

MAMMOTH TRUMPET



Volume 28, Number 1
January, 2013

Center for the Study of the First Americans
Texas A&M University, 4352 TAMU, College Station, TX 77843-4352

Department of Anthropology
ISSN 8755-6898

World Wide Web site <http://centerfirstamericans.org> and <http://anthropology.tamu.edu>

The Big-Game Hunting Conundrum

WHAT IF EVERYTHING you think you know about Paleoindians is wrong?

University of Michigan archaeologists John Speth, Kori Newlander, Andrew White, Ashley Lemke, and Lars Anderson think it's time to take a step back from the conventional view of Paleoindians, built up over the decades since the discovery of the Folsom and Clovis sites, and re-examine the basic assumptions it's based on. In a paper slated to appear in a forthcoming volume of the journal *Quaternary International*, they make a "deliberate attempt to rock the boat, to question something that seems so compelling and well established that there is no need to examine it."

The conventional view of Paleoindians in North America is one of small bands of highly mobile big-game hunters traveling across vast expanses of tundra, prairie, and forest in search of mammoths, mastodons, and bison. The hall-

marks of these societies are the elegant stone spear points typically made from the highest-quality flints available within the compass of their seasonal rounds.

Speth and colleagues call into question virtually every aspect of this traditional model. According to their reading of the data, Paleoindian families likely weren't all that mobile and the magnificent spear



John Speth "rockhounding" at the Ace of Diamonds mine near Herkimer in upstate New York.

INSIDE

4 **The event of the decade!**

Take a peek at what's in store for you at the 2013 *Paleoamerican Odyssey Conference* in Santa Fe.

9 **Laying to rest the 80-year-old mystery of a stone artifact and a mammoth skeleton**

The Angus mammoth and its controversial artifact is a scientific dispute finally resolved by Steve and Kathleen Holen. They find curated materials rich in discoveries overlooked by archaeologists.

12 **Ohio hunters made a meal of a giant ground sloth—200 years before Clovis**

Cutmarks found on supposed mastodon bones by an alert curator further swell a mass of pre-Clovis evidence.

17 **Feasting on Yesterday's camel at Wally's Beach**

We knew that camelids were the preferred prey of South American Paleoamericans. Now that Alberta scientists Kooyman and Hills have found the Clovis-age butchered remains of a camel, they're on the lookout for other instances in North America.

points, such as Clovis and Folsom, actually weren't necessary to bring down mammoths or bison. Instead of being

specialized megafauna-killing weaponry, they are better understood as symbols with social, religious, or political significance. This would explain why it was so important to make them from exotic and usually visually attractive types of flint.

Key elements of the big-game hunting model

Building upon the discoveries of Clovis and Folsom points in direct association with the bones of big-game animals, archaeologists have extrapolated from the demonstrable fact that Paleoindians hunted big game in several documented instances to the conclusion that Paleoindians were big-game hunting specialists. From this premise, it follows that Paleoindians, to be successful, needed to be

sumption that Paleoindians acquired this flint in the course of their normal annual travels and not through trade or special trips made by small groups tasked with the job. It even has been suggested that movements of Paleoindian bands were tethered to these flint quarries. Why were they so dependent upon these particular sources of flint?

This brings us to what Speth and his coauthors refer to as “one of Paleoindian

archaeology’s most cherished, yet seldom seriously questioned, assumptions,” which forms the “bedrock” of the entire chain of reasoning. Supposedly, Paleoindians needed flint of the highest quality to make spear points effective enough to reliably bring down the biggest game.

Getting flint

How did Paleoindians get their flint? Does the distance from kills and camp-



MARIA MALINA

Lars Anderson excavating at the Hohle Fels Upper Paleolithic site in Germany.

highly mobile over an enormous range in order to keep up with their preferred prey.

Paleoindian spear points were crafted preferentially from the highest-quality flint in a region. The distance between camp and kill sites, where spear points made from exotic flint types were found, to the sources of those exotic flint types has been used as a measure of the extent of Paleoindian residential mobility.

Underlying this inference is the as-



The Mammoth Trumpet (ISSN 8755-6898) is published quarterly by the **Center for the Study of the First Americans**, Department of Anthropology, Texas A&M University, College Station, TX 77843-4352. Phone (979) 845-4046; fax (979) 845-4070; e-mail csfa@tamu.edu. Periodical postage paid at College Station, TX 77843-4352 and at additional mailing offices.

POSTMASTER: Send address changes to:

Mammoth Trumpet

Department of Anthropology, Texas A&M University
4352 TAMU
College Station, TX 77843-4352

Copyright ©2013 **Center for the Study of the First Americans**. Permission is hereby given to any non-profit or educational organization or institution to reproduce without cost any materials from the **Mammoth Trumpet** so long as they are then distributed at no more than actual cost. The **Center** further requests that notification of reproduction of materials under these conditions be sent to the **Center**. Address correspondence to the editor of **Mammoth Trumpet**, 2122 Scout Road, Lenoir, NC 28645.

Michael R. Waters Director and General Editor
e-mail: mwaters@tamu.edu

Ted Goebel Associate Director and Editor, **Current Research in the Pleistocene**
e-mail: goebel@tamu.edu

James M. Chandler Editor, **Mammoth Trumpet**
e-mail: wordsmiths@touchnc.net

Laurie Lind Office Manager
C & C Wordsmiths Layout and Design
Tops Printing, Inc. Printing and mailing
Web site: www.topsprinting.com

World Wide Web site <http://centerfirstamericans.com>

The **Center for the Study of the First Americans** is a non-profit organization. Subscription to the **Mammoth Trumpet** is by membership in the **Center**.

Mammoth Trumpet, Statement of Our Policy

Many years may pass between the time an important discovery is made and the acceptance of research results by the scientific community. To facilitate communication among all parties interested in staying abreast of breaking news in First Americans studies, the **Mammoth Trumpet**, a science news magazine, provides a forum for reporting and discussing new and potentially controversial information important to understanding the peopling of the Americas. We encourage submission of articles to the Managing Editor and letters to the Editor. Views published in the **Mammoth Trumpet** are the views of contributors, and do not reflect the views of the editor or **Center** personnel.

—Michael R. Waters, Director

sites to the stone quarries tell us anything about the size of Paleoindian territories?

The predominant view of archaeologists is that entire bands, or at least residential groups, of Paleoindians traveled together to their favorite flint quarries in order to gear-up for the months of following herds of big-game animals. But Speth and colleagues ask, Why couldn't these exotic flints have been acquired through trade or through the extraordinary efforts of individuals or small groups who traveled to the sources, gathered the material, and brought it back to their families?

The late Lewis Binford argued in an influential paper published more than 30 years ago that people acquired the raw materials they needed for making tools in the course of their normal hunting and gathering activities. In other words, people normally didn't go too far out of their way to get flint. Instead, they scheduled their movements and activities so they could collect what they needed along the way to their next hunting or gathering destination. He wrote that the "procurement of raw materials is embedded in basic subsistence schedules."

Speth and his coauthors assert that this interesting idea has become "Paleoindian gospel" without being thoroughly tested. They consider numerous ethnographic examples of just the opposite and conclude that it just isn't true in all cases. "The moment you add a social, political, religious, or other symbolic dimension to the raw material in question, or to its source, or to the item made from that material, or to the context in which that material or item is used," then the argument that people would make no special effort to obtain that material goes out the window.

Australian aborigines, for example, are known to have sent groups of young men on journeys of over 300 miles to quarry large quantities of red ocher, which has a purely symbolic importance. These trips are not part of the normal hunting and gathering routine.

Speth and his team argue that, too often, archaeologists only look for practical or utilitarian explanations for the actions of hunters and gatherers. They quote British archaeologist Richard Bradley, who quipped that most archaeologists seem to think that "successful farmers have social relations with one another, while hunter-gatherers have ecological relations with hazelnuts."

In fact, however, the lives of hunting and gathering peoples are replete with rich symbolism, even if it can be hard to see in the meager traces of those lives recovered by archaeologists. Speth and his team suggest that



◀ Ashley Lemke holding a mammoth vertebra at the Riley mammoth site in Michigan.



▲ Andrew White at the Kosko site (12-Ko-492), Kosciusko County, Indiana.



◀ Khorri Newlander (and his dog, Oliver) preparing for a University of Michigan football game.

"many of the gorgeous, delicate, difficult-to-make, and extremely fragile points for which the Paleoindian period is so justly famous" are not simply utilitarian spear points, but are highly charged symbolic icons—particularly when crafted from exotic raw materials. The several deposits, or caches, of extra-large fluted points also indicate that these artifacts served more than a simply utilitarian function (MT 17-1, "Lithic Caches: The Puzzling Legacy from Early Knappers").

It's also instructive to consider that the amount, by weight, of flint at Paleoindian sites is not all that great. The Fisher site, a large and well-reported Paleoindian encampment in southern Ontario, for example, included over 32,000 flint artifacts. The entire assemblage weighed only 65 pounds, and only a relatively small percentage of this total represented exotic flint.

As a comparison, Speth and coauthors note that the Australian aborigines who traveled up to 300 miles to quarry red ocher each carried back home as much as 70 pounds of the

continued on page 7

PAUL DUFFY, UNIVERSITY OF TORONTO

JESSICA PHILLIPPY

ROBERT MCCULLOUGH

EVERY DECADE or so the Center for the Study of the First Americans has convened a major conference on new thoughts and developments that bear upon the peopling of the Americas. The first was the 1989 *World Summit Conference*, called by Rob Bonnicksen in Orono, Maine. Then in 1999, Rob, in alliance with other organizations, organized the famous *Clovis and Beyond Conference*, a two-day convocation of scientists held in Santa Fe, New Mexico.

