

THE WYOMING ARCHAEOLOGIST



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THE WYOMING ARCHAEOLOGIST

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instructions if the manuscript is available in electronic format. Readers should consult the articles in this issue for style and format. Deadline for submission of copy for spring issues is January 1 and for fall issues July 1. Reports and articles received by the Managing Editor after those dates will be held for the following issue.

The membership period is from January through December. All subscriptions expire with the Fall/Winter issue and renewals are due January 1 of each year. Continuing members whose dues are not paid by March 31 of the new year will receive back issues only upon payment of \$5.00 per issue. If you have a change of address, please notify the Executive Secretary/Treasurer. Your *WYOMING ARCHAEOLOGIST* will not be forwarded unless payment is received for return and forwarding postage. Back issues in print can be purchased for \$5.00 each, plus postage. Back issues out of print are available at \$0.15 per page plus postage.

Checks for chapter subscriptions and renewals should be sent to the chapter secretary involved. All other checks, subscriptions, and renewals should be addressed to the Executive Secretary/Treasurer. Correspondence and orders for back issues should be addressed to the Executive Secretary/Treasurer.

Society yearly subscription rates are as follows:

Individual Associate Member - \$20.00
Institutional Member - \$30.00
Canada and Other Foreign - \$34.00

Other memberships may be available. Contact the Executive Secretary/Treasurer for information. Local chapter dues are in addition to state society dues. The Wyoming Archaeological Society is a Nonprofit Organization.

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THE WYOMING ARCHAEOLOGIST

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**WYOMING ARCHAEOLOGICAL SOCIETY
MEMORIAL GIFT or CONTRIBUTION FORM**

Given by: Miss, Mrs., Mr., Ms., Dr. \$ _____
(Amount)

Name: Last First Middle

Address: City & State Zip

Donor phone number () _____

TYPE OF GIFT:

General Contribution [] Specific Contribution []

In Memory of: _____

Name City & State

In Honor of: _____

Name City & State

Specify where you would like your money to go (e.g., Mulloy or Frison Scholarship Funds, The Wyoming Archaeologist, ????????)

Please make your check payable to THE WYOMING ARCHAEOLOGICAL SOCIETY
Carolyn Buff, Executive Secretary/Treasurer, 1617 Westridge Terrace,
Casper, WY 82604

ANNOUNCEMENTS

WYOMING ARCHAEOLOGICAL SOCIETY, INC.

2004 ANNUAL MEETING MINUTES

8:12 a.m. – Snow King Resort
Saturday, April 17, 2004

PRESIDING: Nick Palmer, President

CALL TO ORDER: 8:12 a.m.

ROLL CALL AND CERTIFICATION OF DELEGATES:

Secretary/Treasurer Carolyn Buff certified the voting delegates: Absaroka, Barbara Nahas-Keiry; Ancient Trails, Cher Burgess; Casper, John Albanese and Mavis Greer; Cherokee Trail, Kenneth and Alice Swanson; Fremont, Ray and Gail Gossett; June Frison, Dewey Baars and Marcel Kornfeld; and Teton, Sal Rodriguez and Jill Anderson.

Roll call showed seven chapters represented: Absaroka, Ancient Trails, Casper, Cherokee Trail, Fremont, June Frison, and Teton. Not represented at the meeting were Ancient Trail, Cheyenne, High Plains, Rawlins, and Sweetwater County. Cheyenne, High Plains, Rawlins and Sweetwater County are all inactive.

MINUTES OF LAST ANNUAL MEETING

April 26, 2003: Approved as printed in the fall 2002 issue of *The Wyoming Archaeologist*.

TREASURER'S REPORT:

Secretary/Treasurer Carolyn Buff gave the treasurer's report showing a total net worth as of March 31, 2001 of \$44,699.73, an increase over 2003.

AUDITOR'S REPORT:

Mark Miller and Mavis Greer performed the annual audit and found the accounts to be in order. Motion by Alice Swanson, second by Dewey Baars to file the treasurer's report for audit. Carried.

EDITOR'S REPORT:

Danny Walker: The next volume of *The Wyoming Archaeologist* is currently at the printer. The table of contents is available for perusal. The journal is three volumes behind in publication, due to a lack of manuscripts. Anyone can submit a

manuscript—amateur or professional. Any information of interest is acceptable. The project is now being done electronically, which cuts costs and time

LIBRARIAN'S REPORT:

Danny Walker reported eight exchange journals on file in the Wyoming State Archaeologist's Office. Material in the library is available to members to check out. A full list of library holdings was published in fall of 1999.

SCHOLARSHIP COMMITTEE:

Carolyn Buff announced the committee will meet at lunch to evaluate the scholarships.

SAA/COAS:

Marcel Kornfeld: The Council of Affiliated Societies provides a link between the national organization (Society of American Archaeology) and the state and local chapters. The COAS sponsors the poster contest. Wyoming won third place this year. As editor of the COAS Newsletter, Marcel would appreciate notes of activities from each of the chapters.

CHAPTER REPORTS:

The chapter reports will be printed in *The Wyoming Archaeologist* if there is enough room.

STATE ARCHAEOLOGIST'S REPORT:

Mark Miller: reported on the state reorganization of State Parks and Cultural Resources and the status of the repository in the anthropology department at the University of Wyoming upon the building of a new anthropology building.

OLD BUSINESS:

Wyoming Archaeology Awareness Month:

Judy Wolf: Announced the posters should be available by the end of May. The picture depicts stone circles with the theme "An Unbroken Circle." T-shirts and travel mugs are available for sale. Motion by Barbara Nahas-Keiry, second by Marcel Kornfeld to donate \$200. Carried.

Wyoming History Day:

If there are any qualified entrants we will award the \$100.

Friends of the George C. Frison Institute:

Ray Gossett: Discussed the endowment and matching funds, and announced Dr. David

**WYOMING ARCHAEOLOGICAL SOCIETY, INC.
Treasurer's Report for Fiscal Year Ending March 31, 2004**

CHECKING ACCOUNT - NC SCHOOL EMPLOYEES FEDERAL CREDIT UNION	INCOME	EXPENSES	BALANCE
Beginning Balance	\$2,877.82		
Deposits	\$5,315.00		
Interest Earned	\$12.55		
TOTAL INCOME - CHECKING			\$8,205.37
EXPENSES			
Fremont County Chapter - Overpayment		\$5.00	
Contractor's Supply - Trowel		\$15.78	
Merback Awards - Trowel Engraving		\$47.30	
Casper College - Postage		\$37.00	
Wyoming Archaeological Foundation - Annual Payment		\$626.00	
Larry Loendorf - Honorarium		\$300.00	
Doug Owsley - Honorarium		\$100.00	
Wyoming Archaeological Awareness Month		\$200.00	
Jeremy M Moss - Scholarship		\$350.00	
Joseph Cheshier - Scholarship		\$350.00	
Doug Owsley - Expenses		\$116.64	
Best Western - Lodging		\$108.00	
Casper College - Postage		\$37.00	
Wyoming Archaeological Foundation - Fremont County Match		\$1,000.00	
Wyoming Archaeological Foundation - Belz Bequest		\$1,000.00	
Casper College - Postage		\$37.00	
SAA - Annual Membership		\$30.00	
Secretary of State - Corporation Tax		\$25.00	
USPS - Bulk Permit		\$150.00	
USPS - Postage		\$37.00	
TOTAL EXPENSES		\$4,571.72	
ENDING BALANCE - Checking Account			\$3,633.65
SAVINGS ACCOUNT			
BEGINNING BALANCE	\$120.80		
Interest Earned	\$0.90		
ENDING BALANCE			\$121.70
MONEY MARKET ACCOUNT			
BEGINNING BALANCE	\$6,234.55		
Interest Earned	\$62.93		
ENDING BALANCE			\$6,297.48
CERTIFICATE OF DEPOSIT ACCOUNT			
BEGINNING BALANCE	\$33,509.15		
Interest Earned	\$1,137.75		
ENDING BALANCE			\$34,646.90
TOTAL NET WORTH AS OF MARCH 31, 2004			
Total Income	\$49,271.45		\$44,699.73
Total Expenses		\$4,571.72	
Net Increase			7735.82*
SCHOLARSHIP ACCOUNT			
Beginning Balance	\$8,430.00		
Deposits	\$(10.00)		
Scholarships Awarded		\$700.00	
Balance			\$9,120.00
ARCHAEOLOGY WEEK ACCOUNT			
Deposit	\$(212.48)		
Balance		\$200.00	(\$12.48)

*undetected error from several years ago resulted in this corrected amount

/s/ Carolyn M Buff
Executive Secretary/Treasurer

Meltzer from Southern Methodist University would be the speaker on September 23 at 3:00 p.m. at the Frison Institute lecture.

A directory of current members will be published in *The Wyoming Archaeologist* if there is room. If no room and if chapters want the directory, they can contact the secretary/treasurer and the information will be forwarded

NEW BUSINESS:

Fall Meeting: Mark Miller: Will be held in conjunction with the Frison Institute lecture on September 23.

PhD Scholarship:

Mary Lou Larson: Proposed students applying for a (currently unnamed) scholarship would have presented a paper in a previous year at the Plains Conference or the Society of American Archaeology, both of which meet prior to the WAS spring meeting, and they need to present a receipt of having gone to the meeting and have a letter from a faculty member at the University of Wyoming and they come to the WAS meeting prepared to give paper (or one similar). The scholarship would then be applied to help defray a portion of the travel expenses to whichever meeting they would choose. The amount of the scholarship would depend on the status of the treasury each year. If more than one application is submitted, stronger consideration would be given to a project based on Wyoming. Motion by Judy Wolf, second by Marcel Kornfeld the scholarship committee proceed with the discussion. Carried.

At Will Employee Contract (AWEC):

The Survey Section of the Office of the Wyoming State Archaeologist (Dave Eckles) would like to hire, on a temporary basis, people who would like to work for small compensation to do survey, testing, and some excavation on an intermittent basis. Persons must be able to do physical labor and walk up to ten miles per day. It would be on a contract basis only, with no guarantees of continued employment and no benefits. There is no requirement if you are called, you have to go at any particular time. There is a short interview and each person must apply for the position each fiscal year. Dave can be reached at 307-766-5301.

New Brochures: New membership brochures are available. Members are asked to take a handful and distribute them to rest areas, libraries, motels, or

any other place where the public may browse.

Danny Walker reported CD-ROMs of *Occasional Papers on Wyoming Archaeology* volumes are available. Contact Danny for information on costs and other particulars.

Reduced Rates for Students: Mark Miller reported the committee had determined student rates should be managed by the local chapters rather than the state society. Motion by Cher Burgess, second by Barbara Nahas-Keiry individual chapters deal with student dues at a lower rate on the local level and the chapters can subsidize the \$16 or \$17.50 state dues. Carried.

WYOMING ARCHAEOLOGICAL FOUNDATION:

Chris Lippincott announced the Foundation was the recipient of \$1,000.00 from the Carlton Belz estate. The Hell Gap investigation is in its second season of an estimated 10-year project. Excavations focused primarily on investigations of the late Paleoindian component, and continued through later deposits at Locality I. The excavations produced chipped stone artifacts and bone. At least 94 faunal specimens were recovered including several pieces of butchered canid bone. It is not yet known if the canid is of a domesticated variety. A new area of the site located to the south with a possible Clovis component was tested, and testing at Locality II west continued. Although the Clovis component has not yet been identified, the testing at Locality II west produced a rich assemblage of tools and debitage from the mid to late Paleoindian component. The 2003 Wyoming Archaeological Society summer meeting was held at Hell Gap on the weekend of June 7 and 8, and was joined by members of the Pikes Peak Chapter of the Colorado Archaeological Society from Colorado Springs. Finally, the Advanced Archaeological Field School was conducted at the Hell Gap Site, in which Dr. Bill Gribb, of the University of Wyoming Geography department, taught a workshop on the use of GPS and field mapping.

Danny Walker asked anyone knowing the recipients of the missing Golden Trowel Awards let him know so he can completed the list of award winners.

ELECTION OF OFFICERS:

Stuart McKenzie, chair: President, Nick Palmer; 1st Vice President, Don Bailey; 2nd Vice President,

Stuart McKenzie; and the three-year term on the Foundation, Barbara Nahas-Keiry (term expires 2007). Motion by Dewey Baars, second by Cher Burgess to close the nominations. Carried. Motion by Alice Swanson, second by Mavis Greer to cast a unanimous ballot. Carried.

2005 NOMINATING COMMITTEE: Stuart McKenzie, chair, Barbara Nahas-Keiry, and Dewey Baars.

2004 SUMMER MEETING: Danny Walker invited the membership to visit Fort Laramie the weekend of July 24.

2005 ANNUAL MEETING SITE: Rawlins, with Mary Hopkins and Judy Wolf as the meeting committee.

INTRODUCTION OF OFFICERS:

- President – Nick Palmer
- 1st Vice President – Don Bailey
- 2nd Vice President – Stuart McKenzie
- Wyoming Archaeological Foundation (term expires 2007) – Barbara Nahas-Keiry

ANNOUNCEMENTS: Papers to begin at 10:30.

Carolyn Buff mentioned she has membership cards, brochures and stationery available.

The need for current names, addresses, phone numbers, and e-mail addresses from chapters was reiterated.

The Wyoming Archaeological Foundation will meet Sunday at 7:00 a.m.

Judy Wolf thanked the Society for the donation to Wyoming Archaeology Awareness Month.

Stuart McKenzie urged the membership to promote archaeology in their communities.

Danny Walker announced work at Fort Laramie will begin June 9. Three 10-day sessions will be held, and all are welcome.

ADJOURN: 10:25 a.m.

BANQUET SPEAKER: Dr. George Frison

GOLDEN TROWEL AWARD: Don and Eva Peden

/s/ Carolyn M. Buff
Executive Secretary/Treasurer

/s/ Nick Palmer
President

WYOMING ARCHAEOLOGICAL SOCIETY, INC.

SCHOLARSHIP COMMITTEE

MINUTES – April 17, 2004

PRESIDING: Carolyn Buff, Chair

PRESENT:

Dewey Baars, Don Bailey, Carolyn Buff, Bill Current (WAPA representative), Mary Lou Larson, Stuart McKenzie, Mark Miller, Nick Palmer

Motion by Mark Miller, second by Stuart McKenzie to award the Frison Scholarship to James Beers in the amount of \$500. Carried.

Mary Lou Larson explained the Society's idea we need to recognize the level of PhD students with a scholarship to help defray travel expenses to present a paper at a regional meeting and/or at the WAS spring meeting. The scholarship will be called the Doctoral Travel Award, supported and funded by the Wyoming Archaeological Society and the Wyoming Association of Professional Archaeologists (with approval by WAPA membership at a later date.)

/s/ Carolyn M Buff, Chair

2004 WAS CHAPTER REPORTS

ABSAROKA

Testing/Excavation – Continued work was performed at the Northwest College Lab curation facility of artifacts from the previous year's excavations. Management/curation of the Platt site artifacts is now 75% complete.

Public Education – Presentations were given around the Big Horn Basin to local clubs and schools about archaeology and archaeology awareness month.

Work With Other Organizations – Students from Northwest College cataloging the Platt Site artifacts have completed about 2/3 of the work. Once the cataloging is complete, Chris and Judson Finley will be documenting the results in a report.

Publications/Reports – The annual report on the Platt Site was prepared and sent to the Office of State Lands and Investments.

Programs Presented – Jeannie Cook, Ladies of the Night; Rich Adams, Steatite in Wyoming; Chris

Finley, Historic and Prehistoric Wyoming; Dan Eakin, Game Creek Site; Judson Finley, Prehistoric Rockshelters of the Bighorn Mountains; Danny Walker, Geophysical Remote Sensing; Doug Nelson, The Hatzetim Excavation; Bill Matthews, Archaeological Surveys

Field Trips – Bighorn Mountain ice caves – enjoyed a picnic and viewed historic petroglyphs near Cowley; summer picnic at Phil and Jackie Anthony's

Other Activities – Money made from a garage sale applied toward the Milford Hanson Book Scholarship Fund. Two students from Northwest College, Kristen Butler and Sara Morris, have been awarded the scholarships.

ANCIENT TRAILS

Survey and Research Projects – Cheyenne-Deadwood Trail byway drive. The chapter did not make any further progress last year with the project to develop this historic drive. During this summer the chapter plans to GPS map the trail segments and stage stations located in field work and still needs to complete the brochure and prepare a map for the byway.

Public Education – Chapter members helped sponsor the annual Island in the Plains conference on Black Hills archaeology and history, along with the Northern Hills Chapter of the South Dakota Archaeological Society and federal and state agencies. At the April 2003 conference several chapter members presented papers.

Programs presented – The chapter held no meetings during the year.

CASPER

Programs Presented – John Albanese and Carolyn Buff, Digging up the Past: Casper's Bison Kill Site; John Goss, Recent Surveys at Hell's Half Acre; Robin Lynn, Historic Stories for the Casper News; John Greer, Painted Caves of Northern Spain; John Albanese, Prehistoric Cave Art in France and Northern Spain; Bryon Schroeder, The Alcova Redoubt Site (48NA3502); Kevin Anderson, Archaeological Materials in the Archives at Casper College; Kerry Lippincott, Home and Gardening Tools from a Thousand Years Age. Even Martha Stewart Would Exclaim, "It's a Good Thing"

CHEROKEE TRAIL

Field Trips – Rawlins Smoke Signal Tower, High Savery Dam Sites, Rudefcha Transfer Station

Programs Presented – George Brox, Rawlins Smoke Signal Tower; Chapter Members, Artifact Show and Tell; George Frison, Prehistoric Hunters; Nicole Waguespack, Clovis Hunting Strategies; Todd Surovell, Folsom Site in Middle Fork CO; Videos

FREMONT COUNTY

Survey – Located and reported petroglyphs on Upper Beaver Creek which had not been previously reported.

Testing/Excavation – Members volunteered approximately 300 hours of excavation and remote sensing at Fort Laramie, Deadwood, SD, and in the Black Hills

Public Education – Many educational programs presented throughout the year with good public attendance.

Work With Other Organizations – Wyoming Office of the State Archaeologist; South Dakota State Archaeologist; National Forest. Donated \$1000 to Frison Institute.

Programs Presented – Mike Bies, Rock Art; George Frison, Stone Tools; Danny Walker, Fort Laramie; Tom Bell, Museums and Preservation

Other Activities – The chapter changed meeting dates and location, resulting in an increase in membership.

