Celebrate Cedar Mesa Archaeology

The Cedar Mesa Archaeological Project is 43 Years Old This Month!

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(slightly revised June 21)
This presentation emphasizes the Cedar Mesa research I’ve been personally involved with since 1967—lumped together under the label “Cedar Mesa Project”

There has been and continues to be important research in the greater Cedar Mesa area by other individuals and groups, especially Winston Hurst, Jon Till, Cathy Cameron, Bill Davis—and others
My initial interest was in learning more about the Basketmaker II period—an interest sparked by experience on the Glen Canyon Archaeological Project, prior to the formation of Lake Powell.

Here is Bernheimer Alcove, a Basketmaker site in Moqui Canyon that we excavated in 1961.
Also in 1961, we excavated a shallow BM II pithouse in an open site in the Clay Hills Pass area, just west of Cedar Mesa.
Richard Wetherill and others had found abundant Basketmaker II material in dry cave sites in Grand Gulch. Were there open mesa-top sites on Cedar Mesa as well?
Cedar Mesa was a logical place to look for BM II sites, and especially for open habitation sites on the mesa.

A reconnaissance in 1967 led to a National Geographical Society grant for 1969-70 that funded an area survey, excavations in BM II and III sites, and an attempt to locate sites where Wetherill had worked during the 1890s.
The Green Mask site at the mouth of Sheiks Canyon was one of the first sites visited in 1967.

Definitely a Basketmaker presence here! This was one of Wetherill’s sites from the 1890s.
Open Basketmaker II habitation sites proved to be abundant on the mesa top.
Excavations underway. Ashy soil and sandstone slabs mark the fill of the shallow pithouse.
An excavated Basketmaker II pithouse. It was occupied for a few years sometime between AD 200 and 400.
The secret to high-angle photography on Cedar Mesa

(alternative caption: the project director rises to the occasion....)
The 1969-70 work was done as a SUNY-at-Binghamton field school, based in a camp at the head of Todie Canyon.
The whole Lipe family got into the act as well.
1971-75 saw a major expansion of the Cedar Mesa Project, focused on settlement patterns of all time periods, and relying primarily on surface survey.

R.G. Matson joined the project and developed a sampling design to enable us to characterize the archaeology of the whole mesa.

We received a NSF grant in 1972 to carry out this work. A sample of 400 x 400 m quadrats was surveyed in selected drainages.
With more funding, we could field larger crews. Here’s the 1972 group
The well-preserved cliff dwellings and rock art in the Cedar Mesa canyons get lots of attention, but most of the prehistoric occupation was on the mesa, where there is much more arable land.
Open sites on Cedar Mesa are usually pretty inconspicuous.

But these open sites make up the bulk of the sites in the region.

Right: RG Matson with a BM II Period firepit. 1971

Below: Carl Mahon with a Pueblo Period house foundation, 1971
Results of sampling surveys done in the 1970s.

Site density estimates (per sq. mi.)

Upper Grand: 83
Pine-Dripping: 38
Hardscrabble: 30
Bullet: 113
North Road: 96
Slickhorn: 16
West Johns: 59

Only about 10-20 percent of the sites are in the canyon portions of these areas.

On the mesa, site density drops off very rapidly below 5600-5800 ft. as farming conditions decline with elevation.

The small squares are 400 x 400 m survey quadrats, located at random in selected drainage units.
In addition to the sampling survey, we mapped selected cliff dwellings in detail and cored beams for tree-ring dating.

The main site in the Moon House complex (above and right). There are three sites in this complex.
We found that most of the visible structures at the Moon House complex were built in the AD 1260s.

Tree-ring sampling at The Moon House site complex, 1974
I first visited Moon House in 1971 with Carl Mahon of the BLM. A boy Scout troop from Moab had been camping in the rooms and had left quite a mess.
We also did some limited test excavations in 1972-75, including at Turkey Pen Ruin in Grand Gulch. It has a number of Pueblo Period structures dating to the AD 1100s and 1200s, but the main level also has an extensive deep midden deposit primarily dating to Basketmaker II, BC 200-AD 400.
In 1972, R.G. Matson and a small crew dug a single test pit in the dry midden at the Turkey Pen site. We isolated a 50 x 50 cm column and bagged it up one layer at a time (more later about studies of these samples).
Unfortunately, the Turkey Pen midden was massively looted in 1979. This was the first case brought to trial (in early 1980) under the newly passed Archaeological Resources Protection Act (designed to supplement the Antiquities Act of 1906)
We developed a phase sequence for the Cedar Mesa area

• Episodic occupation, responsive to drought, social and demographic trends in adjacent areas, and possibly to soil nutrient depletion

• In all phases, including the Grand Gulch, the people were heavily dependent on farming.

