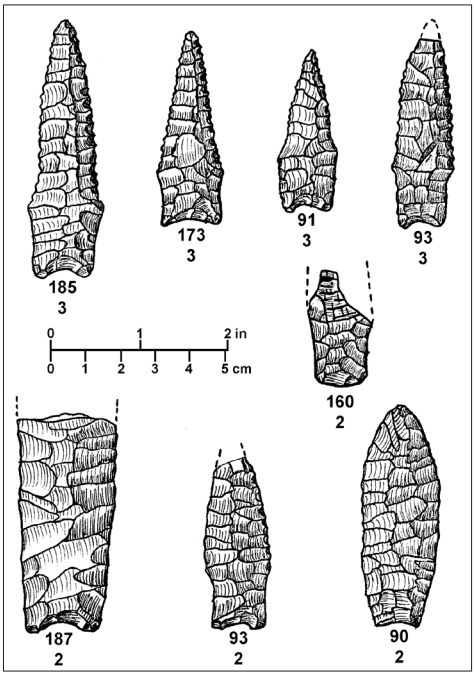
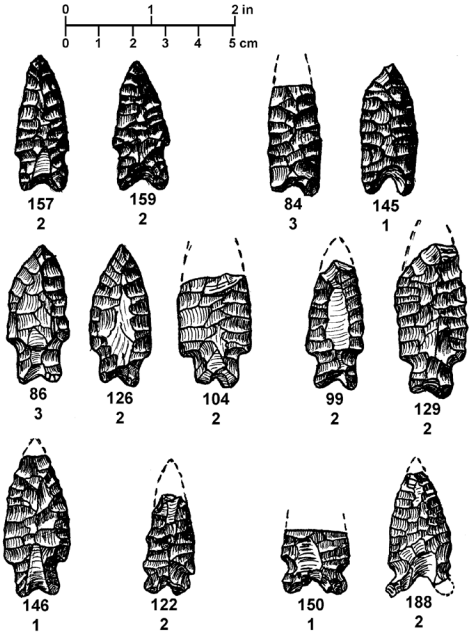
THE WYOMING ARCHAEOLOGIST





VOLUME 48(1)
SPRING 2004
ISSN: 0043-9665

THE WYOMING ARCHAEOLOGIST
VOLUME 48(1), SPRING 2004

Table of Contents

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

IN MEMORIUM

BESSIE BREWER

Longtime Sheridan-Johnson County Chapter member Bessie Brewer died Monday, February 21, 2005, at her home in Dayton, Wyoming. Bessie was born September 7, 1938 in Woodward, Oklahoma, to Francis and Margaret (Jennings) Ludden. Bessie married Lawrence Brewer on December 31, 1961, in Fairview, Oklahoma. Bessie earned a Bachelor of Science degree in occupational therapy from Texas State Women's University. She worked for the VA Hospital Medical Center in Sheridan, retiring as chief of occupational therapy in 1993.

Bessie enjoyed many outdoor activities such as fishing and rock collecting, and she was an excellent photographer. She also enjoyed painting and crafts. Bessie was active in the Sheridan-Johnson County chapter of the Wyoming Archaeological Society for many years, and accompanied many of the society's field trips to record sites. Bessie was also involved with the St. Joseph's Council of Catholic Women, the Sheridan County Historical Society, and Veterans of Foreign Wars Auxiliary, where she was district president in 1980-1981. She also supervised horseshoe games during the annual Dayton Days. A daughter, Kandace Marie Brewer, preceded her in death. Survivors include her husband Lawrence; her mother, Margaret Davis of Lemoore, California; a brother, Lawrence Ludden; and a sister, Margaret Smith.

The editors of the Wyoming Archaeologist encourage members and other readers of the journal to submit obituary information about WAS members to the editorial staff in Laramie when such notices appear in local papers. We will then recognize the accomplishments of these members in the journal. Thank you.

IN MEMORIUM

IMOGENE J. HANSON

Imogene J. Hanson, 80, died Dec. 28, 2005.

She was born Nov. 10, 1925, to Howard and Margaret Bundy in Gillette. She attended grade school at the Bundy rural school outside Gillette and graduated from Campbell County High School. She attended nurses training at St. John's McNamara School of Nursing in Rapid City, S.D. She graduated and passed her boards to become a registered nurse in 1946.

On June 30, 1946, she married Milford Hanson and had sons Milford Jr. "Butch" and Michael.

She spent the next 44 years practicing nursing in numerous capacities and locations. She served as a nurse in Cody, Lovell, Gillette, Moorcroft, Newcastle, Deadwood, S.D., Spearfish, S.D., and Pasco, Wash. Her positions included assistant director of nursing and in-service director. In the in-service director position she received specialized training in the operation and interpretation of results from the EKG machine.

She went on to train other hospital physicians and nurses on the use of the machine as part of an effort to establish an intensive care unit in the hospital. Toward the end of her career she served as a consultant to area medical facilities and eventually came to work on the Lovell hospital nursing home project. She participated in this project from writing certificates of need and grant applications through the operations phase, eventually becoming director of nursing.

Mrs. Hanson spent many days and miles enjoying the outdoors, traveling and artifact hunting with her husband, family and friends. The Hansons' archeological interest led them to become involved with the Wyoming Archeological Society and University of Wyoming. Their greatest discovery was the Hanson Folsom site, a 10,700 year old site near the base of the Big Horn Mountains. The Hanson site is the largest known Folsom site in the world.

She was a member of Eastern Star and in the last couple of years was an enthusiastic member of Cody Square Dance Club (Kut n' Kapers). She also enjoyed bowling and playing cards. In their retirement years the Hansons enjoyed their snowbird retreat in Scottsdale, Ariz., where they enjoyed meeting other snowbirds from around the country.

She is survived by her sons Milford Jr. (Jo) of Powell and Michael (Becky) of Cody, grandchildren Brad (Dayna) Hanson of Buckley, Wash., Daren Hanson of Powell, Casey (Bridgit) Hanson of Billings, Wesley (Kylie) Hanson of Cody, Katie May of Casper, Bear May of Powell, Shad May of Casper, Julie (Cory) Baker of Powell, great-grandsons Austin and Alex Hanson of Buckley, Wash., and great-granddaughters K'Lee Ann and Lanee Baker of Powell, sisters Dorothy Smith of Albuquerque, N.M., Carol Lee Sigrist of Newport News, Va., Mildred Huravitch of Gillette and brother Walter Bundy of Gillette.

She was preceded in death by her husband and parents.

Cremation and services have taken place. In lieu of flowers donations may be made to a favorite charity.

http://www.codyenterprise.com/articles/2006/04/03/obituaries/december_2005/obit477-1563.txt

IN MEMORIUM

DR. RAY SHELBY GOSSETT

RIVERTON — The funeral for Riverton resident Ray Shelby Gossett, D.D.S., 73, was conducted at 10 a.m., Dec. 9, 2005 at the United Presbyterian Church of Riverton by Pastor James Shuman and the Rev. Grayson Gowen. Masonic rites will be accorded and interment will be in Mountain View Cemetery.

Dr. Gossett died Dec. 4, 2005, at Wyoming Medical Center in Casper.

Born Oct. 15, 1932, in St. Louis, Okla., he was the son of Gertrude Violet (Knisley) and Ernest Shelby Gossett; and graduated from Riverton High School in 1950. He completed a pre-dental degree at the University of Wyoming in 1953 and earned a D.D.S. degree from St. Louis University School of Dentistry in 1957. He captained the UW freshman football team in 1950; was a member of Sigma Chi Fraternity; was elected to Phi Epsilon Phi and the Iron Skull honorary at UW; and received the Alpha Omega Award as outstanding dental graduate from SLU.

On Dec. 21, 1952, he married Mary Gail Kearney of Midwest at the First Baptist Church of Riverton.*

He served as a dentist with the U.S. Air Force at Stead Air Force Base in Reno, Nev., from 1957 to 1959; and opened his dental practice in Riverton in 1959, expanding it to the Riverton Dental Center in 1994. He remained in active practice until 2001; and, also, sold real estate from 1968 until his death.

His interests included bird-hunting, especially geese; training dogs; snowmobiling; rockhounding; fishing in Fiddler's Lake; and raising irises.

He was a 41-year member of Riverton Lions Club, serving on the board of directors and as vice president, president-elect and president; and belonged to Riverton Chamber of Commerce for 34 years, including three years on its board of directors.

A member of the United Presbyterian Church of Riverton and a ruling elder for nine years, he was scoutmaster for Troop No. 29, Boy Scouts of America, from 1965 to 1969; and had received the BSA Order of the Arrow and Scouters' Key. He was on the board of directors of Riverton School District 25 from 1972 to 1976, serving as clerk, treasurer and chairman; and was a member of Masonic Lodge No. 26, A.F. & A.M., Kalif Shrine Temple, Fremont County Shrine Club of Riverton, Riverton Snowmobile Club, Riverton Mineral and Gem Society. A former vice president and president of the American Society of Dentistry for Children, Wyoming Unit, he had received the national society's distinguished service award. He served on the Wyoming State Board of Dental Examiners and as a vice president; was on the board of directors for Delta Dental Plan of Wyoming and served as board chairman; and was a life member of the American Dental Assoc. He served as secretary, vice president and president of the Northwest District Society of the Wyoming Dental Assoc.

Dr. Gossett was a 32 year member of the Fremont County Archaeological Society. He served on the Board of Directors and as president, vice president and treasurer. Since April of 1998, he had been a member of the Board of friends of the George C. Frison Institute of Paleoindian Studies.

Survivors include his wife of almost 53 years of Riverton; son, David Ray Gossett, and his wife of Lakeland, Fla.; two daughters and their husbands, Shelby Marie Carlson of Greybull and Gwendolyn Kay Harris of Spring Creek, Nev.; and five grandchildren.

He was preceded in death by his parents and stepfather, Robert Leroy "Steve" Stevens.

Memorials may be made to the George C. Frison Institute of Paleoindian Studies through the George C. Frison Institute Endowment Fund, in care of Davis Funeral Home, 2203 W. Main St., Riverton, WY 82501.

http://www.casperstartribune.net/articles/2005/12/09/news/obituaries/c79354b95bc7abb7872570d1008118db.txt

ANNOUNCEMENTS

A TRIBUTE TO DEBBIE CHASTAIN

On March 2, 1968, the Cherokee Trail Chapter of the Wyoming Archaeological Society was formed in Saratoga, Wyoming. Mrs. R. L. (Debbie) Chastain, owner and operator of the Cedar Creek Ranches near Saratoga was named as one of the directors. Debbie was a strong supporter of the Cherokee trail Chapter, but maintained a relatively low profile. The following decade was, without doubt, the halcyon period of the Wyoming Archaeological Society and the Cherokee Trail Chapter was one of its most active. In 1971, The Wyoming Archaeological Foundation was established with Debbie Chastain among its initial directors. She was a generous contributor and when age forced her withdrawal from active participation in both ranching and Foundation activities, she gave the Foundation 80 shares of IBM stock. This gift was important in efforts to acquire the Hell Gap site from the Frederick family and the artifact materials from Harvard University. Additionally, she presented a gift to the Department of Anthropology as part of her estate.

Geroge C. Frison, Professor Emeritis

ERRATTA

The following acknowledgments were inadvertenly omitted from the article in the Fall 2003 issue of The Wyoming Archaeologist (Volume 47(2), titled "Results of the 2003 Hell Gap Investigation, by Kristen Lamberson, et al.

ACKNOWLEDGMENTS. This project was facilitated by the Wyoming Archaeological Foundation and the Wyoming Archaeological Society who graciously provided the Hell Gap site and the associated facilities to the George C. Frison Institute for research. The project would not have been possible without generous gifts from Forrest and Peggy Fenn, Mark Mullins, Joseph and Ruth Cramer, and other donors to the George C. Frison Institute. The temporary facilities constructed over Locality I of the Hell Gap Site were funded by donations from Forrest Fenn and Mark Mullins. We are most grateful to these individuals for supporting our research. Also, these excavations could not have been possible without the time and energy of the volunteers, students, and professionals who have contributed to the Hell Gap site.

LIFETIME ACHIEVEMNT AWARD GOES TO PROFESSOR EMERITUS GEROGE C. FRISON

Professor George Frison received the 2005 Society of American Archaeology Lifetime Achievement Award at the society's annual meeting in Salt Lake City. The award ceremony was held at the annual business meeting on April 1. Dr. Lynn Sebastian, president of the SAA, presented the award. The presentation, accompanied by a standing ovation from a large audience, was followed by a short speech in which Frison recounted his origins as an avocational archaeologist and the origins of the SAA as a society with both professional and avocational membership. Frison specifically commented on the events of the society in the mid-1980s, acknowledging many individuals that enabled his successful leadership of the society, including his wife June. The award ceremony was followed by a reception attended by numerous University of Wyoming anthropology alumni, current students, faculty, and friends and colleagues.

AN UNBROKEN CIRCLE

The 2004 Wyoming Archaeology Month poster wins First Place in the Society of American Archaeology Public Education Poster con-

test. The contest is co-sponsored by the Council of Affiliated Societies. This is the fifth time in eight years that Wyoming has won first place. In the other three years, Wyoming posters have placed in the top three. The Wyoming posters are created by the Wyoming State Historic Preservation Office (SHPO) in cooperation with the Wyoming Archaeological Society, Wyoming Association of Professional Archaeologists and many other supporters. Judy Wolf of the Wyoming SHPO spearheads the effort. This year, over 20 posters were entered into the contest.

W.A.S. Absaroka Chapter has a website

http://absaroka1.tripod.com/absarokachapterofwas/index.html

The Louisiana Division of Archaeology invites you to take a look at its new interactive web project about Los Adaes, a Spanish colonial site in what is now western Louisiana.

http://www.crt.state.la.us/siteexplorer

The present-day Los Adaes State Historic Site is a National Historic Landmark operated by the Louisiana Office of State Parks, where visitors can explore the remains of a mission and a presidio. Although the settlement marked the eastern frontier of the Spanish Province of Texas, the presidio served as the provincial capital for more than 40 years. Los Adaes also represented a rare instance of cooperation among three cultures: the Spanish, the French, and the Caddo Indians. An interpretive visitor's center is planned for the park, but currently, the online exhibit provides an opportunity for those who want to learn about life at the site, as revealed through history and archaeology. The interactive website presents information in layers, allowing the user to determine the amount and level of information received.

—

Dr. Thomas Hales Eubanks, RPA
State Archaeologist
Louisiana Division of Archaeology
PO Box 44247
Baton Rouge, LA 70804
225-342-8170 Ph., 225-342-4480 Fax., 225-933-1505 Mobile

Louisiana Division of Archaeology:
http://www.crt.state.la.us/crt/ocd/arch/homepage/index.htm

GUIDELINES FOR APPLICANTS WILLIAM T. MULLOY UNDERGRADUATE SCHOLARSHIP OFFERED BY THE WYOMING ARCHAEOLOGICAL SOCIETY

Who may apply:

1. An undergraduate student in Anthropology at the University of Wyoming with preferred, but not required, emphasis toward Archaeology as a subdiscipline.
2. The student is expected to make Anthropology a vocation and to contribute constructively to its subfields.
3. Student must have maintained a minimum 3.00 GPA in Anthropology courses and an overall 2.75 GPA.

What needs to be included in application:

1. Cover Page:
   a. Completely filled out cover page for the scholarship, including name, date, and full address.
   b. Applicant must show that he/she maintains a minimum 3.00 grade point average in all Anthropology courses, and a 2.75 overall grade point average. The Department Secretary must sign in the space provided to verify the student's GPA.
   c. Applicant must sign the release statement on the cover page.

d. Briefly state your current level of progress toward your degree.

e. Include a short paragraph stating your future archaeological intent — career goals.

f. Provide a title and abstract of your proposed activity.

2. A maximum two-page, typed double-spaced explanation of the proposed activity.

3. A short vita (maximum of one page, typed double-spaced).

4. Two letters of recommendation.

a. At least one of the two letters must come from a professional Anthropologist/Archaeologist in Wyoming. The second letter may come from a professional in a related field outside Anthropology.

Where to submit the completed application:

1. Submit two copies of the complete application packet, including the cover page, explanation of proposed activity, and vita to the Mulloy/Frison Scholarship Committee, in the Department of Anthropology office, Anthropology Bldg. Room 123, University of Wyoming, Laramie, WY 82071. The Department Secretary will keep a file to hold all applications until they are delivered to the committee for review. These materials must be in to the Department Secretary by the deadline posted for the year of the award (usually sometime in April), or applications will not be considered.

2. The applicant is expected to work with authors of recommendation letters to ensure their receipt by the Department Secretary by the posted deadline.

What happens if I am awarded a scholarship:

1. The Executive Secretary/Treasurer of the Wyoming Archaeological Society will mail you a letter notifying you of your award, and the check will be included. If you attend the spring meeting the year you apply, the award is usually made and you are recognized as a scholarship recipient at that time.

2. The scholarship recipient can use this support to conduct independent study, to help with travel expenses related to research, or other pertinent activities.

3. Recipients are encouraged, though not required, to deliver a presentation about their activity at a spring meeting of the Wyoming Archaeological Society following the year of the scholarship award.

GUIDELINES FOR APPLICANTS GEORGE C. FRISON GRADUATE SCHOLARSHIP OFFERED BY THE WYOMING ARCHAEOLOGICAL SOCIETY

Who may apply:

1. A graduate student in Anthropology at the University of Wyoming with a preferred, but not required, emphasis toward Archaeology as a subdiscipline.

2. The student is expected to make Anthropology a vocation and to contribute constructively to its subfields.

3. Student must have maintained a minimum 3.25 GPA in Anthropology courses and an overall 3.00 GPA.

What needs to be included in application:

1. Cover Page:

a. Completely filled out cover page for the scholarship, including name, date, and full address.

b. Applicant must show that he/she maintains a minimum 3.25 grade point average in all Anthropology courses, and a 3.00 overall grade point average. The Department Secretary must sign in the space provided to verify the student's GPA.

c. Applicant must sign the release statement on the cover page.

d. Briefly state your current level of progress toward your degree.

e. Include a short paragraph stating your future archaeological intent — career goals.

f. Provide a title and abstract of your proposed project.

2. A maximum two-page, typed double-spaced explanation of the proposed project.

3. A short vita (maximum of two pages, typed double-spaced).

4. Two letters of recommendation.

a. At least one of the two letters must come from a professional Anthropologist/Archaeologist in Wyoming. The second letter may come from a professional in a related field outside Anthropology.

Where to submit the completed application:

1. Submit two copies of the complete application packet, including the cover page, explanation of proposed project, and vita to the Mulloy/Frison Scholarship Committee, in the Department of Anthropology office, Anthropology Bldg. Room 123, University of Wyoming, Laramie, WY 82071. The Department Secretary will keep a file to hold all applications until they are delivered to the committee for review. These materials must be in to the Department Secretary by the deadline posted for the year of the award (usually sometime in April), or applications will not be considered.

