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WE WANT YOU!
To
Join the
IPCAS BOARD
See the CALL for
NOMINATIONS
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CHECK OUT THE
UPDATED IPCAS
WEBSITE & GIVE US
FEEDBACK

From the President

By Rosi Dennett

Welcome to fall and what a busy October we have in store for IPCAS!

Don't miss the next lecture on October 12 by John Wagner on Economic Change and Trade among the Teuchitlan.. We have a full group signed up for the White Rocks tour by the City of Boulder Open Space and Mountain Parks on October 21. A group of IPCAS volunteers continue to assist Dr. Scott Ortman with his Pojoaque Ceramics Analysis Project on Monday afternoons at CU.

Be sure to send in your registration now for the CAS annual meeting at History Colorado in Denver on October 28. The Denver Chapter has a full slate of speakers scheduled on Saturday with field trips



IPCAS Group Photo at Kachina rock art panel, accessed by river raft. Photo courtesy of Rosi Dennett.

on Friday and Sunday.

Mark your calendars for our annual Christmas party on December 7. This year we are going to switch it up a bit by joining forces with Avery Brewing Company for an "Ales of Antiquity" fundraising event and holiday celebration. Travis Rupp, a beer archaeologist (I want that job!) is going to share his expertise on historical beers along with samples of the beers paired and served with a lovely dinner. I'm really looking forward to this event!

I would also like to extend a personal invitation to you, the reader of this newsletter, to seriously consider joining the IPCAS Board in one of the offices that will be vacant at the end of the year. The open slots include President, Outreach Coordinator, Newsletter Editor, Website Content Manager, and At Large Positions. As my two-year term wraps up, I can attest to what a rewarding experience it is to work with this dynamic group of dedicated volunteers. Please let me know, if you are interested in joining us!

Finally, I want to extend a special thank you to Karen Kinnear for organizing another fabulous field trip that included visiting numerous rock art sites and ruins in the Ceder Mesa area in southeast Utah. The raft trip down the San Juan River was a real hoot, and quite refreshing! Also, thanks to Ann Phillips and Lynda McNeil for their assistance in preparations, and then both shared exceptional rock art knowledge and guidance along the way.

Member Activities Request

Dear Members,

Annually, as part of Colorado Archaeology Society's larger commitment to research and education, each chapter is asked to submit an annual report on the research and archaeologically based activities its members participated in throughout the year. As the annual meeting approaches, IPCAS would really like to hear from you regarding what archaeologically inspired activities you were involved in over the past year so that we may include them in the Annual Report. Please email a very brief summary to Delane Mechling at mechlings@hotmail.com, or you can mail the Board at indianpeaksarchaeology@gmail.com. We hope to hear from you soon!

Thank you in advance,

The IPCAS Board

Social Media, Mobile Technology & Archaeology Workshop: Follow-up

By Chris Kerns

The Social Media, Mobile Technology, and Archaeology Workshop was a huge success. Everyone who attended seemed to have a good time and learned a lot about using social media to keep up with archaeology. I've posted a ton of resources for those interested in it on the IPCAS website, including a pdf of the powerpoint presentation. Check out the resources here:

<http://www.indianpeaksarchaeology.org/learn/resource> OR

<http://www.indianpeaksarchaeology.org/learn/presentations>



John Wagner. Photo courtesy of John Wagner

About John Wagner

John Wagner earned his MA in archaeology from CU Denver in 2014, completing a thesis on lithic production in the prehistoric Teuchitlán culture of Western Mexico. A CAS scholarship was instrumental to the success of his project. He is currently seeking the required funding to pursue further research on the Teuchitlán economy.

