

2018 Annual Report



PCRG

PaleoCultural Research Group

Digging Deeper at Magic Mountain



The Magic Mountain site has long been recognized as among the most important stratified archaeological sites in northeastern Colorado. For decades following the 1966 publication of Cynthia Irwin-Williams and Henry Irwin's landmark monograph, the site's well-preserved Middle and Late Holocene record served as a comparative touchstone for systematizing the archaeological record of the Platte River basin.

Nevertheless, significant questions remain about the age of Magic Mountain's earliest cultural deposits, as well as about the site's extensive Early Ceramic period (1850-800 B.P.) occupation and its place in the wider archaeological landscape. To answer these and other questions, the Denver Museum of Nature and Science (DMNS), the University of Kansas

Odyssey Archaeological Research Fund, and PCRG began a multi-year field investigation at Magic Mountain in 2016. Researchers from the University of Denver and the University of Arkansas are also participating in the project.

Work at the site during 2016 was devoted to magnetic and ground-penetrating radar surveys and UAV mapping. Guided by the results of that work, in 2017 the research team opened 28 excavation squares. A total of 14.8 m³ of sediment was screened and eight cultural features were exposed, including earth ovens, basin hearths, and small pits. Radiocarbon dates indicate that the ages of those features span the Early Ceramic, from about 1960 to 1030 B.P.

The 2017 field investigation also revealed the presence of surprisingly deep deposits in several parts of the site. To better understand the

extent of those deposits the team collected 3-in. sediment cores from eight different locations. Several cores exceeded 2 m in length and buried soils occurred near the bases of at least two.

During 2018, the research team continued investigating the site's extensive Early Ceramic period occupation. The crew opened a total of 33 excavation squares (16.3 m³), in the process exposing six rock-filled basin features. Dating of the features documented in 2018 is ongoing, but the distribution of diagnostic projectile points suggests that most or all of them date to the Early Ceramic period.

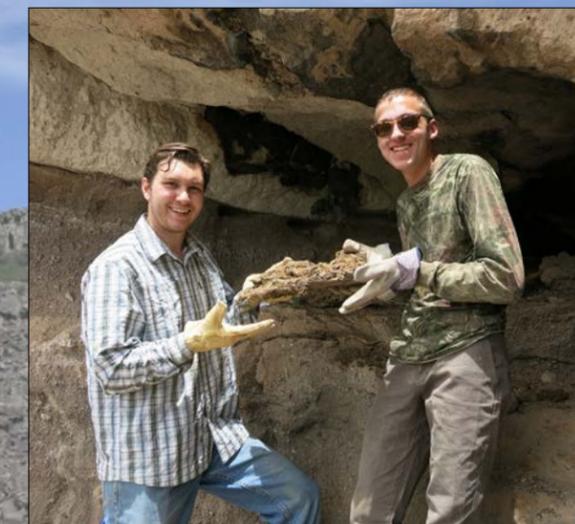
Two squares were excavated to bedrock, revealing a complex depositional history and exposing a deeply buried soil. The alluvium in which that soil developed began aggrading prior to about 8000 B.P. and the soil was buried by colluvium after about 6000 B.P. These ages suggest that intact archaeological deposits dating to the Late Paleoindian and Early Archaic periods may be preserved at Magic Mountain. They also point to an initial occupation several millennia older than previous estimates.

Public engagement has been an important aspect of the Magic Mountain project from the beginning. Over the course of two excavation seasons, 133 individuals participated as volunteer excavators or public tour guides. Educational programming was provided to 135 children and young adults. And more than 2,800 people toured the site, where they learned about the ancient history of the region and about the process of field archaeology. In recognition of the project's outstanding public outreach, the Society for American Archaeology presented the 2019 Award for Excellence in Public Education to DMNS and PCRG.

Upper Right: (L-R) Project directors Rolfe Mandel (Kansas Geological Survey), Mark Mitchell (PCRG), and Michele Koons (DMNS) discuss site stratigraphy in one of the deep excavation units; **Center Right:** DMNS President and CEO George Sparks illustrates excavation techniques for two student excavators; **Lower Right:** PCRG Project Archaeologist Chris Johnston explains geophysical data to two youth participants. (All photos © Denver Museum of Nature & Science.)



Plants, People, and Place



Located deep in the spectacular La Jara Canyon, La Botica—a Spanish term meaning “the Pharmacy”—is a large and complex archaeological site that preserves a record of American Indian lifeways spanning much of the Holocene. The site also is an important locality for the San Luis Valley’s Hispano residents, who gathered medicinal plants there in the nineteenth and twentieth centuries.

Few San Luis Valley sites preserve a record of use spanning such a long period, making La Botica a critical resource for understanding stability and change in mobility and subsistence practices. La Botica is also critical for understanding both the origins and practices of the region’s folk medicine tradition.

Central to the site’s importance is its unique and culturally significant plant community. A variety of delicately balanced natural forces,

combined with a specific history of human use, have shaped the site’s biological inventory. The study of human use of the site is therefore closely intertwined with the study of the site’s ecology, both in the present and in the past: ecological factors have promoted the growth of culturally valued plants and harvesting by human groups may have shaped the site’s ecology.

To understand La Botica’s archaeology and ecology, in 2018 PCRG initiated a unique multi-disciplinary collaboration involving ethnographers, biogeographers, dendrochronologists, ethnobotanists, geologists, and archaeologists. The project is funded by a consortium of state agencies, including History Colorado – State Historical Fund, the Colorado State Land Board, and Colorado Parks and Wildlife. Additional funding is provided by the Sangre de Cristo National Heritage Area.

In addition to understanding the factors that have shaped the site’s ecology, a central goal of the project is to investigate how American Indian use of the site changed over time, whether native peoples gathered medicinal plants there, and whether the region’s early Hispano residents learned about La Botica’s unique resources through their interactions with American Indian visitors. The research team also seeks to learn more about regional climate change and about the continuing cultural significance of the site for both Hispano and native communities.

Top: Austin Smith and Nicholas Koval-Quilty collecting a woodrat midden; Middle: Jordan McMaster-Neely and Larry Scarbrough excavating a test unit; Bottom: Marilyn Martorano documenting a culturally modified tree.