2. The applicant is expected to work with authors of recommendation letters to ensure their receipt by the Department Secretary by the posted deadline.

What happens if I am awarded a scholarship:

1. The Executive Secretary/Treasurer of the Wyoming Archaeological Society will mail you a letter notifying you of your award, and the check will be included. If you attend the spring meeting the year you apply, the award is usually made and you are recognized as a scholarship recipient at that time.

2. The recipient can use this support for an independent research project (i.e., thesis), to help with travel expenses related to research, or other pertinent activities.

3. Recipients are encouraged, though not required, to give a presentation about their project at a spring meeting of the Wyoming Archaeological Society following the year of the scholarship award, or submit a written version of their research to the editor of *The Wyoming Archaeologist* for publication.

STATE ARCHAEOLOGIST'S REPORT

BY
MARK E. MILLER

Hello members of the Wyoming Archaeological Society! With this issue of *The Wyoming Archaeologist*, Dr. Danny Walker is approaching a quarter of a century as its Managing Editor. A hearty thanks to Danny for his many years of dedicated service to the State Archaeologist's office and the Wyoming Archaeological Society.

All of us at the State Archaeologist's Office hope that you are having a great 2005. It certainly has been busy for us so far. As many of you know, last spring started off with a wonderfully successful Annual Meeting in Rawlins where Dr. Dennis Stanford delivered an educational banquet address for over 85 WAS members. The contributed papers during the day covered a number of interesting research projects as they always do. Bill Scoggin, Pam Huter and their local helpers deserve a credit for hosting the festivities. Thank you!

The next Annual Spring Meeting is scheduled for the weekend of April 7-9, 2006 at the Plains Hotel in Cheyenne. Susan Carlson, Larry Adams, Susan Adams and Mary Hopkins are working on details in the Capitol City. Several of us in Laramie are assisting with specific tasks. Room rates will be $60 a night for singles, and Mary Hopkins tells me there will be a block of rooms available for WAS attendees. The Friday night of the meeting will be an open house at the Union Pacific Depot. Dr. Doug Owsley, another Smithsonian Institution scholar from Wyoming, has tentatively agreed to be the banquet speaker. As of this writing, we anticipate that he will be briefing the audience on his work with Kennewick man and the history of that major discovery. More details will follow as the time approaches.

Governor Freudenthal will be signing the 2005 Wyoming Archaeology Awareness Month proclamation the end of August. The text of this year's proclamation is as follows:

Whereas, Wyoming Archaeology Awareness Month connects the public with their cultural heritage through education outreach and enables them to learn about earlier residents, helping sustain the enduring bond between past and present in our society; and **Whereas,** Archaeology is the scientific study of artifacts, features, and sites that yield clues to how people lived long ago and how they helped shape the world of today; and **Whereas,** the Hell Gap Site on this year's poster is one of the most important archaeological sites in North America. Investigations at the site have played a major role in the history of American Archaeology, as showcased in a brochure that accompanies the poster. Research at Hell Gap has helped establish the sequence of archaeological complexes that represent human occupation in the New World beginning over 12,000 years ago, yielding important clues about ancient ways of life; and

Whereas, members of the Wyoming Archaeological Society, through the Wyoming Archaeological Foundation, acquired the Hell Gap Site in 1988 as a citizen's initiative to ensure long-term preservation, and to develop the site's research potential for addressing even more questions about the human experience. As the distinguished archaeologist, Waldo Wedel, is quoted on our 2005 poster, "…it is the unknown that leads the archaeologist on."

Now, Therefore, I, Dave Freudenthal, Governor of the State of Wyoming, do hereby proclaim September 2005 to be

"Wyoming Archaeology Awareness Month"

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

In Witness Whereof, I have hereunto set my hand and caused the Executive Seal of the Governor of Wyoming to be affixed this ____ day of August, 2005.

We are all grateful for continued support each year from the Governor's Office in signing a proclamation for our annual celebration. Most of you have seen this year's calendar of activities brochure prepared by Ranel Capron of the Wyoming BLM office that lists over 30 activities associated with WAAM. We encourage you to take part in all of them that you are able.

Curation activities at the University of Wyoming Archaeological Repository also have been quite successful. We recently received a donation from the Sheridan Chapter of WAS that includes collections from at least eight sites their chapter investigated during the 1950s and 1960s when WAS was in its infancy. The collections expand those already at the repository and promise to offer new research opportunities for faculty and students. We are proud to house collections like this that are so significant to the history of Wyoming archaeology.

As many of you already know, the SHPO Cultural Records office and most of the State Archaeologist's program will be moving with the Department of Anthropology to a new building on campus sometime in 2007. We have been active in the planning process for the new construction and are anxiously looking forward to having all the activities we perform under one roof. Dave Eckles and the Archaeological Survey section in our office will remain off campus, and continue to conduct about 60 archaeological projects a year for the Wyoming Highway Department, Army National Guard, National Park Service, and other clients. They too are looking to move to a new rental facility downtown later this year. Things will get pretty hectic when these moves take place, so please be patient with us as we continue with the programs we deliver.

Speaking of programs, the staff of the State Archaeologist's office presented over 140 public outreach programs to various audiences and media outlets statewide. Thousands of people have heard about or seen ongoing research and results of investigations, forming a network of interaction that we could not possibly accomplish without the dedicated staff in our office and the continued interest of the Wyoming Archaeological Society. We all look forward to another successful year.

WYOMING ARCHAEOLOGICAL SOCIETY, INC.
2005 ANNUAL MEETING MINUTES
8:05 a.m. – The Lodge – Rawlins, WY
Saturday, April 30, 2005

PRESIDING: Don Bailey, First Vice President
CALL TO ORDER: 8:05 a.m.
ROLL CALL AND CERTIFICATION OF DELEGATES: Secretary/Treasurer Carolyn Buff certified the voting delegates: Absaroka, Barbara Nahas-Keiry; Casper, John Albanese and Mavis Greer; Cherokee Trail, John Lund and Jan Soldin; Fremont, Ed and Roni McAuslan; June Frison, Carmen Clayton and Dale

Wedel; Rawlins, Bill Scoggin; and Sweetwater, Bill Current..

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

MINUTES OF LAST ANNUAL MEETING April 17, 2004: Approved as printed in the *The Wyoming Archaeologist.*

TREASURER'S REPORT: Secretary/Treasurer Carolyn Buff gave the treasurer's report showing a total net worth as of March 31, 2005 of $46,234.57, a net increase of $1,534.84 over 2004.

AUDITOR'S REPORT: Marty Rogers and Danny Walker performed the annual audit and found the accounts to be in order.

EDITOR'S REPORT: Danny Walker: The next issue of *The Wyoming Archaeologist* is currently out for bid.

LIBRARIAN'S REPORT: Danny Walker reported that the BLM donated another 16 boxes of books. They will be inventoried after the move into the new anthropology building is made. Plans are being made to set up an archives of early archaeology pictures from throughout the state.

SCHOLARSHIP COMMITTEE: Carolyn Buff announced that the committee will meet at lunch to evaluate the scholarship applications.

SAA/COAS: Marcel Kornfeld: The Council of Affiliated Societies publishes two issues of the newsletter each year which will be available to all on the SAA web site in the near future. There may be a change in the poster contest where there will be two contests: one for aesthetics and one for content. COAS sponsored a session at the meetings of contributions by avocationalists.

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 update of the progress of the new anthropology building. Bob Kelly showed a current architectural rendition of the building which will be constructed at the corner of 12th and Lewis. It will consist of a basement and three floors, and will put all departments except survey in one building. The planned occupancy date is spring 2007. Dr. Miller distributed information regarding the new site definitions.

OLD BUSINESS: Wyoming Archaeology Awareness Month – Marcel Kornfeld for Judy Wolf announced that the poster again won the 1st place award at the SAA. Motion by Barbara Nahas-Keiry, second by Roni McAuslan to donate $200. Carried.

Wyoming History Day: Danny Walker announced that there were five entrants for the WAS and WAPA awards. The WAS award went to Christina Beck from Worland and the WAPA award went to Brian Martin from Worland.

Friends of the George C. Frison Institute: Ray Gossett: Twenty-four members attended the board meeting, which was held in conjunction with the WAS fall workshop. The endowment funds total $20,875.00.

Wyoming Archaeological Foundation: Chris Lippincott: Maintenance will be done before the field season when the Frison Institute will be doing more work.

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: Mark Miller: Announced the deaths of Debbie Chastain and Bessie Brewer. Fall Meeting: Will be held in conjunction with the Frison Institute lecture on September 22. He also announced that Dr. George Frison won the Society of American Archaeology Lifetime Achievement Award.

Grant Proposal: Dan Eakin made a proposal asking for monies to purchase food for a crew to inventory and map cultural resources within the

Boulder Basin II Wildfire Area in the Shoshone National Forest of Wyoming. Motion by Barbara Nahas-Keiry, second by Roni McAuslan to grant $1,000.00 toward the effort. Carried.

Repository: Marty Rogers: Are in the process of scanning and verifying information into a new database which will be linked with the SHPO database. They are also working with the Sheridan Chapter to receive the donation of artifacts which that chapter has been holding from past excavations by the chapter. The Bureau of Reclamation has granted approximately $72,000 to pay for students to update the collections and bring them up to current curation standards. A grant was also received from the State Parks and Cultural Resources (SPCR) Commission Enterprise Funds to develop travel displays to schools, libraries, museums, etc.

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 that if you are called that 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. She proposed that chapters may want to sell windshield/bumper stickers.

ELECTION OF OFFICERS: Stuart Mackenzie, chair: President, Don Bailey; 1st Vice President, Stuart Mackenzie; 2nd Vice President, Dale Wedel; and the three-year term on the Foundation, Terri Wilson (term expires 2008). Motion by Barbara Nahas-Keiry, second by Rich Adams to cast a unanimous ballot. Carried.

2006 NOMINATING COMMITTEE: Dale Wedel, chair, Barbara Nahas-Keiry, Dewey Baars, and Stuart Mackenzie.

2005 SUMMER MEETING: Danny Walker and Marcel Kornfeld invited the membership to a combined visit to Fort Laramie and Hell Gap the weekend of June 3-5.

2006 ANNUAL MEETING SITE: Cheyenne, with Mary Hopkins and Judy Wolf as the meeting committee. They will contact some locals to help with the arrangements.

INTRODUCTION OF OFFICERS:

President – Don Bailey

1st Vice President – Stuart Mackenzie

2nd Vice President – Dale Wedel

Wyoming Archaeological Foundation (term expires 2008) – Terri Wilson

ANNOUNCEMENTS: Papers to begin at 10:30.

Carolyn Buff mentioned that 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.

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

ADJOURN: 9:40 a.m.

BANQUET SPEAKER: Dr. Dennis Stanford

GOLDEN TROWEL AWARD: Richard Adams

/s/ Carolyn M. Buff; Executive Secretary/Treasurer

/s/ Nick Palmer; President

WYOMING ARCHAEOLOGICAL SOCIETY, INC.
SCHOLARSHIP COMMITTEE
MINUTES – April 30, 2005

PRESIDING: Carolyn Buff, Chair
PRESENT: Dewey Baars, Don Bailey, Carolyn Buff, Bill Current, Chris Lippincott, Stuart Mackenzie, Mark Miller
Motion by Don Bailey, second by Mark Miller to award the Mulloy Undergraduate Scholarship in the amount of $400 to Kathleen Strand and the Frison Graduate Scholarship in the amount of %500 to Michael Page. Carried.
Motion by Dewey Baars, second by Bill Current to begin awarding the Henry and Clara Jenson Doctoral Travel Award in the amount of $250 from WAS and $250 from WAPA. Carried.
/s/ Carolyn M Buff, Chair

2005 WAS CHAPTER REPORTS

ABSAROKA

Testing/Excavation – Continuing 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.
Distributed "Archaeology Awareness Month" posters throughout the Big Horn Basin to all schools, home schoolers, visitor centers, chambers of commerce, museums, and business organizations.
Work With Other Organizations – In July some chapter members participated at the Fort Laramie National Historic Site with Dr. Danny Walker. Others participated in the Passport in Time projects including recordation of Spring City, Nevada, Bonanza City, Idaho inventory, and site condition monitoring in Bishop, California.
Students from Northwest Community College cataloging the Platt Site artifacts have completed about 2/3 of the work. Upon completion of cataloging, Chris and Judson Finley will begin writing a report..
Programs Presented – Barn Again by Rowene Giarrizzo and Winifred Wasden; On the Cold Trail of an Outlaw: History, Bioarchaeology and Big Nose George Parrott by Dr. Mark Miller; Sentinels of the Land by Barbara Nahas; That's Nor Archaeology, Is It? by Dr. Larry Todd.
Field Trips – Participated with members of the Fremont Chapter to the Dinwoody Petroglyphs and the Ring and Torrey Lake petroglyphs; Hell Gap; Meeteetse Museums and to the old ghost town of Kirwin.
Other Activities – The Milford Hanson Memorial Book Scholarship was presented to Northwest Community College student Krystal Hazen.

CASPER

Programs Presented – Music Along Historic Trails by Mary Kalbfleisch; The Mormon View of Martin's Cove by Bryce Christensen; The Glen Sweem Collection and Research Potential by Scott Burgan; Story of a Seasonal BLM Archaeologist by Kay Hammer; Historic Photographic Techniques by Rhondasue Beeson; Continuing Work at Fort Laramie by Dr. Danny Walker; Rock Art and Culture in Northern India by Dr. Mavis Greer; Casper's Painted Past by Donna Fisher.

CHEROKEE TRAIL

Programs Presented – Archaeological Investigations at Fort Laramie by Dr. Danny Walker; 1879 Milk Creek Battle and Military Sites by Dr. Mark Miller; Trapper's Point Prehistoric Human and Wildlife Migration Corridor by Meredith Taylor; Evidence for an 18,000 Year Old Occupation of the Great Plains by Steve Holen; Recent High Altitude Research by Rich Adams; Anazazi Dwellings and Pottery in the

Four-Corners Area by George and Mary McIlvaine; Archaeological Investigations at the Game Creek Site by Dan Eaken.

JUNE FRISON

Survey – Members have assisted in surveys at Ord Ranch, Hell Gap, Fort Laramie and OWSA Projects

Public Education – Public invited to all chapter meeting and guest speakers. Distributed materials to schools and clubs. Talks by various members to interested groups.

Work With Other Organizations – Chapter members worked with Frison Institute, OWSA, and UW projects.

Programs Presented – Skunk Oil; Sal Water and Sure Fire: The Shoshone and Elijah Wilson by Paula Renaud; Engendering Plains Archaeology by Shanna Cox; A Global Perspective on Clovis Elephant hunting by Todd Surovell; Barger Gulch, Locality and Insight into A Folsom Campsite by Nicole Waguespack; Faunal Analysis and Ethnohistory: Breathing New Life into Old Bones by Rory Becker; Temporally and Cultural Diagnostic Artifacts: Establishing Dates and Possible Affinities for the Nunn Individual and the Clear Creek Cemetery by Rick Weathermon; Geophysics and Archaeology at Fort Laramie by Dr. Danny Walker; Williams Spring: An Oasis in the Island on the Plains by Rory Becker; Result of UW's field work at Agate Basin 2003/4 by Mary Prasciunas.

AUDITING COMMITTEE REPORT
March 31, 2005

In compliance with the bylaws, the Auditing Committee has reviewed the Treasurer's books and records for the Wyoming Archaeological Society, Inc. for fiscal 2004.

AUDITING COMMITTEE SUMMARY
March 31, 2005

The Wyoming Archaeological Society, Inc. checking account number is 7141005-75, the savings account number is 7141005-01, the money market account number is 7141005-60, and the certificate of deposit account number is 7141005-38 at the Reliant Federal Credit Union (formerly Natrona County School Employees Federal Credit Union), 900 Werner Ct, #100, Casper WY 82601.

Balance on hand March 31, 2004 - $44699.73

Receipts:
Interest Earned - $1110.78
Deposits - $5533.58
Disbursements - $5109.52

Balance on hand March 31, 2005 - $46,234.57

Includes 0 outstanding check(s) and and 0 outstanding deposits.

Audited and found correct.

/s/ _____
Date April 29,2005

/s/ _____
Date April 29, 2005

WYOMING ARCHAEOLOGICAL SOCIETY, INC.
Treasurer's Report for Fiscal Year Ending March 31, 2005

CHECKING ACCOUNT -
NC SCHOOL EMPLOYEES FEDERAL CREDIT UNION

	INCOME	EXPENSES
BALANCE		
Beginning Balance	$3,633.65	
Deposits	$5,533.58	
Interest Earned	$8.98	
TOTAL INCOME - CHECKING	$9,176.21	
EXPENSES		
Bloedorn Lumber - Trowel		$14.19
Merback Awards - Trowel Engraving		$25.30
Teton Chapter		$200.00
Wyoming Archaeological Foundation - Annual Payment		$220.50
Wyoming Archaeological Awareness Month		$200.00
George Frison - Honorarium		$200.00
Snow King Resort - Frison Expenses		$124.60
Kinko's - Journal Printing		$1,730.00
James D Beers - Scholarship		$500.00
Casper College - Postage		$37.00
Danny Walker - Postage		$3.03
USPS - Bulk Permit		$500.00
Casper College - Postage		$37.00
SAA - Annual Membership		$30.00
Danny Walker - Journal Printing		$1,075.90
USPS - Bulk Permit		$150.00
Secretary of State - Corporation Tax		$25.00
Casper College - Postage		$37.00
TOTAL EXPENSES		$5,109.52
ENDING BALANCE - Checking Account	$4,066.69	
SAVINGS ACCOUNT		
BEGINNING BALANCE	$121.70	
Interest Earned	$0.60	
ENDING BALANCE	$122.30	
MONEY MARKET ACCOUNT		
BEGINNING BALANCE	$6,297.48	
Interest Earned	$47.39	
ENDING BALANCE	$6,344.87	
CERTIFICATE OF DEPOSIT ACCOUNT		
BEGINNING BALANCE	$34,646.90	
Interest Earned	$1,053.81	
ENDING BALANCE	$35,700.71	

TOTAL NET WORTH AS OF MARCH 31, 2004	**$46,234.57**	
Total Income	**$51,344.09**	
Total Expenses		**$5,109.52**
Net Increase	**$1,534.84**	

SCHOLARSHIP ACCOUNT		
Beginning Balance	($8,446.00)	
Deposits	$50.00	
Scholarships Awarded		$500.00
Balance	$(8,896.00)	
ARCHAEOLOGY WEEK ACCOUNT	$(212.48)	
Deposit	$200.00	
Balance	($12.48)	

/s/ Carolyn M Buff
Executive Secretary/Treasurer

WYOMING ARCHAEOLOGICAL FOUNDATION 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., Hell Gap Site Research, other, ???????)

