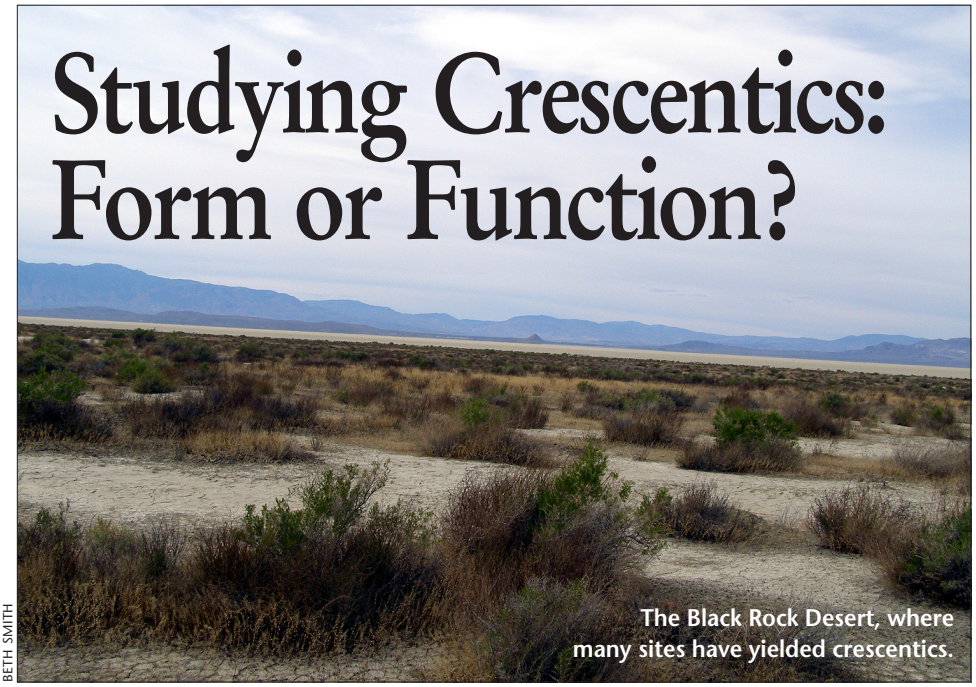
MAMMOTH TRUMPET

Volume 25, Number 3 | Center for the Study of the First Americans | Department of Anthropology
July, 2010 | Texas A&M University, 4352 TAMU, College Station, TX 77843-4352 | ISSN 8755-6898

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

Studying Crescentics: Form or Function?



BETH SMITH

The Black Rock Desert, where many sites have yielded crescentics.

CRESCENTICS, also known as transverse points or simply crescents, are a class of pre-Archaic lithic artifacts shrouded in mystery. They're rare and highly variable in form, there aren't many accurately dated sites where they have been found, and there are no modern-day examples to give us clues about how they might have been used.

Use-wear and residue studies have yielded inconclusive results. Consequently we still aren't sure what role crescents played in the pre-Archaic toolkit. Some scientists feel, however, that function is secondary in the study of crescentics. Such considerations as materials used to make crescents, discard sites, and evidence of possible retooling in production and post-production stages can tell archaeologists a great deal about how early Americans waged their fight for survival in an unfamiliar landscape.

Crescentics 101

Found mostly in western North America (the Great Basin area, Southern California, and the Channel Islands), crescents make up fewer than 5% of the artifacts at most sites. They have been found in the context of the pre-Archaic Stemmed Point tradition of highly mobile hunter-gatherers and with fluted points, which are thought to predate or overlap stemmed points. The intriguing aspect about crescentics is that they are almost invariably associated with

INSIDE

water (pluvial lakes, rivers, waterways). In fact, Eugene Hattori of the Nevada State Museum cites only one exception, a crescent from Humboldt County in

DEPARTMENT OF TRANSPORTATION PHOTOGRAPHER:JULIE DUEWEL

Beth Smith.

Nevada, which was recovered from an upland context.

Many sites in the Great Basin are deflated and lack organic materials, which makes it difficult to date crescents. The Lind Coulee site in north-central Washington gives a minimum date of 7000 CALYBP for crescents found beneath the Mount Mazama ash layer. At the Sun-

NEVADA STATE MUSEUM

Eugene Hattori.

shine locality in Nevada, a crescent was excavated from beneath a layer with a minimal age of 10,500 CALYBP; unfortunately a paucity of datable material means we may never know just how much older it may be.

Thought to be contemporaneous with stemmed and fluted points, crescents are made of similarly tough materials like cryptocrystalline silicates (chert, chalcedony), fine-grained basalts, and obsidian. Chert is the most common. Archaeologist Beth Smith, with the Nevada Department of Transportation, says when they're made of anything else, the material usually matches that of other lithic artifacts at that site.

The term crescent covers a wide assortment of irregular artifacts. Even among the three subgroups (lunate, winged, and eccentric) there is considerable variability in size, craftsmanship, materials, wear patterns, and shape. The average size of crescents is 4–6 cm, but specimens exist as small as 3 cm and as large as 10 cm. Their shape ranges

MAMMOTH TRUMPET

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

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.

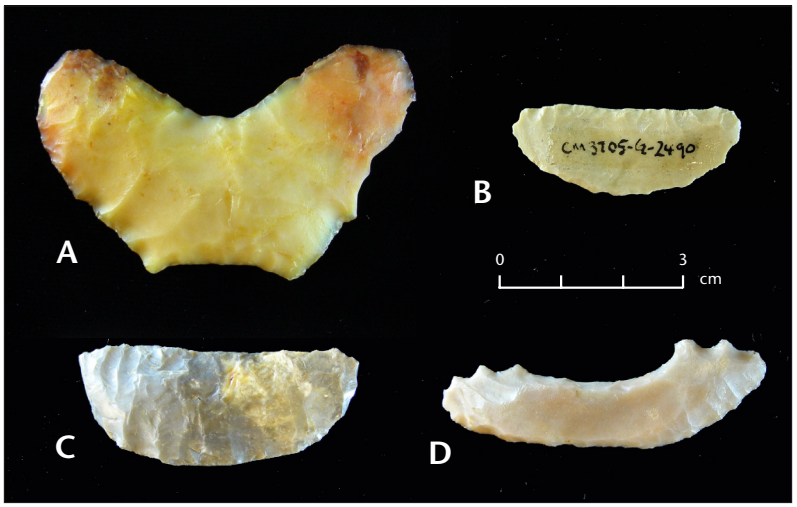
–Michael R. Waters, Director

from crude lozenge-like shapes, to lunate forms, to stylized shapes that appear to bear nodules or even legs. Dr. Hattori points out that the variety of crescent shapes can be organized into a neat continuum linking the primitive lunate versions to the more stylized versions, called eccentrics. He admits that without chronological controls there's no way to know what accounts for the changes in shape. "We don't have a good understanding of the changes in style," says Hattori. "Is it change over time or a change in function?"

In this article we'll discuss the form and function of lunate and winged crescentics of the Great Basin.

Bet you can't guess what this is: Theories regarding use

Archaeologists have known of crescents since the turn of the century, when crescents found on San Miguel Island, one of the Channel Islands off the coast of Southern California, were reported as "implements of surgery" by *American Anthropologist*. Hattori has heard scads of theories on the function of the lunate crescents of the Great Basin. Perhaps the most well known is that they were blunt projectile points (hence the name transverse point) for hunting water birds. "You need a blunt tip to stun the birds rather than to pierce their skin," he says. "Seems every winter there is a photo of a goose on a golf course with an arrow through its neck. They can survive an arrow. It is more effective to stun them with a rock." Native Americans had blunt-ended arrows for this purpose. Beth Smith, however, says there's no way crescents could have been projectile points. "A good portion of crescents, if you look at them edge on, are just absolutely not straight. They are crooked, they're curved, they're bent every which way. Sometimes one tip goes one way and another tip goes the other way." She estimates that over 30% of crescents are so crooked they wouldn't fly true.



ALL: GENE HATTORI

A, winged crescent from Humboldt County, Nevada; B–D, lunate crescents from Long Valley in central Nevada.

Hattori has his own ideas about how lunate crescents of the Great Basin were used: "as side blades on throwing sticks for the procurement of water fowl." The stick he's describing is sometimes called a rabbit stick or non-returning boomerang. Ethnographic examples exist for Native American wooden throwing sticks, but those don't have side blades. It's commonly thought, however, that ancient throwing sticks were made of hardwood with one end weighted for momentum. That weight could have been a crescent. This doesn't explain the absence of crescents at upland sites, though. The throwing stick is traditionally thought to be a very versatile tool, useful in digging, hand-to-hand combat, and other tasks. Discarding such a tool at the shoreline wouldn't make sense.

To haft or not to haft

Whether crescents served as projectile points or side blades, Hattori has seen enough evidence to convince him they were hafted. Breakage patterns on crescentics suggest hafting in the center because the ends often break at the juncture between the haft and unsupported edge. He also observed a curious concave break on the convex surface of some crescents, indicating the haft may have chipped the edge when broken by a twisting motion. Hattori describes it as "a really curious little break, like you took a bite out of it."

Hattori also notes what appears to be intentional dulling on the center portion of many crescents, in some instances by grinding the central edges. Edge dulling was also apparently achieved, he notes, by intentional steep-angled flaking in a manner similar to platform preparation. He feels strongly that both methods were used to prepare crescents for hafting. Early projectile points exhibit similar dulled areas along the basal edges to prevent damage to binding sinew.

Hattori and other authorities have also observed striations between what he believes to be the central hafted area and the winged area. He attributes the diagonal grooves to haft wear. Other researchers identify them as use wear and suggest crescents were used as scrapers. "Despite archaeology being a science, it can be very subjective," Hattori warns. "People looking at the same evidence are coming up with different conclusions. There's a lot that has to be taken into account when you are looking at artifacts both under the microscope and with the naked eye."

Smith says at least six use-wear studies have been conducted on crescentics in recent years. She investigated a larger collection. "Everyone got excited early," she recalls, "thinking crescents must be hafted because of evidence of grinding along the edges. But the grinding is not consistently found in any one spot on all crescents. Some crescents will have this beautiful ground spot on the convex edge, and it is crescents like that, particularly in the Black Rock Desert, that initially made people report hafting." Studying a larger collection, however, Smith found some crescents ground on the tips, some ground on the concave side inside the crescent, and some on the convex edge, without a consistent pattern. Archaeologists Charlotte Beck and Tom Jones (**MT 19-4,** "When the Camel Died, Did Anyone Hear It? Archaeological Research at the Sunshine Locality, Nevada") have looked closely and not found evidence of haft wear. Polish, too, has been inconsistent from one crescent to the next. In short, use-wear studies remain inconclusive.

continued on page 6

Remembering Alan Lyle Bryan 1928–2010

ALAN BRYAN passed away May 14 in Edmonton, Alberta, after a months-long battle with respiratory disease.