Hidatsa Archaeology at Molander Village

Molander Indian Village, an eighteenth-century Awaxawi Hidatsa community, is a little-known gem among the 57 historic sites managed by the State Historical Society of North Dakota. To better understand its age and condition, PCRG and the SHSND began a cooperative citizen-science project at the site in 2017, when University of Texas at Dallas graduate student Arlo McKee conducted a high-resolution UAV mapping survey and PCRG member Ken Kvamme and his University of Arkansas team completed a magnetic gradiometer survey of the entire village.

In 2018, PCRG, the SHSND, Oklahoma State

University, Eastern Oregon University, and the University of Arkansas returned to Molander to continue the investigation. The team conducted additional geophysical surveys (see page 8), cored 25 magnetic anomalies, and opened five small test excavation blocks.

A primary focus of the field investigation was the site's beautifully preserved fortification system. Ditch-and-palisade fortifications represent an enormous investment of labor. They also require complex planning and coordination to select an appropriate design, to gather required materials, and to manage the work effort. Molander's defensive system offers

a unique opportunity to investigate fortification design and to quantify the construction effort required.

Among the most prominent features of Molander's fortification are its eight large bastions, projections designed to permit crossing fire along the palisade. Some have branded the presence of bastions at the site an "enigma" on the theory that bastions were not used during the eighteenth century. However, we now know that bastions were regular, if not common, features of northern Middle Missouri fortification systems beginning in the 1100s. The size and spacing of the bastions at Molander are typical of those at other sites in the region.

By combining excavation data with spatial data drawn from McKee's digital elevation model it is possible to estimate the amount of effort that was needed to build the fortification. The ditch is approximately 440 m long. Along the coulee on the northern side of the site the defensive system consists of a 152-m cut terrace, rather than a ditch. The accompanying log palisade would have been roughly 574 m long.

Excavating the ditch and terrace required the

removal of about 1.62 million liters of sediment. A total of about 1,780 trees were needed to build the palisade. Making some simple assumptions about labor productivity, it is clear that at least 3,600 person-days were required to excavate the ditch and install the posts.

Current estimates put Molander's total population at about 450 people. If one-tenth of the community was tasked with the construction effort, roughly 80 days of continuous effort would have been required to complete the job—the better part of a growing season. Extensive pre-planning would therefore have been needed, to stockpile food for the construction crew, to obtain a supply of pre-cut trees for the palisade, and to ensure the safety of the community while construction was underway.

Facing page: Overview of Molander Indian Village showing the 2018 excavation units (photo courtesy Tim Reed, State Historical Society of North Dakota); **Below left:** Erin, Dillon, Chloe, Amy, and Lisa waterscreening; **Below right, top:** Reagan excavating Feature 6; **Below right, bottom:** waterscreen samples drying.



Molander Village Ground-Penetrating Radar Survey

Kenneth L. Kvamme

While magnetometry has consistently been shown to be a reliable and informative method of subsurface archaeological prospecting in the Northern Great Plains, the same cannot be said of ground-penetrating radar (GPR). This technique

transmits a microwave into the ground and records the strengths of reflections from buried features. The quality of the results depends on the nature of soils, sediments, and moisture conditions, which must be “just right” for a strong reflection contrast to result from buried archaeological features. In over 20 years of archeo-geophysical work

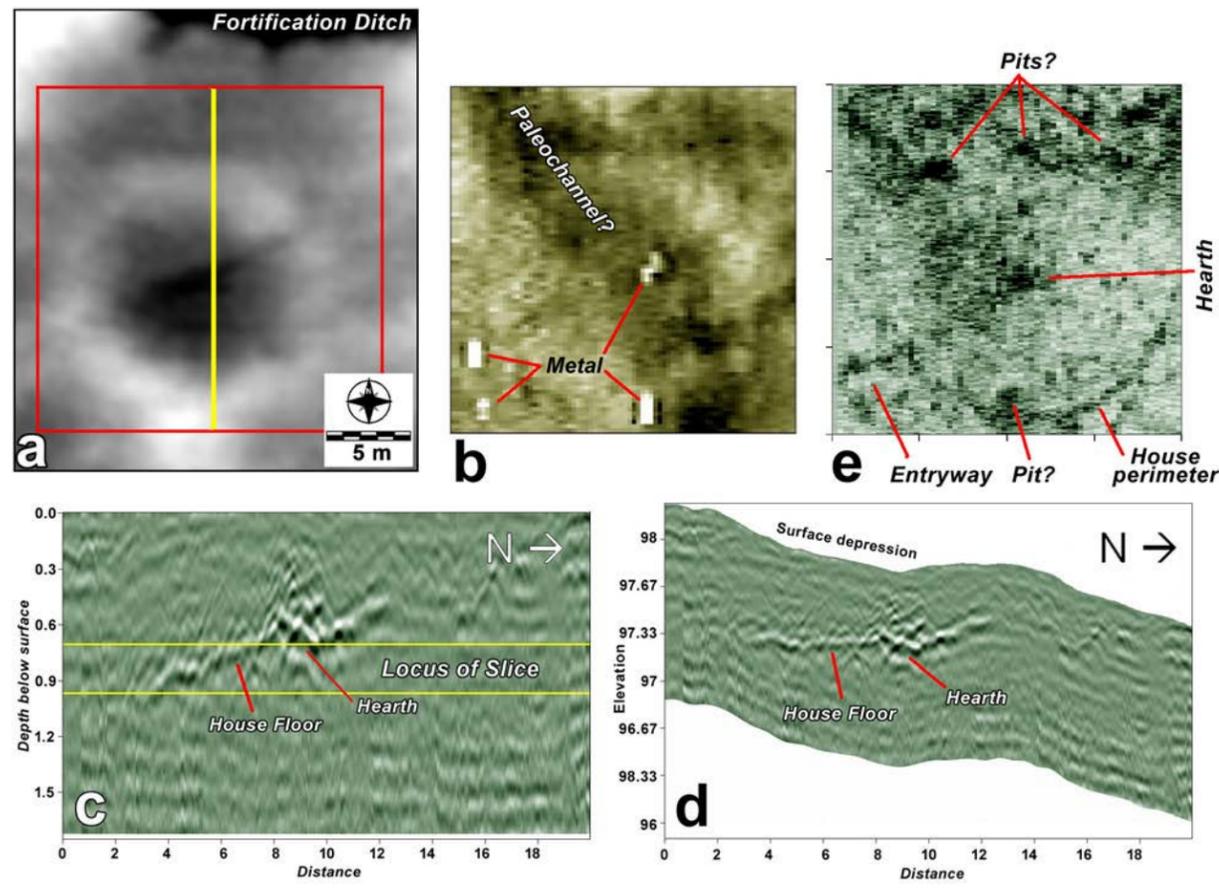


Figure 1. Surface, soil conductivity, and GPR findings at a prehistoric house at Molander Village: a) surface depression indicated by a DSM with survey area in red, b) soil conductivity survey showing likely paleochannel (black high), c) initial GPR profile, d) terrain-corrected GPR profile, e) plan-view slice map across all uncorrected GPR profiles showing significant house features.

in the Northern Plains, I have achieved good quality GPR results in only a relatively small number of instances.

