



Sacramento Archeological Society, Inc. *Newsletter*

www.sacarcheology.org

May/June - 2010

"Use of 3D Laser Scanning for Archeological Sites and Artifacts"

by

Kevin Akin

Senior Land Surveyor
California Department of Transportation

Saturday, June 11, 2010

7:00 p.m.

at

Dennis Fenwick and Martha Lewis' Home
2825 Butler Court, West Sacramento, CA 95691
916-373-1465

On June 11th Kevin Akin will discuss his scanning of the Rock Shelter archeological site in Santa Barbara for Cal Trans, how the results (for example an arrow point) can be and have been printed to a 3D printer, and answer questions regarding the potential use of laser scanning for other archeological purposes, such as its use for underwater sites. Kevin Akin is a Land Surveyor working for the California Department of Transportation. His current duties involve the investigation of new surveying technology.

Creating a representation of any object has been based on the ability to measure. For thousands of years measurements have been made using angles and distances. In Egypt, after the Nile floods, property boundaries were re-established using special ropes to measure distances. (See following picture from Egypt).



The Greeks and Romans also used these same principles to layout property boundaries, build roads and structures, and to describe the world around them. One of the earliest attempts to measure the

circumference of the Earth based on measurements was in 240 BC by a Greek mathematician-Eratosthenes.

The invention of Cartesian coordinates later allowed measurements to be used to create maps at a constant scale. The three dimensional world was represented on a two dimensional surface. Two dimensional maps have also been the main tool for thousands of years to describe objects. The invention of photography brought another way to capture objects but photos are not maps. Multiple images and additional measurements are needed to remove scale distortions from photographs.

The electronic revolution of the past decades has changed the way measurements are made. Lasers now measure distances to objects, angles are recorded, and data saved in a computer. A new type of measurement tool has been created which measures many thousands of times a second. One name for this technology is 3D laser scanning. Objects large and small can now be described in great detail and in three dimensions. The three dimensional data of an object can also be used to create a solid model. Three dimensional printers have been invented and are used to reproduce objects in a solid form.

Computer tools now allow the world around us to be recorded in three dimensions and two dimensional representations will be used less. The potential use of new technology in Archaeology is endless. This presentation will show some uses of this technology to document an archaeological site in Santa Barbara County and historical preservation on the San Francisco Presidio. Mark your calendar for this interesting talk.

“Tour of pre-Clovis Paisley Oregon Caves and Modoc County sites”

Thursday, June 24, 2010 - Monday, June 28, 2010
Cave Tour - Friday, June 25@ 1:00 p.m.

So far, 27 have signed up for the special tour of pre-Clovis Paisley Oregon caves. There is still room but please contact Dennis Fenwick at fenwick_lewis@msn.com to make your reservation.

Archeologist, Dennis Jenkins who has been leading excavations of Paisley cave for four years, will be leading the tour coincident with his fifth and last excavation of the site from June 22 and ending on July 30. Finds include human dried excrement that, from DNA testing, reveals the oldest evidence of humans in North America dating to 14,300 years ago. This is 1200 years before the Clovis culture. The cave tour (or tours if there are more than 20) is **scheduled for Friday, June 25, 2010, at 1:00 p.m.** June 24th and 28th are targeted travel days.

In addition to the cave visit, one or more of the following sites in Modoc County area near Alturas will be visited on Saturday and Sunday:

- **Obsidian** collecting sites northeast of Davis Creek, near Eagleville, California.
- **Petroglyphs** northeast of Lava Beds National Monument, with its lava caverns. See information on the area below.
- Tule Lake **Relocation Center** (detention camp) near Lava Beds in California.
- **Petrified wood** sites near Cedarville, California.

