference (contract report, published article)

In providing this data you are helping share information to other researchers, so in return for submitting information to this effort, you will receive a diskette with the complete information at no charge. DS/HD 3.5 diskettes will be returned by October 1, 1995. Please take this opportunity to review the information you have in your files and submit the information no later that August 1, 1995. From that date on, you should copy and send the Lab sheets to the CRO on receipt. We will then update the information on a periodic basis. We intend to publish this update in a future volume of the Wyoming Archaeologist.

WYOMING ARCHAEOLOGICAL SOCIETY, INC.
1995 ANNUAL MEETING MINUTES

8:35 a.m. - Saratoga Inn - Saratoga, WY
Saturday, April 22, 1995

PRESIDING: Dewey Baars, President

CALL TO ORDER: 8:35 a.m.

ROLL CALL AND CERTIFICATION OF DELEGATES: Secretary/Treasurer Carolyn Buff certified the voting delegates: Absaroka, Russell Purdue and Milford Hanson; Ancient Trails, Cher Burgess and Rick Dowdy; Casper, John Albanese and Dave Baskett; Cherokee Trail, Lois Flohr and Dave McKee; Cheyenne, Larry Adams and Donna Durako; Fremont, Eva Peden and Loucille Adams; High Plains, Alan Korell and Geri McIver; Platte, absent; Rawlins, Dean Young and Joann Whitson; Sheridan/Buffalo County, Bessie Brewer; and Sweetwater, Dirk Murcray and Joe Bozovich.

Roll call showed nine chapters represented: Absaroka, Ancient Trails, Casper, Cheyenne, Cherokee Trail, Fremont, High Plains, Rawlins, Sheridan/Buffalo, and Sweetwater. Not represented at the meeting was Platte County.

MINUTES OF LAST ANNUAL MEETING: April 30, 1994; Motion by Adams, second by Joann Whitson to approve the minutes as printed in the fall 1994 issue of *The Wyoming Archaeologist*. Carried.

TREASURER'S REPORT: Secretary/Treasurer Carolyn Buff gave the treasurer's report showing a total net worth as of March 31, 1995 of $25319.37, an increase of $1,044.14. Motion by Dave Baskett, second by Dave McKee to file the treasurer's report for audit. Carried.

AUDITOR'S REPORT: Mark Miller, Dave Reiss, and Danny Walker reported that they had examined the accounts and receipts of the Secretary/Treasurer, and found them in order.

EDITOR'S REPORT: Danny Walker for Bonnie Johnson, editor, reported that the current issue is ready for publication, but that manuscripts are desperately needed to keep the publication in print.

LIBRARIAN'S REPORT: Danny Walker reported that exchange publications are on file at the Department of Anthropology, University of Wyoming.

SCHOLARSHIP COMMITTEE: Carolyn Buff announced that the committee would meet during lunch at Wally's.

CHAPTER REPORTS: Were given by all chapters present.

STATE ARCHAEOLOGIST'S REPORT: Mark Miller reported that the focus of his office will be the Plains Conference to be held in Laramie October 18-23, 1995.

OLD BUSINESS: Archaeology Support Fund - no report.

Society for American Archaeology Representative: Marcel Kornfeld reported that the state representatives will meet at the next meeting. Marcel agreed to continue to serve as the Wyoming representative to the Affiliated Societies.

Archaeology Week: Mary Hopkins reported another successful endeavor with Larry Loendorf featured as the guest lecturer in Worland, Powell and Riverton, with a large number of attendees at each lecture. Again, we were able to get a Wyoming Council for the Humanities grant to help defray the expenses to bring a guest lecturer to the state.

Membership Committee/Brochure - Carolyn Buff - Ten thousand membership brochures were printed. The return has been surprising and it is hoped that all members will actively continue to distribute the brochures in their travels.

NEW BUSINESS: Archaeology Week - Mary Hopkins will again coordinate activities, but local chapter coordinators are needed in order to make the activities happen.

WAS Meeting at Plains Conference: Mark Miller requested that if WAS wants to hold a business meeting in Laramie, a room needs to be reserved

ASAP. It was the consensus of the group that no meeting will be scheduled.

Chapter Report Forms: Dewey Baars distributed a form to be used for future chapter reports. Cher Burgess, Carolyn Buff, and Mark Miller will accept comments on the form over the summer and then make a proposal at the next annual meeting for a standardized report form.

Donation for Plains Conference: Motion by Dean Young, second by Joann Whitson that the Society donate $500.00 to the Conference. Carried.

Donation for Island in the Plains Conference December 1-3, 1995 in Newcastle: Motion by Dave Baskett, second by Dean Young to donate $200.00 to the Conference. Carried.

WYOMING ARCHAEOLOGICAL FOUNDATION: George Frison announced that the Foundation would meet immediately following the WAS business meeting.

ELECTION OF OFFICERS: Joe Bozovich, chair, members Susan Carlson and Sandra Hansen, nominated the following officers for 1995-1996:

President - Robin Perdue
1st Vice President - Dirk Murcray
2nd Vice President - Gail Gossett
Foundation - Dudley Gardner (3-year term)

Motion by Dean Young, second by Joe Bozovich that a unanimous ballot be cast. Carried.

It was announced that the 1st vice president was to be the official WAS representative for Archaeology Week, and that the 2nd vice president is the chair of the nominating committee.

SITE OF 1995 SUMMER MEETING: Motion by Larry Adams, second by Robin Perdue to hold the summer meeting in Shell, WY July 8-9, 1995. Carried.

Other field activities announced were May 18, Hell Gap, and two sites to be worked at Kemmerer and Cody. Volunteers can contact Dave Eckles with the Office of the State Archaeologist for further information.

SELECTION OF SITE FOR 1996 ANNUAL SPRING MEETING OF THE SOCIETY AND FOUNDATION: Motion by Eva Peden, second by Julie Francis that the 1996 annual meeting be hosted by the Sweetwater County Chapter. Carried.

1996 NOMINATING COMMITTEE: Gail Gossett, chair; Dean Young of Rawlins, and Joe Bozovich of Rock Springs.

ANNOUNCEMENTS: Carolyn Buff mentioned that she had membership cards and membership brochures available.

A thank-you was extended to Dave McKee and the Cherokee Trail Chapter for a highly successful annual meeting.

ADJOURN: 10:00 a.m.

BANQUET: The banquet address was presented by Dr. Tom Hester, University of Texas, who spoke on "Stone Tools of the Ancient Maya: A 4000 Year Record from Colha, Belize."

GOLDEN TROWEL AWARD: Deborah Chastain, Saratoga.

/s/ Carolyn M. Buff

Carolyn M. Buff
Executive Secretary/Treasurer

/s/ Dewey Baars

Dewey Baars
President

WYOMING ARCHAEOLOGICAL SOCIETY, INC.
SCHOLARSHIP COMMITTEE
MINUTES - April 22, 1995

PRESIDING: Carolyn Buff, Chair

PRESENT: Dewey Baars, Joe Bozovich, Carolyn Buff, Jim Buff, Bonnie Johnson, Mark Miller, and Virginnia Miller

Six outstanding applications were received. The committee voted to give the Frison Scholarship to Patrice White, a graduate student, and the Mulloy Scholarship to Jud Finley, an undergraduate. Motion by Bonnie Johnson, second by Joe Bozovich to award both scholarships in the amount of $350.00. Carried.

/s/ Carolyn M. Buff

Carolyn M. Buff
Scholarship Committee Chair

WYOMING ARCHAEOLOGICAL SOCIETY
TREASURER'S REPORT
For Year Ending March 31, 1995

CHECKING ACCOUNT

Beginning Balance	$3,243.99
Deposits	5,165.20
Interest Earned	50.42
TOTAL INCOME	$8,459.61
Withdrawals	
United Building Center - Trowels	$ 17.98
Peden's - Trowel Engraving	20.00
WAF - Annual Payment	318.00
Karen Rogers - Scholarship	300.00
Karen Rogers - Banquet Ticket	13.50
Roger Powers - Honorarium	200.00
Comfort Inn - Powers Room	63.00
Alan Wimer - Scholarship	300.00
Laura Niven - Scholarship	300.00
Casper College - Postage	29.00
Wyoming Department of Commerce - Printing	1,345.20
Casper College - Postage	32.00
Bonnie Johnson - Editor	50.00
SAA - Membership	30.00
Natrona Printing - Flyers	856.60
U S Postal Service - Flyers	32.59
Paper Direct - Mailing Labels	94.80
Larry Loendorf - Airfare, room, board, expenses - Archaeological Week	1,380.00
Secretary of State - Corporation Fees	10.00
Casper Star-Tribune - Archaeology Week Advertising	123.50
U S Postal Service - Annual Bulk Mailing Fees	85.00
TOTAL WITHDRAWALS	$5,601.17
ENDING BALANCE	$2,858.44

SAVINGS ACCOUNT

Beginning Balance	$3,493.07
Deposits	624.00
Interest	90.32
TOTAL	$4,207.39
ENDING BALANCE	$4,207.39

CERTIFICATE OF DEPOSIT

Beginning Balance	$17,534.72
Interest	718.82
TOTAL	$18,253.54
ENDING BALANCE	$18,253.54

PETTY CASH

Beginning Balance	$3.45
Close Account	3.45
ENDING BALANCE	$0.00

TOTAL NET WORTH AS OF MARCH 31, 1995	$25,319.37
NET INCREASE	$1,044.14

SCHOLARSHIP ACCOUNT

Beginning Balance	($2,236.00)	
Deposits		
Julie Francis	25.00	
TOTAL	$25.00	
ENDING BALANCE		($2,211.00)

ARCHAEOLOGY WEEK ACCOUNT

Balance	$1,377.75

/s/ Carolyn M. Buff
Executive Secretary/Treasurer

We do hereby certify that we have examined the accounts and receipts of the secretary/treasurer, and find them correct; and that the balance in her hands is $25,319.37. Date: April 25, 1995

/s/ Mark E Miller /s/ David Reiss /s/ Danny N Walker - Auditing Committee

Total paid memberships as of March 31, 1995 266 (down from 308 in 1994)

Absaroka = 17
Ancient Trails = 6
State Archaeologist = 2
Associate = 40
Casper = 20
Cheyenne = 20
Cherokee Trail = 16
Department of Commerce = 2
Exchange = 10
Family = 2
Of Chapters: Single = 85
Family = 67
Fremont County = 14
Honorary = 12
High Plains = 21
Institutional = 48
Platte County = 6
Rawlins = 0 - unpaid
Sheridan = 0 - unpaid
Single = 2
Sweetwater County = 28