JUNE FRISON

Programs Presented – Nicole Waguespack, Barger Gulch, Locality B: Insight into a Folsom Campsite; Rick Weatherman, Archaeological Investigations at Whitewood Cave, A Late Archaic Occupation in the Northern Black Hills of South Dakota; Carlos Rincon-Mautner, The Environmental Effects of Adaptive Change in the Tehuacan Valley and the Mexteca of Southern Mexico; Amanda Rees, RIP: Landscapes of Death; Kristen Rawlings, Racial Variation in the Palatal and Palatine Suture Forms Among Americans; John Allen, The Archaeology of Lewis and Clark: Searching for the Iron Boat and Other Oddities; Rose Fosha, Chinese Research in Deadwood; Phil Roberts, Shoshone Caverns National Monument

Other – The chapter, in conjunction with the Frison Institute, is conducting an inventory and assessment of the Ord Ranch (a 7,000-acre cattle operation) southwest of Lusk, WY. This is an ongoing project that will take several years to complete. A number of chapter members have contributed to the project along with other interested individuals. The youngest is a 13-year-old from Wheatland.

archaeological Society Meetings April 18, 2004 at the Snow King Resort, Jackson, Wyoming. Board members in attendance included Chris Lippincott (President), Barb Nahas-Keiry (Treasurer), Mary Lou Larson (ex-officio, University and Secretary), George C. Frison, Mark Miller (ex-officio-State Archaeologist), Eva Peden (Past-President of the WAS), Nick Palmer (President of the WAS), Dewey Baars (Hell Gap site manager), Marcel Kornfeld, and Janice Baars. The terms of members are listed at the end of these minutes. Chris Lippincott called the meeting to order at 7:10 a.m.

**MINUTES
WYOMING ARCHAEOLOGICAL
FOUNDATION
BOARD MEETING**

Sunday April 18, 2004 - Jackson, Wyoming

The spring meeting of the Wyoming Archaeological Society Board of Directors was held in conjunction with the 51st Annual Wyoming Ar-

MINUTES OF THE LAST MEETING:

Mary Lou handed out copies of the minutes from the last WAF board meeting (which had been emailed to Board members before the WAS meeting as well). Eva moved the minutes from the 2003 meeting be accepted. George seconded the motion. Motion passed unanimously by voice vote.

Balance in checking as of 4/30/2003		\$1387.34
 <u>Income:</u>		
WAS Dues	\$ 626.99	
Henry Jensen Estate	2,218.25	
Frison Endowment	10,850.00	
Checking Interest	2.86	
Carlton Belz Trust	1,000.00	
Absaroka Chapter - P. O. Rental	34.00	
 Total Income	 \$14,731.11	 \$14,731.11
 <u>Expenditures</u>		
St. Paul Company - Insurance	\$ 1,378.00	
Shoshone First Bank - Safety Dep. Box	13.50	
Goshen County Treasurer - Hell Gap	334.28	
Wyoming Secretary of State - Annual Report	25.00	
Postmaster - Annual P. O. Rental	68.00	
WAS - Absaroka Chapter - Milford Hansen	150.00	
Laramie Peak Realty	125.00	
Postage	14.80	
Big Horn Federal	10850.00	
 Total Expenditures	 (\$12,958.58)	 (\$12,958.58)
 Balance in Checking as of 4/18/2004		 \$ 3,159.87

TREASURER'S REPORT

Barb presented the treasurer's report for the 2003-2004 fiscal year. Eva and Nick audited the report.

FRISON ENDOWMENT

Barb also passed out and explained the Frison Endowment spread sheet detailing the funds donated to the Foundation in support of \$50,000.00 matching for the University of Wyoming Frison Institute Endowment fund.

Eva moved we accept the Treasurer's report and Nick seconded. Motion passed unanimously by voice vote.

OLD BUSINESS

HENRY JENSEN ESTATE:

Jensen Trust:

Chris asked what the requirements of the Henry Jensen Trust are. Barb explained the Henry wanted information to get out to people about Wyoming history in order to save our history. Henry was a very early supporter of the WAF. The Foundation has received a letter from Lucille Dunbrill of the Wyoming Historical Foundation inquiring as to how WAF was going to spend its Jensen Trust funds (WHF is awarding a Henry A. and Clara M. Jensen prize to teachers in the state). Barb suggested WAF should use the Henry Jensen funds to support part of the U. W., Department of Anthropology PhD travel stipend to be shared with the WAS and the Wyoming Association of Professional Archaeologists (WAPA). Mark suggested the Clara M. and Henry T. Jensen Doctoral Award as a name for the stipend. Everyone thought the idea was a good one. Mark will coordinate with Carolyn Buff of the WAS and Bill Current of WAPA in setting up the fund for the 2004-2005 school year. Marcel noted he'd like to see WAF not spend all of the income on the estate on the doctoral fund, as he would like to see the fund amount grow.

Acreage

Part of Henry Jensen's estate also includes partial rights to 320 acres leased for gas exploration. Barb has had two different inquiries about the lease - one from Tom Brown (the current lessee) and Howe Petroleum Corporation. The acreage and the income from leases are split three ways between

WAF, WHF, and the University of Wyoming. The board instructed Barb to contact the University of Wyoming Foundation (Mary Ann Garmin?) to find out what they were going to do with their share of the acreage and income. Income is currently \$200.00/ year

NEW BUSINESS

CARL BELZ DONATION:

Part of Carl Belz's estate included \$1000 donation to the WAF for use at the Hell Gap site. Barb currently is holding the money in the General Fund account so she can access it easily if we need to do work at Hell Gap.

WAS DUES TO WAF:

Barb noted the annual dues paid by WAS to the Wyoming Archaeological Foundation has dropped significantly since last year.

FRISON ENDOWMENT:

Barb noted a number of people have donated this year to the Endowment fund (Cher Burgess - \$200 — and others will be paying in installments to come up to their pledged totals). Barb noted there has been some confusion as to who to send the money to (her or Marcel at the Institute) and she also noted we should always send a thank you note with the WAF tax identification number listed. Marcel thanked everyone for their help with establishing the endowment and their contributions to the fund.

HELL GAP REPORT:

Outdoor Museum: Marcel presented a long-term proposal for future educational opportunities at the Hell Gap site. Marcel proposed the conceptual plan of an outdoor museum at Hell Gap incorporating more of the archaeology and environment than we are currently doing. He noted we have an incredible record of archaeology in the Hell Gap valley between the different localities, stone circles, historic structures, mines, Clovis test area, and other resources. Marcel proposed we develop a series of pathways around the valley that would be improved over time. The paths would go from the parking lot to the hill above the lab - to locality I, II, and III areas, up to the stone circles and hills on the west end of the property, to the historic homestead and mine on the eastern side of the property. He would like to erect signboards along the path — but we need to consider security and long-term use. The

board thought this was a good idea and Marcel might consider approaching the Wyoming Council for the Humanities or other funding agencies. Marcel suggested he and Mary Lou would work on the start of this project at the Advanced Archaeological Field Studies class to be held in June 2005. Mary Lou suggested the next field class work towards developing a guidebook. Janice noted the house was also supposed to be used as an interpretive center as well as for other things. The house could be incorporated into the outdoor museum for those people who don't want to visit the excavations or take the walking tour.

Hell Gap Condition Report: House: Dewey reported the house needs to be scraped, primed and painted, a new roof, and the septic system pumped out and cleaned. He suggested we could put Carl Belz's \$1000 towards this expense and obtain the rest through volunteer labor. While we have had volunteers working on the house in the past, Dewey wasn't sure if we needed to bid out for these services rather than relying on volunteers. George suggested putting siding on the building. Marcel didn't think we had the money to side the structure. Barb suggested grants exist for building repair if the building was to be used as a visitor's center. Janice reminded the board the house is currently used as a kitchen and dining hall for the crews at Hell Gap. The Board concluded the roof and painting need to be done this summer — and Dewey should solicit bids for this work. The septic system work should be done before the UW crews arrive in late May 2005.

Lease: It is coming close to time to renew the grazing lease on the Hell Gap property and Dewey suggests we give the lease to Albert Martin again. Albert pays the utility bills on two electric meters (and reads the meters) plus keeping an eye on the property as his lease payment. He therefore pays the utility bills when the UW Anthropology crews are working at the property. Dewey figures the cost is about \$600/year. Barb moved and Mary Lou seconded we renew the grazing lease to Albert Martin for the next five years. Motion passed unanimously by voice vote.

Locality III and V: George and Marcel were asked to talk to Ed Peterson about getting UW some form of agreement for access to Localities III and V.

Barb thanked George, Marcel, and Dewey for their donation of volunteer time — and reminded them they should be keeping track of the number of hours they spend maintaining the property.

Dewey suggested Albert Martin would be a good source of information about local history.

ESTABLISHMENT OF OFFICE OF EXECUTIVE TREASURER:

Over the past year the Board has discussed the establishment of an Executive Treasurer's office, since Barb Nahas-Keiry is willing to serve in such a capacity. However, in order to do this WAF has to revise its by-laws and also make sure the by-laws match with the Articles of Incorporation. Mary Lou suggested these changes be made over the next year with a vote to accept the changes be done electronically by the WAF board over the next year. Once is done, another Member-at-Large can be elected from the WAS membership and Barb can step into the job of Executive Treasurer.

Barb and Mary Lou will work on drafting the language in the By-Laws and work on synching the change with the Articles of Incorporation.

ELECTION OF OFFICERS:

All officers were retained in their positions for another year. Barb Nahas-Keiry was elected for another three year term as member at large from the WAS.

OTHER BUSINESS

Everyone was reminded the 2004 Summer Meeting would be held at Fort Laramie, July 24,

Mary Lou moved and George seconded for meeting adjourn. Chris adjourned the meeting at 8:42 a.m.

Dewey and Mark witnessed the signing of the lease agreement with Chris Lippincott and Barb Nahas-Keiry as signatories on the lease to Albert Martin.

SYMBOLISM AND RITUALISTIC USES OF THE BISON SKULL AMONG THE PLAINS INDIANS OF NORTH AMERICA

by
Jacquelin E. St. Clair

INTRODUCTION

Both the body and the spirit of the buffalo were highly involved in the lives of the Plains people. Discoveries continue to substantiate the fact buffalo skulls were used by many tribes in cultural, ceremonial and religious contexts. Evidence of these practices appears in a wide variety of ceremonies including; Sun Dance, Okipa, Massaum and Medicine Pipe ceremonies, sweat lodge rituals, in connection with successful hunting expeditions, and as a bolster to the warrior and the bereaved. The reverence shown the buffalo, as portrayed by the placement and use of the skulls, reflect a desire for assistance from something greater than self and intervention of a higher power in times of strife and conflict as well as an expression of thanksgiving.

Archaeological data show acts which may at first appear to involve merely the acquisition of food are, indeed, interwoven with spiritual beliefs and emotions. Bison kill sites have been investigated to gain information regarding hunting strategies and food appropriation. However, some of the sites have yielded additional information taking us beyond the procurement of food, widening our view to include religion, rituals and ceremonialism. The Cooper site (Bement 1999) offers early evidence of hunting ritual at a Folsom age (ca. 10,000 B.P.) bison kill site in the form of a red zigzag painted on the frontal bone of a bison skull. The Ruby site (Frison 1971), a Late Plains Archaic period bison pound, indicates the probable ritualistic function of a lenticular ceremonial structure. An arrangement of skulls at one end of the structure replicated the lens shaped form. The Vore site, a Late Prehistoric buffalo jump, supports the specialized treatment of skulls in several clearly circular ceremonial alignments, with most of the skulls exhibiting strikingly similar frontal openings of the brain cavity.

This account will focus on ceremonial and ritualistic uses of bison skulls by addressing the following topics; 1) the importance of bison to Plains Indian subsistence, 2) rituals employing skulls and circles as sacred symbols, 3) ethnographic accounts of ritualistic practices involving bison skulls, 4) archaeological evidence for sacred uses of bison crania and 5) a detailed analysis of the Vore site skulls and their notable circular alignment. The combination of these topics should provide a unique and useful document for anyone conducting related studies in the future.

To provide better understanding of the possible relationship between ritual activity and the opening of the brain case often found archaeologically in Late Prehistoric bison crania, background information must be reviewed concerning ceremonial use of bison skulls. This ceremonialism developed over time, being adapted from previous rituals as these people moved out onto the Plains. This review began by assembling a collection of ethnographic accounts of ceremonial and ritualistic activities using bison skulls. The importance of bison and the significance of the circle to native culture are noted. Emphasis is given to the strategic placement of bison skulls on tops of mounds, altars and staffs, outside sweat lodges, and in circular formations. Next, particular attention was given to the Vore site skulls noticing any selective treatment of specific bison from a population such as age or sex of individual animals. The Vore skull analysis will provide an opportunity to observe patterns of cultural behavior and selective activities concerning butchering procedures: the opening of the cranium from the front rather than the back and how this might relate to butchering and nutrition. Large scale study of patterning of brain-case opening should ultimately result in a more complete understanding of when this process be-

gan and why.

RESEARCH DESIGN

The Late Prehistoric Period ranges from 1700 B.P. to 200 B.P. The later part of this time frame also encompasses the climatic period known as the "Little Ice Age", which may have played an instrumental role. Evidence indicates this period consisted of cool moist climatic conditions. Such conditions most likely resulted in improved grass and increased bison populations, contributing to larger human populations who became increasingly more dependent upon bison for food clothing and shelter. This ultimately would have resulted in an increased need for more bison brains with which to tan hides so greatly needed for clothing and shelter.

Climatic studies from the Vore site support this hypothesis. The lowest five components at the Vore site are contained in varved sediments. The thickness of these varves is believed to be an accurate indication of past precipitation. These five separate bison-jumping events were chronologically arranged within the varved sediments. It was found these five kills occurred on an average of four to seven years after periods of maximum precipitation. One interpretation is periods of high rainfall improved grass and breeding conditions, resulting in a better calf crop. After three years, these calves were ready to bear young, resulting in a minor population explosion (Reher and Frison 1980:59).

The patterns presented here support the concept of selectivity for specific bison for butchering and brain removal. Nearly all specimens exhibiting frontal cranial openings, from both typical specimens and ceremonial samples, are young adult females. One possible explanation for this is young female bison are easier to manage in terms of skinning and butchering. Hides are smaller and easier to remove and skulls are thinner and easier to open. Another consideration in selectivity is the nutritional status of the bison herd. Burgett's studies of the Vore site limb bones indicate high quality meat and marrow were being targeted. Evidence also indicates most kills at the Vore site were late fall-early winter events, with a great proportion of male bison represented by limb bones. This may be informing us males, due to their reduced nutritional utility during this season, are not being selected as a source of meat and marrow (Burgett 1989:13).

Reher and Frison's (1980) analysis of the mandibles from the Vore site revealed male bison were represented in proportions ranging from 9% to 29% with a mean of 11% estimated for all excavation levels (Reher and Frison 1980:72-74). New data presented below also show most animals butchered at the Vore Site were young adults and mostly female. It appears based on size and degree of cranial fusion, size selection must have taken place.

GENERAL METHODOLOGY

Extensive research of ethnographic accounts which describe ceremonies, ritualistic treatment of bison skulls, reasons for opening bison crania, and a possible time frame for this, has been undertaken. Previous research papers written by the author on the anthropology of religion and the Vore site have provided background information for this study. A bison skull bibliography was prepared. Vore site analysis began with an inventory and organization of slides and photos paying special attention to skulls. Selections from this inventory were scanned and used to enhance and provide physical support for this thesis. A preliminary inventory was conducted of the Vore site bones which are housed in the University of Wyoming Archaeological Repository. Boxes were checked, counted, and returned to specific locations in the Vore room, sorted by content again, still with particular attention to the skulls. All complete and nearly complete skulls with measurable cranial openings were taken to the archaeology lab for further analysis. A skull coding format sheet was produced to record index number, provenience, age of specimens, size of cranial openings, and impact marks. Sketches were made of each skull making record of portions present and shading out portions missing. Skull measurements were taken.

Archaeological reports were extensively researched for additional documentation of the previously mentioned, paying particular attention to sites which may indicate specialized treatment or positioning of skulls such as those in the Vore (Reher and Frison 1980), Ruby (Frison 1971), Cooper (Bement 1999), Glenrock (Frison 1970) and Gull Lake (Kehoe 1973) sites.

The Vore site skull analysis consisted of measuring the length and width of the cranial opening, noting specific aspects or consistency in size

of opening, symmetry, patterning, green or dry bone breakage, and tool marks to support a ceremonial component to the skull butchery. Horn cores were measured, and fusion of cranial sutures was noted to ascertain approximate age and sex of individual bison to help determine if selective treatment for ritualistic activity was targeted toward specific groups in bison populations. Analysis of these data lends insight into the cultural and behavioral aspects concerning the relationship between bison skulls and ritual activity.

LIMITATIONS

The limitations of this study stem from insufficient documentation concerning the opening of the cranium, on both ethnographic and archaeological levels. Literary accounts are lacking specific information on religious as well as functional reasons for opening the brain case.

Archaeological reports are lacking somewhat, because the realization of the significance of analytic techniques such as taphonomy, detailed analysis of individual skeletal elements, and bonebed patterning have come to be recognized only within the last few years. Promised patterning of cranial openings is relatively recent and therefore not seen in many site reports. In addition, physical evidence of religious activity has not always been sought out or recognized in kill sites.

Additional information has been lost due to the destroying hand of time. Limitations on the analysis of the Vore site skulls include problems resulting from bone breakage and worn away catalog numbers; these too are consequences of the passage of time.

RITUALS AND CEREMONIES

The life of the American Indian is a vast mosaic of ritual symbolism. Hunting, warfare, dress, medicine, ceremonies, courtship and death are all dominated by ritual. Rituals are provoked by religious experiences and tend to become important components of culture. As Christopher Vecsey states, "Most rituals in tribal cultures are symbolic expressions of religious thought. They usually correspond to human needs and desires, and are instrumental in carrying them out" (Vecsey 1981:53). American Indian rituals exist as prayers, dances and songs, usually in solemn behavior repeated in certain situations, but always in relation to religious

beliefs.

It is important to note Plains Indian rituals were processes which changed over time. Behaviors characteristic of these cultures had more ancient roots. John H. Moore writes:

A nation is like a biological individual. It is *born* from the shared needs of possibly diverse people who group together out of self-interest. A nation has a *maturation* during which it tends toward uniformity of behavior and toward a homogeneity. But inevitably nations, like all social institutions, *die*, and they are fragmented into diverse groups that ultimately become other nations, with different languages, religions, and political structures (Moore 1939:14).

In *Belief and Worship in Native America*, Vecsey states it is vital to recognize religion does not consist of mindless rituals; it is not simply people going through mindless motions. Religion is based on beliefs and values both conscious and unconscious. These are the most important parts of a religious system, since they provide basic motivation for the action of religion; they make religion what it is (Vecsey 1981:xxi).

The Plains Indians include several tribes of people who migrated onto the Plains at some distant point in time. These tribes include the Arapaho, Assiniboine, Blackfoot, Crow, Cheyenne, Mandan, Pawnee, Shoshone, and Sioux. The geographical location of these tribes at approximately 1750 A.D. is shown (Figure 1). Much of the Plains Indian culture centered on religion. Nearly all they undertook began with and was influenced by this single base or source. In Indian life there was one inevitable duty—the duty of prayer, the daily recognition of the unseen and eternal. "Religion was not a matter of certain days and set observances, but was a part of his every thought and his daily life" (Steton and Steton 1963:5). Most likely this behavior originated with the belief one could be successful in all undertakings with the help of the force which ruled nature, nature's Creator. Likewise, when having success or receiving good things from the Creator, one should offer some part of this to the Creator in thanksgiving.