Now, 14 years later, Santa Fe is again in the spotlight for the three-day *Paleoamerican Odyssey Conference*, October 17–19, 2013, to be presented jointly by the Center for the Study of the First Americans and the Southeastern Paleoindian Survey (DSO) in cooperation with the Paleoindian and Paleoecology Program at the Smithsonian Institution.

These conferences summarize, invigorate, and revolutionize the study of the first Americans. Since 1999 we have enormously increased our store of knowledge. Now it's time to bring everyone up-to-date and to set a new direction for Paleoamerican archaeology! You are invited to be part of this historic event and the legacy it will create! This is your once-in-a-decade opportunity to hear the latest ideas, mingle with the archaeologists, join in and express your opinions, and see the artifacts you read about in *Mammoth Trumpet*.

Successes in the Past

The 1989 World Summit Conference

Rob Bonnicksen organized this ground-breaking conference, which comprised three days of talks followed by a banquet. In attendance were about 500 folks—archaeologists, avocationalists, and the public. I was there, a young assistant professor from Texas A&M University. It was a grand time with over 35 notable speakers. The lecture topics ranged from radiocarbon dating and Pleistocene peoples of China, Japan, Korea, and Russia, to the Old Crow basin, discussion of the Pacific Coastal route, Meadowcroft Rockshelter, Clovis, and sites in Mexico and South America.

It was the first time I heard Tom Dillehay speak about the Monte Verde site in Chile. His presentation stunned the audience. As David Meltzer notes in his book *First Peoples in a New World*: “Monte Verde first leapt into archaeological consciousness one afternoon in the spring of 1989 when a couple hundred archaeologists assembled at the University of Maine for several days of wran-

gling over the origin and antiquity of the first Americans. It was a tough crowd. . . . Ten minutes into Dillehay's talk on Monte Verde, the fellow sitting next to me (then, a hard-nosed skeptic—now, ironically, the purveyor of his own pre-Clovis site) whistled softly in astonishment and then said, to no one in particular, ‘What planet is this stuff from?’ I was wondering that myself.”

Paleoamerican Odyssey



The Sweeney Conference Center will host all functions—registration, presentations, and artifact displays.

SANTA FE COMMUNITY CONVENTION CENTER

A special conference about the first Americans

It was a stunning moment. I recall the talk vividly because we were seeing the unbelievable—convincing evidence of pre-Clovis occupation in the Americas and all the way to the southern tip of South America! The talk went overtime, but no one noticed because we were all spellbound. This was a pivotal event that shaped the future direction of Paleoamerican archaeology!



Artifact displays of past conferences, fascinating though they were, will be humbled by the enormous collection that will be shown at the Paleoamerican Odyssey Conference.

DON ALAN HALL

The 1999 Clovis and Beyond Conference

This second conference, organized by Rob Bonnicksen with the help of many colleagues, was convened in a more spacious venue, the Sweeney Convention Center in Santa Fe. A large forum was needed to accommodate the crowd of 1,400 attendees—archaeologists, avocationalists, and the interested public. In addition to choosing from presentations by more than 30 leading scholars, the audience was free to inspect and admire a display of some of the greatest Paleoindian collections—the Fenn Cache,

the Anzick Cache, artifacts from such important sites as Lange-Ferguson, Colby, and Dent. All these artifacts seen for the first time in one place made it an unforgettable experience.

The *Clovis and Beyond Conference* witnessed more evidence for the pre-Clovis occupation of the Americas, and there were fireworks as Monte Verde was brought center stage. A standing ovation for Tom Dillehay marked a notable moment in Paleoamerican archaeology. It was also at this event that Dennis Stanford and Bruce Bradley first presented their Solutrean hypothesis, which proposes that the founders of the Clovis culture came from "Iberia and not Siberia."

The Paleoamerican Odyssey Conference

Now, 14 years later, the Center for the Study of the First Americans and the Southeast Paleoamerican Survey (DSO) are teaming up to bring you the *Paleoamerican Odyssey Conference* in partnership with the Smithsonian Institution. We confidently promise you a conference as grand and unforgettable as the 1999 *Clovis and Beyond Conference*. Three days of presentations by the leading scholars in the field, scores of famous artifact collections from the most important sites, hundreds of poster presentations, a banquet, and more will be yours to enjoy in Santa Fe October 17–19, 2013.

Let's talk about what you'll see and hear!

Lectures

Leading archaeologists, geoarchaeologists, and earth scientists from Russia, Japan, Canada, Denmark, England, Mexico, Argentina, Brazil, Australia, France, and the United States will deliver 37 special 30-minute presentations on these topics:

The Yana RHS site, Russia ■ the Japanese Upper Paleolithic ■ Late Pleistocene settlement of Siberia ■ the earliest sites in Alaska ■ the biface traditions of Alaska ■ migration along the Pacific coast ■ submerged sites along the Pacific coast ■ submerged sites in the mid-Atlantic Region ■ the Solutrean hypothesis ■ the Ice-Free Corridor and Canadian fluted points ■ modern Native American genetic signatures ■ ancient DNA signatures of the earliest humans ■ how the interior of the North American continent was colonized ■ Clovis chronology ■ Clovis technology ■ Clovis subsistence ■ Clovis caches ■ Younger Dryas Boundary cosmic-impact hypothesis ■ Pleistocene extinctions ■ the Western Stemmed Tradition ■ the human skeletal record of

the first Americans ■ the human remains of the first Americans from submerged caves in the Yucatan ■ the early record of human occupation of Argentina and Chile ■ first Americans in Peru ■ the colonization of Brazil ■ the human skeletal record from South America ■ the pre-Clovis Schaefer and Hebior mammoth sites in Wisconsin ■ the pre-Clovis human coprolites and artifacts from Paisley Caves, Oregon ■ the pre-Clovis Manis mastodon site, Washington ■ the pre-Clovis Debra L. Friedkin site, Texas ■ the pre-Clovis sites of Cactus Hill, Virginia, Meadowcroft Rockshelter, Pennsylvania, and Monte Verde, Chile ■ the Topper pre-Clovis site, South Carolina ■ La Sena and Lovewell pre-Clovis sites in the Great Plains ■ Pre-Clovis sites in Brazil ■ Pre-Clovis stone tools ■ New models of colonization of the Americas ■ Geochronology, stratigraphy, and taphonomy ■ Geoarchaeology.

We can't think of a single topic of interest to investigators of Paleoindian cultures that won't be discussed by our speakers. And all this happens at one event!

For a list of speakers and a description of the scheduled presentations visit our website www.paleoamericanodyssey.com

Exhibits

If I can give you one piece of advice, don't miss the exhibits. People still talk about the artifact collections on display at *Clovis and Beyond* in 1999. Well, the artifact display at *Paleoamerican Odyssey* will be far more impressive—in fact, it will be the largest ever assembled under one roof.

You'll be dazzled by Clovis artifacts from such key sites as Gault, Blackwater Draw, Jake Bluff, Shawnee Minisink, Mockingbird Gap, and Topper. What's more, you'll be able to admire the Fenn, Crook County, DeGraffenried, Anzick, and Hogeys caches. Unbelievable!

If that weren't enough to take in, we'll also have on display artifact collections from such important Alaskan sites as Serpentine Hot Springs, Raven Bluff, Mesa, Owl Ridge, and Dry Creek. It's your opportunity to see collections of Alaskan fluted points and Nenana and Denali artifacts for the first time.

Hang on, there's still more! For the first time we'll have a magnifi-

cent display of pre-Clovis artifacts from the Friedkin, Manis, Schaefer, Hebior, Mud Lake, Coats-Hines, Miles Point, Paisley Caves, and La Sena sites. You'll also be treated to seeing up close the *Cinmar* biface dredged up from the Atlantic Ocean, a key piece of



A poster informs all visitors to the conference of your project. See website www.paleoamericanodyssey.com for information on how to submit your poster.

DON ALAN HALL

evidence supporting the Solutrean hypothesis! Rounding out the displays will be Great Basin artifacts from the Bonneville Estates Rockshelter and Sentinel Gap, and microblades and other artifacts from Upper Paleolithic sites in Japan.

This is your chance of a lifetime to see all these famous artifacts assembled in one place—at the ***Paleoamerican Odyssey Conference!*** You won't be able to see them anywhere else except in pictures.

Poster Presentations

Scientists, students, and avocationalists will present evidence from their sites and investigations. Posters describing sites, surveys, artifacts, paleoclimate, geochronology, geochronology, paleontology, and more will cover the entire geographic scope of the Americas—from Alaska to the southern tip of South America. There's a lot for you to learn, and presenters will be standing by their posters ready to answer your questions.

If you wish to participate and present a poster, visit our website **www.paleoamericanodyssey.com** The deadline for submitting a title and abstract for a poster presentation is April 1, 2013.

Banquet

While you enjoy great company and a fine meal at the historic La Fonda Hotel, you'll be treated to a stimulating lecture by Peter Hiscock on the peopling of Australia. Just as in North America, the timing of the arrival of humans at the end of the last Ice Age and their role in the extinction of megafauna, such as the giant kangaroo (the "whopper hopper," 10 feet tall and 500 pounds), are contentious topics "Down Under." This is a story with uncanny parallels to the peopling of the Americas and the role of humans in American megafaunal extinctions. To learn more about Peter Hiscock and his presentation, visit our website **www.paleoamericanodyssey.com**

Schedule of Events

October 16

Registration will be open all afternoon, and that evening there will be a free beer and wine kick-off reception at the Sweeney Center.