Chapter Officers:

Absaroka -	Russell Perdue, President Robin Perdue, Vice President Patty Raffauf, Secretary Jim Platt, Treasurer Mildred Rickell, Historian
***Ancient Trails -**	Rick Dowdy, President Cher Burgess, Vice President Tani Dunder, Secretary Edith Growe, Treaserer
***Casper -**	Jim Curkendall, President Anne Stanley, Secretary Gloria Boyce, Treasurer
***Cheyenne -**	George Durako, President Susan Adams, Secretary Susan Carlson, Treasurer
***Cherokee Trail -**	Dave McKee, President Berneil McCord, Vice Pres Doris Cornell, Sec/Treas
Fremont County -	Helen Krause, President Alice List, Vice President Loucille Adams, Secretary Donna Peterson, Treasurer
***High Plains -**	Janice Baars, President Jim Phipps, Vice President Geri McIver, Secretary/Treasurer
Platte County -	Alan Bennett, President Lynnette McInroy, Vice President Cherie Wilson, Secretary/Treasurer
***Rawlins -**	Dr. William Scoggin, President Dean Young, Vice President Joann Whitson, Secretary/Treasurer
***Sheridan -**	Bessie Brewer, President BJ Earle, Vice President Lynn Levin, Sec/Treas
***Sweetwater County -**	Matthew D Kautzman, President Barry Beausoleil, Vice Pres Debbie A Braithwaite, Sec/Treas

***Updated for 1995**

PLEASE UPDATE THIS INFORMATION WITH THE STATE SECRETARY/TREASURER AS SOON AS POSSIBLE, INCLUDING ALL ADDRESSES AND PHONE NUMBERS

USTINOVKA-VI SITE: RECENT INVESTIGATIONS OF THE MICROBLADE INDUSTRIES IN THE MARITIME REGION, RUSSIAN FAR EAST

by
Nina A. Kononenko, Aleksander A. Kryp'anko, and Andrei V. Tabarev

In 1993 and 1994, archaeologists from the Institute of History, Archaeology and Ethnography of the People of the Far East (Vladivostok, Russia), Far Eastern State University (Vladivostok, Russia), and the Institute of Archaeology and Ethnography (Novosibirsk, Russia) investigated a new pre-ceramic (12-11,000 years B.P.) site, Ustinovka-VI, in the Maritime Region (Primorie), of the Russian Far East. Even the preliminary results of the excavations permit an interpretation of the assemblage of the site as a technologically sophisticated example of the microblade industry typical for the Northeastern Paleolithic. The industry includes the combination of microblade, blade, biface, and burin techniques.

EARLIEST SITES IN ZERKAL'NAYA RIVER

The first sites with paleolithic materials in the Zerkal'naya River valley near the district town of Kavalerovo (44°15'N, 135°04'E; Figure 1) in the Eastern Maritime Region were found by archaeologists in 1961 (Andreeva 1962). A combination of natural conditions (climate, temperature, river system, sea coast, wet forest), natural resources (animals for hunting, forest plants, shellfish, annual salmon runs), and raw material sources (flinty tuff, chalcedony, chert, obsidian) determined the initial settlement of the valley at the end of the Pleistocene following the last glaciation after 14-13,000 years B.P.

During the following 30 years, and especially at the end of the 1980s and beginning of the 1990s, 24 localities with evidence of pre-ceramic period human cultures were opened, investigated, and interpreted by archaeologists. Some of the sites and workshops were partly destroyed by agricultural and building construction, but most of them were excavated and archaeological reports published in Soviet/Russian journals, monographs, and dissertations. Very few results have been published in English, in Japanese, or South Korean journals (Kononenko 1993a, 1993b; Tabarev 1993). Only one article has been published in the New World (Tabarev 1994). This is why each new opportunity for publication in English is of great importance.

USTINOVKA-VI

As was mentioned above, the first data about these sites became known in the early 1960s. But for many years, archaeologists didn't pay special attention to Ustinovka-VI because it is situated near the large open workshop Ustinovka-I and seemed to be a part of that site. In 1993 and 1994, archaeologists from Vladivostok and Novosibirsk laid out an eight meter trench, and excavated 20 square meters of the site. The site is located on the surface of the cliff terrace (11-14 m above the river) on the left bank of the Zerkal'naya River 15 km east from the town of Kavalerovo and about 30 km west from the river's mouth.

All the artifacts were found to be concentrated in a thin level (35-40 cm) of brown loam which covers the cliff. The soils of the Eastern Maritime Region are extremely acidic which explains why artifacts are represented solely by the products of the stone industry. There is no evidence of ceramic industries at the site.

The total number of artifacts recovered from Ustinovka-VI is close to 2,000. Preliminarily,

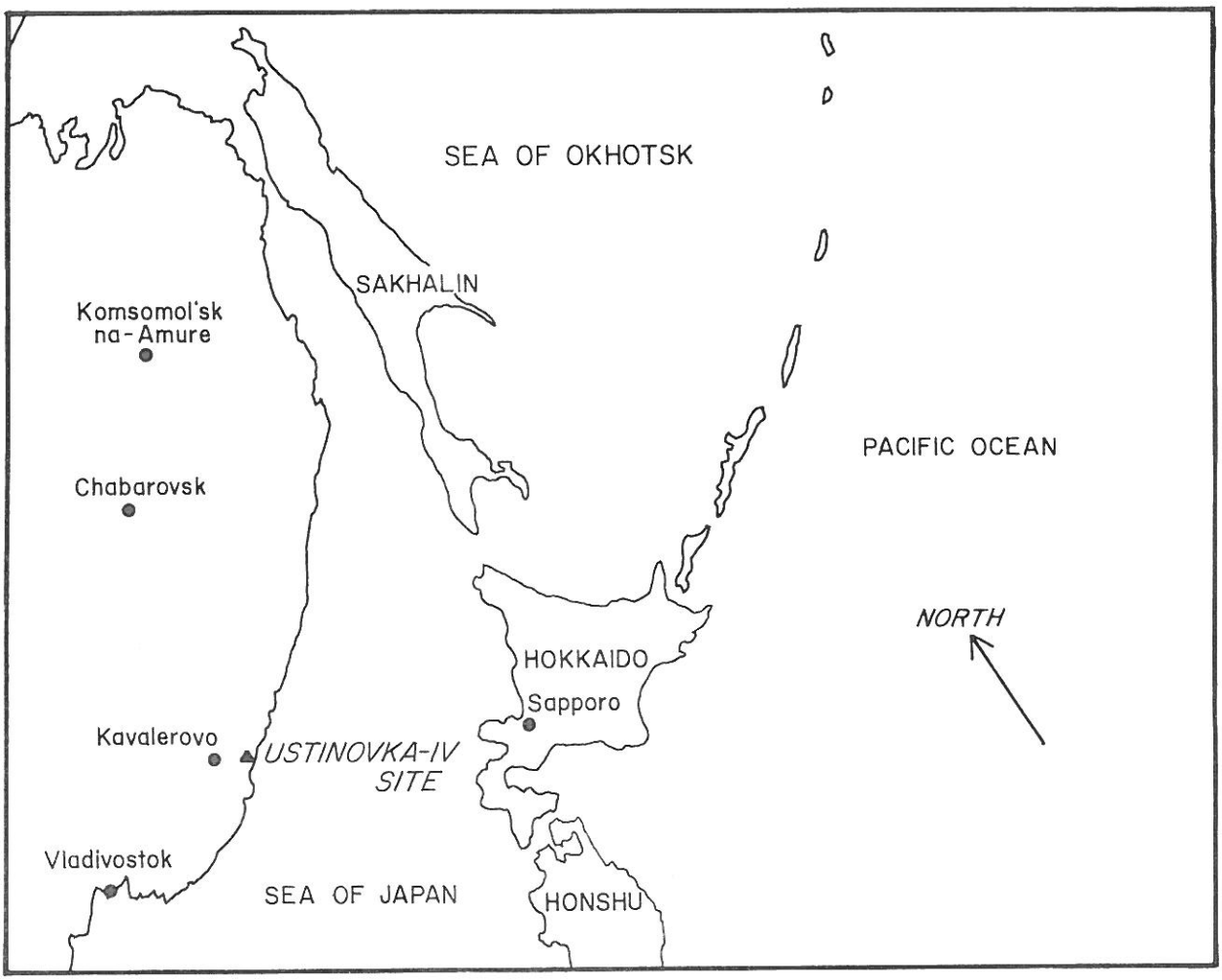

Figure 1: Geographical position of the Ustinovka-VI site in the Far East of Russia.

they were divided into the following categories:

1) products and by-products of direct blade percussion (cores, preforms, exhausted cores, blades, and elongated flakes);
2) products of microblade technique (preforms for micro cores, broken and exhausted cores, edge platform spalls, ski platform spalls, and microblades);
3) formal tools with evidence of secondary reworking and trimming (retouch, burination, etc.);
4) pebbles with traces of fire;
5) debitage (fragments, pieces, small flakes).

Platform spalls are the result of biface blank reduction. One of the ridges of the biface is taken off by blade detachment. This spall has a triangular section. The following spall then has a trapezoidal section. So, typologically, they are edge platform spalls and ski platform spalls.

TECHNOLOGY, REGIONAL COMPARISONS, AND IMPLICATIONS FOR NEW WORLD OCCUPATION

It is well known that the Late Paleolithic industries of Northeast Asia are characterized by three main components of:

1) microcores of boat-shape and wedge-shape forms;

2) bifaces;
3) transversal and dihedral burins (very often multifaceted).

These components existed together more than 15,000 years and we suggest they were brought to North America by Asian migrants.

The Ustinovka-VI site eloquently demonstrates the deep technological integration of these components. Microcores for microblades were mostly prepared from bifacial blanks (Figure 2, numbers 2,3,4). The by-products of microblade techniques (edge platform spalls and ski spalls) were used for burins. There are many examples of such burin techniques, such as two ski spalls removed one after another during platform preparation (Figure 3, number 7). Both of these were later remodified into transverse burins.