Accommodations in the area include:

- **Geyser and hot springs filled swimming pool** at Hunter's Hot Springs Resort, 18088 Highway 395 North, Lakeview, Oregon 97630, 800-858-8266, 541-947-4242
<http://www.huntersresort.com/> This motel is near the Paisley Caves.
- Surprise Valley **Hot Springs** Resort, Cedarville, CA 530-279-2040 877-927-6426
<http://www.svhotsprings.com/main.html>
- Camping at **Goose Lake Recreation Area**, south of Lakeview on 395, **Cider Hill** and **Dog Lake Camp grounds** west of Lakeview off of 140 in Oregon

For additional information on the Paisley Caves, see the article entitled, "Researchers, led by UO archaeologist, find pre-Clovis human DNA – Discoveries by Dennis Jenkins from Oregon's Paisley Caves validate claims made years ago by UO anthropologist Luther Cressman"

<http://pmr.uoregon.edu/science-and-innovation/uo-research-news/research-news-2008/april/researchers-led-by-uo-archaeologist-find-pre-clovis-human-dna/> and "On the road to Paisley, Oregon, to see the caves of the human coprolites" <http://pmr.uoregon.edu/science-and-innovation/science-blogs-archive/science-blogs-2008/on-the-road-to-paisley-to-see-the-caves-of-the-coprolites/?searchterm=paisley+cave>. Excerpts from the later article follow.

***This activity is limited to two groups of 20 participants so please sign up early!
Individual donation of \$5 suggested to support 2010 SAS scholarship award.***

Donations may be in person or sent to
Sacramento Archeological Society, P.O. Box 163287, Sacramento, CA 95816

OPEN to SAS and Fossils For Fun Members

Lava Beds Petroglyphs

http://www.nps.gov/archive/labe/content/HISTORY_Rock.htm



A panel of rock art hundreds of feet long along the cliff at Petroglyph Point.

There are two basic types of rock art found in Lava Beds National Monument: pictographs and petroglyphs. Pictographs are figures which are painted on rock surfaces. Petroglyphs, in contrast, are figures carved or pecked into the surfaces. Although both types of rock art are present in the monument, there is a difference in their geographic locations. Petroglyphs are, with very few exceptions, found on cliff faces or boulders along the ancient shorelines of Tule Lake. Most pictographs, however, are located in areas inland from the lake, most often at the entrances to large lava tubes where sunlight illuminates large portions of the cave's interior.

We have no solid evidence suggesting the age of the rock art in Lava Beds National Monument, however, researchers (Heizer and Clewlow 1973) have offered some tentative dates which appear to be reasonable. They believe that the pictographs in the area date from about 500 A.D. to 1600 A.D. at the latest (from approximately 380 to 1480 years ago). This latest date is based on the fact that common design elements of the local Native American culture in the historic period are not found (the horse and other objects introduced by white settlers) in rock art of the Lava Beds. It has also been noted that inquiries made to surviving Native Americans in the early part of the century produced no information on the rock art or its creators, hence this knowledge must have passed away in the intervening centuries since its last use. Heizer and Clewlow also concluded that the pictographs were done at a later date than were the petroglyphs in the region.



Detail of rock art at Petroglyph Point.

Types of figures common in rock art of the Lava Beds include wavy or zigzag lines, dots, and designs made of dots, cross-hatching, the rake (including rain symbols), human figures, and the star (or cogwheel?). Other less obvious figures can also be found. Lava Beds rock art appears to have stylistic similarities with the rock art of other regions in the western United States.

Heizer and Clewlow have assigned the petroglyphs to the Great Basin Style. It seems the pictographs do not have direct similarities with any other region. They have been termed the Northeast California Painted Style, again by Heizer and Clewlow, and identified by the art motif of outlining one color with a different one in the paintings. This style is also found in portions of the Klamath Basin in southern Oregon and may have affiliations with the paintings of the Chumash in southern California.

There are several rock art sites accessible to the visitor at Lava Beds National Monument: petroglyphs can be seen on the cliff face of the Petroglyph Section of the monument, at the northeast entrance. Good examples of pictographs can be seen at Symbol Bridge and Big Painted Cave on boulders within the cave, and on either side of the cave entrances.

