Excavation Inside the Museum

One of California's biggest recent archaeological discoveries occurred not in the field, but in the Santa Barbara Museum of Natural History, where this block of earth from a site on Santa Rosa Island had been in storage since 1960. Bones sealed within the sediments have proven even older than the site's original investigators suspected (Page 1).
CHANNEL ISLAND WOMAN MAY BE OLDEST YET

Bones Archived Within Sediments Yield New Dates

Human bones and mouse bones stored for 40 years in the Santa Barbara Museum of Natural History are providing new information regarding the antiquity of humans on California's Channel Islands.

Scientists examining bones of what is now being called the "Arlington Springs Woman" believe they may be the oldest found in North America—approximately 13,000 calendar years old. The find also bolsters the Pacific Rim hypothesis that humans may have come to the New World by boat rather than by an island route.

"I believe these could be the oldest skeletal remains, at least among the oldest, found in the New World," says Thomas W. Stafford, the Colorado scientist considered a foremost authority on dating bone.

John R. Johnson, curator of anthropology at the Santa Barbara Museum of Natural History, who has headed the research team examining materials from the Arlington Springs site, calls the new information highly significant. "It demonstrates that the earliest Paleoindians had the watercraft necessary to cross the Santa Barbara Channel," Drs. Johnson, Stafford, and colleagues presented their findings in a paper March 30 at the Fifth California Islands Sym-

posium held at the Santa Barbara museum. Though he is excited by the new information, Johnson says it is but another chapter in a story that began in 1959. That's when Phil C. Orr, former curator of anthropology at the Santa Barbara Natural History Museum, found three bones (two femora fragments and one humerus) that had been buried 11 meters in the sidewall of Arlington Canyon on Santa Rosa Island, about 25 miles southwest of Los Angeles urban sprawl. The site is now part of a maritime wilderness administered by the National Park Service as Channel Islands National Park.

Realizing the significance of his find, Orr gathered a group of scientists to examine the site and verify the stratigraphic context of the bones, which were near the prehistoric spring that gave the site its name. Charcoal from the spring containing the bones, and a fragment of one bone itself, were radio-
carbon dated at 10,000 years old, making them the oldest human remains that had been found in North America. Researchers initially concluded the skeletal remains were those of a male, so Orr labeled his find "Arlington Springs Man." (Recent reexamination of the bones has indicated that they mostly likely were those of a woman.)

In the years following Orr's initial discovery, researchers grew to doubt the antiquity of the human bones because they had come from an eroded stream channel. Possibly the human bones were younger than the continued on page 10
The Center for the Study of the First Americans Advisory Board met this spring at Oregon State University to review the research and outreach projects and to plan fundraising efforts. Three new members were elected to the board and officers were chosen for another year. Joining the board were Cheryl M. Bonfigliano, a cardiovascular physiologist from Reno, Nev.; Robert E. Hogdson, an environmental attorney from Atlanta, Ga.; and Mark Harvey Mullins, an avocational archaeologist from Colorado Springs, Colo.

Dr. Bonfigliano, whose deep interest in archaeology has involved her in CSFA field work, is author of dozens of technical scientific articles. She is director of Vascular Labaratories in Klamath Falls, and is an adjunct professor of vascular technology at the Oregon Institute of Technology.

Hogdson, who studied anthropology at Reed College and the University of Chicago before pursuing graduate studies in forestry at the University of Washington and Oregon State University, and then earning a doctorate in jurisprudence from Northwestern School of Law in Portland, is with the firm Hunton & Williams in Atlanta. He is a partner in the Administrative Group.

Mullins, a businessman who studied anthropology, archaeology and environmental science at Southwest Texas State University and the University of St. Thomas, is an active member of several regional archaeological societies. He has a fine collection of Clovis artifacts and is involved in the sponsorship of the "Clovis and Beyond" conference that will be presented in October in Santa Fe, N.M.

"Clovis and Beyond," which will bring together leading scientists studying the question of the initial peopling of the Americas, is involving several CSFA members, among them CSFA Director Robert Bonnichsen, who is organizing the conference's two days of scientific presentations. Board members Sandy and Larry Tradtaker of Cortez, Colo.; Jo Ann Harris of New York City, and Annet Stanaway of Boulder, Colo., are active in planning the Santa Fe conference.

The board elected Sandy Tradtaker as secretary and reelected Marvin Beatty, Madison, Wis., and Gerry Friths, Kellogg, Mont., as chair and vice-chair, respectively.

Board members heard extensive reports on CSFA research projects including a multi-year science education endeavor that will involve 120 high school teachers over the next four years and may impact as many as 10,000 college-bound students. The community-based Mammoth Park Project in Woodward, Ore., will be the site for viewing and field work. The Pleistocene peat-bog site on Woodward School District property contains extensive deposits that will involve archaeologists and paleoecologists with high school teachers in two weeks of field work starting July 20. Teachers will learn excavation and analysis techniques from professionals and later they will involve their students with work on analyzing plant and animal remains, pollen, diatoms and other materials.

The board also heard reports on recent research in molecular archaeology from CSFA, scientist Walter Ream of Oregon State University's Department of Microbiology. Dr. Ream and his colleagues have demonstrated their ability to replicate DNA recovery and analysis from the hairs of a bighorn sheep that died nearly 10,000 years ago. Dozens of the animal's hairs were recovered from a Great Basin archaeological site, proving the reliability of the team's procedures. They are continuing to develop new procedures for recovering and analyzing biological residues from stone tools.

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CAA Symposium Spotlights Eastern Beringia Research

Canadian scientists recently took a new look at the environment of the northwestern Yukon and growing evidence that it was home to people when much of North America was covered by glacial ice. As part of the Canadian Archaeological Association's 32nd Annual Conference in April in Whitehorse, Yukon, a symposium of interdisciplinary research on Beringia was chaired by archaeologist Jacques Cinq-Mars of the Canadian Museum of Civilization in Hull, Quebec. The symposium, which we hope to report on in a future Mammoth Trumpet, included paleontologists, glacial geologists, paleoecologists and archaeologists.

"We're at a turning point in terms of what eastern Beringia has to say about the peopling of the Americas," said Cinq-Mars, who says the past 30 years have produced seminal research into the environment of eastern Beringia that has profoundly changed the view that the area was an isolated refugium. In fact as part of a continent that linked Asia and North America, it facilitated a massive movement of plants, animals and people.

"In this larger archaeological context, it is important to revisit past Beringian work, look at new evidence, and take stock," Cinq-Mars said. "My view, and that of numerous colleagues, is that there is no question that there were people in eastern Beringia 60,000 years ago, and this view has to be taken into serious consideration if you want to discuss the peopling of the New World."

Though there is scientific debate about the peopling of eastern Beringia much earlier than 12,000 years ago, the CAA symposium described research that shows that, contrary to the view 30 years ago, the region was definitely habitable. Fossil evidence reveals an environment with more than 25 species of grazing and browsing animals from woolly mammoths to saiga antelope and steppe bison. Paleontologist Richard Harrington, a symposium participant and leading authority on eastern Beringia, said, "The productivity of this steppe-like grassland was relatively high, certainly much more than it is now."