October 17

The main lecture hall will be the setting for 12 presentations of 30 minutes each. The topics for presentations in the morning will be the latest findings from Russia, Japan, and Alaska. An eagerly anticipated presentation is Vladimir Pitulko's description of the 32,000-year-old Yana RHS site

on the edge of the Arctic Ocean with its amazing ivory artifacts. The afternoon will be occupied with discussions of how people traveled south of the continental Ice Sheets into what is now the United

States, including such hotly debated topics as the Pacific coastal route, the Ice-Free corridor route, and the Atlantic (Solutrean) route.

The morning session promises to be lively, thanks to well-known speakers including Jon Erlandson and Dennis Stanford and the diversity of opinions on these topics. Geneticists Eske Willerslev and Connie Mulligan will inform us about what modern and ancient DNA evidence tells us about the first colonizers of the Americas. The audience will have the opportunity to ask questions during morning and afternoon sessions. The whole time the exhibit room and poster presentations will be available to visitors.

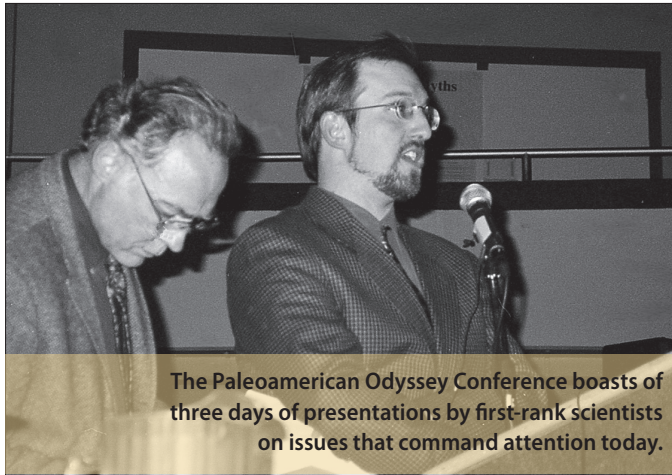
October 18

In the main lecture hall we'll have 13 presentations, each 30 minutes. The morning is all about Clovis. A series of six papers will cover Clovis from every angle: chronology, technology, subsistence, and caches. During this session we'll revisit the question of Pleistocene extinctions and the controversial theory that a comet may have struck the Earth at the time of Clovis. The afternoon session will begin with a discussion of the Western Stemmed Tradition. Then Doug Owsley will give us an overview of the remains of the first Americans and what they tell us. Rounding out the day will be a close look at the early archaeological record from South America, presented by leading scholars from Mexico, Argentina, and Brazil. The audience will be able to ask questions during morning and afternoon sessions, and the exhibit room and poster presentations will be available to visitors.

October 19

In the main lecture hall we'll have 11 presentations, each 30 minutes. The entire day will be devoted to discussion of the pre-Clovis record. In the morning, leading archaeologists will fill you in on the Schaefer and Hebior sites in Wisconsin, Paisley Caves in Oregon, the Friedkin site in Texas, and the Manis site in Washington. Pre-Clovis evidence from Meadowcroft Rockshelter, Cactus Hill, and Monte Verde will also be discussed. The morning concludes with a discussion of the Topper site.

The afternoon session will resume with discussions of the earliest proposed evidence for human occupation of the Americas from the Great Plains of the United States and Brazil, followed by such issues



The Paleoamerican Odyssey Conference boasts of three days of presentations by first-rank scientists on issues that command attention today.

DON ALAN HALL



Tom Dillehay (left) and Dennis Stanford chat at the Clovis and Beyond Conference. You'll see them at the Paleoamerican Odyssey Conference.

DON ALAN HALL

as the role of geoarchaeology and geochronology in the search for the first Americans. Several broad-spectrum papers will be followed by an hour-long panel discussion by leading scholars summarizing and discussing what we have learned over the last three days. During the morning and afternoon sessions, the exhibit room and poster rooms will be open.

The Paleoamerican Odyssey Conference concludes with a banquet and a talk by Peter Hiscock about global migrations and the colonization of Australia. This promises to be a richly rewarding event.

For a detailed schedule of events visit our website www.paleoamericanodyssey.com

About Your Visit and Registering

We've made it easy for you to register. In the centerfold of this issue you'll find a registration form to use for registering by mail, along

with information on hotel accommodations and advice on traveling to Santa Fe. You can also register online by visiting our website www.paleoamericanodyssey.com

Don't miss this one! If you missed *Clovis and Beyond*, you don't want to miss *Paleoamerican Odyssey*. I encourage everyone to attend, to discuss what you learn and join us in celebrating the First Americans. Come find out what we know and what we don't know. Come find out where the new frontiers are and who are making the discoveries. Come see the evidence for yourself. Then you can decide who were the First Americans. This conference is for everyone. Don't miss this historic event. It will likely be another decade or two before we organize the next one.

I look forward to seeing you in Santa Fe! 

—Mike Waters

Director, Center for the Study of the First Americans

The Big-Game Hunting Conundrum

continued from page 3

material. So one Paleoindian easily could have carried the entire assemblage of flint artifacts found at the Fisher site for hundreds of miles if it was considered important to do so.

Why was high-quality flint so important?

Speth and colleagues argue that archaeologists frequently assume that high-quality flint “was essential to the success and viability of Paleoindian lifeways.” If true, this would suggest that Paleoindians would not use flint and chert of lesser quality, yet it's abundantly clear that early Paleoindian flintknappers frequently made their fluted points and other tools from locally available lower-grade materials. Moreover, if high-quality flint was the priority, then Speth and his coauthors ask why Paleoindians in the southwestern United States ignored locally available flint of high quality in favor of exotic high-quality flint, such as Alibates and Edwards. They conclude that “some factor or factors other than their cutting and piercing properties must have influenced the raw material choices” of Paleoindians.

Paleoindian spear points

Speth and colleagues observe that most of the exotic flint found at Paleoindian sites was used to make projectile points. So what is it about spear points that would have required they be made from high-quality, exotic flint?

At this point in their argument, Speth and his coauthors ask the heretical question: “Is a beautifully shaped and finely finished projectile point really necessary in order to make a kill?” The surprising answer to this question is, Evidently not.

Speth and colleagues point to a number of examples, ranging from 400,000-year-old wooden spears from Germany to wooden-tipped arrows of the historic Crow Indians and Papua

New Guineans used to good effect in hunting large mammals. In addition, experiments show that wooden points penetrate animal carcasses just as effectively and are much more durable than stone-tipped projectiles.

So, not only did Paleoindians not need to craft their stone points from the highest-quality flint obtainable, they apparently didn't need stone points at all.

Speth and his coauthors go on to demonstrate that not only are large, flint points not necessary to bring down big game, they are something of a liability. The flint, particularly if you insist on using only material of the highest quality, is costly to obtain and the points made from it break frequently—both in the process of manufacture and in use.

Big-game hunting: provisioning or politics?

Speth and colleagues raise one final issue, “perhaps the most difficult and controversial of all.” Was Paleoindian big-game hunting primarily about putting food on the table or was it more about males vying with each other for prestige?

They attempt to answer the question in two ways. First, they examine the two most thoroughly studied examples of hunting and gathering societies, the San of the Kalahari Desert and the Hadza of eastern Africa, for insights into why they hunted big game. Second, they review the archaeological record of Paleoindians to see what it can reveal about why these ancient cultures hunted big game.

As it turns out, big-game hunting, as practiced by the San and Hadza, requires a large investment of time and energy both to acquire the skills to be an effective hunter as well as to locate, pursue, bring down, and transport the meat from a kill back to the hunters' home base. Moreover, the activity has a very low success rate. According to one study, Hadza hunters failed to kill large game on 97% of the days when they went hunting. Speth and colleagues argue that the San and Hadza hunters would be better off spending their time gathering nuts or caterpillars, both of which are rich in protein and fat. In fact, they go on to argue that the only reason the men from

these cultures have the luxury to spend so much time on hunting is that the availability of these other sources of protein insures that the groups won't starve when, as is usually the case, the men don't bring home the bacon.

Speth and his coauthors clearly appreciate that the late-glacial environments of North America were radically different from those of modern southern and eastern Africa. Nevertheless they regard these case studies as red flags that demonstrate that big-game hunting need not be

Ohio Historical Society Collections
Assistant Juli Six with a finely crafted Clovis point. This point, found in southern Ohio, was made from Hixton Silicified Sandstone, which outcrops in western Wisconsin. Speth and his coauthors suggest that such splendid artifacts made from exotic raw materials are more than merely hunting weapons. They likely were intended to convey some symbolic or religious significance.



BOTH PHOTOS: BILL PICKARD, OHIO HISTORICAL SOCIETY

only, or even mostly, about diet. Instead, it could be a result of other factors, "factors that were firmly rooted in the social and political domain."


The archaeological record of Paleoindian big-game hunting offers clues that appear to be consistent with the idea that it was more about politics than subsistence. For example, we know that Paleoindians didn't generally attempt to glean every ounce of protein and fat from their bison kills because we find little evidence they fractured bones to obtain marrow and bone grease. Speth and his colleagues cite archaeologist Douglas Bamforth's observation that there was no evidence that Plains Paleoindians processed bison kills for long-term storage, such as by turning the meat into pemmican. Speth and his coauthors claim that without pemmican "the incredibly high mobility commonly postulated for Paleoindian hunters in the Plains would likely *not* have been possible."

Speth and his colleagues offer the following conclusions, which they freely admit are speculative. First, the primary purpose of Paleoindian big-game hunting likely "revolved around the social and political affairs of men." Second, although Paleoindian groups undoubtedly were highly mobile, the distances that exotic high-quality cherts were being moved isn't a reliable measure of the annual movements of

residential groups. Instead, the mostly small quantities of this material likely were exchanged between groups or directly acquired by small parties of men making extraordinary journeys expressly to obtain this symbolically potent material. Third, the beautiful Paleoindian projectile points weren't designed principally to serve as

killing weapons, though it isn't disputed that they indeed fulfilled this purpose, but as symbols pregnant with social, political, and even religious significance.