Please make your check payable to THE WYOMING ARCHAEOLOGICAL FOUNDATION
Barbara Keiry, Secretary/Treasurer, P.O. Box 3146, Cody, Wyoming 82414 — 307-868-2685

SITE 48JO303

by
DON GREY

ABSTRACT

The 48JO303 site is located in the southern Big Horn Mountains of Wyoming. This was the first occurrence of the Pryor stemmed projectile point in an acceptable stratified sequence. A carbon date of 5850 +/- 110 B.C. was obtained for the Pryor stemmed level.

LOCATION AND SETTING

Site 48JO303 is located in the rimrock sandstones of the Tens1eep formation on the south side of the Middle Fork of Powder River. The elevation is about 7000 feet. The river flows through a canyon which has been cut to a depth of about 1700 feet in Paleozoic limestones. The canyon is almost impossible to cross at this point, and one must go about two miles up, or four miles down, the stream to find even a difficult crossing.

The site is situated above the pine-zone lower border at the present time. Conifers are confined mainly to the sandstone substrates, while the limestone substrates are dominated by mountain mahogany (*Cercocarpus montanus*). *Artemisia* and *Yucca* dot the open spaces. Wild Canadian rye grass is often associated with habited sites in the area. The reason for the association is not yet established.

Game, in the very recent past, consisted of antelope, deer, bison, elk, and many small game animals. There is little evidence to indicate that this pattern was ever significantly different during the time of occupation. A similar lack of change in the general area was suggested by the data from the Sister's Hill site (Haynes and Grey, 1965).

A spring occurs about 1/4 mile to the south of the site, as does an outcrop of quartzite used

---

Site 48JO303 was excavated by the Sheridan Chapter of the Wyoming Archaeological Society in the late 1960s. This article describing the excavations and material from the cave site was originally sent to Dr. George Frison by Don Gray in August 1972. We have learned a lot about what we now call Pryor Stemmed and Lovell Constricted, two Late Paleoindian point styles from northern Wyoming. However, many observations made by Don in the early 1970s are still valid to overall Paleoindian studies today, 35 plus years later. This paper is presented here almost like Don originally wrote it, only minor editing and grammatical changes being corrected. Don's perspective on the site pretty much provides a historical background:

> I have always had a rather subjective feeling that the 48 JO 303 site just missed being a real keystone in the evolution of some important artifact types. A greater depth of deposit and hence better time resolution might have provided a good deal of information about the relation of lanceolate forms like number 90, to the bi-bevels, and the relationship of the latter to the McKean. Whether the latter relationship exists in any real sense is problematical, but I have certain mystical impressions from handling the material and seeing it in the site that leave me feeling that there may well be a genetic relationship here. A few more good sites may help to soothe my fevered brow one way or another on that point (Don Gray, letter to George Frison, August 17, 1972).

---

for artifact manufacture. A characteristic magenta chert, widely used for artifact production in the area, occurs about two miles down the river as surface float derived from the gypsum beds overlying the Tens1eep sandstone and underlying the Chugwater formation.

SITE DESCRIPTION

Site 48JO303 consists of a small group of rockshelters among a series of sandstone ledges. The sandstone locally contains thick layers of soft material interlayered with ledges of more resistant material. The formation thus weathers into ledges or terraces with varying degrees of overhang. Three small shelters at the site were numbered. Numbers One and Two faced approximately south, while the largest, number Three, faced west onto a-steep drainage which plunged into the canyon in less than a quarter mile.

Shelter Three had about 300 square feet of floor space under an overhanging ledge, and opened onto a large flat area thirty to forty feet wide and a hundred feet long. This area contained several large boulders, but afforded usable camping and working area. Several large pine trees border the west edge of the flat space at the present time. Most of the flat area is covered with grass except for a zone next to the sandstone wall bordering the east side in which the shelter occurs. Here, deflation has removed most of the fine sand, leaving many small pebbles. Slight depressions, caused by deflation and by the spill of rain and meltwater over the overhanging ledges show signs of having- held water at times, but the sandy soil soon drains these away.

PROCEDURE

The site was discovered during an archaeological reconnaissance, and a small test pit was dug in Shelter Three. This revealed a significant depth of deposit and several artifacts, including two points of the type herein called bi-bevels as a temporary designation. The site was later excavated in June, 1959, by members of the Wyoming .Archaeological Society.

Shelter One did not appear to be productive, and was not excavated. Shelter Two was sampled with a trench about 20 feet in length, perpendicular to the back wall of the shelter. This trench revealed that the deposit was shallow and rather well mixed, so that no cultural stratification could be detected. Some 63 artifacts were recovered from the trench, and included a range of types, with a tendency toward greater numbers of recent material.

Shelter Three was opened with a trench along the south portion of the shelter, perpendicular to the general trend of the wallrock, and following the south wall of the shelter. This trench revealed several natural strata and many artifacts. The trench was extended northward near the back wall through an area which appeared to have been disturbed, thus forming an L-shaped trench. Another lateral trench was dug northward from the front or west end of the first trench through an area where the strata were less distinct due to lesser occupation and greater exposure to weather and mixing processes. Finally, the trench system was closed with a fourth trench along the north portion of the shelter. This served to isolate a block of material about 8 feet by 10 feet .in size, possessing well-defined natural strata, in the central portion of the shelter. This central column was then trowelled down from the top.

Most artifacts were found in situ, but all material was screened as a double check.

STRATIGRAPHY

The exploratory trench of Shelter Three revealed five natural strata (Figure 1), described as follows, from top to bottom. The first, or top; stratum consisted of loose, fine sand, with few artifacts, light colored and well-mixed by animals and wind. The stratum was about 4 inches thick.

The second stratum was dark colored, due to charcoal and ash, fine textured, slightly cohe-

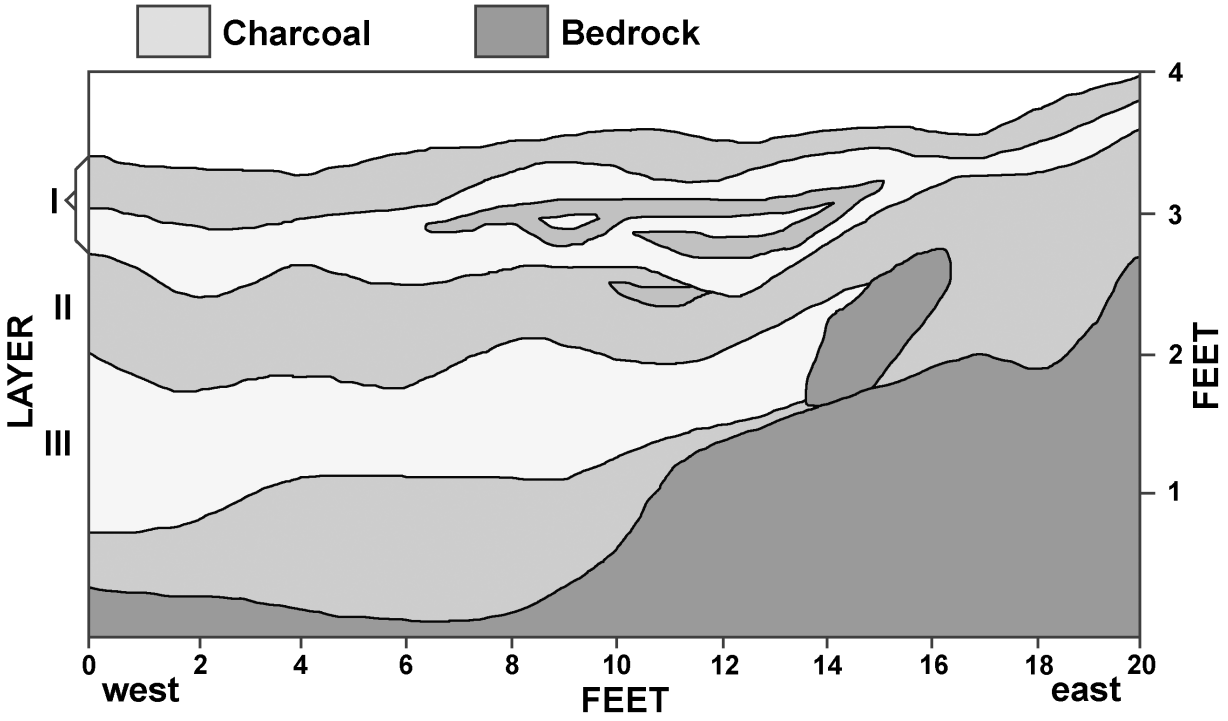


Figure 1: Stratigraphy in the north wall of the exploratory trench in Shelter 3. Note difference in vertical and horizontal scales.

sive, and contained abundant cultural material. This was about 5 inches thick.

The third stratum was light colored, contained firepits but no disseminated ash or charcoal, contained numerous artifacts, and was about 7 inches thick. The lower portion of the layer was quite pebbly and lightly cemented.

The fourth stratum was about 5 inches thick, dark, with ash and charcoal throughout, and numerous artifacts.

Below the fourth stratum, in the deepest part of the shelter, there was a clean, culturally sterile layer of sand which constituted the fifth stratum. This stratum was level on top through much of the area, and was somewhat pebbly in the top portion. The level nature suggests that the material might have been ponded at one time. This in turn suggests that the rockfall in front of the shelter, and the subsequent buildup of soil, etc., may have occurred between the time of formation of the fifth stratum and the beginning of the fourth stratum.

The thickness figures given are general averages, of course. The thicknesses were least near the back walls and greatest near the southwest portion of the shelter area, where they totaled 39 inches at the top of the fifth stratum.

Because there was probably always a zone of mixing at the surface, such as the present four inches or so of loose sand, it was felt that the natural light and dark strata would be the best stratigraphic guides during excavation, rather than cultural strata. The exploratory trench had revealed several components in the site, and that these were somewhat mixed. Since the thickness of the zone of mixing was comparable to the thicknesses of the natural strata, it was assumed that cultural stratigraphy would be largely a matter of statistics.

For purposes of cataloguing and note taking, the strata were assigned Layer numbers as follows:

Layer 1 was composed of strata 1 and 2.

Layer 2 was composed of stratum 3.

Layer 3 was composed of stratum 4.

Stratum 5, which was culturally sterile, was not assigned a Layer designation. Thus there were three layers recognized in the tabulation and cataloguing at the site.

CULTURAL STRATIGRAPHY

As expected, the stratigraphic relationships of the cultural materials were somewhat diffuse. However, certain generalizations were very apparent. The dominant artifact in Layer 3 was a bi-beveled projectile point (Figure 2), usually made of quartzite. Layer 2 was dominated by McKean-like materials (Figure 3) and chert was the preferred material. Deer bones were present in all three layers, but were particularly abundant in Layer 2, associated with McKean-like materials.

The corner-notched points were confined to Layer 1. These points showed a greater variety of lithic materials than the McKean-like materials or the bi-beve1led materials.

Virtually all the bi-beveled points and the McKean-like materials were made of either quartzite or chert, both apparently of local origin. There was a definite preference for quartzite in the bi-beveled material (62% quartzite, 38% chert), and a definite preference for chert in the McKean-like materials (88% chert, 12% quartzite). Table 1 shows the distribution of materials used for point manufacture in the three layers. The materials are classified as local quartzite, local chert, or imported material.

The increased use of imported materials in later times may reflect increased mobility, although pre-horse, or increased population and/or trade. Table 1 also shows the distribution of total artifacts and broad style classes in the three layers. The term "total artifacts" refers to nameable forms, and excludes the flakes, chips,

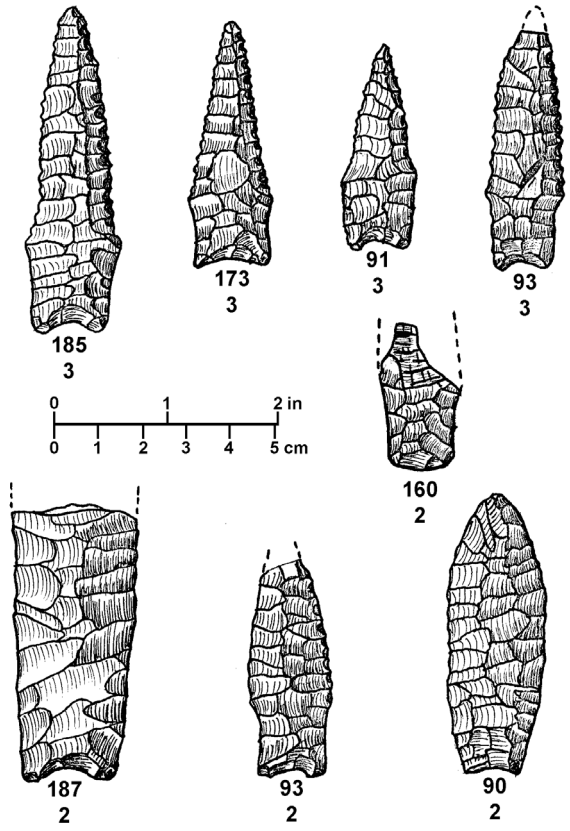


Figure 2: Bi-bevel and lanceolate points from Shelter 3. Upper number by each artifact is site catalog number. Lower number is number of layer in which artifact was found.

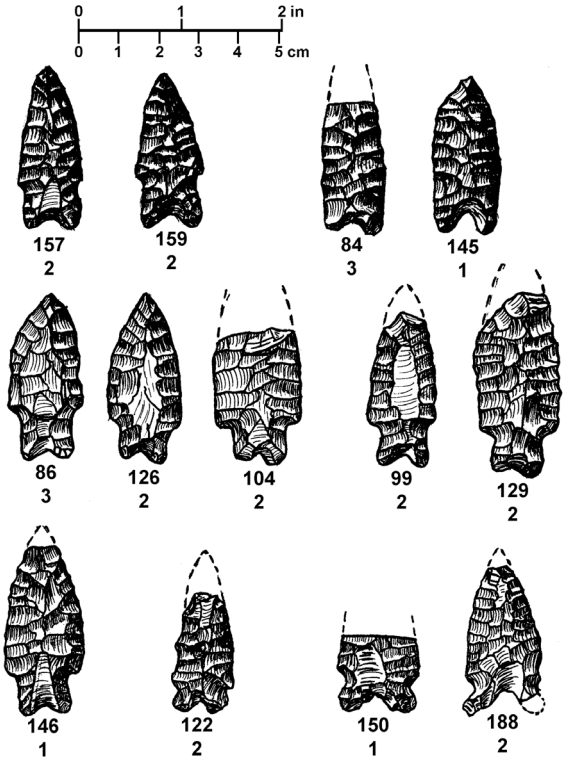


Figure 3: McKean-like and possibly related points from the 48JO303 site. Catalog numbers and level numbers given for each point.

Table 1: Projectile point summary data.

Table 1: Projectile point summary data.

LAYER	POINTMATERIAL, %			TOTALARTIFACTS	CORNERNOTCH	BI-BEVELS	MCKEAN	SIDENOTCH
	QZT	CH	IMP					
1	46	32	22	20	1	3	2	2
2	22	74	4	30	4+1	10	3+1	0
3	52	40	8	25	10+4	2+2	1+1	0

Where identification is not certain, a number like 4 + 1 is used to indicate 4 positively identified specimens and 1 probable.

etc.

While the number of artifacts per layer is not greatly different, there is a definite concentration of bi-bevels in the lower layer, McKean-like materials in the middle layer, and corner-notched points at the top. Side-notched points occur in all levels, with a slight preponderance in the second layer. One type of side-notched point, number 166, Figure 4, resembles closely a type observed at Kaufmann Cave (Grey, 1962) and by Kivett at Logan Creek. The point dates around 6600 years at the latter site, and appears to be quite early at Kaufmann Cave also. In the present site, it occurs in Layer 2, and in shelter 2.

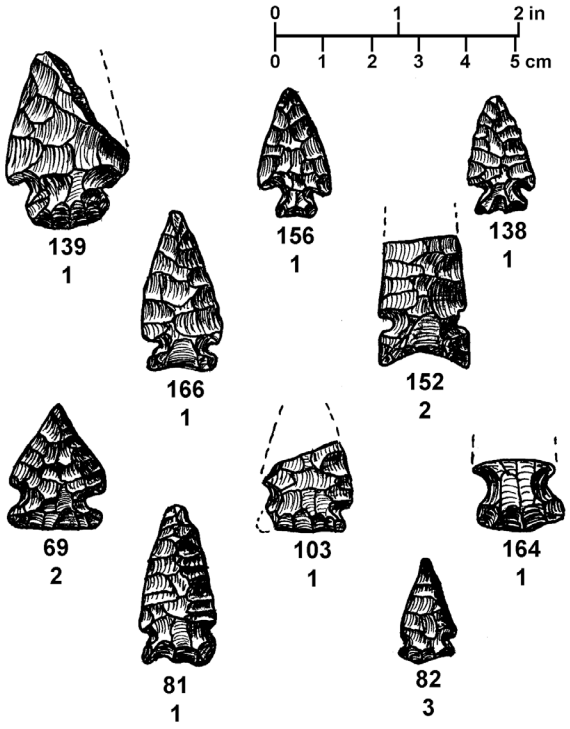


Figure 4: Notched points from Shelter 3 at the 48JO303 site. Catalog numbers and level numbers given for each point.

BONE MATERIAL

Deer bones were particularly abundant in Layer 2, but were present in all levels. Two bone awls (Figure 5) were found in Layer 2 closely associated with McKean materials.

Two large cuspid teeth, tentatively identified as bear at the time of excavation, were found in the lower part of Layer 3, quite close to point number 90 (Figure 2). These teeth were partially petrified.

The second phalanx of a large horse, probably modern, was found in the unstratified deposits of Shelter 2.

COMMENTS ON THE BEVELED POINTS

The beveling of the edges of these points invariably resulted in a serrated edge, and this may have been, at least in part, the objective of the procedure. The general workmanship of the stem and surfaces of the points is rather good, while the workmanship involved in the beveling seems almost crude by comparison. This, perhaps, taken with the asymmetric nature of the edge flaking, lends a certain credence to the idea that these points have been re-sharpened, re-worked, or even re-used. However, there is

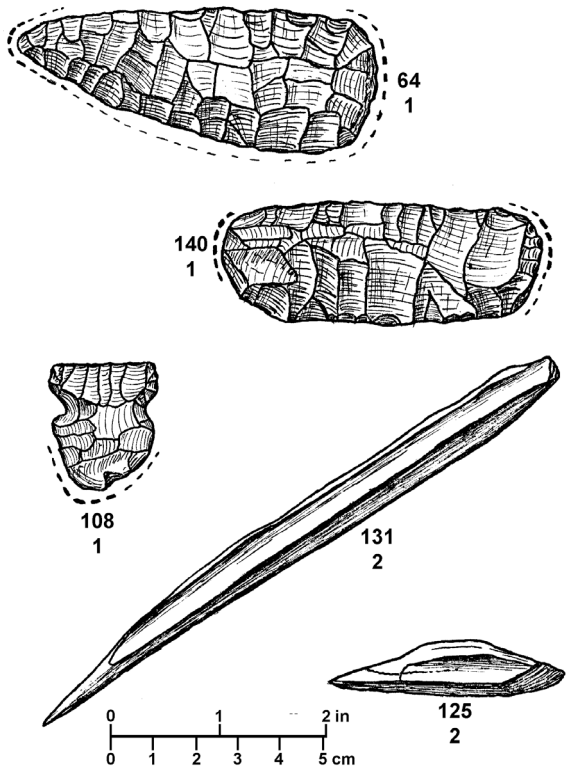


Figure 5: Tools from Shelter 3, 48JO303. Catalog numbers and level numbers given for each point.

other evidence which argues against this hypothesis.