Clyde Kluckhohn, in *The Function of Religion in Human Society*, explains ceremonials tend

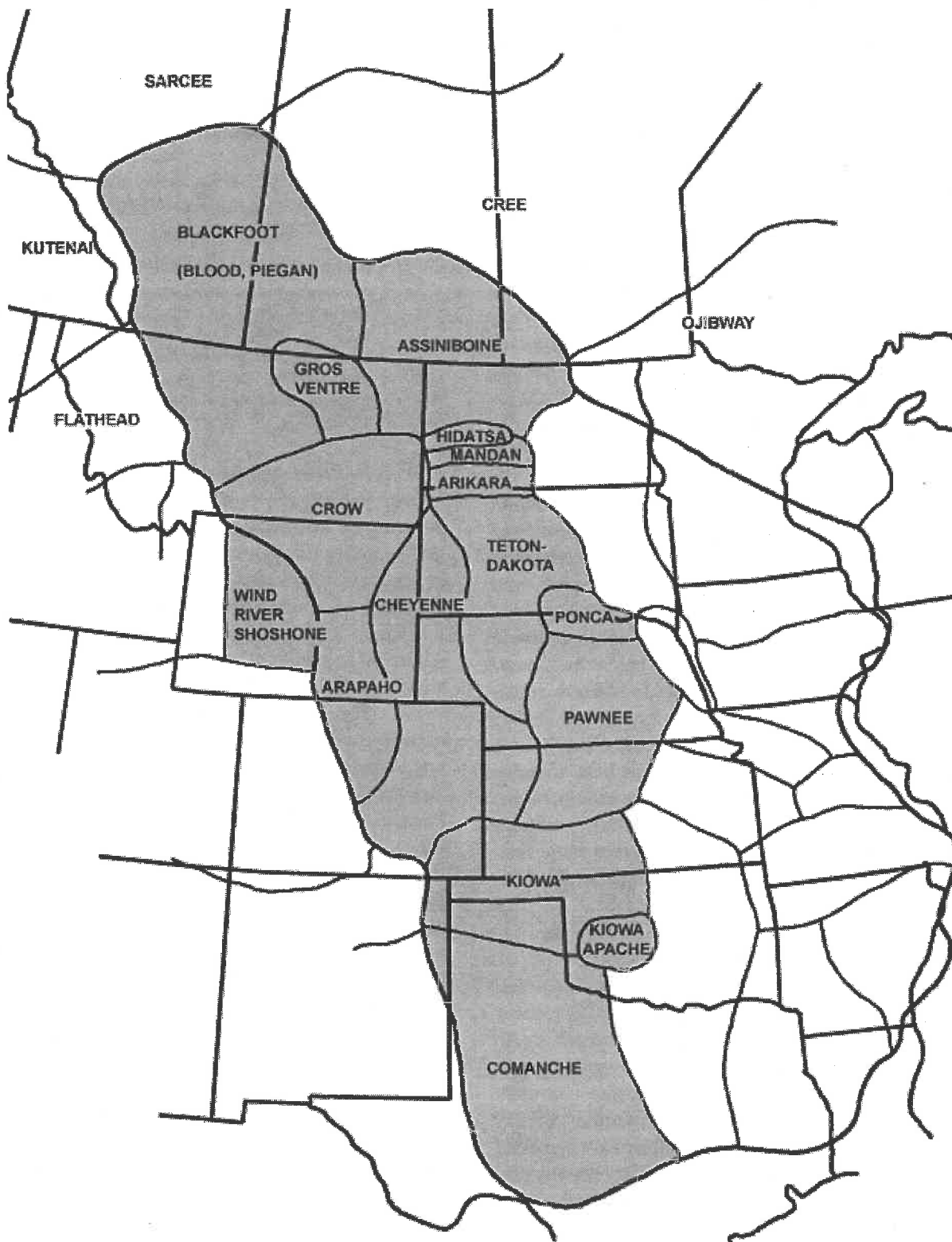


Figure 1: Map Of Tribal groups emphasized In this study (adapted from Verbicky-Todd 1984).

to portray a symbolic resolution of the conflicts which external environment and historical experience have caused to be characteristic in the society (Kluckhohn as cited in Lessa and Vogt 1979:78). This explanation also defines the behaviors in ceremony and ritual of the Plains Indians concerning the belief of showing proper, respectful treatment of the buffalo skull would result in continued protection against adverse conditions in the external environment than might otherwise be expected.

THE BUFFALO AS A SACRED ANIMAL

Buffalo figured prominently in the religious beliefs and ceremonies of the Plains Indians. They placed enormous importance on this animal because they were extremely dependent upon it for subsistence. Brooke Medicine Eagle emphasizes this point, writing, "The buffalo is seen as one who gives away everything for the people, and thus blesses them. The buffalo gave its body to the Native people not only for food, but for clothing, shelter, implements and many other things. It symbolizes serving others by giving of one's self" (Medicine Eagle 1991:44). The significance of and dependency upon Bison (buffalo) by the Plains Indians is further summarized by F. G. Roe:

I know of no other instance throughout the entire world wherein from one single source so many commodities of primary importance were derived. Among the really fundamental needs of mankind, there was practically none which buffalo did not furnish. It supplied food for immediate and later use, clothing, bedding, shelter, fuel, tools, weapons (in part), household furnishings, the means for person or ritual adornment and even the outer "ecclesiastical" symbols of worship (Roe 1955:602).

Thus, the buffalo was considered to be a sacred animal because it possessed everything necessary to life, both material and spiritual.

RITUALISTIC USE OF BISON SKULLS

The religious beliefs of the Plains tribes closely reflected their experiences in the natural world. The buffalo was extremely important to the survival of the Plains people and consequently had a prominent role in the religious life of the tribes, as exemplified in their ceremonies and rituals. This role was very evident in the mythology of the Plains Indians (Verbicky -Todd 1984:197). Various parts

of the buffalo were commonly used as ritualistic objects. The buffalo skull was eminent in numerous rituals, including the important ceremony commonly known as the Sun Dance. Most tribes used one or more buffalo skulls in the altar of the Sun Dance lodge (Verbicky-Todd 1984:228).

Sun Dance, Weighted Skulls and Okipa Rituals

Because hardships and the unexpected were so much a part of life, it is possible the Plains Indians began to believe personal suffering was involved in the receipt of supernatural power and favor. Suffering and testing became forms of thanksgiving since this proved beyond any doubt the sincerity of their gratitude to God for his response to their pleas (Mails 1991:59). The modes of suffering and testing included vision quests, fasting and the Sun Dance.

The Sun Dance has become one of the most important Plains tribal ceremonies. The specifics of the ideology and procedures vary considerably between tribes and from past to present. The Sun Dance ceremony was usually associated with an offering of pain to show the intensity of the sufferer's thankfulness. According to Spier (1921:459), the Sun Dance was offered throughout the Plains, except among the south and southeastern marginal tribes (Verbicky-Todd 1984:228). Howard Harrod made a thorough study of the Sun Dance rituals of four Plains tribes, the Arapaho, Blackfoot, Cheyenne, and Crow. Each tribe traditionally had a somewhat different reason for making a Sundance vow. The Blackfoot emphasize building sacred lodges as part of the Sun Dance activity. The Crow sacrifice was to fulfill vows of revenge for a slain family member or close friend. Themes of new birth, regeneration and renewal are central features of the Cheyenne ceremony. Rituals of renewal preserved the spiritual and physical well being of the people. The Arapaho focus on the offering of sacrifices of food, clothing and flesh (Harrod 1987:72, 129, 137,153). Skewers were placed through the skin of the chest or back of the supplicant who is then suspended in mid-air or attached on the ground to a center pole and required to dance or hang until the skin gives way. Other methods involved leaning backward while standing on the ground, rather than being suspended from the pole. The worshiper may gaze steadily at the sun while dancing in some of the ceremonies and

may also be associated with the piercing. As a rule all who perform important functions in the Sun Dance are required to spend several days in fasting and other purification ceremonies (Wissler 1974:121,124).

Another form of personal suffering involved the use of buffalo skulls attached to slits in the warrior's chest and/or back by ropes. In some cases the supplicant would drag heavy, sometimes weighted, skulls back and forth over a prescribed course. An older man served as an assistant, and after an agreed upon time, removed any skulls remaining attached to the sufferer. Thomas Yellow-tail, a Crow Indian and respected Sun Dance medicine man told of young men in search of medicine who had, "leather thongs attached to their backs and dragged seven buffalo skulls behind them, beseeching the seven buffalo bulls of the Great Dipper to give them plenty of horses and to aid them in wresting a gun from the enemy" (Voget as cited in Fitzgerald 1991:xxv).

Clifford Geertz noted in *Religion as a Cultural System* there are few, if any, religious traditions in which the proposition that life hurts is not strenuously affirmed and in some, it is glorified.

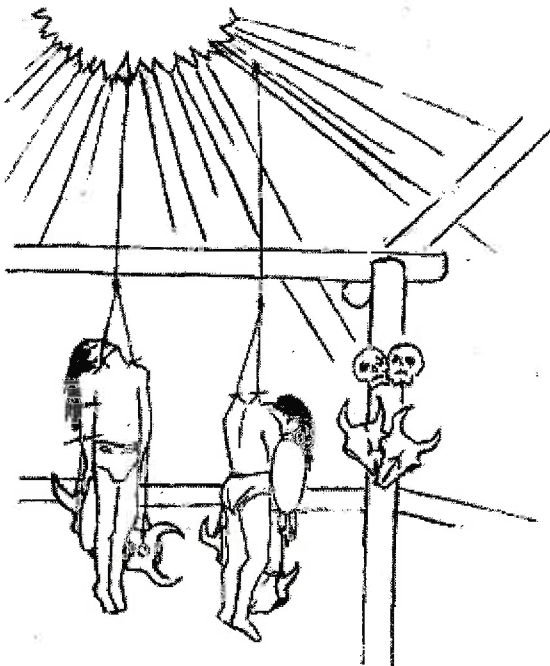


Figure 2. Sketch Of Okipa Ceremony (adapted from Catlin, as cited in Hassrick 1977).

As a religious problem, the issue is not how to avoid suffering but how to suffer, how to make physical pain, personal loss or other painful conditions, bearable and supportable (Geertz as cited in Lessa and Vogt 1979 :84). Thus we see the suffering of the Sun Dance is not a unique concept in religion and is, in fact, fundamental in human religious experience.

The Mandan had an intricate ceremony known as the Okipa which was not a Sundance but had some of the same elements, such as fasting, thirsting, tethering or suspending the dancers from the center pole by ropes attached to skewers inserted through the skin (Verbicky-Todd 1984:231). George Catlin has depicted this part of the Okipa in a well-known painting (Figure 2). At the altar in the Okipa lodge eight skulls were aligned, four on each side. Two of these were human, then two buffalo and on the opposite side of the altar, two more buffalo and then two more human (Bowers 1950:127). The skull placements may emphasize the critical interplay between human and bison.

The Massaum

During a battle, a Cheyenne leader might vow to observe a Massaum ceremony in exchange for victory. Grinnell describes a 1911 Massaum ceremony as encompassing four days. The parts of the ceremony centering on the buffalo skull are summarized as follows:

Preparation of the site occupies the first day. At daylight on the second day, the wife of the man offering the ceremony leaves the lodge to retrieve the sacred skull. All remain silent until she cries, "I have my hands on it," and those in the lodge begin to sing. She slowly walks back toward the lodge, alternately carrying and resting the skull on the ground through three more songs. She makes four motions forward with the skull and enters the lodge on the fourth, placing the skull on the ground. On the third day, other sacred objects are placed beside the buffalo skull with similar ceremony. If it becomes necessary to move the buffalo skull to arrange the additional objects, the precise location of the skull is marked in the ground so that it may be returned to the exact spot. The same four motions precede its being replaced on the ground. Upon the observation, on the fourth day, that the "buffalo should be dressed," the participants paint the skull with a black moon, a red crescent, and

a blue morning star and put grass in the eye and nose sockets in the same manner as it had been done by the "old ones" (Grinnell 1972:287-291).

The Massaum as described by Grinnell is a long, involved ceremony with several other sacred objects and rituals in addition to those involving the buffalo skull.

Medicine Pipe Ceremony

The Crow Indians used a buffalo skull as part of their Medicine Pipe Ceremony in which an initiate was adopted by a pipe owner and therefore also became a pipe owner. Often a man who was himself sick or had a sick relative vowed to be adopted if he or his relative recovered. At the initiation, the tyro and his wife hid in some tipi. Pipe-owners proceeded to search for the "children" with beating drums and singing. In front of them a man holding a ceremonial pipe led the procession, dancing. The rest all walked abreast with one participant on the extreme right carrying a painted buffalo skull slung over his back by a cord of sweetgrass. The party raised the door flap of one tip tipi after another in search of the "children" until they were finally found (Lowie 1956:271).

Sweat Lodges

The ceremony of the sweat lodge or purification lodge is a very basic rite, often done for ritual cleansing and purification at the beginning of much more complex ceremonies. The ritual of steam and radiant heat is produced by pouring water over heated rocks in a small willow and/or hide enclosure. This ritual is still performed today. The symbolism of purifying steam is probably associated with breath and smoke, both sources of life (Harrod 1987:72).

Many tribes considered sweating a necessary purification and required a sweat before allowing participation in an important ceremony. Several tribes placed a buffalo skull on a mound of earth in front of the sweat lodge. Before coming into the sweat lodge, warriors offered prayer before the buffalo skull outside the entrance (Capps 1973:136). A pipe was smoked to the sweat lodge skull beseeching it to rise, cover itself with flesh and come to life to present the tribe with meat for their kettles and skins for their lodges. During ceremonies inside the sweat lodge, warriors sometimes sliced sacrificial bits of skin from their arms or legs

which were later deposited under the buffalo skull at the sweat lodge entrance (McHugh 1979:114).

Among the Blackfoot, the shape of the hole dug in the center of the sweat lodge for the hot stones could vary, depending on the type of ceremony for which the sweat was taken. A triangular shape represented the heart of the buffalo and was used for the medicine pipe ceremony while a rectangular hole represented the head (Wissler 1912:146, 155).

The circular form of the Sweat Lodge is reflective of sacred space where significant events and experiences once occurred. The construction of the Sweat Lodge elicited the ideas from oral traditions and so was probably quite meaningful to the people (Harrod 1987:129).

Hunting

The outcome of a buffalo hunt was so vital to the Plains people it could hardly be left to chance. Indians prayed to their Spirit Power to send the herds near to their camp, to cause them to enter a trap or fall to their hunters. Success in their efforts was attributed to strict observance of their ceremonial procedures and failure to some defect or omission in the ceremony. The significance of hunting success is indicated by examples such as the winter of 1871 being marked on the Sioux calendar by the most significant event of the season: "Buffalo Ceremony Failed." (McHugh:52). We have no further information about this particular event, but we can assume a buffalo hunt was unsuccessful and the ceremony preceding it was flawed or otherwise not satisfactory.

The Pawnee's success in hunting depended in part on the care and respect given to their "buffalo staffs." These were slender spruce poles wrapped with red and blue streamers and decorated with beadwork and eagle feathers. Priests and shamans fasted for several days, then inside the medicine lodge and in the presence of twelve buffalo skulls, prayers were offered for success in the hunt and, the bows and arrows to be used as well as the buffalo staffs were blessed (McHugh 1991:53).

Buffalo skulls were part of the highly successful system of "impounding." McHugh (1991:64) provides a composite description of the more commonly used methods of impounding in his book *The Time of the Buffalo*. A corral was built in a hollow between two hills or in a clump of trees,

obscured from sight. Extending in a 'V' from either side of the entrance were two wings of spaced stations manned by camouflaged Indians. When it came time for the actual hunt, men would conceal themselves in the stations, creating living fences. When the corral and wing stations were complete, a shaman consecrated the venture. In the center of the corral he placed a tall pole and from the pole hung charms to attract the herd—a streamer of red cloth, a piece of tobacco and a buffalo cow's horn. At the foot of the pole he placed two buffalo skulls painted red and adorned with feathers. When the pound was consecrated, the shaman sent four scouts after the buffalo. Eventually the herd was lured to the corral where the hunters waited.

Final Ritual

After a successful drive, slaughter, butchering and feasting, the Blackfoot held a final ritual in which the hide of the buffalo herd leader was given to the pound master to wear (Verbicky-Todd 1984:230). All the meat of this lead bull was butchered and eaten like any of the other meat except the head. The nose and mouth of this head were stuffed with grass and put in a high place. At impoundments, the head was put on a corral post at the gateway. At jumps, the buffalo leader's head was put on the cliff edge nearby. It was a sacrilege to let children play near the head or for anyone to disturb it (Kehoe 1973:187).

In conclusion, the above examples illustrate some of the ceremonial and ritualistic uses of the buffalo skull among the Plains Indians. The persistent appearance of the buffalo skull in a wide variety of ceremonies seems to signify the interplay and deeply rooted importance of the buffalo to the people of the Plains culture.

In *Renewing The World*, Howard Harrod writes:

The kinds of tribal institutions which developed upon the Plains also reflected the interrelationship between humans and buffalo. Tribal life was characterized by a rhythm of uniting in the summer months and dispersing during the winter months. During the summer months the buffalo moved in great herds across the Plains. Corporate hunting was required during this period if a food supply sufficient to last throughout the winter was to be gathered. Likewise, larger numbers of people

were required to dry the meat, prepare the skins, and fashion needed utensils and implements. Thus evolved the tribal hunt and division of labor in preparing the products of the chase (Harrod 1987:8).

BISON SKULLS AS SYMBOLS

Sherry Ortner in *On Key Symbols* has provided a typology analyzing key cultural symbols. She defines symbols as vehicles to understand cultural meaning, and also provides a means of identifying key symbols in a society:

1. The natives tell us X is culturally important.

2. The natives seem positively or negatively aroused about X, rather than in-different

3. X comes up in many different contexts.

These contexts may be behavioral or systemic: X comes up in many different kinds of action situation or conversation, or X comes up in many different symbolic domains (myth, ritual, art, formal, rhetoric, etc.)

4. There is greater cultural elaboration surrounding X, e.g., elaboration of vocabulary, or elaboration of details of X's nature, compared with similar phenomena in the culture.

5. There are greater cultural restrictions surrounding X, either in sheer number of rules, or severity of sanctions regarding its misuse (Ortner as cited in Less and Vogt 1979:93)

The bison skull as a key symbol meets all of these criteria and is identified and described as such throughout this paper.

SKULLS AS KEY SYMBOLS

Symbols which embody themes or patterns (keys to understanding) may be categorized according to their primary uses in thought and action. By distinguishing between symbols that summarize and those that elaborate, the ways in which symbols operate in relation to a culture's worldview or actions become clearer. Ortner proposes a continuum in which summarizing symbols are on one end of the line and elaborating symbols are on the other. Summarizing symbols are those thought of as sacred. They are objects of reverence and can contain a conglomerate of feelings and ideas. Elaborating symbols enable one to sort out feelings or ideas, making them clear to one's self and communicable to others. Elaborating symbols are frequently not sacred but translate to orderly action.