“On the road to Paisley, Oregon, to see the caves of the human coprolites”

<http://pmr.uoregon.edu/science-and-innovation/science-blogs-archive/science-blogs-2008/on-the-road-to-paisley-to-see-the-caves-of-the-coprolites/?searchterm=paisley+cave>

A crew from the NewsHour with Jim Lehrer (Public Broadcasting System, PBS) came to campus April 23, 2008 to get a close-up scoop on the 14,300-year-old, human DNA-containing poop -- poop (feces) being the non-jargon name for the scientific moniker coprolite. The next

day, April 24, the crew and Jenkins visited the scene of the coprolites discovery: the Paisley Caves, which rest on a westward-facing bluff in a still tectonically active region overlooking the southernmost finger of Summer Lake.



Sweeping view looking out from inside one of the Paisley Caves.

The view is spectacular and brings to mind the ancient setting where Ayla, a young Cro-Magnons woman lived after being ousted by the

Neanderthals who had raised her -- and where she first meets one of her own kind, Jondular -- in Jean M. Auel's 1986 novel *Clan of the Cave Bear*. Really, that's just a passing thought.

The caves are mostly rock shelters located on land that is under the auspices of the [Lakeview District](#) of the U.S. Department of Interior's Bureau of Land Management. Specifically, the caves are in the Five Mile Butte area of the Summer Lake Basin. The BLM provided some of the funding support for Jenkins' earlier work, and future work will depend on BLM generosity.

Past Events

"Archaeology Movie Night"

Dennis and Marty Fenwick hosted a potluck and movie night on Friday, March 26, 2010. Three video were presented:

"Poverty Point Earthworks" in Louisiana dating to 1750 BC

are the oldest of their size in the Western Hemisphere. Next to the Western bank of the Mississippi River from **1750 BC to 1350 BC**, the residents constructed semicircle mounds on which they built houses, a tall large mound that appears to be an eagle, and smaller mounds. They also started using clay pottery for the first time in the area making pottery balls to cook.

Bird Mound – Mound A, shaped as a bird was 90' to 100' high with a wingspan of 640'. It is estimated that 10 million 50 pound basket loads of dirt were moved to create the mound. (22 minute VCR, 1999.)

"Dominican Republic Underwater Viewing"

John Foster shared a video of underwater archeology in the Dominican Republic. The video which captured life transmission of underwater excavation to officials of the Dominican Republic was staged to illustrate the importance of the effort.

"Cahokia Mounds" in Illinois, East of St. Louis

were occupied from about **700 AD to 1400 AD** and are the **largest earthworks in Ancient America**. At its peak from 1050 A.D to 1200 the city covered nearly six square miles and 10,000 to 20,000 people lived here. **Cahokia was larger** than London, Paris, or most European cities of its time.

Over 120 mounds were built in the area over time. Three major mound types were constructed: **rectangular platform flat top** mounds for ceremonies and residents, **ridge top** mounds (charnel houses) and **conical** mounds for burials and markers for significant locations. They constructed a Monks

Mound which is the largest in Ancient America with a platform mount that has 14 acres on top, four terraces, and is 100' tall. **Woodhenge** with a series of poles is possibly a giant solar calendar.

The culture grew as a result of the arrival of **corn** from Mexico as they **adapted corn to the colder climate** of Illinois. (1 hour VCR, 2002.)

“Marsh Creek – Ancient Stratigraphy at a Windmill site”

On Saturday, April 10, 2010 State Park Senior Archaeologist, Rick Fitzgerald, an expert in prehistoric archaeology and part of the NSF-funded team that has been studying the area led a group of 18 SAS members on a tour of the Marsh Creek Windmill site in Contra Costa County near Brentwood. This site along a major creek that flowed into the delta in earlier times, which is on State Park land not yet open to the public, contains stratified series of archaeological deposits dating **7000 to 3000 years old**. The site profile is visible from down-cutting by the creek. A short hike up a creek bed offered a splendid viewing of items in the bank of the creek that were associated with an ancient village.

The archaeological resources on Marsh Creek at and around the old John Marsh Home are some of the most unique and important within the California State Park system. Research has indicated that the first inhabitants occupied the area by at least 7000 years ago. These people and culture are virtually unknown yet they resided on the property for about 15 centuries. It is unclear what happened to these people. They either left on their own or were forced to move away by a changing environment. Either way the Marsh lands were abandoned by about 5300 years ago.