IPCAS Lectures

When: Thursday, October 12th at 7:00 pm

Where: CU Museum, Dinosaur Room

Cost: Free and Open to the Public

John Wagner - University of Colorado - Denver

Economic Change and Trade among the Teuchitlán

The Teuchitlán culture existed in the Tequila Valleys in Western Mexico during the Late Formative and Early Classic periods (CA 300 BC – AD 400). The group is suspected to have had a trade connection to groups in the Southwestern United States, as well as seafaring groups from coastal South America. I propose that a spatial expansion of the culture into the surrounding hills around 200 AD also corresponds to an economic extension from an agrarian base, towards one based on trade. This presentation examines the evidence of the shift towards trade, the potential for a Southwestern U.S. connection, and future steps towards examining these possibilities.

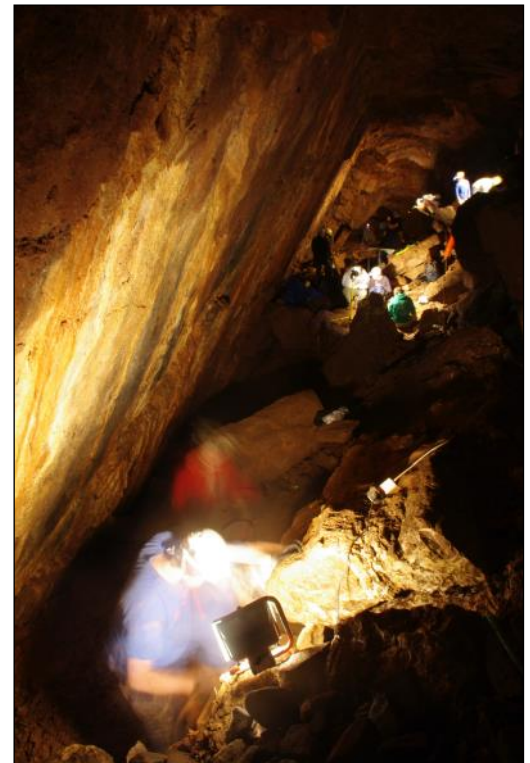
NEXT MONTH...

Thursday November 9, 2017 at 7:00pm

Chris & Allison Kerns - IPCAS

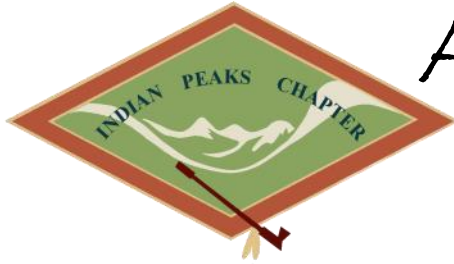
Buried Underground: The Excavation and Re-examination of Iron Age activity at Read's Cavern, Southwest England

The two presenters will discuss the results and conclusions from excavations they conducted at Read's Cavern during April and May 2010. The possible uses of the cave have been reconsidered through comparisons to activities taking place at other Iron Age sites around Britain, including other cave sites. The defining aspect of Read's Cavern as a space is its lack of visibility, as both a feature in the landscape and as a place in which it was difficult to penetrate the darkness. Concepts of contamination and cleanliness may have had an important role in forming the intricately structured deposits within Read's Cavern.



Read's Cavern. Photo by Liam Powell.

SAVE THE DATE



Ales of Antiquity Holiday Dinner



Thursday, December 7th, 2017

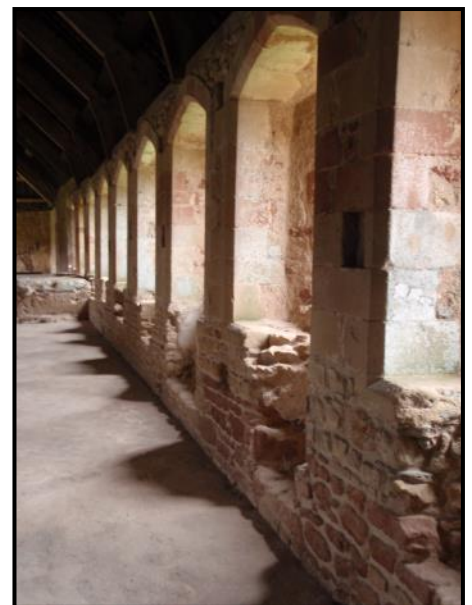
7:00pm

Join IPCAS

At Avery Brewing Company for an Ales of Antiquity Holiday event! Beer archaeologist and Avery brewer, Travis Rupp, continues his quest of beer discovery with ancient-inspired ales and food! Enjoy a lecture, historical beers, and small plates of food all focused on the ancient world.