In a career spanning half a century, Dr. Bryan with his wife, Dr. Ruth Gruhn, both professors emeriti at the University of Alberta, undertook major archaeological investigations across two continents. His work shook the rafters of the temple of accepted theory and helped set the direction of today's research into the peopling of the Americas. Along the way Alan inspired and launched the careers of a new generation of scientists, and 50 seasons of fieldwork prove he was no academic idler but a dirt-and-trowel archaeologist. Says Ruth of her husband and colleague, "He moved a lot of dirt in his time." The truth of her statement was recognized by his colleagues at the University of Alberta: When Alan retired from teaching in 1993, they presented him with a gold-plated Marshalltown trowel.

A conventional beginning for an unconventional thinker

There wouldn't be anything exceptional about Alan's birth at San Juan Island in Washington State or the years of his youth, the war years, spent in Fairbanks, Alaska, except that as a teenager in Alaska he was deeply impressed by a lecture delivered by Froelich Rainey on early man in America. Possibly this was the event that planted in his mind the seed of doubt about Clovis First, the dogma sworn to at the time by all orthodox anthropologists, which decreed that the first immigrants who trudged across the Bering Land Bridge 13,000 years ago set foot on a hemisphere barren of all human inhabitants.

ROY CARLSON

Alan looking for artifacts at the Mission Ridge site in San Diego, 1981.

Acquiring the academic training needed to pursue a career in archaeology had to wait until Alan, after serving a tour of duty in postwar Korea, entered Pacific Lutheran College in Tacoma, Washington, on the GI Bill. While writing a term paper (not surprisingly, on the initial settlement of the Americas), he interviewed Erna Gunther of the Department of Anthropology at the University of Washington. If he was so interested in the issue, Dr. Gunther told him, why didn't he come to UW? He did. The move gave his academic career a solid foundation and introduced him to the nuts and bolts of archaeology. Alan learned fieldwork skills digging with Carl Borden in the interior of northern British Columbia. For his master's thesis at UW he surveyed shell middens by boat in northern Puget Sound.

The early part of Alan's career was enmeshed with the Great Basin, a region rich in evidence of early Americans. He was introduced to it in the mid-1950s when he surveyed parts of the route of the Pacific Northwest gas pipeline, which ran from Arizona to Washington State. In 1956, while visiting a friend at a field camp near The Dalles in Oregon, he met Ruth Gruhn. In 1958 Alan and Don Tuohy worked with Earl Swanson of Idaho State College on an archaeological survey of southern Idaho. That was when Alan showed Ruth her future dissertation site, Wilson Butte Cave in Idaho. In May 1961 Alan and Ruth were married in Pocatello, Idaho, and went to work with Earl Swanson at the Birch Creek rockshelters.

Alan and Ruth never lost interest in the Great Basin. They excavated at Smith Creek Cave in Nevada in 1971 and 1974, and returned to work at Wilson Butte Cave in Idaho in 1988–89.

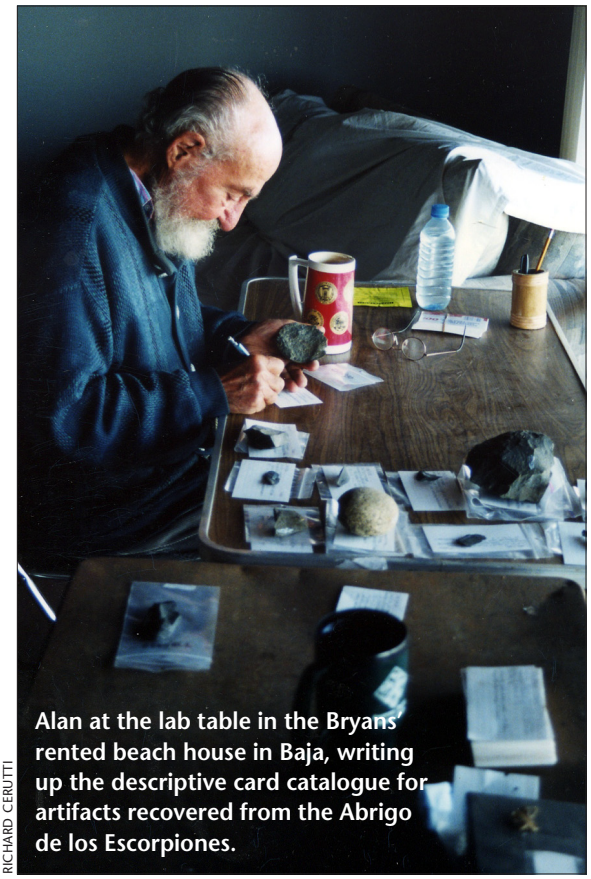
From 1961 to 1963 Alan and Ruth were in postgraduate studies in environmental archaeology at the Institute of Archaeology, University of London. They did geoarchaeological fieldwork in the area of Southend-on-Sea, Essex. In 1963 Alan completed his doctoral work at Harvard. His dissertation, *Paleoamerican Prehistory*, was published by the Idaho State College Museum in 1965.

ROY CARLSON

Alan and Ruth in Wilson Butte Cave, Idaho, 1989.

A new home in Alberta

The Great Basin of the U.S. was one of three regions that exerted a special kind of magnetism for the Bryans. Alberta, Canada, was another. In the fall of 1963, Alan and Ruth accepted teaching positions at the University of Alberta in Edmonton. They became founding members of the Department of Anthropology, where they both taught a variety of courses. From 1964 to 1969 Alan and Ruth surveyed and excavated sites in northern and central Alberta.



RICHARD CERUTTI

Alan at the lab table in the Bryans' rented beach house in Baja, writing up the descriptive card catalogue for artifacts recovered from the Abrigo de los Escorpiones.

Canada treated the Bryans kindly, for which they felt a debt of gratitude. They became naturalized citizens in 1973. In 1970 they had already taken up residence in a comfortable house in Edmonton, big enough for their books and ethnographic collection, where Ruth lives today.

The love affair with Latin America

Alan Bryan will probably be best remembered for his seminal studies of paleo Latin America. Long before the discovery of pre-Clovis occupation at Monte Verde in Chile in 1977, Alan was convinced that archaeological sites in Central and South America rivaled in age Clovis sites of North America. Latin American scientists, he believed, were denied the recognition they deserved, and he was determined to get a firsthand look at their labors.

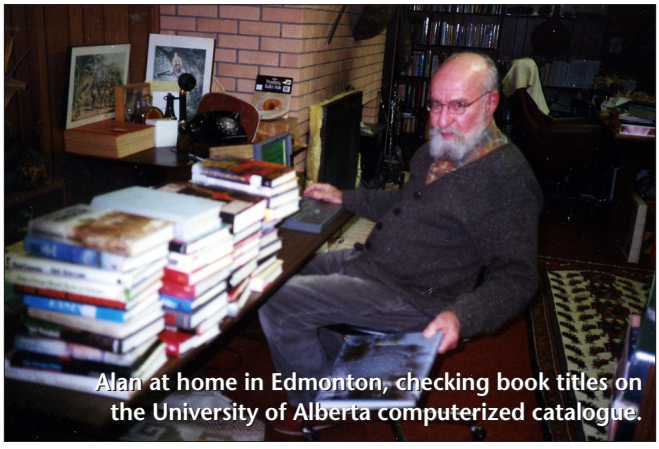
On their first sabbatical leave in 1969–70, Alan and Ruth took delivery of a Land Rover and undertook a year-long tour of Central and South American archaeological sites. Their itinerary reads like a brochure from the American Museum of Natural History: Taima-taima, Muaco, and Cucuruchu in Venezuela; El Abra in Colombia; El Inga and San José in Ecuador; Talara, Chivateros, Pikimachay, and Puentes in Peru; Talabre, Fell's Cave, Loma Negra, Tagua-tagua, and Mylodon Cave in Chile; Intihuasi Cave in Argentina; and Confins Cave, Lapa Vermelha IV, and Cerca Grande in Brazil.

Alan and Ruth later returned to excavate two early sites, Los Tapiales, discovered by Alan in the Guatemalan highlands, and Taima-taima, an El Jobo mastodon kill site in Venezuela. In 1977 they excavated Lapa Pequena in Minas Gerais state, Brazil; and returned again to Brazil in 1984–85 to excavate six caves and rockshelters in central Bahia state.

In the 1990s Alan and Ruth turned their interest to Baja California, Mexico, in search of evidence for an early coastal entry route. Alan conducted extensive surveys of the peninsula in 1993–94. In 1997 and 1999, working with Oregon State University anthropologist Loren Davis, Alan and Ruth concentrated on sites around the Laguna Seca Chapala, excavating the Abrigo Paredón. In 2000 they began work at the Abrigo de los Escorpiones, a rockshelter perched on the interior rim of a small volcano near the coast. As excavation proceeded, what first appeared to be a modest-size rockshelter proved to be a filled-in cavern; Ruth recalls that it took four field seasons to reach bedrock and the rear of the cave. Abrigo de los Escorpiones was Alan's last field project.

A special friendship

The relationship between Alan and Rob Bonnichsen, founder of the **Center for the Study of the First Americans** and its first director, sprang from a chance meeting one day in 1960, when Alan was surveying for caves in southern Idaho (the Great Basin again). At Brown's Bench, an outcropping of obsidian south of Twin Falls that had served as a toolstone quarry since Paleoamerican times, he struck up a conversation with Rob, then a skinny youngster fresh out of high school obsessed with projectile points and other lithic tools he had surface collected over the years. Alan, impressed with Rob's enthusiasm and the remarkable depth of his self-acquired knowledge, suggested he contact Earl Swanson, the archaeologist at Idaho State College, and set about transforming himself from an avocational archaeologist into a scientist. Even as an undergraduate Rob's gifts in practical archaeology were evident, and on his graduation in 1965 Alan encouraged him to enter the graduate program in the new Department of Anthropology at the University of Alberta. There Rob pioneered the methodology of a cognitive approach to the study of stone-tool technology and applied it to analyzing late-Pleistocene bone specimens.



RUTH GRUHN

Alan at home in Edmonton, checking book titles on the University of Alberta computerized catalogue.

In 1974 Dr. Robson Bonnichsen joined the faculty of Anthropology and Quaternary Studies at the University of Maine at

Orono. Ruth remembers the immense pride Alan felt in 1981 when Rob, with funding from the Bingham Trust, founded the Center for the Study of Early Man, later renamed the Center for the Study of the First Americans. Alan, exultant, must have felt he was at his journey's end when Rob in 1999 convened the Clovis and Beyond Conference in Santa Fe, New Mexico. Here for the first time scholars of many disciplines gathered for a frank exchange of arguments for—and counter-arguments against, of course—evidence for Clovis *and pre-Clovis* occupations in North *and South* America.