Speth and his coauthors don't claim to be the first to offer many of these alternative interpretations, but the evidence and arguments they marshal are unprecedented in their scope and force. No longer can interpretations of Paleoindian lifeways take for granted the bedrock assumptions of a big-game hunting focus, high residential mobility, and dependence on spear points made from the highest-quality flint solely for fulfilling their dietary needs. As part of this process researchers must look beyond the issues of settlement and subsistence to consider the social, religious, and political aspects of Paleoindian lives.

Certainly, archaeologists have long been interested in these things, but most felt the available data offered little or no window onto these more esoteric spheres. How ironic that the very flint spear points and bison bones that have constituted the bread and butter of Paleoindian studies may prove to be the equivalent of the sacramental bread and wine we thought we'd never find. 

— Bradley Lepper

How to contact the principal of this article:

John D. Speth
Museum of Anthropology
4013 Museums Building
University of Michigan
Ann Arbor, Michigan 48109-1079
e-mail: jdspeth@umich.edu

Suggested Readings

- Speth, J. D. 2010 *The Paleoanthropology and Archaeology of Big-Game Hunting: Protein, Fat, or Politics?* Springer, New York.
- Speth, J. D., K. Newlander, A. A. White, A. K. Lemke, and L. E. Anderson 2012 Early Paleoindian Big-Game Hunting in North America: Provisioning or Politics? *Quaternary International*, in press.

EARL BROOKS, an adventurous 15-year-old scouting around on his grandfather's farm near the town of Angus in south-central Nebraska, couldn't have known the stir that would result from his find on a hot August day in 1931 of an almost complete mammoth skeleton. Called to investigate, A. M. Brooking, curator of the museum in nearby Hastings, directed excavation of the skeleton. It was while digging under the scapula that Earl found a fluted lithic artifact.

the artifact itself, given its crude appearance, was a fake.

Today, with the advantage of new techniques and technology that have accrued over the decades, scientists are able to answer questions they couldn't answer in the 1930s and to unravel the mystery of the dubious association between the mammoth and the artifact. This renewed interest in such an old excavation underscores the value of museum collections and good records, as well as the importance of periodically reevaluating

very old sites and associated collections, rethinking assertions, and testing conclusions as new technology comes available.

Reexamining the find

When Brooking of the Hastings Museum came to the farm to investigate Earl Brooks's discovery, it was clear they had a mammoth skeleton on their hands. When Earl discovered the fluted artifact, Brooking summoned Jesse Figgins, famous as the discoverer of the Folsom type site in New Mexico (MT 21-1, "The

The mounted skeleton of the Angus mammoth, 1932.



DENVER MUSEUM OF NATURE & SCIENCE

The mammoth skeleton was an exciting and important discovery, and even more astounding was the crudely shaped artifact found in apparent association with the skeleton. If genuinely associated with the mammoth, the artifact would be the first documented find of its kind, linking prehistoric Americans and mammoths and placing humans in North America thousands of years before previously thought.

Brooking knew this and wasted no time calling in a prestigious authority, Jesse Figgins of the Colorado Museum of Natural History (the present-day Denver Museum of Nature & Science). The site was carefully excavated, but no other artifacts were found. The paucity of evidence supporting the mammoth-artifact association, coupled with the enormous disparity between the geomorphically and taxonomically determined age of the mammoth and the assumed approximate age of the artifact, made Brooks's lone lithic artifact quite a controversial find. Thus began an 80-year disagreement between those who believed the artifact was as old as the mammoth, and those who insisted it must have been planted at the site or in some other way introduced. Some even suspected that

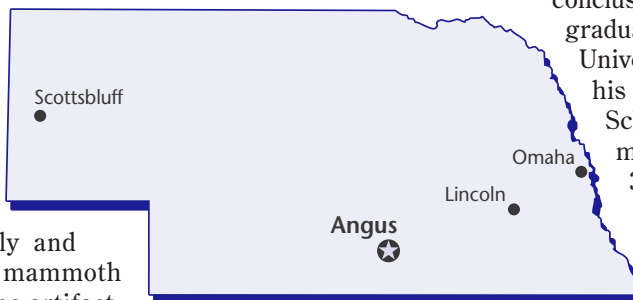
Denver Museum of Nature & Science: A History of Early-Paleoindian Research"), who showed up the next day with several other scientists and a professional excavator. Extensive excavations failed, however, to produce additional artifacts or to quell disagreement among the experts.

Archaeologist William Duncan Strong from the Smithsonian Institution doubted the association. In his 1931 paper addressed to the Nebraska Academy of Sciences, he cited the

conclusions of C. B. Schultz, then a graduate student in geology at the University of Nebraska. Based on his analysis of the site geology, Schultz estimated the age of the mammoth at approximately 300,000 years. Paleontologist Henry Fairfield Osborn of the American Museum of Natural History examined the Angus mammoth

specimen and, noting the similarity of its teeth to those of mid-Pleistocene European mammoths, pronounced it a new species, *Archidiskodon meridionalis nebrascensis*. He agreed with Schultz's estimate of age.

The lithic artifact, however, was the sticking point. Though



repeatedly referred to as a very “crude” specimen, it was nonetheless unmistakably the product of human hands. The artifact was taken to be a Folsom point, the only kind of fluted projectile point known in 1931, and therefore couldn’t be older than 13,000 years. Strong declared the mammoth far too old to be associated with such a recent artifact. Although he admitted as a possibility Schultz’s supposition that “the scapula might have been undercut and the point [*sic*] washed in by the creek” (the farm lay on a small tributary of the Little Blue River), many observers suspected that the artifact had been planted at the site, perhaps was even a forgery. Whatever explanation held favor, the association was considered by many to be questionable at best.

The Angus mammoth scapula excavated by A. M. Brooking, 1931.



DENVER MUSEUM OF NATURE & SCIENCE

On the other side of the argument were those who were convinced the association was authentic. In an article published in 1931, Figgins expressed his belief that the association was authentic. His decision, however, relied heavily on his faith in the “integrity of the discoverers.” The debate hinged on irreconcilable polar opposites, the extreme age of the mammoth and the comparatively young age of the artifact.

The debate fulminated for 80 years. Since about 1932, no significant new evidence was brought into play. None, that is, until recently.

The modern investigation

It isn’t surprising to anthropologist Steve Holen, of the Denver Museum of Nature & Science, that the scientific community found itself divided over discovery of the Angus mammoth and the problematic lithic artifact. Many experts involved in the investigation undeniably arrived at incorrect conclusions, but Dr. Holen readily concedes that the fault lies with the crude tools available to them and their incomplete understanding of the peopling of the Americas.

Holen is confident that he has solved the puzzle. Credit for the solution, he believes,

The artifact found with the Angus mammoth.



DENVER MUSEUM OF NATURE & SCIENCE

properly rests with modern technology and methods, the vast body of knowledge accumulated over the decades in Earth sciences, and our grasp of the lithic technology practiced by early Americans.

Dating the mammoth

Modern-day science can neither confirm nor refute Osborn’s 1932 estimate of the age of the Angus mammoth based on the taxonomy of the creature itself. Although we can better read variations in the dentition of mature mammoths today, the heavy wear on the teeth of the Angus mammoth makes it impossible to determine the creature’s place in the species continuum and thereby place it on the geological timeline.

Holen concluded that the only way to resolve the controversy was to date either the remains or the sediments in which the mammoth was found, using modern dating methods. (Remember that almost 30 years would pass after the Angus mammoth was discovered before Willard Libby perfected the technique of radiocarbon dating.) Test excavations made in 1982 at the exact location of the original site found a mammoth rib in situ. An attempt to radiocarbon date the bone, however, was unsuccessful because it was just too old. The lab reported that

the bone was depleted of collagen, which ruled out accelerator mass spectrometry testing.

In 2002 sediment samples were collected from the site for dating by optically stimulated luminescence (OSL), which,

like radiocarbon dating, lay far in the future in the 1930s. Quartz grains build up energy. When excited in a dark lab, the grains emit a measurable amount of light. Based on that measurement, scientists can approximate how many years have passed since the quartz particle was last exposed to sunlight (**MT 18-3**, “Luminescence Dating of Quaternary Sediments: New Methods for Dating Archaeological Components”). Holen concedes that although OSL ages are not as precise as radiocarbon dating, whose range is limited to about 45,000 years, it is “the most accurate dating we can do on deposits of this age.”

The Angus mammoth, it turns out, was buried in heavy sands and gravels unsuitable for OSL dating, so samples of finer-grained deposits from above the mammoth were tested. The result was an age of 75,000–80,000 calendar years for the mammoth. Although not nearly as old as Schultz and Osborn’s estimate of 300,000 years, it

was still far too old to be associated with early Americans that made fluted artifacts.

With the age of the mammoth confidently established, Holen now turned his attention to the troublesome artifact.

Focusing on the artifact

Holen confirms, oddly enough to some observers, that the artifact is indeed a genuine fluted projectile point in the preform production stage, thus laying to rest another topic that has stirred debate over the years. Technologically, he says, the Angus artifact “is more similar to some Eastern post-Clovis preform production than it is to either Folsom or Clovis preform production.”

Literature published in the early years after discovery of the Angus mammoth and the suspicious fluted artifact emphasizes the crudeness of the artifact, implying that its poor workmanship is a tip off that it’s a modern forgery. Holen points out that at that time archaeologists had only a rudimentary grasp of lithic technology and didn’t recognize a preform as a point in an early stage of the manufacturing trajectory. As a spear point was manufactured, Holen explains, the knapper sometimes discovered imperfections in the blank that made it difficult or unsuitable to finish. The Angus biface is a fluted projectile point in the making that was abandoned at the preform stage.

