UNIVERSITY OF WYOMING
THE FRISON INSTITUTE OF ARCHAEOLOGY AND ANTHROPOLOGY
BULLETIN 29
FALL, 2016

From the Director, Todd Surovell

This summer, Bob Kelly and I returned to the La Prele Mammoth site for ten days with the University of Wyoming Archaeological Field School. We spent a second ten-day session at the site with funding from the National Geographic Society and the QUEST Archaeological Research Program. The focus of our excavations this year was an area 12 meters south of where George Frison excavated the remains of a young mammoth in 1987. Our excavations were focused on an area of intensive staining of red ochre. There we found hundreds of flakes, half a dozen flake tools, at least three bone needles and a bone bead. These are very interesting and unusual things to find associated with a mammoth. They are unprecedented in American and possibly world archaeology. The ochre is particularly enigmatic and may indicate some kind of ritual activity. While the purpose of the ochre remains unknown, one thing we may be able to learn is its geologic source.

One of our field school students, U.W. senior Meghan Kent, expressed interest in completing a research project after field school. This fall, Meghan received a $440 grant from the Frison Institute to try to determine the provenance of the ochre. Meghan collected samples from Wyoming's two major hematite sources, the Sunrise Mine near Hartville and the Rawlins Red Paint Mine. After powdering the samples, Meghan dissolved them in acid, and they are now ready for chemical analysis. If Meghan is successful in developing a method for distinguishing between these two sources, this will not only allow us to determine the provenance of the ochre at La Prele, but it will also open the door to ochre sourcing across the state. This is one example of the kind of important work that can be accomplished with small grants for archaeological research. Work like this would not be possible without your support, and I am grateful to all of our donors over the years for what we have been able to accomplish.

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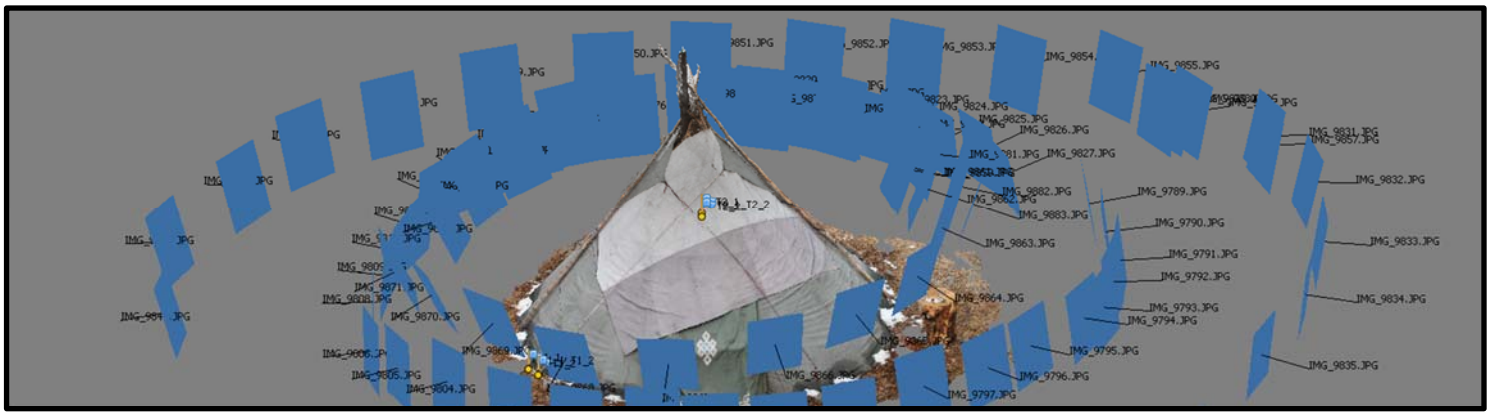
Creating 3D Models from Photographs

By Madeline Mackie

Traditional methods for recording cultural resources, like photography, illustration and mapping, operate in two dimensions, and three-dimensional sites, bones, and artifacts, necessarily become flattened to 2D during recordation. In that process, we potentially lose information. Thanks to recent advances in technology, 3D recordation is increasingly available and affordable. One such method is photogrammetry.

Photogrammetry, taking measurements from photographs, is not new, but the complex algorithms necessary to create fully interactive models have only recently become widely available. Structure from motion (SfM) or 3D photogrammetry creates interactive three-dimensional models from two-dimensional photographs. To make a model, photographs are taken of an item from many different perspectives. A computer program then identifies points of reference visible in multiple photographs and triangulates them to reconstruct the intended item in 3D. Models can include hundreds to thousands of photographs and can be scaled to have sub-centimeter accuracy. In the Anthropology Department at the University of Wyoming, 3D photogrammetry has been used for a variety of purposes including creating topographic maps of sites, analyzing stratigraphy, modeling artifacts for 3D printing, recording ethnographic features and measuring rock art panels. The uses for 3D photogrammetric models in archaeology continue to grow.