RICHARD CERUTTI

Alan at the Abrigo de los Escorpiones, examining a sea-mammal bone for evidence of modification.

How do you measure a great man's life?

Gauging the scope of Alan Bryan's life can't be done by any usual standard. Certainly not by the staggering list of books, articles, and monographs he wrote, many of them with Ruth as coauthor. You'll come closer if you consider his lasting legacy at the University of Alberta. Take, for example, the Bryan-Gruhn Anthropology Collection at the University Library. Alan and Ruth donated some 40,000 volumes in 1989, and the collection has continued to grow ever since.

The truest measure is the countless lives he touched and enriched with his gentle nature and patient knowledge. Ruth has been besieged with condolences from acquaintances of Alan's, literally "from Alaska to Tierra del Fuego." Jo Ann Harris, CSFA Advisory Board member emerita, remembers spending four memorable days in a tiny Transiberian railroad sleeping coach peopled by Alan, Rob, herself, and their female Russian translator traveling to Siberia for a conference. "You get to know someone pretty well in those cramped quarters," she says, "and getting to know Alan well was to treasure his sense of humor and humanity." She also spent a couple of weeks as a digger in his Baja California excavation when his partner, Ruth, was hospitalized with an intestinal obstruction (not a fun-filled experience, according to Ruth) and saw how much he relied upon and treasured her. As for best professional moments: "Alan's excitement in Baja when I uncovered an ancient hearth and whale bone yea-many meters down; and his extreme disappointment when the dates came back at some 9000 B.P. [RCYBP]. Way too modern for his working hypothesis of early migration to the 'new' world."

Harris summarizes Alan's life in two sentences that would fit on a telegram: "A wonderful, funny, smart man. The profession will miss him." Which of us wouldn't wish for such a eulogy? MT

–JMC

Studying Crescentics: Form or Function?

continued from page 3

No ethnographic show-and-tell this time

Where are the ethnographic examples for crescents? Did the need for crescents disappear? Was the crescent replaced by another tool as yet unrecognized? Without an ethnographic example it's hard to say conclusively whether crescents were hafted. Hattori notes that an unhafted crescentic, possible related to a Stockton Curve from central California, was found at a 4,000-year-old site in western Nevada. Stockton Curves are lithic artifacts similar to crescents, although they are usually made of obsidian and are serrated and stemmed, but 4,000 years separate the two and archaeologists don't think they are related functionally or culturally. Hattori's example had some sinew wrap and human hair attached to the side of its base. He concludes that either the hair was used to decorate the artifact or the artifact was a hair ornament.

The *ulu* is a curved knife that Alaskan women have been using for 5,000 years to clean fish, but it's much larger than a crescent (as large as 35 cm), doesn't have points, and is made of ground slate as opposed to flaked stone. Moreover, studies show a distinctive use-wear pattern unlike anything seen on crescents.

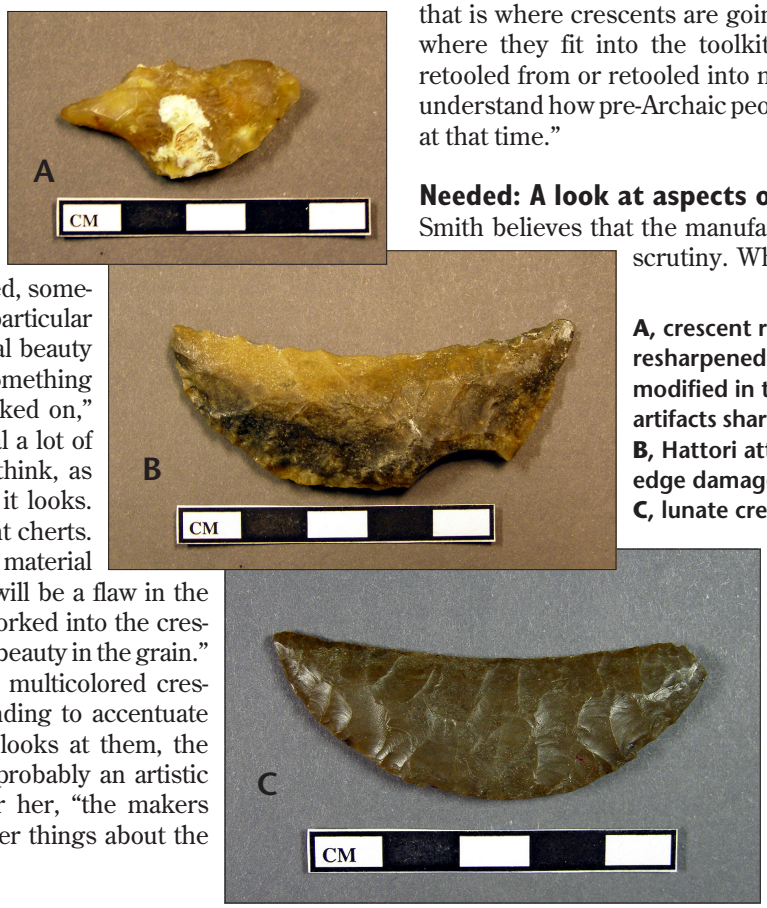
Use of crescents in toggle harpoons has been considered as a possible application, but Smith doesn't think it likely because both bone and wood toggle harpoons and hooks have been found at sites in the Channel Islands along with crescents believed to be contemporaneous. Smith considers it equally unlikely that winged crescents served as the butt piece on harpoons. "There's nothing else in the toolkit to indicate they were used as part of harpoon technology," she argues. "There are things that go along with harpoons, and none of that material is present." What Smith does find consistently in common with crescents is water: "They definitely were used for something that had to do with the shoreline."

What's special, low priority, and valued only at the shore?

If you said pail and shovel, you're wrong. The answer is crescents. At some lake sites numerous camps are found with a similar range of tools, scrapers, and stem points, but only certain locations along a shoreline yield crescents. This leads Smith to infer that the crescent was only a small part of the tool kit, with a specific purpose associated with activities

happening on that particular shoreline. Smith noticed that crescents in obsidian collections tend to be made either of locally obtainable material or, conversely, of material from the farthest distance represented, even if alternative sources existed in between. She believes crescents, because they were apparently useful only on the shoreline, were low-priority tools made on the spot from either locally obtained material or discarded toolstone. This would explain why crescents were left behind on shorelines but not at upland sites, and it would solve the mystery of the unpredictable wear patterns seen on crescents. The variable grinding, use wear, and polish observed on crescents could be remnants of the recycled stone tool's former life.

Smith points out, however, that crescents aren't an everyday tool. They are often extremely finely flaked, sometimes parallel flaked with particular attention paid to the natural beauty of the material. "They are something that can just really be worked on," she says. "And the material a lot of times has been picked, I think, as much because of the way it looks. You'll find the most brilliant cherts. Some of the examples—the material is just beautiful. Or there will be a flaw in the material and that will be worked into the crescent to bring out its natural beauty in the grain." She is most impressed by multicolored crescents flaked along the banding to accentuate the effect. The more she looks at them, the more she realizes there's probably an artistic element to them also. For her, "the makers were trying to express other things about the material."



A, crescent reworked into a drill, not resharpened. Stemmed points were also modified in this way, which suggests the artifacts shared a common lithic technology. B, Hattori attributes this bitelike kind of edge damage to twisting in the haft. C, lunate crescent with tip damage.

Crescents: A study in form

Archaeologists haven't ruled out the possibility that the crescent was solely ornamental, perhaps serving as a fishing talisman or an amulet for protection against drowning. Smith's retooling theory explains ambiguous and often contradictory use wear that has had archaeologists scratching their heads for years. Smith, however, remains ever cautious about the theory that crescents might have had spiritual or ritual significance because "you never find them away from that working environment on the shoreline. Also, you just don't find crescents as part of the grave goods. Even if there is a cache of points, there usually isn't a crescent." Hattori, who enjoys a challenge, finds this puzzle some of the frustration and fun of archaeology. "We don't know what they are used for," he says, "but there's always that chance that we can still find out from the archaeological record."

Crescents disappeared around the same time as larger points. There was a period of a couple of thousand years when, as the Great Basin environment became drier and harsher, the human population became severely reduced. When people returned they had a totally different toolkit containing much smaller notched points—and no crescents. Smith reasons that crescents might be important not just because of what they were used for, but also because they might help us understand the technology of how a pre-Archaic toolkit was put together. "We know they didn't have multiple tools for the same use because weight constraints were really important," she explains. "Your toolkit was designed so that if something broke you could retool it and use it for another, smaller tool. I think that is where crescents are going to be important, identifying where they fit into the toolkit. What they may have been retooled from or retooled into may better help archaeologists understand how pre-Archaic people survived in the Great Basin at that time."

Needed: A look at aspects other than function

Smith believes that the manufacturing process needs further scrutiny. What circumstances favored the manufacturing of crescents? Why do some sites have no crescents while others have a few and still others have hundreds? Environmental components like the water, the plants, the animals could be valuable aids to solving the puzzle. "It isn't going to be short and sweet," quips Smith. "It's not like points, not like something you can stick on the end of an arrow shaft and fire at something. This is something a little bit different." MT

–Dale Graham

How to contact the principals of this article:

Eugene M. Hattori, Ph.D.
Curator of Anthropology
Nevada State Museum
600 N. Carson St.
Carson City, NV 89701-4004
ghattori@nevadaculture.org

Beth Smith
Nevada Department of Transportation
Environmental Division
1263 S. Stewart St.
Carson City, NV 89712
e-mail: BSmith2@dot.state.nv.us

The Little John Site

Rewarding Archaeologists *and* Yukon Natives

LATE-PLEISTOCENE HUNTERS moving south through the valleys of extreme southeast Beringia would have seen a distinctive knoll poking above *Cheejil niik* ("Grayling Creek" in the local Upper Tanana language, English Mirror Creek on English maps) at the easternmost extension of the Tanana River drainage in Yukon Territory, Canada. The knoll, a bump along a series of elevated land fingers reaching from the nearby mountains into the valley, offered a bird's-eye view across a tiny slice of a much broader game-filled corridor through Beringia once known as the Mammoth Steppe. From a southwestern outcrop along this windswept knoll, hunters looking south across the carpet of grass, sage, sedge, and willow would spot bison, wapiti, moose, horse, caribou, and perhaps mammoth flowing along it. At night the watchmen would camp with their families in a depression about 50 m north, sheltered from the wind, and process their freshly killed game.