Details regarding the subject of his lecture, beer styles, menu and ticket prices still to come! Limited Seating (40 max). Therefore, IPCAS Members will have the opportunity to purchase tickets early.

All proceeds from the event will benefit IPCAS



Fare thee well: Pete Gleichman

By Pete Gleichman

After living at 9,400 feet for the past 18 years, I will be moving away from Boulder - and winters spent fighting snow - to explore the southwest, get re-involved in archaeology around New Mexico, and spend some time traveling.

I first moved to Boulder in 1974, after living in Europe for several years. Back then I paid for traveling by forming a company called “Intergalactic Imports.” We exported Native American art, mainly silver and turquoise jewelry, into Europe. I eventually returned to school and completed a degree in Anthropology which included spending three seasons at the Mesa Verde Research Center.

Over the next few years I worked for federal and state agencies and private companies, including as a staff archaeologist with Arizona State University and several years with the Navajo Nation. Returning to Boulder, Carol Legard (Gleichman) and I started Native Cultural Services (NCS) in 1985.

I joined IPCAS sometime in the late 1980’s, and have enjoyed a long association with the chapter. In 1989 Carol Gleichman found the Rock Creek Site during a survey of the Rock Creek trail corridor for Boulder County Parks and Open Space. In 1990 NCS with the assistance of IPCAS, CU students, and other professionals conducted ten days of voluntary excavations at the site. The majority of the 44 volunteers were IPCAS members. A tour of the site during a



Pete Gleichman playing the role of tourist at the Ruins of Uxmal, Mexico.
Photo by Katherine McComb, courtesy of Pete Gleichman

quarterly CAS meeting hosted by IPCAS in 1992 led to the discovery of a previously unexposed firepit in the cut bank on the western edge of the site. The fire pit was salvaged by a voluntary excavation by NCS and 11 IPCAS members, and IPCAS paid for a radiocarbon date, which showed the firepit to be ca. 6200 years old.

In 1993 Rick Lippencott (IPCAS) and I nominated the Rock Creek Site to the State Register of Historic Properties. IPCAS and NCS were awarded a grant from the Historic Preservation fund from the Colorado Historical Society for additional excavation at Rock Creek. I

think this was the first grant, or at least one of the first, awarded for archaeological projects. NCS staff supervised the 31-day dig, and 48 volunteers participated, mainly IPCAS members or other professionals. The excavation was conducted as an exercise in public archaeology, and several hundred school children and adults were given tours of the site. Ten IPCAS members assisted with the lab analysis, with Kris Holien assisting with supervision.

The IPCAS Education Committee and NCS put together the “Rock Creek Trunk” a collection of replicated artifacts and hands-on workshops to educate school-age children about archaeology and local prehistory. Editions of the trunk were placed at the University of Colorado Museum, Boulder Valley School District, and the Boulder County Parks and Open Space Dept.

Myself, along with NCS staff, IPCAS and CU students collaborated on several projects including salvaging a firepit eroding out of the cut bank of Rock Creek at the Flatirons Crossing shopping center in 1998. Along with seven IPCAS volunteers, we conducted excavations in 2004 at the Big Rock Spring Site (5BL18), a site whose location had been lost for years. The report was dedicated to Jim Morrell, former leader of IPCAS, who dug with us at the site, and died in 2005 shortly before the report was finished.

I served on the IPCAS Board as either an At-Large member or Professional Advisor from 1999 until 2009, and again in 2011 to help organize the CAS annual meeting, hosted by IPCAS. Managed to arrange some corporate donations from colleagues to help defray costs of the meeting.