Their key status is indicated by their recurrence within the culture being studied. Elaborating symbols can then be divided into root metaphors or key scenarios. Root metaphors are symbols relating to many aspects of the culture. Key scenarios can be rituals. They also can help to create goals and suggest actions to achieve these goals. The key scenario category can have actions, objects and entire events within it (Ortner in Lessa and Vogt 1979:92-97).

The skull as a key symbol meets Ortner's criteria all along her continuum. On the summarizing end, where the symbol is sacred, an object of reverence, we see the skull included in prayer and blessings.

An example of the skull as a summarizing symbol can be seen in the Plains Cree activity where a single bison skull oversaw group confessions. A man would place the skull in his tipi, call his friends together and ask them to tell about their illicit sexual relations. Fearful of the power of the skull, the men would tell their stories truthfully, knowing disaster awaited liars and those not confessing would likely be killed in the next battle (McHugh 1991:115).

On the opposite end of the continuum is the key scenario. The key scenario defines behaviors appropriate to successful living in a particular culture. It tells how to act. This is illustrated in a traditional story, a Pawnee myth widespread among the Plains tribes:

One day a hungry coyote was traveling over the prairie looking for something to eat. As he went along he sang a song about how much he would like to run down a few buffalo and have a nice meal. Suddenly his singing was interrupted by a loud shout, "Stop singing and dancing around my station!" Coyote looked around and saw that the command came from a buffalo skull. Coyote answered, "Who are you that I should be afraid?"

The skull began to march like a robot (sic) after the coyote and after a while caught him and ate him as well as most of the inhabitants of a village. Only one Indian girl escaped and fled from the village even though the skull chased her. At last the girl arrived in front of a little hut. There the skull met his defeat. Living in this little hut was a boy with special powers. He spit a little blue bead from his mouth at the

skull. The bead struck the skull and the skull was killed.

The Pawnee story-teller then warned his listeners that buffalo skulls have supernatural powers and must not be called names and certainly must not be kicked around (McHugh 1991:133). This story was told to inspire awe and respect for the buffalo skull, and to provide a guide for action in times of uncertainty.

Along Ortner's continuum we can find objects of less intensity and importance. For example, among the buffalo skulls at the Sundance altar of the Cheyenne was a specially decorated skull whose colors and designs bore ritualistic significance. The priest who painted the tribal skull drew a black line down the front with two narrower white lines down either side; the eye sockets and nasal cavity were filled with three neatly formed plugs of grass. He then painted the remainder of the skull red. The paint of the skull symbolized the earth, and the grass plugs, vegetation; the white lines represented day, and the black ones night (McHugh 1991:112-113). This ritual would fit around the middle of the continuum. The representations are not sacred but are an elaborating system which helps in the contemplation of the environment or universe. They are straightforward representations, still they are symbolic.

Other tribes also painted skulls symbolically. Wissler (1918:250,252) reported a skull painted with red spots on one side and black spots on the other and sagegrass inserted in the nose and eye-sockets. George Dorsey watched a skull being painted for a Cheyenne Sun dance. He described a black line about one inch wide being painted down the center of a skull. On either side of the black lines, narrower white lines were painted parallel to it and then the rest of the skull, including the horns was painted red. The white line represented day and the black, night. The red symbolized the earth. The painter then put a solid red circle on the right jaw, representing the sun, and a black crescent, symbolizing the moon, making four passes with his finger before he began painting these two symbols (Dorsey 1905:96-97). The Pawnee place a bison skull painted red on the altar during their Thunder ceremony (Figure 3). There is a rectangle painted between the eyes to represent the garden

of the evening star and lines are drawn emanating from the nose to signify the sun's rays (Murie 1981:56).

Sacred traditions were preserved, reinterpreted, and mediated through elaborate ritual processes. By participating in these ritual processes, powerful religious and moral sensibilities were evoked in the experience of the people. Basic in this context are root symbolic forms which encode the fundamental meanings borne in the oral traditions and enacted in ritual processes (Harrod 1987:1).

Circles and Skulls

The circle is a sacred symbol common to many native cultures; American Indian cultures are no exception. Circular shapes can be found in dwellings, ceremonial structures, village layout patterns, geographical directions traced in ceremony, sacred objects such as shields and hoops representing the eternal circle of birth, life and death. It is said the line which creates a circle never ends, just as the circle of life never ends.

Black Elk, a famed Ogallala medicine man, explained his feelings about the circle through author John Neihardt (1972:165): "The life of a man

is a circle from childhood to childhood, and so it is in everything where power moves. Our tepees were round like the nests of birds, and these were always set in a circle, the nation's hoop, a nest of many nests."

Sioux writers Lame Deer and Erdoes state:

To our way of thinking the Indian's symbol is the circle, the hoop. Nature wants things to be round. The bodies of human beings and animals have no corners. With us the circle stand for the togetherness of people who sit with one another around the campfire, relatives and friends united in peace while the pipe passes from hand to hand. The camp in which every tipi had its place was also a ring. The tipi was a ring in which people sat in a circle and all the families in the village were in turn circles within a larger circle, part of the larger hoop which was the seven campfires of the Sioux, representing one nation. The nation was only a part of the universe, in itself circular and made of the earth, which is round, of the sun, which is round, of the stars which are round. The moon, the horizon, the rainbow-circles within circles within circles, with no beginning and no end (Lame Deer and Erdoes 1972:100).

Because the circle is a reoccurring symbol in American Indian life and religion, it should not be surprising we find skulls placed in circular patterns. Examples of this will be discussed in the following sections.

Sketches and paintings are also forms of documentation. George Catlin has sketched a Mandan cemetery in which corpses are wrapped in buffalo skins resting on top of scaffolds, all with their feet toward the east, facing the rising sun (Figure 4). After the remains decomposed, the bleached skulls were gathered and arranged in a large circle, similar to the Assiniboine traditions, but decorated with staffs and a pair of buffalo skulls in the center of the circle. In a more "popular" format, Mails (1991:184) states:

"When scaffolds decayed and fell to the ground, the nearest relations buried the bones of the body. Often the skulls were buried too, but the custom of many clans was to lay them out in circles of a hundred or more on the prairie, placed some

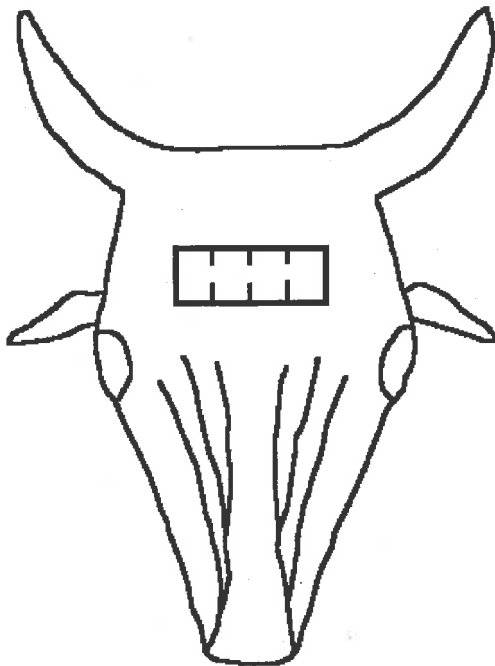


Figure 3. Sketch of Pawnee painted skull, (adapted from Maurie 1981).

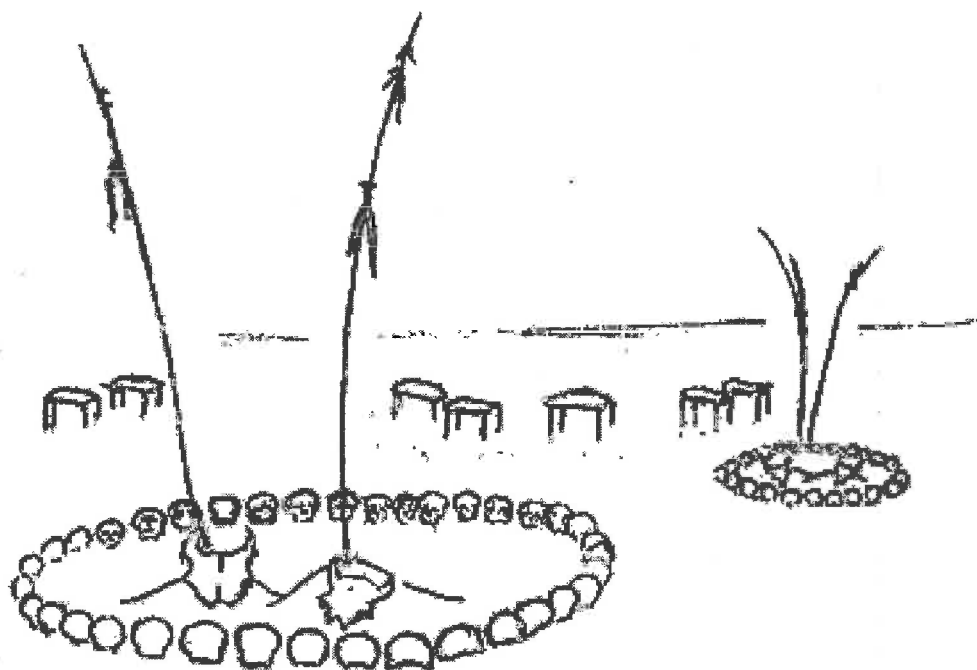


Figure 4. Sketch of Mandan cemetery (adapted from Catlin, as cited in Hassrick 1977).

eight or nine inches apart with the faces all turned toward the center; where they were diligently protected and preserved in their precise positions from year to year, as objects of religious and affectionate veneration. Several of these circles of twenty or thirty feet in diameter were seen on the plains by whites. In the center of each ring was a mound some three feet high, on which rested two buffalo skulls, a male and a female; and in the center of the little mound was a medicine pole." Mails (1991:184)

Murie (1981:443) relates a Pawnee story of a hunter who came upon buffalo skulls and recognized it as a holy place because of the circle formation. After smoking, passing his hands over each skull, and praying, he went a little further away to mourn. He then discovered a herd of buffalo, including a white one and a bull. He rejoiced over the herd sighting as living proof of his accepted reverence and prayer.

ADDITIONAL FUNCTIONS OF THE SKULL

Other uses of buffalo skulls may or may not be symbolic. Skulls have been used as site markers. Skulls have been used for sleds and ice skat-

ing, recreational use, probably without any religious overlay. They have also been used as mementos of significant times or places.

APPEARANCES OF SKULLS IN OTHER SETTINGS

Crow Chief Tip of Fur directed stampedes of buffalo over a cliff at the confluence of Hoodoo Creek and Dryhead Creek about 1865. After the butchering, the chief ordered all the severed heads be piled at the foot of the cliff. This site was used on many occasions afterward, and in time there was a vast accumulation of skulls or dried heads at the place. The Crows called this site, "The Place of Many Dry Heads" and for this reason the creek was eventually named Dryhead Creek (Medicine Crow 1992:87). Dryhead Creek is located on the present Crow reservation in Montana.

A form of ice-skating was a recreational use of the buffalo skull. A boy seated his girlfriend on a skull, looped a rope through the nostrils, and towed it over the ice (McHugh:108). An Arapaho youth about to join his first war party suspended a buffalo skull at the top of the medicine lodge in anticipation he would be successful in the upcoming raid.

The buffalo skull placed in the center of

the circular rock alignment known as the ancient Medicine Wheel in the Big Horn Mountains is said to be a symbol of the sun. Perhaps the rationalization is the buffalo is a giver of life as is the sun. Even though there is no longer a skull in the center of the Medicine Wheel, older photos provide evidence there was once a skull there.

Medicine bundles, a collection of sacred objects which have significance to tribes, clans and societies, have been reported to contain complete or partial bison skulls.

Burials

The buffalo skulls revered in life often served the Indians after death, continuing their watch at the burial ground. Frequently, the same skull painfully borne in the Sundance, and then placed over the doorway of the warrior's lodge, followed him to his burial place. Buffalo skulls have been found in a variety of burial contexts. Burials on scaffolds, in mounds, caves, and tombs have been discovered accompanied by buffalo skulls.

The Pawnee propped the body of a deceased warrior in a sitting position and surrounded it with a shelter of tightly woven reeds and branches, to keep out wolves. To mark this tomb, they added some buffalo skulls which were painted red.

The Assiniboine laid out their deceased on burial scaffolds. Frail in construction, the structures eventually weakened with age and collapsed, dumping the sun-bleached bones to the ground. Relatives then gathered the remains, burying most of the bones and setting the skulls aside for totemic remembrance. After accumulating a number of these skulls, they placed them in a circle on the open prairie with the faces turned toward the center. To complete the circle they added a medicine pole and several buffalo skulls. The circle was respected and tended with care (McHugh 1972:115).

BRAIN CASE OPENINGS

To examine archaeological aspects supporting the use of bison skulls in rituals, we will now turn our attention to the opening of the brain case. Archaeological evidence exists for the extraction of the brain from the buffalo skull; this cranial opening could be the result of killing or may have been made intentionally to remove the brain. There is no question buffalo brains were used in food, tanning and perhaps other reasons.

FUNCTIONAL REASONS

Stephen Irwin (1994:166) reports:

At the kill site, the frontal bone of the buffalo was bashed in with a stone maul so the brains could be scooped out and mixed with the blood that pooled in the chest cavity after butchering. This concoction was then stone-boiled by placing hot rocks in the cauldron formed by the rib cage. When the mixture congealed it was ready to eat (Irwin 1994:166).

McHugh (1972:85) describes the butchering of the kill as a tumult of cutting and slashing of carcasses, shouting, quarreling and laughing with neighbors. Most of the Indians snacked on raw morsels taken still warm from the slain buffalo. Hunters bashed holes in the tops of skulls and scooped out the fresh brains.

These versions allude to frontal openings of the brain case. A third report details the butchering process by an analysis of the bone from a Montana Bison kill where the skull was turned up-side-down and the mandibles and tongue removed, then the brains were taken out by smashing the basal section of the cranium (Kehoe and Kehoe 1960:422).

At the Gull Lake site, (Kehoe 1973:152) discusses two ways of butchering the skull to extract the brain. One was through the frontal bone and the other through the base of the skull.

The Glenrock Buffalo Jump also provides evidence of variations in the manner of brain removal. The most common method was to "chop" a hole in the frontal bones between the horns. These holes were in the center or near the center of the skull. Some brain cavities seem to have been entered by way of injuries probably caused in the fall. Some skulls offer no evidence of brain removal at all (Frison 1970:25). It is reasonable to assume many animals injured in the fall were probably killed by a hard blow to the head. Anomalies of the skull fracture are most likely reflective of the type of tool used in striking the skull. Wissler (1910:37), in the description of a Blackfoot drive, states the fall maimed some of the buffalo and the others were shot as they milled around the enclosure. When all were down, the struggling ones were dispatched by striking their foreheads with stone mauls.

In his discussion of the Piney Creek site excavations, Frison notes there is the possibility women killed crippled buffalo with mauls, or dying animals received a final blow with a grooved maul or other device (Frison 1967:32).

Buffalo brains were also removed for tanning. It is said nothing can equal the texture of a brain-tanned skin. The brains break down the glycerin of the hide to soften it and plump up a hide to make it thicker and have a spongier texture. The Blackfoot women "soft-dressed" hides by rubbing an oily mixture of animal brains, fat and liver into the hide with their hands (Verbicky-Todd 1984:190). The Sioux dried brains and moss together into cakes to store for use when fresh brains were not available. Smooth stones were used to help work the brain mixture into the skins for tanning (Belitz 1995:9).

CEREMONIAL REASONS

Killing, eating and tanning are functional reasons for opening the brain case. There may be ceremonial implications as well, however, very little documentation has been found on the subject. At the Big Goose Creek site, Frison et al. (1978:10) state opening the brain cavity from the front may have resulted from some ritual or ceremonial treatment of certain animals as well as a by-product of butchering. While not discussed by Frison, some questions have been raised as to whether this opening might also be a "letting out" or spiritual release of the animal.

ARCHAEOLOGICAL EVIDENCE OF EARLY RITUALS INVOLVING BISON SKULLS

Excavations of some bison kill sites have yielded evidence of early rituals using bison skulls. In these locations the bison skulls are a cultural depiction of ceremonialism rather than merely one of subsistence. Some of these sites include the Cooper site (Bement 1999), Ruby Bison Pound (Frison 1971), and the Vore site (Reher and Frison 1980).

COOPER SITE SKULL

This Folsom period site is located along the flood plain margin of the Beaver River in north-western Oklahoma. The Cooper site is a relatively recent discovery providing evidence of ritual in Paleoindian culture. Excavation revealed a painted bison skull strategically placed on top of a bone

bed in the lowest of the three bison bone deposits. Bement notes the skull was not painted at the time of the bison's demise but after time allowed nature to clean and bleach the skull. The painting was done with red ochre, a pigment frequently chosen in ritualistic activity. This delayed use of the skull and the choice of a zig-zag design on the forehead indicate a desire to use the skull in a special way. Also, the skull was placed so the zig-zag design was visible from all areas of the bone bed. As Bement noted: "Zig-zags and circles are common designs drawn by shamans following entopic experiences often associated with rituals" (Bement 1999:181).

The Cooper site skull has been identified as the oldest painted object in North America (Bement 1999:4). Estimates of the age of the site, using a combination of radiocarbon dating, index artifacts, stratigraphy and bison species identification, range from 7020 ± 120 to $10,050 \pm 210$ B.P.

TREATMENT OF SKULLS AT OTHER SITES

The Ruby Bison Pound is a Late Plains Archaic Period bison procurement site. Post holes reveal the outlines of the corral complex, but nothing remained of the actual structure. This lenticular structure is believed to be ceremonial in nature. Next to the structure were intentionally placed "arcs" or portions of circles. Around the south end of this structure, and aligned in a curvilinear pattern, were six buffalo skulls lacking the mandibles. Two other skulls gave the impression of having originally been part of the same pattern but had been subsequently moved. No holes were found in the fronts of the bison crania, and deterioration may have obscured evidence of brain removal.

The Glenrock Buffalo Jump (Frison 1970) is a late Prehistoric Period bison procurement site. It is located along the North Plate River in east-central Wyoming, where a scarp several miles long forms several perpendicular drop-offs. At a number of locations along the scarp used in various jumping operations are stone circles believed to have a ritualistic or ceremonial function. One is located near the final drive lane; another is on a rise overlooking the jump, in a position where much of the driving operations could be observed. Several skulls found here exhibit frontal cranial openings very similar to those at Vore; however there does not appear to be any ceremonial or intentional

placement of skulls.

Vore Site

The Vore site is a Late Prehistoric Period buffalo jump in the Black Hills of northeastern Wyoming (Figure 5). The site is in a natural sinkhole or karst-like feature. This site is believed to have been used by several cultural groups possibly including Arapaho, Cheyenne, Crow, Kiowa, Kiowa Apache, Shoshone, and Lakota.