This tableau is how archaeologists envision the Little John site (KdVo-6) at the sunset of the Ice Age. Lying scarcely two miles east of the Alaskan border, the site encompasses 5,000 m^2 of well-stratified cultural material that spans 12,000–14,000 years of aboriginal occupations, says archaeologist Norman Alexander Easton, a lecturer on northern studies in the School of Liberal Arts at Yukon College in Whitehorse and the principal investigator of the site. The overlook is known as the West Lobe; the East Lobe is the campsite, whose lower levels have yielded a possible hearth and tools for processing game in association with Pleistocene fauna.

ALL PHOTOS: NORMAN ALEXANDER EASTON

View south from the Little John site toward the Nutzotin Mountains and the St. Elias Range. At the time of occupation at the end of the Pleistocene this broad plain would have been treeless herb-tundra, rich with herds of bison and caribou.

AFTER G. R. MACKAY

The location of the Little John site and related late-Pleistocene sites of the Tanana Valley.

Home to hunters through the ages

"What we have here is a site that contains material from yesterday to the first occupants in the region, and it is all in one place," says Easton. Deep cultural deposits include a number of teardrop Chindadn bifaces and microblades most closely associated with the Nenana complex of Alaska, but until now not found in Canada. Easton and his colleagues believe the site "quite likely represents the initial occupation of contemporary Canadian geography by late-Pleistocene humanity . . . making it one of the oldest sites in eastern Beringia."

The Little John site derives its name from a patriarch of the Upper Tanana Athapaskan *Dineh* (people). Like his ancestors and descendants, Little John hunted from the knoll-top location through much of the twentieth century. The site was discovered as part of the Scottie Creek Cultural History Project, a multidisciplinary study of aboriginal occupation along the upper Tanana River basin that Easton began in 1992. Easton launched the project in collaboration with the White River First Nation of Beaver Creek, Yukon, and the Northway, Tetlin, and Tanacross village councils of Alaska, groups that continue to lend financial and logistical support.

Stumbling onto a site unique in Canada

Easton had camped at the knoll on a number of occasions. He knew it was a historical campsite that people still used as a lookout for moose. In view of the fact that the knoll sits within the Alaskan Highway right-of-way, he assumed archaeologists for the highway project, who had scoured the area for potential sites in three previous surveys, had surveyed this one. It was then known as 12-16, named after a nearby highway mile post marker.

Chief David Johnny and the 2009 field crew on an exploratory survey of the middle Mirror Creek valley. Chief Johnny and other experienced natives are Easton's guides on surveys of the bush.

In 2002 Easton, accompanied by tribal members and a few of his students, stopped near there while going up-valley to survey and excavate other sites. Heavy rains having washed out several trails, Easton's troop hunkered down to wait for better conditions. Some students, denied the opportunity to practice archaeology, were getting bored, so Easton led them to the lookout "just for a change of scenery." At the suggestion of Upper Tanana tribal elder Joseph Thomas Johnny, Easton's students dug a dozen test pits in the area. To his great surprise they found cultural material in every one. He returned to the site with field school students in 2003, thinking to spend a week there before moving to another site. By the end of the first week, however, students had recovered all manner of wonderful artifacts, including large biface points and blades and components of microblade technology. A long-term project had been launched.

◄ An atlatl dart recovered from the basal loess levels associated with Chindadn points.

▼ A stone feature associated with bison bones (*circled*) and a hammerstone (*above circle*) in the basal loess, dated to 12,000–14,000 CALYBP.

When they came across Chindadn points in the basal loess layers from the site's West Lobe, Easton realized they had found artifacts never before seen in Canada. As a result, he says, "We have been there since."

Cultural material, spanning the continuum from the Ice Age to the present, pops out in their yearly digs: spent shells, bottle fragments, and military materials related to the building of the Alaska Highway surface in historic upper levels; hammerstones and edge-modified flakes from levels dating from the late prehistoric to 1,250 years ago; microblades, burins, small projectile points from levels associated with the Northern Archaic period (2,000–6,000 years ago); bifaces and examples of microblade technology of the Denali complex associated with such fauna as bison, moose, caribou, hare, and swan from lower levels of both the East and West lobes; teardrop points, large bifaces, blades, scrapers, and burins attributed to the Nenana complex of tools—the first such finds in Canada—from the West Lobe. At the East Lobe, researchers have recovered from loess below paleosols hammerstones, edge-modified flakes, and a flake core directly associated with 14,000-year-old fauna. Site dating has been accomplished principally by AMS (accelerated mass spectrometry) dating of bone collagen. So far, however, failure to find material suitable for radiocarbon dating has frustrated researchers' attempts to date the Nenana/Chindadn–complex component of the West Lobe.

A rich menu for hunters

Well-preserved faunal remains found across the site confirm that early hunters enjoyed a varied diet. With about 120 m^2 of ground uncovered so far, faunal evidence already shows hunters dined on bison, caribou, swan, ptarmigan, squirrel, and hares. Despite the presence of nearby streams, researchers have recovered only one fish vertebra from the site. Easton isn't surprised; fish skeletons, being composed mainly of cartilage, don't preserve well. Moreover, he suspects that stream turbidity caused by glacier melt may have severely reduced the fish population. A suspected mammoth tusk dated 38,160 RCYBP and remains of prehistoric horse, *Equis lambei*, dated 20,660 RCYBP have been found in the area but not on the site, and neither in a cultural context. Easton's teams have dug to a depth of nearly 4 m on site and noted 42,000-year-old soils. "These are not cultural," Easton explains, "but they are organic paleosols with environmental information, and we intend to go to the bottom." Nevertheless he doesn't expect to find cultural material predating 14,000

CALYBP for the simple reason it hasn't showed up anywhere else in the region.

Precisely how materials recovered at the site's overlook relate to those recovered from the depression (camp area) is a fundamental question whose answer still eludes researchers. Says Easton, "We are conceptualizing that the site's hunters and watchmen gathered at the overlook and then camped up behind the hill about 50 meters away, where they would have been out of the wind." But that piece of the puzzle hasn't been finally determined yet.

Two young Tetlin Tribal members. Camille Sanford (*left*) has a degree in cultural anthropology from the University of Alaska Anchorage. Patricia Young, the Environmental Officer of the Tetlin Tribal Village, has a degree in Archaeology from the University of Alaska Fairbanks. Both are graduates of Easton's field program and continue to work with the Culture History project.

Archaeology the hard way: Digging in permafrost

Paraglacial processes, and especially varying depths of permafrost across the site, have complicated Easton's task of establishing stratigraphic correalations for the site. "Sometimes," he says, "we have beautiful stratigraphy, and other times we have a jumbled mess." Particularly slow and arduous is the job of excavating permafrost, which they encounter continually across the site; in some places it's close to the surface, in others it may be at a depth of several meters. What they do is expose it and let it melt. Advanced technological measures for melting permafrost quickly are available, but not on Easton's tight budget. "We are pretty low-tech," he admits. "We put black plastic garbage bags over a unit to increase the thermal insulation, and that helps increase the thawing a little bit." Even here, though, there's a payoff: The permafrost is giving up cultural material, so Easton considers it well worth their while.

Mrs. Darlene Northway of Northway Village shows Jodi Crewe and Magili Perreault how to prepare whitefish for smoking. The egg sac is also smoked and stored for a winter treat.

Easton is pleased with the overall research results, although he allows that some dates need to be more clearly defined. "We do have a strong, clear period of occupancy at the 10,000- to 12,000-year-old range, and that's as old as it gets in Canada," he says. He concedes, however, that the evidence gets a bit tentative near the 14,000-year-old mark, but he hopes future work will clarify this.

The Little John site is contributing to a burgeoning database of regional sites that is shedding light on First Americans issues. Finding Chindadn/Nenana and Denali complexes on the same site is a big plus, for it may help answer long-standing questions about the relationship of two distinct toolmaking traditions that, until now, haven't been found together in Canada. As the database grows, researchers hope to trace more clearly the footprints of the separate cultures through time and space while addressing broader research issues. Until now, Easton and other researchers have been involved in mundane, limited cultural and historical sequencing aimed at finding out who these people were and when they occupied the site. Easton hopes detailed datasets will broaden researchers' goals, perhaps eventually make it possible to define migration routes and discover the subsistence strategies used by these early people as they marched southward through Beringia and into New World prominence. "This site definitely pushes early occupation farther east than previously known," says Easton. For this year's field school he plans to excavate at the 12,000- to 14,000-year-old levels containing faunal remains and renew investigation of the Holocene levels, all with the aim of exploring possible features and refining dates.

Bonding by cooperative efforts

Not only has the Little John site yielded a wealth of scientific information, it has inspirited a unique educational program that fosters cross-cultural understanding as field school students interact with Athapaskan First Nation peoples. Together they work closely with Easton to assemble the pieces of the puzzle that Easton is confident will eventually become a coherent picture of the site. He heartily applauds tribal participation in the project, which is fleshing out a three-dimensional understanding of the *Dineh* and their ancient history. "I couldn't do any of this without their help," he eagerly concedes.

Tunneling into the past at the Little John site is only one facet of Easton's regional research program, which is inseparable from his overall educational mission: To build cross-cultural understanding using as levers ethnography, linguis-

tics, social history, and community involvement and service. For him, this is the heart and soul of the program, itself the culmination of an effort spanning 20 years to build mutual trust and respect with area Indian tribes. Starting with ethnographic work in the 1980s, he advanced to archaeological projects. The first was launched in 1994 when the tribes set aside a long-held taboo and allowed him dig up cultural material at an old village site near the Alaska Highway. Today the tribes are firmly on board with his projects.

Eldred Johnny, grandson of Little John for whom the site is named, displays one of three Chindadn points he has recovered at the site since 2003.

"This is the way these programs should work," says White River First Nation Chief David Johnny, Sr. He recalls that trust and respect for Easton and his programs came slowly, but now their relationship has matured to the point where Easton and his crews are practically one with the tribes. That's a far cry from times past when researchers routinely ignored First Nation people. "Usually they didn't say anything to the First Nation," Chief Johnny remembers. "They would come in and dig a few holes, make their report, send it to [the government of] Canada. The First Nations were left out of it. They didn't have a say. But when Norm came in, he didn't just jump right in and wander around the country without permission. He started talking with the people, learning the culture, learning the language. After a while the people are comfortable with him and they say 'okay' when he is going to dig." Easton succeeded, according to Chief Johnny, because he explained why he wanted to dig, "why he was bothering our ancestors. . . . He didn't push himself, he let time flow through." The next thing you know, he recalls, the people said "'go ahead' so long as you respect our dead people."

◀ Easton discusses the Upper Tanana language with Ruth Johnny, a local certified language instructor who works in the primary school teaching both Upper Tanana and Northern Tutchone to the youngsters of Beaver Creek.

▼ Magili Perreault shares a moment of laughter with Scottie Creek Elder Mrs. Ada Gallon during an ethnographic interview at Big Scottie Creek fish camp.