Some of the bi-bevel points show unifacial flaking on the stem portion, e.g., points 186, 183, 171; 173, 94, 93, and perhaps 70. In most cases, the sense of the unifacial flaking on the stem is the same as that on the blade portion, but in some cases, e.g. 94 and 70, the sense is opposite. Certainly this argues against the beveling being a result of resharpening of hafted points.

Point number 90, Layer 3, is a lanceolate form, but there are certain features about it which may relate to the bi-bevel industry. Viewed from the point end, there is a definite asymmetry of cross section which is very like that of the beveled points, although not so pronounced. The edges of the blade are uniformly convex, while the bi-bevels are usually, but not always (cf. point 93, Figure 2) straight edged. Number 93 has convex edges, and could almost serve as a transitional form between 90 and more typical bi-bevels. The stem of 93 is quite typical of bi-bevels.

The ground edges of the stem of number 90 are straight or slightly convex, while the typical bi-bevel is slightly concave. The difference is not due to intensity of grinding, because 90 is perhaps more heavily ground than most of the bi-bevels. The base of number 90 is not so deeply concave as most bi-bevels. The typical bi-bevel has a slightly "eared" appearance, due to the concave base and concave edges of the stem. Still, if point number 90 were unifacially chipped from the end of lateral grinding to the point, it would hardly be noticed as aberrant in a group of bi-bevels, and the trace of beveling which is present of the point leads to speculation about possible relationships between them.

The bi-bevel points were shown at the 1959 Plains Conference for Archaeology at Lincoln.

Several archaeologists identified the points as Meserve-Dalton. Hamilton, who had worked at the Meserve-Dalton type sites, felt they were indistinguishable from the type-site materials. Certainly the dating at the present site is consistent with this identification.

THE MCKEAN-LIKE POINTS

An appreciable range of variation is present in those materials referred to as McKean-like. Figure 6 delineates the essential features of the types. Types A, B and C all have flaring stems. D is stemless and E and F have parallel-sided stems. In A and B, the shoulder is essentially the same width as the base, while C has a wider shoulder. B has a nearly parallel sided blade, while A has a triangular blade. C's blade may be either triangular or parallel-sided. E and F differ mainly in the relative width of stem and blade, with E showing a parallel sided blade, while F tends toward the triangular.

Type D is easily converted to A or B by shaping the sides of the stem. Some of the points show some grinding on the stem edges, but there seems to be little correlation of grinding with

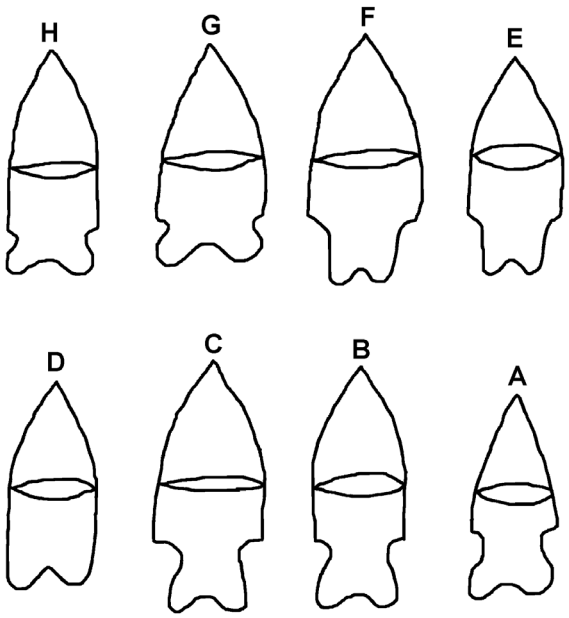


Figure 6: Stylized features of the types of points called McKean-like in this report. Two additional types of problematical relationship are also shown (G and H).

type.

The distribution of types with depth shows types A and B (5 specimens) confined to layers 1 and 2, type C (5 specimens) in layers 2 and 3, type E (3 specimens) in lower 2 and 3, type D (3 specimens) in all 3 layers, and type F (one specimen) in layer 2. The small numbers involved do not provide a sufficient statistical base to attempt serializing the types.

Types G and H were not classified as McKean types, although they may be related. These types have such short stems, if indeed they may be said to have stems, that the lateral portion of the stem is a mere notch, and the point was here classified as a side-notched type. However, the basal concavity and general form suggest McKean affiliations.

TOOLS

The tools at 48JO303 were confined to awls, scrapers, possible knives, and some problematical forms. Several end scrapers showed considerable wear. The awls were of bone.

Layer 1 contained three stone artifacts worth passing comment. Number 64 (Figure 5) is a quartzite tool of bladelike form, roughly triangular in outline, showing considerable abrasion on both the "point" and "basal" ends, and to a lesser degree, along one edge. Number 140 (Figure 5) is a parallel-sided form with blunt ends, made of local chert of good workmanship. Both ends show considerable abrasion.

Number 108 (Figure 5) was apparently a hafted tool. Its use is problematical. The end is very worn. The shape precludes use as a scraper, and it is far too dull to have been used as a cutting instrument. The "point" is off the midline of the tool. Almost the entire surface shows some polish, but the wear is greatest at the projecting point. Tool 140 shows a similar asymmetry, with the greatest length occurring at one side of the mid line. If this tool were broken transversely across the middle, the two halves would need only basal thinning and notching to match tool 108 very closely. It is possible that tool 140 is a hand-held version of the hafted tool 108.

CHRONOLOGY

A large number of radiocarbon dates were obtained for the site (Table 2). Most of these were done by Grey, on newly constructed equipment, as a test of reproducibility and consistency. Aliquots of three of the samples were re-measured at the University of Arizona Radiocarbon Laboratory. The dates are tabulated below. Samples were taken from fire hearths for the most part, although one sample was made up of disseminated charcoal from Layer 2, and therefore represents a space-averaged value.

Differences between DCG and Arizona dates may be due in part to sampling errors. Samples were sacked at the site, using material from single hearths, except for sample 14. Portions for dating were taken from the sacked samples without homogenizing the samples. In the event that the apparent sample was a mixture, this could account for some differences. Considering that the DCG equipment was new

Table 2: Radiocarbon dates from

LEVEL INSITE		SITESAMPLENO.	LAB NO.	C14 AGE COMMENTS
~~Upper 1~~	~~11~~	~~DCG 9~~	~~1140 +/- 150~~	
Lower 1, 9”	12	DCG 16	2420 +/- 160	
Upper 2	5	DCG 18	1690 +/- 150	
Upper 2	6	DCG 17	2130 +/- 150	
Middle 2, 16”	13	DCG 13	3750 +/- 170	
Averaged 2	14	DCG 14	3080 +/- 160	
McKean, 2	9	DCG 6	3170 +/- 160	Hearth, McKean points, awl, deer bones on rim.
		A-483	3450 +/- 40	
Middle 2, 17”	8	DCG 7	4180 +/- 180	
Upper 3	7	DCG 8	4460 +/- 180	
Upper 3	10	DCG 15	4620 +/- 180	
Upper 3	17	DCG 4	4750 +/- 180	
Middle 3, 20”	15	DCG 5	5230 +/- 190	
Middle 3	18	DCG 2	5600 +/- 190	Probably lowest McKean
		A-485	3980 +/- 70	
Lower 3, 23”	16	DCG 3	8600 +/- 250	Bi-beve1
		A-484	7800 +/- 110	

and relatively untried at the time, the Arizona dates must be considered more reliable.

ACKNOWLEDGEMENTS

Space does not permit listing the names of all the persons who participated in the excavations at the site, but gratitude is expressed to the Wyoming Archaeological Society for the labors involved, and for the use of the materials in the preparation of this report. Special thanks must go to Mr. and Mrs. Louis Allen, now at the University of Wyoming, for surveying the site area. The University of Arizona provided three radiocarbon check dates, while the remainder were provided by Don Grey.

BIBLIOGRAPHY

Grey, Donald C.
1962 The Bentzen-Kaufmann Cave site 48SH301. *Plains Anthropologist* 7(18):237-245.

Haynes, C. Vance Jr., and Donald C Grey.
1965 The Sister’s Hill site and its bearing on the Wyoming postglacial alluvial chronology. *Plains Anthropologist* 10(29):196-207.

DIFFERENTIATING HUMAN AND NON-HUMAN IMPACTS ON LEPORID REMAINS: A COMPARISON OF RABBIT BONE CAVE (48PA202) AND WOLF DEN CAVE (48BH1796) FAUNAL ASSEMBLAGES

By

Joshua L. Tatman

INTRODUCTION

One of the primary concerns of zooarchaeology is the differentiation between human and non-human impacts on faunal assemblages. To that end, the zooarchaeological literature of the past few decades has been saturated with studies aimed at differentiating human from non-human effects on bone (Behrensmeyer et. Al 1986, Olsen and Shipman 1988, Curz-Uribe 1991, etc.). Much of this literature has taken the form of actualistic studies. These studies were aimed at describing modern faunal assemblages with known taphonomic histories. Such research revealed important information on two scales. First, it revealed information on how different human and non-human impacts affect bone itself, thus at a microscopic scale. Second, it revealed information on how different human and non-human processes affect the composition of faunal assemblages as a whole, on a macroscopic scale.

Unfortunately, most of such research focuses on large or mid-sized mammal remains. This has created a biased level of detail in understanding taphonomic processes in archaeological sites. Taphonomy-oriented zooarchaeologists tend to give small mammal species and other remains such as birds and fish less attention. No matter what the causal reason for this bias, archaeologists tend to focus on larger fauna and neglect smaller fauna in their attempts to understand the formational processes that create an archaeological site.

The goal of this paper is to add to the shallow base of data on taphonomic processes affecting small mammal remains in archaeological contexts. To that end, faunal assemblages from two sites, the Rabbit Bone Cave, and the Wolf Den Cave will be compared. For the purpose of this project, only leporid remains will be compared. Both *Lepus* sp. and *Sylvilagus* sp. remains will be analyzed in this project. The comparisons made in this paper represent an attempt to differentiate between assemblages of leporid remains accumulated and impacted partially by humans, and leporid assemblages with no human impact. In addition, taphonomic impacts that represent a human 'signature' will be discussed.

MATERIALS

For this project, faunal assemblages from the following two sites were analyzed. It is necessary to give a short description of these assemblages and of the sampling methods used for them to understand the significance of the results addressed in this paper.

RABBIT BONE CAVE

Rabbit Bone Cave (48PA202) is a small rockshelter located in Park County, Wyoming. It is radiocarbon dated to 1670+/- 100 years before present (Strukenrath and Mielke 1972). This date coincides with diagnostic Late Ar-

chaic corner-notched projectile points recovered from the site (Strukenrath and Mielke 1972). The site, consisting of the sediment fill of the rockshelter, was entirely excavated between 1963 and 1967 by an advocational archaeologist. Precise provenience data does not exist for any of the artifacts recovered from Rabbit Bone Cave. Other artifacts from the site include grinding implements, beads, a bone awl, and scrapers and knives (Strukenrath and Mielke 1972). The archeo-faunal assemblage consists primarily of leporid bone, but also some highly fragmented specimens of large and mid-sized ungulate bone. The entire sample of recovered leporid bone was used in this study, but only femora and tibiae were analyzed due to time constraints.

WOLF DEN CAVE

Wolf Den Cave (48BH1796) is a paleontological site located in northern Bighorn County, Wyoming. Wolf Den Cave is an inverted funnel-shaped cave that acted as a natural geological trap to any animal that happened to fall into it. Radiocarbon dates from the surface of the cave and from 50 cm below surface are 420+/-60 and 1210+/-70 years BP respectively (Walker 1994). The site contains remains of various fauna, including a large assemblage of leporid remains. This site has been interpreted as not having any definitive archaeological component (Walker 1994), although a single Avonlea point was recovered from the deposits (personal communication, Danny Walker, April 5, 2004). For this project, a sample was used that consisted of all leporid remains from the surface of the cave's deposits. All femora and tibiae from this level were analyzed. Leporid remains were also present in subsurface strata, however these were not analyzed during this study.

METHODS

Analyses conducted on the assemblages involved only qualitative data (see Appendix B for data and a list of codes). Variables included the following: Catalog number, Site, Species, Element, Portion, Side, Location of Rodent Modification, Proximal Fusion, Distal Fusion, Weathering, Type of Cultural Modification, Location of Cultural Modification, Type of Burning, Number of Breaks, and for each individual break, Break Type, Break Location, and Break Age. Catalog numbers were the established University of Wyoming Archaeological Repository catalog numbers assigned to the individual elements and fragments in the assemblages. There was no attempt made to differentiate specific species, thus classification is only to genus level, either *Lepus* sp. or *Sylvilagus* sp. Only fragments that were identifiable to species, element, side, and portion were included in this analysis. Only the femora and the tibiae from the two assemblages were analyzed. The methods of classification and coding for the following measures were taken from coding formats modified by Todd (1996): Element, Portion, Side, Proximal Fusion, Distal Fusion and Weathering. One additional category was added for classification of portion, that of DSP, meaning complete with the exception of a partially missing or damaged epiphysis(es). The following measures- Location of Rodent Modification, Location of Cultural Modification, and Break Location, used a scale that divides a complete long bone into five sections. Zone 1 consists exclusively of the proximal epiphysis. Zone 2 consists of the proximal 1/3 of the diaphysis. Zone 3 consists of the most medial 1/3 of the diaphysis. Zone 4 consists of the distal 1/3 of the diaphysis. Zone 5 consists exclusively of the distal epiphysis.

All specimens were examined both naked-eye and under a low-power hand lens, after Blumenschine et. al (1996), and doubtful specimens were examined using a multi-power microscope. All data were entered and analyzed using SPSS 11.5.

Sample descriptives, including Number of Identified Specimens (NISP) and Minimum Number of Individuals (MNI) were calculated.

MNI was calculated by including consideration of possible refits in the assemblages. Thus, these numbers represent minimum possible values.

RESULTS

Minimum Number of Individuals and Number of Identified Specimens were established using the protocols described above, after Klein and Cruz-Uribe (1984). For the Rabbit Bone Cave sample, *Sylvilagus* sp. NISP is 31 for femora and 91 for tibiae. The *Sylvilagus* sp. MNI for the Rabbit Bone Cave sample is 38, based on the left tibia. For the Wolf Den Cave sample, *Sylvilagus* sp. NISP is 59 for femora and 73 for tibiae. The *Sylvilagus* sp. MNI for the Wolf Den Cave sample is 38, based on the left tibia.

For *Lepus* sp. from the Rabbit Bone Cave sample, NISP for tibiae is 10, and for femora 2. *Lepus* sp. MNI from the Rabbit Bone Cave sample is 3, based on the left tibia. For Wolf Den Cave, *Lepus* sp. NISP is 35 for tibiae, and 20 for femora. MNI for *Lepus* sp. from the Wolf Den Cave Site sample is 22, based on the left tibia.

If one discounts the possibility of species-differential fragmentation, based on the MNIs for the samples, *Sylvilagus Sp.* represents approximately 93% of the leporid assemblage at Rabbit Bone Cave, while from the Wolf Den Cave sample, *Sylvilagus Sp.* represent only approximately 63% of the sample under the same criteria.

Comparisons of proximal and distal fusion of elements from Wolf Den Cave and Rabbit Bone Cave reveal a slightly higher number of immature individuals at Rabbit Bone Cave, however, these values may be misleading due to differential erosion of the epiphyses at the two sites (Figures 1 & 2). In all cases, fusion of elements from Rabbit Bone Cave exhibited more indeterminacy due to more fragmentation that resulted in a lack of zone of epiphyseal fusion.

The Rabbit Bone Cave assemblage exhibits a higher degree of weathering and fragmentation then does the Wolf Den Cave assemblage (Figures 3 & 4). Wolf Den Cave exhibits a much higher degree of completeness, with the most commonly occurring portion being DSP, or complete other then partially damaged epiphysis(es). The most commonly occurring portion for the Rabbit Bone Cave assemblage was DF, or diaphysis. This illustrates a trend in erosional fracturing that was observed almost exclusively in the Wolf Den Cave assemblage. In specimens with epiphyses present, epiphyses in the Wolf Den Cave assemblage tended to be partially fragmented near the zone of epiphyseal

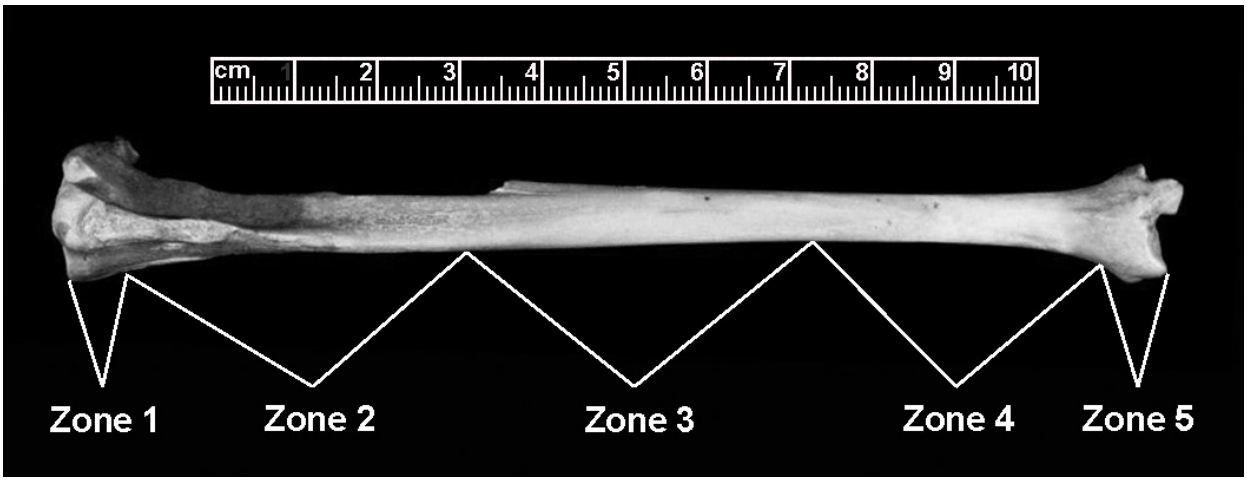


Figure 1: Location of zones dividing leporid tibia during present study.