Along the way, I arranged for, and conducted, tours for IPCAS members of the archaeology at White Rocks, Rabbit Mountain, and Indian Mountain. I also made several presentations to IPCAS, and assisted IPCAS members in analyzing over 800 projectile points from the Swallow Site.

NCS ended up completing 450 projects in seven states, with an emphasis on the archaeology of Boulder County and adjacent areas of the Front Range as well as NE Colorado. Several IPCAS members were even employed by NCS on field projects over the years.

As I prepare to move out of Colorado, it has been my great privilege to get to know many dozens of IPCAS members. I am grateful for the experiences, particularly with Tom Cree, Cheryl Damon, Kris and Bernie Holien, Tom Meier, Steve Montgomery, the late Dock Teegarden, -- and of course Katherine McComb. I do intend to stay involved with Colorado archaeology, but with a little distance.

We did some archaeology and had a lot of fun. Fare thee well.

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IPCAS wants you to help shape our FUTURE...

The Indian Peaks Chapter of the Colorado Archaeology society is currently seeking nominations for its open board positions. Join in shaping this 100% volunteer-run organization that brings local archaeological programming to members and interested public participants. We're looking for motivated volunteers to help us pursue IPCAS's mission to advance archaeological education, interest, participation, research, and conservation. Self-nomination is permitted and encouraged. The incoming volunteer board will play a pivotal role in shaping the future of IPCAS and archaeology in the local area. Serving on the board can enrich your personal and professional

OPEN POSITIONS

- ◆ **President**
- ◆ **Outreach Coordinator**
- ◆ **Newsletter Editor**
- ◆ **Website Content Manager**
- ◆ **At Large Positions**

life, providing board members an opportunity to meet accomplished industry professionals and network with up-and-coming talent. Board nominees need not be IPCAS members at the time of nomination, but elected nominees are required to join and maintain their memberships for the duration of their terms.

This year, there are several opportunities to quickly become involved as we have several open positions, including Chapter President. Nominations close and elections/appointments will take place at the IPCAS Annual meeting on November 9th.

Alice Hamilton Fund

The 82nd CAS Annual Conference

By Betsy Weitkamp

An important part of the CAS annual meeting at the end of October will be a silent auction and the money which is earned from the auction will be used by the Alice Hamilton Fund for scholarships to college students in archaeological fields. It is important that there be as many items as possible and your donation will make a difference. The event is at History Colorado at 1200 Broadway. Your donations can be dropped off there on Saturday morning, October 28 or on the Friday evening before items can be delivered to 1961 S Marion St, Denver near Downing and Evans. You can call Betsy at 303-722-1656 for more information. Small or large, anything is appreciated. Archaeological items are welcome such as pottery, anything with rock art designs, books etc. Other donations are welcome too. One idea might be to lead a great field trip that people could bid on. Please have an idea of the value or the amount you think a starting bid should be. If you cannot deliver the items, a way will be found to get them to the museum. And be sure to plan on bidding on many other exciting items. Thanks so much.

From the University of Colorado to Harvard Medical School: What I've Learned While Working in an Ancient DNA Laboratory

By Jakob W. Sedig

From 2007-2015 I was a graduate student in the Anthropology Department at the University of Colorado, Boulder. During that time, I researched the symbolic use of projectile points in the northern Southwest and the Transitional phase of the Mimbres region (with the help of many IPCAS and CAS members). Less than two years later, I now work in one of the world's leading ancient DNA (aDNA) laboratories, the Reich Laboratory of Medical and Population Genetics, at Harvard Medical School. In this article, I'll discuss what I've learned in my time as an archaeologist in a genetics laboratory and how ancient DNA is revolutionizing the field of archaeology.

Methods Overview

Ancient DNA research is truly a collaborative process—no single person could ever complete all the required analysis alone. The first step in the process is identifying interesting samples to study. This could be through an archaeologist contacting the lab and requesting to have samples analyzed, or the lab developing a research question and then identifying the samples needed to address the question. I am most involved with these first steps; along with helping identify samples, I serve as an “interpreter” between archaeologists, geneticists, and the institutions that curate osteological remains.