Microcores at the Ustinovka-VI site were prepared not only on bifaces but also on unifaces (Figure 2, number 5). The entire complex of microcores (on bifaces and unifaces; both wedge-shaped and boat-shaped) are very close in appearance to microcores from Japan of the same age, including the horoka, yubetsu, and togeshita types (Flenniken 1987; Hayashi 1968;

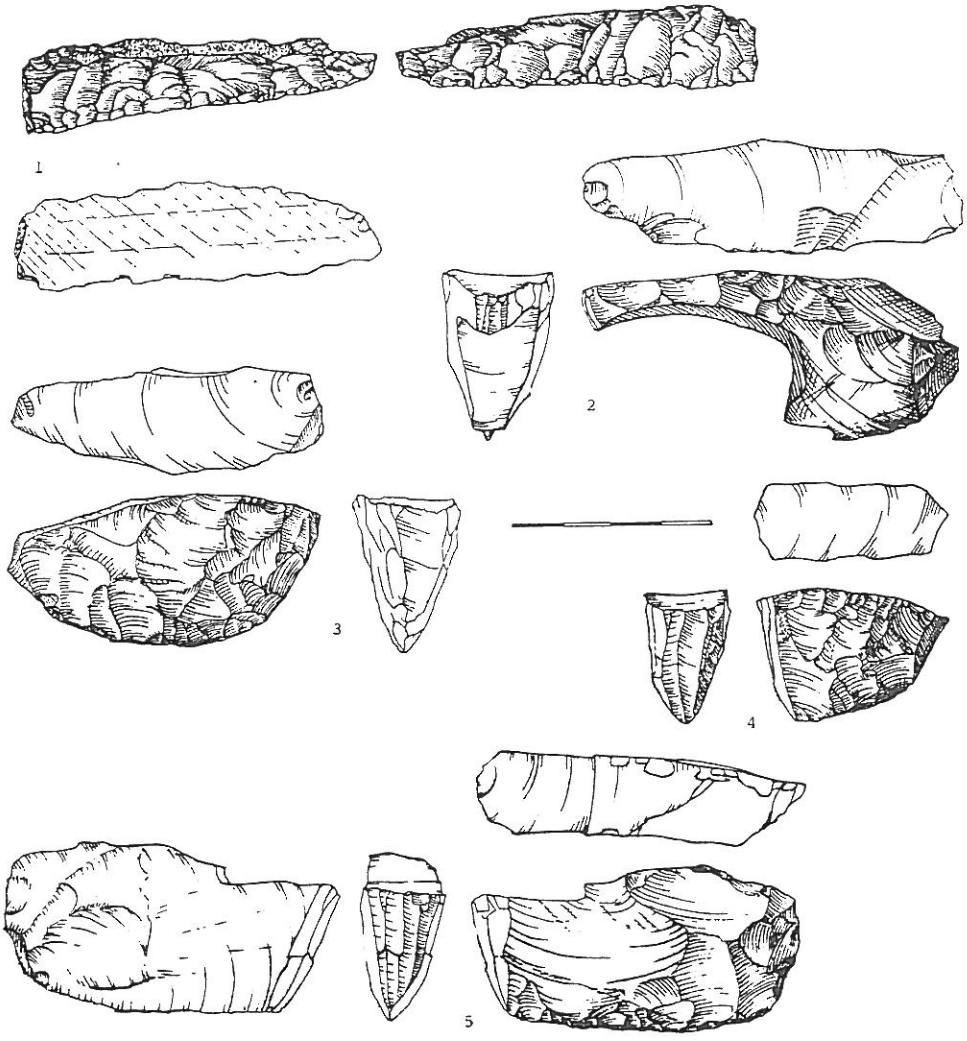

Figure 2: Artifacts from the Ustinovka-VI site. 1 = edge platform spall; 2-5 = microcores.

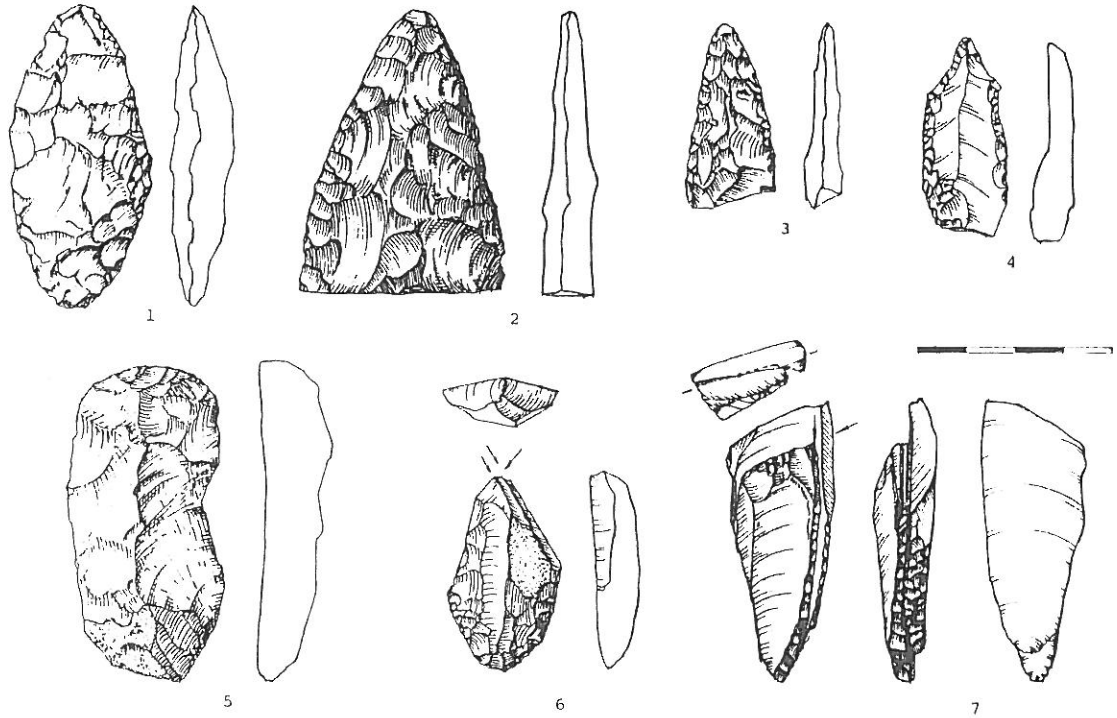

Figure 3: Artifacts from the Ustinovka-VI site. 1 = bifaces; 4-5 = scrapers; 6-7 = burins.

Kobayashi 1970; Morlan 1970).

It is clear that a lot of tools will be recognized after careful use-wear analysis and we will be able to interpret the functional type of the site and its specialty. But in any case, such a rich collection (more than 100 formal artifacts from 28 square meters) proves the significance of the Ustinovka-VI site and the importance of future excavations.

As far as we now know, migrants from Asia had in their "technological bank" three highly integrated techniques. Archaeological records from North America demonstrate a highly developed bifacial technique, and some evidence of blade and burin techniques during the Paleoindian period. Microblade and transverse burin techniques were also highly developed in the ice-free corridor, but they didn't penetrate to the south. Why certain techniques were not transferred into the New World, while others were, and when and where this separation occurred, remains unknown. We hope these questions are of joint interest to American and Russian archaeologists and that they can be the focus of future joint investigations.

ACKNOWLEDGEMENTS

This paper was prepared during the visit of Dr. Nina A. Kononenko and Dr. Andrei V. Tabarev in the United States organized and supported by the American Council of Teachers of Russian (ACTR) in 1994-1995.

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A NOTCHED TOOL FROM THE HELL GAP SITE, AREA I

by
George M. Zeimens, Harry Earl, Geri McIver, Dewey Baars, and R. Clayton Housh

This artifact (Figure 1) probably a hafted knife, was discovered at the Hell Gap site on November 2, 1994 by George Zeimens while on a field trip with a group of third and fourth grade students from Lingle Elementary School. the tool was found on a talus pile in front of an animal burrow. The burrow had been dug into the perpendicular stream bank approximately 25 m southwest of the western edge of the Harvard Area I excavations, and about 0.95 m below the present ground surface. It is presumed that the knife was kicked out of the bank when the animal dug the hole.

The item was collected immediately for fear that if it were found by a collector, it would encourage impromptu digging into the deposits. The talus pile also contained several flakes which were not collected. Zeimens had noticed flakes eroding from this location for several years and periodically checked the area. Footprints are often seen along the bank and suggest that other people check this area as well.

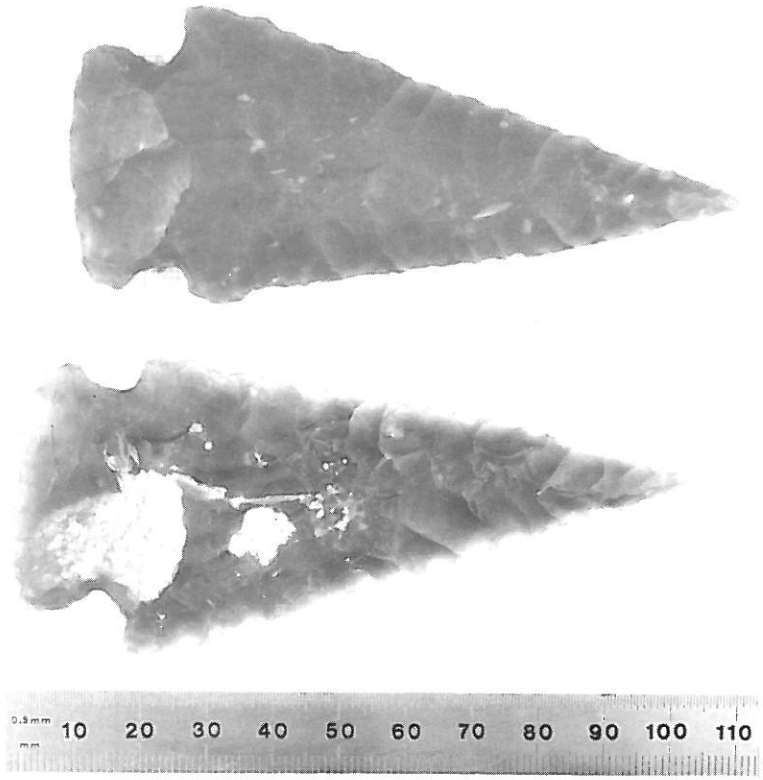

Figure 1: Two views of notched tool from Hell Gap site, Area I. Note inclusions visible on lower view.

The knife appears to be made from Knife River Flint. The material is a translucent, dark amber color, with inclusions of small white specks typical of the Knife River Flint. Two large yellow spots on one surface are impurities in the material which surely challenged the skills of the knapper to complete the piece without breaking it (Figure 1). The largest impurity is located on the hafting element and forms a circular concavity that actually dips through the center of the tool but does not quite extend to the opposite surface.