Use-wear analysis confirms its authenticity for Holen (MT 25-1, “Use Wear, Up Close”). “High-magnification study of the wear patterns reveal it was used as a cutting tool for both hard and soft applications,” he tells us. “That’s another piece of evidence that this was a real artifact.” He emphasizes that this doesn’t mean it was actually in association with the mammoth; it merely confirms that it is a bona fide artifact. And *that* is precisely the proof that it cannot be associated with the Angus mammoth. The difference in their ages of more than 50,000 years makes that an impossibility.

“It took years to resolve this controversy because we didn’t have the technology,” says Holen. “It shows the importance of going back to these early sites to determine whether they really were important or not.” In this case his work in the field and lab proves that someone must have planted that artifact with the mammoth.

It’s a source of satisfaction for Steve Holen, anthropologist with the Denver Museum of Nature & Science, that his predecessor, H. Marie Wormington, the legendary curator of archaeology at the Colorado Museum of Natural History from the ’30s through the ’50s, is right on target when she declares in her definitive work *Ancient Man in North America* that the artifact found with the Angus mammoth was “deliberately introduced into the deposits by some unknown individual.”

The real value of museum collections

Granted, it would have been a landmark discovery, scientifi-

cally monumental, if the association of this fluted artifact with the Angus mammoth had proved true. It’s equally important, however, as Holen points out, that we now know it to be false, “to get this out of the archaeological literature and expose this for the fraud it was.” Some authoritative scientific sources still list the Angus mammoth as an archaeological site, and Holen is eager to set the record straight.

Holen welcomes the opportunity to review an old excavation like the Angus mammoth site. “It shows the importance of museum collections,” he explains. “We have the artifact to go back to and look at when we develop new techniques.” And that’s exactly what he and his wife, Kathleen, a retired nurse practitioner and now a professional archaeologist, are doing. The pair study museum collections all around the United States, especially in the West, looking for patterns of breakage on large mammal bones that might be evidence of human association with mammoths and other large mammals (MT 23-1, “Early Mammoth Bone Flaking on the Great Plains”). “We think it is a very important aspect of researching the early

humans in the new world,” he says. “We are looking for evidence of human modification of bones as well as human-made artifacts.”

This after-the-fact research pays rich dividends for the time the Holens spend for the simple reason that it doesn’t take nearly as much time to review a museum collection as to excavate a site. If a quick macroscopic evaluation of a collection turns up something interesting, then they do a microscopic analysis. It wouldn’t surprise Holen to find in really old



Steve and Kathleen Holen outside their tent in Tanzania, Africa, where they were conducting experiments breaking elephant limb bone with large rock hammers.

collections—some date back a hundred years—evidence of human-modified bones or even man-made artifacts that either weren’t recognized or were thought unimportant by early investigators.

Many of the older collections the Holens review aren’t well dated, which makes dating them one of the first orders of business. Holen and his wife are passionate about their work. “It’s been very productive,” he says. “We are learning a lot. It goes to show you that museum collections are important to keep in good condition and have accessible to other researchers.” The down side is that many sites need to be revisited and he can’t do them all. He praises anthropologist David Meltzer, of Southern Methodist University, for doing just that in the 1990s with the famous Folsom site in New Mexico—originally excavated by Holen’s own museum in 1926 and 1927. The Folsom site, Holen

continued on page 20

MUSEUMS ARE REPOSITORIES of remarkable discoveries where collections can be studied and restudied as new technologies become available and where new interpretations of classic sites are tested against the original data. Occasionally, however, museum collections hold surprises that weren't recognized as remarkable discoveries at the time they were obtained by the museum.

In 1998, Matthew Burr was cleaning and organizing materials stored in the attic of the Firelands Historical Society Museum in Norwalk, Ohio. He came across a box containing a number of large bones that he recognized were from a giant ground sloth and apparent evidence of cutmarks made by stone tools. Even more remarkable is the fact that radiocarbon dates recently obtained on the bones indicate the beast was butchered almost two centuries before the Clovis culture spread across North America!

This rediscovery in a museum attic of bones originally pulled from an Ohio swamp sometime around the turn of the century could change our understanding of the peopling of America and the role that humans played in the extinction of the Pleistocene megafauna.

Discovery

The box Burr found in the attic of the Firelands Historical Society Museum contained a number of large bones and a note indicating they were the bones of a mastodon, but Burr noticed among the bones two claws that he knew belonged to a giant ground sloth. He also noted the presence of what appeared to be stone-tool cut-

Historical research suggests this small wetland in Norwich Township, Huron County, Ohio, may be the locality where the bones of the ground sloth were found.

marks on the left femur, or upper leg bone. He published his observations in a short note in the avocational publication the *Ohio Archaeologist*.

The bones were brought to the attention of Brian Redmond,

Curator of Archaeology at the Cleveland Museum of Natural History. Redmond recognized the potential significance of the discovery and arranged for the material to be loaned to the Cleveland Museum so that it could be studied more thoroughly. The results of this investigation are published in a special issue of the journal *World Archaeology* devoted to "faunal extinctions and introductions."

The meager records associated with this small collection of bones indicated they had been recovered from 4 ft beneath

Pre-Clovis Butchered Ground Sloth in Ohio



the surface of a "swamp" in Norwich Township, Huron County, Ohio. R. C. Niver was listed as the donor of the collection.

A search of early 20th-century published reports of late-Pleistocene fossil discoveries in Ohio revealed a few additional details. Oliver Hay, in a 1915 report on a *Bison sylvestris*, mentioned that it had been found in a "tamarack swamp" in Huron County along with bones of a *Megalonyx*. In a 1923 publication, Hay narrowed

down the location to a "hackberry swamp" located "about seven miles from North Fairfield" in Huron County. Hay indicated that he learned of the discovery from Roe Niver, then a student at the University of Illinois. Unfortunately, Niver died before revealing the exact location of the find.

Redmond and his colleagues were able to establish that property owned by the Niver family was located in Norwich Township "exactly seven miles west of North Fairfield." Moreover, there is still a small bog on the property.



ALL PHOTOS UNLESS NOTED:
CLEVELAND MUSEUM OF NATURAL HISTORY

Redmond and his team make a strong circumstantial case that this Norwich Township bog was the site of the Firelands ground sloth discovery, but admit that it “cannot be verified at this time since no further information or accounts of the actual discovery have as yet come to light.”

What the bones reveal

The bones are the remains of a Jefferson’s Ground Sloth (*Megalonyx jeffersonii*). The collection includes two claws, the left femur, right tibia (lower leg bone), right patella (knee cap), right astragalus (one of the foot bones), a right posterior rib, and one lumbar and two thoracic vertebrae.

Based on the overall size of the bones, paleontologist Greg McDonald, with the National Park Service, estimates that the ground sloth was fully grown and is one of the larger *Megalonyx jeffersonii* specimens known. It likely weighed more than a ton. The characteristic brown staining of the bone confirmed it had been recovered from a bog.

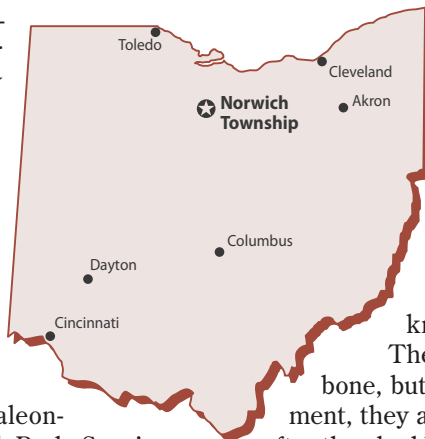
A sample of bone obtained from the left femur was sent to Stafford Research Laboratories for AMS radiocarbon dating. The results indicate this ground sloth died between 13,738 and 13,435 CALYBP. This age is remarkable because it is as much as 700 years older than the currently accepted oldest dates for the Clovis culture, still thought by some archaeologists to mark the earliest well-established human presence in the Americas. If Burr was right about the butchering marks, then this *Megalonyx* is another blow to the “Clovis First” model of the original peopling of America.

Evidence for butchering

Redmond and his colleagues focused their attention on the intriguing markings on the femur. Are they indeed marks made by stone tools, or could they have been made by some other process, such as gnawing by carnivores, trampling, or damage from metal excavating tools?

The team ultimately concluded that the left femur and other bones in the collection bear marks “from a variety of sources.”

None of the marks on the other bones, however, are thought to be cutmarks.



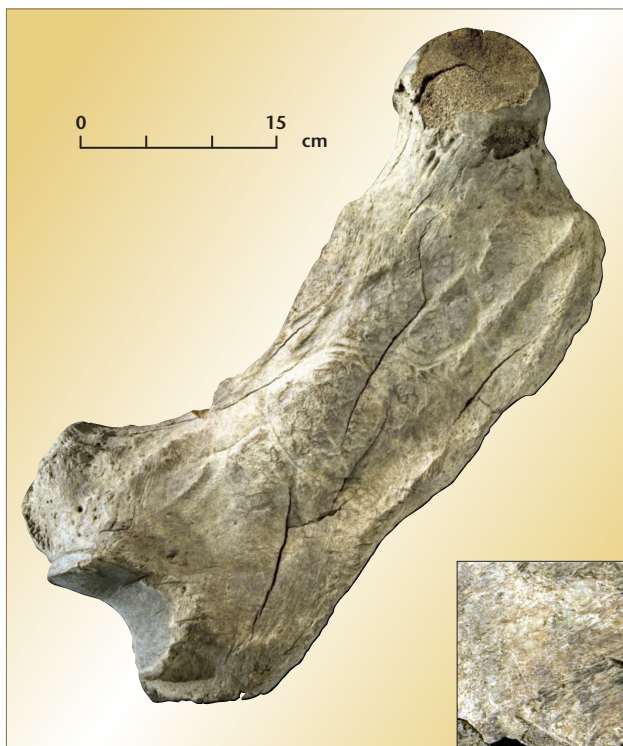
Some of the marks on the femur are “fresh and randomly directed and placed scratches . . . that were probably made during handling and storage” of the bones. The team didn’t observe any evidence of carnivore gnawing, although they documented several randomly oriented grooves with a deeper indentation at one end, which they interpret as claw marks made by some unknown animal.