Figure 1: One of the Reich Lab's processing rooms. UV light is used to destroy modern DNA, which could contaminate ancient samples. Photo courtesy of Jakob Sedig.

Once permission to study samples is granted, the samples are brought into the lab for processing (Figure 1). During processing bone powder is created (Figure 2) and then liquefied to amplify and isolate human DNA for sequencing (Figure 3). Many readers are aware of companies that, for a fee, will analyze and provide ancestry information for customer provided DNA samples. These companies have it easy—the samples sent to them have DNA that is in a neat, long, chain of adenine, thymine, cytosine, and guanine bases. This is not the case for ancient DNA, which is very fragmented. As a skeleton remains buried underground for hundreds or thousands of years, its DNA breaks into much smaller bits and pieces. DNA from organisms and bacteria in the soil also intermingle with the human DNA. Another added difficulty for aDNA analysis is that skeletons are usually contaminated with modern DNA. Thus, by the time a sample arrives at the lab, its DNA is no longer in a neat, easily readable chain, but stirred into a messy DNA soup.

Laboratories have two approaches to study the aDNA in this soup. In one method, called “shotgun

sequencing,” every chunk of DNA in the stew—ancient DNA, bacterial DNA, and modern DNA—is sequenced. Researchers then must sort through these chunks to find and analyze the human ancient DNA bits. The Reich lab uses a different method called “capture.” In this method, “probes” are inserted into the DNA soup; the ancient DNA fragments are attracted to these probes, then sequenced and analyzed (Figure 4).

Regardless of whether shotgun or capture is used, the next step is to analyze the data. This is done through the identification of single nucleotide polymorphisms (SNPs), or mutations to a single A, T, C, or G, that cumulatively create the unique DNA signature of each individual person. The Reich lab examines 1.24 million of these SNPs (there are roughly 10 million in the human genome). Different groups of people have different types of SNPs, which allows us to study the genetic similarities and differences of modern and ancient groups of people. Several researchers in the lab do complex statistical analyses (f statistics, d statistics, principal component analysis, admixture analysis, and more) to figure out how ancient samples were related to one another and other groups.

Finally, after processing and analysis, we discuss the results with the archaeologists and/or the institutions that shared the samples with us. Working together, an article is written and (hopefully) published in a leading scientific journal.

Exciting Discoveries, Ethical Concerns

It seems as if almost every month a paper is published that uses aDNA to help create a better understanding of the past. Ancient DNA research has confirmed previous archaeological findings, and made multiple unexpected discoveries. However, there have been some concerns, particularly ethical concerns, raised about these studies.

One of the earliest aDNA studies is perhaps the most well-known: evidence of human-Neanderthal interbreeding during the last Ice Age. It now seems that most modern, non-African populations have 1-4% Neanderthal DNA in their genome (Green et al. 2010; Reich et al. 2010; Sankararaman et al. 2010). As mentioned above, aDNA becomes increasingly fragmented over



Figure 2. One of the Reich Lab technicians processing a sample. Technicians wear body suits and a facemask to avoid contaminating ancient samples. Photo Courtesy of Jakob Sedig.