The Cheyenne Medicine Blanket is a buffalo robe which may contain reference to the use of the Vore buffalo jump by the Northern Cheyenne. This robe was once owned by a Cheyenne Medicine Man named "Caller of the Game." It is embroidered with a number of patterns worked in colored porcupine quills. The most important figure on the robe is a representation of a "natural pit" in the Black Hills which was used for trapping buffalo. The robe was used ceremonially by Caller of the Game to give the hunters power over the bison during preparation for the drive, as well as the drive into the pit (Wildschut 1926:33).

Most of the information about this robe was provided by a Cheyenne named "Limpy" in 1925. Limpy remembers as a boy, nearly 60 years before the written account of 1925, he had seen as many as three hundred buffalo driven over the edge of this pit. The robe is believed to have played such an important role in the early history of the Cheyenne, it was always given a prominent place in the Sun Dance and other important tribal ceremonies (Wildschut 1926:33).

The cultural stratigraphy of the Vore buffalo jump consists of superimposed bone levels beginning about 1.2 meters below the floor of the sink and extending to 5.2 meters. At least 22 levels have been discovered, making this one of the largest known buffalo procurement sites on the Plains. The entire bone deposit was apparently laid down between A.D. 1500 and A.D. 1800 (Reher and Frison 1980:1).

Unique features of the Vore site include circular alignments of buffalo skulls. This intentional arrangement and circular form clearly indicate the extreme likelihood of ceremonial function (Figure 6). Reher and Frison write "The three skull features cross cut by excavation units were of a different character than other butchered and stacked bone and deliberately arranged in curving or circu-

lar fashion, usually with the nose pointed inward" (Reher and Frison 1980:19). The authors also commented given the weight of green buffalo skulls it is unlikely 40 or 50 skulls would have been arranged by children or as the result of butchering.

The clearly circular arrangement of bison skulls in the main, most well preserved area was composed of an outer circle and an inner circle. The inner circle was closely packed with the outer circle having intervals between paired skulls. Most of these skulls are facing inward and exhibit strikingly similar frontal openings of the brain cavity.

Vore Site Skull Analysis

My investigation of the Vore site skulls began with measurements of selected specimens. Specimens were selected for completeness and existence of an apparent, well defined cranial opening. Some measurements were estimated using length/width dimensions $\frac{1}{2} \times 2$ formulas. On broken specimens, these were noted in bold type on the "data sheet." From these 22 specimens, skull measurements were taken in several areas such as Height of Cranial Opening, Width of Cranial Opening (see appendices A and B for definitions and diagrams). All measurements were taken with a millimeter measure. Photographs were taken of each skull using 100 ASA, 35 mm color print film on a blue gray matte board background (Figure 7).

Measurements of the skulls from the ceremonial circle were taken from computer scanned photographs because none of the physical specimens were retrievable, or because the few specimens on hand could not be confirmed as being the same as those in the excavation photographs with absolute certainty. Photographs of the North and East Units containing the ceremonial circle were scanned with HP Deskan and measured using the Sigma Scan Pro Software program (Figure 8). Measurements were taken in pixels (Figure 9) and estimates were made to convert pixels to millimeters using averages and actual measurements from the nearest comparable specimens for size, age, sex, and cranial opening. In every case estimates were very near 3 mm. per pixel, for three conversions used for each cranial measurement in the ceremonial circle. These were,

Conversion 1: **2.92** pixels, obtained by taking an average of

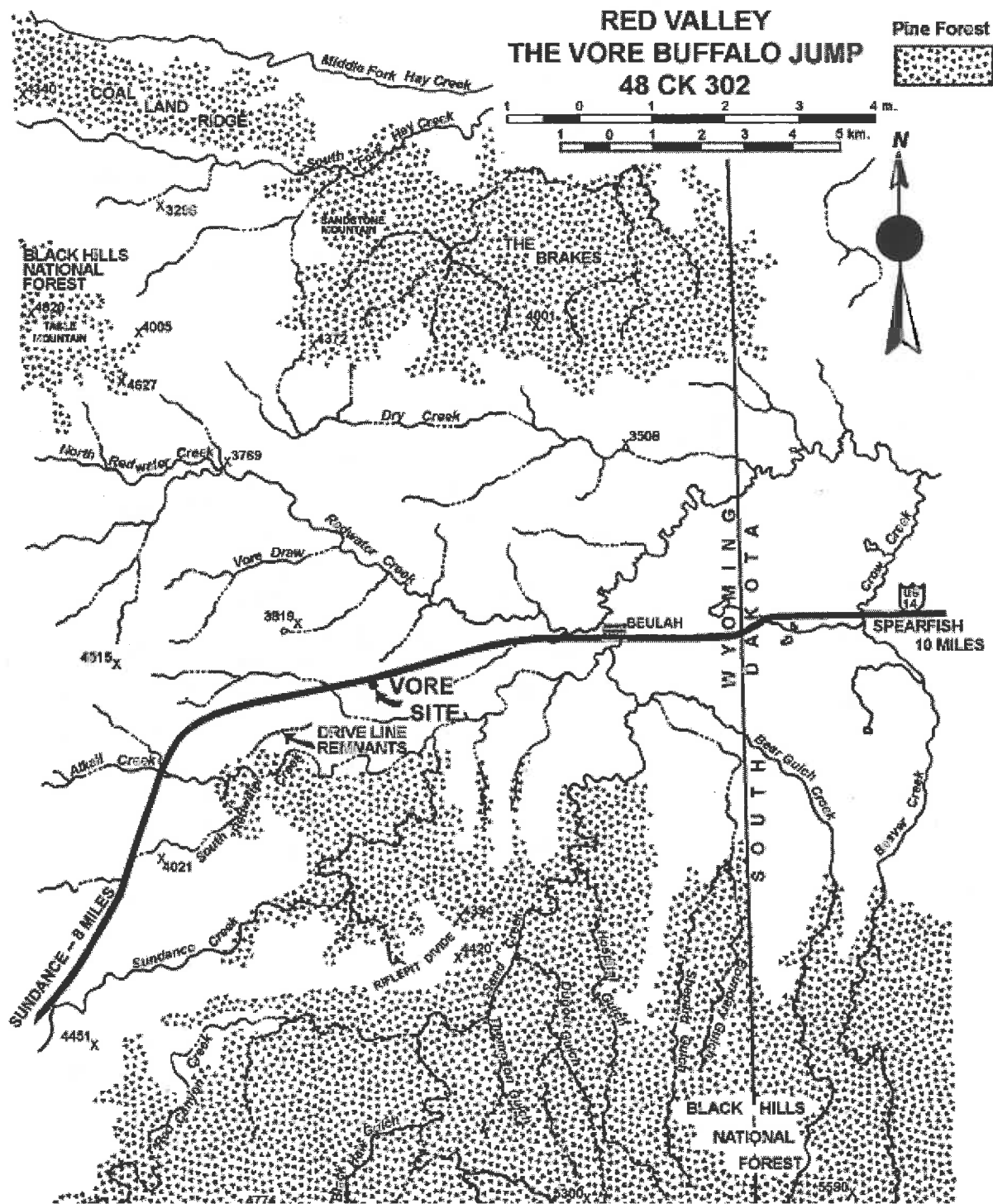


Figure 5: Map showing Vore site location (adapted from Reher and Frison 1980).

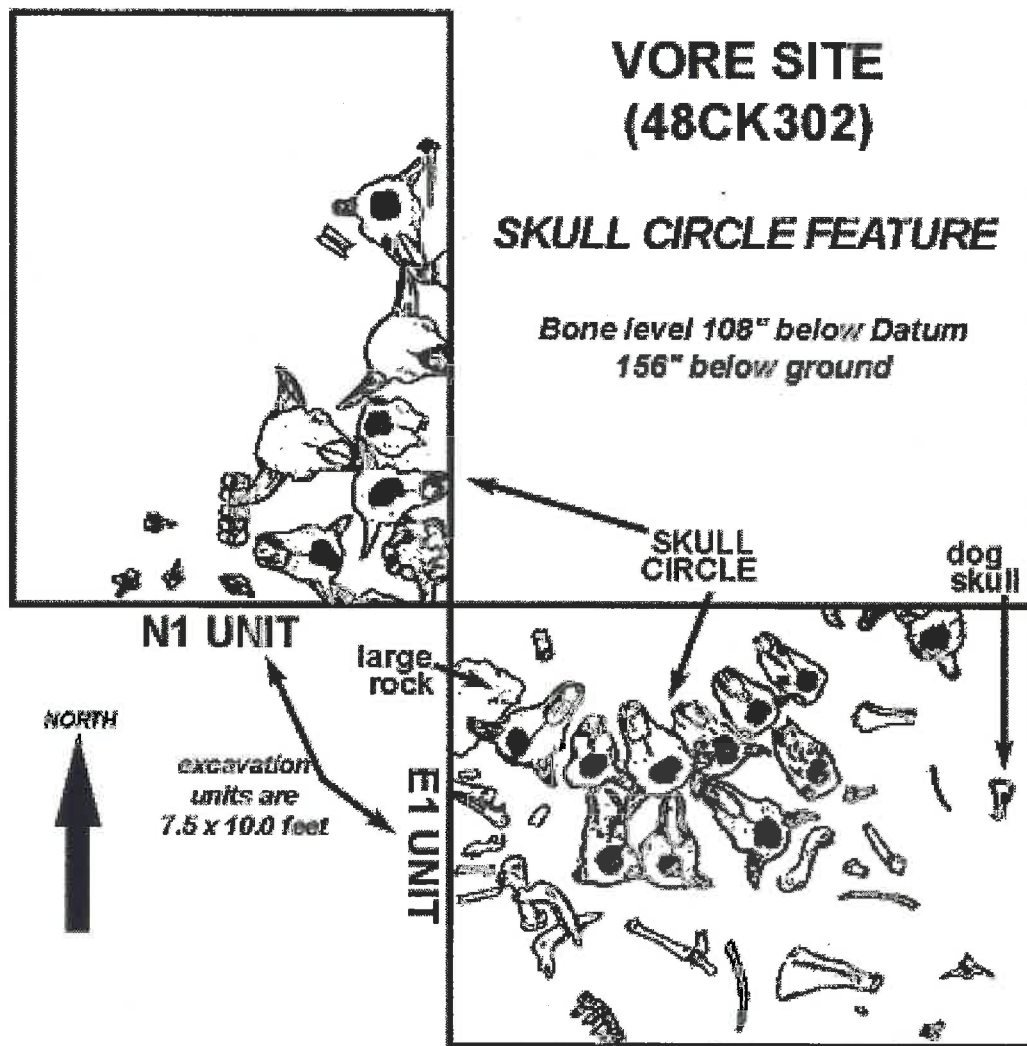


Figure 6: Ceremonial buffalo skull circle at the Vore site (adapted from Reher and Frison 1980).

Greatest Postorbital Breadth measurements for 35 Vore skulls, 91.44 mm, actual measurements of specimen 13 and the Greatest Postorbital Breadth measurement from skull N2 equaling 267 pixels.

Conversion 2: 3.05 pixel/mm was arrived at using Height of Cranial Opening measurements from skull 19, 110 mm, and Height of Cranial Opening measurement of 36 pixels from ceremonial skull N1.

Conversion 3: 3.14 was obtained

using Width of Cranial Opening measurements from skull 20, 100 mm, and Width of Cranial Opening measurements from ceremonial skull E3 at 309 pixels.

Each conversion was used to convert all pixel measurements to millimeters. Height of cranial opening and width of cranial opening were graphed for conversion 1 (Figure 10), conversion 2 (Figure 11), conversion 3 (Figure 12), and for all three conversions, 1, 2, and 3 combine (Figure 13).

Cranial indices were also created as an-

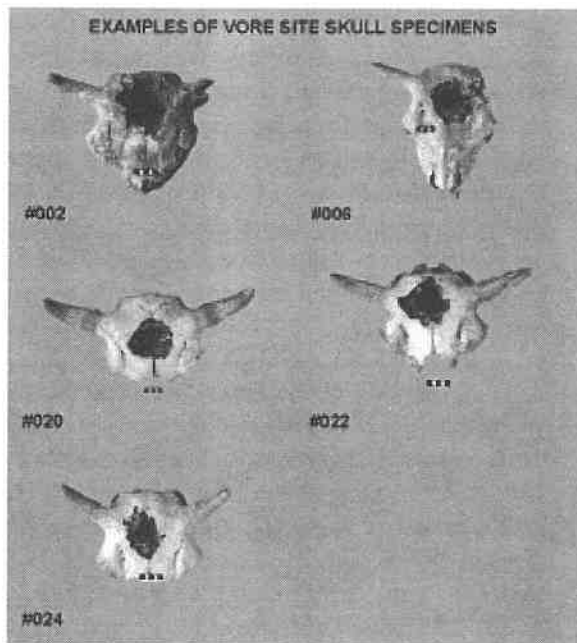


Figure 7: Examples of Typical Vore site bison skulls.

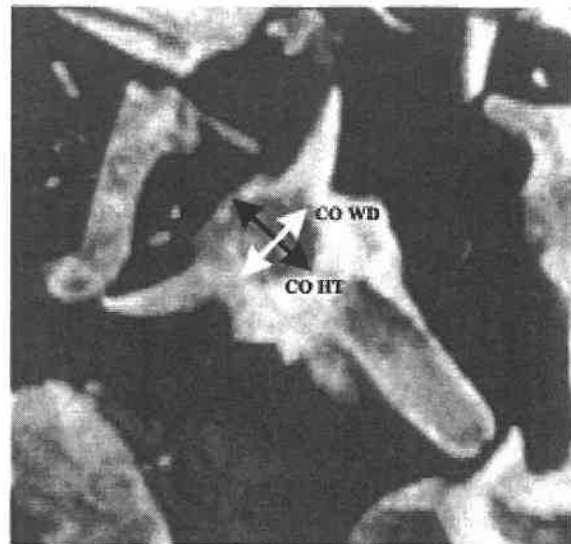


Figure 9: Scanned photo of Vore site Bison skull from East Unit, within Ceremonial Circle, showing methodology used for pixel measurements.

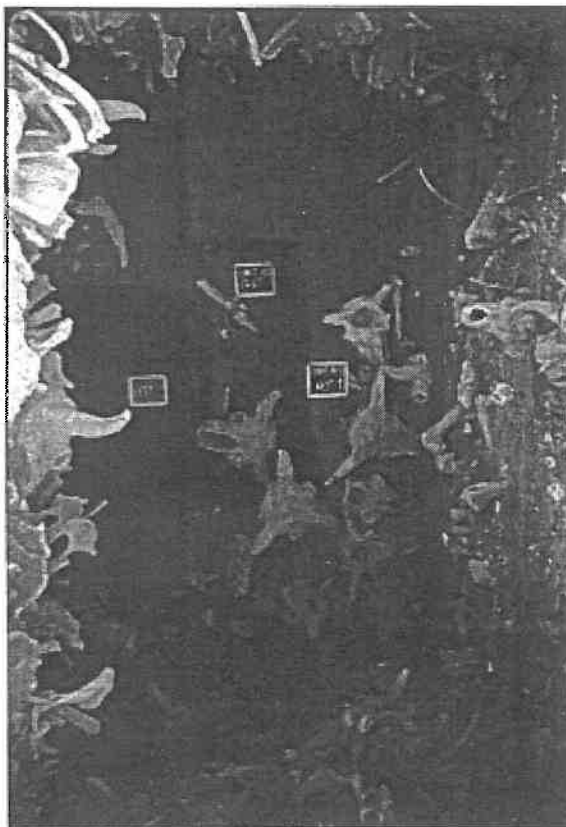


Figure 8: Photographs of Vore site Bison skull circular feature in North Excavation unit (left) and East Excavation Unit (right).

other means of comparing the cranial openings between the ceremonial and "typical" Vore site skull specimens. Indices were calculated by dividing the Cranial Opening Height measurement with the Cranial Opening Width measurement. The ideal index would denote a score of 1, indicating equal height and width measurements and therefore, near perfect symmetry. These indices were also graphed (Figure 14).

Cranial traits such as general shape and closure of sutures were closely examined for degree of fusion as indicators of sex and ontogenic age. Cranial sutures, the interlocking joints or irregular linear gaps where the bones of the skull come together have been used to estimate age because they unite and often become obliterated in old age. Lack of fusion in cranial sutures is indicative of younger animals, while partially fused sutures would indicate a more mature animal. Designated age classes were recorded for each skull. These classes included categories for Juvenile, Young Adult, Mature, and Senile specimens. All but two of the Vore site skulls in this study showed minimal fusion of cranial sutures; these two are older animal exhibiting complete cranial fusion. One is male, the other female.

The patterns presented by these data support the concept of selectivity for specific bison for butchery and brain removal for sex as well as for age. Due to the high degree of fragmentation, horn cores could not be measured on all specimens, therefore, an alternative method using a length/width proportion was used in determining sex. Among the "typical" samples exhibiting cranial openings, all but two of the specimens were female. While it is difficult to say with absolute certainty, similar selectivity appears to have taken place with the skulls placed in the ceremonial circle. The general appearance of the skulls in the ceremonial circle photograph indicates these skulls are mostly female. The length to width ratio for nearly all specimens appear to exhibit shorter length and smaller circumference than is typically seen in bull bison, making it fairly safe to assume most of these skulls also are female.

Patterns presented for the ceremonial circle also indicate additional selectivity of specific bison in terms of symmetry of the cranial opening. These skulls are more complete, and the cranial

openings are smaller and more symmetrical. While we may never know exactly why these openings are more symmetrical, if more care was taken in the initial opening because original intentions were ceremonial in nature, or if selection for ceremonial placement occurred later because of the more complete symmetrical appearance, it should not be surprising the most attractive looking skulls should be chosen for favored ceremonial treatment.

SUMMARY AND CONCLUSIONS

Opening of the brain case from the front of the cranium seems to have begun approximately 1000 years ago, based on findings from Late Prehistoric sites such as the Big Goose site (Frison 1976; Frison et al. 1978), Glenrock Bison Jump (Frison 1970), The Gull Lake site (Kehoe 1973), and the Vore Buffalo Jump (Reher and Frison 1980). The frontal opening of the cranium may be associated with killing methods or butchery, but may also have a ceremonial component. A ceremonial aspect for this process is not out of the question given ethnological and historical evidence of religious activity concerning buffalo and Native cultures has been well established.