There also are some drying cracks across the bone, but since none of these were filled with sediment, they all appear to represent drying of the bones after they had been excavated.

Redmond and his team have identified four marks on the femur, which they regard as cutmarks made by stone tools. They distinguish at least two kinds of cutmarks: slice marks,

straight, thin incisions made with a horizontal cutting motion; and chop marks, deep, wide gouges resulting from hard vertical impacts. The team identified 41 slice marks and 5 chop marks.

The evidence that the Firelands ground sloth was butchered is based on four sets of observations. First of all, “the patterning of



◀ Top view of the left femur (thigh bone) of an Ice Age Jefferson’s ground sloth. Microscopic analysis of marks on the bone reveals that they were made by stone tools.

▼ A close-up view of cutmarks on the lower front surface of the left femur of a Jefferson’s ground sloth. Research published in *World Archaeology* reveals this to be the earliest evidence of hunting by prehistoric Ohioans.



tool marks appears non-random and deliberate.” The cutmarks are “arranged into lines or rows of parallel incisions,” most of them located on the lower part of the left side of the femur on its front-facing surface. In addition, most of the

cutmarks are oriented at an angle to the long axis of the bone.

Second, the markings on the Firelands ground sloth share the characteristics of experimentally produced cutmarks rather than damage from trampling. Redmond and his coauthors refer to experimental work that identified distinctive features of trampling marks versus cutmarks: “Trampling marks

were readily identified by the presence of shallow striations which overlap or obliquely cross over deeper grooves and most often exhibit sinuous or 'curvey' forms." According to Redmond and his team, the markings on the Firelands Ground Sloth femur don't exhibit these features, but instead resemble marks produced experimentally with retouched stone tools.

Third, SEM (scanning electron microscopy) analysis of the cutmarks by archaeologist Haskel Greenfield, with the University of Manitoba, detected both chop marks and slice marks on the Fireland ground sloth femur. He reports that chop marks are "deep, wide and steep," indicative of a "direct impact with a cutting tool, such as a large primary reduction flake, that hit the bone from above and then slid across its surface." Slice marks "have irregular, V-shaped cross sections" and exhibit "relatively straight and thin lines." In addition, striations appear along one or both sides of the channel. Slice marks are of two types, "those made with a narrow flake or blade (producing a fine slice) and those made with a wide blade (producing a coarser slice)."

SEM analysis revealed that "at least two types of instruments were used in the butchering process": unmodified flakes or blades, and unifacially retouched flake tools. The majority of the cutmarks appear to have been made by the first type of tool.

Moreover, the marks on the bones are distinguishable from marks made by metal tools. Although nothing is known about how the bones were excavated, metal edged tools can be confidently dismissed as the agent that made the marks.

Matthew Burr, whose keen eye spotted the sloth bones in the attic of the Firelands Historical Society Museum.



Finally, SEM analysis indicated that all the cutmarks were made "while the bone was relatively fresh," which means that the pre-Clovis radiocarbon date tells us when the ground sloth died *and* when cutmarks were made on the bone.

Fourth, and most importantly, there are anatomically dictated reasons for a butcher to make cutmarks where they're found on the sloth bones. Not simply scattered randomly across the bone, the marks instead are concentrated in just those areas dictated by a rational butchering strategy. Traditionally, this has been one of the most important criteria for distinguishing cutmarks from naturally produced markings such as those resulting from trampling or gnawing by carnivores.

Redmond and his team observe that the cutmarks occur at the distal, or lower, end of the femur, precisely where a Paleoindian butcher would cut to remove the large mass of muscle that covers the femur, "the most abundant source of easily accessible flesh on most mammals," Redmond and his

coauthors observe. The cutmarks "most likely represent vigorous attempts to cut one end of this meaty mass" and therefore "appear to correspond to the most predictable location of meat-stripping."

Is there reason for doubting that the Firelands ground sloth was butchered?

Redmond and his team candidly discuss various aspects of the discovery that might call into question their interpretation that humans butchered the Firelands ground sloth. First of all, the lack of information relating to the circumstances surrounding its excavation and early handling "precludes an *absolute* determination as to whether the incisions found on the femur are the result of human butchering." Perhaps some unknown process involved in non-systematic excavation left marks on the bone that only mimic butchering marks. This

theory will be difficult to test, however, because it's impossible to foresee all the ways similar marks could be produced.

Second, some features of the marks on the femur appear to be inconsistent with human butchering. Redmond and his team identify three such "unusual" aspects of the marks, "the high frequency of possible cut marks and their apparent execution at varying angles using at least two types of tools."

Redmond and his coauthors suggest that severing the "fibrous and large patellar tendon" would have "required extensive and deep cutting strokes, perhaps by more than one person wielding different forms of cutting tools and approaching the job from opposite sides of the limb." This scenario, though plausible, may be unnecessarily complicated.

Archaeologist Gary Haynes, having observed the butchering of many elephants, notes that "expert butchers never left a mark on post-cranial bones that they completely stripped of meat or disarticulated." His observation suggests either that the marks on the Firelands ground sloth femur are something other than butchering marks, or that the Paleoindian butchers weren't skilled in their work.

Besides a lack of butchering proficiency, other factors Haynes cites contributed to a "degree of surface marking" sometimes found on butchered elephant bones and may account for the unusual nature of the marks found on the ground sloth femur. Inordinate haste to get the butchering job done, an inadequate toolkit, or ignorance of the anatomy of the particular species being butchered all could result in the sorts of marks that Redmond and his colleagues observed on the Firelands ground sloth femur.

What killed the Firelands ground sloth?

Redmond and his team make a compelling case that the Firelands ground sloth was butchered by Paleoindians more than



predators. Archaeologists Russell Graham and Marvin Kay interpret the concentrated presence of these dermal ossicles at Kimmswick as evidence that ground sloth hides were brought to the site by Clovis hunters; only scattered ossicles remained, they suggest, after perishable skin and fur decomposed.

The presence of small dermal ossicles may not be evidence of modification. Nevertheless large numbers of them in the absence of other ground sloth bones argues that the hide had been removed from a carcass. In the context of a Paleoindian site, the simplest explanation for how a ground sloth was separated from its skin is that humans skinned a killed or scavenged sloth.

Of course, to find concrete evidence that late-Pleistocene human hunters routinely ex-


Greenfield (left) examines the sloth femur with Redmond. The youngster is Greenfield's son, Noah.

13,400 years ago, nearly two centuries earlier than the probable appearance of the Clovis culture. Although they don't make a specific claim as to whether the animal was killed or scavenged, the data seem to support the interpretation that the ground sloth was killed by Paleoindian hunters.

Since none of the possible claw marks observed on the femur overlaps with the cutmarks, it's impossible to determine which got to the sloth first, carnivores or human hunters. If a carnivore killed the ground sloth, then humans scavenged what was left. If, however, Paleoindian butchers removed prime cuts of meat as the location of the possible cutmarks suggests, it's likely that hunters killed it, butchers took what they needed, and some lucky carnivore feasted on the remains of the carcass.

Redmond and his colleagues assert that the Firelands ground sloth is "the first evidence from North America" that ground sloths "may have been exploited by late Pleistocene humans." They do acknowledge that dermal ossicles of the ground sloth *Paramylodon harlani* have been found at the Kimmswick site in Missouri as well as the Aubrey site in Texas, but dismiss these as not showing "evidence of butchering or modification by human activity." Dermal ossicles, small, spheroidal bone plates that were embedded in the skin of the neck, shoulders and back of some species of ground sloth, may have served as a kind of armor to protect the sloth from

plotted ground sloths we only have to look farther south. In Fell's Cave at the southernmost tip of South America, archaeologist Junius Bird found skeletal remains of the sloth *Myiodon* associated with artifacts, together with prehistoric horse and guanaco (MT 23-4, 24-1, and 24-2, "In the Footsteps of Junius Bird"). It doesn't take a great leap of imagination to suppose North American hunters were as capable as their South American coevals.

If Graham and Kay's interpretation is correct, then the Firelands ground sloth is not "the first [reported] evidence from North America" for the human exploitation of ground sloths. Nevertheless, it would be the earliest such evidence. It represents a significant contribution to our understanding of human hunting of *Megalonyx* and, by adding to the list of megafaunal species known to have been exploited by Paleoindians, of the role humans played in the extinction of these Pleistocene big game. 

— Bradley Lepper

How to contact the principal of this article:

Brian G. Redmond
John Otis Hower Chair of Archaeology
The Cleveland Museum of Natural History
1 Wade Oval Drive, University Circle
Cleveland, Ohio 44106-1767

Suggested Readings

Burr, M. L. 2007 A Possible Paleo-Indian Butchering Site in Huron County, Ohio. *Ohio Archaeologist* 57(1):31.

Cannon, M. D., and D. J. Meltzer 2004 Early Paleoindian Foraging: Examining the Faunal Evidence for Large Mammal Specialization and Regional Variability in Prey Choice. *Quaternary Science Reviews* 23:1955–87.