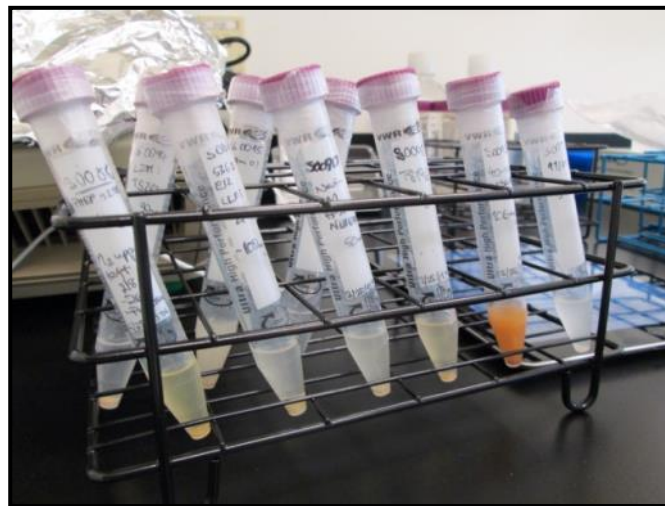


Figure 3. Liquefied samples ready for sequencing. Photo courtesy of Jakob Sedig



Figure 4. One of the Reich Lab spaces where samples are analyzed. Photo courtesy of Jakob Sedig.

time, so reconstructing 30,000+ year old Neanderthal aDNA is especially difficult. Despite this, geneticists and archaeologists have been able to make interesting discoveries, including the identification of an extinct relative of Neanderthals called Denisovans, from a finger bone recovered from a cave in the country of Georgia (Meyer et al. 2012; Reich et al. 2010). Researchers have even found differences in Neanderthal diet by examining the aDNA of organisms found in the calculus (aka plaque) scraped from the teeth of separate Neanderthal groups (Weyrich et al. 2017).

While Neanderthals seem to generate the most headlines, many-fold more aDNA data exist for post-Ice Age Europe and Eurasia. One study (Haak et al. 2015) traced the spread of farming from the Near East into Europe, which agreed with traditional archaeological models. However, this study also revealed that several waves of migration occurred later into Europe, including a massive migration from the steppe, which likely introduced Indo-European languages. Ancient DNA studies have also provided insight into the genetic origins of Minoans and

Mycenaens (Lazaridis et al. 2017), the genomic origin of farming in the Near East (Lazaridis et al. 2016), and the demography of Iron Age nomads (Unterländer et al. 2017).

Although there has been a focus on ancient Europe and Eurasia, interesting aDNA studies of the New World have also been published. Genetic evidence has helped demonstrate that the “Clovis first” model is outdated; multiple waves of people (none of which were Solutrean) migrated into the Americas around the end of the last Ice Age (Rasmussen et al. 2014; Skoglund and Reich 2016). In addition, genetic data has helped resolve one of the most public controversies in American archaeology—Kennewick Man. Genetic analysis revealed that Kennewick Man indeed is most closely related to modern day Native Americans, and not European/Caucasian groups, as some had claimed (Rasmussen et al. 2015). Ancient DNA studies have also helped answer questions about Chaco Canyon. A paper published this spring (Kennett et al. 2017) found that high-status burials from Pueblo Bonito were related through the maternal line, and that several generations of these relatives were buried together. While the findings of this paper provided new insight into long-standing questions about Chaco Canyon, the paper also stirred up some controversy (which seems to be the case with anything Chaco), particularly ethical issues surrounding aDNA research (Balter 2017).

As readers are likely aware, many issues surround the study of human remains, particularly those of Native Americans’ ancestors. In the past, archaeologists (and other scientists) conducted sensitive studies on Native Americans and their ancestors without (or even against) their consent. Many people are therefore concerned that ancient DNA will be conducted similarly, especially on skeletal remains that have not been repatriated and have been sitting in museums for decades (as was the case with the Chaco Canyon study). Like archaeologists, geneticists must collaborate and consult with Native American communities during aDNA studies. This is not the case for

European samples, which might partially explain why ancient Europe has been more intensively studied than North America. However, it is also unethical to ignore one entire continent with this new technology. Those who study aDNA therefore must learn to work with Native American communities, so that Native Americans are not denied this powerful tool to study their past.

Conclusion

Ancient DNA research must be collaborative. While, in my experience, geneticists and archaeologists have mostly “played nice together,” there has been some butting of heads: archaeologists get upset when aDNA results do not match long-standing assumptions about the past, geneticists sometimes think archaeologists are misinterpreting the results of aDNA analysis. Because I have been trained, and work, in a leading ancient DNA laboratory, I have a somewhat unique perspective; I understand (as much as I can) the genetic research being conducted, but I also understand the archaeological record and concerns of archaeologists. There needs to be more people that straddle the genetic/archaeological boundary, to allow aDNA research to thrive.