Eastern Beringian researchers say that one of the reasons for progress in investigations in the area has been the excellent support and involvement of the Yukon's First Nations peoples. One of the goals of the symposium was to advance this positive relationship. Two researchers and two Vuntut Gwich'in elders received special recognition for their contributions to Beringia research and public awareness. Elders Charlie Peter Charlie and Charlie Thomas of Old Crow, and scientists Richard Morlan of the Canadian Museum of Civilization and John V. Matthews of Ohana Productions were awarded short-faced bear plaques for "contributions to the preservation and understanding of the history of First Nations and ancient landscape, landscape history and paleoecology." Both Morlan and Matthews were praised for involving Vuntut Gwich'in people of Old Crow in their research work.

Jill Vishton of the Yukon Heritage Branch said that the CAA's Eastern Beringia Symposium is important to identifying research priorities for the future.
WHO'S WHO OF SCIENTISTS who are actively studying the prehistory of the Americas will gather in Santa Fe, N.M., this October to examine "Clovis and Beyond." They will discuss how far First Americans studies have come in the past six decades, and will consider where future research is going.

The goal of the conference is to present an overview and synthesis of the latest scientific developments occurring in the field of First Americans studies. The conference, open to all interested persons, will focus on changing scientific perceptions about how the Americas were populated and what we know about those earliest inhabitants.

After more than 40 years of debate, the Clovis model has fallen out of favor. Now the scientific community is actively rethinking the foundation of American prehistory. The possibility that the Americans were populated not once but several times by different human populations during the Paleo- and late-Pleistocene times has major implications for the future of First Americans studies and archaeology.

Emerging scientific trends concerning the origins, adaptations, and dispersals of the First Americans throughout the Western Hemisphere suggest important new directions for the future of scientific research and the development of public policy, which will be discussed at length at the conference.

The conference will feature speakers from a wide range of disciplines who will share their presentations to include the interested amateur as they present well-illustrated lectures on key topics.

Two important synthesizing panel discussions will close the conference with a focus on the future. Dennis Stanford, Chair of the Department of Anthropology, Smithsonian Institution, will lead a panel of scientists who will discuss future directions of research. In Ann Harris, professor of law and former Assistant Attorney General of the United States, will lead a panel discussion on the future of public policy. Public-policy issues will be viewed from the perspectives of government agencies, the Society for American Archaeology, Native Americans, avocational archaeologists, scientists, and legal specialists.

Conference organizers hope that these two panels will open a continuing dialogue among all groups interested in the future of First Americans studies.

Scientists Chart Clovis and Beyond

Looking to Future of 1st American Studies After 6 Decades

The Clovis and Beyond Conference will be Oct. 28-31 at Santa Fe's Sweeney Convention Center, 201 West Marcy St. Conference sponsors include the Center for the Study of the First Americans, Smithsonian Institution, and Museum of New Mexico Laboratory of Anthropology.Advance registration is $30 and registration forms must be postmarked by Sept. 15. After that date all registration will be on site at the Museum of Fine Arts located at 107 East Palace Ave., Santa Fe, N.M., and will cost $125.

You'll find a registration form on the back page of the wrapper of this issue. For additional forms and information on places to stay in Santa Fe, contact Clovis and Beyond, P.O. Box 8174, Santa Fe, NM 87504; 505-983-8661, fax 505-989-8466. Conference information, including agenda and hotel information, can also be found on the CSFA web site www.csfa.org/cbsa/cfda.html.

Friday's Program

The conference will open on Friday with an introduction and perspective on the conference by Robson Bonfield, Director of the Center for the Study of the First Americans at Oregon State University. Archaeology will be the focus of Friday's presentations. The following day will

58 Years Ago

In Santa Fe

It was in Santa Fe just 58 years ago that "Clovis" came into the language of American prehistoric to describe a particular type of artifact that archaeologists had been finding. The years before that initial Santa Fe Clovis conference saw a number of important developments in American archeology.

Beginning in 1932, a number of important sites were excavated near Clovis, N.M., in a flat, and elevated plain known as the Utez Estacado (pokol plain). In her highly regarded book Ancient Man in North America published in 1939, the late K. Maria Wendorf described grooved points, later known as Clovis fluted points, found directly associated with mammoth remains in a sand deposit overlying bedrock gravel. (The fluted point type had been confirmed near Folsom, N.M., in 1926 and 1927 in association with the remains of extinct bison.)

Discovery of these remarkable artifacts in the 1920s and 1930s led the University Museum of Philadelphia and the Laboratory of Anthropology of the Museum of New Mexico to propose a conference that would bring together the foremost scholars studying the earliest American prehistory—"Early Man in the New World," as it was referred to in those days. That conference was held in 1941 in Santa Fe.

According to Ken Tankersley, an archaeologist working for his interest in the earliest Americas, the purpose of the 1941 conference was "to bring some resolution to the fact that there was greater time depth in the archaeological record than previously acknowledged.

Andrea Tankersley, "This symposium participants decided that the term 'Clovis' would be used to designate archeological
bring discussions on human biology and the future of research and public policy. C. Vance Haynes, Jr., University of Arizona geochronologist, begins the morning presentations with a discussion of "Clovis and Clovis Environments." Following that, the conference will take a look at "Clovis and Related Traditions West of the Mississippi," presented by Bonnichsen and the handout includes the work of Margaret "Fay" Jodry and Dennis Stanford. Jodry is currently a professor in paleo-American Studies at the University of British Columbia, Site Director at the Smithsonian Institution, Paleo/Anthropologist, and chairman of the Department of Anthropology at the National Museum of Natural History.

"Are We Sure It's Clovis? Clovis East of the Mississippi," will include Kenneth Tankersley, a geoarchaeologist at Kent State University; Bradley Lepper, an archaeologist with the Ohio Historical Society; and Chris Ellis of the University of Western Ontario's Department of Anthropology.

"Later that morning George Frison, professor emeritus at the University of Wyoming, will talk about "Cultural Patterns That Overlap Clovis." Alan L. Bryan from the University of Alberta will conclude the morning session with a look at "The History of Pre-Clovis Research in the Americas."

The Friday afternoon session will begin with Albert Goodyear, an archeologist at the University of South Carolina, speaking on "Pre-Clovis Sites in Eastern North America." Then Dan Fisher, a paleoanthropologist at the University of Michigan at Ann Arbor, will discuss "Did Mastodons Meat Have Freezer Burn?" Steve Holen, an archaeologist with the Nebraska State Museum, will follow with "Recognizing Flaked Bone Artifacts." Mike Waters, a geoarchaeologist at Texas A&M University, will complete the afternoon program with "What Makes You Think It's Pre-Clovis?"

**Saturday's Programs**

To begin the morning program, Paul Grunh, University of Alberta archaeologist, will discuss "Evidence for Pre-Clovis Man in Central and South America." David Madson, with the Geological Survey of Utah, will speak on "China America Connections."

The program next moves to human biology with Theodore Schurr of the Foundation for Southwest Biomedical Research in San Antonio, Texas, who for the past eight years has been investigating the peopling of the Americas from a molecular genetic perspective. His talk is titled "Modern and Ancient DNA: The Peopling of the Americas."