In overall shape, the tool forms an asymmetrical triangle. When a center line is drawn perpendicular to the notched base to establish a long axis, the tip is situated 7.0 mm to the side of the line (Figure 2). Conversely, if the line is drawn through the tip, then the notches, or haft element base axis, are asymmetrical to the

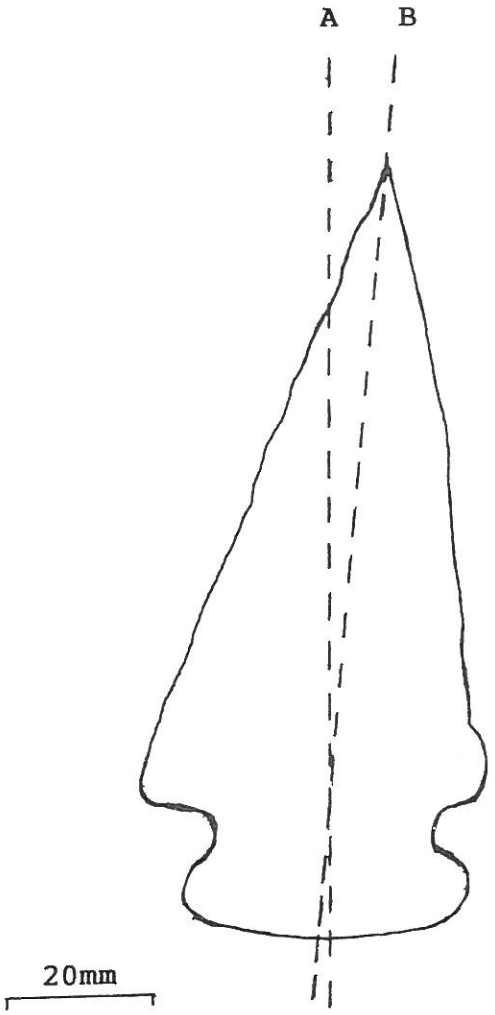

Figure 2: Profile of tool showing asymmetrical form. A = long axis perpendicular to hafting element. B = long axis through tip.

line. This phenomenon is the main reason the piece has been designated functionally as a knife rather than a projectile point. However, the blade edges appear freshly made and exhibit no wear, retouch or crushing that would be suggestive of function.

The tool weighs 31.2 gms. the working edges are relatively straight and extend from the top of the notches to the tip. When a centerline is extended perpendicular to the base, one blade edge parallels the line and measures 84.0 mm from the notch to the tip. the other edge is 89.0 mm. Where the edges converge at the tip, they form a 33° angle. The notches are 9.0 mm and 11.0 mm wide, respectively,k and the haft element neck width (between the notches) measures 29.0 mm. Corners of the base are rounded and with the base slightly convex and lightly ground. Overall length of the specimen is 101.5 mm. Maximum width (at the upper corners of the notches) is 46.0 mm. Width of the base is 37.5 mm. the thickest portion of the artifact is 8..0 mm, found near the longitudinal center of the artifact. Flake scars across the surfaces vary from oblique to perpendicular to the long axis. both edges appear to have been resharpened, so the artifact was probably originally somewhat larger. Sharpening of one edge terminated distally from the corner of one notch, leaving a rise in the blade edge near the notch. Perhaps this was from resharpening while the tool was hafted. Conceivably, some feature of the haft covered that small portion of the edge and inhibited sharpening clear to the notch. Wear in the form of polished flake scar ridges in the area of the notches indicates the tool was indeed hafted.

The Hell Gap site is well known for its Paleoindian deposits but considering the shallow depth of the burrow, it is not likely this artifact is of Paleoindian age. The precise age is not known, but it is possible that sometime in the future, it can be dated. If the tool was manufactured or resharpened near where it was found, perhaps flakes can be refitted which would determine the exact level from which the specimen was removed by the animal. Until definitive studies can be conducted, it is tenuously estimated that the artifact represents either a Late Archaic or Early Late Prehistoric occupation since artifacts diagnostic of those periods are found on eroded surfaces near Area I. For example, a large eroded fire pit located approximately 50 m downstream from Area I was salvaged by the WAS High Plains Chapter in 1985. The pit was situated in the same soil horizon as the rabbit hole and radiocarbon dated

at 1750 yrs B.P. Woodland pottery was also found associated with the firepit. However, the artifact also resembles Early Archaic period knives reported elsewhere from Wyoming.

Artifacts similar to the one discussed here occur quite often as surface finds in the general area. Traits such as size and material vary considerably among these finds, but generally they are large, corner notched blades with large notches and wide bases. We would argue that its size suggests a function other than that of a projectile point; that is, it appears to be similar to other large "projectile points" that have been classified as hafted knives.

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A RADIOCARBON DATE ON THE RESIDUE ADHERING TO A STEATITE VESSEL FROM SOUTHERN WYOMING

by
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ABSTRACT

Wyoming's steatite industry is at least 5500 years old, but steatite vessels are considerably more recent. Just how recent was determined by accelerator mass spectrometry (AMS) dating of the organic residue adhering to the inside of a fragmentary steatite vessel. The date of 101.7 $\pm$ 6 yrs BP is the first direct date on a steatite vessel in Wyoming. The surprisingly recent date raises questions about who used steatite vessels. Clearly, Shoshoni (and maybe even Euroamericans) used steatite in the recent past. The question now is whether there are any prehistoric steatite vessels in Wyoming.

INTRODUCTION

This article is the result of a cooperative effort between the authors and members of the Rawlins Chapter of the Wyoming Archaeological Society (WAS). Together, we chose a steatite vessel for study, sampled the residue and had it radiocarbon dated. A Wyoming Archaeological Support Fund Grant paid for the accelerator date. The WAS has long supported and encouraged basic research and excavation. WAS members, in addition to having extensive artifact collections, have the desire to answer basic questions about the chronology of Wyoming's steatite artifacts.

The curiosity concerning steatite artifacts chronology goes back over 100 years. In 1881, P. W. Norris, the first superintendent of Yellowstone National Park, questioned whether steatite vessels were made by the current Indians in and around the Park or by their ancient "progenitors" (Norris 1881:34). Over 40 years ago, Waldo Wedel outlined a course for steatite research:

> What is urgently needed, of course, is a great deal more detailed information on the exact nature, antiquity, distribution, associations, and wider relationships of the steatite industry in the Wyoming area; and in view of the generally meager nature of findings at most sites here, this sort of information may be a long time coming. (Wedel 1954:408).

The purpose of this paper is to add one small example about the antiquity of the steatite industry in Wyoming. After reviewing some of the chronological and geographical background of Wyoming's steatite industry, a direct accelerator mass spectrometer (AMS) date of a steatite vessel from southern Wyoming is reported along with speculation on the implications of this date.

STEATITE ARTIFACTS THROUGH TIME AND SPACE

The chronological depth of steatite artifacts in Wyoming is surprisingly deep. Only the Paleoindian period shows no evidence of steatite use. Hundreds of steatite artifacts have been found in Wyoming and the region (Figure 1) (Adams 1992). When the distribution of these steatite artifacts is plotted chronologically, a changing pattern of steatite use through time is revealed (Figure 2). It is suggested that differential use of steatite occurred through time; first, steatite was used to make different artifacts at different times and second, artifact types were distributed differently through time and space.

A chronological distribution, from the Paleoindian period to the present, was compiled from the limited amount of data available in published reports (Figure 2). Compared to other artifact classes, steatite artifacts remain chronically untethered in time. Despite the paucity of artifacts associated with radiocarbon or typolog-

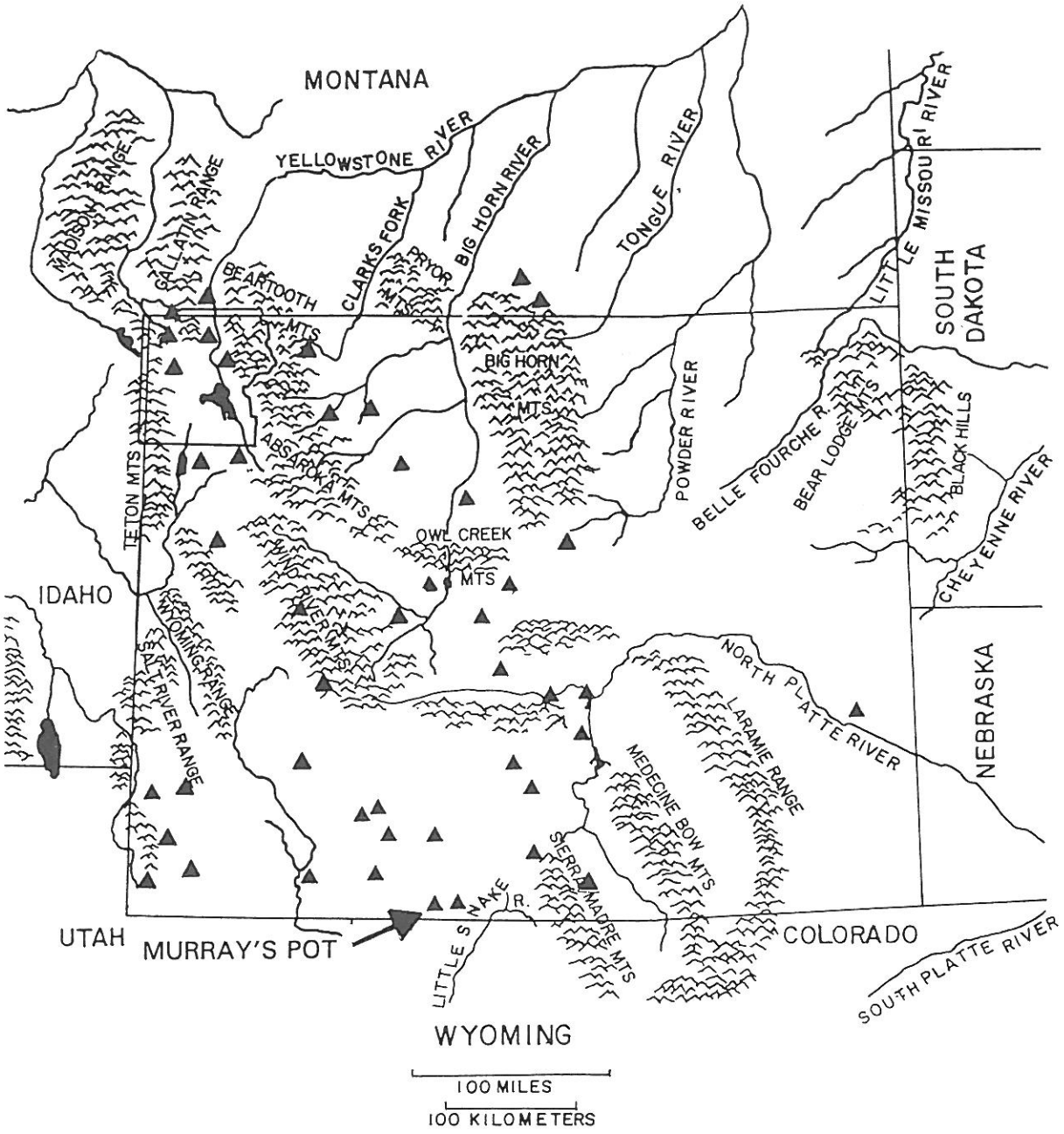

Figure 1: Map showing location of steatite bowls. Arrow points to location of radiocarbon dated vessel (adapted from Adams 1992).

ical dates, there are clues to the period of use.