Building lasting friendships

Easton's field schools cultivate understanding with tribal members by practicing cultural immersion. Students, many from large urban areas in Canada and the United States and consequently unfamiliar with rural life in general and Indian culture in particular, are required to do community service work with tribal members; they help cut firewood for the elderly, go fishing for them, cook for them, assist in hunting and butchering—not the cleanest of activities. They also document place names and enlarge their linguistic knowledge by working with local speakers of tribal language.

Not that the life of the students is all work: Easton and his crew enthusiastically participate in local community events—horseshoe and baseball tournaments, pig roasts, and Canada Day. From these activities has come an enormous reward in cross-cultural understanding.

"Once these kids go through this program," Easton declares, "I can guarantee you they will never put up with any derogatory comments about native peoples." Moreover, the activities pay off in both directions. Chief Johnny is gratified that the native people, young and old alike, who participate are "contributing to the students' understanding of the vibrancy and vitality" of the native communities and sending forth ambassadors for their way of life.

A win-win compact for both partners

Chief Johnny has watched Easton's students evolve in their understanding of native ways. For example, some students didn't want to get dirty at first. But after working with native people for a while—cooking moose stew, cooking bannock, eating "moose guts," cutting up the meat—they gained a broader perspective on native culture. He says that "by the end of the summer they were getting dirty quite regularly."

As a result of the program, Chief Johnny's own people have found a deeper appreciation for their ancestors. He recalls candidly that at first there was very little interest among some of his people. "You know," he says, "Western culture kind of blinds you about your ancestors." Individuals sometimes down-played cultural history while reaching instead for rapid assimilation. But when Easton's crews dug up cultural material and explained it, Chief Johnny's people found renewed interest in ancient methods and deep appreciation for the skill of their forebears. Some, for example, were surprised to learn that their ancestors were able to "cut up a moose with a little rock." Now he is amused to see a "little tent city" spring up around the archaeologists each year as tribal members enthusiastically participate in every phase of the program and embrace incoming students. Come tea time each day, tribal elders share long-forgotten stories with the students as they sit around a large fire.

Northway History Days at Deadman Lake, August 2009. Several times a year Easton gets together with the Native people of the valley to share food, conversation, and their findings.

Easton is humbled by the gains he and his program have made. Finally, after the years it took for people to become "more comfortable" with him and his agenda, the program has become a two-way street of learning. Former field school students show up years later just to work with tribal members, and many routinely correspond with tribal members they have bonded with. Likewise, many tribal members working on the archaeological projects go on to seek higher education, some in anthropology. "It's a fact," Easton tells us, "that finding old Pleistocene stuff is exciting and wonderful, but in terms of the educational program, the heart and soul is the social interaction—the archaeology is just a vector for that to happen."

There is no greater measure of the great respect Easton enjoys than that the *Dineh* have offered him one of their highest honors, a gravesite on their land.

–George Wisner

How to contact the principals of this article:
Norman Alexander Easton
Lecturer, Anthropology
Yukon College
P.O. Box 2799
Whitehorse, Yukon Y1A5K4
e-mail: northeaston@gmail.com

David Johnny, Sr.
Chief, White River First Nation
General Delivery
Beaver Creek, Yukon YOB1AO
e-mail: huskaiy@wrfn.yk.ca

Suggested Readings

Easton, N. A. 2008 *Archaeological Investigations at KdVo-6 and Regional Survey about Beaver Creek, Yukon Territory, Canada*. Scottie Creek Culture History Project Research Manuscript 2008-01. Whitehorse: Northern Research Institute.

Easton, N. A. and G.R. MacKay 2008 Early Bifaces from the Little John Site (KdVo-6), Yukon Territory, Canada. *Projectile Point Sequences in Northwestern North America,* edited by R. Carlson and M. Magne, pp. 263–82. Simon Fraser University Press, Burnaby, B.C.

Easton, N. A., G. R. MacKay, P. B. Young, P. Schnurr, and D. R. Yesner 2008 *Nenana in Canada? Emergent Evidence of the Pleistocene Transition in Southeast Beringia from the Little John Site, Yukon Territory, Canada.* Text and illustrations of a presentation to the Society for American Archaeology, 28 March 2008, Vancouver, British Columbia.

——— 2010 Chindadn in Canada—Emergent Evidence of the Pleistocene Transition of Southeast Beringia as Revealed by the Little John Site (KdVo-6), Yukon Territory, Canada. *From the Yenisei to the Yukon: Interpreting Lithic Assemblage Variability in Late Pleistocene/Early Holocene Beringia,* edited by T. Goebel and I. Buvit. Center for the Study of the First Americans, Texas A&M University Press, College Station, Texas.

Easton, N. A., D. R. Yesner, V. Hutchinson, P. Schnurr, and C. Baker 2009 Wisconsin Interstadial(?), Terminal-Pleistocene, and Early-Holocene Radiocarbon Dates from the Little John Site, Southwest Yukon Territory, Canada. *Current Research in the Pleistocene* 26:47–50.

West, Frederick H., ed. 1996 The Study of Beringia. In *American Beginnings*. University of Chicago Press, Chicago and London.

Additional publications and manuscripts related to Easton's work on the borderlands can be found at **http://dl1.yukoncollege.yk.ca/anth225/N_A_Easton_Publications**

On the Trail of the Domestic Dog

Part II

OUR FIRST site/sight of the dog in North America The Koster site in the Illinois River Valley yielded skeletal remains of three domestic dogs dated to 8500 RCYBP (about 9500 CALYBP). The remains, discovered in shallow pits, significantly constitute the earliest known dog burial in North America. Interestingly, Michael Wiant and Darcy Morey's article in the 1992 issue of *Current Anthropology* surrenders the debate about dog domestication to speculation because they allow that "canid domestication may have occurred more than once and in more than one place." Of course, their article was written nearly 20 years before Savolainen's team launched their milestone study that fuses genetics with archaeological expertise. It's worth noting, also, that even world-famous scientist and naturalist Konrad Lorenz was absolutely convinced of the *dual* domestication of wild canines, the yellow jackal and the northern wolf (**MT 24-4,** "Big Black Wolf"), though modern genetics studies have refuted his theory of jackal ancestry.

DEL BASTON, CENTER FOR AMERICAN ARCHEOLOGY

Aerial view of the Koster site, 2003.

There can be no doubt, however, that the spread of domestic dogs in the New World played a key role in refining human hunting skill during the Holocene. "Dog domestication in this region occurs long before the advent of plant cultivation," says Dr. Wiant. "The Koster dogs were interred in a settlement that was occupied 8,500 [radiocarbon] years ago, when hunting and gathering strategies provided subsistence." Morphological evidence, including the crania and mandibles, confirms that the Koster dogs were, in fact, domestic. The very nature of the Koster site, which includes 25 cultural components representing early-Archaic human occupations, verifies that humans and dogs lived in close proximity. Nevertheless, Wiant and Morey cannot describe with certainty the role these dogs might have played in their domestic relationship with humans.

That the Koster dogs were deliberately buried with their bones intact invites us to surmise that dogs shared an affectionate relationship with humans and that their existence surpassed strictly utilitarian value. Wiant notes that "based on two observations: 1) the remains of these animals were intentionally buried and 2) a lack of evidence that they were used for food, it appears they were appreciated." It's unlikely, however, that they were mere pets. "Naturally, hunting and security come to mind when one thinks of the roles of dogs in contemporary societies," Wiant explains, "so it seems reasonable to conclude they served in the same capacity in the past." The Koster site gives us a glimpse into the old ways of the New World while recommending platforms for new research.

Asked *why* the domestic dog seemed suitable to receive human affection during this prehistoric time, Wiant answers obliquely by recalling "an interesting theory about wolf domestication that suggested that people didn't domesticate wolves, wolves domesticated people. I suspect wolf domestication occurred in many places at many different times and perhaps under different circumstances." Clearly, Wiant is dubious about evidence set forth by authorities like Swedish geneticist Savolainen, who practice a highly specialized science. He concedes, however, that "some groups may have been accompanied by wolves/dogs when they entered the Western Hemisphere, but again I'm speculating. Whatever the circumstances, they are a part of life in the Midwest early on."

TAMU anthropologist David Carlson offers a different take on the significance of the Koster site and its dogs. "It [the Koster site] suggests that people viewed dogs differently from other animals. If they buried dogs, they viewed dogs more like people than other animals," he explains. "I talked about dogs for the things they did for people, but we could also look at the dog's perspective—what did people do for dogs?" Dr. Carlson believes that human camps generated garbage that provided a reliable food source for

wolves that might have encouraged them to become more accustomed to humans. "The domestication process could be one of mutual accommodation that only later become one of interdependence. Note that this possibility is more likely if people are sedentary. Otherwise the wolves could just wait until they leave to feed on the garbage," he says. This symbiotic relationship was the likely impulse that gradually galvanized the domestication process in both the Old and New Worlds. As this relationship developed, Carlson adds, people found other ways to use dogs and then systematically began breeding them. He thinks that "it would be nice to see when some of the major breeds were started, which we could get with current genetic evidence—extracting DNA from bones." This tactic would demand dog bones in early American sites, which professionals haven't yet discovered. In time, however, Carlson hopes to learn "how the first major breeds were developed and how quickly dogs were subdivided for different areas and different purposes."

BOTH: CENTER FOR AMERICAN ARCHEOLOGY. MICHAEL WIANT

Koster Horizon 11 dog.

ILLINOIS STATE MUSEUM

Wiant, 2005.

Dogs and Clovis: still unresolved

Did the domestic dog make an appearance in the Clovis culture? "I haven't heard solid evidence that domesticated dogs lived with Clovis people," says Gary Haynes, an archaeologist at the University of Nevada at Reno and one of the leading experts on Clovis. He ventures the opinion that Clovis people, the first human inhabitants in the New World, probably had dogs with them. "Dogs may have been useful as game trackers or 'harriers' that kept animals preoccupied while hunters approached," Dr. Haynes explains. "Dogs also may have been useful as sentinels around camps to warn people of nearby carnivores."

Fiedel adds that there already exists important evidence of early canine assistance in the form of transportation. Four domestic dog burials were recovered at Dust Cave in northwest Alabama, and those have shoulder wear on the bones, indicating their use as pack animals. Dust Cave is remarkable for its preservation of organic remains, including charred plant remains and animal bones. The site contains over 6 m of sediments dating from 10,500 to 5200 RCYBP, making the early-Holocene dogs possible contemporaries of the Koster dogs; these deposits include a basal late-Paleoindian component with an age of 10,500–10,000 RCYBP, overlain by two early-Archaic components (Early Side Notched, 10,000–9000 RCYBP, and Kirk Stemmed, 8500–7000 RCYBP) and two middle-Archaic components (Eva/Morrow Mountain, 7000–6000 RCYBP, and Benton, 6000–5200 RCYBP). Fiedel strongly believes that domesticated dogs were brought by Clovis people from Beringia because both the genetics of ancient and living American dogs, and their skeletal anatomy—particularly the shape of the lower jaw—indicates their descent from Asian, not native American wolves. Furthermore, he says that there is "no evidence of significant cultural contact between East Asia and interior North America between the time of Clovis entry (13,000 CALYBP) and the date of the Koster dogs," which would mean dogs couldn't have been introduced during later migrations.