Next, Walter Ream, associate professor of microbiology and director of the Genetics Program at Oregon State University, will present "Advances in Molecular Archaeology," assisted by Orin Shankel, a second-year Ph.D. candidate in genetics at Oregon State University, and CSFRA Director Bonnichsen, followed by "Late Pleistocene Modern Humans in Asia and the Peopling of the Americas," by Richard Jantz of the Department of Anthropology at University of Tennessee and Douglas Owsley, Curator and Head of Physical Anthropology at the National Museum of Natural History, for the cranial institution.

"Finally, the conference will continue with the Art and Science Sessions in North America and South America." Presenters are: Albert Goodyear, physical anthropologist at the University of Arizona, Mexico at Albemarle; Henry Speak, physical anthropologist at Texas A&M University; and Walter Ream, physical anthropologist at the Institute of Biosciences, University of Sao Paulo, Brazil. The afternoon is taken up with two panel discussions, the first on the future direction of scientific research, the second on the future direction of public policy.

"The program concludes with "Research: Where Do We Go from Here?" panel will include Tom Dillehay, University of Kentucky archaeologist and one of the early South American peoples, who investigated Chile's Monte Verde site; David Meltzer of Southern Methodist University; James Adovasio, an expert in the analysis of perishable fiber artifacts and director of Mercyhurst Archaeological Institute, Erie, PA; Michael Collins, archaeologist at the Texas Archaeological Research Laboratory at Austin, Texas; Richard Jantz, physical anthropologist at the University of Tennessee; Theodore Schurr, anthropological geneticist with the Foundation for Southwest Biomedical Research in San Antonio, Texas; and Alan L. Bryan, archaeologist at the University of Arizona."

**Facts that were older than Folsom and had the characteristics of bifaces recovered from the deepest levels of the Kent [Colored] and Blackwater Draw [New Mexico] sites.**

**Before the 1930s American archaeology was very much a movement phase. Data collection standards were far from uniform in those days. Stratigraphy was incompletely understood and systematic comparisons between sites were not regularly done. In the 1920s techniques of digging and record keeping were greatly improved. Also in the 1920s Ernst Antevs developed the 4-step method of dating archaeological events through geologic studies: 1) study beds and geological features, 2) interpret climatic context of beds and features, 3) assign a bed with a human record to a particular regional climatic age or phase, and 4) correlate the regional relative chronology with a dated climatic history.**

Prior to 1940 American prehistory was thought to fit into a timeline covering only the previous 3,000 or 4,000 years. Those attending the 1941 Santa Fe Conference saw that mounting archaeological evidence directed a broader time frame, but it wasn't until the development of radiocarbon dating in the 1950s that the actual timeline was shown to be much longer than previously thought. Radiocarbon dates of 11,500 to 11,200 B.P. are commonly ascribed to Clovis; Folsom dates run generally 11,000 to 10,500 radiocarbon years ago. Correcting radiocarbon dates for variations in radioactive carbon over the years remains a complex issue, especially for the Clovis era, but scientists believe that the Clovis phenomenon is approximately 13,000 calendar years old.

Although American archaeology has come a long way since the 1941 Santa Fe Conference, all aspects of human movement into North America, including answers to the basic questions of where, when, where and how, are still eluding a scientific consensus.**

—Carol Ann Lysett
AAPA Symposium Offers New Analyses and Varied Perspectives Concerning First Americans

Latest Human Biology Research Shares Podium With Linguistic, Archaeological, Cultural Views

A symposium at the 68th annual meeting of the American Association of Physical Anthropologists in Columbus, Ohio, in late April brought together recent research on the origins and evolution of Native American populations. The 12 presentations in the half-day session examined the issues of the number of colonizing migrations, the origin and timing of those migrations, and the nature of evolutionary changes in genetics, morphology, and language that occurred after the first people arrived in the Americas.

Though the papers covered genetic research on DNA both from living peoples and ancient remains, it also considered linguistics, skeletal biology, archaeology in Siberia, and cultural perspectives. "It's been a long time, if ever, that a meeting of AAPA has had such a holistic symposium," said discussant Emilie J. E. Sasmith, veteran Canadian anthropologist. ("'A Geologist Looks at the Peopling of the Americas,' Mammoth Trumpet 8:2 and "Assessing Eskimo and Indian Affinities," Mammoth Trumpet 2:3).

In summarizing the symposium, "Population Origins and Evolution in the New World," organized by Connie J. Kolman and J. C. Long of the National Institutes of Health, Dr. Sasmith emphasized the importance of ancient DNA research that indicates regional differentiation of people existed far into the past, before the time of initial contact with Europeans.

"Furthermore, there was continuity over time—modern people look like those ancestors 4,000–5,000 years ago," she cautioned her colleagues not to overlook the likelihood that Siberian peoples have moved about as much as people anywhere. "Who knows if the current picture..." in Siberia is related to the Peopling of the Americas," she said. "Things were fluid."

The Opening of the Gates

Introducing the symposium, Dr. Kolman noted that presentations represented differing perspectives and hypotheses. Kolman noted that various genetic researchers infer different numbers of migrations—some as few as one and others as many as four—often called "waves." The first speaker, University of Michigan geneticist D. A. Merriwether, defined "waves" as the "opening of the gates" between Asia and North America, and implied that at this point in the research it is necessary to be somewhat vague about the meaning of such terms. Dr. Merriwether compared mtDNA haplotypes (genetic markers) of samples between North and South America, noting divergence between the two hemispheres and considerably more sharing of haplotypes between populations of Central and South America than with North America.

Using nuclear DNA markers, Judith Kidd of Yale University reported the Reh 4th that so-called "Amerind" speakers originated from a small population, but one that probably did not pass through a genetic "bottleneck." Dr. Kidd and coauthor K. K. Kidd inferred that the American populations diverged from ancestral groups before the current East Asian populations developed, and that the divergence probably occurred in Asia. Their research also suggested that genetic drift due to small population size occurred in American Indian populations, which show different patterns of linkage disequilibrium than do contemporary populations in Africa and Europe.
New Books

The Fenn Caves: Clovis Weapons and Tools, by George Frison and Bruce Bradley. One Horse Land & Cattle Co., Santa Fe. 116 10 x 10-inch pages, 58 color plates and 58 drawings. 1999. $45 plus $4.75 postage (hardcover). Order from the publisher at P.O. Box 8174, Santa Fe, NM 87504.

This book features the beautiful Fenn Clovis Cave, a collection of 56 artifacts of uncertain provenience made of obsidian, Green River Formation chert, red Jasper, quartz crystal, and Utah agate. Each is featured in a life-sized color photograph by Pete Bostrom, who used his large-format, triple-exposure technique "The Art of Preserving Ancient Skulls," Mammoth Trumpet 13:2, and also depicted in line drawings by Sarah Moore. Text by University of Wyoming archaeologist Dr. Frison and Dr. Bradley, the Colorado archaeologist known for his flint-knapping skills, goes beyond the artifacts of this cache to discuss what is known about Clovis, Clovis archaeology, Clovis caves, mammoth and elephant hunting, elephant meat, projectile tools, Clovis flintknapping, and transportation of flint.