I still consider myself a Southwest archaeologist first and foremost; I spent over a decade focusing almost solely on the archaeology of the US Southwest and am still deeply interested in the people who lived there. However, I now work in an ancient DNA laboratory that studies archaeological samples from around the world. I feel extremely fortunate to work in the Reich laboratory, and be at the forefront of a scientific revolution in the field of archaeology. I was trained as a field archaeologist, but it has become clear that aDNA is now a crucial aspect of archaeological research. Archaeologists need to have a basic understanding of aDNA and how analysis is conducted. I hope to spread what I have learned, so that archaeologists and geneticists can continue to build their relationship and better understand each other.



Jakob exploring Chaco Canyon, one of the sites mentioned in the text with recent, groundbreaking, aDNA research. Photo courtesy of Jakob Sedig.

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OCTOBER EVENTS CALANDER

Lectures			
10/5/2017 7:00pm	Terracotta Warriors After the First Emperor: Re-evaluating the Qin Legacy in the Han	Dr. Allison R. Miller	Hale Science Building, Room #270 (Boulder AIA)
10/9/2017 7:00pm	Recent Archaeological Investigations at Cherokee Ranch and Castle, Douglas County, Colorado	T. Reid Farmer	Ricketson Auditorium, Denver Museum of Nature and Science (Denver CAS)
10/11/2017 7:00 pm	A Quilt of Honor	Richard Boston	Medical Center of the Rockies, Arapahoe Room (Northern Colorado)
10/11/2017 6:00pm	What Was Ours (Documentary Film Screening)		Boulder Public Library, Canyon Theater. (MOB & NARF)
10/12/2017 7:00pm	Economic Change and Trade among the Teuchitlan	John Wagner	University of Colorado Museum, Paleontology Hall (IPCAS Lecture)
10/14/2017 2:00 pm	The Castles of Ireland	TBA	North Classroom #1511, Auraria Campus, University of Colorado Denver. (AIA Denver)
10/16/2017 7:00 pm	Egyptian Magic - 101	Bill Cherf	Ricketson Auditorium, Denver Museum of Nature and Science (Egyptian Studies Society)
10/16/2017 6:00pm	American Indian Sacred Sites in Boulder and Beyond	Steven Moore	Native American Rights Fund, 1506 Broadway. Boulder. (MOB & NARF)
10/25/2017 6:00pm	Let Us Rebury Our Dead	Dr. Chip Colwell	University of Denver, Sturm Hall, Lindsey Auditorium. (DU Anthro)
10/26/2017	The Way Forward: Self-Determination in Cultural Expression and Representation	Ava Hamilton & Dr. Angelica Lawson	Boulder Public Library, Boulder Creek Room. (MOB & NARF)
Events and Conferences			
10/5/2017 - 10/19/2017	Utah Rock Art Research Association	Green River, UT	https://urara.wildapricot.org/2017-Green-River-UT
10/27/2017 - 10/29/2017	82nd Colorado Archaeological Society Annual Meeting	Denver, CO	http://cas-denver.org/annual-meeting
Workshops			
10/21/2017	International Archaeology & Family Day	Boulder, CO CU Museum of Natural History	http://www.colorado.edu/cumuseum/

As always, if you know of any events, lectures, exhibits, or fieldtrips you would like added to our events calendar, please send an email to indianpeaksarchaeology@gmail.com

2017 IPCAS Board & Supporting Members

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Members are encouraged to send ideas or material for The Calumet. All content is subject to review and approval by the IPCAS Board.

The submission deadline is the 3rd Monday of the month for the next month's issue.

Send to indianpeaksarchaeology@gmail.com or ChrisJKerns@gmail.com