The patterns presented in Figures 10, 11, 12, and 13 display some hint of sub-clustering among the ceremonial samples, and all fall within an overall range of 80 and 120 mm for all three conversion estimates. This clearly indicates the ceremonial specimens have smaller and more symmetrical cranial openings. While these clusters are not quite as clear as one would hope for, it does support at least the idea the ceremonial skulls were carefully selected for their strategic placement in the circle. The Cranial Opening Indices in Figure 14 clearly show clustering toward more symmetrical openings in the ceremonial specimens, falling within a range of 0.8 and 1.1 mm. The ceremonial specimens show both more skull completeness, without a great deal of butchering and more symmetrical cranial openings than the typical Vore Site skulls (Figure 7). It is important to note, however, there are differences between the physical specimens and those measured from the scanned images. These images were scanned from a photograph taken in 1980, while the typical Vore Skulls have been subjected to the hardships of storage, where time and curation have caused drying and crum-

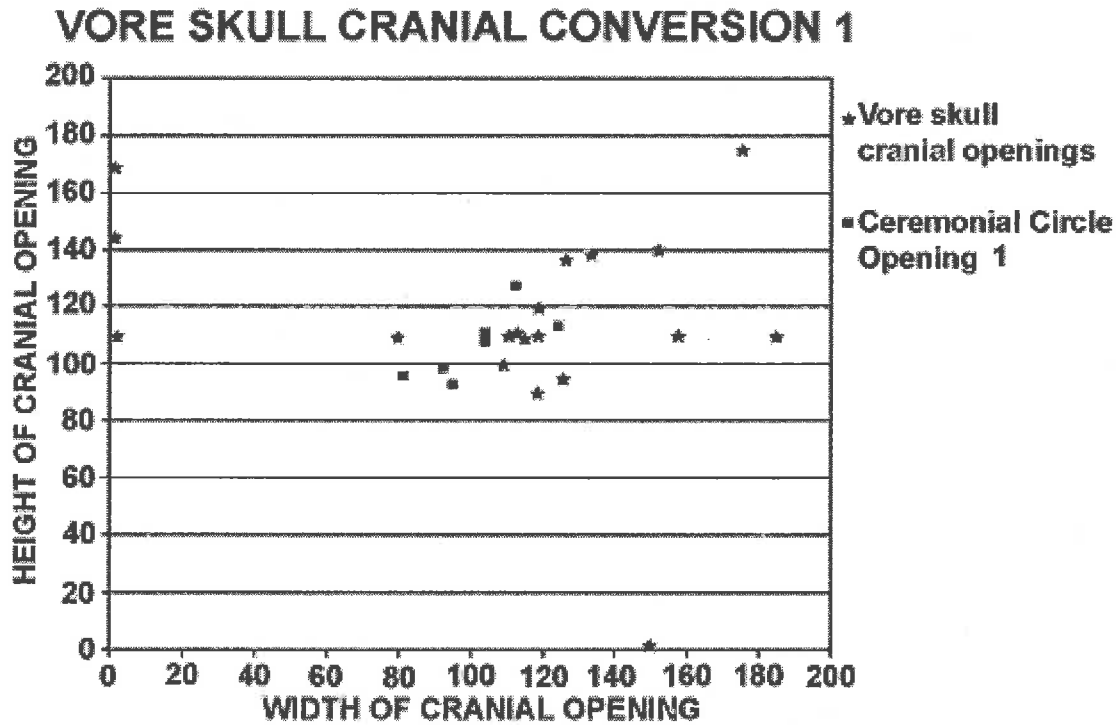


Figure 10. Plot of cranial openings using Conversion 1.

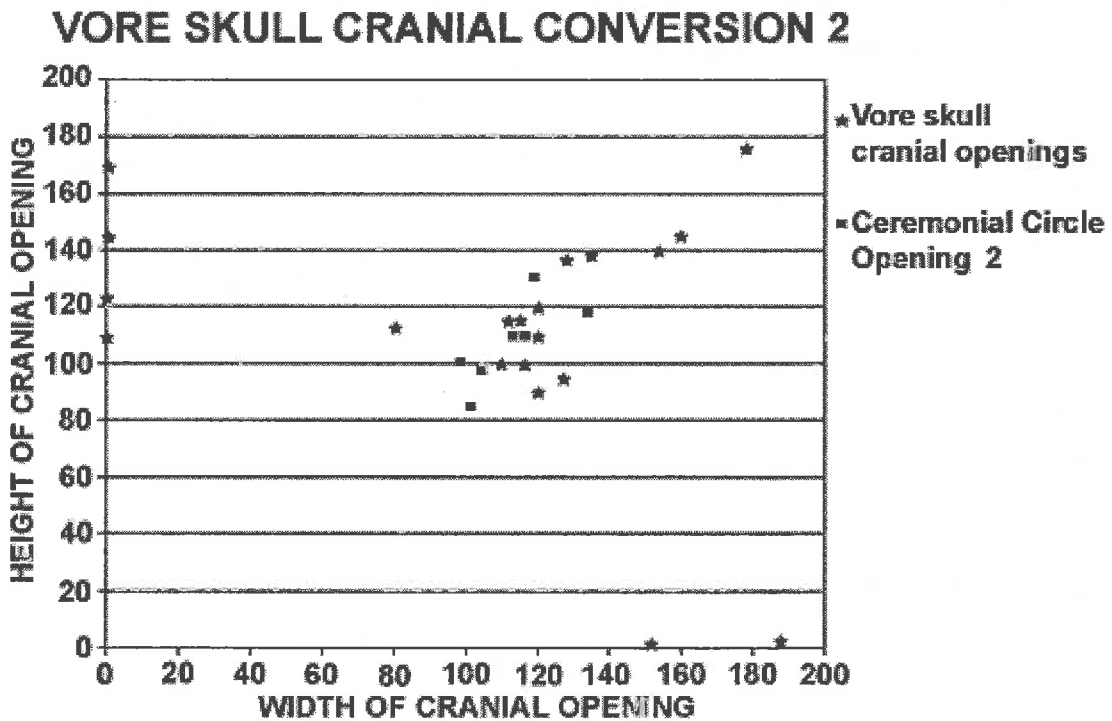


Figure 11. Plot of cranial openings using Conversion 2.

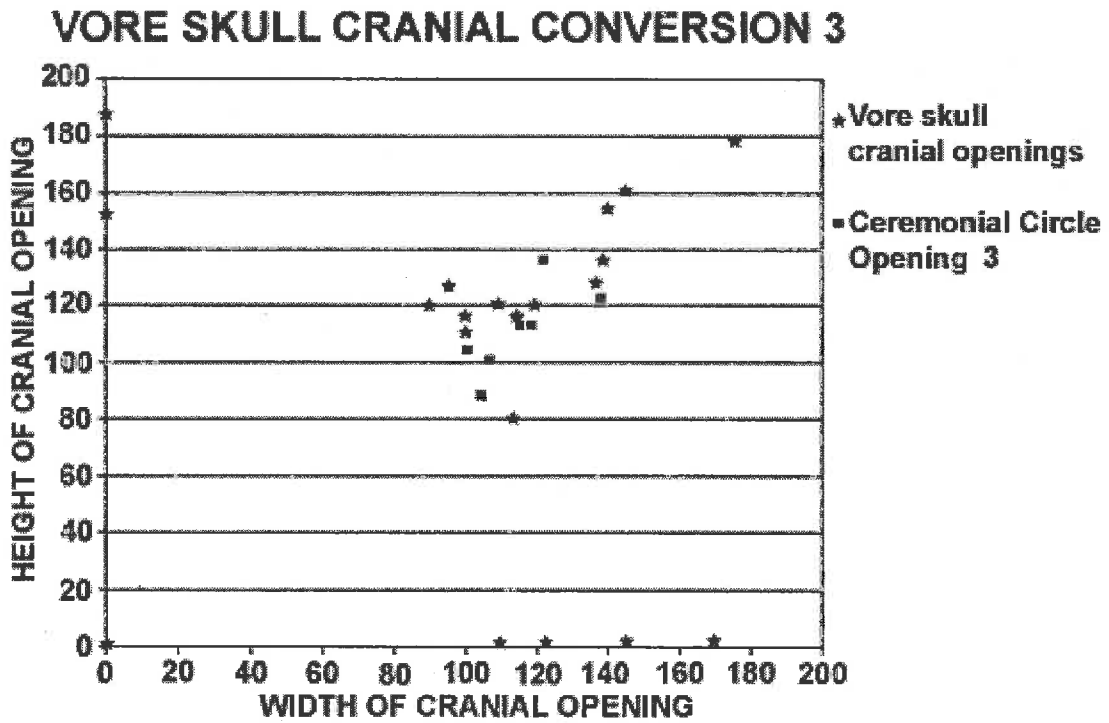


Figure 12. Plot of cranial openings using Conversion 3.

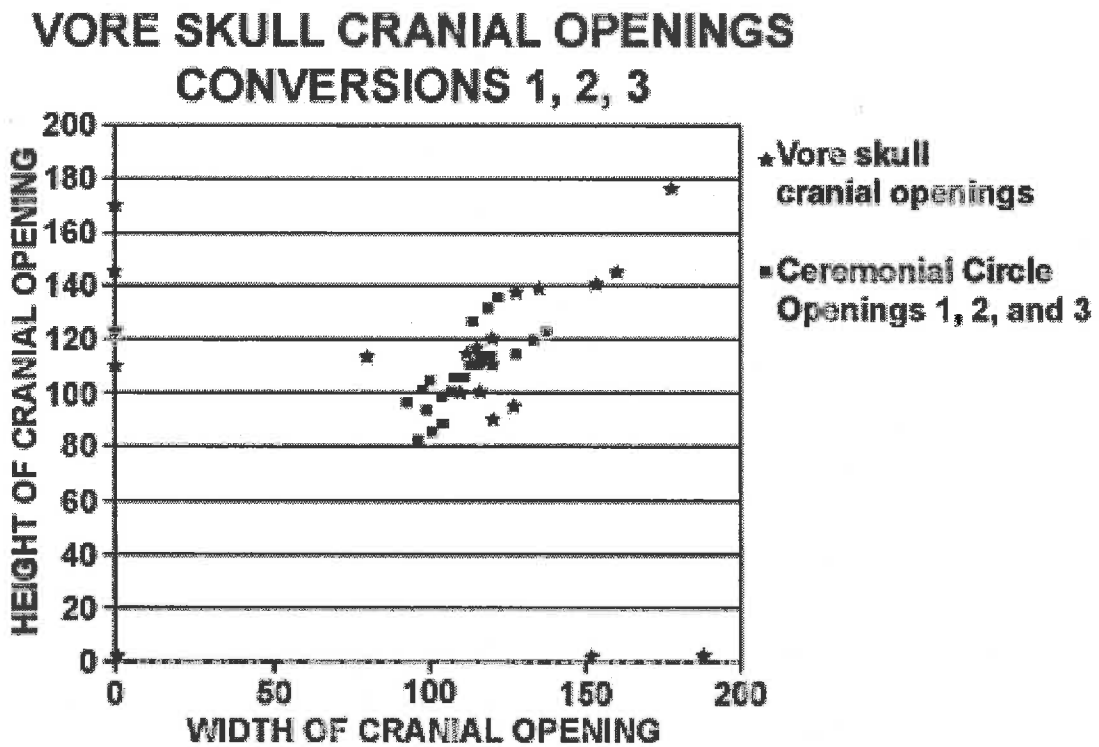


Figure 13. Plot of cranial openings using Conversions 1, 2, and 3.

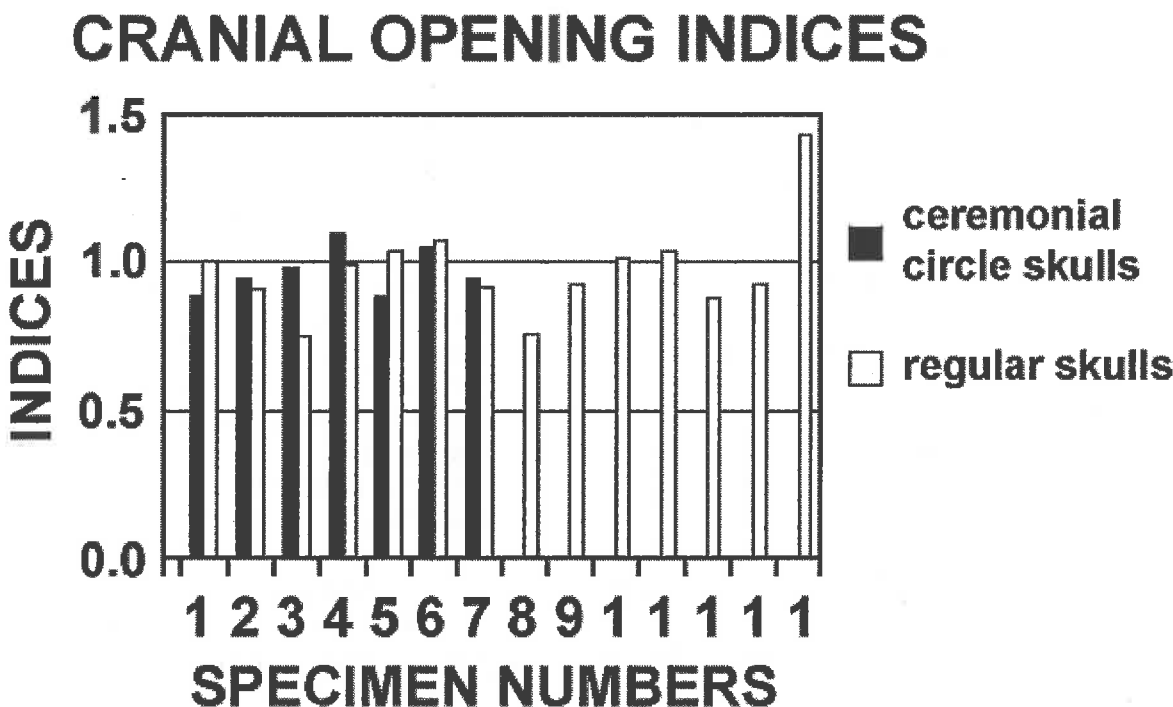


Figure 14. Chart of cranial openings using indices.

bling.

Another important observation is all but two of the skulls in both the typical and ceremonial samples with cranial openings are females. With the exception of one mature female, all of these are young adults. The “typical” skull samples contain only two males, one young adult, and one mature. The original inventory also included one fetal or very young skull showing the same cranial opening. This indicates selective treatment for age or size of specific bison among a population.

Discoveries continue to substantiate buffalo skulls being used by many Indian tribes in cultural, ceremonial, and religious contexts. Evidence of these practices appears in ceremonies, in connection with successful hunting expeditions, and as a bolster to the warrior and to the bereaved. The reverence shown the buffalo, as portrayed by the placement and use of the skulls, reflect the desire for assistance from something greater than self and intervention of a higher power in times of strife and conflict. Archaeological data show acts which may at first appear to involve the acquisition of food are, indeed, interwoven with spiritual beliefs and emotions. Ideas presented here have been directed toward understanding archaeological evi-

dence of ritual and symbolism in the lives of the Plains Indians. Future studies will lend further insight into the cultural and behavioral aspects concerning the correlation between bison skulls and ritual activity.

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APPENDIX A

Vore Site Cranial Measurement Coding Format

Cranial Opening

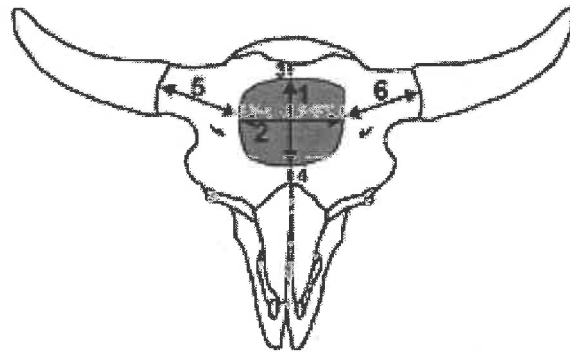
- CO HT - Cranial Opening Height
CO WD - Cranial Opening Width
VT SP T - Vertical Spacing - Top
VT SP B - Vertical Spacing - Bottom
HZ SP L - Horizontal Spacing - Left
HZ SP R - Horizontal Spacing - Right

Skull Measurements

- HC SPR - Horn Core Spread
HC LG L - Horn Core Length - Left
HC LG R - Horn Core Length - Right
CW B - Cranial Width - Base of Horn Core
CW HCO - Cranial Width - Between Horn Cores and Orbits
CW PO - Greatest Postorbital Cranial Width
HCC L - Horn Core Circumference - Left
HCC R - Horn Core Circumference - Right
CRN SU - Cranial Suture UF - unfused PF - Partially Fused F - Fused

APPENDIX B

Skull Sketch Diagram



APPENDIX C

HEIGHT AND WIDTH MEASUREMENTS
FOR CRANIAL OPENINGS (IN MM.)

INDEX NO.	CO HT	CO WD
1	120	120
2	100	110
3	90	120
4	176	178
5	139	135
6	137	128
7	140	154
9	0	152
11	95	127
14	170	0
16	145	0
19	110	120
20	115	115
21	115	113
22	100	116
23	145	160
24	113	80
29	0	188
31	123	0
34	110	0

CONVERSIONS FOR CEREMONIAL
SKULL CRANIAL OPENINGS (IN MM.)

INDEX NO.	HT 1	HT 2	HT 3	WD 1	WD 2	WD 3
(N1)36	114	119	122	128	134	138
(N2)37	105	110	113	111	116	119
(N3)38	105	110	113	108	113	116
(E1)39	126	131	135	114	119	122
(E2)40	82	85	88	96	101	104
(E3)41	96	101	104	93	98	100
(E4)42	93	98	100	99	104	107

Jacquelin E. St. Clair
Grand Teton National Park
Jackson, Wyoming

RESULTS OF THE 2003 HELL GAP INVESTIGATION

by

Kristen Lamberson, Derek T. Anderson, Mia Lyren, and Lisa Tromley

Hell Gap (48GO305) is located in the Hell Gap Valley in Goshen County, Wyoming (Figure 1). The site contains at least five discrete localities (Figure 2) including remnants of a complete Paleoindian cultural sequence, from more than 11,000BP to 7,500 BP (Irwin-Williams et al. 1973). Initially investigated in 1959 by George Agogino of the University of Wyoming, the site was excavated by Agogino along with Henry Irwin, Cynthia Irwin, and J.O. Brew of Harvard University from 1961-1966. In conjunction with a re-analysis of the site and the recovered assemblage beginning in the early

1990s, the University of Wyoming initiated fieldwork at Hell Gap in 1992 and continues investigations through the present (Kornfeld et al. 2002). In cooperation with the Wyoming Archaeological Foundation and the Wyoming Archaeological Society, in 2001 the University of Wyoming began a ten-year project centered on the excavation of a contiguous block left by Harvard University between Locality I and Locality I East, and the investigation of the surrounding valley.