Clovis people were nomadic hunter-gatherers, without villages, crops, or livestock. Hence the sedentary lifestyle that supposedly gave rise to domestication in East Asia has no bearing here. Savolainen resolves this disparity by theorizing that dogs could have "spread through trade from farmers to their neighboring hunter-gatherers," who in turn brought dogs and their nomadic lifestyles with them to the New World. Haynes remains optimistic that evidence of dogs may eventually be found in association with Clovis people. "Short of finding dog skeletons in Clovis sites," he tells us, "I suspect it may be possible to find indirect evidence for the existence of dogs. Expert taphonomists might be able to discover typical doglike gnaw damage on animal bones from Clovis campsites or killsites." He warns that this task isn't as simple as it sounds, in view of the fact that large dogs gnaw bones in ways quite similar to the ways that wild wolves gnaw them. "But with luck, there may be some identifying differences such as the existence of a 'kennel' pattern that I named years ago to refer to gnaw damage by bored or captive animals."

RENEE WALKER

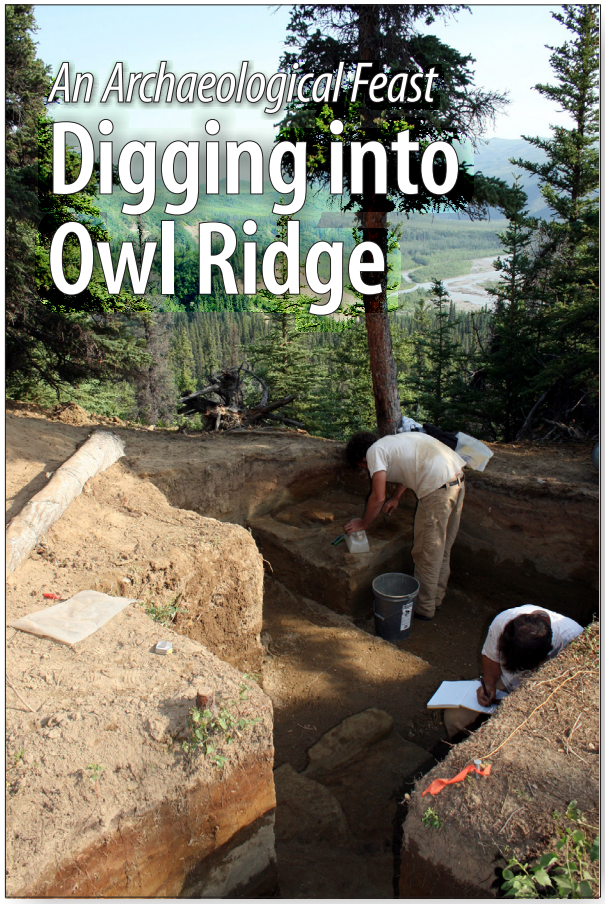
Walker with her students in the field at Oneonta, April 2009.

Why is this important to us?

Dogs seem to have been uniquely mobile. They are the only domestic animals that accompanied humans to every continent in ancient times. Though dogs didn't necessarily spread in connection with human migrations or with the spread of agri-

continued on page 20

An Archaeological Feast
Digging into Owl Ridge



ALL PHOTOS: KELLY GRAF

High above the Teklanika River, TAMU graduate students John Blong (*center*) and Josh Keene excavate and record findings at Owl Ridge in July 2009.

RIGHT NOW Kelly Graf is busy discovering Alaska's ancient human history. Whether troweling through a layer of paleosol or collecting rock samples from a nearby waterway, she's gathering evidence to help answer the tough questions about the timing of ancient immigration into Alaska, the different toolmaking technologies that were used, and the changing ecosystem these unintentional explorers had to face.

She's doing this from a remote site called Owl Ridge in central Alaska. Remote is the word. Owl Ridge lies just outside of the northeast corner of Denali National Park in the foothills of the Alaskan Range, a stone's throw east of the Teklanika River. Getting there requires a little more than a flight to Fairbanks and a sturdy pair of hiking boots. The nearest road a vehicle could possibly traverse is 20 wilderness miles away, which means all goods and equipment have to be flown in using a helicopter with an external sling load. All gear must be light and minimal. "We eat a lot of spam," Dr. Graf says, and you can almost picture her winking.

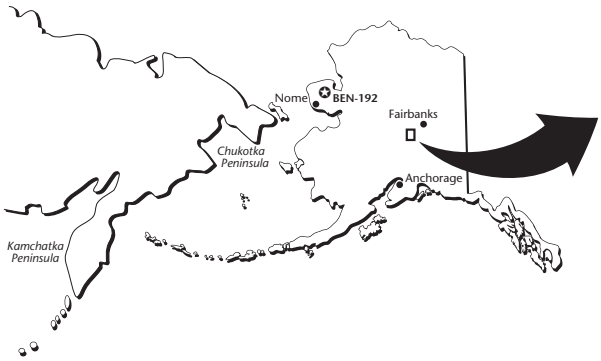
Owl Ridge has the potential to be a very important site, but before looking into the questions it can answer in the future we must first understand its past.

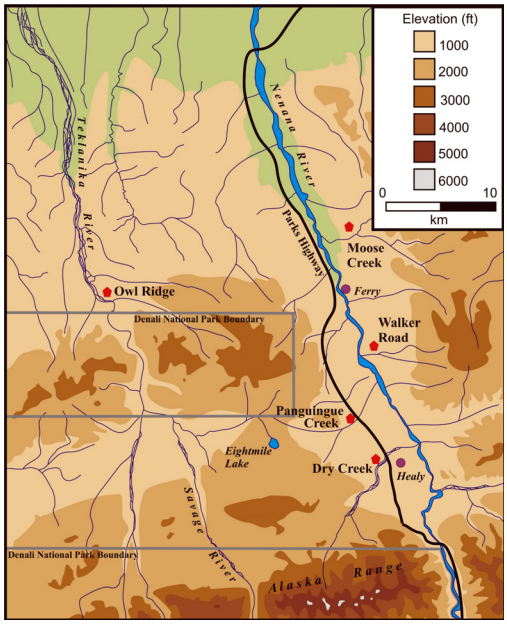
Owl Ridge: A history

History and prehistory are, of course, two different entities. Graf and her colleagues are currently excavating Owl Ridge to uncover its prehistory layer by layer. But why the sudden interest in a site that first came to light in 1976? For that answer we need a little history.

When originally investigated in the late '70s, Owl Ridge was thought to contain two possible components that dated to the early Holocene. Between 1982 and 1984 the site was revisited by P. G. Phippen, a graduate student in Anthropology at University of Alaska Fairbanks, who dug test excavations and came up with new evidence. This site contained not two different components but three, dated in the range of 13.3–7.8 ka (13,300–7800 CALYBP). The oldest cultural level, Component 1, he determined was of the Nenana complex after finding a Chindadn preform and a large ovate biface, artifacts characteristic of this complex. The younger levels, Components 2 and 3, he dubbed Denali. Because of scanty information, however, these assignments were considered tentative. The Nenana appellation caught Graf's attention and is one of the reasons she was first attracted to Owl Ridge.

The Nenana complex, named for the Nenana Valley in central Alaska, is thought to date to 13.3–13 ka. It's defined by petite teardrop or triangular Chindadn points, small bifaces, simple flake tools, and—most importantly—an utter lack of microblades. Microblades, Graf explains, are tiny blades 5–7 mm wide (**MT 21-1,** "Traveling Light on the Trans-Siberian Trailway: The Studenoe 2 Site"). "Inset into the sides of slotted osseous points or knives," she explains, they are particularly handy for your average ancient big-game hunter on the go. The Nenana complex is characterized by an "expedient set of toolstone procurement and reduction strategies." Denali, by comparison, usually younger than





The Problem with Alaskan Fluted Points

When Kelly Graf wraps up Owl Ridge for the season she heads west (almost as far west as she can go, in fact, without ending up in the East) with Ted Goebel, Associate Director of the Center for the Study of the First Americans. With their crew they will launch a full-scale excavation of an intriguing site on the Seward Peninsula in hopes of resolving what Dr. Goebel calls the "Alaskan fluted-point problem."

The site, called BEN-192, lies two miles north of Serpentine Hot Springs in the Bering Land Bridge National Preserve. At this moment the site is something of an enigma, but once it has been excavated it may become the key that unlocks the secrets of Alaskan fluted points. Let's first address what the problem is, then we'll discuss BEN-192 and why it's important.

That thing called Clovis

Of all lithic tool technologies in the Americas, none gets more publicity than that of the Clovis culture. Clovis sites are found nearly the entire width and breadth of North America, from the Pacific to the Atlantic, as far south as Mexico and as far north as Canada and Alaska. In 2007 Mike Waters and Tom Stafford redated Clovis sites across the continent to 13,100–12,900 CALYBP (**MT 22-3,** "Clovis Dethroned: A New Perspective on the First Americans"). Standing front and center on the Clovis stage are those conspicuous fluted spear points.

There's a problem, however, with Alaskan fluted points. Fluted points are abundant in Alaska, but dates for them aren't reliable. Most have been surficial finds; a few were shallowly buried. Lacking stratification, the archaeologist's best friend, dating artifacts becomes anyone's best guess. Attempts to date fluted points found in shallow deposits using C-14 and obsidian-hydration techniques haven't been informative. Often the dates are either much younger than those from secure sites in the temperate U.S. or have uncertainty bounds so great they're unusable. Relying on the scanty data obtained so far, many archaeologists believe that Alaskan fluted points are younger than their southern cousins; others contend they are at least as old as Clovis in the south. Still other scientists argue that fluted points found in Alaska may be evidence of a reverse migration of Paleoindians, or even a completely unrelated lithic industry, an independent invention in the north. The point is that all these theories need to be tested. "The bottom line," says Goebel," is that we still don't know how old fluted points are in Alaska." Finding out how old they are is Goebel and Graf's mission.