In August, 2018, I and my team from the Archeo-Imaging Lab at the University of Arkansas, including Jo Ann Kvamme and Ph.D. student Jeremy G. Menzer, collaborated with Paleocultural Research Group, the State Historical Society of North Dakota, and students taking an Oklahoma State University field school to further investigate the Molander Indian Village State Historic Site utilizing, primarily, GPR. Thanks to our prior magnetic gradiometry surveys of this site and aerial drone photo surveys by Arlo McKee of the University of Texas, Dallas, good indications of earthlodge locations could be determined, despite disturbances caused by historic plowing. Four houses were investigated by GPR survey and, unsurprisingly, three yielded very poor results without new insights, likely because of very dry conditions that limited ground moisture necessary for reflection contrasts, but it is also possible these houses were shallowly buried and thus greatly impacted by plowing.

A single house, indicated by a modest surface depression about a dozen meters in diameter, yielded startlingly clear GPR findings. This house is located on moderately sloping ground in the north-central portion of the village close to the outer fortification ditch, as is indicated by a digital surface model (DSM) generated from the aerial drone data (figure 1a). A diagonal scar across its surface suggests historic plowing in this area. Apparently, geological, moisture, or soil conditions are somewhat different at this location, and favorable to forming strong GPR reflections. The slope is somewhat lower in elevation and less than 40 m from a wetland and small creek to the north. Moreover, a soil conductivity survey of this 20 x 20 m block (indicated in red, figure 1a) reveals the presence of a likely paleochannel beneath it (figure 1b). The sediments below likely hold greater moisture because soil conductivity is more than twice as great

within the house than outside of it, which likely contributes to the improved GPR response. A GPR profile (figure 1c), acquired at the position of the yellow line in figure 1a, shows clear indications of a central hearth and house floor, tilted because of the sloping ground (the earthlodge is more deeply buried on its southern end). The elevations corresponding to this transect were extracted from the DSM to “terrain-correct” this profile (figure 1d). The shallow depression on the surface is visible and, more significantly, the house floor appears in its correct relative position—i.e., horizontal!

These data are currently under further analysis and processing. Meanwhile, figure 1e illustrates a tantalizing composite which gives a partial plan-view map created by a thick “slice” across all 80 profiles in their original state—not terrain corrected—that cuts through the southern half of the house up to the central hearth, but which then “dives” below the floor, perhaps picking up deeper features, such as pits, to the north (the approximate locus of this slice is indicated in figure 1c). In the partial plan (figure 1e) the central hearth, perhaps a compacted work area near the hearth, part of the house perimeter, the southwest-facing entryway, and several possible storage pits may be visible. One thing can be immediately concluded from these data: the actual diameter of this house—close to 18 m—is much greater than its associated surface depression (about 12 m), a cautionary tale for future interpretations of house sizes from surface evidence. It is hoped that when this experiment is recreated and applied to all 80 terrain-corrected GPR profiles, a clearer and more complete indication of this house, its form, and content may be achieved.

Kenneth L. Kvamme is a Professor of Anthropology at the University of Arkansas where he is Director of the Archeo-Imaging Lab, devoted to the detection of archaeological remains through geophysical prospecting and remote sensing.

Living History

The southern foothills of the San Juan Mountains in southwest Colorado—especially in the headwaters of the Piedra River—harbor extensive groves of bark-peeled ponderosa pines. Peeled ponderosas, also known as cambium trees, reflect American Indian harvesting of forest products for food, medicine, and craft production. The harvesting process left a scar of bare wood surrounded by intact bark. Because the trees continued to grow after harvesting, the ages of the scars can be determined by tree-ring dating.

In 2018, PCRG and the San Juan National Forest began a pilot study to document peeled ponderosas in the Piedra River headwaters. Sixty sites containing one or more cambium

trees have already been recorded in the area, but the agency's reconnaissance efforts indicate that well over 100 additional—and as yet undocumented—locations also contain peeled trees.

Cambium trees are fragile, non-renewable resources that are threatened by wildfires, insect infestations, and other processes. The severity of these threats is only likely to grow as the climate changes. Timber harvesting has already claimed many of the area's oldest, largest trees. Data from peeled ponderosas can reveal patterns of American Indian land use. Cambium trees are also culturally important to many native people, including members of the Southern Ute, Ute Mountain Ute, and Jicarilla Apache tribes, who still live in the area.

PCRG and the Forest Service plan to return to the Piedra headwaters in 2020 to continue this important project.



A Trail Well Traveled

Covering some 2,700 miles across mountain peaks, deserts, and deep canyons, the Old Spanish National Historic Trail (OST) linked commerce and trade between Santa Fe and Los Angeles. While the main period of significance was between 1829 and 1848, sections of the trail were used as early as the 1600s by Spanish explorers. And like many early trails, the OST followed routes first established by American Indians hundreds or thousands of years earlier.

The OST was not just a single route with one well-worn path. Instead, it had three main branches leaving New Mexico, traversing through different parts of what now are Colorado, Utah, Arizona and Nevada, ultimately all converging in California. Each of these branches had alternate routes that were used depending on the season and condition of the trail. One such route, from Santa Fe to Taos, is called the Miranda Valley road. This route was

impassable in the winter but was preferred during the summer months. PCRG first began work in the Miranda Valley in 2017 and returned last September to continue our partnership with the Carson National Forest.

The 2017 work was a reconnaissance survey and metal detecting of previously identified trail segments. Trail segments are visible today as linear depressions or swales. In 2018, the crew conducted block surveys around possible trail segments. Nine new archaeological sites were documented, all with American Indian components and three that also have settler-era components. Two linear segments possibly associated with the OST were also documented. Many of the sites contain Pueblo pottery, and several have Archaic projectile points. These findings further confirm that although the OST may be best known for its use as a nineteenth century trade route, these paths have been worn through for millennia.