Questions regarding chronostratigraphy, geomorphology, and paleoenvironment are the

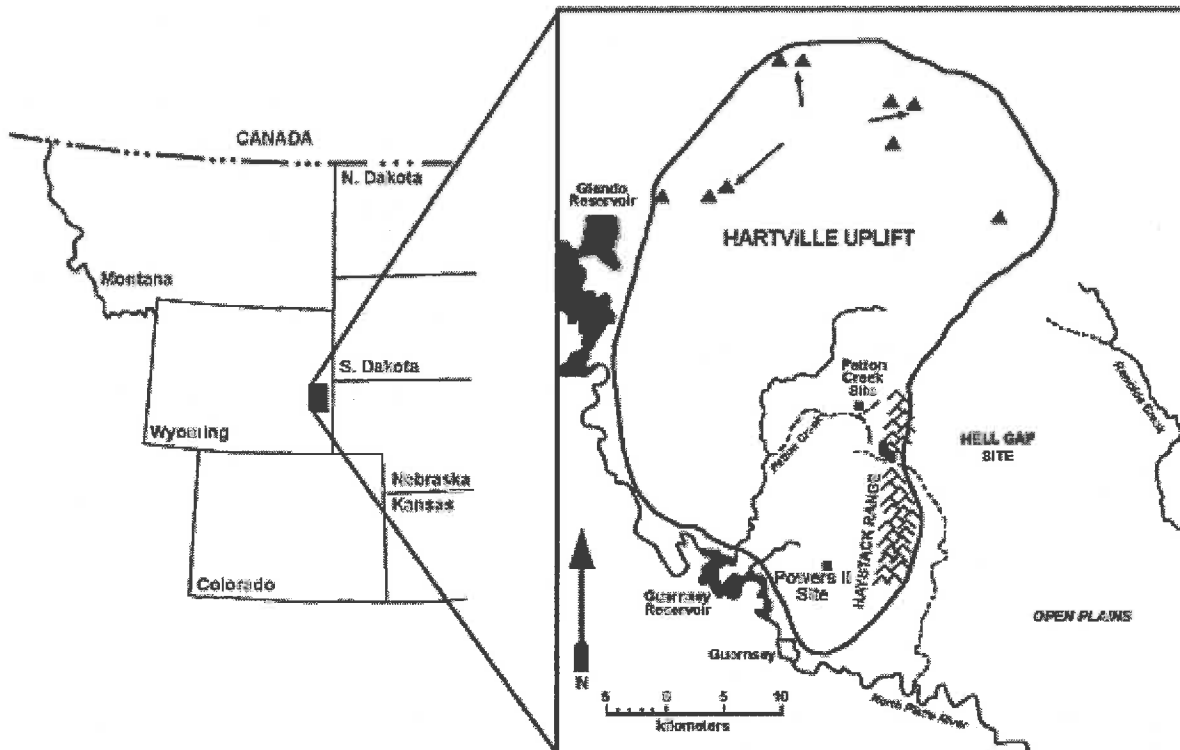


Figure 1: Hell Gap is located in the Hartville Uplift, a major physiographic feature of Southeastern Wyoming. The site lies in Hell Gap Valley at the ecotone of the open plains and the Hartville Uplift.

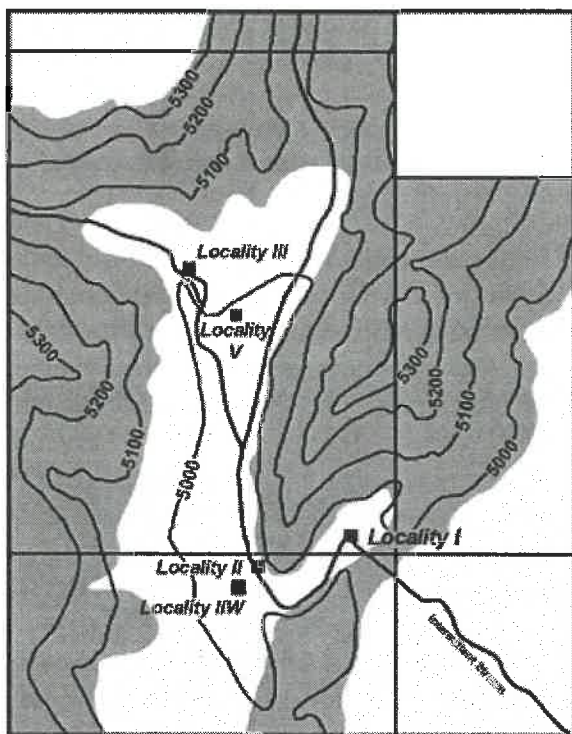


Figure 2: As defined in the 1960's the Hell Gap site consists of five localities, four of which contain Paleoindian materials. The Baars Locality is not visible on this map.

primary focus of this research effort and as such involve a multidisciplinary effort (Kornfeld et al. 2002). However, to understand the Hell Gap site it is inadequate to just focus on Locality I, as the entire valley forms the research domain. Consequently testing and sampling in other portions of the valley are being carried out. The 2003 excavations focused on Locality I and two recently discovered localities: Locality II West and the Baars Locality.

METHODOLOGY

The Hell Gap methodology employs sophisticated field methods. Developed over the last 20 years this process includes careful, systematic excavations utilizing high-tech field equipment. At Locality I, three dimensional location of all items larger than one centimeter is measured to the nearest millimeter with a Total Station, while the positional information

(declination, orientation, and the upward facing side of the object) of point provenienced items is measured with a Brunton compass or a similar instrument. All information regarding the location and condition of each artifact is recorded on field coding forms. Fine scale artifact recovery is completed by water screening all matrix through 1/16th inch screen providing a gentle technique for preserving fragile remains. Quality control of field data and artifact recovery is accomplished in the field lab, where data entry and cataloging complete the process.

For several seasons now, the excavation at Locality I focused on the block between Locality I and I East. Currently, ten 1 x 1 meter units have been opened, four on the east side and six on the south side of the block. The eastern units were initiated last season, while the southern units were continued from 2001.

STRATIGRAPHY

The 2003 field season provided significant information for linking the 1960's strata and cultural material to recent UW excavations. Correlation between the 1960's and recent excavations rely on several complementary sources of information: the density of cultural material at different levels, sediment descriptions, the 1966 photograph of the witness wall (Figure 3), and lithic refitting. Our analysis has produced a refit between a flake recovered in 2001 (Figure 4) and a graver recovered in the 1960's from Harvard's Frederick stratum, providing a confirmation of the stratigraphic position of the Frederick component.

The 1966 photograph of the witness wall (Figure 3) has our current understanding of the stratigraphic sequence (labeled "Sedimentary Units") as compared to the 1960's designations. The 2003 field season excavated exclusively in stratigraphic units F, F1, E6, and E5. The modern surface soil at Locality I is currently defined as stratum G3. This stratum contains the Sudbury mate-

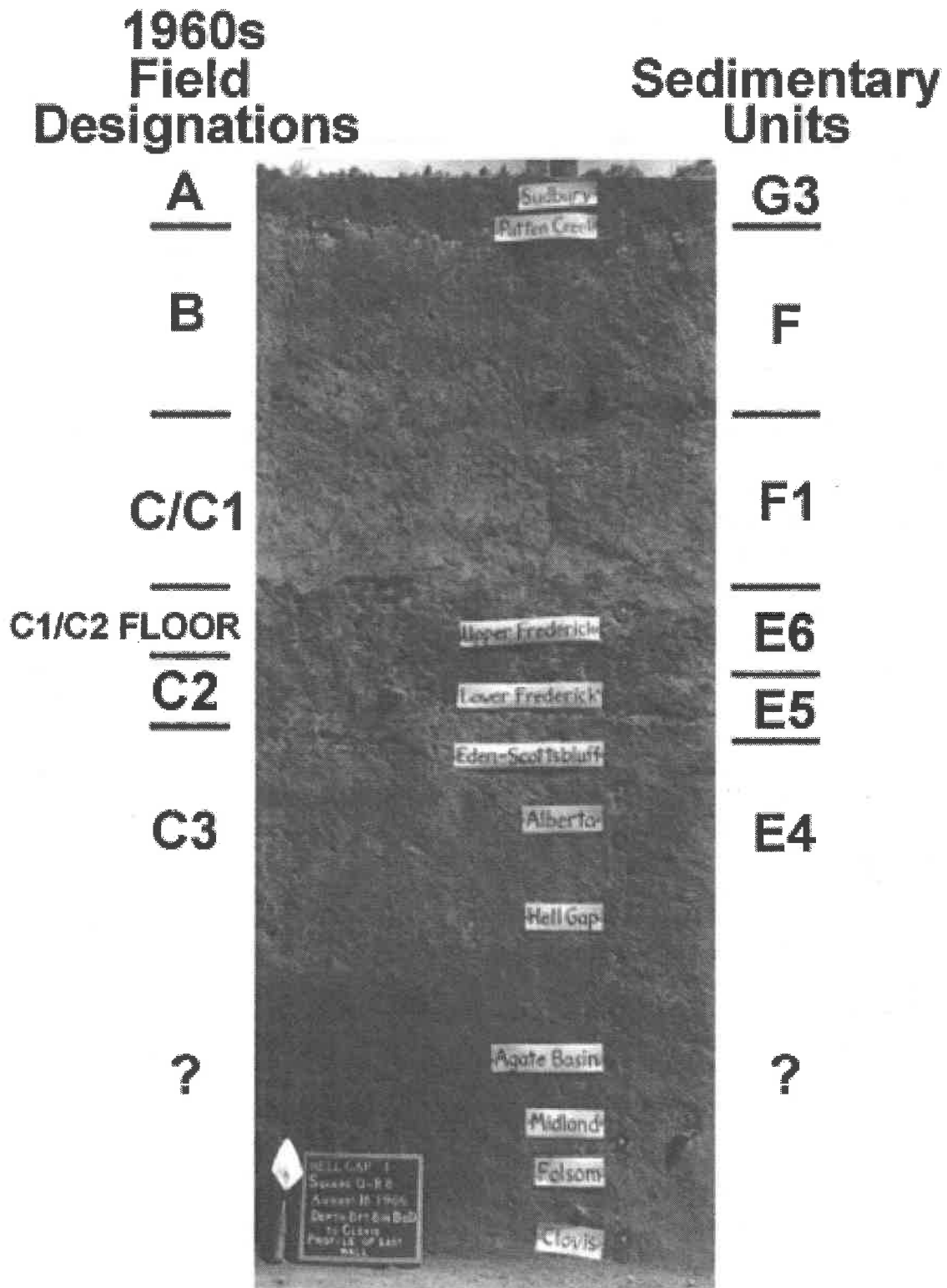


Figure 3: The 1966 photograph with our current understanding of the stratigraphic sequence (labeled “Sedimentary Units”) as compared to the 1960’s designations.

rial and may equate with some part of the Kaycee formation. Stratigraphic level G3 was last excavated in 1999.

Stratum F lies below G3 and the two are thought to be separated by the Patten Creek cultural layer. The sediment of stratum F is defined by "orange-brown fine silts and sands with clasts generally less than 5 cm" (C. V. Haynes personal communication 2003). The clasts exhibit very little rounding and originate from the Pre-Cambrian outcrop to the north of Locality I suggesting the deposit is colluvial.

Stratum F1 contacts F in the southern units with a thick layer of caliche. The block and its strata slope down from northwest to southeast and the horizontal caliche was formed by a rising streambed to the south (R. Reider personal communication 2001). These carbonates thin out towards the western edge of the block where the witness wall lies. The slight presence of the carbonates on the witness wall gives stratum F1 a light appearance. In actuality, stratum F1 is darker than the overlying stratum and is less orange-yellow. F1 is gravelly like F, but the gravels are finer and fewer in number (C.V. Haynes personal communication 2003). The two northeastern most units were terminated in this stratum at the end of the 2003 excavations.

The 2003 excavation created a stratigraphic designation for the F1/E6 contact zone. Because of the density of the carbonates percolating into the boundary of F1 and E6, it is very difficult to define the contact of strata F1 and E6 while excavating. This arbitrary stratum is unique to our excavation as there is no evidence of a similar designation during Harvard's excavations.

Once through the carbonates, stratum E6 is distinct. Stratum E6 is characterized by a grayish brown fine silt with infrequent, small clasts, and a distinct gravel lens toward the bottom of the stratum (C. V. Haynes personal communication 2003). Although no cultural diagnostics were recovered during 2003, this stratum is identified with the Frederick occupation as defined during the 1960's excavation. The excavation of five units was terminated in this stratum during the 2003 field sea-

son. Two of these units are located on the southern end of the eastern block and three are positioned on the eastern half of the southern block.

The 2003 excavations were terminated at the E6/E5 contact in the three southwestern most units. As the gravel lens disappeared, "light yellowish brown sand" was encountered. This sediment description has been assigned the stratigraphic designation of E5 (C. V. Haynes personal communication 2003). This stratum is associated with the Eden-Scottsbluff complex as defined in the original excavation.

Stratigraphic layers can be difficult to define. The comparison of Harvard's stratigraphy with our current interpretations is reliant on an old photograph, cultural material, and brief descriptions of the sediment. The conclusions drawn in the 2003 field season are preliminary and are subject to change with further information and the recovery of diagnostics.

LOCALITY I

There are several cultural complexes associated with the stratigraphic units excavated. Unit E5 is associated with the Cody complex, and unit E6 is associated with the Frederick complex. While unit F has not been associated with a specific cultural complex, it is of late Paleoindian age and contains a clear archaeological horizon as evidenced in Figure 4.

The east-west backplot shows the distribution of point provenienced chipped stone, bone, and rock as well as the general location of sedimentary units. Because of the southern sloping nature of the sediment in the east-west backplot, many specimens plot out in a lower stratum than their actual stratigraphic association. Even with this slight bias, the backplot illustrates the general distribution of cultural material. The top cultural layer is post Paleoindian in age representing a deflated Middle and Late Archaic occupation the Harvard expedition assigned to Patten Creek and Sudbury components and later material. Below this, a component is visible in the lower portion of unit F. Although this part is blurry on the east side of the backplot,

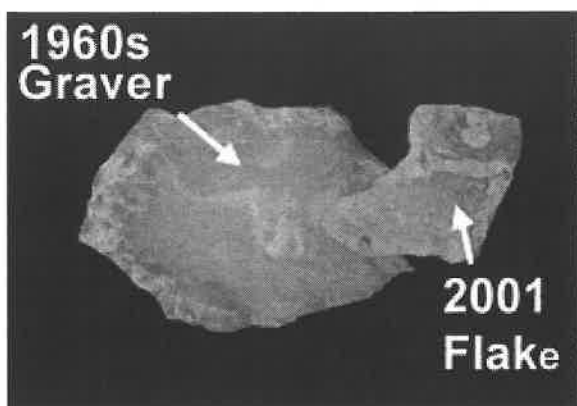


Figure 4: Refit between a 1960's graver and a flake recovered in 2001, providing a confirmation of the stratigraphic position of the Frederick component.

the component is clearly seen in the north-south backplot (Figure 5). As unit F predates the Altithermal, the cultural component is tentatively assigned a late Paleoindian age.

Faunal remains make up 46% of the assemblage at Locality I, while chipped stone artifacts compose 43% of the assemblage. The remaining 11% is a combination of plant matter, seeds, ochre, rock, charcoal, historical items, and gastropods (Figure 6). The organic matter includes Hackberry seeds, which were recovered both in situ as well as from the 1/16" screens. They are not fresh and occur predominantly in stratigraphic unit E6.

The vast majority of chipped stone recovered at Locality I is chert, while a small percentage is quartzite. From a total of 3110 chipped stone artifacts recovered in 2003, 18 are tools and the rest is debitage. The tools include one end scraper, two bifaces, one core, one retouched flake and 13 utilized flakes. The scraper, manufactured from Flattop chert from Northern Colorado (Greiser 1983), was recovered from the gravel lens in stratum E6, the Frederick component, located in the western corner of the south wall. The debitage includes 2917 flakes and 175 pieces of angular debris. Of these, 32 are burned and 25 are heat-treated. Over half of the lithic artifacts were recovered from stratum F, the newly identified late Paleoindian component.

The 2003 excavations at Locality I recov-

ered 3306 individual faunal specimens, the majority from the matrix ($n = 3051$). Of these, 3124 specimens are bone and 182 are teeth. Strata E5 and E6, the Frederick and Cody cultural levels, respectively, produced the largest number of bones, accounting for almost 89% of the sample. Faunal analysis consisted of assessing each specimen for species, element or portion, as well as looking for evidence of modification by humans, carnivores, or other natural agents. It should be noted most of the faunal remains were small (less than 2cm in maximum length) and extremely fragmentary, preventing detailed identification and analysis.

Overall, 78% of the recovered bone is unburned. Stratum E6 contained 82% of the burned bone fragments while 18% came from the F1/E6 contact.

A small percentage of the faunal remains show signs of carnivore damage, and two fragments exhibit rodent gnaw marks. Another specimen, identified as a left canid humerus, has butchering marks oriented perpendicular to the main shaft of the bone and a large impact fracture and flake removal on its proximal end. Six canid vertebrae, some of which were burned, were also recovered.

Of the faunal specimens recovered, 294 are identifiable to genus and 298 are identifiable to element. An additional 160 pieces were identified to element and size class (Brain 1981:9, Klein 1976:231). Of the 9% of faunal remains from the entire assemblage identifiable to taxon, the largest category is composed of teeth, followed by identifiable long bones and vertebra. The assemblage contains 196 rodent bones, 42 class II/III bones, 26 class III (deer, sheep, or pronghorn) sized remains, 25 carnivore specimens, and three class III/IV sized remains.

LOCALITY II W

Initial testing of Locality II W began in 1996 with the placement of a backhoe trench on the west side of the Hell Gap arroyo near Locality II. The trench and back dirt contained archaeological material and consisted of stratigraphic units G, F, and E. Archaeological material identified as

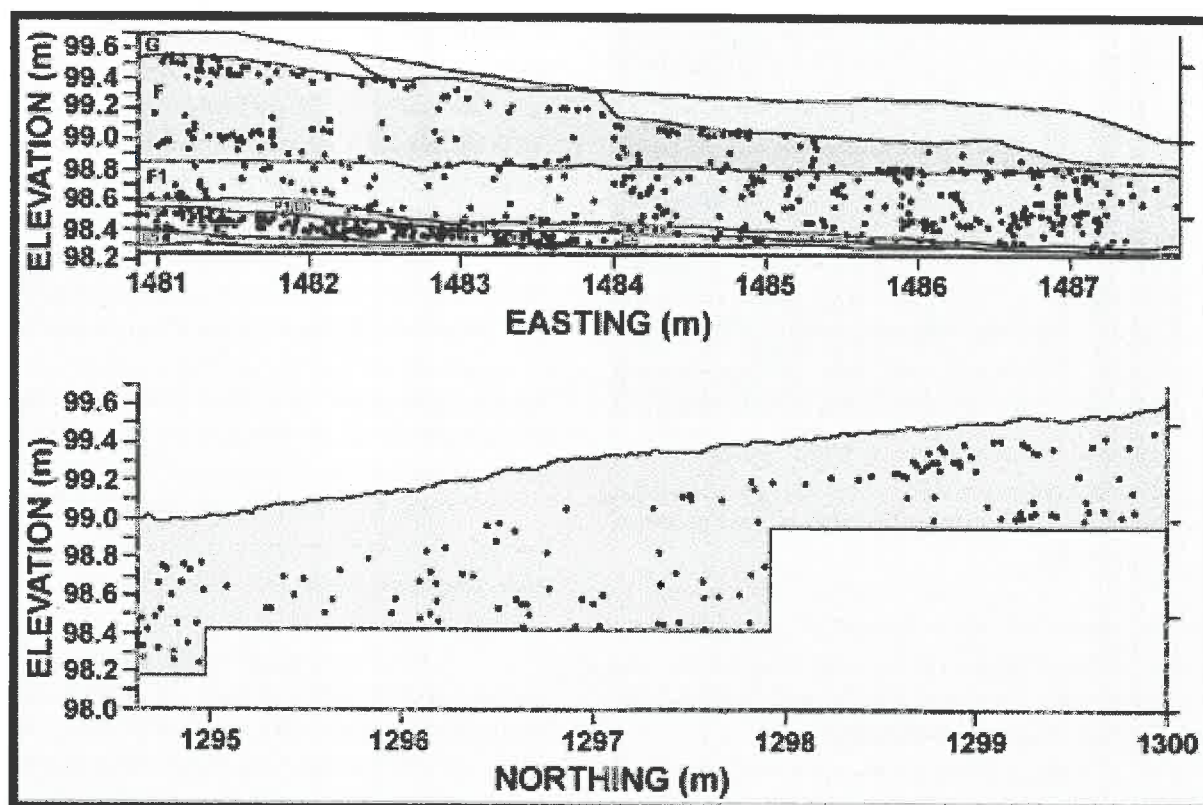


Figure 5: Cross-section diagrams showing distribution of artifacts throughout the excavation block at Locality I. Major stratigraphic unit designations are labeled in the south wall profile.