For example, two steatite beads were found at the Early Plains Archaic Split Rock pit house site. The small steatite beads came from feature fill dated to 5500 radiocarbon years B.P. (Eakin 1987).

It is assumed that atlatl weights predate bows and arrows and thus are over 1500 years old and diagnostic of the Late Plains Archaic (Frison 1991:350). Six steatite atlatl weights are known from isolated surface finds. Atlatl weights have been found along plains-foothill boundaries and in the Great Divide Basin.

A steatite tubular pipe fragment was found

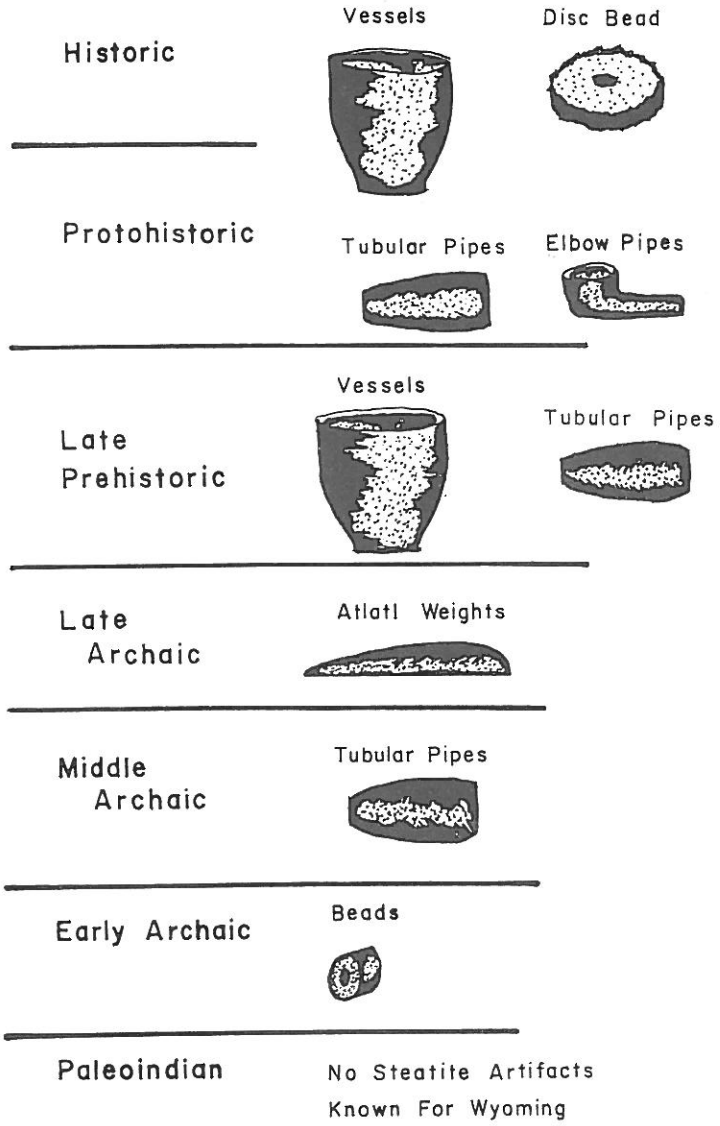

Figure 2: Chronological distribution of steatite artifacts in Wyoming.

on the surface at the 4,000 year old Dead Indian Creek site in Northwest Wyoming (Frison and Walker 1984). It is unclear if the pipe is associated with the Middle Plains Archaic component.

Many steatite pipes are probably Late Prehistoric, although the dating is rather tenuous (Adams 1992). Three pipes have come from dated sites (Frison 1971, 1970). Others have been dated by association with rock art panels (Francis et al. 1991, Frison and Van Norman 1993), and some by typological association.

Steatite vessels are the most common steatite artifact in Wyoming. They range in size from a small hand-held bowl (Adams 1992) to a vessel preform requiring many people to carry (Frison 1982). Most of Wyoming's steatite vessels exhibit a certain regularity of shape forming a "classic pattern." The classic vessel is flowerpot-shaped with a flanged base and holds just under two liters (Adams 1992, Frison 1982:281).

VESSELS

Unlike pottery, steatite vessels do not appear in time sensitive styles, and they are infrequently associated with archaeological sites. Most steatite vessel finds have been isolated surface finds, without obvious association with buried archaeological sites. The remains of a partial vessel were uncovered at the Protohistoric River Bend site (48NA202) near Casper, Wyoming along with the skull of a horse and metal tools (Buff 1983; McKee 1988). Steatite vessel fragments were also found at another Protohistoric site in southwestern Wyoming. The Natural Corrals site (48SW336) is a multicomponent site with diagnostic Protohistoric artifacts such as percussion caps and trade beads (Larson 1978).

A concentration of steatite vessels occurred along the shores of Jackson Lake in Grand Teton National Park. Ten vessels and preforms were found earlier this century by W. L. (Slim) Lawrence and others, but the site contexts were never adequately recorded, so we have no idea of their age. Jackson Lake has been utilized for ten millennia (Frison and Eckerle 1989). The lake is near three steatite sources. Only two of the ten vessels from Jackson Lake have metal tool marks on them, the other eight vessels have either ambiguous manufacturing marks or tool-

ing marks consistent with stone tools. The steatite vessels at Jackson Lake have the potential to provide a steatite chronology of their own.

GEOGRAPHIC DISTRIBUTION: Vessels are found throughout Wyoming but are most common in the western half of the state and along the North Platte River (Figure 1). Vessels have been found at all altitudes, from above timberline to low altitude river bottoms. While individual vessels have not been positively traced back to their quarry of origin (Adams 1990, 1992) it is possible to get an idea of transport by calculating the distance from the find spot to the nearest known prehistorically utilized quarry. The average distance from a vessel to the nearest prehistorically utilized steatite quarry is 81 km for a sample of 33 vessels (Adams 1992:92).

The distribution of heavy, bulky vessels so far from their quarries suggests that they were important to the people who used them. They appear to have been transported and then cached. The sheer distance that some, including the vessel that was dated, were transported suggests that at least some of them were carried on horseback.

MANUFACTURE: Manufacturing marks left on steatite vessels can provide clues as to when they were made. Carving steatite is a subtractive process. A preform is hewn out of solid rock. Then, with choppers or hatchets, chips and talc dust are removed from the preform until the final vessel shape is reached. But steatite is so soft and so workable that usually only the final traces of the manufacturing process remain. Metal tools produced distinctive manufacturing marks that were more regular than those produced with stone or bone implements (Adams 1992). Hatchets remove uniform chips with smooth ventral surfaces. A knife leaves a deep V-shaped groove that even a sharp quartzite flake cannot reproduce.

Numerous quartzite and chert tools have been found at steatite quarries (Frison 1982:276), but Protohistoric-aged metal tools at steatite quarries have not been reported. However, in 1805, Larocque (cited in Wedel 1954:407) reports that

> "I traded eight beavers with the Snake Indians in whose possessions I saw a Kettle or pot hewn out of solid stone. It was about 1 1/2" thick and contained 6 or 8 quarts; it had been made with no other instrument but a piece of iron."

DATING MANUFACTURE: In some cases, the manufacturing marks on a vessel can identify the tools used in the finishing process. The presence of steel hatchet and tool marks dates some steatite vessels to the Protohistoric or Historic period. Roughly a third of the over thirty vessels so far examined have unequivocal hatchet or knife marks on them. Another third of the sample have ambiguous manufacturing marks on them, and the final third have striations that are consistent with manufacture by stone tools.

USE AND SUBSISTENCE

A vessel replicated by the author was used to cook a meal of venison. After one firing, the replicated vessel was sooty and black. The interior took on the characteristic greasy patina common to steatite artifacts. Neither the soot nor the grease penetrated very far into the steatite. The greasy soot was easily scraped off with a knife, exposing the unaffected steatite.

Steatite vessels are commonly fire blackened, and the simplest explanation for this is that they were used for cooking. Frison (1982:281) reports that a "black residue nearly always accumulated on the outside surfaces, in some cases up to a millimeter in thickness". A residue adhering to the interior surface is less commonly found. In most cases where it occurs, there is a heavy concentration. Out of a sample of 32 vessels, 56% had sooty residue, while 44% had no soot. Until chemical analysis of the residue is available, we can only conclude that vessels were subjected to fires, but maybe not necessarily in the act of cooking. Although there is ethnographic evidence for cooking (see

Wedel 1954; Frison 1982; Marceau n.d.), other uses (such as crucibles for melting bullet lead) are still possible.

Citations from the ethnographic literature show that steatite vessels were used as cooking vessels at the time of Euroamerican contact (Frison 1982:284). Wedel (1954) and Marceau (n.d.) summarize the ethnographic literature for steatite use. Wedel (1954:406-407) reports three sighting of Indians using what appeared to be a steatite vessel. All these reports are from outside Wyoming but within the surrounding high country region.

HOW ABOUT A DATE?

It is clear that steatite vessels were used at the time of European contact, but we are uncertain of their time depth. If steatite beads are 5500 years old, who is to say that all vessels have to be recent? In an attempt to fulfill Wedel's edict about understanding the steatite industry in Wyoming, members of the Rawlins Chapter of the Wyoming Archaeological Society and the senior author began research to find out how long ago Wyoming's steatite vessels were made.