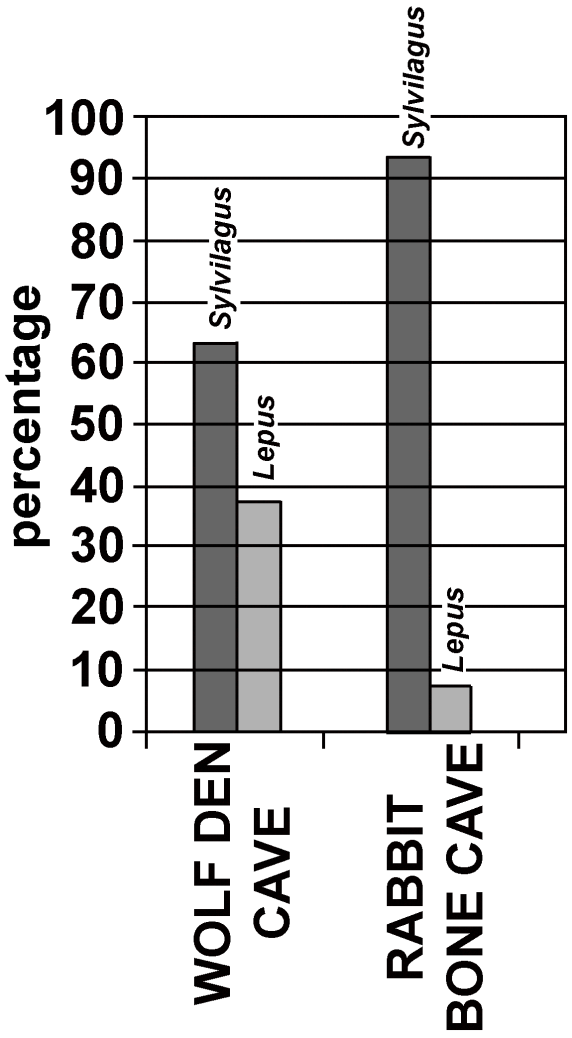


Figure 2: Relative percentages of *Lepus* and *Sylvilagus* represented in Wolf Den Cave and Rabbit Bone Cave assemblages.

fusion, or immediately below it on the diaphysis. This trend was not observed in specimens with present epiphyses in the Rabbit Bone Cave assemblage.

Rodent modification was extremely variable between the two assemblages. At Wolf Den Cave, rodent-modified specimens were common. Locational preference of modification was clearly expressed. For example, for the tibia, there is a clear trend towards modification on the epiphyses, and on zone 2, which in the tibia includes the tibial crest (Figure 5). Conversely, no specimen from Rabbit Bone

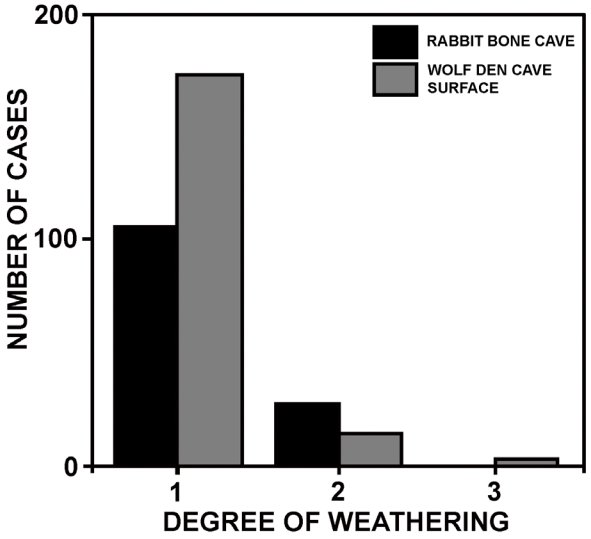


Figure 3: Relative differences between degrees of weathering, between Wolf Den Cave and Rabbit Bone Cave assem-

Cave exhibited rodent modification. Rabbit Bone Cave specimens did display root etching, a variable that was not quantified in this study. Root etching ranged from 0-60% of etching of bone surface. No specimens from Wolf Den Cave exhibited root etching.

Cutmarks were very rare. Only two specimens from Rabbit Bone Cave exhibited cutmarks. The first specimen exhibited multiple stone tool cutmarks on the anteriolateral portion of a *Lepus* sp. tibia, just below the tibial crest. The second specimen was the distal end of a *Sylvilagus* sp. tibia, incised and snapped in zone 4. Several of the specimens from Rabbit Bone Cave appeared to have been sawed or cut with a metal tool, obviously excavator/post-excavation breakage, since the patina of these cuts was drastically different from that of the bone surface. No specimens from Wolf Den Cave exhibited cutmarks.

Four specimens from Rabbit Bone Cave exhibited burning. All were *Sylvilagus* sp. tibiae. Two of these exhibited carbonization of the diaphysis, one had a carbonized epiphysis, and the last was completely carbonized/calcined.

Comparisons of types of breakage observed

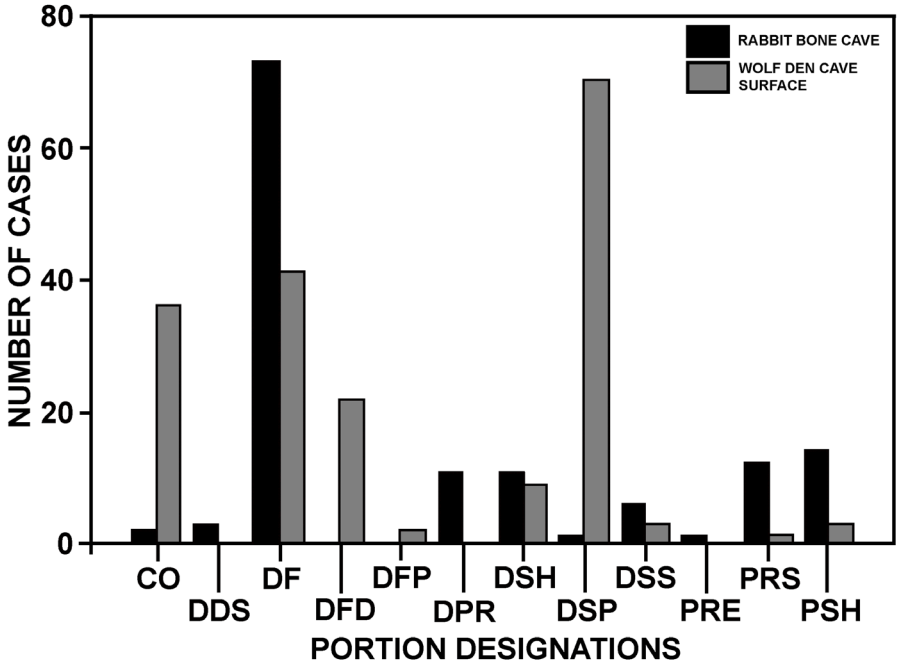


Figure 4: Relative percentages of bone portions (see Figure 1) represented in Wolf Den Cave and Rabbit Bone Cave assemblages.

in the two assemblages revealed several trends (Figure 6). First, at Rabbit Bone Cave, both angular or spiral and jagged breaks were far common then at Wolf Den Cave. Angular/spiral fractures were present in the Wolf Den Cave assemblage, despite its lack of cultural influence. This may be due to damage from roof fall in the cave, or from injury sustained by animals falling into the cave. Lack of breakage (i.e. complete elements) was much more common in the Wolf Den Cave assemblage then in the Rabbit Bone Cave assemblage. Erosional breakage was by

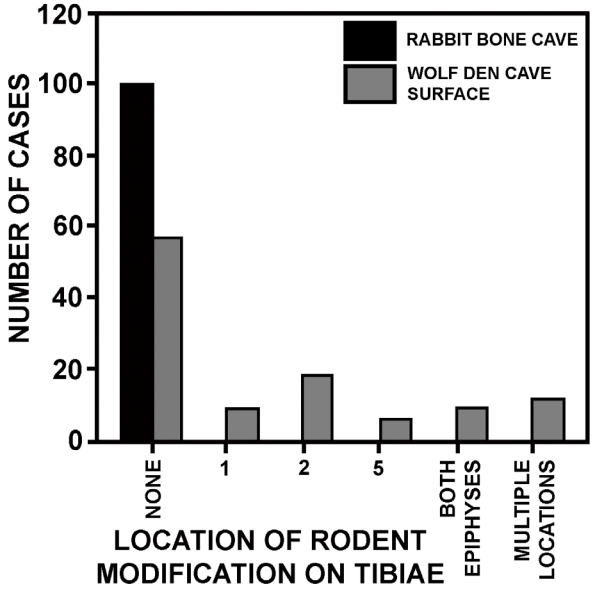


Figure 5: Location of rodent modification on tibia (left) with example of modification

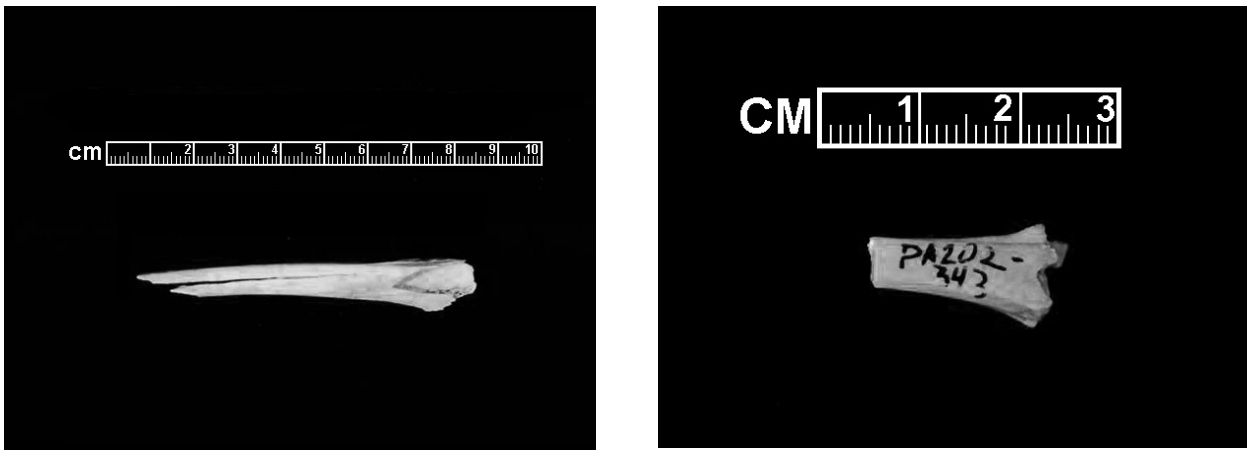


Figure 6: Examples of breakage types on leporid bone from Rabbit Bone and Wolf Den Caves: Left: angular; Right: cultural grooving.

far the most common breakage type in the Wolf Den Cave assemblage, following the trend in eroded epiphyses discussed earlier. Crushed/sheared breaks, possibly attributable to carnivore modification, were relatively common in both assemblages. Jagged breaks were the most common break type in the Rabbit Bone Cave assemblage, but angular/spiral breaks were also very common.

Location of break exhibited clear differences between the two assemblages (Figures 7 and 8). At Rabbit Bone Cave, the most common break location is Zone 3. In the cultural assemblage, there is a clear trend towards fracturing occurring along the diaphysis, with more central fractures being more common. At Wolf Den Cave, the trend is exactly opposite. Fracturing tends to occur more often at Zones 1 and 5, or at the epiphyses, and fewer trends toward the center of the diaphysis. These trends are especially true of the femur, while in the tibia the Wolf Den Cave assemblage tends to be less differentially distributed across Zones 2-5.

While dry bone breaks are most common in both assemblages, at Rabbit Bone Cave, green bone breaks are much more common then at Wolf Den Cave. Indeterminate-aged breaks were common in both assemblages, but more common at Rabbit Bone Cave (Figure 9).

While there are trends in break location between the two sites overall, these trends may be due to multiple taphonomic impacts. Dry bone breaks are more common than green bone breaks at Rabbit Bone Cave (Figure 9). In order to more clearly differentiate location of cultural fractures and location of non-cultural fractures, I compared location of break with age of break in the Rabbit Bone Cave assemblage.

For both green and dry breaks, fracturing along the diaphysis is most common in tibiae and femora. However in the tibia (Figure 10), both green and dry bone breaks occurred fairly evenly along the diaphysis, except for a spike

Figure 7: Examples of bone breakage locations on leporid bone from Rabbit Bone and Wolf Den Caves.

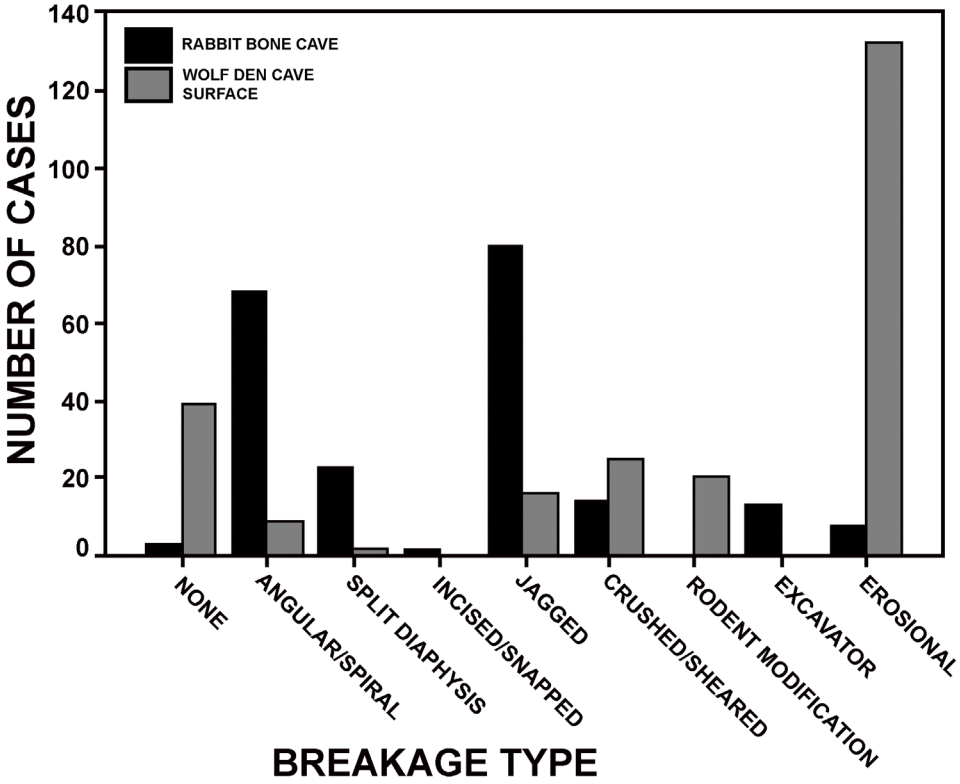


Figure 8: Comparison of relative location for bone breakage on leporid bone from Rabbit Bone and Wolf Den Caves.

in green bone breaks in Zone 4, the distal diaphysis. Dry bone breaks were less common in this zone. In the femur (Figure 11), green bone breaks fractured most often on the upper 3/4 of the diaphysis, while for dry bone breaks fracturing tended to occur at mid-shaft.

Conclusions

This study has revealed trends across multiple variables that separate the leporid assemblage of Wolf Den Cave from that of Rabbit Bone Cave. However, it is important to remember that Wolf Den Cave does not represent a sterile control case, such as might be used in a pure actualistic study. The faunal assemblage at Wolf Den Cave has a dynamic taphonomic history, despite the fact that it has no established cultural affiliation. It is important to keep in mind the formational factors of the Wolf Den Cave assemblage are no more 'known' then the factors contributing to the formation of the Rabbit Bone Cave faunal assemblage. In fact, Wolf Den Cave presents a somewhat unique taphonomic situation, in that it is mostly isolated from carnivore action and trampling, and subjected to different depositional processes then would occur at a rockshelter like Rabbit Bone Cave.

Given these precautions, we can draw several conclusions from the comparison of these two leporid assemblages.

Weathering, root etching, and rodent modification of the two assemblages are as expected given the unique taphonomic environments of the two sites. Root etching would be expected to be present in a rockshelter site, but not a cave site. Weathering is a product of time and unique formational processes of a site (Lyman 1994). More extensive weathering at Rabbit Bone Cave would be expected because first it is a rockshelter (therefore more susceptible to the elements), and second because of the greater age of the Rabbit Bone Cave assemblage

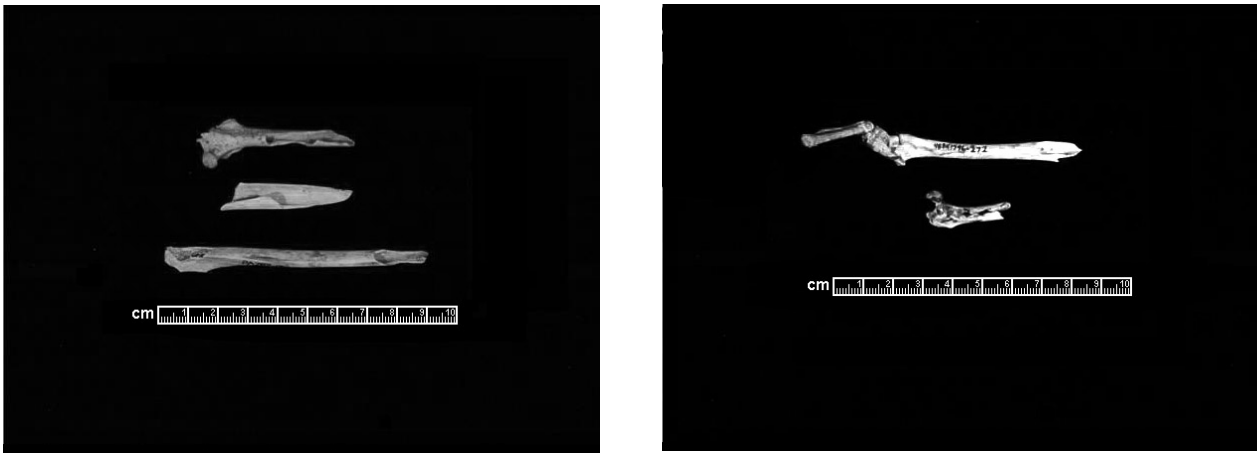


Figure 9: Comparison of dry bone versus green bone breaks in leporid bone.