Haynes, G. 2002 *The Early Settlement of North America: The Clovis Era*. Cambridge University Press, Cambridge.

Redmond, B. G., H. G. McDonald, H. J. Greenfield, and M. L. Burr 2012 New evidence for Late Pleistocene Human Exploitation of Jefferson's Ground Sloth (*Megalonyx jeffersonii*) from Northern Ohio. *World Archaeology* 44(1):75–101.

Graham, R. W., and M. Kay 1988 Taphonomic Comparisons of Cultural and Noncultural Faunal Deposits at the Kimmswick and Barnhart Sites, Jefferson County, Missouri. In Late Pleistocene and Early Holocene Paleoeology and Archeology of the Eastern Great Lakes Region. *Bulletin of the Buffalo Society of Natural Sciences* 33:227–40.

THE FAR NORTHEAST, a peninsula incorporating the six New England states, as well as New York east of the Hudson, Quebec south of the St. Lawrence River and the Gulf of St. Lawrence, and the Canadian Maritime Provinces, provided the setting for a distinct chapter in the peopling of North America. *Late Pleistocene Archaeology and Ecology in the Far Northeast* focuses on the Clovis pioneers and their eastward migration into this region, which was inhospitable prior to 13,500 years ago, especially in its northern latitudes.

Bringing together the last decade or so of research on the Paleoindian presence in the area, Claude Chapdelaine and the contributors to this volume discuss, among other topics, the style variations in the fluted points left behind by these migrating peoples, a broader formal disparity than previously thought. This book offers not only an opportunity to review new data and interpretations in most areas of the Far Northeast, including a first glimpse at the Cliche-Rancourt Site, the only known fluted-point site in Quebec, but also permits these new findings to shape revised interpretations of old sites. The accumulation of research findings in the Far Northeast has been steady, and this timely book presents some of the most interesting results, offering fresh perspectives on the prehistory of this important region.

Says Dr. Jean-Luc Pilon, Curator of Ontario Archaeology at the Canadian Museum of Civilization, "This book provides a much needed update of that incredible story of human adaptation on the very edge of the inhabitable world."

Editor **Claude Chapdelaine**, professor of archaeology at the Université de Montréal, specializes in the prehistory of North America.

Hardcover
8½ x 11, 264 pp.
92 b&w photos. 34 line art. References. Index.
Pub date 09/18/2012
ISBN 978-1-60344-790-4
See rear cover for ordering information.

NEW BOOK!

"Archaeological science at its best."

—Dean R. Snow, professor,
Pennsylvania State University

Late Pleistocene Archaeology & Ecology in the Far Northeast



Edited by Claude Chapdelaine

Christopher Ellis
Foreword

Claude Chapdelaine and Richard A. Boisvert
Introduction: Toward the Consolidation of
a Cultural and Environmental Framework

Jonathan C. Lothrop and James W. Bradley
Paleoindian Occupations in the Hudson
Valley, New York

John G. Crock and Francis W. Robinson IV
Paleoindian Settlement Patterns on the
West Coast of New England

Richard A. Boisvert
The Paleoindian Period in New Hampshire

**Arthur Spiess, Ellen Cowie, and Robert
Bartone**
Geographic Clusters of Fluted Point Sites in
the Far Northeast

**Leah Morine Rosenmeier, Scott Buchanan,
Ralph Stea, and Gordon Brewster**
New Sites and Lingering Questions at the
Debert and Belmont Sites, Nova Scotia

Claude Chapdelaine
The Early Paleoindian Occupation at the
Cliche-Rancourt Site, Southeastern Quebec

**François Courchesne, Jacynthe Masse, and
Marc Girard**
The Burial of Early Paleoindian Artifacts in
the Podzols of the Cliche-Rancourt Site,
Quebec

Brian S. Robinson
The Bull Brook Paleoindian Site and Jeffreys
Ledge: A Gathering Place near Caribou
Island?

Francis W. Robinson IV
Between the Mountains and the Sea: An
Exploration of the Champlain Sea and
Paleoindian Land Use in the Champlain
Basin

Jean-Yves Pintal
Late Pleistocene to Early Holocene
Adaptation: The Case of the Strait of
Quebec

A Revised Paleoamerican Menu

Wally's Beach Camel

The camel spinal column in situ.
Note the ribs severed at the vertebrae.

L. V. HILLS

AS FAR AS CAMELS have anything to do with archaeology, most people will conjure images of pyramids, pith helmets, and tracts of endless sand. Brian Kooyman and L. V. Hills of the University of Calgary have a different setting altogether in mind, and a site that well predates the pyramids.

Recently the bones of now extinct *Camelops hesternus* were revealed by the wind at Wally's Beach in southwestern Alberta. This species of camel disappeared from the Earth's surface around 10,000 RCYBP. Though the date coincides with human habitation, this is one extinction for which human hunters hadn't shouldered any blame. No solid evidence had ever been unearthed to prove that Clovis people hunted these animals, and so it had been generally accepted that they didn't. Nonetheless some authorities have speculated about the possibility. In their 1967 book *Pleistocene Extinctions: the Search for a Cause*, Herbert Edger Wright and Paul Shultz Martin envision how camels could have been hunted at the Tule Spring site in Nevada, but their scenario is only hypothetical. More recently Dr. Tom Jones and Dr. Charlotte Beck of Hamilton College investigated the possibility at the Sunshine locality in Nevada (MT 19-4, "When the Camel Died, Did Anyone Hear It? Archaeological Research at the Sunshine Locality, Nevada"). As luck would have it, the bones they found had been transported by water and bore no butchering marks, so they could neither prove nor disprove a human connection.

There's abundant evidence of camelid hunting in South America, but nothing definitive had turned up farther north. Nothing, that is, until recently, when water and wind once more exposed an ancient surface on the Canadian site of Wally's Beach to the light of day.

Not your average windswept beach

Wally's Beach in southernmost Alberta is a giant shadowbox made real, a site where you can literally walk in the footsteps of mammoths (MT 22-4, "Footprints in the Mud: Insights into Extinction at Wally's Beach") and other members of the megafaunal pantheon. More than 13,000 years ago it was an island refuge (or so they thought) for Pleistocene dwellers such as bison, caribou, horses, mammoths, musk oxen, and, yes, camels. Sitting in the middle of St. Mary's River, it had mammoth steppe vegetation that ran smoothly to the shore, giving ideal access to the water. Unfortunately for megafauna, it was also a setting made to order for human hunters to lay an ambush.

Fast forward to the 1950s and the island has disappeared under the waters of St. Mary's Reservoir. There it stayed until the 1990s, when the water level was lowered for construction on the spillway. With all vegetation wiped away by water, the newly exposed sediments were at the mercy of the winds. And as later evidence would show, the wind has always been a factor at Wally's Beach.

The gusts made short work of sweeping away the eolian



detritus of millennia and revealed the Pleistocene surface to Shayne Tolman, who brought it to the attention of Dr. Kooyman, Dr. Hills, and then grad student Paul McNeil. They discovered that the winds that exposed the landscape were also the agent responsible for originally conserving it. High winds had buried and preserved footprints of the megafaunal community so swiftly it's easy to imagine yourself only a few hours, not many thousands of years, behind them.

Footprints aren't all we find today of these ancient inhabitants. Skeletal remains of some are still there (MT 21-3, "Wally's Beach: New Evidence for Pleistocene Horse Hunting in Canada"). The remains of seven horses were found on Wally's Beach by our team, including Tolman (whom the discovery inspired to pursue

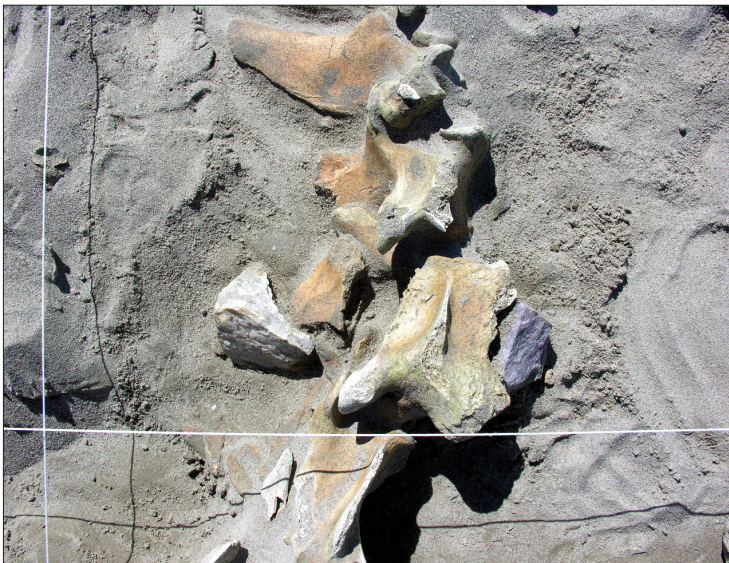
Kooyman (left) and Tolman excavating the camel bones.



a further degree). The bones show compelling evidence of butchering. Witness their articulation, the absence of gnawing marks by carnivores including scavengers (further indication of a speedy burial), the presence of cutmarks from stone tools, and even stone tools themselves. For further evidence, lithic artifacts, including three Clovis points, were submitted for protein analysis. Lo! The artifacts tested positive for horse proteins. Before this event it was commonly thought that Clovis people didn't utilize the ancient horse. But before this, no one had ever brought in an armload of evidence.

Having shaken the horse out of the tree, the same team has now turned its attention to the camel bones found on the beach.

Camel vertebra in situ, displaying a cutmark.