Hunting the Divide

Archaeological surveys around ice patches—accumulations of snow and ice that are rapidly receding as the climate warms—have increased greatly in the past decade. Across the globe, archaeologists have recovered amazing artifacts from these melting snow fields. Especially striking are perishable artifacts that otherwise would not have been preserved, including wood and bone shafts, basketry, and even leather boots and bags. In the Rocky Mountains, similar finds have been made, especially by researchers in Wyoming and Montana. However, to date, most of the materials documented from Colorado ice patches are non-cultural, or at least not obviously cultural.

In the late summer of 2018, PCRG sent a small research team, led by PCRG Research Affiliates Matt Stirn and Rebecca Sgouros, to survey ice patches and other areas along the Continental Divide in the majestic Mount Zirkel

Wilderness in northern Colorado. During their journey, the research team covered over 1,000 acres and documented four new archaeological sites, five isolated finds, and visited three ice patches in this previously unsurveyed area.

The three ice patches appear to be like most of the other Colorado ice patches documented by archaeologists in recent years. All three contained abundant organic material, including one with a nearly complete bison skeleton. Bone samples were collected for radiocarbon dating, and selected wood samples were also collected for species identification and potential dating. However, no obvious cultural materials were

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Above: site recording; facing page, left: ice patch survey; facing page, right: the crew making their way to camp with the pack string.



Testing in North Park

Archaeological resources from surface contexts are rarely determined eligible for the National Register of Historic Places. Despite the valuable information researchers can gain from archaeological survey, cultural resources that are exposed on the surface

can be disturbed or out of context, and often lack any type of temporal markers. The surest way to determine the potential research value of a site is by testing for buried and intact archaeological deposits, like PCRG members

Bill and Met are seen here doing at the Pinkham Quarry site.

In July, a PCRG research team traveled to North Park, a large montane basin, on the Colorado-Wyoming border to test five American Indian sites. These sites were

previously documented by archaeologists from the Medicine Bow-Routt National Forests. The primary purpose was to identify sites with additional research potential. This was the first project of a multi-year agreement between PCRG and the forest.



Four of the five sites are lithic scatters, consisting mostly of debitage and stone tools, including two possible Paleoindian point fragments as well as several Archaic and Late Prehistoric points. The fifth

site is the Pinkham Quarry, where at least 15 quarry pits show where stone tool raw material was mined from the ground. Not surprisingly, the other four sites contained

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PCRG Members' Activities

Rob Bozell

In 2018, the Nebraska State Historical Society changed its name to History Nebraska but we still are home to the State Archeology Office (SAO). The SAO completed the final field season of the Nebraska Sand Hills Archeology Project. The 2018 work focused initially on survey of several thousand acres of the upper Snake River valley. Over 80 new sites were discovered ranging in age from Late Paleoindian through early 20th century. The survey was accomplished with the assistance of the University of Nebraska-Lincoln Archeological Field School under the direction of PCRG member Phil Geib. The latter few weeks of the Sand Hills season were spent conducting additional testing at the 17th century Plains Apache Humphrey site along the Middle Loup River. A house floor and several external pit and midden areas were tested. In addition to Geib and his students, we were joined by Matt Hill and students from the University of Iowa and Sarah Trabert and students from the University of Oklahoma.

History Nebraska sponsored a volunteer dig, in addition to a variety of surveys completed for the Nebraska Department of Transportation and other governmental agencies. The event took place over a September weekend and was part of Nebraska Archeology Month. The work involved about 30 enthusiastic volunteers engaged in testing features associated with trading posts connected to the 1870s Red Cloud Agency in northwest Nebraska.

Research work included analysis of vertebrate remains recovered from several sites including: the Big Hidatsa, Lower Hidatsa, and Sakakawea villages within the Knife River National Historic Site, North Dakota, and the Kaw Mission and Quixote sites in northeastern Kansas. The Knife River and Quixote projects were in collaboration with PCRG Vice President Carl Falk. 2018 also saw the completion of two publications on the archeological investigations at Engineer Cantonment—the 1819-20 winter quarters of the Long Expedition. One of these was non-technical and designed for a more general audience.



Bozell: History Nebraska crew at the late 1870s Red Cloud Agency (RCA). RCA was the focus of a fall 2018 Nebraska Archaeology Month volunteer dig.

PCRG Members' Activities

Carl R. Falk

Generally, 2018 mirrored 2017 with the processing and analysis of vertebrate assemblages recovered through 2015-2016 NSF-sponsored investigations of Chief Looking's Village, Bismarck, North Dakota. Work with these Late Prehistoric collections will continue through 2019, focusing on modified bone, analysis of ground squirrel remains (with Dr. Holmes A. Semken, Jr., University of Iowa), and drafting of a final project report.

In 2018, I completed descriptive analysis of vertebrate assemblages from PCRG's 2016 work at the Archaic period Venado Enojado site near Buena Vista, Colorado, and the 2017 investigation of the multicomponent Magic Mountain site. Analysis of collections from 2018 excavations at Magic Mountain will begin later this year. This past year I concluded analysis of Archaic and Late Prehistoric period bone samples from Upper Crossing site; a paper with Mark, based largely on these collections, is near completion.

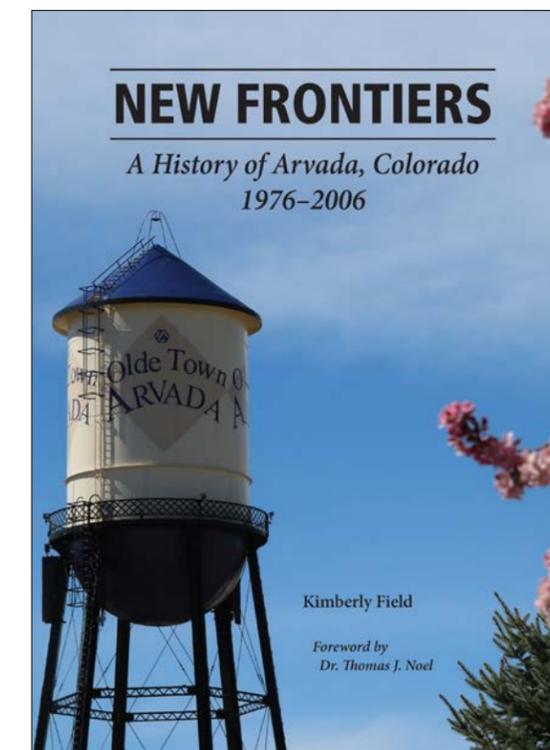
Additional activities include contributions to reports on vertebrate materials from the Engineer Cantonment (the winter quarters of the 1819-1820 Stephen H. Long Expedition, located near Omaha, Nebraska; in coordination with Rob Bozell, History Nebraska). Reports for work at the Late Prehistoric Beadmaker site (located on the Heart River, Grant County, North Dakota; with Dr. Brooke Morgan, Illinois State Museum, Springfield), and investigations in the Knife River Indian Villages NHS (part of the Archeoblitz project, also with Rob) were also completed. Preliminary analysis of fauna from the Late Woodland period Quixote site was completed late in the year (again, with Rob). Research at the Quixote site, located in the Delaware River drainage of northeast Kansas, is in coordination with Dr. Brad Logan (Kansas State University, Manhattan). Professional travel was limited to attendance at the 83rd Annual SAA meetings in Washington, D.C. Finally, I