The black sooty residue from the inside of a steatite vessel (Figure 3) was submitted to Beta Analytic, Inc., for an accelerator mass spectrometry date. The vessel came from a collection of steatite artifacts belonging to members of the Rawlins Chapter, WAS. This vessel had the blackest, most organic, sooty residue of all the vessels in the sample.

It belongs to the junior author and was found by her late husband, Murray, south and east of Rock Springs, Wyoming (Figure 1). The vessel was found eroding out of a dune in the Washakie Basin of southern Wyoming. No other artifacts were found associated with the vessel. A few miles west of the Daniels' pot, another avocational archaeologist found a fragmentary steatite pot. All together, at least ten steatite pots, four steatite pipes, and few steatite atlatl weights have been found in this region of extreme southern Sweetwater County, Wyoming.

Murray's pot is one of the most distant vessels from a quarry. The vessel was discovered more than 170 km from the nearest source in the Wind River Mountains along the Sweetwater River (Figure 1). A number of sources exist on the west side of the Wind River Range (Adams 1992, 1993; Schoen and Vlcek 1991).

The incomplete vessel is in two pieces (Figure 3). The larger piece consists of the base and about one third of the body. The other piece is a much smaller rim sherd. The Daniels have gone back to the find spot time and again looking for the remaining sections without any luck. In all respects, this is a classic vessel: size, shape, base flange, lip treatment, and manufacturing marks are modal. The base is 8.0 cm in diameter, the vessel is 10.0 cm high, and the rim diameter is estimated to be about 15.0 cm. The volume is estimated to be about 2.0 liters. The two pieces weigh about 2.0 kg, the complete vessel is estimated to have weighed over 3.0 kg. The vessel stands on a flat base with a flange above the base. There is a small amount of rounded lip present on the smaller fragment, but no evidence of a spout. There are no metal tooling marks on any of the surfaces. All manufacturing marks are consistent with those produced by stone tools.

The residue on Murray's pot is consistent with use as a cooking vessel. There is a thin patina of greasy soot similar to that which formed on the inside of the replicated vessel used in the cooking experiment.

METHODS: The soot was scraped into a small vial from the inside of the pot with a new razor blade wiped with rubbing alcohol. The vial was then sent to Beta Analytic for AMS dating. Accelerator Mass Spectrometry dating requires a fraction of a gram of carbon compared to the five grams needed for regular radiocarbon dating. This makes it ideal for dating the last use of a steatite vessel.

RESULTS: The age of the soot adhering to the

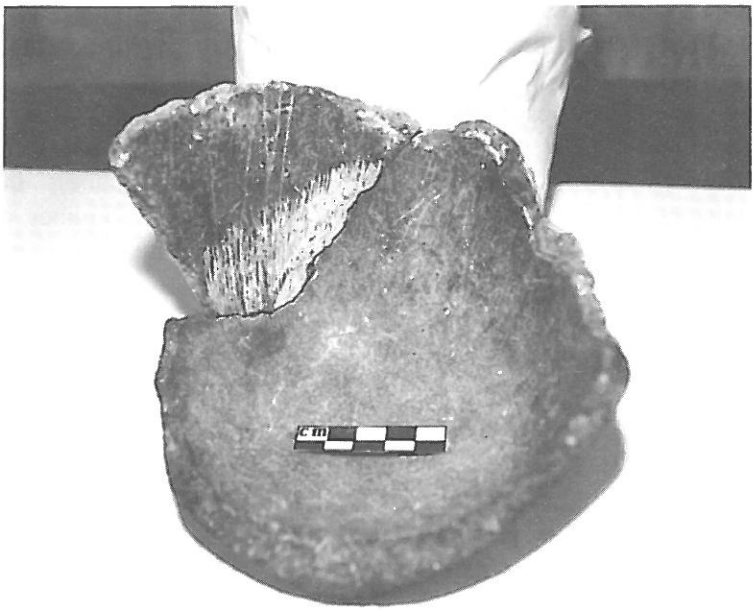

Figure 3: Photograph of Murray's pot. The lighter area on the smaller fragment was sampled for AMS dating (photograph by Bonnie Johnson).

vessel is 101.7 ± 0.6% yrs B.P., or A.D. 1848 (Beta 48240, ETH8655). This is a surprisingly recent date, but is consistent with the young age of other vessels implied by the presence of steel tool marks on them.

The soot on the interior of this steatite vessel is assumed to be the residue from the last time the vessel was used. Soot on the outside of the vessel is subject to the problem of ancient wood being used to fuel modern fires.

There is a possibility that the soot sample was contaminated with modern carbon by the handling it received from the time it was found until it was AMS dated. The stated error of ± 0.6% seems to argue against this.

DISCUSSION

This AMS date for the last use of a steatite vessel raises three interesting points. First, Murray's pot exhibits no obvious metal tool marks, yet it was last used at a time when metal tools were already widespread. Roughly a third of Wyoming's steatite vessels were obviously finished with metal tools. While it is possible that the vessel could have been made hundreds of years ago and last used only one hundred years ago, only more accelerator dating of vessels will prove the existence of truly prehistoric steatite vessels in Wyoming.

The second point is that Murray's pot had probably been cached at the site where it was found; perhaps it was to be used by whosoever happened by, similar to coffeepots stashed at Nunamuit hunting camps (Binford 1978). Steatite vessels are ideal appliances to cache as storage containers or to cache for use at a later date. Steatite is superior to terra cotta pottery because it is resistant to freeze - thaw cycles. A vessel carved from a billion year old piece of steatite can withstand hundreds of years of freeze - thaw cycles in comparison to a terra cotta pottery vessel that begins to disintegrate after a single year (Reid 1989:174). This difference permits a steatite vessel to be cached for indefinite periods of time, allowing a band making seasonal rounds to cache a vessel at a strategic location where its use allows optimization of available resources (Shepherd 1992).

In Wyoming, where it is safe to say that steatite vessels were used by mobile hunters and gatherers who may not have had the ability or inclination to carry heavy steatite vessels around with them, caching makes good sense. Murray's pot was found over 170 km from the nearest known aboriginally utilized quarry. This supports ethnographic evidence for both caching and long distance transport of steatite vessels (Dominick 1964; Frison 1982:274; Shimkin n.d.).

The third and final point is that this AMS date, the vessel typology, and the ethnographic evidence point to Shoshonean manufacture.

Steatite pots are included in Steward's (1943) culture element lists for the Northern Shoshoni. Some early ethnographic accounts mention Shoshoni using steatite pots (Larocque 1805; Russel 1955; Shimkin n.d.).

A case could be made for steatite vessels being the product of Shoshonean specialization in high altitude resource use since raw steatite is only found at high altitudes in the Rocky Mountain region. Bettinger (1991) documents a radical change in high altitude resource use among the southern Great Basin Shoshoni sometime after A.D. 600 (Bettinger 1991:675) that paved the way for subsequent Shoshoni expansion from the southwestern Great Basin into Utah, Idaho, Oregon and Wyoming.

Just how and when the Shoshoni arrived in Wyoming and surrounding environs has been discussed elsewhere (Kehoe 1959; Keyser 1975; Steward 1938; Wright 1978; Young and Bettinger 1992). It is likely that they are fairly recent arrivals to Wyoming. Shoshonean Intermountain ware (Wedel 1954:406) is similar in appearance to steatite vessels from Wyoming; they are both flat bottomed, truncated ovoid in shape, and hold a couple of liters.

The date for Murray's pot is just 20 years before Chief Washakie was forced to settle his band on the Wind River Reservation in central Wyoming. But the steatite industry in Wyoming is far older than the commonly accepted for the date of the Shoshoni influx (Keyser 1975:210). The scarcity of dated vessels makes it imprudent to rule out pre-Shoshonean steatite vessels. Perhaps every group using high altitude resources in Wyoming dabbled with steatite.

ACKNOWLEDGEMENTS

The junior author and her husband, Murray Daniels, found the vessel years ago. Their enthusiasm epitomizes collaboration between avocational and professional archaeologists. Bonnie Johnson provided support, encouragement, and enthusiasm. Bill Scoggin of the Rawlins Chapter of the WAS arranged the workshop and provided a number of steatite artifacts for analysis. Dr. George Frison pioneered steatite research and encouraged my interest in steatite and archaeology. Ten years ago, Dr. Chuck Reher provided critical comments on my first steatite research paper, and I thank him for his help. Don Frazier, Carmen Clayton, Dennis Seipp and Marian Collins produced the figures.

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PRELIMINARY REPORT OF SALVAGE EXCAVATIONS AT THE HELL GAP SITE, 48GO305

by
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The Hell Gap site, renowned for its stratified Paleoindian deposits, is also a rich repository of more recent prehistoric cultural occupations. A thorough inventory of all archeological aspects of the site has never been conducted and at this time virtually nothing is known about the post-Paleoindian components of the archeological record contained there. For example, the surface of the site contains many circles or tipi rings at numerous locations over several thousand square meters. The exact number of stone features present is unknown since they have never been mapped or counted and none have been excavated. Also present on the surface in many areas are numerous firepits in various stages of erosion. Over the past ten to twelve years, we have witnessed several pits eroded away and one that was pothunted and have seen others suddenly appear as they enter the early stages of erosion. Projectile points found in these eroded areas are temporally diagnostic of Middle Plains Archaic, Late Plains Archaic, and Late Prehistoric periods.

During the winter of 1984-85 (before Hell Gap was acquired by the Wyoming Archeological Foundation) we observed an unusually large firepit eroding out of the left bank of the arroyo just below the Harvard Locality I excavation area (Figure 1) Numerous flakes, bones, fire-cracked rocks, and a few pot sherds were also eroding from the matrix surrounding the partially exposed feature. It was obvious that the pit would soon either erode entirely away or be looted by collectors that frequent the site. Much of the erosion was due to cattle rubbing on the perpendicular bank accentuated by over-the-bank runoff. We discussed the situation with the land owners, Bill and Bob Frederick, and received permission to take whatever action that we deemed necessary.

PRESERVATION AND SALVAGE EFFORTS

In late March and early April of 1985 we proceeded with a plan to stabilize erosion of the feature. An old, iron well casing protrudes above the ground along the site access road and a short distance north of the feature. Using the casing as a reference point we placed a 1x3 m excavation unit along the stream bank over the top of the feature. Coordinates to the unit from the casing measured south 22.0 m to 25.0 m, east 6.0 m to 7.0 m. In arbitrary 5.0 cm levels, the unit was excavated to the top of the pit or a depth of 36.0 cm.