A 3D photogrammetric model of a Mongolian reindeer herder ortz. The rectangles show reconstructed camera positions for photographs from which the model was created. To see the model in 3D, go to the site sketchfab.com and search for the user "Madeline Mackie."

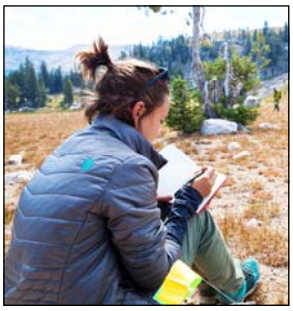
INSTITUTE FUNDED RESEARCH

STUDENT RESEARCH

Six students received Institute funding, three of whom were from U.W.; **Heidi Van Etten** (M.A.), **David Howe** (M.A.), and **Tony Fitzpatrick** (Ph.D.). **Joanna Wells** (University of Alaska, Anchorage), **Morgan Robins** (Central Wyoming College), and **Victoria Bowler** (University of New Mexico) also received funding.

ALPINE ARCHAEOLOGY FUND

During the 2016 field season, **Rebecca Sgouros** and **Matt Stirn** continued surveys in the Teton Mountains as part of the Teton Archaeological Project. In total, the team identified seven sites ranging from the Paleoindian Period to the Late Prehistoric. In addition to terrestrial archaeological sites, eleven permanent ice patches were investigated for thawing artifacts, wood, or bone items. While no obvious cultural material was discovered in association with any of the ice patches, the team recovered several bison bones from above 10,000 feet and collected specimens from large trees melting out of the ice. It is hoped that these biological items might provide information regarding the past environment of the Teton Range and on ancient bison ecology in the high mountains. Radiocarbon dates and chemical analysis results from the bones and wood are pending and the TAP team looks forward to integrating new information into ongoing research. Ed and Shirley Cheramy provided generous support for this project.



Rebecca Sgouros takes notes on survey in the Grand Tetons.

WILLIAM TYRRELL FUND

With **Drs. Tammy Rittenour** and **Judson Finley** of Utah State University, U.W. M.A. student **Heidi Van Etten** collected sediment samples this summer from the Hell Gap site for optically-stimulated luminescence (OSL) dating. She took samples mainly from the Folsom and Goshen levels, which are located at depths where questions have arisen concerning how and when sediments were deposited, questions which may affect our understanding of Hell Gap's cultural levels. Recent work at the site indicates that the stratigraphy at Hell Gap is more complicated than previously thought. Heidi received Tyrrell Fund support to clarify these issues through a renewed dating effort.

Heidi Van Etten at work in the field lab at the Hell Gap site

PATRICK ORION MULLEN FUND

Joanna Wells coring a depression at Cottonwood Creek Village

Joanna Wells (University of Alaska, Anchorage) examined intensification of salmon use at the Cottonwood Creek Village site in a study of the genesis of Dena'ina subsistence and social organization. Cottonwood Creek, near Wasilla, Alaska, is a large village spanning the pre- and post-contact periods. Typical of many Dena'ina sites, artifacts are scarce, and organic preservation is limited. Geochemical methods are important in subsistence studies. Semi-subterranean depressions, ranging from AD 1233 to modern age, are remnants of cache and house pits still present on the landscape. Analysis of stable nitrogen and carbon isotopes from cache sediments can reveal former pit contents, such as marine or terrestrial resources, because marine resources (including salmon) are enriched in these isotopes, and sediments in which these resources have decayed should reflect those isotopic values. The result of these analyses will be used to test hypotheses concerning Dena'ina social inequality as it relates to fish storage.

WAPA RESEARCH FUND

Morgan Robins and **Todd Gunther** (Central Wyoming College) conducted surveys of ice patches in the Dinwoody and Gannett Peak areas of the Wind River Mountains to test a high elevation lithic site predictive model created by Paul Burnett and Larry Todd. They made two ten-day expeditions into the project area. Although they hoped to identify organic artifacts, the target ice patches are extinct, but they did identify two cairns that may have been part of a hunting blind above one former ice patch on Goat Flats. The Burnett and Todd predictive model developed for the Absaroka Mountains worked well in the Winds to predict both where concentrations are present, and where they are absent.