continued active participation in PCRG, serving as the organization's Vice President and as a member of the Board of Directors.

Kimberly Field

Kimberly Field has retreated into her childhood—and probably yours too! Much of her work focuses on the postwar period in Colorado. It was a glorious time of sparkling new subdivisions full of free range children drinking from garden hoses, and there was plenty of free parking everywhere.

Kim's fourth book, *New Frontiers: A History of Arvada, Colorado 1976-2006*, tells the story of the ascendance of Arvada, Colorado, from a quiet bedroom community to a vibrant city of over 120,000. Historic Olde Town and the world class Arvada Center for the Arts and Humanities



Field: *New Frontiers: A History of Arvada, Colorado 1976-2006* Cover.

PCRG Members' Activities

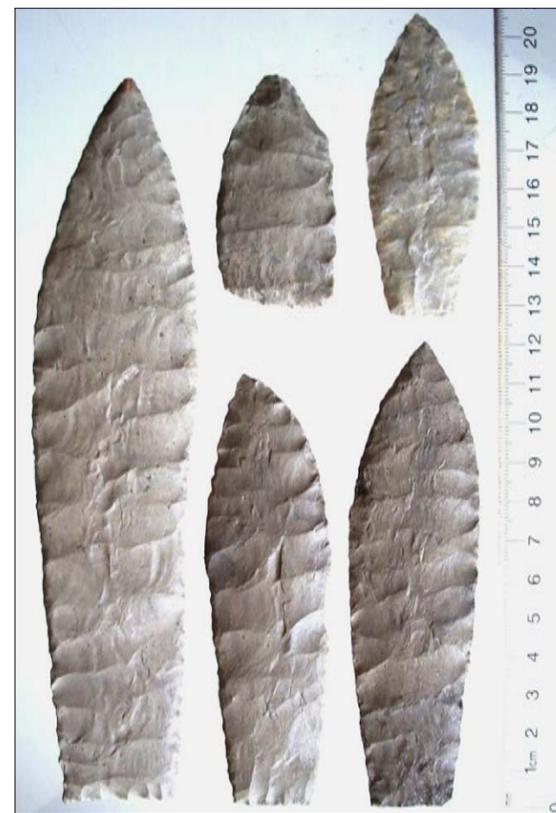
draw visitors from the metro area, Colorado, and beyond. Over 250 pages of history are captured through interviews with the history makers themselves. The hard cover book is lavishly illustrated with 400 photos, maps, and drawings. Published by the Arvada Historical Society (www.arvadahistory.org).

Kim is working with the City of Littleton to establish the MidModMile, promoting awareness and preservation of commercial modernism in Littleton. West Littleton Boulevard boasts important mid-century architectural gems by significant architects including Temple Buell, Victor Hornbein, Joseph & Mary Louise Marlow, Earl Chester Morris, and Eugene Sternberg. The 1.35-mile corridor is perhaps the finest stretch of mid-modern commercial structures in the state and is listed as one of Colorado's most endangered places. Kim serves on Littleton's Historical Preservation Board.

Eugene M. Gryba

My archaeological fieldwork during 2018 was limited to assisting with the recording of sites in Waterton Lakes National Parks, southwestern Alberta that were exposed by a forest fire that swept through a large portion of the park in 2017. Over the summer, I prepared a set of Arctic Small Tool Tradition artifacts for instruction purposes for Professor Matthew Walls at the University of Calgary. I also made a sample of stone tools typical of the Yukon region for hands-on purposes for the Beringia Interpretive Centre in Whitehorse. On October 25th, I led a lithic technology workshop at the 76th Annual Plains Conference in San Antonio, Texas. There I focused on microblade manufacture and fluting/basal thinning. The workshop was organized by Dr. Heather Smith, a recent PhD graduate from Texas A&M, College Station and Brendon Asher. Currently at Eastern New Mexico University in Portales, Dr. Smith has a special interest in the Fluted Point Tradition of northwestern North

America, which had been the focus of her dissertation research. Also during the course of 2018, I prepared a paper titled "Interpreting Variability in Microblade Technology Reported from Northeastern Asian and Northwestern North American Sites". How microblades were produced prehistorically remains an extremely contentious issue amongst many researchers. I still have some photographs to complete before I submit the paper to the editor of a major international scientific journal such as *Arctic Anthropology*. And, in December, Professor Walls and I began recording me manufacturing microblades. Additional video recording for this project is slated for early 2019. Editing and distribution of the video will be carried out by University of Calgary archaeology students.



Gryba: Beaver R.S. Preforms.

PCRG Members' Activities

Dale Henning

This past year has flown by, as I am told it should with each passing year. But, it seems to me that it takes much longer than it did in the past to stamp 'Finished' on any project. One bit of research that I am happy is completed is a chapter in a book *Cahokia in Context: Hegemony and Diaspora* to be published in 2019 by the University of Florida Press. The chapter title: "Cahokia and the Northwest Quarter," by Henning and Ronald C. Schirmer. We searched for evidence of Cahokia influence and interaction with contemporaries across a broad western territory bounded by the Mississippi River to its confluence with the Minnesota River, northwest to the mouth of the Knife River, due south to the Republican River drainage system, then east to Cahokia. Contrary to a number of interpretations in the past, we found little tangible evidence for either a Cahokian diaspora or hegemony. The IMMT Mill Creek villages appear to be the exception - trade and interaction with Cahokia did occur here but Mill Creek did not develop from a Cahokian migration. Who would have predicted that I would publish with the U. of Florida press?