The Serpentine Fluted-Point Site

In 2005 the National Park Service found a fragmented fluted-point base on the surface of what was about to become BEN-192. Test units put in by Robert Gal, Chris Young, and Sabra Gilbert-Young of the Park Service recovered stone artifacts along with wood charcoal, which dated to 12,000 CALYBP (**MT 24-3,** "Fluted-Point Technology in Alaska: An Early Example from the Seward Peninsula"). In 2009 Goebel and Graf revisited the site with Gal. Accompanying them were Sergei Slobodin of the Russian Academy of Sciences, an authority on early Beringian technology, and CSFA Director Mike Waters, who contributed his expertise in geoarchaeology. What they found was a site that begged to be excavated. During the surface survey they discovered two more fluted points. They weren't datable, of course, but they encouraged Goebel and Graf to dig test units of their own. In one unit near the 2005 excavation they discovered a hearth feature. Within it was a channel or fluting flake, along with three possible microblades and hundreds of bone fragments. And then, 20 cm away, they found a fluted-point base in situ. In the lower paleosol they found even more artifacts accompanied by charcoal. "Our test excavations," Goebel declares unequivocally, "showed conclusively that a fluted-point assemblage exists in a buried and stratified context." It's also backed by the hearths and faunal remains needed to date it. In fact, Goebel has sent samples to a laboratory for C-14 dating and now awaits the results.

Clearly BEN-192 merits a closer look.

The most ancient site

Fluted points aren't the only mystery to be solved. On the Bering Land Bridge—the Chukotka Peninsula in Siberia, the Seward Peninsula in Alaska, and the land now below the water's surface that joins them—there isn't a single site that predates Clovis. In fact, the earliest secure site is Trail Creek Cave 2, which dates only to 10,200 CALYBP. Trail Creek Cave 9, dated to 15,000 CALYBP, now doesn't appear to have human presence as originally thought. So currently BEN-192 is the closest site on the remnant Bering Land Bridge that dates to the late Pleistocene.

On the other side of that now submerged land bridge, matters are just as baffling. There are sites in Asian Beringia containing wedge-shaped microblade cores and microblades, artifacts diagnostic to the Paleolithic. Unfortunately these tend to be surface sites or very shallow sites that can't be securely dated. To further complicate the mystery, artifacts from Kamchatka and the Kolyma River basin in Siberia date to 13 ka, is recognized by an assemblage of burins, wedge-shaped cores, and, of course, microblades. Both these complexes have been found in sites across Beringia, from Alaska to Kamchatka in Siberia. What makes Nenana and Denali such a fascinating tug-of-war is that microblades were found at Swan Point, the oldest site in Alaska, dating back to 14 ka, yet considered Denali (**MT 20-1,** "Early Americans in Eastern Beringia: Pre-Clovis Traces at Swan Point, Alaska; **MT 24-1,** "Clues from

much earlier than Clovis, yet two sites in Siberia, Chel'kun and Ananaiveem-1, thought to date to the Pleistocene turned out to be younger than 9500 CALYBP. This proves the danger of dating a site on its assemblage alone.

According to our theories of colonization and genetics studies, *Homo sapiens* crossed the Bering Land Bridge sometime after 20 ka. But where are the sites that support this? That's what Goebel wants to find out. "There is an obvious paradox," he says, "between what we know about the archaeological record of the Bering Land Bridge and theoretically what we infer should be there." Perhaps once BEN-192 has been excavated we'll have to do less inferring.

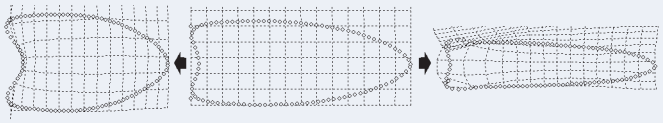
JOHN BLONG

Smith at the Owl Ridge site, 2009.

Can we call it Clovis?

Beyond dating, what else can we learn from the fluted points BEN-192 has to offer? Goebel plans to glean every speck of information. Besides standard technological analyses of physical and chemical properties, he also intends to put into practice a computer-assisted technique known as geometric morphometric analysis. For this part of the research he's enlisting the help of Heather Smith, a Ph.D. student in Anthropology at TAMU.

Biologists originally developed geometric morphometric analysis to study the shape of organisms, such as fish, to investigate microevolution in specific environmental contexts, and it proves just as effective in assessing differences in shape among projectile points. Traditional morphological analysis of stone tools involves measuring with calipers distances between standard defined locations on the artifact. Although this traditional technique has contributed significantly to archaeology, it risks losing details of the original shape. Geometric morphometric analysis enjoys the benefit of preserving the entire geometry of the artifact throughout analysis. After digitizing a high-resolution photograph of the artifact, the outline is defined by a series of adjacent dots. Each dot is assigned an X-Y coordinate and projected onto a grid. With each new shape, the grid morphs, or bends, to accommodate the unique position of the outline dots. Variability among specimens can then be studied in detail by examining and comparing the degree and nature of the bending of the grid.



HEATHER LYNN SMITH

In computer-assisted geometric morphometric analysis, a grid designed to fit the dimensions of an archetype, in this case the "perfect" Clovis point (*center*), conforms to the outline of a shape being analyzed (*left, right*). The amount the grid bends and warps in different dimensions tells how much the analyzed shape deviates from the norm.

Shape analysis is a technique new to archaeology that discerns commonalities among specimens. Oversimplifying, it tells us how much you can distort an object in various dimensions and still call the shape a member of the same family. In 2009 Smith, with the help of Dr. Thomas DeWitt, associate professor of Ecology and Evolutionary Biology at TAMU, took it for a test drive using 123 complete early fluted points from the best-dated Clovis sites, caches with diagnostic Clovis points, and sites with the earliest fluted points in a region, which represent the first human inhabitants in the area. Sure enough, they found "interesting patterns of geographic variation associated with regional variants and special gradients forming what appear to be variations in tool-making norms." In other words, knappers in South Carolina and Montana both made Clovis points, but each with a regional flavor. The next logical step, Goebel tells us, "will be to investigate the development of regional fluted-point traditions, among them the northern fluted-point complex of Alaska and Yukon," and to discover the relationship of northern fluted points to those of the continental United States. "Was there a diffusion of fluted-point characteristics from the lower 48 to Alaska," Dr. Graf asks, "or vice versa?" With luck, time and the Serpentine Hot Springs site will tell.

With hopes to dig

BEN-192, sitting on the brink of the Bering Strait almost nose to nose with Siberia, likely holds information about the timing of the first American immigration. It may also shed light on those microblades that mysteriously appear then disappear in sites across Beringia, as we discuss in the adjoining article on the Owl Ridge site. At the time of this writing Goebel and Graf have received funding for the project from National Science Foundation and National Geographic Society and plan to return in late summer to BEN-192, the site Goebel calls "possibly the first site on the Seward Peninsula that dates to Land Bridge times."

–K. Hill

the Ashes: A Closer Look at Swan Point"). Then starting around 13.7 ka microblades fall off the map, only to reappear in 13 ka and continue on a fruitful run into the Holocene (until about 2 ka).

Rediscovering an old dig

After Phippen's excavations in the early '80s, Owl Ridge lay fallow. Its isolation makes it likely no human being visited there again until 2007, when Graf and company arrived on a scouting

mission. They were eager to investigate the geological context and to see if the site might help define the relationship between Nenana and Denali.

As archaeological sites go, Owl Ridge is choice. Its remote location has protected it, keeping it unplundered and stratigraphically sound. Just as Phippen had stated, Graf's team found three stratigraphically separate components, all deeply buried. Test units revealed well-stratified walls spanning from the late Pleistocene to the early Holocene. Complete with datable material, these profiles read like the Rosetta stone of Pleistocene/Holocene stratigraphy for central Alaskan sites. This evidence, supported by new radiocarbon dates, told Graf and her team that Owl Ridge was likely to illuminate the timing of human dispersal into the New World, any kinship in Upper Paleolithic technologies between Siberia and Beringia, and the ecology of Beringia. So they made arrangements to investigate further.

In July 2009 Graf flew back to Owl Ridge with a five-person crew and set to work on the site, which covers an area of approximately 20,000 m^2. They camped near the river about a kilometer from the site, which they hiked to every day. Bears are more than a possibility at Owl Ridge. "Last year," Graf remembers, "we had a black bear visit the site." The crew was safe in camp at the time, but the bear made itself known by stumbling into the excavation (it doubles as a bear trap), destroying a profile wall in the process of getting out and venting its frustration by biting a hole in a field-gear storage box. Perhaps this is a sample of what life might have been like for those ancient Americans.

Clean stratigraphy makes Owl Ridge a valuable site.

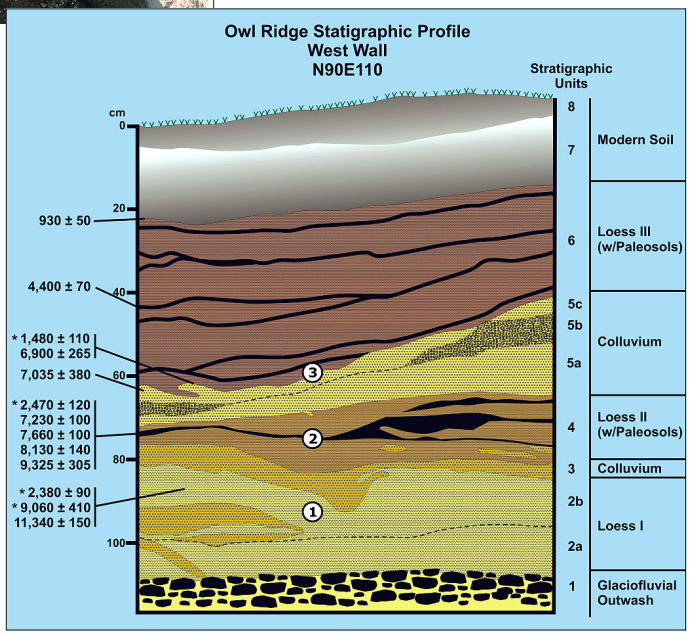
Imperfect timing

With a little luck X will mark the spot. Owl Ridge might help clarify when *Homo sapiens* first crossed from Siberia into Alaska and began populating the Western Hemisphere. Genetics has already given us part of the answer. Studies of mtDNA and Y-chromosome lineages determine that Siberian and Native American haplogroups shared the most recent common ancestor as recently as 20 ka. That gives us one bookend. The other is 14 ka, the date for Swan Point. What now needs to be defined is the precise chronology of events that occurred in the 6,000 years sandwiched between them.

Genetics studies confirm that humans reached the New World after the last glacial maximum. In other words, their first look at Alaska was not of a brutal land of solid glacier. Molecular genetics further reveals that after reaching Beringia, these wanderers paused for a few millennia before dispersing. The clue to this pause, known as the "Beringian Standstill," is a subhaplogroup found in Native populations throughout the American continents that isn't present in Asia; this indicates that the mutation must have evolved after the estrangement of the Siberian and American groups. Geneticists estimate the groups separated sometime between 16.6 ka and 11.2 ka. This is compelling evidence. Unfortunately, we don't have evidence from the archaeological record to confirm the genetics conclusion. Sites like Owl Ridge need to be thoroughly excavated to discover if human genetics and the archaeological record are telling the same story.

