Historic Preservation in 3D:
Drone and Camera-Based Photogrammetry in Archaeology

A presentation by Casey Dukeman

With recent advances in data processing and Artificial Intelligence, archaeologists are finding new and innovative ways to apply digital photogrammetry to assist in locating, documenting, and preserving cultural sites and landscapes. High resolution 3D models and point cloud data sets can be generated from images taken from drones and/or digital SLR camera, using Structure from Motion (SfM) technology. The resulting SfM models produce high-resolution three-dimensional data sets that can be easily manipulated for documentation and public education, as well as accurate object morphological analyses with very few restrictions.
Our February Speaker: Casey Dukeman

Casey Dukeman began his archaeological career in 1994 and has worked in the western United States and Rocky Mountains for over 20 years. He completed a Bachelor of Arts Degree in Geoarchaeology and History at Western State College in 1997 and his Master of Arts in Anthropology at the University of Wyoming in 2002. His M.A. Thesis was entitled *An Analysis of Analysts: A Critical Assessment of Debitage Attributes*, in which he compared the replicability of lithic analysts across the discipline of archaeology. Since then, Casey has worked as an archaeologist, manager, and principal investigator in academia, cultural resource management, environmental compliance, and state historic preservation. He has extensive field survey and excavation experience, as well as countless hours of laboratory experience in cataloging, analysis, and methodological development. Casey is also a certified ArcGIS Server and Enterprise administrator.

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The Squint and Juanita Moore Scholarship
Created in honor of Chipeta Chapter founding member Carlyle “Squint” Moore and his wife, the scholarship is awarded each year to a deserving high school senior or college student intending to enroll or already enrolled in an Anthropology or Archaeology program. Students can apply online at collegeXpress—and note that the deadline is April 1.

The scholarship is managed by the Montrose Community Foundation. If you wish to donate, please send your tax deductible donations to the Montrose Community Foundation, PO Box 3020, Montrose, CO 81402.
We are off to a good start for the chapter! There was a meeting of the field trip leaders and myself to brainstorm a great list of upcoming trips for the springtime (see below). This is probably not a complete list: there might be some other trips added throughout the months, but we wanted to make sure that everyone had a "save the date" idea for the multi-day trips. So be sure to check out the information in the newsletter: there are going to be some wonderful trips to some great sites. We also discussed trip guidelines with some additions and a possible "tailgate" talk before each trip.

We would like to invite the new members to review the list with the trips by the site stewards. What a way to explore a site with the steward and learn what the program is all about with some site etiquette too. On another note, we are looking for someone to become the new membership chair and we need a representative for PAAC. Please let a board member know your interest or questions. Also, just a reminder that you can renew your membership online but only within a thirty-day window. Again if you have any questions please feel free to ask a board member. I want to thank you for supporting the oldest CAS state chapter.
<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Brief Information</th>
<th>Leader(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>February 2</td>
<td>Grand Junction Old Spanish Trail rock art</td>
<td>One day. Meet at the City Market in Orchard Mesa at 9:00 a.m. (See emailed announcement)</td>
<td>Dennis DeVore 970-201-5199</td>
</tr>
<tr>
<td>February 11-13 (Mon-Wed)</td>
<td>Verde Valley, AZ</td>
<td>Camp Verde Rock Art, Rock Art Ranch at Winslow, motel or camp (still has room on trip)</td>
<td>Leigh Ann Hunt</td>
</tr>
<tr>
<td>February TBA**</td>
<td>Roc Creek hike</td>
<td>One day. Rescheduled, along Unaweep Byway. short hike. Might still have room.</td>
<td>Russ Barr 970-240-4196</td>
</tr>
<tr>
<td>March 21-23 (Thurs-Saturday)</td>
<td>San Rafael Swell - BCS sites - Temple Mountain</td>
<td>Possibly Horseshoe Canyon Great Gallery. Multi-day campout; lots of hiking</td>
<td>Dennis DeVore and Leigh Ann Hunt.</td>
</tr>
<tr>
<td>March TBA</td>
<td>Harris Site local rock art</td>
<td>Near Montrose, possibly other Site Steward sites, 1 day.</td>
<td>Bill Harris &amp; Site Stewards</td>
</tr>
<tr>
<td>April 12-14 (Fri-Sun)</td>
<td>Canyon of the Ancients Ranch and National Monument</td>
<td>Outside Cortez, CO, lodging option at the Ranch or camping. Detailed announcement will be emailed. For more info now, leave a phone message for Dave at 970-260-2117</td>
<td>Dave Upchurch</td>
</tr>
<tr>
<td>April TBA</td>
<td>Escalante Canyon</td>
<td>Historic cabins and rock art with Site Stewards, 1 day</td>
<td>Bill Harris &amp; Site Stewards</td>
</tr>
<tr>
<td>April TBA</td>
<td>Little Park and Glade Park</td>
<td>Rock art, 1 day</td>
<td>George Decker</td>
</tr>
<tr>
<td>May 3-4 (Fri-Sat)</td>
<td>Maybell /Rangely area</td>
<td>Clock site and other unusual prehistoric sites</td>
<td>D. DeVore, G. Decker, L. A. Hunt.</td>
</tr>
<tr>
<td>June TBA</td>
<td>Rio Grande Southern Railroad sites</td>
<td>Trout Lake Trestle, Vance Junction coal chutes, possibly Ames power house, with Site Stewards</td>
<td>Fred and Sue Henderson</td>
</tr>
<tr>
<td>June TBA</td>
<td>Special</td>
<td>Debeque wild horse herd viewing trip, single day</td>
<td>George Decker</td>
</tr>
<tr>
<td>June 27-28 (Thurs-Friday)</td>
<td>Los Pinos Old Agency Ute Fort</td>
<td>Single long day or multi-day camp-out in Cochetopa Park south of Hwy 114.</td>
<td>Leigh Ann Hunt</td>
</tr>
<tr>
<td>July 13 or 20th or TBA</td>
<td>Monarch Pass Game Drives</td>
<td>Single day hike, Monarch Pass ski area vicinity with Pike-San Isabel Forest Archaeologist</td>
<td>Joe Oglesby</td>
</tr>
</tbody>
</table>