Work with Oneota, Great Oasis, and Mill Creek collections continues with slow progress but progress nonetheless. Our travels continue: Two overseas ventures were greatly appreciated—a cruise up the Norwegian coast beyond the Arctic Circle, around the British Isles with stops in the Shetland and Orkney Islands with their fantastic archaeological sites, and we surely enjoyed a tour of Portugal in December. Barbara and I continue to forge ahead, very fortunate to maintain good health, positive attitudes and hope for the coming year.

Craig Johnson

Three milestones occurred in my professional activities this year. During this period, I ended my employment with the Minnesota Department

of Transportation. Early in the year, I made revisions to my book to be published by the University of Utah Press in the spring of 2019. The book's title is *Chipped Stone Technological Organization: Central Place Foraging and Exchange on the Northern Great Plains*. Beginning in August, I worked with my copy editor on the book and later in the year with the press on page proofs to complete the process.

Starting in late August, I traveled to the Smithsonian Institution's Museum Support Center in Suitland, Maryland, to begin a 10-week artifact collection effort on my next projects, the completion of site reports from five multi-component Plains Village sites located along the Missouri River in South Dakota. These sites, Sully (39SL4), Oldham (39CH7), Cheyenne River (39ST1), Black Widow (39ST3), and Black Widow Ridge (39ST203), were excavated by personnel from the Smithsonian Institution River Basin Surveys (SI-RBS) Missouri Basin Project in the 1950s.

Finally, I spent two weeks as a volunteer at PCRG's Molander excavations in early August. Perhaps the most notable aspect of this work was the very hot weather, pushing into the upper 90s and low 100s for many days. Luckily, the humidity was rather low, allowing for comfortable evening meals and



Johnson: Craig with squash at Knife River Indian Villages garden.

sleeping. I worked on the initial excavations at the fortification ditch along the southern periphery of the site. Our excavations adjacent to but outside of the ditch discovered a layer of buried glacial cobbles from the ditch excavation thrown on top of the original land surface at the time of occupation. Because the sediment below the cobbles contained few artifacts, the ditch was excavated early in the site's occupation. Depositing ditch fill to the outside is unusual since at most villages it is thought to have been placed on the inside of a ditch to increase the height of the wooden palisade. However, since at Molander it was mostly rock unsuitable for post placement, its deposition to the outside seems logical.



Johnson: Craig in near-ditch excavation unit at the Molander site.

Chris Johnston

What a year 2018 was. In May, I resigned as the Assistant State Archaeologist of Colorado. I learned a lot in my two years working for the state and enjoyed interacting with many wonderful colleagues during my time there. The biggest thing I learned, however, is that I missed being in the field, asking challenging research questions, and working with so many amazing volunteers. When Mark mentioned my old role was opening, I took a long hard look at my life

and career and where I wanted to be in 20 years. After bouncing around back and forth from PCRG since 2010, I'm happy to say that I am back, and it feels like coming home. I couldn't dream to be part of a better team and I look forward to helping the organization grow and prosper in the coming years.

In 2018, we also learned we were expecting our second child. Our first, Graham, will be five this year so it was a bit of a shock and change of course. But we were overjoyed, and Graham could not wait to become a big brother. On March 4, 2019, we welcomed his baby brother, Finn Arthur Johnston. He was tiny in stature only, coming in at 4lbs 12 oz, but is a strong, healthy, and loud little man. He is often only calm when his big brother is near, and we can't wait to watch them grow up together and come to join us on some field projects!

Richard A. Krause

Unfortunately, I have been unable to participate in PCRG field programs since 2011. I hope that will change this summer. I have, however, used my retirement time to continue writing books, book chapters and articles. I have also participated in Plains Conferences and Southeastern Archaeological Conferences. Since I have done nothing else of professional interest I will summarize the publications and conference participation. The Plains Anthropological Conference first. I presented a paper at the 2011 Plains Conference in Tucson, Arizona, titled "Proto Arikara Mandan and Hidatsa Kinship, Tradition and Settlement Pattern" and with Kacy Hollenback (a PCRG member) presented a paper titled "A Brief Study of Arikara Ceramic Change." At the 2012 Plains conference I just listened to the papers given by colleagues. At the 2013 Plains Conference I threatened my credibility by presenting a paper titled "In Defense of Culture History" and in repentance just listened in 2014 and 2015. At the 74th Annual Plains Conference in 2016 I gave a talk titled "The Wallace Site in

Colorado Prehistory" and served as a discussant at a symposium on the Archaic Stage in Great Plains Prehistory organized and directed by Mary Adair and Kacy Hollenback. In 2017, in a presentation titled "The First New Archaeology" I argued that from a history of archaeology perspective, culture history was the first New Archaeology and processual archaeology was the second. In 2018, I turned to a less controversial topic in a paper titled "The Arikara Medicine Lodge in Middle Missouri Archaeology." Over the same time span I gave papers to the Southeastern Archaeological Conference titled "Choctaw Pottery from Two Sites in Kemper County Mississippi," "The Metricization of Choctaw Vessel Forms," "Kinship and Social Inequality in the Prehistory of the Tennessee Valley," and "Modes, Wares, Types and Varieties."

Michael Scullin and Wendy Munson-Scullin

The Hidatsa garden is now in its 40th year and each year we test various aspects of gardening (recognizing that maintaining a garden in the same spot imposes different variables than are faced by those who moved their gardens around every few years). But the insects which find our garden attractive, from pollinators to predators, the wildlife depredations (deer,

rabbits, raccoons), and the variability of growing conditions are pretty much the same. This was a year of drought, blow-downs by thunderstorms, and corn borers. The three bean varieties (only the red bean being truly an old Hidatsa variety, although Buffalobird-woman has other ideas) just had a terrible year with various bacterial and fungal problems.

We also did some small excavations in a ridged garden complex on the western border of the Upper Peninsula of Michigan. These were small test units into the sides of two ridges in two different situations. These were to enable us to better understand the construction and maintenance of these very labor-intensive ridges that are 5-10 meters long and a meter or so wide (there is considerable variability). They may be 20-30 cm higher than the surrounding surface which is now wooded. Whether it was wooded when the gardens were established remains to be seen. These ridges are found in numerous places in Wisconsin, some in southwestern Michigan and two known in Iowa. Their function and productivity remain topics of debate

Wendy is working on phytolith analysis and organic acid analysis from the site to help determine source-soils between layers of soil in the gardens.