By around 4000 years ago the Windmill culture makes its first appearance at Marsh Creek. The Windmill people represent one of the most sophisticated and advanced prehistoric cultures of aboriginal California. They were accomplished artisans who made finely rendered ornamental and ceremonial artifacts out of alabaster, marble, diorite, steatite, shell and slate. They lived on acorns, fish and hunting game.

The Marsh property was their home for about a thousand years (4000-3000 years before present), in what appears to be a large community, currently the largest known. They lived in the Sacramento and San Joaquin Valleys with their heartland being the Delta Region. Windmill culture may have also occupied portions of the Sierra foothills to the east and apparently were a powerful influence on the Berkeley cultures to the west based on the presence of their stylized artifacts found through the Bay Area. The Windmill occupation eventually gave way to what is called the Meganos people who carried on the Windmill culture until about 1000 years ago. Evidence of these people also exists at the Marsh property.

For pictures from the event check out www.sacarcheology.org .

Archaeology News
Finding the “Silver Clump”
John Foster

I've done a lot of excavations over my many years as an archaeologist, but this one was different. We were working underwater in the Dominican Republic. I was using a dredge that vacuumed a growing sand hole in the shallow cove. The water was crystal clear and excitement was in the air. Local experts said this was the location of a 1725 shipwreck, and although nothing was visible on the sandy bottom, the evidence was buried about 1 meter deep. We used a portable magnetometer and underwater metal detectors to locate targets buried in the sand. Then the dredge was employed.

Our search was for the *Begoña*, a Spanish frigate enroute from Venezuela to Puerto Rico when she ran into a big storm. The captain diverted to Santo Domingo, but the vessel was sinking, low in the water and could not make it into the Ozama River across the sand bar. Finally, the captain chose to wreck the ship where the passengers could be saved at the little beach now known as "La Caleta," the only place you could possibly get to shore safely in a raging storm. (Similar story as the *Pomona* at Ft. Ross.)

So when I took over the dredge, there was a feature being exposed with cannon balls and other iron objects. After about 5 minutes, I began to see the clump. I did recognize that it wasn't round like the other objects we had exposed. It was clearly a pile of coins. The clump was round with many coins concreted together.



(M) Cannonball feature excavated in the sand

(R) Harley McDonald operates the dredge

Now the *Begoña* was owned by the governor of the Canary Islands and supposedly was laden with contraband coins and treasure. So the shape of the clump may be important. It looks like it was coins in a canvas bag or perhaps the false bottom of a small barrel. It weighs about 15 pounds. A few of the coins have now been conserved. They are silver Reales in various denominations. Some have marks identifying the Mexico City mint. Others may be from the Potosi mint. One is dated 1697 from preliminary observations.



Best thing about it is: this is in a DR national park and will be preserved!! Sadly, there was no "finder's fee," but the DR government is very happy about the discovery and our recommendation to preserve the site within La Caleta National Park.

SCHOLARSHIPS

Stay tuned for the next issue of the newsletter to find out the recipients of the 2010 scholarship award.

Sacramento Archaeological Society, Inc.

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Mark Your Calendars

May 1, 2010 Scholarship applications due

May 6-8, 2010 - 9th Annual ISHI Gathering and Seminar, contact Lucy Sperlin, 530-533-9418 for details

May 16, 2010 State Indian Museum docent meeting, 2:00 to 4:00 at museum

May 23-30, 2010, Yampa River Tour, tactours@nm.net

May 31 – June 4, 2010 - Annual Flintknapping Workshop with Tim Dillard at Center for American Archeology.

<http://www.caa-archeology.org/forms/>

June 5, 2010 Honored Elders Day, State Indian Museum

June 11, 2010, 7:00 – 9:00 p.m. “Use of 3D Laser Scanning for Archeological Sites and Artifacts”, Kevin Akin

June 24-28, 2010, Tour of pre-Clovis Paisley Oregon Caves and more

July 9-23, 2010 – Peru Tour, tactours@nm.net

Note: SAS sponsored events are highlighted in blue.



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