* This list has our goals and dates. As our plans get solidified we will send out specific information on how to sign up and final details. Please ask if you have questions now; it will help us plan.

** To Be Announced. Watch for detailed Field Trip announcement in your email
From the Editor

The Solutrean Connection

I notice that Dr. Bruce Bradley will be in Durango this month, talking about the possibility of a cultural connection between Ice Age Spain and Southern France and post-Ice Age America. He argues that the Solutrean point (22,000 to 17,000 years ago) is technologically related to the Clovis point (ca 13,000 years ago), and that therefore some early Europeans must have crossed the Atlantic, bringing their material culture with them. This idea was first seriously floated about 15 years ago by Bradley and Dennis Stanford, both highly qualified and influential archaeologists.

I have not kept up with the argument over the years, but am skeptical. They proposed that as the sea ice reached down toward southern France, the rich sea life we associate with the Arctic moved down with it. These “Solutrean” people got used to hunting seals along the southern edge of the sea ice. Later, as the Ice Age began to wane and the ice sheet retreated north, they began making longer and longer seasonal seal hunts with small boats along the edge of the ice. One or more of these journeys resulted in a transatlantic crossing of ca 2500 km.

This idea came out at a difficult time for archaeology. The so-called Kennewick Man had been found a few years earlier, and was initially described as having Caucasian features. This upset many Native Americans, as it came across as an attack on their priority in North America. Thus began a long court battle over whether archaeologists had the right to study the remains. One can only imagine the depth of feeling among Native Americans while fighting this battle, to then have Bradley and Stanford suggest that Europeans were here on this continent first. In fact, Bradley and Stanford were only suggesting that Native Americans might perhaps themselves have ancient European roots as well as Asian, but it’s not surprising that this may have been misinterpreted.

In 2015, Eske Willerslev’s (et al.) article on the Kennewick DNA was published in Nature. The result was that Kennewick was most closely related to modern Native Americans of the U. S. Northwest. As I noted in this column last month, two recent pan-American DNA studies have looked at 64 ancient and more recent genomes from North and South America. Nobody has reported any European component.

It’s important to understand that material culture is simply the remains of human manufacturing, use, and discard. We don’t know that all the people who used Clovis technology shared other elements of culture, like language and social organization. In fact, it seems likely that many different societies throughout North America used Clovis technology. Thus, a child associated with Clovis tools who lived in what is now Montana, would be only distantly related to a group using Clovis technology in present-day New England. However, they are all genetically Native American.

You may notice a theme that I’ve touched on before. There is a long-running debate among archaeologists about whether technology spreads only through contact between peoples, or by independent invention. According to the latter point of view, any techniques that are invented by one group could be re-invented at another time and place by another group. It is certainly true that the flaking technique is remarkably similar between the Solutrean and Clovis points, but that doesn’t mean the knowledge and skills were passed from person to person. I find it more probable that independent invention occurred than that the technology was passed on uninterrupted for a period of at least 4000 years and across two continents and an ocean.

Dr. Bradley is a brilliant archaeologist and lithics analyst, and he has put a great deal of thought into this topic. He is certainly aware of the sensitive nature of the suggestion, as his talk is titled “Awkward proposal.” Yet he is convinced that it is a proposal worth defending. Even though DNA studies find no evidence of a Solutrean connection, it would be very interesting to hear what he has to say.
2019 VOLUNTEER FIELD WORK OPPORTUNITY
in Belize
With Dr. David Hyde, Western Colorado University

This is a chance to help excavate classic Mayan ruins, get a custom tour and program, and live in a beautiful eco-lodge for a week, arranged just for Colorado Archaeological Society local volunteers by David Hyde. The site is the Medicinal Trail Preserve in Belize, the subject of David’s October program in Montrose. The dates are June 8-15, 2019.