Paleoindian was recovered in unit E and two radiocarbon dates on units E6 and E5 yielded dates of $8780 \pm 60\text{BP}$ and $9392 \pm 67\text{BP}$, respectively (Haynes personal communication 2003). In 1997, additional trenching was carried out and a test unit was initiated on the north side of the trench. During the 2003 season, excavation was continued at the test units adjacent to the trench by initiating a third unit with the use of a total station.

Excavation at Locality II W in 2003 resulted in the recovery of a total of 936 chipped stone artifacts. The analysis includes 904 artifacts recovered by dry screening through 1/8" inch hardware cloth and 32 artifacts mapped in situ during trowel excavation.

Chipped stone artifacts dominate the assemblage at 87.2%, followed by faunal remains at 11.8% ($n=127$). Ochre makes up less than 0.6% ($n=5$) of the artifact assemblage. The frequency distribution of artifacts indicates the presence of

two distinct cultural depositions, one each in sedimentary stratum F and E6.

Chert represents 96.6% of the chipped stone and quartzite represents the remaining 3.4%. This frequency is comparable to other Paleoindian assemblages at Hell Gap. Also comparable to other assemblages is all material is either the local Hartville formation chert or Dakota formation quartzite. All tools recovered in 2003 were made of chert. Among the identifiable chipped stone tools were two graters, one scraper fragment, six re-touched flakes, and ten utilized flakes. Both of the graters, the scraper fragment, and one of the re-touched flakes were recovered from stratum E6.

A small percentage (3.6%) of the total assemblage of chipped stone artifacts exhibits heat alteration. All heat-altered artifacts were Hartville Uplift chert flakes. When heated, the yellow/brown Hartville chert turns red. Artifacts with reddened tips are likely heated at the tip, or edge, after a flake

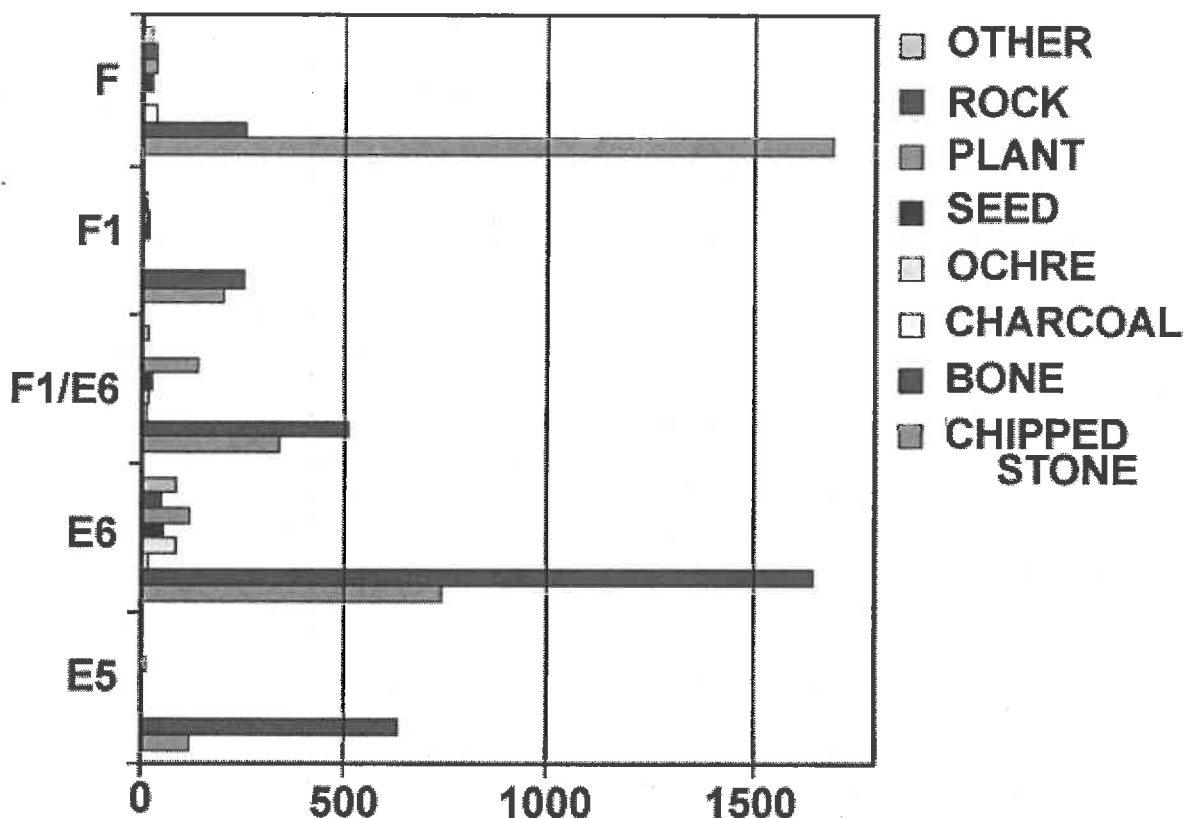


Figure 6: Frequencies of major artifact classes in each stratigraphic unit excavated.

is removed from a core (Judge 1973:112). Twenty-five chert flakes with reddened tips occurred in strata F and E6. Three of these specimens were utilized flakes, one of which was finely serrated at the tip.

At Locality II W, three burned and heat-spalled artifacts were recovered in two different strata vertically at a distance of one meter apart. All three were one centimeter or less in maximum dimension and account for 0.3% of the assemblage.

BAARS LOCALITY

During the 2001 Hell Gap excavations a Flattop chert Clovis projectile point base fragment was found on a cow path approximately 800 meters south-southwest of Locality I. This find has led to testing in the area, now known as the Hell Gap Baars Locality. Testing was initiated after a buried Paleosol was identified stratigraphically above a Pleistocene loess in the

arroyo wall approximately 40 meters southeast of the Clovis point base (C. V. Haynes personal communication 2003). The Paleosol has been identified as the E1 stratum encountered at Locality I containing Goshen and Folsom diagnostics (Irwin-Williams et al. 1973), and auger probing has verified the presence of the Paleosol throughout the area.

During the 2003 field season at Hell Gap, two 1 x 1 meter test units were established, one approximately 10 meters north and one approximately 10 meters south of where the artifact was found. The locality was placed in the Hell Gap grid system with a Total Station and newly established sub-datum. The units were excavated in 10 cm arbitrary levels and dry screened through ¼" hardware cloth. One unit was excavated to an alluvially deposited loess layer. The other unit was believed to lie outside of this loess layer and the excavation was left

unfinished.

In the spring of 2004 a crew completed the partially excavated unit and established two more test units. The new test units were established and placed in the Hell Gap grid with a Total Station. The new test units were also skim shoveled and troweled in 10 cm arbitrary levels, but dry screened through 1/8" hardware cloth. Elevations were determined with a line level and tape measure. All artifacts were recorded using standard Hell Gap coding forms. The arroyo wall to the south of the Baars Locality was surveyed and flagged by two people spaced at five meter intervals. All encountered artifacts were mapped with a Total Station and collected. A 75 by 55 meter area was augered in order to define the extent of the Paleosol. All three dimensional coordinates were recorded for each auger hole including the elevations defining the upper and lower limits of the Paleosol.

The four test units produced a total of four bones and 21 chipped stone artifacts; four of which were recovered from the Paleosol. The artifacts recovered have not undergone extensive analysis and the results are only preliminary. The survey produced 11 flakes. As noted, the results are preliminary, but several recovered flakes suggest signs of utilization exhibited by edge wear. Finally, a biface fragment was recovered from the arroyo exhibiting an *outré* passé termination. This technology is often associated with Clovis bifacial thinning (Bradley 1991:373) but occurs accidentally at other time periods, and therefore not considered in this investigation to be a diagnostic trait.

The testing at the Baars Locality has not produced any artifacts clearly associated with the Clovis cultural complex. The recent testing has, however, broadened our knowledge of the area and will help to determine possible locations for further excavations. Such excavations will take place in upcoming field seasons.

CONCLUSION

In conclusion, after the 2003 field sea-

son, the Clovis area testing proved inconclusive, as no additional material of definite Clovis age has been recovered. Second, Locality II West contains rich Cody and late Paleoindian age deposits with evidence of stone tool production as well as production of a wide array of other materials. Third, Locality I contains a post-Frederick, late Paleoindian component. The nature of this component is still poorly defined, but it consists of chipped stone and poorly preserved bone in the mid to upper portions of stratigraphic Unit F. However because of small sample size defining the nature of this occupation is premature. Fourth, the Frederick component from the 1960 excavation has now been conclusively linked to the cultural component in unit E6 through numerous minimum analytical nodules and a refit.

Results of the 2003 field season provide significant new data about the Hell Gap site as well as information relevant for linking previous excavations to current ones. Preliminary analysis of vertical and horizontal artifact distributions is beginning to yield clues about site formation processes, especially about the time and tempo of material and cultural deposition. Although most questions will not be answered until the block excavation is complete, many years down the road, each field season solves another piece of the Hell Gap puzzle.

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BOOK REVIEWS

Storied Stone: Indian Rock Art of the Black Hills Country. By Linea Sundstrom. 2004. University of Oklahoma Press, Norman, 2004. x + 238 pp., tables; figures, references cited. \$44.95 (cloth); \$24.95 (paper). (Cloth ISBN 0-8061-3562-X; Paper ISBN 0-8061-3596-4)

In *Storied Stone: Indian Rock Art of the Black Hills Country*, Linea Sundstrom offers a comprehensive summary of Black Hills area rock art. Sundstrom's interest in rock art began in her college years as an anthropology major and led her back to her home state of South Dakota to investigate rock art with the help of a grant from the South Dakota Historic Preservation Office. This research ultimately led to her doctoral dissertation, which was published in 1990 as *Rock Art of the Southern Black Hills: A Contextual Approach*, as well as a report on the 1980 survey. Unfortunately, both of these publications are out of print. But rather than reiterate the same information, *Storied Stone* builds on these earlier works and incorporates information from rock art surveys gathered in 1992, 1993, and 1997-2002. Sundstrom writes she wanted to "write a new book that would focus on the most fascinating aspect of the rock art of the Black Hills and Cave Hills: its meaning and significance as part of the larger world of Plains Indians" (pp. x), and this is just what *Storied Stone* accomplishes.

Sundstrom begins by outlining the area of study, its natural environment, and the history of human occupation in the area beginning with the Paleoindian period 11,500 years ago. A concise summary of human occupation in the area allows the reader to familiarize him or herself with the basic history of human occupation of the Black Hills and leads into a description and chronology of rock art in the region. Sundstrom also attempts to incorpo-

rate the Black Hills into the larger archaeological picture by tracing the prehistory of Plains Indians beyond their stay in the Black Hills and tying their cultural experiences both before, during, and after their stay together. This provides a larger framework in which to understand the significance the Black Hills played in a particular Plains Culture. Sundstrom also reminds the reader that rock art is traditionally considered a place where spirits reside and power can be gained, making it inherently sacred. This sacred status remains, and the reader is cautioned to remember this when visiting and appreciating rock art sites.

Storied Stone traces the chronology of Black Hills rock art from Paleoindian up through Historic times. Each rock art style is discussed in terms of its manufacture, placement on the landscape, possible meaning, and time range. A map showing the area where a particular style is found, along with its possible and probably time ranges concisely summarizes this information for each rock art style. The book is also full of black and white photos and sketches that give numerous examples of each type of rock art. When possible, the Plains Indian group responsible for the art is identified, and further information about the rock art and its meaning is provided. Very detailed information about the ceremonies and/or societies that would have produced or used rock art sites gives a fascinating look into the lives of Plains Indians. This emphasis on human behavior makes the book more than just a narration of rock art styles and provides for captivating reading.

Storied Stone is valuable as both a reference for professionals and a guide to rock art for advocationalists. It is laid out in a manner easy to follow whether you are a rock art researcher or just have a general interest in the subject. The only thing

lacking is color photographs, which would greatly enhance the book. I would encourage anyone with an interest in rock art to read *Storied Stone*.

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The Cheyenne/Arapaho Ledger Book from the Pamplin Collection. By Craig D. Bates, Bonnie B. Kahn, and Benson L. Lanford, with Imre Nagy. Edited by Kenneth E. Kahn II. Privately published at Dynagraphic, Portland, Oregon, by Dr. Robert B. Pamplin, Jr., 2003. viii + 347 pp., figures, tables, references cited. No Price Given (Cloth ISBN 0-9710506-0-0)

In 1997 Dr. Robert B. Pamplin, Jr. purchased an outstanding ledger book drawn in the early 1880s by Cheyenne and Arapaho scouts at Ft. Reno, Oklahoma Territory. The ledger's excellent condition and intricately detailed drawings had led a previous owner to contemplate breaking the book into individually saleable plates, but Pamplin's foresight kept the book whole and his publication of the analysis he sponsored makes this amazing collection available to scholars for the first time.

The book is divided into six chapters. Craig Bates discusses the history of Cheyenne and Arapaho ledger art and documents the origin of the Pamplin ledger in chapters 1 and 2; Bonnie Kahn describes and discusses the various types of military equipment illustrated in the ledger in chapter 3, Benson Lanford does the same for American Indian material culture items (exclusive of shields) in chapter 4, and Imre Nagy describes and interprets the shields illustrated in the ledger in chapter 5. Finally, Bates provides commentary to each of the 96 ledger drawings in chapter 6. An index to proper names and the individual drawings and their discussions in various chapters occupies the book's last five pages.

Overall, the book is richly illustrated with photographs and I commend the authors for rounding up other than the "usual suspects" in many instances. Often these photographs and ethnographic items come from the Lessard collection or the book's owner, Robert Pamplin, but other less well known items were found in well known museum collections or national archives, and their use adds greatly to the value of this book for Plains scholars. In this treasure trove of less-well-known photographs I have found at least two never before published gems directly relevant to my own research (Flathead chief Charlo wearing a muslin robe with narrative exploit paintings was completely unexpected) and I am sure other scholars will be equally rewarded.

These fine illustrations are used as the backdrop to discussions ranging from exclusively detailed and well presented (Kahn, Nagy) to surprisingly shallow for a project of this magnitude (Bates, Lanford).

Bates' chapter 1 contribution is the book's weakest part. Despite trying to give the appearance of an in-depth history of ledger art and the Pamplin ledger's place therein, this chapter fails to account for basic rock art source material, fails to consider key ledger art sources available at the time this was written, omits any discussion of Howling Wolf (arguably the best known ledger artist ever and himself a Cheyenne), and gives an erroneous impression of the influence of the Ft. Marion artists in the broader history of ledger art.

Bates' chapter 2 is better, providing a good description of the Ft. Reno Indian scouts and identifying the ledger beyond question as a product of that group. The identification of Seargent Washee is good detective work, though the sojourn into the life of John Washee (a different man altogether) seems unnecessarily confusing. Bates also separates the drawings into the work of 13 different artists, a benefit for future students of this and other ledgers from the Ft. Reno scouts.

Bonnie Kahn's contribution is the strongest in the book. In painstaking detail she describes and discusses the saddles and bridles, guns, sabers, and

lances, and military clothing and insignia illustrated in the ledger. Her chart of lance pennons and table of material culture items by individual drawing are models of appropriate treatment of such imagery.

Lanford's contribution describing the illustrated American Indian material culture is of uneven scholarship. After a sophomoric beginning, the discussions of stroud cloth, eagle feathers, hair pipes, clothing, and war bonnets are quite good. But his discussion of crosses and their symbolism among Plains Indians, and horse bridles and their decorations misses key references available in the ledger art literature, and his discussion of the interplay between the lines drawn to indicate the horse's belly and the rider's leggings or moccasins is simply wrong in several cases. Likewise, Lanford misses even the most obvious rock art connections for his subject matter—an oversight of some significance, given the book's stated objectives in chapter 1.

Imre Nagy, an acknowledged expert in Cheyenne shield heraldry with several key publications already to his credit, does an excellent job of identifying and discussing the 24 shields illustrated in the ledger. Using some amazing ethnographic specimens Nagy is able to identify five known named Cheyenne shields and three others, plus a Pawnee shield with an ethnographic counterpart. My only disappointment with this chapter is more illustrations would have made for much more effective comparisons between ethnographic specimens and those illustrated in the ledger.

Finally, Bates' discussion of individual illustrations occupies nearly a third of the book. Unfortunately, Bates' contribution here is also weaker than it should be, given the richness of the drawings themselves. In the individual narratives for each drawing he misses some surprisingly obvious (and important) aspects of the art. What struck me most was his failure in so many descriptions to structure his discussion around the narrative aspects of the drawings (possibly because he really had not internalized the narrativity of even the simple drawings?). Thus, wounds, projectiles flown wide of the mark, track sequences and other conventions are

frequently glossed over or even ignored. Given the detail invested in describing objects, this omission is puzzling at best.

Other than these bits of uneven scholarship (which can be expected in any group effort), the book's only glaring weakness is its editing. On a general level the authors' individual contributions were not well integrated with one another. Thus, one expert's bear claw amulet (page 183) is another's antelope horn (page 242), and one's trouble leading horses to water (page 82) is another's battle scene (page 265). While a few such examples are perhaps inevitable, I noted far more of these discrepancies than should have been allowed.

The editing deficiencies, however, are greater than simply poor integration of the authors' contributions. Without going through the book with a fine-toothed comb, I found blank page numbers for a footnote reference (page 202), a missing reference (Chronister 1999) in the bibliography for chapter 4, miscounted stars on a shield (page 225), a table 2 in chapter 5 but no table 1 anywhere, and the failure to list Nagy on the title page, though he is listed in the copyright page and his contribution is equal to any of the others. The book deserved a much better job of editing, which could have meshed together the various contributors' works and weeded out the annoying discrepancies that make using the book as a scholarly reference more difficult than need be.

Despite the book's editing problems, however, this is a volume both serious scholars and interested laypersons will want to add to their libraries. The photographs are gorgeous, the ledger drawings themselves illustrate hundreds of interesting things, and the texts provide a wealth of information for both scholar and novice.

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