Yesterday's camel is today's news

Found among the equids were the remains of a single camel, though it isn't presumed that all these animals met their end in one fell swoop. The watering hole has long been an ideal setting for falling upon unsuspecting pray, and cunning humans have a well-earned reputation for using a good trick twice. The horses were likely the victims of more than a single raid, and the camel appears to have been a solitary victim.

The camel bones, consisting of the spinal column and ribs, date to 13,000–13,500 calendar years ago. The bones weren't found scattered. Instead, they lay in two slightly separated groups, roughly corresponding to the upper half of the body and the lower half including ribs. This orientation could indicate two independent butchering events of the same animal. Like the horse bones, those of the camel show no evidence of carnivore gnawing. In fact, the breakage pattern of the ribs is quite credibly human in origin. A savvy butcher would use a chopper to sever and remove intact the main body of ribs. Indeed, Wally's camel was left with "four rib proximal ends . . . still articulated with the thoracic

vertebrae." Though most of these tips are too worn to verify the kind of fracture, two demonstrate "spiral and conchoidal fracturing," a telltale sign that the bone was broken when still green, not after it had become weathered and brittle (MT 23-1, "Early Mammoth Bone Flaking on the Great Plains").

More evidence of the hand of man

Three lithic objects were discovered in situ with the skeleton. All are fragments of quartzite from a nearby glacial moraine. None came from the modern surface and therefore can't be recent additions to the site. Nor does it seem likely they were swept in by natural Pleistocene-age processes, since they are much larger than the surrounding sand and silt. Gravity isn't the culprit either, because the landscape is flat and was demonstrably so in the past.

The smallest of the three stone objects is 5 cm long and appears to be a flake fragment or a piece of shatter. A larger piece, nearly 10 cm long, could possibly have been used as both a core and a small chopper. The most noteworthy of the collection is the largest, some 10 cm long. It isn't its size that makes it significant, however, or the fact that it bears multiple flake scars. Rather, it's the location where this suspected artifact was found, not located next to the bones but among them under a vertebra, actually "enclosed in

the processes.” The team concludes that it could have been used as a scraper or a steep-edged chopper. Not exactly a smoking bullet, but it’ll do.

A slip of the hand

Perhaps the most remarkable piece of evidence is found where stone and bone meet. While still in the field our Canadian Camel Corps noted a stone-tool cutmark on cervical vertebra 6. It’s no secret that some authorities have sounded the alarm for the practice of accepting cutmarks as evidence of butchering without careful inspection. Consequently Dr. S. L. Olsen of the Carnegie Museum of Natural History and Dr. Pat Shipman of Penn State devised microscopic criteria to determine if a suspected cutmark should be classified as evidence of butch-

ering. To be accepted as an indisputable cutmark, they say, the mark should be deep and V-shaped, and show indications that it was made on green bone. It should display the “shoulder effect,” a striation made when the shoulder of the tool hits the bone. Another key indicator is a barb, which Kooyman describes as a fishhook-shaped gouge that’s made at the end of a cutting motion, when the butcher draws the tool back toward himself. A suspected butchering cut should also lie in an expected place



on a carcass, such as on the spinal column where muscle mass is heavy, and should be oriented at an appropriate angle to slice through ligaments—like the mark on the Wally’s Beach camel.

After carefully examining the other bones of the camel the team found no other possible cutmarks. The fact that only one was found doesn’t dash their hopes. In fact, as Kooyman explains, it’s common. Chopping or sawing bone with a stone tool rapidly dulls a sharp edge. (See **MT 27-2**, “What It Means to Be Clovis,” for convincing photos of use wear on stone tools.) Undue abrasion would make more work for a flintknapper and

shorten the use life of a tool. Kooyman reminds us that butchering techniques changed dramatically with the introduction of metal tools. No longer does a butcher have to be so careful to maintain a sharp blade.

The evidence suggests that the camel was only partially butchered on the spot and whole sections, like the side of ribs, were hauled elsewhere to complete the process. The reason for this, the team decided, is probably the same reason why the site was preserved and eventually recovered: the wind. No one wants to cut up tonight’s dinner in a swirl of sand.

As for that dinner menu, if camel was actually on it, then can archaeologists continue to dismiss the idea that human hunters may have played a role in making the ancient camel yesterday’s news?

After storming Wally’s Beach

The Wally’s Beach camel bears the mark of humans (in more ways than one). But if early Americans exploited this species, where are all the other camel butchering sites? A possible explanation is that sites like Wally’s Beach, where only a single animal was killed, “are almost invisible archaeologically.” Kooyman explains that “a few bones and an expedient flake might be all that remains,” and that’s not going to

A close up of the butchering mark.

convince anybody. The camel at Wally’s Beach was preserved because wind-borne sand covered the remains swiftly. In most instances, of course, this wouldn’t be the case, and any bones that escaped gnawing scavengers would decay over time, leaving no trace for archaeologists to find. This explains why the archaeologist who comes across a few ancient camel bones dismisses them as purely paleontological evidence and makes no effort to discover human association. The Wally’s Beach camel throws a totally new light on the scene. Today the question is, Now that we know they were prey for human hunters, how do we look for further camel butchering sites?

Suggested Readings

Kooyman, B. P., L. V. Hills, P. McNeil, and S. Tolman 2006 Late Pleistocene Horse Hunting at Wally’s Beach Site (DhPg-8), Canada. *American Antiquity* 71:101–21.

Kooyman, B., L. V. Hills, S. Tolman, and P. McNeil 2012 Late Pleistocene Western Camel (*Camelops hesternus*) Hunting in Southern Alberta. *American Antiquity* 77:116–24.

Kooyman, B. P., M. E. Newman, C. Cluney, M. Lobb, S. Tolman, P. McNeil, and L. V. Hills 2001 Identification of Horse Exploitation by Clovis Hunters Based on Protein Analysis. *American Antiquity* 66:686–91.

McNeil, P., L. V. Hills, B. Kooyman, and S. Tolman 2004 Late

Pleistocene Geology and Fauna of the Wally’s Beach Site (DhPg-8) Alberta, Canada. In *Archaeology on the Edge: New Perspectives from the Northern Plains*, edited by B. P. Kooyman and J. H. Kelly, pp. 79–94. University of Calgary Press, Calgary.

McNeil, P., L. V. Hills, S. Tolman, and B. P. Kooyman 2007 Significance of Latest Pleistocene Tracks, Trackways, and Trample Grounds from Southern Alberta, Canada. In *Cenozoic Vertebrate Tracks and Traces*, edited by S. G. Lucas, J. A. Spielmann, and M. G. Lockley, pp. 209–23. New Mexico Museum of Natural History and Science Bulletin 42, Albuquerque.

Olson, S. L., and P. Shipman 1988 Surface Modification on Bone: Trampling versus Butchery. *Journal of Archaeological Science* 15:535–53.


Our group from Calgary will be ready to revisit Wally's Beach whenever the water level is lowered. Currently it's underwater again, so you can only swim in the footsteps of megamammals. What's important, they say, is to prove that the Wally's Beach camel isn't simply an isolated hunting event. They've got an ear to the wind for news of other archaeological/paleontological remains from the late Pleistocene. Their hope is that their thoroughly documented instance of camel hunting will galvanize other archaeologists into taking another look at camel remains—not

Hills (*near right*) in the lab examining the skull of a horse found at Wally's Beach; Kooyman (*far right*) in New Zealand, 2007.



just newly discovered specimens, but older curated remains as well—for example, known instances of camel bones found in gravels that now deserve closer scrutiny. And the Mahaffy Cache in Colorado has recently produced tools that bear traces of camel protein. The good folks of Calgary reason that since the Wally's Beach camel remains survived, thanks to rapid covering by windblown sediments, it might pay to look for other localities with similar characteristics such as deposits

of wind-blown sediments near pro-glacial lakes or rivers.

Could there exist two sites like Wally's Beach? And when the water level in St. Mary's Reservoir is lowered again, what will it reveal next? No one can say for sure, though it seems this lucky, hard-working team is overdue for, say, a mammoth in showroom condition. One thing seems fairly certain: Wally's Beach still holds hidden treasure. 

—K. Hill

How to contact the principals of this article:

Brian Kooyman
Department of Anthropology
University of Calgary
2500 University Drive NW
Calgary, Alberta T2N 1N4, Canada
e-mail: bkooyman@ucalgary.ca


L. V. Hills
Departments of Geosciences and Archaeology
University of Calgary
2500 University Drive NW,
Calgary, Alberta T2N 1N4, Canada
e-mail: lvhills@ucalgary.ca

Angus Mammoth

continued from page 11

says, “changed archaeology forever because we learned that humans were here at the end of the last glacial period. When Dave Meltzer went back in the 1990s and reexcavated that site we learned a lot more about it because we had better techniques and better ways to date the site, and so forth.”

Revisiting early discoveries is an effective and efficient means

of advancing North American archaeology and the study of the First Americans. That's Steve Holen's firm belief, and he hopes to see more work invested here in the future. 

—Dale Graham

How to contact the principal of this article:

Steven Holen
Department of Anthropology
Denver Museum of Nature & Science
Denver, CO 80205
e-mail: sholen@dmns.org

Suggested Readings

Figgins, J. D. 1931 An Additional Discovery of the Association of a “Folsom” Artifact and Fossil Mammal Remains. *Proceedings of the Colorado Museum of Natural History* 10(2):23–24.

Holen, S. R., D. W. May, and S. A. Mahon 2011 The Angus Mam-

moth: A Decades-old Controversy Resolved. *American Antiquity* 76(3):487–99.

Holen, S. R., M. P. Muñiz, and R. Patten 2008 The Angus Nebraska “Point”: Comment on Howard's Authentication Results. *Plains Anthropologist* 53(207):357–66.