Members' Recent Publications

The following contributions represent a partial list; technical reports, conference papers, and theses are not included. PCRG members are listed in **bold**.

Bozell, John R., Robert E. Pepperl, and Gayle F. Carlson (editors)
 2018 Archeological and Natural History Investigations at the Winter Quarters of the 1819-1820 Stephen H. Long Expedition.

Nebraska History 99(1). Nebraska State Historical Society, Lincoln.

Bozell, John R., Gayle F. Carlson, and **Robert E. Pepperl** (editors)
 2018 *Archeological Investigations at Engineer Cantonment; Winter Quarters of the 1819-1820 Long Expedition, Eastern Nebraska*, Publications in Anthropology 12. History Nebraska, Lincoln.

Bozell, John R., Robert E. Pepperl, Gayle F. Carlson, **Carl R. Falk,** and Karen A. Steinauer
 2018 Material Recovered from the Archeological Investigation. In *Science*

PCRG Members' Activities

- and Survival at Engineer Cantonment: Archeological and Natural History Investigations at the Winter Quarters of the 1819-1820 Stephen H. Long Expedition*, edited by John R. Bozell, Robert E. Pepperl, and Gayle F. Carlson. Nebraska History 99 (1):38-45. Nebraska State Historical Society, Lincoln
- Drass, Richard H., **Stephen M. Perkins**, and Susan C. Vehik
2018 Digging Ditches: Archaeological Investigations of Historically Reported Fortifications at Bryson-Paddock (34KA5) and Other Southern Plains Village Sites. In *Archaeological Perspectives on Warfare on the Great Plains*, edited by Andrew J. Clark and Douglas B. Bamforth, pp. 211-236. University Press of Colorado, Louisville.
- Falk, Carl R., Amy Koch**, and Thomas Labeledz
2018 Vertebrate Fauna. In *Archeological Investigations at Engineer Cantonment; Winter Quarters of the 1819-1820 Long Expedition, Eastern Nebraska*, edited by John R. Bozell, Gayle F. Carlson, and Robert E. Pepperl, pp. 197-228. Publications in Anthropology No. 12. Nebraska State Historical Society, Lincoln.
- Field, Kimberly**
2018 *New Frontiers: A History of Arvada, Colorado 1976-2006*. Arvada Historical Society.
- Geib, Phil R.**
2018 Mesoamerican Flat Curved Sticks: Innovative "Toltex" Short Sword, Fending Stick, or Other Purpose? *Ancient Mesoamerica* 29(1):45-62.
- Genoways, Hugh H., Brett C. Ratcliffe, **Carl R. Falk**, Thomas Labeledz, **Paul R. Picha**, and **John R. Bozell**
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- Green, William, **Norman A. Bowers**, Calvin Grinnell, Stanley A. Ahler, and **Thomas D. Thiessen**
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- Gryba, Eugene M.**
2016 Heat Treating Obsidian. *Alberta Archaeological Review*, 62 & 63: 5-11.
- 2017 Beaver River Sandstone: Characteristics and Use, with Results of Heat Treatment Experiments. In *Alberta's Lower Athabasca Basin Archaeology and Paleoenvironments*, edited by Brian M. Ronaghan, pp. 333-358. AU Press, Athabasca University, Edmonton.
- Handy-Manchild, Barbera, and **Fern E. Swenson**
2018 *Traces: Early Peoples of North Dakota*. State Historical Society of North Dakota, Bismarck.
- Krause, Richard A.**
2011 An Inventory and Analysis of Ceramics from Sites on the Fort Carson Military Base. *Plains Anthropologist* (56)220: 305-322.
- 2013 A Kinship, Tradition and Settlement Pattern Archaeology of Middle Missouri Community Life. *Plains Anthropologist* (61)240: 394-409.
- 2014a Federal Archaeology in the Southeast. In *Dam Projects and the Growth of American Archaeology: The River Basin Surveys and the Interagency Archaeological Salvage Program*, pp. 95-114, edited by Kimball Banks and John S. Czaplicki. Left Coast Press, Walnut Creek, California.
- 2014b The Pottery Vessel from Site 5LA3189, A Possible Navajo Vessel from Southwestern Colorado. *Plains Anthropologist* (59)230: 182-199.
- Kvamme, Kenneth L.**
2018 Geophysical Correlation: Global

PCRG Members' Activities

- Versus Local Perspectives. *Archaeological Prospection* 25(2):111-120.
- 2018 Getting Around the Black Box: Teaching (Geophysical) Data Processing through GIS. *Journal of Computer Applications in Archaeology* 1(1):74-87.
- Landt, Matthew J.**, and Robin Watkins Morris
2018 Lithic Procurement in the Sand Wash Basin of Northwester Colorado: How Unpredictability Highlights Adaptations. *Plains Anthropologist* 63(245):26-45.
- Landt, Matthew J.**, and Justin P. Williams
2018 Archaic Semisedentary Foragers and Analytical Nodule Analysis: The Aught-Six Site of Northwestern Colorado. *North American Archaeologist* 39(3):171-197.
- Lee, Craig M.**, and Kathryn Puseman
2017 Ice Patch Hunting in the Greater Yellowstone Area, Rocky Mountains, USA: Wood Shafts, Chipped Stone Projectile Points, and Bighorn Sheep (*Ovis canadensis*). *American Antiquity* 82(2):223-243.
- Milideo, Lauren E., Russell W. Graham, **Carl R. Falk**, Holmes A. Semken, and Max L. Christie
2018 Overprinting of Taphonomic and Paleocological Signals across the Forest-Prairie Environmental Gradient, Mid-continent of North America. *Paleobiology* 44 (3):546-559.
- Mitchell, Mark D.**
2018 Introducing *Reviews in Colorado Archaeology*, a New Online Journal for Archaeological Research and Cultural Resources Management. *Reviews in Colorado Archaeology* 1 (Article 1):1-9. doi.org/10.32946/RCA.2018.0004.
- 2018 Modeling Middle Missouri Warfare. In *Archaeological Perspectives on Warfare on the Great Plains*, edited by Andrew J. Clark and Douglas B. Bamforth, pp. 275-294. University Press of Colorado, Louisville.
- Morgan, Brooke M.** (editor)
2018 *The Beadmaker Site (32GT238): A Plains Village Hunting Camp in Grant County, North Dakota*. State Historical Society of North Dakota, Bismarck.
- Murray, Wendi Field**, and Brad KuuNUx TeeRIt Kroupa
2018 Remembering Nishu: Spatiality and Belonging in the Missouri River Bottomlands. *Ethnohistory* 65(2):215-246.
- Rood, Ronald J.**
2018 Archaic Communal Jackrabbit Hunting in Central Wyoming: Faunal Remains from the Dick Myal Housepit Site, 48FR6256. *Plains Anthropologist* 63(247):260-278.
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2018 Indigenous Impacts on North American Great Plains Fire Regimes of the Last Millenium. *Proceedings of the National Academy of Sciences* 115:8143-8148.
- Scott Cummings, Linda**, Chad Yost, and Arkadiusz Sołtysiak
2018 Plant Microfossils in Human Dental Calculus from Nemrik 9, a Pre-Pottery Neolithic Site in Northern Iraq. *Archaeological and Anthropological Sciences* 10(4):883-891.
- Wilshusen, Richard H.**
2018 How Agriculture Took Hold in the Mesa Verde Region: A Review of Recent Research on the Late Basketmaker-Early Pueblo Periods (AD 500-920). *Reviews in Colorado Archaeology* 1 (Article 4):69-95. doi.org/10.32946/RCA.2018.0004.