Bob Patten shares 40 years of flint-knapping experience and practice in this book explaining the principles and concepts of making stone tools. After retiring from a career of mapping with the U.S. Geological Survey, he produced this, the book he wished he had as a boy when he first got interested in making stone tools. The book is extensively illustrated by the author and Richard Jagoda. Further information is available from Patten's web site: www.idaho.com/personal/knapperbob.


Subtitled an introductory overview, this book explains federal laws, regulations, and protocols and the agencies associated with the identification and protection of America's cultural resources. King, who has been actively involved in cultural resources management for almost 30 years, untangles the webs of regulations and provides frank, practical advice on how to ensure regulatory compliance in dealing with archaeological sites, historic buildings, urban districts, sacred sites and objects, shipwrecks, and archives. This insider's guide to cultural resources management is written for local historians, archaeologists, historic preservationists, environmentalists, tribal governments, agency managers, and students.
Where North Meets South

Seeking a "Unified Theory" in Panama

Panama, the presumed funnel for the first humans entering South America, is the location of a preliminary research project undertaken by archaeologists seeking evidence that will lead to a better understanding of the peopling of the New World. From January through March of this year, Georges A. Pearson of the University of Kansas and Robert A. Beckwith, a graduate student at the University of Alaska-Fairbanks, conducted the first thorough survey around Lake La Yeguada in Veraguas Province. The goal is to find evidence of the first Panamanians.

"The isthmus of Panama is..."

This almost complete stemmed projectile point shows a fluted-like basal thinning on one side. Most of its base, which would have been on the lower left, is broken off. It was made from a large flake of local yellow jasper and is similar to fluted projectile points discovered by earlier archaeological investigations at La Divina in Colombia and El Inga in Ecuador.

the most promising area in which to test colonization models between North, Central and South America," said Pearson, a graduate student at the University of Kansas-Fairbanks. "He said Panama's geographical characteristics, as well as the fact that both Clovis-type and fish-tail-type projectile points have been found there, make the area an ideal place to seek clues linking the Paleolithic of both hemispheres.

"Because human movements between North and South America were funneled through Panama, and since its archaeological record is confined to a narrow strip of land, it is the most logical area of research for this particular problem," said Pearson. Based at the Smithsonian Tropical Research Institute in Panama City, the research was made possible by a Smithsonian fellowship grant. Institute archaeologist Richard G. Cooke and physiologist Andrew D. R. Piper are supervising the project, which Pearson heads.

The 1999 Lake La Yeguada Paleoindian Survey focused on the basin of the lake, which is 650 meters above sea level on the Pacific side of the Continental Divide. The area's archaeological potential was initially tested in the 1980s by Dr. Cooke, who collected surface materials, including a bifacial projectile point with a broken stem, along the lake shore during their Santa Maria River survey project. The lake's past shorelines have been inundated because of levees built to raise the level of water, some of which is used by a hydroelectric plant. The lake, in a closed basin, is believed to have been formed about 14,000 years ago as the result of volcanism. Either the lake was..."
the result of damming by lava flows or it formed in a caldera. Now the lake is sur-
rounded by a reforested pine plantation.

Pearson is confident that if people were present, the lake would have at-
tracted them to the area. The survey con-
sisted of an extensive reconnaissance
around the lake shore and its immediate
area. The goals, he said, were clear and
defined. "One of these was to ascertain if a
pre-Clovis basal culture, comparable to
Monte Verde (Chile), spread along the
Pacific coast and was present in this part
of the Panamanian interior," he added,
noting that Monte Verde has brought
about a paradigm shift in American ar-
chaeology.

Another goal of the project was to col-
lect information to test current hypoth-
eses relating to the peopling of Central
and South America. Pearson listed four
specific questions being asked by Paleo-
indian archaeologists:

- Are Clovis-like points found in Central
  America older than, younger than, or
  contemporaneous with finstral projec-
tile points?

- Was South America populated by a
  group of generalized hunter-gatherers
  using a unilacial industry before the
  spread of fluted points across North
  and Central America?

- Is there evidence of an early migration
  along the Pacific coast that may be
  related to Monte Verde?

- Are the technological variations be-
  tween Clovis and the early assem-
  blages of Central and South America
  simply a representation of different
  environmental adaptations during the
  spread of Clovis, or do they represent
  separate cultural groups?

Seeking clues to help answer these
difficult questions, the Lake La Yeguada
project focused its surface collecting and
subsurface testing on key geographic fea-
tures such as mouths and confluences of
streams, rockshelters, and sources of
lithic raw materials. It also examined
knolls, promontories, and other points
that could have served as strategic look-
outs. Pearson and Beekhuyzen actively pros-
ppected for knappable stones in expo-
sures, stream beds, and gravel bars. In
the process the project is building a lithic
comparative collection that will be stored
at the Smithsonian Tropical Research In-
stitute.

Pearson explained that stone tools
found in Panamanian sites changed con-
siderably through time, a fact that aids
archaeologists because it allows them to
recognize specific diagnostic traits that
characterize each period. For example,
 bifacial reduction of cryptocrystalline
raw material ceased about 7,000 years
ago; lithic industries that followed were
dominated by unifacially retouched
blades and flakes. "The mere presence of
 bifacial thinning flakes of fine-grained
material at a site is an indication of its
great antiquity," he wrote.

Reviewing the background of the
search for early human presence in
Panama, Pearson noted that until rela-
tively recently the country's Palaeoindian
tecno was limited to isolated finds
around Lake Alhajuela, formerly called
Madden Lake. Then Cooke and col-
league Anthony J. Ranere located many
additional sites during their Santa Maria
survey. One of their discoveries, the Co-
rona Rockshelter, which is less than 20
km south of Lake La Yeguada, contains a
bifacial industry dated at 30,440 + 150
years B.P. In addition, Clovis-like point
fragments and fluted bifaces were un-
earthed at the La Mula West site situated
east of Parita Bay.

Paleoenvironmental research is also
providing information about early Pan-
amanians. Palynologists have reported
that a significant increase in particulate
carbon in Lake Yeguada's sediments oc-
curred slightly more than 11,000 radi-
carbon years ago. This suggests that
early humans were burning vegetation
surrounding the lake, possibly to attract
game animals by encouraging grass
grazing or to clear areas for camps.

Preliminary results of this year's field
work included the discovery of 10 quar-
ry/workshop sites associated with
sources of three different types of raw
materials. Pearson reported that the
quarries are quite large, one measuring
61 by 18 meters and another measuring 65 by 54 meters. The workers discovered the sites on exposed or poorly vegetated mounds of volcanic rock. "The same erosional forces responsible for denuding the bedrock left behind large angular boulders of jaspers and cherts as lag deposits. In most cases, these large workshop areas consisted of nothing less than solid carpets of mixed debris, cores, and tools."

Unfortunately, for the archaeologists, the materials represent several millennia of exploitation, so the team collected only diagnostic samples. These included several broken bifaces, bifacial trimming flakes, spurred endscrapers, keeled scrapers (limaces), large scraper planes, and a stemmed point (photo, page 8). Pearson said that some of the bifacial fragments were so weathered that they had become completely porous and almost unrecognizable. In their survey, Pearson and Beckwith noted that only those tools considered as Paleolithic were manufactured from heat-treated or non-local materials.