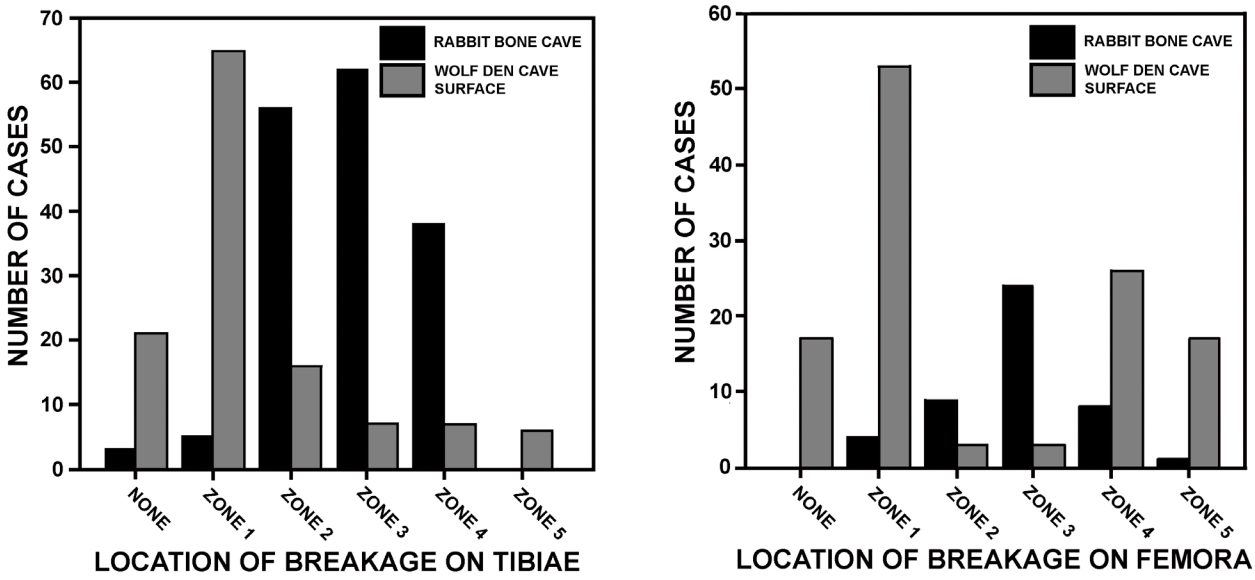


Figure 10: Comparison of breakage patterns between leporid tibiae and femora.

compared with the age of the sample from Wolf Den Cave. Degree of rodent modification may be linked to the amount of bone material available to rodents (Brain 1981). Rodent gnawing at Wolf Den Cave may indicate a fairly steady accumulation of faunal remains, since most specimens have limited rodent modification. Preferential location of rodent modification by element was clearly observed in the Wolf Den Cave assemblage.

There is a distinct patterning in the species composition of the Rabbit Bone Cave assemblage. The fact that *Sylvilagus* sp. represents such a large portion of the Rabbit Bone Cave assemblage suggests that the human occupants (and perhaps carnivores) at the cave preferentially procured cottontail species instead of jackrabbit species. At Wolf Den Cave, one would expect the assemblage would be relatively representative of both cottontail and jackrabbit species distribution in the immediate area of Wolf Den Cave over the time period the surface assemblage of that site was accumulated. In other words, one kind of rabbit can fall down a hole as easily as another. This conclusion is strengthened when one considers

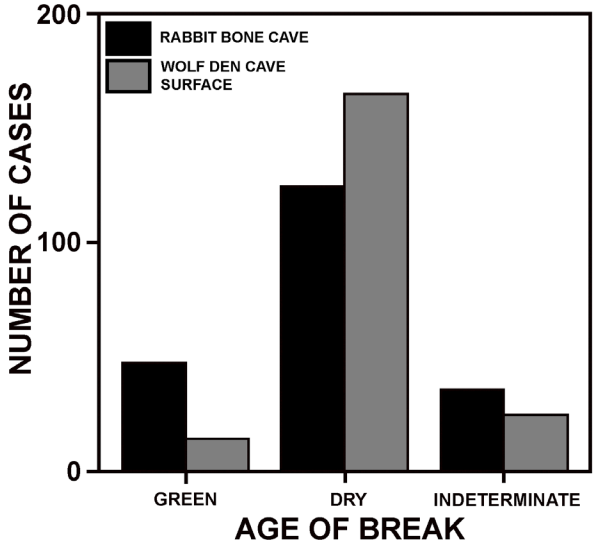


Figure 11: Relative ages of leporid bone breakage between Wolf Den and Rabbit bone Caves.

the current environmental characteristics of the two sites. These two sites are both located in the intermountain basins of northern Wyoming. However, there are several important differences between their immediate environment. This is especially true of their plant communities, an important determiner of leporid species habitat (Brown and Krausman 2003). Today, the vegetation community of Wolf Den Cave is transitionary between a basin sagebrush/grass plant community and a lower-mountain mixed juniper/sagebrush community (Walker 1994; analysis, Wyoming Gap 1996). The plant community of Rabbit Bone Cave is a typical basin sagebrush community (analysis, Wyoming Gap 1996). While vegetation is most often seen as a determiner in leporid species due to height of cover (Brown and Krausman 2003), it may also be a determiner due to plant production (MacCracken and Hansen 1982). While jackrabbits are more likely to prefer exclusively grass species, cottontails are more likely to prefer grass and forb species (MacCracken and Hansen 1982). Under these criteria, jackrabbits would be expected to preferentially exploit flatland sagebrush and grass environments, like the immediate environment of Rabbit Bone Cave. Cottontails would be expected to exploit mixed species environments, like the immediate environment of Wolf Den Cave. If one assumes that the current vegetation of this region is

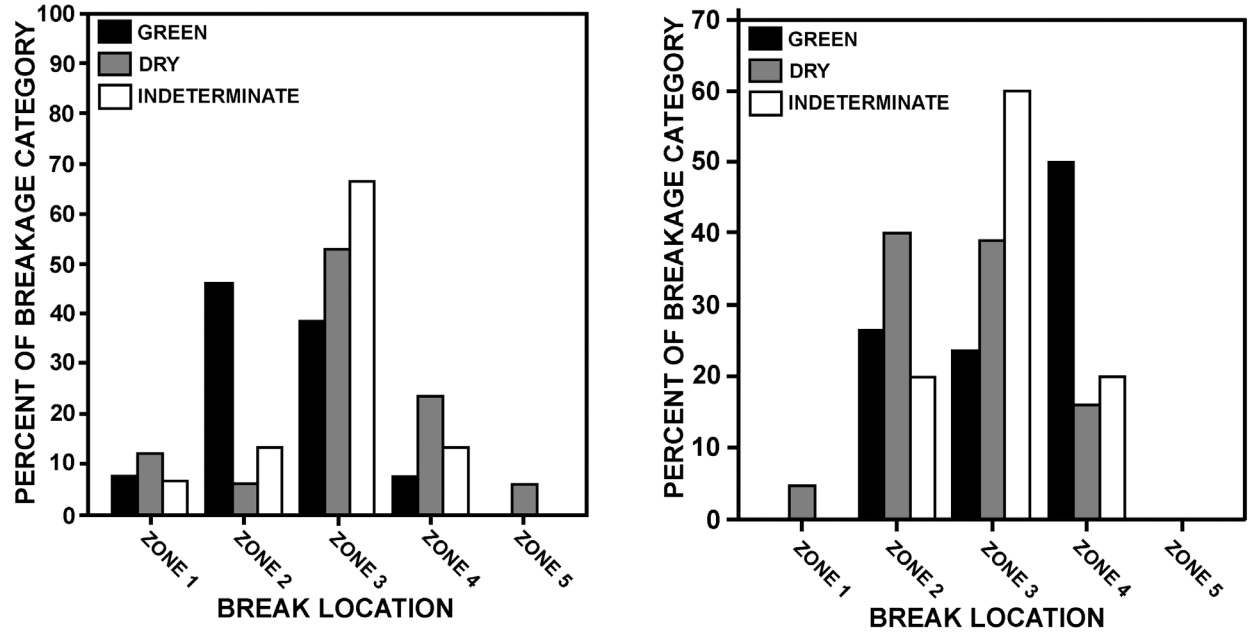


Figure 12: Comparison of breakage location and relative age of breakage of leporid bone breakage between Wolf Den and Rabbit bone Caves.

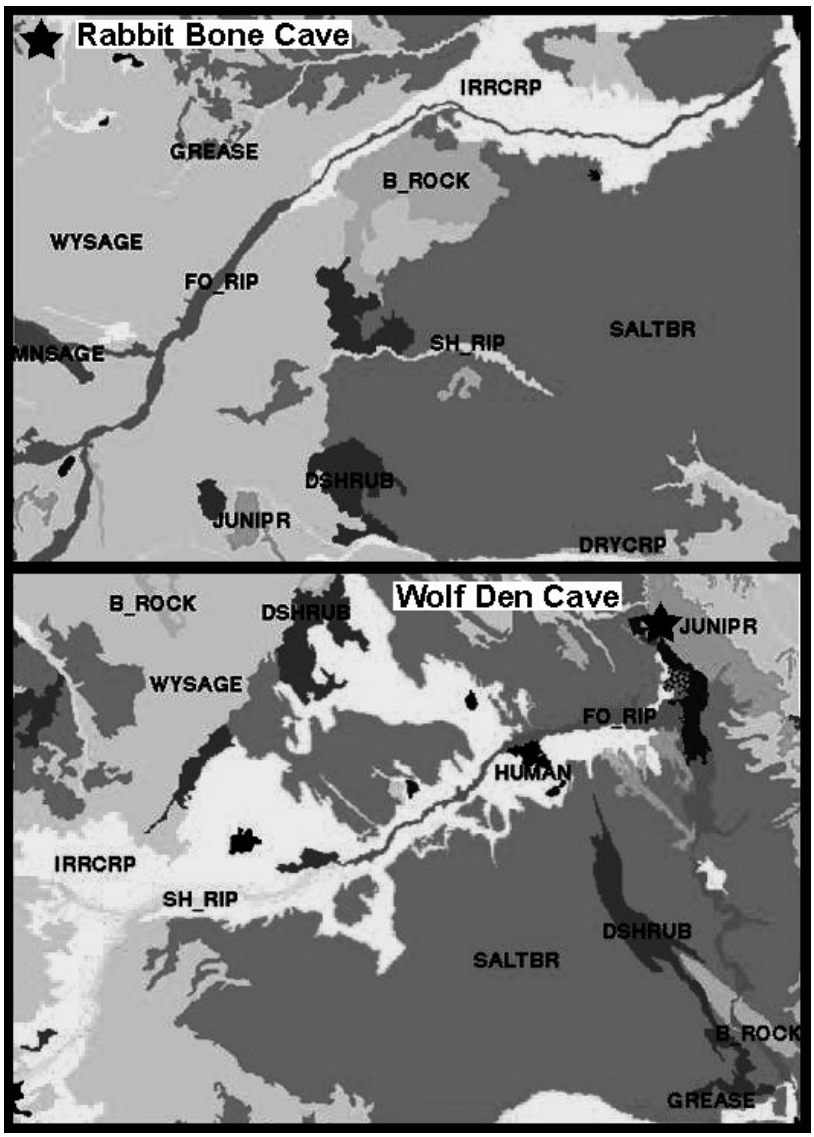


Figure 13: Modern vegetative communities around Rabbit Bone and Wolf Den Caves.

not vastly different from that of 420 and 1670 years before present then one would expect a local, non-selectively accumulated assemblage at Rabbit Bone Cave to be characterized by a *higher* percentage of jackrabbits in relation to cottontails, exactly the opposite of the trend observed in the site's assemblage. While this biased representation may represent a cultural 'signature' at Rabbit Bone Cave, an alternative explanation of the high *Sylvilagus* sp. representation at Rabbit Bone Cave involves the surface geology of the site.

The site is located on the rim of the Oregon Basin, and *Sylvilagus* sp. are known to have higher population densities in areas with rock outcrops (MacCracken and Hansen 1982). If this *is* a contributing factor, then the leporid species representation at Rabbit Bone Cave may actually be representative of an immediate population surrounding the site.

Other conclusions can be made about the assemblages at a smaller scale. At Rabbit Bone Cave, the infrequency of clear cultural modifications such as cut marks and burning imply that these are inadequate in assessing the cultural affiliation of a leporid assemblage. Fracture

patterning produced the clearest differences between cultural and non-cultural assemblages in this study. Fracturing with possible cultural affiliation tends to occur toward the center of long bones in both the *Lepus* sp. and *Sylvilagu.* elements analyzed in this study. This pattern would be expected from static and possibly from dynamic loading (Lyman 1994) of a green bone. Structural density assays indicate that diaphyses in leporid femora and tibiae are less dense (g/cm*3) then epiphyses, with Zone 4 including the least dense bone in both elements (Pavao and Stahl 1999). The data on location of break presented in this study must be considered critically. It is possible that trends in break location indicate more extensive fracturing overall in the Rabbit Bone Cave assemblage, since more central breaks may obscure the presence of previous breaks toward the epiphyses of the specimen.

There is a definite trend toward more green bone breaks in the archaeological assemblage, as opposed to the paleontological assemblage. This is also true of angular/spiral breaks. Such breakage is often attributed to human activity, although more current research cautions that the mere presence of such breakage does not necessarily imply a human agent (Lyman 1994). In most of the specimens analyzed in this study, human fracture diagnostics such as impact flakes and hackle marks (Lyman 1994) were next to impossible to discern, given the size of leporid elements. This raises questions about the adequacy of such determinates of human agency often used in analysis of large mammal bone. It is also possible the human bone fracturing in small mammals may not typically exhibit such characteristics due to static and not dynamic loading. It may be easier to fracture a rabbit tibia by hand then by use of secondary force such as a hammerstone.

The assemblages of Wolf Den Cave and Rabbit Bone Cave are products of their own unique formational histories, and thus are not directly comparable. However, this study has revealed several interesting differences between the characteristics of these cultural and non-cultural leporid remains. Future research and comparison of these data with other archaeological sites and actualistic collections will continue to aid in differentiating between indicators of human action and indicators of other taphonomic impacts on small mammal remains in archaeological contexts.

REFERENCES CITED

Analysis, Wyoming Gap
1996 *1201, Land Cover for Wyoming:* University of Wyoming, Spatial Data and visualization Center, Laramie, Wyoming.

Behrensmeyer, A.K., K.D. Gordon, G.T. Yanagi
1986 Trampling as a Cause of Bone Surface Damage and Pseudo-Cutmarks. *Nature* 319(6056): 768-771.

Blumenschine, Robert J., Marean, Curtis W. and Salvatore D. Capaldo
1996 Blind Tests of Inter-analyst Correspondence and Accuracy in the Identification of Cut Marks Percussion Marks, and Carnivore Tooth Marks on Bone Surfaces. *Journal of Archaeological Science*. 23:493-507.

Brain, C.K.
1981 *The Hunters or the Hunted? An Introduction to African Cave Taphonomy*. Chicago: University of Chicago Press.

Brown, Coleen F., and Paul R. Krausman
2003 Habitat Characteristics of 3 Leporid Species in Southeastern Arizona. *Journal of Wildlife Management* 67(1): 83-89.

Cruz-Uribe, K.
1991 Distinguishing hyaena from hominid bone accumulations. *Journal of Field Archaeology* 18:467-486.

Klein, Richard G. and Kathryn Cruz-Uribe
1984 Quantifying Taxonomic Abundance and Sex and Age Profiles of Fossil Specimens. *In* The Analysis of Animal Bones from Archaeological Sites. Pp. 24-99. Chicago: University of Chicago Press.

Lyman, R. Lee
1994 *Vertebrate Taphonomy*. Cambridge: University of Cambridge Press.

MacCracken, James G. and Richard M. Hansen
1982 Herbaceous Vegitation of Habitat Used by Blacktail Jackrabbits and Nuttall Cottontails in Southeastern Idaho. *American Midland Naturalist* 107(1): 180-184.

Olsen, Sandra L. and Pat Shipman
1988 Surface Modification on Bone: Trampling versus Butchery. *Journal of Archaeological Science* 15:535-553.

Pavao, Barnet, and Peter W. Stahl
1999 Structural Density Assays of Leporid Skeletal Elements with Implications for taphonomic, Actualistic and Archaeological Research. *Journal of Archaeological Science* 26:53-66.

Stuckenrath, Robert, and James E. Mielke
1972 Smithsonian Institution Radiocarbon Measurements VII. 14(2): 401-412.

Todd, L.C.
1996 Coding the Bison Skeleton. *In* AP460/660 Field Class in Archaeology: 1996 Excavations at the Hudson-Meng Bison Bonebed 25SX115. Department of Anthropology, Colorado State University.

Walker, Danny N.
1994 Preliminary Results of Initial Paleontological Testing at Wolf Den Cave, Bighorn County, Wyoming. Office of the Wyoming State Archaeologist. Submitted to Bureau of Land Management, Cody Resource Area, Cody, Wyoming.

Joshua L. Tatman
Department of Anthropology
University of Wyoming
Laramie, WY 82071-3431

CLOVIS TESTING AT THE HELL GAP BAARS LOCALITY: 2003-2004

by
John P. Laughlin, Marcel Kornfeld, C. Vance Haynes, Dewey Baars, George C. Frison, and Mary Lou Larson

The Hell Gap Site (48GO305) has provided archaeologists with one of the most complete and stratified sequences of Paleoindian occupation on the Northwest Plains (Irwin-Williams et al. 1973). Unfortunately, Clovis diagnostics are conspicuously missing from this sequence, although the possibility does exist for Clovis being present at the site (Kornfeld 1999). Clovis surface finds, while not common, appear in the surrounding area. East of the Hell Gap site, mammoth bone was found in vicinity of a Clovis point (Haynes n.d.), although contemporaneity is unclear. Current fieldwork at Hell Gap focuses on gaining a better understanding of the original excavations by Harvard University (Irwin 1968; Irwin et al. 1970). Determining how Clovis peoples used the Hell Gap valley is also a question ongoing excavations may help answer. A Clovis surface find gave us the opportunity to begin answering the question.

During the 2001 Hell Gap excavations, a Clovis projectile point base fragment (Figure 1) was found 801 meters south-southwest of Locality I in an area now referred to as the Hell Gap Baars Locality. The point was located in a livestock trail, in a flat, open air setting approximately 30 meters north of an arroyo.

The arroyo wall south of the surface find was cleaned of slump revealing the local stratigraphy (Figure 2). This exposed a buried paleosol resting on a deep layer of what is most likely Pleistocene loess. The buried paleosol is analogous to stratum E1 at Locality I which contains Goshen and Folsom age materials near the base. Stratum E1 is referred to in this paper as the "Goshen paleosol." Six flakes were present along the uncleaned arroyo wall at the Baars Locality, however, the stratigraphic posi-

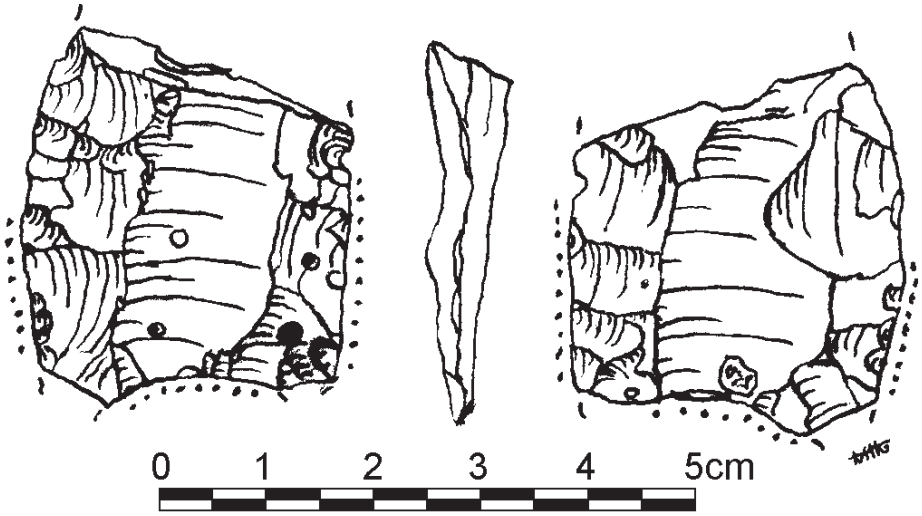


Figure 1: Clovis surface find from Baars Locality (1st flute face is on the right).