Today Graf is busy prying loose the secrets of Owl Ridge. Last summer's dig yielded some conclusive dates. The youngest of the levels, Component 3, hasn't divulged any diagnostics or datable material. However, owing to clean stratigraphy and its uppermost location, we know it's younger than Component 2, which has been solidly dated to 12.5–11.5 ka. Component 1, the oldest, has been dated to 13.5–12.7 ka. This date ranks Owl Ridge as one of the oldest sites in Alaska.

Does Graf believe this summer's dig could push the earliest human presence at Owl Ridge even further back in time? She mentions offhand that some artifacts were found below Component 1, but she is too levelheaded a scientist to get excited without more conclusive evidence. These artifacts, she explains, were found vertically oriented and may have been displaced below Component 1 by cryoturbation (postdepositional freeze-thaw action). "Nevertheless," she says, undaunted, "we are keeping our eyes open for an older cultural occupation."



Complex complexes and missing microblades

Another field her research may illuminate is tool industries utilized on either side of the Bering Land Bridge. Do they have any similarities? It turns out they do. Across the Bering Strait in Kamchatka is a tool complex known as Ushki (**MT 18-1,** "Hunting Pre-Clovis in Siberia: Year 2000 Excavations at Ushki, Kamchatka"), characterized by stemmed bifaces and, more importantly, not a trace of those highly diagnostic microblades. Interestingly, Ushki is a contemporary of Nenana. Is this more

than a mirrored coincidence? It also once again raises the question, Why the disappearance of microblades? Adding further confusion are two other complexes. The first, which is possibly contemporaneous with Nenana and Ushki, is the Tuluaq-Sluiceway complex in northwestern Alaska. Its lithic technology is defined by large bifacial lanceolate points. Dates for this site are shaky, currently placed in the range of 13–11.5 ka. What adds piquancy to this picture is that the toolmaking technique found at Tuluaq-Sluiceway complex is apparently absent of microblades.

The second complex, Mesa, coincides with the later Denali complex. Mesa is interesting because of its paucity of microblades and microblade cores. The few that have been found are possibly intrusive. The picture is further complicated by other Denali assemblages, such as those from Panguingue Creek and Carlo Creek, that also lack microblades. Authorities have proposed numerous theories to account for why microblades appear in Alaska's oldest site, Swan Point, then disappear for a few hundred years before resurfacing in some, but not all, later complexes. So far, though, no theory has all members of the scientific audience bobbing their heads in unison.

The answer to this conundrum may lie in differences among populations of people, cultural traditions, or hunting methods. "Our own preliminary research," says Graf, "suggests that Nenana and Denali may have resulted from different provisioning strategies and land use." Archaeologists can come up with hypotheses all day long, but they have to be tested. To do this, sites are needed that span the late Pleistocene/early Holocene transition. Owl Ridge fits that description.

Using last year's data, Graf was able to substantiate some of Phippen's conclusions on tools found at Owl Ridge. Component 3, lacking diagnostics, is still up in the air; it could be Denali, but without proof Graf won't give it a label. So far as Component 2 is concerned, Graf agrees with Phippen that it is Denali, but beyond that they differ. Phippen had dated it to 9000–8000 RCYBP (about 10,000–9000 CALYBP) in the early Holocene, but Graf has evidence that it's older, 12,600–12,000 CALYBP, falling in the Younger Dryas. Last year's excavation uncovered in Component 2 a microblade fragment and an unknown type of projectile point, both associated with wood charcoal. "The point," Graf says in a paper she coauthored with Ted Goebel and grad student John Blong, "has a concave base and waisted hafting element, but little-to-no edge grinding along the margins." It also demonstrates some basal thinning—not fluting, Graf is quick to point out. Points with similar features have been found in late-Pleistocene components of Broken Mammoth, Nogahabara-1, and other Alaskan sites.

Although Graf's date for Component 1 is a little younger then Phippen's, the cultural level still appears to be Nenana. No trace of microblades has been found at this level. Augmenting the Chindadn preform and large ovate bifaces that Phippen found, Graf's team recovered the tip of a projectile point. Is it Chindadn? Graf says she can't know for sure, "but it is very thin like Chindadn points." By now she may have uncovered further evidence.

Picturing ancient Alaska

What did the world of those first Americans look like? There must have been rapid change at the end of Pleistocene due to Younger Dryas cooling. Certainly there weren't the lofty forests we see today, but were these early wanderers looking out over a barren landscape, or was there something more? Graf's goal is to discover "the environmental parameters that shaped human dispersal into Beringia during the late Pleistocene."

To understand how and when these people moved, scientists must know what was ecologically available to them. Game is less of a question than what fuel was burned for fires. One model states that during this period of climate change the area became a shrub-tundra landscape. To prove or disprove this, scientists need accurate dates for local vegetation at sites like Owl Ridge. Help for Graf in reconstructing the paleoclimate is coming from palynologist Dr. Nancy Bigelow, director of the Alaska Quaternary Center at University of Alaska Fairbanks, who is analyzing high-resolution fossil-pollen records of eolian and peat deposits near the site and cores of peat and sediment from nearby Eightmile Lake.

A picture is taking shape, although Graf stresses the tentativeness of her findings. Component 1, she believes, might have seen a cooler and dryer climate compared with today. The windblown layer of sediment that separates older Components 1 and 2 suggests that the land was barren during the period between occupations. It was also likely colder, owing to the onset of the Younger Dryas. Interestingly, Component 2 is associated with a well-developed paleosol, which means that when hunters revisited the site with microblades climatic conditions were relatively warm. This is confounding news for Graf because it has been commonly theorized that microblades were used to minimize risk when hunting unpredictable mammals in unforgiving cold climates. The charcoal found in Component 2 is willow, which suggests to Graf that the terrain was shrub-tundra. The Holocene-age soil in Component 3, on the other hand, bears witness to more abundant vegetation and a climate similar to today's. "We're just beginning to understand the paleoecological record from . . . this site," Graf explains. Everything, she cautions, is extremely tentative because her team is still gathering evidence.

Graf at Owl Ridge, 2009

And more to come

Owl Ridge shows promise of surrendering answers, if somewhat reluctantly, that will untangle knots in the timelines of lithic tool industries and sketch out the environment that both helped and hindered the first Americans. Last year Kelly Graf took a quick bite out of the site with only five people. Now she's back for a longer stay with a crew of 10. It's a safe bet there will be more to report in the future.

–K. Hill

How to contact the principals of this article:
Kelly Graf, Ted Goebel, Heather Smith
Center for the Study of the First Americans
Department of Anthropology
Texas A&M University
4352 TAMU
College Station, TX 77843-4352
e-mails: kgraf@tamu.edu goebel@tamu.edu
hls2112@neo.tamu.edu

Suggested Readings

Geobel, T., W. R. Powers, and N. H. Bigelow 1991 The Nenana complex of Alaska and Clovis Origins. In *Clovis: Origins and Adaptations*, edited by R. Bonnichsen and K. L. Turnmire, pp. 49–79. Center for the Study of the First Americans, Corvallis, Oregon.

Graf, K., and T. Goebel 2009 Upper Paleolithic Toolstone Procurement and Selection at the Sites of Dry Creek, Alaska, and Ushki-5, Russia. In *Lithic Materials and Paleolithic Societies*, edited by B. Blades and B. Adams. Blackwell Publishers, London (in press).

Hoffecker, J. F., and S. A. Elias 2007 *Human Ecology of Beringia*. Columbia University Press, New York.

Hoffecker, J. F., W. R. Powers, and P. G. Phippen 1996 Owl Ridge. In *American Beginnings: The Prehistory and Paleoecology of Beringia*, edited by F. H. West, pp. 353–55. University of Chicago Press, Chicago.

Potter, B. A. 2008 Radiocarbon Chronology of Central Alaska: Technological Continuity and Economic Change. *Radiocarbon* 50(2):181–204.

On the Trail of the Domestic Dog

continued from page 14

culture, they seem to have been a more mobile "sign of contact" to ancient humans than even most material artifacts. Savolainen's conclusions have no significance in some parts of the world; no such relationship existed, for example, between early humans in Australia and their canid counterparts (the Australian dingo originated from East Asian dogs about 5,000 years ago, but there's no sign of contact between Australian aboriginals and China during this time). However, dog domestication does have strong implications for the peopling of some continents, namely the Americas. The Koster site, lying squarely in the center of the New World, is tantalizing evidence of early dog-human bonding. Such evidence is sparse, but archaeologists like Wiant hope to find more in coming years. "I understand that there are a number of people working on dog/wolf genetics and one study is incorporating the Koster dogs," he informs us. "At present, it seems to me that our understanding of the subject is in its infancy, but kudos to everyone who is advancing the subject."

Although Savolainen and his team express confidence in their scientific findings, they realize that today their theories are only "loosely founded" and will need to be tested through subsequent detailed studies of dogs in East Asia. This is the opening through which Fiedel makes an entrance. He predicts that "more progress with dog genetics and also more work done on the preserved dogs in North and South America will undoubtedly clarify the lines of descent more."

In a wishful mood Fiedel suggests it would be helpful to have some archaeological specimens that are earlier. He has ulterior motives, however, that don't bear directly on the peopling of the Americas. He says, "Consider this: You know that there were more than 60,000 people in America more than 12,800 years ago, and we only have one human skeleton from that age. It would be very interesting, assuming that early dogs were found, to see if there were disease organisms that could be sampled from them—viruses or bacteria that might shed some light on the megafaunal extinction." The issue of megafaunal extinction, though possibly related to the peopling of the Americas, presents a distinctive area for research that will consume a new set of energies. Haynes can envision possibly applying research on dog domestication to exploring the extinction of megafauna, but he won't think it likely that dog domestication contributed to megafaunal extinctions unless he can see "some empirical evidence such as preserved pathogens in fossil specimens."

That's what we all seek: empirical evidence. But often in the science of archaeology, the *possibility* is all we have. To be sure, new insight into the connection between the Old World and the New may illuminate our understanding of the domestic dog and its impact on the peopling of the New World, but only through constant dialogue between the disciplines.

–Katy Dycus

How to contact the principals of this article:
Michael Wiant
Director, Dickson Mounds Museum
ISM Dickson Mounds Museum
10956 North Dickson Mounds Road
Lewistown, IL 61542
e-mail: wiant@museum.state.il.us

Renee Walker
Associate Professor, Department of Anthropology
312 Fitzelle Hall
SUNY Oneonta
Oneonta, NY 13820
e-mail: walkerr@oneonta.edu