• All phases had about the same population size—750 to 1500 people at any one time for our Cedar Mesa study area.

• Cultural relationships were with Mesa Verde tradition communities to the east, except for the Kayenta-related Clay Hills phase
After being away from Cedar Mesa research for a number of years, Matson and I started some new work in 2008, supported by a grant to Matson from the Social Sciences and Humanities Research Council of Canada.

This work has included mapping several “great house” sites on Cedar Mesa, plus new analyses of specimens that have been in museum storage for years.

First, the story of the Basketmaker turkeys at the Turkey Pen site.
The midden samples collected from the Turkey Pen site in 1972 have proved to be a gold mine for botanical and genetic studies.
The Turkey Pen midden is loaded with dried turkey droppings, full of well-preserved DNA
Camilla Speller and Brian Kemp sampled mtDNA from SW archaeological contexts dating from 200 BC to 1500 AD.

We expected the SW birds would be examples of or closely related to the local SW Merriam’s subspecies.

Our samples from the Turkey Pen site (# 3 above) were the earliest—the only ones from BM II contexts.
Instead, 85 percent of the SW archaeological samples showed a distinctive haplotype not closely related to the Merriams. And the severely restricted variety indicates that people were controlling the breeding of these birds—one definition of domestication.
Another research question: Did “stone-boiling” maize with limestone enhance Basketmaker II nutrition?

Suggested nutritional benefits of an alkaline cooking environment for maize:

- Increases calcium content
- Releases niacin and tryptophan
- (Arguably) releases lysine
- Reduces harmful Mycotoxins

This research is being done by Emily Holstad, WSU grad student

Mycotoxin: *Penicillium*  
[Link](http://www.uoguelph.ca/~gbarron/MISCELLANEOUS/april.htm)
Initial Stone Boiling Results:
(Average pH of Distilled Water: 7-7.5)

- **500 C**
  - a) 30 minute steep = 7.65 pH
  - b) 24 hour steep = 9.32 pH

- **600 C**
  - a) 30 minute steep = 7.9 pH
  - b) 24 hour steep = 9.26 pH

- **700 C**
  - a) 30 minute steep = 11.7 pH
  - b) 24 hour steep = 12.55 pH

- **800 C**
  - a) 30 minute steep = 12.89 pH
  - b) 24 hour steep = 12.96 pH

Temperatures of 700 or 800 C are readily achieved in open fires fueled with dry juniper, indicating that stone-boiling with limestone could have enhanced maize protein availability.
In August, 2009, we mapped two sites that have “Chacoan Great house” characteristics.

One of these we call the Et Al site. It has a large mound of masonry rubble (left).
Et Al has mounded middens, a possible great kiva, and several road traces. Pottery indicates it was initially occupied in the early AD 1100s and then again in the early 1200s.

Winston Hurst found this 14\textsuperscript{th} century Hopi sherd in the road trace just north of the site.
One possibility is that the road leads to this “fortified mesita” several miles away.

Below: Jon Till, Winston Hurst and Bill Lipe at this site in 2008.
The other “Chaco-esque” site we mapped in 2009 is called the “Owen Site” after its discoverer, Owen Severance. It also has a multiple-story section, and a definite great kiva. Surface pottery indicates occupation principally in the early AD 1100s.
What was the timing of Cedar Mesa abandonment?
(Cutting and near-cutting dates, standardized so no site contributes more than 20 dates)

Red line at 1260
Stem and Leaf Plots of Tree-Ring Dates
(e.g., “125 3334” means three dates of 1253 and one of 1254)

1190s 119 011367778
1200s 120 0003344444577899999
1210s 121 0112223334444555555668
1220s 122 0122223334666777788889999
1230s 123 0000000112222222222233444455555556666788889999
1240s 124 011122223333333333334444444445555555555566666788889999
1250s 125 000000000000233347
1260s

Left: Building ceased in the Natural Bridges area in the very early 1250s

Left: On Cedar Mesa, building continued at Moon House through The 1260s

Above: The rest of Cedar Mesa was more like Natural Bridges
Conclusion

Cedar Mesa has been a fertile ground for archaeological research for over 100 years.

But new discoveries continue to be made and new scientific techniques are opening up new ways to learn more about the human and environmental history of this remarkable area.