They excavated some test pits near quarry sites in hope of finding stratified assemblages. These excavations revealed that the prehistoric Panamanians did not limit themselves to exposed boulders, but also engaged in mining. The buried debris appeared as rich as that found on the surface. "We recorded over 600 lithic artifacts in a single 45-cm-deep, 30-cm-square test pit just north of quarry site Q1."

The survey also discovered four rockshelters, which Pearson described as from car-sized to house-sized. "These were nothing more than very large, freestanding erratic-like volcanic boulders that afforded protection against the elements." Artifacts were found around them, and the survey tested the largest by excavating a one-meter-square pit to a depth of 1.2 meters. Artifacts proved to be only in the uppermost 40 cm of the excavation. The underlying clay was hard and sterile of cultural material, and there was no evidence of Paleolithic or bifacial technology. Pearson said the presence of a three-sided edge-ground cobble 30 cm below the surface suggests that the rockshelter may have been occupied as early as 6,000 or 7,000 years ago.

Taking advantage of the dry season, which extends from December to mid-April, the archaeologists found many artifacts on newly exposed beaches and banks around the lake and the seasonal water level gradually fell. Among these discoveries was a small concentration of bifacial thinning flakes of non-local and apparently heat-treated chert.

The other sites the survey investigated included a variety of places such as lookouts, mountain tops, deflated surfaces, and cut banks. "The most common diagnostic artifacts found at these locations were bifacial thinning flakes," said Pearson. Among the discoveries was a triangular blade that had been fashioned of non-local white chert into what he describes as a double-fluted end scraper that shows evidence of having been hafted. "The fact that it is complete and was found by itself suggests that it is, perhaps, a lost item."

The many lithic sources the team found provided prehistoric peoples with a variety of materials. Six quarry sites on the north side of the lake contain jaspers of various colors including red, yellow, and caramel. Northwest of the lake are off-white gray cherts mixed in with the jaspers. At a quarry site on an eroded surface on the west side of the lake the archaeologists found banded bluish-black chert, and on the southern side of the lake, they found nodules of olive-brown chert and yellow jasper eroding out of the banks.

George A. Pearson examines lithic debris on the surface of a quarry area designated as Q2. Below is a point base the survey found on surface of Q2.
SUGGESTED READINGS

ON California

ON Arlington Springs

ON Panama

These bifacial thinning flakes were found together on the beach of Lake La Vaguada.


ON Panama


ON Year 2000 Problem

Though the survey found no large Paleoindian camp, Pearson said there could be several reasons—site density, variability, or destruction by recent rise in water level. Also the survey could simply have missed sites because of the large area surveyed by only two archaeologists.

Pearson believes that Panama holds the potential to allow archaeologists to better understand the peopling of the Americas, and especially the relationship between Clovis and Fishtail projectile points. However, lack of information has prevented archaeologists from developing ideas that "integrate both hemispheres of the Americas into a unified theory of the peopling of the New World." As it is, several hypotheses re-
late these classic North American and South American projectile points. These the-
ories, Pearson insists, need testing and resolving.

mobile," he said, noting that the archaeo-
logical materials discovered were rather dis-


These bifacial thinning flakes were found together on the beach of Lake La Vaguada.

Planning is under way for a follow-up project to allow more thorough examina-
tions of the quarry sites as well as to ex-

line has not significantly receded since the post-glacial seal-level rise," said

Preliminary results of the survey sup-
port findings from Piperno's paleo-
environmental research that people were being accounted Lake La Vaguada in Paleo-
indian times. "We can surmise that these early populations were sparse and very

These bifacial thinning flakes were found together on the beach of Lake La Vaguada.
In Search of the First Californians

California may be one of the best places to look for clues to the first Americans, but it has also been the focus of more sensational claims about the peopling of the New World than any other part of the hemisphere. As a result, California archaeologists who would offer evidence of the state's most ancient people may be hampered by the ghost of Archaeologists Past.

"California is a good place to look for the remains of the First Americans," says Michael J. Moratto, archaeologist at California State University-Fresno and author of California Archaeology. The abundance of resources and great diversity of environments supported a large population in prehistoric times. Before the first Europeans arrived, there may have been a half million people in the land that what was to become California. There is evidence of craft specialization, the establishment of trade networks by 10,000 years ago or before, and unmistakable indications of environmental management, such as controlled burning. The evidence suggests great time depth to Dr. Moratto, and California's astounding linguistic diversity—nearly 100 distinct languages representing six or more separate, seemingly unrelated phyla—is further indication that people have been in California for a very long time.

Extending from the moist coastal forest to the deserts of the south, and from the depths of Death Valley to the crest of the Sierra Nevada, California's topography encompasses great diversity. The contrasting habitats provide an enormous variety of places to look for evidence of early peoples, so it's no accident that the state has a large number of archaeologists at work.

Where should one look for evidence of the earliest Californians? Moratto posed the question. Based on his work in California, he offered possible answers, including "Prospects for Pleistocene Archaeology" in California he delivered also suggested looking at quarry sites that would have yielded high-quality lithic materials.

"Wherever faunal remains are encountered in contexts less than around 25,000 years old, archaeologically potential sites should be carefully accessed," he said, adding that potential sites might be identified through skeletal or aggregation of bone as well as sites well known as the La Brea tar pits, where the bone of a Smilodon bearing possible tool marks has been dated to about 15,000 radiocarbon years ago.

Wherever the first humans arrived in California, it was not as long ago as some people have insisted. Moratto says that outstanding claims of the 19th century, which included people such as "Eocene Man" and "Auriferous Gravel Man," brought on a period of scientific controversy and skepticism early in this century. Then the 1950s, '60s and '70s brought a new flood of claims of the great antiquity of Californians. Many of these claims were the result of faulty dating techniques, and once again the scientific establishment exercised caution anew. The suggestion that there may have been Californians much before 11,000 radiocarbon years ago continues to be met with great skepticism.

Moratto says the colorful archaeologi-
cal record of California dates back 150 years. "During the Gold Rush, there were numerous claims of human remains and artifacts being found in deposits representing truly great antiquity." For example, at Tule Lake Table Mountain in the Sierra Nevada foothills, miners reported finding a human skull along with charcoals, mortars, and pestles beneath a lava flow that dates to the Pleistocene Epoch—evidence that the first Californians were millions of years old! And then at Gold Springs, also in the central Sierra, miners claimed to have found mastodon bones along with mortars and milling stones in gold-bearing gravels up to 10 feet below the surface. Further, a human skull was reportedly found in a gold mine near Columbia 250 feet deep in solid rock.

Then there was the Calaveras skull, said to have been found near Angels Camp in 1866 in a mine shaft at a depth of 150 feet in gravel dating to the Eocene Epoch. Moratto says that rather than being around 70 million years old, the skull had been removed from a local mortuary cave and is probably only 1,000-1,500 years old. Unfortunately, in the latter part of the 19th century, many people—including scientists—concurred with such claims. For example, the noted geologist Josiah Whitney published a book in the 1890s in which he accepted the veracity of the miner's hoax. Moratto himself has studied the mortuary caverns in the vicinity where the miners took the skull; most of the skeletal material dates to around A.D. 900 to 1500.