PCRG Technical Reports

PCRG reports are distributed at no cost to current members. All recent titles are available as Portable Document Format (.PDF) files. Paper copies of selected titles are also available. Please contact the lab for a list of recent titles and for information about how to place an order.

From the Field

The 72 days that PCRG spent in the field during 2018 may have been a record. Of course, it's not only quantity that counts. Solid progress on our shared goals to conduct state-of-the-art research, promote scholarly collaboration, and foster public appreciation for the past depends on what we do with the time spent away from home.

2018's projects were among the most multi-disciplinary we've ever undertaken. As Mike Metcalf mentions below, volunteers had a chance to work with, and learn from, botanists, climate scientists, ethnographers, geologists, soil scientists, dendrochronologists, and historians.

Of course, multi-disciplinary research has always been a hallmark of PCRG research. Our bylaws specifically extend our research mandate beyond archaeology to "related sciences," and many PCRG projects feature important contributions by researchers who are not by training primarily archaeologists.

But 2018—and especially the La Botica project described on pages 4 and 5—felt different to me. The difference, I think, lies in the fact that persuasive answers to the research questions we asked this year depend on data and interpretations from many different fields of study, only one of which is archaeology. In the past, we data offered by researchers in "related

sciences" primarily to bolster archaeological interpretations. In 2018, the other disciplines contributed at least as much to the success of the work as we did. I found that shift in emphasis toward true multi-disciplinary collaboration very rewarding. Many of our volunteers, as well as the other researchers involved, felt much the same way.

The key to fostering the kind of collaboration we experienced in 2018 is to ask the right research questions. Those questions situate the human experience in the larger framework of socio-natural studies. Although it may seem counterintuitive, I believe that our discipline will have matured when other researchers consider archaeology to be a "related science," and rely on us for the data needed to bolster *their* interpretations.

In the coming years, PCRG will endeavor to build the kind of on-going collaborative relationships that will make multi-disciplinary projects routine rather than remarkable.



Mark Mitchell
Research Director

From the Boardroom

It has been another great year for PCRG! We added 36 new members and engaged 101 volunteers in seven field projects. Although not rolling in dough, the organization is financially healthy—but don't hesitate to donate if you are so inclined! Congratulations to Mark, Chris, Brittany, and Frank for a fine job in landing, planning, organizing, and executing these projects. 2018 was a remarkable year for the geographic spread and diversity of projects. From New Mexico to North Dakota, our projects covered most of the prehistoric and historic periods and engaged volunteers with professionals from a range of specialties. As this report details, crews conducted traditional archaeological survey and excavations, but depending on project may have participated in geophysical studies, ethnobotanical survey, study of traditional practices, use of historical materials

to guide fieldwork, and metal detection. On the more mundane side, we moved to a larger and more effective office and lab space, and thanks to Chris the web site was revamped. And this spring, PCRG and the Denver Museum of Nature and Science were awarded the Society of American Archaeology's award for Excellence in Public Education for our joint work at the Magic Mountain Site. Thank you to members and volunteers for making 2018 special.



Mike Metcalf
President

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2018 By the Numbers

36 New Members

7 Field Projects

101 Volunteers

72 Days in the Field

PCRG's New Website

After years of thinking “this will be the year we update our website,” we are happy to announce we have finally taken the leap. PCRG’s re-designed website launched in early 2019. The new site highlights our research and improves access to our technical reports and other research products. We also improved the pages dedicated to each upcoming research projects, added a more detailed “About Us” section, and made it easier to join and donate. Visit <https://paleocultural.org> to see all the new features. Be sure to check back often as additional information is added.

Hunting the Divide, continued from page 12

identified within or near the ice patches.

This was not a total surprise, although it is clear from the rest of the Zirkel survey that this area was not devoid of human occupation in the distant past. Most of the newly recorded cultural resources are relatively small lithic scatters, consisting mainly of flaking debris from stone tool manufacture and maintenance. A few rock features and cairns were also identified, but these are likely to be recent in age.

Kings Canyon, continued from page 13

many flakes and some tools made from this type of material.

The four lithic scatters proved to have limited potential for additional excavation. As often is the case in mountain environments, there is little sediment accumulation making the cultural deposits only partially, or shallowly buried. However, the work at Pinkham Quarry left many unanswered questions. The limited testing we conducted revealed no clear geologic unit the raw material is coming from. How did people in the past know this tool stone was there? Is the stone part of a secondary deposit? Were people just mining the material out and taking it elsewhere or were they doing some reduction and manufacture at the quarry? These

and other questions make testing projects like this so valuable. We will be returning to the Pinkham Quarry this summer, and coupled with our upcoming work at the Windy Ridge quartzite quarry, we hope to shed new light on raw material procurement in the southern Rocky Mountains.

Donations to PCRG

As a 501(c)(3), your donation to PCRG is tax deductible and is used to support state-of-the-art archaeological research and education in the Great Plains and Rocky Mountains. There are many ways to contribute, including:

- One-time donations through our website
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