To apply or for more information please contact David directly.

David’s information on the trip includes:

- Round trip transportation from the airport to camp (a two hour drive)
- Accommodations would be at the La Milpa Ecolodge (directly next to the university field school camp, and much more comfortable)
  https://www.pb Belize.org/ecotourism/
  https://www. facebook.com/Programmeforbe lize/
- Meals would be at our camp, the REW Adams Research Facilities
- I will give a tour of the Medicinal Trail Community
- 4-5 days of excavation at Medicinal Trail
- I will take you to visit to the site of Lamanai and give a tour
  https://en.wikipedia.org/wiki/Lamanai
- I will provide a lecture for the group while in Belize

There would have to be a minimum of 6 volunteers and a maximum of 10. The cost for this week in Belize would be $1200 per person (does not include airfare).

If you have any questions please let me know – I hope to be able to host a group of you this summer, it is an amazing experience.

Sincerely,

David

David M. Hyde
Lecturer in Anthropology, MGES Instructor, Western Colorado University

970.943.2222
www.western.edu
dhyde@western.edu
Membership Application

Date: __________________________
Name: ____________________________________________________________
Street or RR Address: ________________________________________________
City: ______________________ State: _______ Zip: _______
Telephone: ___________________________________________________________________
Email: ___________________________________________________________________
(email required to receive Chipeta & CAS newsletters & field trip info)

Check One:  
___ New  
___ Renewal  

Annual Dues* (includes state CAS dues): Check one  
___ Family (2 or more members same household) .................. $40  
___ Individual .......................................................................................... $35  
___ Student (Circle if Individual or Family) ................................ $25  
___ Senior/Disabled** (Circle if Individual or Family) ................ $25  

* Southwest Lore is the journal of the Colorado Archaeological Society: print copies are mailed quarterly to all members except seniors, who receive electronic (PDF) copies.

** Senior is any person who is at least 65 years of age; Disabled is any person who is permanently disabled.

Code of Ethics

As a member of the Colorado Archaeological Society, I pledge to:

- Uphold local, state, and federal antiquities laws.
- Respect the property rights of landowners.
- Report vandalism to appropriate authorities.
- Support only scientifically and legally conducted archaeological activities.
- Conduct field and/or laboratory activities using professionally accepted standards.
- Not condone the sale, exchange, or purchase of artifacts obtained from illegal activities.
- Be sensitive to the cultural histories and spiritual practices of groups that are the subject of archaeological investigation.
- Accept the responsibility, if serving as principal investigator, to publish the results and make the collection available for further study.

Signature: ___________________________________________________________________  
Other Family Signature: ___________________________________________________________________

Make checks payable to "Colorado Archaeological Society" and mail the signed application to:

Teri Hauser  
11041 5800 Road  
Montrose, Colorado 81403
CHIPETA CHAPTER BOARD MEMBERS

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- **Vice Pres**: Leigh Ann Hunt, lahunt970@gmail.com
- **Secretary**: Annette Butts, annettebutts63@gmail.com
- **Treasurer**: Jim Douras, mtncpa@gmail.com
- **CAS Rep**: Nick Ard, nrard@bresnan.net

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- **Membership**: Teri Hauser, teribhCCR@gmail.com
- **BLM Liaison**: Bill Harris, trlgpa48@gmail.com
- **Library**: Linda Manske, cc-manske2@bresnan.net

OTHER COMMITTEES AND POSTS

- **Scholarship**: Jon Horn / Bill Harris/ Bill Manske, trlgpa48@gmail.com

CHIPETA CHAPTER WEBSITE

- [https://www.chipetachaptercas.org](https://www.chipetachaptercas.org)

TO JOIN OR RENEW:

- Go to the Chipeta Chapter website and follow the membership links, or mail in the application form above.

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Program for Avocational Archaeological Certification (PAAC)

There are no PAAC Classes scheduled this winter for this area of the state.

**PAAC Contacts**

Rebecca Simon  
rebecca.simon@state.co.us  
Assistant State Archaeologist/PAAC Coordinator  
303-866-4671

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Want More?

[Archaeology Southwest](https://archaeologysouthwest.com) is a great link to find out about current issues and events relating to Southwest Archaeology.

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**Upcoming Chipeta Speakers**

March, Dan Simplicio, Zuni archaeologist  
April, John Seebach, CMU professor  
May, Larry Loendorf, rock art archaeologist

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Field Trip Committee

Leigh Ann Hunt, Joe Oglesby, and George Decker

For more information on upcoming field trips and to sign up, please contact the Field Trip Leader

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Masthead photo courtesy of Carol Patterson. All other unattributed photos are by the editor.