Early in the 20th century, the deficiencies and mistaken analyses regarding intractable ancient archaeological evidence were gradually refuted. Alex Hrdlicka and other scientists were able to show conclusively that human specimens said to be Eocene in age were actually of recent age. The truth was accompanied by decades of scientific conservatism. "Even as late as the 1950s," says Moratto, "the prevailing orthodoxy allowed only a few thousand years for the prehistory of the Western Hemisphere." Discovery elsewhere of Folsom and then Clovis points associated with the reprints of extinct animals changed that thinking. Soon fluted points were being discovered in California.

The state's first fluted-point site was Borax Lake near Clear Lake in the Coast Ranges about 100 miles north of San Francisco, but so far at least 46 fluted-point sites have been discovered in the state. One of these, the Witt site in the Tulare Lake area between Fresno and Bakersfield, has produced more fluted points than any other in the United States ("California Lake Site Rich in Fluted Projectile Points," Mammoth Trumpet 12/2).

Fluted-point sites occur all across California from the sea to the Sierra Nevada and from the northern plateau to the southern deserts. "Judging from the number, and the geographic dispersion of the known fluted points," says Moratto, "California was widely and well populated by about 11,000 radiocarbon years ago. But, he notes, despite California's great biotic diversity and the cherished notions..."
In the Mojave Desert east of Barstow, Calif., is Lake Manix, a Pleistocene playa. Viewed from the Calico Hills, Lake Manix is seen as the white band just below the distant horizon.

that Paleoindians were big-game hunters, the fluted points have not yet been discovered in unequivocal association with the remains of extinct megafauna. Claims of much earlier human occupations were based on evidence from a number of Southern California sites from the 1950s to the 1970s, and some of these were sensationalized in the press. Sites in the San Diego area were reported to yield lower-Paleolithic artifacts 80,000 to 100,000 years old. Bipolar artifacts were found that looked similar to those found in 400,000-year-old sediments in China's Zhekoukudian ("Research Suggests Early Tools Near San Diego," Mammoth Trumpet 1:4). Enormous ancient beavers were reported at the Texas Street site. Many Southern California sites that had been dated far back into Pleistocene time by the amino acid racemization technique were eventually determined to be much younger, according to careful radiocarbon dating.

The most controversial site of all is in the Mojave Desert east of Barstow. A 1960s archaeological survey of Lake Manix, a Pleistocene lake playa with abundant chalcedony and stone tools made from it, ultimately led researchers up into the nearby Calico Hills. Lake Manix tools occurred only on the surface and not in a context that could be dated. Could these tools be found in situ, in their original stratigraphic context? That search, led by Ruth DeLisle Simpson, then director of the Southwest Museum in Los Angeles, and championed by paleoarchaeologist Louis Leakey, led to discovery of the Calico site ("The Calico Site: Coming of Age in California," Mammoth Trumpet 2:2). Simpson and her colleagues located Lake Manix artifacts in what appeared to be their original context. Leakey, visiting the site in 1963, said that the context was actually a secondary deposit, but there was great interest in the site. Excavation at Calico began in earnest in November 1964.

Over the years, suggested antiquity of the site, set on an old pediment or an inactive alluvial fan, ranged back in time from tens of thousands of years to millions of years, though Uranium-Thorium dating placed it around 200,000 years old. Moratto says a major problem with Calico has been the artifacts, noting that the project's investigators including Leakey, who died in 1972, selected them from "literally tons and tons of natural
COMING CONFERENCES

Contact: Marcel Konfield, University of Wyoming, P.O. Box 3431, Laramie WY 82071-3431, 307-766-3548. Abstracts due July 1. e-mail: mkonfield@uwyo.edu.
Oct. 4-8 XIII Congresso Nacional de Arqueologia Argentina, Cordoba, Argentina.
Contact: Casilla de Correo 1082, Correo Central 5000, Cordoba, Argentina. Fax: 5451-68-0689. e-mail: 12conacfiyniec.unc.edu.ar.
For information: www.filiosoa.unc.edu
Contact: Archaeology Laboratory, Augustana College, 2012 S. Grant Ave, Sioux Falls, SD 57105. 605-336-5495.
HANUS@rcti.unc.edu.
Oct. 28-31 Conference: Clovis, and Beyond, Santa Fe, NM. Sponsors: Center for the Study of the First Americans, Laboratory of Anthropology of the Museum of New Mexico, and the Smithsonian Institution.
Contact: Clovis and Beyond Conference. 505-982-8520.
Nov. 7-11 Multidisciplinary Conference—Human Remains: Conservation, Retrieval and Analysis, Williamsburg, VA.
Contact: Deborah S. Chapman, Williamsburg Inst., P.O. Box 1776, Williamsburg VA 23187-1776. 800-603-0946.
dchapman@cvjl.org.
April 5-9, 2000 65th Annual Meeting of the Society for American Archaeology, Philadelphia.
Contact: SAA, 900 Second St. NE, Suite 12, Washington, D.C.
20002. 202-789-8200. meel@saa.org; www.saa.org.
Deadline for submissions: Sept. 2.
Send conference notices to mammoths trumpet, 620 Northwest Willamette Dr. Corvallis, OR 97330

Oldest Bones?

continued from page 1

charcoal that yielded the 10,000-year-old date. No cultural mate-
rrial had been found in association with the bones, and little more was done with the find.

But Orr had anticipated that the future would hold advances in chronoloical and archeological techniques; he and his team excavated an irregular block of earth, 60 centimeters by 40 ce-

nimeters, by 33 centimeters, that contained the bones. After jacking it in plaster, Orr stored this block of sediments in the Santa Barbara museum’s basement so they could be examined when new dating methods evolved, Johnson said.

In 1987 Johnson and Don P. Norris, of Channel Islands

In the Santa Barbara Museum of Natural History, Gil

Unzueta and John R. Johnson measure the block of earth

removed nearly four decades ago from the Arlington Springs site on Santa Rosa Island.

National Park, found the block and decided it was time to reevaluate the Arlington Springs material. Johnson said the impetus to do so included new techniques of bone protein isolation, and radiocarbon dating by Accelerated Mass Spec-

rimetry (AMS).

Several studies were undertaken in 1989 and 1992. After

-Don Alan Hall
CAT Scan Reveals Evidence of Stature

The block of earth from the Arlington Springs site recently underwent a CAT scan that gave researchers at the Santa Barbara Museum of Natural History "x-ray vision" to see what was inside. Curator of Anthropology John Johnson said the CAT scan (computed axial tomography) revealed the distal end of a femur (thigh bone) and a patella (kneecap). "We were able to add the length of the distal part of the femur to measurements taken on the proximal part that we had already removed," Dr. Johnson told the Shinnecock Trumpet.

By learning the total length of the femur, the researchers were able to estimate that the Arlington Springs Woman was between 4 feet 11 inches and 5 feet 2 inches tall.

...a species that was endemic to the island. It went extinct during the early Holocene when it was replaced by a smaller, more aggressive mouse from the mainland, P. mani- cula. Probably inadvertently introduced by people, although it is possible that the mouse could have floated to the island on a piece of driftwood, John Johnson said researchers suspect that it stowed away aboard the watercraft that people used to ply the waters between the mainland and the island.