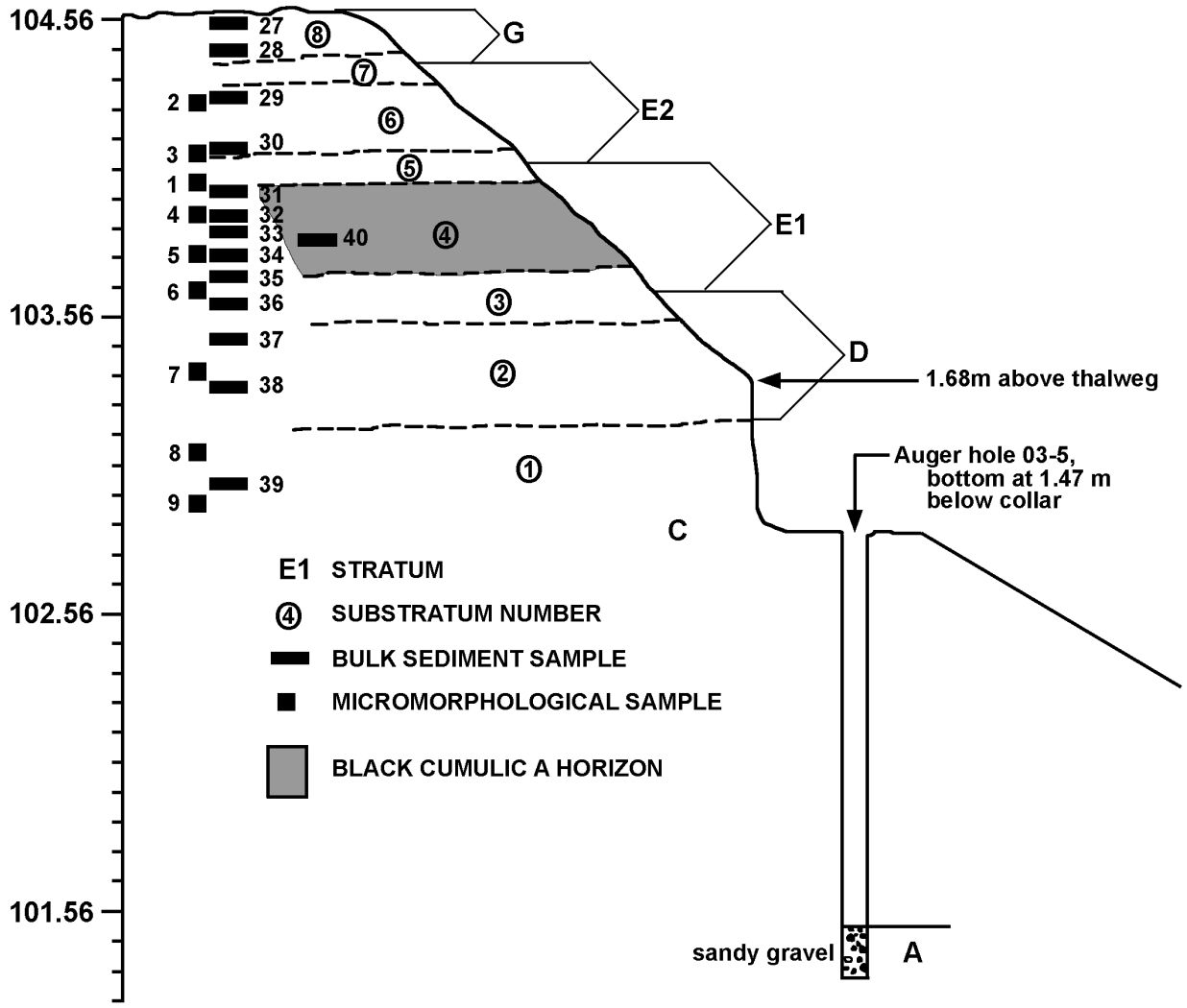


Figure 2: Arroyo profile, left bank, 39m south, 10 degrees east of Baars Locality.

tion of these flakes is uncertain. The presence of the Goshen paleosol, the Clovis point, and the chipped stone led to development of plans to further investigate this locality.

During the 2003 University of Wyoming field season (Lamberson et al. 2003), auger probes placed at the Baars Locality verified the buried paleosol extended northwest of the arroyo (Figure 3). Two one-by-one meter test units were established at the Baars Locality (14F42-18 and 14F38-24). Work on unit 14F42-18 was finished the 2003 summer while 14F38-24 was only partially excavated. In the spring of 2004, a small crew spent two days finishing 14F38-24, and also excavated two other test units (14G41-15 and 14F40-10). In addition to testing, auger probes were placed to identify the extent of the Goshen paleosol, artifacts eroding from the arroyo were mapped, and the local topography was mapped (Figure 4).

METHODS

Initial work at the Baars Locality consisted of establishing a datum and sub-datum related to the grid system used for archaeological excavations in the Hell Gap valley. All test units were located with a total station (Nikon DTM 530), with an elevation datum placed near the southwest corner of each unit. Excavation generally proceeded in 10-centimeter arbitrary

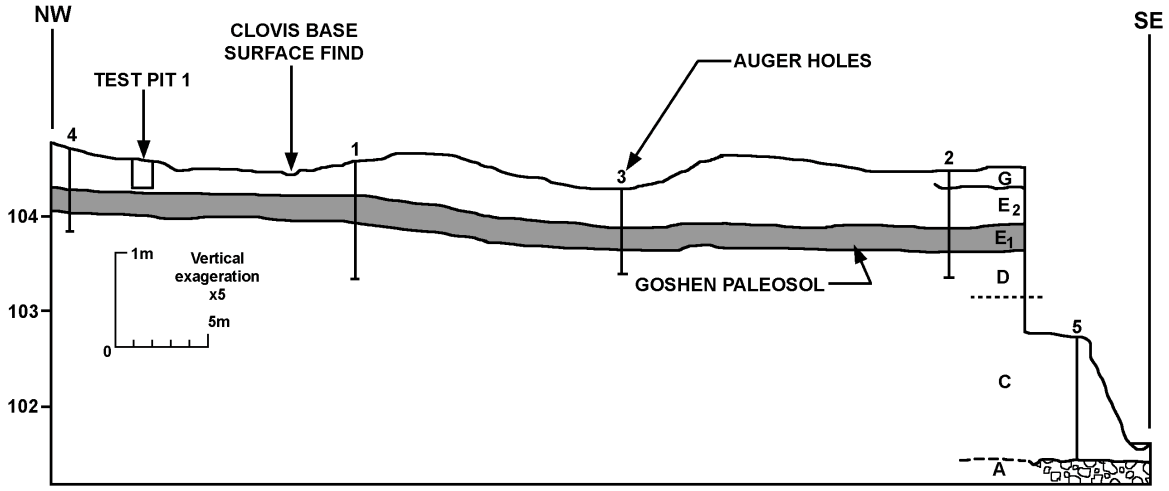


Figure 3: Terrace profile at the Baars Locality.

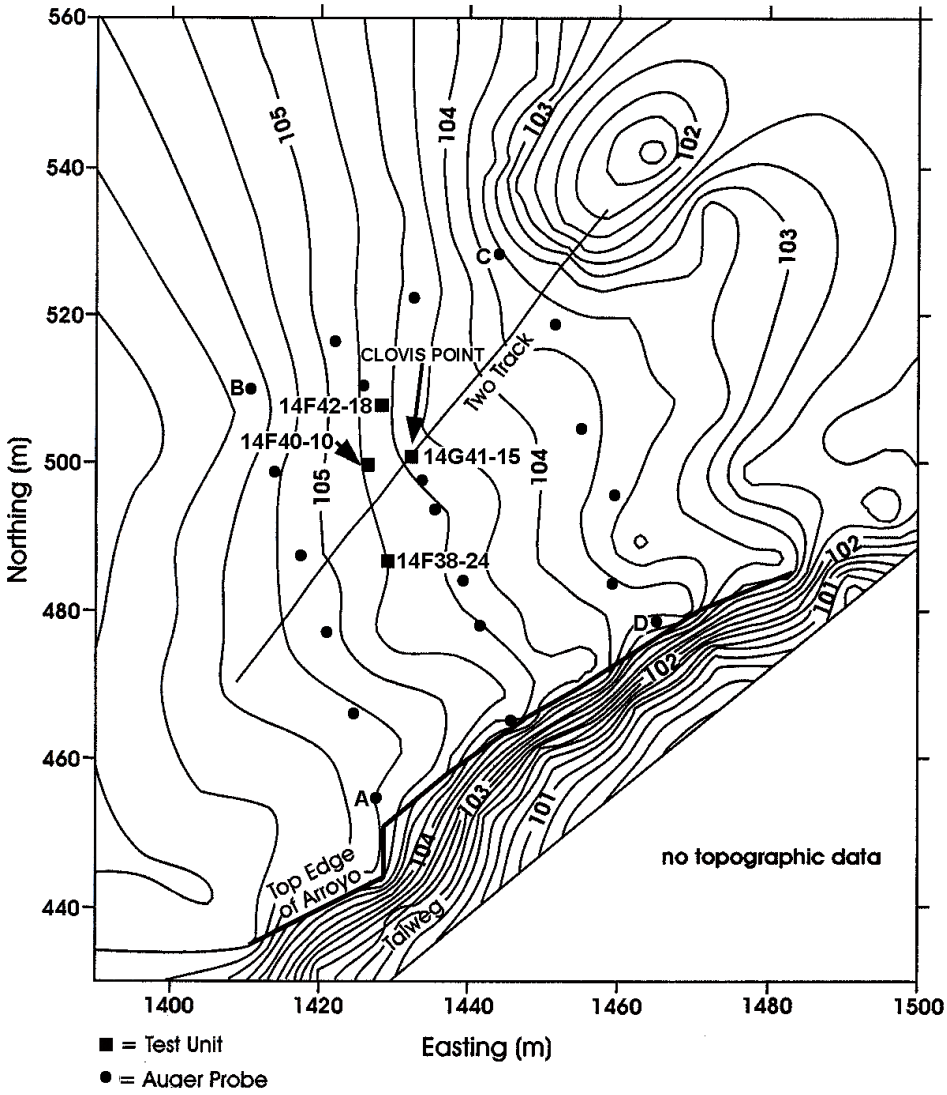


Figure 4: Baars Locality topographic map with locations of test units and auger probes.

levels using shovels and trowels (exceptions resulted from initial leveling of the ground surface and one excavator error). All elevations were taken using a line level and tape measure. An 1/8" mesh hardware cloth was used for dry screening except during the 2003 excavations in unit 14F42-18 and the first 20 centimeters of unit 14F38-24, where ¼" dry screens were used. Excavators used standard Hell Gap coding and map forms to record all field data and level notes (Kornfeld et al. 2003). Profiles were drawn, with a Munsell color chart being used to identify soil color (Munsell Color 2000).

The survey of the arroyo south of the Baars Locality was conducted following the 2003 discovery of a biface edge fragment exhibiting an outré passé termination (Figure 5). Two people walked shoulder to shoulder, flagging all chipped stone encountered, along approximately 100 meters of the arroyo. All flakes were later mapped and collected.

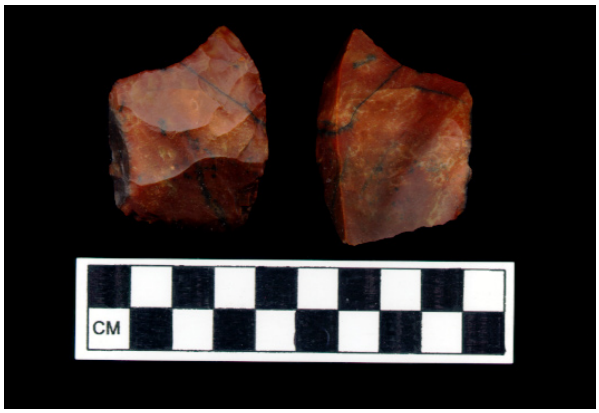


Figure 5: Arroyo biface fragment exhibiting outré passé termination.

Auger probes were placed at approximately ten meter intervals in a 75 by 55 meter area, centered on the Clovis projectile point. The upper and lower elevations of the Goshen paleosol were recorded along with the three-dimensional coordinates of each auger hole. In this way, the topography of the paleosol could be determined.

RESULTS

Excavation of four test units at the Baars Locality revealed 19 pieces of chipped stone and four bones (Table 1). Of these, four pieces of chipped stone were recovered from the Goshen paleosol, while the remaining chipped stone and bone were recovered above the paleosol.

Test Unit 14F40-10

Seventy-five centimeters of sediment were removed from Test Unit 14F40-10 (Figure 6). This unit produced three flakes and two bones with one flake from the Goshen paleosol. The first level (104.700-104.570) yielded a fragment of a left mandibular condylar process of a cow or bison-sized animal. Discoloration on

Table 1: Artifacts recovered by unit/level.

	Unit 14F42-18	Unit 14F40-10	Unit 14G41-15	Unit 14F38-24
Level 1	culturally sterile	1 bone (*Bos taurus*)	culturally sterile	culturally sterile
Level 2	*culturally sterile*	2 flakes; 1 bone	2 flakes; 1 bone	1 tool; 3 flakes
Level 3	*culturally sterile*	*culturally sterile*	***1 tool?***[1]	4 flakes; 1 gravel frag w/residue
Level 4	***2 flakes***	***1 flake***	*culturally sterile*	culturally sterile
Level 5	*culturally sterile*	*culturally sterile*	culturally sterile	*1 flake; 1 bone*[2]
Level 6	culturally sterile	culturally sterile	culturally sterile	*1 flake*[2]
Level 7	1 flake (in krotovina)	culturally sterile	culturally sterile	***culturally sterile***
Level 8	----	----	----	*culturally sterile*

[1] small piece of gravel, may be retouched.
[2] possible Goshen paleosol affiliation.

bold/italic = material from Goshen paleosol
italic = level containing some Goshen paleosol

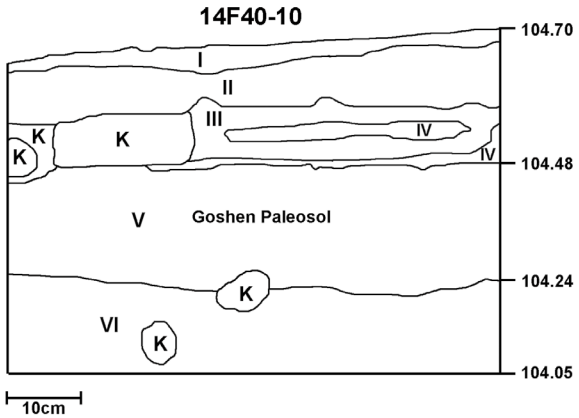


Figure 6: Test unit 14F40-10 profile.

one portion of the bone suggests a small area had been exposed to sub-aerial weathering and thus weathered at a higher rate than the buried portion (Hill 1994:44). Although unidentifiable because of fragmentation and weathering, chances are good this specimen is a modern domestic cow (*Bos taurus*), being from the ground surface and in a livestock pasture. Level two (104.570-104.450) contained two flakes and one unidentifiable bone fragment. Level three (104.450-104.350) was culturally sterile. Level four (104.350-104.250) was completely within the Goshen paleosol and produced one Hartville Uplift chert flake. The last two levels (five and six) located at the base of the Goshen paleosol and extending into the loess layer were culturally sterile.

Test Unit 14F38-24

Test Unit 14F38-24 (Figure 7) is located closer to the arroyo than the other test units and revealed a stratigraphy similar to the arroyo wall. The unit was excavated to a depth of 75 cm, yielding ten pieces of chipped stone and one bone. The first cultural materials, one tool and three flakes, were encountered in level two (104.750-104.650). The tool, a utilized and retouched flake, had several heavily used edges. The next level (104.650-104.550) also contained four flakes, while level four was culturally sterile. Level five (104.450-104.350) contained one Hartville Uplift chert flake and one bone, while the subsequent level (104.350-104.250) produced one flake and was the last to produce cultural material. No cultural materials are unequivocally associated with the Goshen paleosol in this test unit, although artifacts from levels five and six may have originated from the Goshen paleosol. Uncertain artifact provenience and an undulating paleosol surface make a stratum association impossible. Roughly 85 % of level six excavation was within the Goshen

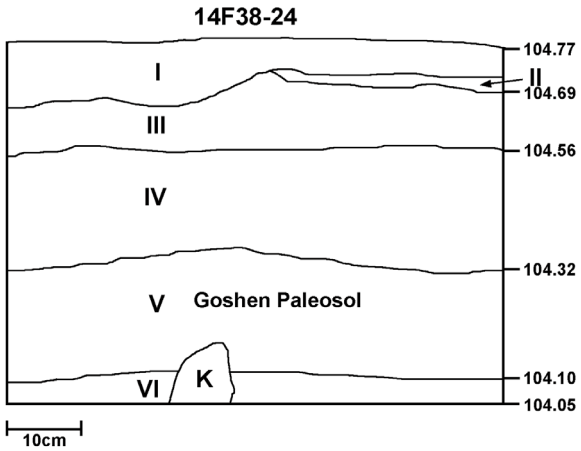


Figure 7: Test unit 14F38-24 profile.The profile shows an apparent sediment color discrepancy between this unit and the other three possibly accounted for by length of exposure and recording of dry and not wet sediment. "Dry soil or sediment is usually about two units higher in value (on the Munsell Soil Color Charts [2000]) than the same soil or sediment when moist" (Rapp and Hill 1998:37, parentheses added). Such discrepancies may be explained by soil moisture content and profiling in 14F42-18 was accomplished without spraying wall with water.

paleosol suggesting the possibility the flake recovered in the level originated there.