Once the surface opening of the pit was exposed, we attempted to preserve the feature by covering the top and exposed side of the pit with a plaster jacket. The jacket was then covered with sheets of neoprene weighted down with soil and rocks. The surface and perpendicular profile of the bank were then lined with old automobile tires to keep cattle from rubbing against the exposed profile.

While working in the area another feature was discovered in the same exposed profile just a few meters northwest of the pit. This feature consists of a basin shaped lens of charcoal at the same depth as the firepit and may be a subterranean structure of some sort and perhaps about the same age as the pit. It is also quite possible the charcoal lens is the result of natural depositional processes and only further investigations will determine exactly what this feature repre-

Figure 1: Fire pit exposed in arroyo bank at Hell Gap site, 48GO305.

sents. C. Vance Haynes obtained a charcoal sample from the lens during his work at Hell Gap during the summer of 1994 and a radiocarbon date should soon be available for this feature. We also piled tires along this portion of the bank to discourage itchy bovine induced erosion.

We monitored the features during the summer and by fall it became obvious that our preservation efforts would soon fail. Cattle rubbed against and scattered the piles of tires and water continued to seep into cracks in the bank and erode the pit. Finally, in October, 1985 we were forced to excavate the pit. Given our meager resources, we preferred to avoid this action but it did give us the opportunity to observe and record the various and interesting attributes of the feature, an opportunity that surely would have soon been lost as the rate of erosion was increasing. We did nothing further with the charcoal lens since erosion of that feature was not as severe.

OBSERVATIONS AND DATA COLLECTED

Soils above the pit consisted of a dark, sandy loam which seems to overlie this entire area of the site as well as the Harvard I locality. This upper soil unit is demarcated by its almost black color which immediately below the 36.0 cm level changes to light brown sandy loam. Large quantities of scattered charcoal were found throughout the upper unit as well as numerous flakes, fragmentary bones and fire fractured rocks. A highly disturbed tipi ring is located on the surface adjacent to the excavation. Charcoal and artifacts are present on the surface and were found to be continuous to a depth of 36.0 cm. At least in this area of the site, cultural deposits seemed to be mixed and it appeared that the matrix consisted of slope-wash which originated a few meters north and upslope of the present bank.

Distinct cultural levels were not definable although cultural materials and charcoal, while present at all depths, were found in heavier concentrations at the 15.0 cm, 24.0 cm and 34.0 cm levels. Small, triangular, side notched and unnotched projectile points were present at the surface as well as at depths of 16.0 cm, 20.0 cm and 32.0 cm (Figure 2, a-d). Two larger corner notched points were present at 16.0 cm and 34.0 cm (Figure 2, e-f). Four pot sherds exhibited cord roughened surfaces and may represent Woodland culture at 15.0 cm and 22.0 cm (Figure 2, g-h). One decorated rim and neck sherd may be Upper Republican and was present at 15.0 cm (Figure 2, i). Other artifacts found at various levels include a bone awl, a large

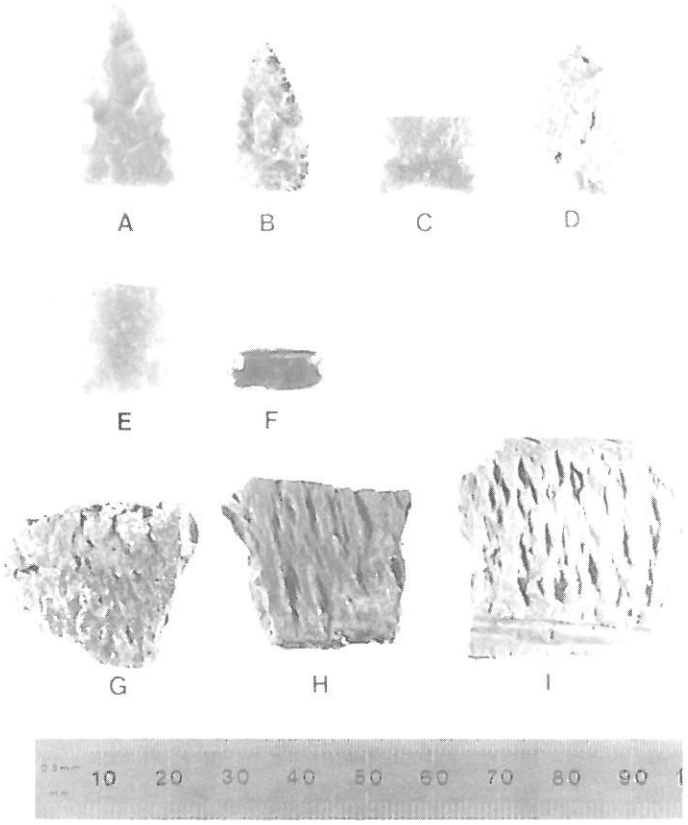

Figure 2: Selected artifacts from 1985 excavations, Hell Gap site, 48GO305.

biface, an end scraper, a graver and several flake tools. A total of 2,287 flakes were collected, most of which were of Hartville Uplift cherts and quartzites, but two flakes are of Red Desert oolite. The horizontal distribution of diagnostic artifacts suggested that the deposits were of mixed ages. For that reason no attempt was made to radiocarbon date the upper soil unit. While it seems reasonable to speculate that better stratigraphy may exist upslope, that remains undetermined since we limited our project to the deposits located immediately over the feature.

In vertical outline, the firepit was of a configuration with which we were not familiar, nor could we find features of comparable form in literature pertinent to this area (Figure 3). Also, the size of the feature was larger than any pit known to us locally although very few have been delineated completely and systematically by professionals.

The surface opening of the pit became definable at a depth of 36.0 cm which was also the contact point between the upper and lower soil units. Because the matrix above the feature was eroded and mixed, it is possible that the top of the pit was originally somewhat higher. The surface opening, as it existed at the time of excavation, measured 41.0 cm in diameter. A reddish oxidized ring of soil 3.0 cm to 6.0 cm in thickness surrounded the feature. Oxidized soils decreased in thickness down the sides from the top to about 40.0 cm at which point they disappeared. The surface opening and walls were intact and were almost perfectly circular. Beginning at the top the sides flared gradually to a depth of 28.0 cm below the rim where the diameter measured 56.0 cm. From this point the sides slanted inward forming a conical shaped bottom at a depth of 81.0 cm below the rim.

Unlike the upper matrix, the pit contents did not appear disturbed. Content samples were taken from several levels and at this writing remain sealed and stored for future reference. Charcoal was abundant and unidentified samples were saved. A charcoal sample was submitted for radiocarbon analysis and produced an uncorrected date of 1,750+/-70 yrs B.P. (Beta 20112). The remainder of the contents were washed through 1/4 inch and 1/16 inch mesh screens. Occasional small flakes were present but in general the contents were void of arti-

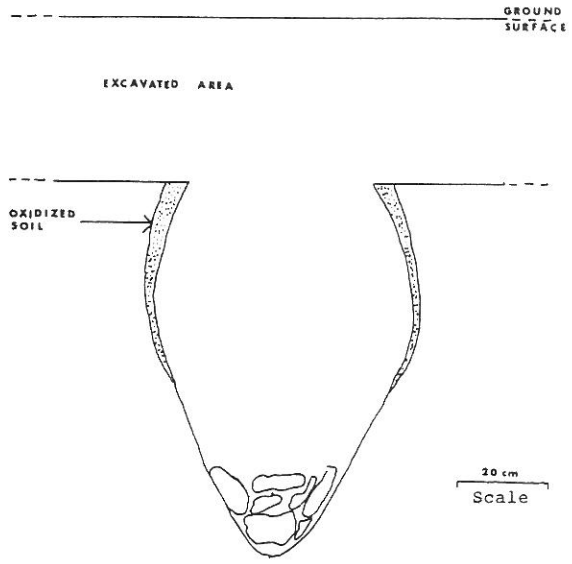

Figure 3: Profile of fire pit at Hell Gap site, 48GO305, after excavation.

facts, debitage, or seeds. A few small burned bone fragments were found. Fire fractured rocks were very sparsely distributed in the upper fill, and the bottom 15.0 cm of the pit was lined with cobbles. The cobbles had been very hot and were burned and fractured. The contents seemed to contain too much soil for the feature to have gradually filled during use. It is likely that the pit was intentionally refilled after use. Had the pit been left open when abandoned the sides surely would have crumbled long before the feature could have been filled by natural depositional processes. The source of the fill could not be determined and that factor will have to be a major consideration if and when the contents samples are analyzed for pollen and phytolith remains. And obviously, that factor also sheds doubt on the reliability of the radiocarbon date.

Other than the interior of the pit, we did not excavate into the lower soil. The lower unit remains unexplored at this location but flakes do occasionally erode from these deposits and there are some indications that they may be quite old. For example, we discovered a Folsom channel flake eroding from the profile close to and at the same depth as the bottom of the pit.

CONCLUSIONS

The answers to the obvious questions relevant to the form and function of this feature loom in future with more encompassing research. We discovered no information with which to determine how the pit was constructed, how it was used, or for what purpose. To obtain those kinds of data large-scale, horizontal excavations will be necessary here and at other areas of the site. It is possible that similar features are present upslope or in other areas and in better context. Data collected during our small salvage operation will only become significant in the light of much expanded efforts in the future.

The apparent Late Prehistoric feature discussed above has been salvaged but many others remain in various stages of erosion. Hopefully, a complete site inventory will be forthcoming in the near future followed by site stabilization or salvage efforts.

Incidentally, also of interest with regard to later cultural occupations at Hell Gap, we have recently obtained several large sherds of Woodland pottery which were collected from the same general area of the pit some fifty years ago. The sherds were collected by Mrs. Merle Potter of Ft. Laramie when as a child she lived and played in the vicinity of the site. Since so much time has lapsed since the discovery of these ceramics, we are not suggesting here that there is a relationship between them and the pit, but they do need to be included somewhere as part of the site record.

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BOOK REVIEWS

Skeletal Biology in the Great Plains: Migration, Warfare, Health, and Subsistence. Edited by Douglas W. Owsley and Richard L. Jantz. Smithsonian Institution Press, Washington, D.C. 1994. xii + 415 pp., figures, tables, references cited. $45 (cloth).