The two series of radiocarbon tests produced somewhat conflicting information, yielding 10 radiocarbon dates on bones and charcoal that ranged from 6,610 ± 60 years (CAMS-13060) by osteocalcin analysis, to 11,490 ± 70 years (CAMS-17123) on AMS dating of the deer mouse mandible. Charcoal collected during 1993 from the site's stratum in which the human bone was found yielded a date of 10,090 ± 70 radiocarbon years (CAMS-13060).

Johnson said in the symposium paper written jointly with Stafford of Stafford Research Laboratories, Inc., Boulder, Colo., Henry O. Aje of the Department of Earth System Science, University of California, Irvine, and Morris of the National Park Service, that the date on mouse bone may be the most accurate measurement of the site's age. The researchers explained that the chemical preservation of the mouse bones was better than the preservation of the human bones—they contained more

At the Arlington Springs site during 1960 excavations, two human femora are pictured in situ. One is in the hand of a member of the archaeological team; the other is on the right.
taking off the plaster jacket, Johnson and Morris sent an isolated bone fragment to the Laboratory of Isotope Geochemistry at the University of Arizona's Department of Geosciences to determine its condition. The lab analyzed the amount of original protein in the bone and reported that it was too deteriorated to use for dating. But the possibility remained that bone within the sediment block would be better preserved and thus yield more information.

Researchers probed further into the eastern block in 1993. They subjected bone samples to DNA testing and concluded that the samples contained no preserved DNA.

Then Johnson gave three different specialists fragments of the bone to conduct various chemical tests. The bone proved too degraded for enzymatic collagenase testing. Johnson said, so efforts focused on testing remaining amino acids, AMS radiocarbon dating of different preserved fractions of preserved bone protein, and AMS dating of osteocalcin, a non-collagenous bone protein and the most abundant protein in bone after collagen.

Also in 1993, researchers returned to Arlington Canyon on Santa Rosa Island to map the site's stratigraphy. In the process, they recovered more charcoal from the stratum that had yielded the human femur and sent it for testing. At the same time, they also subjected to AMS radiocarbon dating the mouse bones extracted from the museum's sediment block. They were identified as the bones of an extinct deer mouse, Peromyscus

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Peromyscus, a species that was endemic to the island. It went extinct during the early Holocene when it was replaced by a smaller, more aggressive mouse from the mainland, P. maniculatus, probably inadvertently introduced by people. Although it is possible that the mouse could have floated to the island on a piece of driftwood, Johnson said researchers suspect that it was carried by wind and water into the waters of the mainland and the island.

The two series of radiocarbon tests produced somewhat conflicting information, yielding 10 radiocarbon dates on bones and charcoal that ranged from 6,510 ± 60 years (CAMS-14135) to 7,160 ± 70 years (CAMS-17125) on AMS dating of the deer mouse mandible. Charcoal collected during 1993 from the site's stratum in which the human bone was found yielded a date of 10,090 ± 70 radiocarbon years (CAMS-13056).

Johnson said in the symposium paper written jointly with Stafford of Stafford Research Laboratories, Inc., Boulder, Colo., Henry O. Aige of the Department of Earth System Science, University of California, Irvine, and Morris of the National Park Service, that the date on mouse bone may be the most accurate measurement of the site's age. The researchers explained that the chemical preservation of the mouse bones was better than the preservation of the human bones—they contained more

At the Arlington Springs site during 1990 excavations, two human femora are pictured in situ. One is in the hand of a member of the archaeological team; the other is on the right.
The block of sediments from Arlington Springs lies on a museum work table in December 1993, exposing part of a human femur.

collagen. Further, the human bones apparently had been reworked into the sediments containing the rodent bones. "Therefore the rodent bones would be older than the human bones."

Citing difficulties with radiocarbon dating that have been expounded by archaeologist Stuart J. Finfer, Johnson and his colleagues also say that the difference between the 10,000 and the 11,200 radiocarbon years may be a reflection of radiocarbon calibration problems, an actual age difference ("Corrected Radiocarbon Calendar Can Clarify Peopling of America," "Mammoth Trumpet" 12:4).

Recalibration of the oldest dates by comparing radiocarbon dates with those obtained from Greenland ice cores, Caribbean corals, and lake-bed sediments in Europe and Canada resulted in a determination that the materials are approximately 13,000 calendar years old, Johnson and Stafford said. While the new Arlington Springs dates are older than originally thought, they remain coeval with recalibrated dates for Clovis sites, Stafford noted, pointing out that the dates remain younger than the 12,500 radiocarbon-year dates for material from the Monte Verde Site in Chile. The antiquity of Monte Verde has convinced many American archaeologists that humans entered the New World earlier than Clovis—possibly along the Northwest Coast.

Stafford and Johnson say that recalibration of radiocarbon dates remains controversial because the curve used in the testing procedure may not be reliable. They believe that more dates need to be obtained to verify the antiquity of the Arlington Springs human bones because they apparently were eroded from their original location and deposited into alluvial sediments of a small stream channel through the site, leaving it uncertain whether the associated charcoal and mouse bones are contemporary with the human remains.

However, the researchers remain convinced of the site's overall significance, particularly because of research on other Channeled sites such as Daisy Cave on San Miguel Island, where University of Oregon archaeologist Jon M. Erlandson has recovered material dating at least to 10,000 radiocarbon years ("Living on the Rim," "Mammoth Trumpet" 13:2). San Miguel and Santa Rosa islands were linked as a single island during the terminal Pleistocene when the sea level was about 150 feet lower than today.

Although research at Arlington Springs and Daisy Cave does not provide sufficient evidence to prove people first entered the New World by boat, Johnson says this proven seafaring ability of Paleolithic is an important clue. "When you consider these two sites, it is evident people had to get to the islands on some kind of watercraft, and we know they were adapted to marine resources." But, Johnson adds, "when you are dealing with ancient remains there remains a little bit of uncertainty." Thus his research team plans to conduct more tests on bones.

Stafford says he would like to see the geology of the site analyzed from the top to the bottom so researchers can have a complete profile to study.

Johnson says Arlington Springs points up the importance of saving portions of archaeological sites for future study. The Spirit Cave site in Nevada provides good evidence that researchers make significant discoveries by using new methods to reanalyze material recovered decades earlier ("Remarkable Discovery," "Mammoth Trumpet" 12:2).

"This whole thing reaffirms the importance of museums as proper places to archive significant finds for posterity," Johnson said. "Or had the foresight to plaster-jacket his find and archive it for the future. The lesson is that there is value in setting aside samples for the future and saving ancient skeletal remains."

—George Winner

In August 1993, Dr. T. Rockwell examines the stratigraphy at the Arlington Springs site.
AFA Symposium

Replacement or Continuity?

Using craniodental morphological data, Joseph F. Powell of the University of New Mexico examined what he called "two simple models" regarding the origins of the earliest-known Americans—many investigators have found different continuities from recent American Indians. One, the Replacement model, posits that the earliest population died out and was replaced by later populations. The other, the Continuity or relationship model, posits that various evolutionary processes, such as genetic drift, explain differences between earliest and later skeletal samples.

Under the first model, morphological data from the oldest individuals would be expected to be quite different from those of modern American Indian populations, but similar to samples in other parts of the world, such as Europe, Africa, or the Pacific. Under the second model, the craniodental data should show some connections between past and present populations in the Americas.