Surveying for cultural material , Goat Flats at 12,000 ft in the Wind River Range

Featured Project:
The Jameson Site

An overview of the Jameson site

A Passage Through the Red Wall

By Spencer Pelton

The Red Wall is a 25-mile long cliff of red Chugwater sandstone, which impedes movement from west to east along the southeastern edge of the Bighorn Mountains. The easiest passage through this imposing landscape feature is along the valley of the Middle Fork of the Powder River. The Jameson site sits at the base of a prominent butte called Castle Rock on the Hole in the Wall Ranch exactly where the Middle Fork cuts through the sheer cliffs of the Red Wall in Johnson County, Wyoming.

With generous support of the Wold Foundation, the U.W. Archaeological Field School has conducted research at the Jameson site over the last two field seasons. The site contains stratified archaeological deposits, buried features, rock art and a number of perishable artifacts. With a dense and diverse assemblage, it is potentially one of the most important archaeological sites in northeastern Wyoming.

Initially investigated by former U.W. master's student John Jameson in 1975, the field school resumed investigations in 2015. As a result of auger testing, we discovered that buried archaeology exists over an area of several acres and at depths approaching four meters. Subsequent excavation revealed three archaeological components spanning the last ca. 3,000 years and enigmatic older components. In one excavation area, we discovered a stratified sequence of several Late Archaic occupations (ca. 3,000-2,000 BP) that contain well-preserved bison bone, features and many thousands of chipped stone flakes and stone tools. In another, we discovered a buried accumulation of Late Prehistoric habitation debris including fire-cracked rock, stone tools, animal bone and shell beads, including one *Dentalium* shell bead, likely from the Pacific Ocean, brought to the site around 1,200 years ago.

Two surprising discoveries include a Protohistoric component comprised of two perishable bundles cached under rock overhangs on Castle Rock and rock art depicting horses and human hands. Our initial interpretation is that one is a "medicine bundle" comprised of willow bark and the other is a bundle of gaming sticks. Continued investigations will focus on refining the locations and ages of earlier components. It is clear that this location has served repeatedly as an important travel corridor for people moving between the Bighorn Mountains and Powder River Basin for thousands of years.

A cache of sticks placed under a rock in a overhang on Castle Rock. Our working hypothesis is that these are gaming sticks.

2016 field school students Sandra Zarzycka, Paige Van Ostran, Valentín Darré and Anne-Marie Card profiling a test unit.

A Dentalium shell bead. Dentalium is a marine species of mollusk meaning that this bead likely from the Pacific.

A Late Archaic hearth feature associated with butchered bison bone and thousands of pieces of chipped stone.

Ph.D. student and field school graduate assistant, Madeline Mackie, photogrammetrically documenting cached sticks.

2015 field school student Becca Hudson using the bucket auger to explore subsurface deposits.

Absarokas Ice Patch Archaeology

by Robert Kelly

Ice patches are enormous, perennial patches of ice and snow; some have existed for millennia. Not large enough to move as glaciers do, these ice patches preserve artifacts, including organic things such as shoes, baskets, bows, arrows and other wooden implements. However, with global warming, these patches are melting and releasing those artifacts. As a result, ice patch archaeology is now a growing field around the world. We have surveyed ice patches in Glacier National Park, the Wind River Mountains, and most recently the Absarokas. A survey of 11 ice patches in 2014, 2015 and 2016 recovered two small wooden bows, an arrow shaft and numerous pieces of unmodified wood and animal bone. One of the bows is 625 years old, and the other is probably from the late 19th century. One is pine and the other, spruce. The arrow shaft has not yet been dated or identified. In addition, the unmodified wood dates to a variety of different times; many fall within the 4000-5000 years range, and one is 8600 years old. These tell us about changes in treeline and climate change.

Cougar Pass ice patches (2015). Note people for scale.

Fall Lecture

With interests in Rocky Mountain high elevation and Paleoindian archaeology, **Dr. Bonnie Pitblado** of the University of Oklahoma gave this year's Frison Institute public lecture. Her talk was titled, "The Role of the Rocky Mountains in the Peopling of the Americas." Dr. Pitblado argued that high elevation regions would not have been avoided during the colonization process but would have been colonized early on. Alpine regions are not only good places for hunter-gatherers to live, she argued, but also the ancestors of early Paleoindians who moved into North America came from mountainous regions in northeast Asia.

2016 Frison Institute speaker Dr. Bonnie Pitblado of the University of Oklahoma

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Did you see our new logo? Elizabeth Rahel Ono is the designer. Bison hunting has been a regular and enduring topic in George Frison's career.

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