Skeletal Biology on the Great Plains is a superb synthesis of recent bioarchaeological analyses in the western region of the United States, an excellent update for the physical anthropologist, as well as a necessary overview for those interested in prehistoric life on the Plains. It is divided into five main topics: burial archaeology, demography and paleopathology, biological distance, subsistence and diet, and warfare. Thirty-nine contributors authored a thirty-two chapters. Some summarize large areas, and others take more of a case-study approach. Much of the volume is based on analyses of the W.H. Over Collection of the University of South Dakota and of sites excavated by William Bass and the Missouri River Basin Projects. The first chapter of each section highlights problems within that area and summarizes the chapters contained within it.

The first section addresses archaeological topics. Owsley and Jantz, the editors of the volume, call their approach an "integrated" one because of the input from archaeologists, ethnohistorians, ethnologists, physical anthropologists, and other specialists. The archaeological time periods used in the book are outlined by Blakeslee (Northern and Central Plains) and Brooks (Southern Plains). These chapters are especially helpful for those who are unfamiliar with the often confusing cultural groups, phases, variants, and complexes found outside of their areas. Blakeslee's maps of various areas and tables of major sites are also highly useful. Concentration is placed on Woodland, Plains Village, and Historic periods. In the last chapter of this section, Snortland examines Woodland mortuary practices - concluding that the complexes are poorly defined and inconclusive especially in multi-component and special use sites.

Part two involves demography and paleopathology. Most of the chapters concentrate on the Northern and Central Plains. Ortner provides an introduction and cautions against classifications of disease without solid description and emphasizes that explanatory models must follow basic analyses. Trimble next examines the smallpox epidemic on the Upper Missouri, attributing the rapid spread of the disease to certain core variables.

Williams' article summarizes bioarchaeology and disease of Archaic and Woodland populations on the Northern Plains. These groups are often not studied in favor of more recent peoples, cultural continuity, and larger samples. A discussion of pre-Columbian syphilis is introduced by Schermer, Fisher, and Hodges. They provide a background of the debate, the current evidence, and methods to recognize the disease on the skeleton. Endemic treponematosis probably existed among hunter-gatherers in their study area of Iowa by at least 2,500 years ago. The specific syndrome (yaws, endemic syphilis, venereal syphilis, or pinta) remains unknown. Kelley, Murphy, Levesque, and Sledzik continue the discussion of infectious diseases, focusing on pulmonary diseases (rib periostitis) in four Arikara sites. The condition probably resulted from pulmonary tuberculosis and pneumonia.

Ear infections (otitis media) are another infectious disease common to children. Mann, Owsley, and Reinhard study the presence of this condition in two children from a historic Omaha site and a Custer focus site in Oklahoma. The children probably contracted the disease secondarily after having histiocytosis X and tuberculosis respectively.

Willey and Hofman next present an interesting theory that grooves found near diseased teeth were created by toothpicks made from plants and used to numb the area. They also provide a useful list of plants used by Plains Indians for throat and mouth medicine as well as a more

detailed table of medicinal uses for black sampson (a type of purple coneflower) among various Native American groups.

Demonstrating that skeletal biology focuses on more than one racial group, Gill discusses skeletal injuries of white, black, and Chinese immigrants. He compares samples from Wyoming, Texas, and Utah. Differences are noted in demographic patterns, skeletal injuries, racial variety, dental health, and general robusticity.

Part three is entitled "Biological Distance Relationships and Populations Variation in Cranial and Post Cranial Measurements." Jantz introduces this section, emphasizing dependence on metric data, especially craniometrics, for comparing groups. Complex statistics and the use of computers have greatly helped develop complex models. Key utilizes discriminate function analyses to compare Central and Northern Plains Woodland populations to each other and to other groups. He concludes that three different Middle Woodland groups existed on the Plains, and biological continuity between Archaic and Woodland populations probably existed, especially on the Northern Plains. Statistical analysis is also employed to separate racial and ethnic variability by Jantz and Owsley (white from Indian ancestry in a historic Arikara site) and by Byrd and Jantz (descendants of two Post-coalescent Tradition phases at the Leavenworth Arikara site.

Physical changes due to stress caused by the introduction of agriculture is explored in three articles by Cole and Cole (brow ridges), Cole (femur and tibia size and shape), and Ruff (biomechanical beam analysis of the femur). Finally, Jantz and Owsley correlate dental and long bone growth among Arikara children in an effort to develop a better standard for aging Native American sub-adults.

Part four emphasizes subsistence strategies and diet. This section in particular is different from the others because it focuses on chemical analyses. The reader will find it quite interesting, although highly scientific. Tieszen introduces the concept of stable isotope analysis. This study is an important contribution but is often ignored because of its chemical nature. It is based on ratios between stable isotopes, especially carbon, found in various grasses and ingested by animals. Two site-specific articles using bone chemical analyses by Tuross and Fogel and Habicht-Mauche, Levendosky, and Schoeninger conclude the section.

Part five concerns warfare on the Plains. Although warfare was common, its study has not been used to develop models and theories of pre-industrial war, according to Robarchek. However, warfare on the Plains has been a cultural tradition for at least 2,000 years, as shown by the authors in this section.

Evidence for warfare on the Southern Plains is examined by Brooks. War among the village tribes was small-scale with greater intensity on the western fringes. Northern Plains warfare patterns are similar to those found to the South. Owsley specifically considers scalping from late prehistoric through historic times. Small-scale warfare was common throughout the Coalescent Tradition with some major massacres. Border warfare was again more common. Ewers takes a different approach by examining the role of Plains Indian women using ethnohistorical documentation. Women played a larger role than generally imagined, both as warriors and as casualties. Articles by Hollimon and Owsley; Bovee and Owsley; Owsley, Mann, and Baugh; and Olsen and Shipman also document warfare among prehistoric groups.

Ubelaker's chapter concludes the book. Two major developments have changed bioarchaeological interpretations - new research techniques (i.e., chemical and functional analyses) and shifting attitudes of Native American groups which have focused attention on large collections and spurred further research.

As a Wyoming archaeologist with interests in physical anthropology, I found the entire book to be well worth reading. It is interesting, contains a number of excellent reviews, and

provides information that can later be referenced and used in a variety of comparative studies. It is a long book for a one-sitting read but is a valuable reference. Page after page of statistical analyses, especially those in the population affinity studies, can be confusing but are also important for future comparisons.

Although the "Great Plains" is featured in the title, the Northern and Central Plains predominate the book with almost three times the number of articles as the Southern Plains. Part of this imbalance can be attributed to the predominance of the Over Collection data used in these analyses. Also, numerous chapters contain analyses of specific time periods. However, very few of the temporal studies or isolated case studies concentrate on sites dating to the Archaic period or earlier. Most of the articles focus on the historic tribes and Plains Village traditions with slightly less relating to Woodland populations.

A few chapters will be of particular interest to Wyoming readers. Blakeslee's article is especially helpful in its description of various archaeological periods on the Northern and Central Plains. Readers will also enjoy the chapter on Wyoming pioneers by Gill. He discusses four males with various traumatic injuries including a possible Civil War sabre cut and multiple gun shots wounds.

So much exciting and interesting research is based on skeletal studies. Information is gathered, analyzed, and disseminated. In fact, few actual excavations of human graves now occur except when sites are threatened by looters or forces of nature. Archaeologists, skeletal biologists, and others have long been putting together the pieces of the past through a steady progression of knowledge and understanding of past and present cultures. It can be frightening that at the dawn of new discoveries, time signals the twilight of basic data collection obtained for future generations. Conflicts between scientists, descendants, legislators, and other interested parties complicate the situation. Some groups such as the Omaha welcome information that can help them understand current disease patterns. Others are not sure if derived information is important or useful. These ideas must be remembered as we enter a new era of physical anthropology - one in which the interests of everyone should be considered without sacrificing the concerns of any one group. For we will never understand the other until we understand ourselves; yet, in realizing that which is different, we better appreciate who we all are.

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The Cheyenne in Plains Indian Trade Relations 1795-1840. By Joseph Jablow, with Introduction to the Bison Book Edition by Morris W. Foster. University of Nebraska Press, Lincoln. 1994. xvi + 100 pp., 2 maps, bibliography, index. $6.95 (paperback).

This is the classic case study of the changes brought about in the culture, economy, and intertribal relations of the Cheyenne Indians from 1795-1840, changes brought about by the expansion of Euroamerican populations onto the Plains through trade. This volume was first published in 1950 as part of the American Ethnographic Society Monograph series, #19. It was reprinted in 1994 by the University of Nebraska Press.

The author, Joseph Jablow, offers a different perspective for the understanding of cultural and social organization by examining the relationships of the Cheyenne Indians with trade between Euroamericans and other Native American tribes from an economic and historiographic point of view. At the time of its first printing,

this approach was not the norm. The more common scholarly approach of the time was to generalize from the tribal level to a region, and then propose or define a regional identity to describe tribal social organization. Jablow argues that the economic consequences of Euroamerican expansion onto the Plains changed Native American societies to such an extent that they must be seen in light of these historic effects. In fact, the change was so dramatic that it influenced all aspects of the economy, social organization, and relationships of the Cheyenne with both the Euroamericans and their Indian neighbors, making Cheyenne society very different from that which had existed prior to the influence of Euroamerican trade.

As Jablow himself stated in his preface, the purpose of this study was to examine the economic aspects of Plains Indian tribes in relationship to the function and structure of intertribal trade. Jablow's thesis rests on what he sees as the two main determinates of historic period trade, horses and the fur trade. He traces the history of the Cheyenne from the late 18th to almost mid-19th centuries in this regard. He also examines how trade effected the changing interrelationships between Plains Indians, and specifically the change from a horticultural society to an equestrian nomadic society of the Cheyenne during this period, and how this affected intertribal relationships on the Plains.

In Chapter 1, Jablow discusses the historical influences on the Cheyenne. He examines what is known of Cheyenne history and begins the discussion of the influence of Euroamerican trade on this tribe. In Chapter 2, Jablow discusses the trade relationships among the various Plains tribes in relation to the Cheyenne of this period. In Chapter 3, he brings in the effects of this trade on intertribal relationships, and in Chapter 4, Jablow discusses how the trade developed to effect the Cheyenne themselves.

This was a very important work for its time, and remains so today. It provides an excellent history of the Cheyenne, and other Plains tribes for the period covered. Jablow integrates this historical discussion with cultural information to draw a picture of how dramatically Plains Indian cultures changed due to the effects of trade stimulated by Euroamericans. This is an important work, and is of value to anthropologists, historians, archaeologists, and anyone interested in the subject. It is organized and written like a historical text, but this should not necessarily dissuade the reader from reading it and gaining its insights.

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