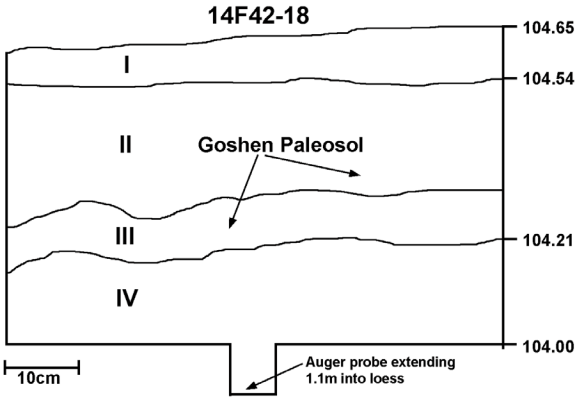
Test Unit 14F42-18

Test Unit 14F42-18 (Figure 8) excavated during the summer of 2003, yielded flakes from screened matrix. Two came from level four (104.400-104.300) which was well into the Goshen paleosol. The third flake was several levels below in a krotovina.

Test Unit 14G41-15

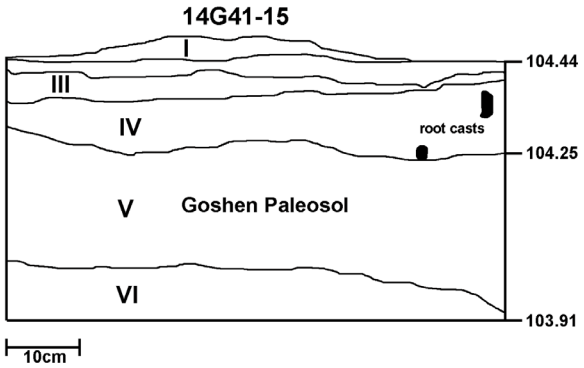
Test Unit 14G41-15 was excavated to a depth of 54 cm (Figure 9). Excavations yielded three pieces of chipped stone and one bone. One piece of chipped stone is a large piece of gravel appearing to have been retouched into a tool. This tool is from the Goshen paleosol, but its cultural origin is uncertain.

Like two other test units (14F40-10 and 14F42-18), the stratigraphy of unit 14G41-15 differs from the arroyo wall profile. An erosional event appears to have removed sediment above the Goshen paleosol and possibly a portion of the paleosol itself. All three test units (14G41-15, 14F40-10, and 14F42-18) are located in a slight depression, which may account for differences in stratigraphy between these test units and the arroyo wall profile.



I 2.5Y4/2 Dark grayish brown. O Horizon
II 10YR6/2 Light grayish brown. Upper paleosol. Grayish-brown, blocky structure, high clay content, nearly devoid of granules and pebbles
III 2.5Y5/2 Grayish brown. Lower paleosol. Slightly darker than upper paleosol but sediments are the same
IV 2.5Y7/4 Pale yellow. Loess extending at least 1.1m below bottom of test unit

Figure 8: Test unit 14F42-18 profile.



I 7.5YR4/2 Dark brown. O horizon.
II 10YR4/2 Dark grayish brown. Silty sand, harder that stratum I
III 10YR5/3 Brown. Silty sand, softer than stratum II
IV 10YR6/3 Pale brown. Silty sand on top of paleosol. Contact between IV and V is abrupt and appears erosional
V 10YR5/2 Grayish brown. Paleosol. Blocky structure, high clay content. Fairly hard
VI 10YR6/3 Pale brown. Loess with some carbonate flecking

Figure 9: Test unit 14G41-15 profile.

Survey Results

Survey within the arroyo recovered eleven flakes predominately from Hartville Uplift chert. Flake edges modified by retouch indicate these are expedient tools because there is no formal patterning, shape or design (Andrefsky 1998:213). One biface edge fragment demonstrates an outré passé termination, but attributing this artifact to Clovis peoples is tenuous. Although Clovis people used overshot technology to thin bifaces (Bradley 1991:373; Frison and Bradley 1999), overshots also occur as incidental by-products of chipped stone production process, and this seems to be one such case.

Auger Probe Results

The auger holes delineate the topography and delineation of the paleosol. They were started close to the arroyo profile (A; see Figure 4) and form a rectangle around the Clovis find. The auger holes can be envisioned as four cross sections, A-B, B-C, C-D, and D-A (see Figure 4). Cross-sections A-B and C-D are oriented northwest to southeast, while cross sections B-C and D-A are oriented southwest to northeast.

The A-D cross-section is essentially at the arroyo.

Section A-B shows the current ground surface dipping then rising to its highest point in the northwest corner of the block at point B (Figure 10). The Goshen paleosol shows a steady rise to the northwest, thus differing from the undulating modern ground surface. This provides additional support for an erosional event postdating the Goshen paleosol, possibly responsible for the stratigraphic differences noted earlier. The paleosol also thickens towards the center of this profile.

From point B to the northeast (point C), the current ground surface drops sharply as does the paleosol. Again the paleosol thickens in the middle of the profile, but at point C, it was no longer visible in the auger matrix. It may be the paleosol was incorporated within the present A horizon near the current surface.

The northeast cross section of this block (C-D) shows an undulating surface eventually rising slightly towards the arroyo (point D). The paleosol is either absent in the first two auger holes or incorporated into the current A horizon. In the third auger hole, the surface is a bit higher than the first two and the fourth, and there is a thin band identified as the buried paleosol. In the fourth auger probe, the paleosol is again missing. In the last two auger holes, the current surface rises sharply towards the arroyo, while the paleosol also rises slightly.

The final cross-section of the block, D-A, is essentially parallel to the arroyo and was probed

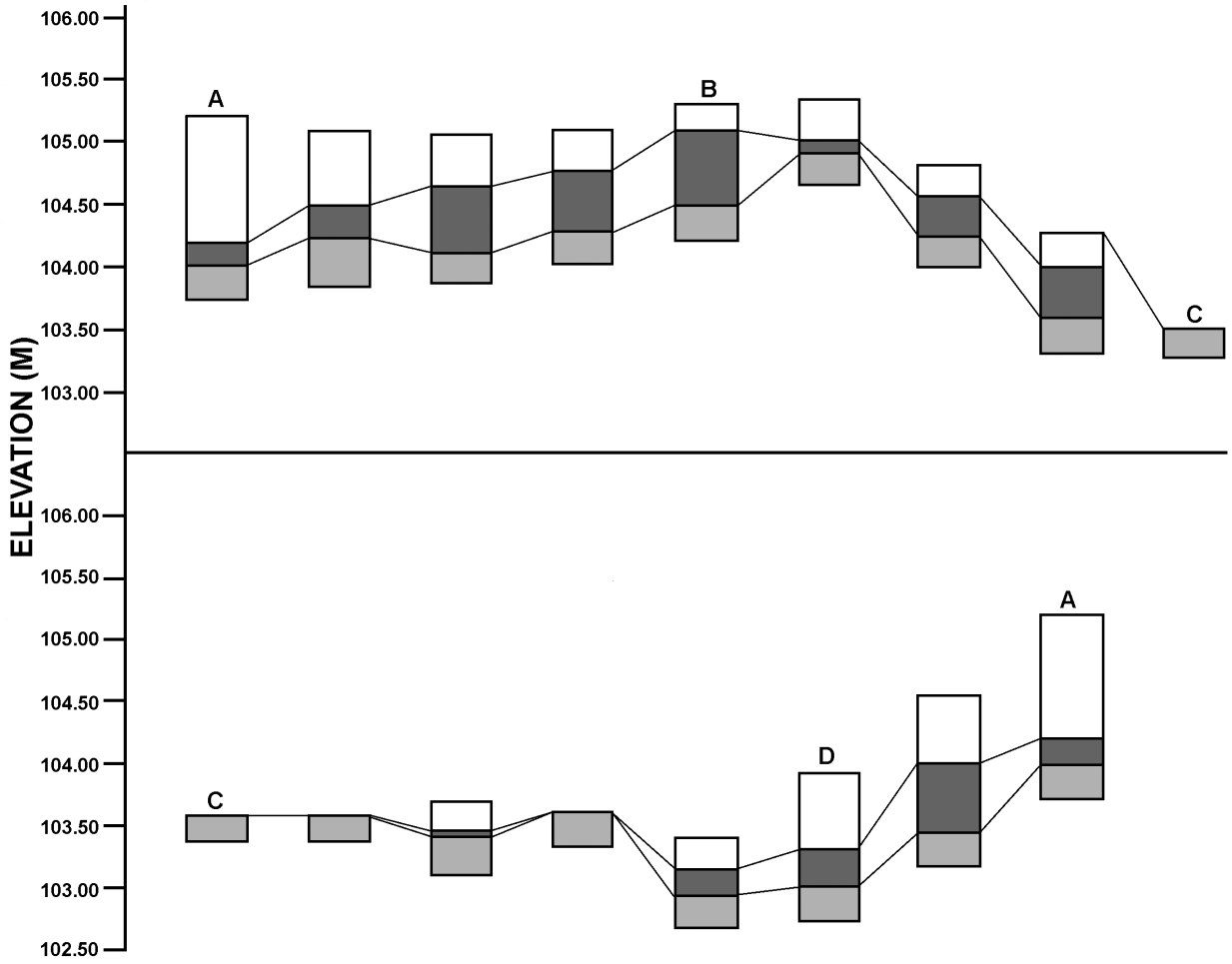


Figure 10: Profile of auger holes showing the depth of the paleosol.

with only three auger holes. Essentially the modern surface rises sharply, while the paleosol rises more sharply at first, then slower towards the southwest.

This distribution suggests the paleosol is most likely absent in topographically lower parts of this block (auger holes no. 9-13; the first part of the C-D section). Three of the five auger holes have no paleosol, one has paleosol, and one has a thin remnant of paleosol. The topographically lowest parts of this block are the east/northeast corner, with the low topography stretching to the southwest, close to the Clovis surface find. It is likely the paleosol in this area has been truncated by modern erosion and is perhaps the reason for the exposure of the Clovis point. The Goshen paleosol distribution in the auger holes also suggests the need for additional auger probing or other testing to the northwest and southwest to define the paleosol limit in these directions. If the paleosol is correctly identified as corresponding to stratum E1, then it is clear the search for in situ Paleoindian material should proceed.

Clovis Projectile Point (48GO308-14G41-15-1)

The Baars Locality surface find consists of an incomplete basal portion of a Clovis point made on a pale red (10R 6/2; GSA1991) Flattop chert (chalcedony; Greiser 1983). The material has white inclusions, several of which have decalcified. The Flattop source is located 200 km south of the Hell Gap Site and this material can be considered exotic to the local area.

The point base measures 34.8 mm in maximum length, 31.3 mm in maximum width and 7.93 mm in maximum thickness (Table 2). The basal width is 28.6 mm, but as both ears have been broken this is only an estimate. The maximum flute thickness is 6.5 mm. The first flute scar measures 26.0 mm long, 16.0 mm wide, and has a very slightly hinged termination. The second flute scar is minimally 26.8 mm long, 15.2 mm wide, and while the left side of the flute hinged, the right side continued beyond the break. Since the second flute removed the proximal end of the first flute and the distal end of the second flute is on the missing portion of the specimen, there is no absolute length measurement on either flute. The hinge termination on the left side of the second flute occurred at a stack the manufacturer failed to remove in thinning the preform. The basal concavity is approximately 1.9 mm deep. A ratio of an estimated 1.1 to 1.6 finishing edge flakes to one cm of edge exists along the point perimeter.

The point base exhibits heavy grinding along both lateral edges and the base. Grinding extends up both sides from the base to a point where post manufacture flaking has terminated (14.9 mm on the right lateral side when facing the first flute removed and 19.2 mm on the left side). On the right side, when facing the first

Table 2: Quantitative date on Baars Locality Clovis projectile point.

MEASUREMENT LOCATION	MEASUREMENT IN MM
Maximum length	34.8 (incomplete)
Maximum width	31.3
Maximum thickness	7.9
Maximum interflute thickness	6.5
1st flute length	26.0
1st flute width	16.0
2nd flute length	26.8 (incomplete)
2nd flute width	15.2
Basal concavity	1.9

flute, a deep lateral flake terminates the grinding by completely removing the ground edge and extends over the flute to nearly the center of the point. On the left side, the grinding terminated at a small very deep notching type flake scar appearing intentional (see below). Both of these are post manufacture modifications of the point base.

Ears on both sides of the base are broken. Breakage on one side appears to be done intentionally to create a small, needle sharp spur, about 1.2 mm long. A white inclusion/impurity in the raw material at the very point of the spur makes it impossible to identify any wear. The deep notching flake scar terminating grinding on the left side of flute 1 and another initiated at the distal break create a spur/graver (projection). This projection has small microflakes removed from the tip, that is, the graver has been used and exhibits use wear. The distal break of the point appears to be a snap, retaining fairly obtuse edges and although there is some damage to both edges, the damage may be the product of animal trampling rather than use.

In terms of microwear, there is one longitudinal striation on the second flute scar. The striation is reminiscent of wear resulting from unintentional movement of the tool within the haft (Rots 2004). Two somewhat curved striations more or less perpendicular to the longitudinal axis also appear on this flute scar near the base of the point. The cause(s) of the perpendicular scars is less clear, but may be from use of lateral sides of the point for butchering (e.g.., Kay 1996), although this cannot be confirmed by use wear on the missing blade.

CONCLUSIONS

Nineteen pieces of chipped stone and four bone fragments were recovered from excavations at the Baars Locality, with four pieces recovered from the Goshen paleosol. The testing did not recover additional artifacts diagnostic of the Clovis period, but the four flakes in the Goshen paleosol suggest a Paleoindian presence at the Baars Locality. Later occupations are also suggested by presence of artifacts in strata located above the Goshen paleosol. The low frequency of artifacts could indicate the area was used only marginally, but the possibility exists additional testing could reveal a more substantial occupation.

Survey within the arroyo resulted in the recovery of eleven flakes. Some of these exhibit evidence for use as expedient flake tools while one artifact is a biface edge fragment (Figure 5) retouched into a tool. The biface edge fragment was recovered approximately 100 meters upstream from the Clovis surface find. The absence of clustered artifacts within the arroyo and artifacts spread over an area of almost 100 meters suggests there may be other areas where testing should be undertaken.

Auger probes at the Baars Locality helped define the extent of the Goshen paleosol. The southeastern boundary of the paleosol is the modern arroyo, while to the east, it is the small drainage/eroded area. To the west, the Goshen paleosol boundary extends at least 50 meters past the Clovis surface find, while the northern limit is uncertain, but is at least 25 meters north of the Clovis point locality. Based on auger results, the Goshen paleosol should extend further north and west, but additional augering or other testing will be required for confirmation.

Testing at the Baars Locality confirms the area was used prehistorically, although whether or not Clovis peoples are responsible for the recovered artifacts is uncertain. Additional testing will be required to define the nature and extent of the archaeological record at the Baars Locality. Such testing is planned in conjunction with the University of Wyoming, George Frison Institute biannual archaeological field school and related studies of the Hell Gap site.

ACKNOWLEDGEMENTS

Testing at the Baars Locality would not have been possible without the generosity of Mr. and Mrs. Joseph Cramer and permission

to access the property granted by the Wyoming Archaeological Foundation. To both, the authors are most grateful.

An enthusiastic 2003 and 2004 field crew consisted of University of Wyoming students and members of the June Frison Chapter of the Wyoming Archaeological Society. The crew and volunteers included Rich Adams, Dewey and Janice Baars, J.P. Cavigelli, Kristen "Sparky" Lamberson, Jim and Rusty Miller, Matt O' Brien, Mary Prasciunas, David Reiss, Joshua Tatman, Yvette Widman, and Chris Young. We appreciate Leon Lorentzen's graphic talents and thank him for Figure 1.

REFERENCES CITED

Andrefsky, Jr., William
1988 *Lithics: macroscopic approaches to analysis.* Cambridge University Press, Cambridge, UK.

Bradley, Bruce A.
1991 Flaked Stone Technology in the Northern Plains. In *Prehistoric Hunters of the High Plains,* by George Frison, pp. 369-395. Academic Press, San Diego.

Frison, George C., and Bruce Bradley
1999 *The Fenn Cache.* One Horse and Cattle Company, Santa Fe.

Geological Society of America (GSA)
1991 Rock Color Chart. The Geological Society of America. Boulder, Colorado.

Greiser, Sally T.
1983 A Preliminary Statement about Quarrying Activity at Flattop Mesa. *Southwestern Lore* 49(4):6-14.

Haynes, C. Vance, Jr.
n.d. Geochronology of the Hell Gap Site, Wyoming. Unpublished manuscript on file, Department of Anthropology, the University of Wyoming. Laramie.

Hill, M. G.
1994 *Subsistence Strategies By Folsom Hunters At Agate Basin, Wyoming: A Taphonomic Analysis Of The Bison And Pronghorn Assemblages.* Unpublished M.A. thesis, Department of Anthropology, University of Wyoming, Laramie.

Irwin, Henry T.
1968 *The Itama: Late Pleistocene Inhabitants of the Plains of the United States and Canada and The American Southwest*. Unpublished Ph.D. Dissertation, Department of Anthropology, Harvard University.

Irwin, Henry T., Cynthia Irwin-Williams, and George Agogino
1970 Archeological Investigations at the Hell Gap Site near Gurnsey, Wyoming. *National Geographic Society Research Reports 1961-1962*.

Irwin-Williams, C., H. Irwin, G. Agogino, and C. V. Haynes.
1973 Hell Gap: Paleo-Indian Occupation on the High Plains. *Plains Anthropologist* 18(59): 40-53.

Kay, Marvin
1974 Microwear Analysis of Some Clovis and Experimental Chipped Stone Tools. In *Stone Tools*, edited by G.H. Odell, pp. 315-344. Plenum Press, New York.

Kornfeld, Marcel
1999 Clovis at Hell Gap? *Current Research in the Pleistocene* 16: 46-48.

Kornfeld, Marcel, Mary Lou Larson, George C. Frison, and C. Vance Haynes, Jr.
2003 *Hell Gap Renewed Field Investigations: The First 10 Years, 1990-2000*. Technical Report No. 22, George C. Frison Institute of Anthropology and Archaeology, University of Wyoming, Laramie.

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

2003 Results of the 2003 Hell Gap Investigations. *Wyoming Archaeologist* 47(2):35-43.

Munsell Color
2000 *Munsell Soil Color Charts*, 2000 revised washable edition. Munsell Color, Gretag Macbeth, New York.

Rapp Jr., George (Rip), and Christopher L. Hill.
1998 *Geoarchaeology: The Earth-Science Approach to Archaeological Interpretation*. Yale University Press, New Haven.

Rots, Veerle
2004 Prehensile wear on flint tools. *Lithic Technology* 29(1):7-32.

John P. Laughlin
Department of Anthropology and
Office of Wyoming State Archaeologist
University of Wyoming
Laramie, Wyoming, 82071

Marcel Kornfeld
Department of Anthropology
University of Wyoming
Laramie, Wyoming, 82071

C. Vance Haynes
Department of Geology
University of Arizona
Tucson, Arizona

Dewey Baars
Office of Wyoming State Archaeologist
University of Wyoming
Laramie, Wyoming, 82071

George C. Frison
Department of Anthropology
University of Wyoming
Laramie, Wyoming, 82071

Mary Lou Larson
Department of Anthropology
University of Wyoming
Laramie, Wyoming, 82071