Over the past few years, Dr. Powell has been examining both the few American skeletal remains of 8,000 or more years antiquity ("Paleoindian Skeletal Data Re-examined" Mammoth Trumpet 7:2) as well as a much larger Archaic sample, now numbering 958 individuals, that lies between Paleo and Modern samples in age. To test the two hypotheses, his analysis also employed the cranial databases of W. W. Howells and Tsonne-hiko Nashuns, which include many relatively modern samples.

Data Favor Continuity Theory

Though Powell's analysis found differences between Paleo and modern American Indian samples, he found that Archaic samples tended to cluster with Paleo samples, suggesting that microevolutionary change is involved in these changes, including a trend toward increased cranial breadth. Although he reported continuities between Archaic and modern peoples, notably in samples in the Western Great Basin. Considerable variation among modern ancient crania available for study complicates interpretation as well as analysis, but overall Powell's data led him to favor the Continuity hypothesis over Replacement.

Powell said that Kennewick Man of Washington State and Lapa Vermelha IV of Brazil, two ancient individuals much debated in recent months ("Discovery of Ancient Skeleton Raises Trying Rights Question" Mammoth Trumpet 13:1 and "New World Migration Research Paints Increasingly Complex Picture" Mammoth Trumpet 13:4), like other ancient crania, fit this model of continuity.

Dr. Lang and three coauthors from the National Institutes of Health analyzed the genetic structure of contemporary American Indian populations for ancient European ancestry. Assuming that some post-Columbian admixture has occurred within these populations, they wanted to determine whether current genetic data suggest that there might also have been some pre-Columbian admixture—that is, whether the native American ancestry includes early migrants from Europe as well as from Asia. They did this using a model developed by L. L. Cavalli-Sforza and their own data on polymorphic loci from Cheyenne, Pima, and Navajo populations, along with samples from China and Scotland. The model allowed a comparison of the evolutionary history of the Native American gene pools from an Asiatic source, with some post-Columbian admixture. Like earlier skeletal analyses, their conclusion from genetic data did not support a pre-Columbian European contribution to the American Indian population.

Archaeologist Favors Late Entry

Archaeologist Ted Goebel of the University of Nevada-Las Vegas evaluated the archaeological evidence from Siberia that causes him to believe humans did not actually come into the Americas until considerably later than much of the genetic and linguistic analyses suggest. Archaeology, he said, indicates that early Siberian people favored regions that offered a variety of resources—mountainous areas of southern Siberia. People seemed to reappear to foothills and mountains that offered different habitats and thus a diversity of foods as well as wood, a vital commodity still absent on the great Mammoth Steppes farther north. Dr. Goebel said that southern Siberia's blade-and-flake stone technology indicates that the peopling of Alaska and the Americas was the final episode of the spread of hunter groups into Siberia. Because of the severity of the last glacial maximum, he doesn't believe people could have started to occupy Siberia until after 17,000 years ago.

Everett Rhodes, a physician at the University of Oklahoma Health Sciences Center and past director of the Indian Health Service, offered a cultural perspective to the symposium. A Kiowa Indian who traces his heritage on his maternal side to Iroquois ancestors who were considered powerful traditional healers and witches, as well as to his biotechnical training, Dr. Rhodes reminded the scientists that many people have alternate explanations for the origins of the First Americans. In an often humorous presentation that carried a serious message, he said that many American Indian people are concerned that genetic research will have unknown and potentially adverse consequences for them. He noted that the issue of Kennewick Man is of acute concern in Indian country, where people have heard that politicians are preparing one bill and another bill and several agencies, that one ancestor of Indians, the United States should abrogate all those treaties with Indian people. He told the researchers he doesn't know of any Indians who have "a vested interest in learning that there may have been other migrations."

Respect for Ancient Dominion

Rhodes urged the human biologists to carefully acknowledge the TNA that they are testing, "Who makes the decision about the ultimate disposal of that DNA? Is that TNA treated with the reverence that is one of the characteristics of Indian people?" Southwestern revisited Rhodes' theme by stating her own background as an immigrant to Canada from a heritage of Asian people who immigrated into what was to become Hungary. Scientists making broad continental analyses of ancient migrations should make it clear, she said, that evidence from the relevant population groups actually is quite sparse. She suggested that her colleagues should recognize, as Dr. Rhodes indicated, "that these peoples are entities that have their own histories." Further, she noted, comparative data on many of the
Now, what has all this to do with the peopling of the Americas? Simply this: if bytes were so precious just a few years ago, how much more important would they have been extrapolating back 15,000 or 20,000 years? Everybody has been wondering how the Americas happened to be peopled so fast, and here finally we have the answer. Consider the most probable occupation site in the U.S., dated with certainty to be 14,000 B.P., and the respective one in the south of South America to be about 12,000 B.P. They must have been rushing like mad.

And this, thousands of years before the marathons was invented, which means they knew about the problem? It was still worse for them, not only because they needed five digits instead of four, but also for having to use an extra bit for the negative numbers.

So at last we can get a clear picture of what really happened. The first Asian to become an American was a clever fellow called Nagay, who led his tribe over the Bering Land Bridge while the going was still good. Once in America he gathered his tribe together and told them:

"It's rather cold over here. I know of a land called Tierra del Fuego, so it should be warmer there, full of meaning fire, but it is far away. We will go there. But remember, the Y10K problem (the year minus 10,000 problems) is upon us and we don't want to cross those stones all over again to correct the dates. So let's make a run for it!"

And leading by example, he started to run south. Not everybody could sustain Nagay's pace, and those who peetered off settled North America. But some kept the tradition and ran on and on, wondering as they reached South America how everything turned upside down and was spelled backwards. And so it is how Tierra del Fuego was to be peopled so quickly by Nagay's descendants, who, spelling backwards, became the Yagan tribe.

They made it well before the Year-minus-10K problem came to a head, and they even were rewarded by a big fire.

Our own Y2K problem looks small in comparison. If they could solve it, so can we.

-Juan Piefernheimer
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people also are sparse, and extrapolation from a sample in one area is a larger group [such as from an Athapaskan-speaking group to a hypothesized language group such as Na-Dene] may be invalid. "What Na-Dene are we talking about?" Siahmery asked.

"How many samples do you really have, for example, of Northern Athapaskan?"

She spoke of Indians' concerns about scientific interest in their origins. It raises painful questions both in the United States, where they were born to be citizens, and in Canada, where they were not. "For Canadian aboriginal peoples, this notion that you're just another bunch of immigrants' causes grave consternation because of the land-claims issue." When we speak of the original peopling of the Americas, Siahmamy told her colleagues, we should remember to say that it occurred such a long time ago that "those were the people who first took dominion over North and South America, Dominion," she said, "is a very nice word that comes from the Bible. Taking dominion means that you make it yours, and it was their land. Who cares if they came 12,000 years ago or 18,000 years ago? This was their land."

Praising Powell's paper, she said skeletal biologists need to be very careful about how they undertake their analyses and the conclusions they then render, because most of the conclusions are not based on the large number of early Holocene and Paleoindian-era individuals Powell used. "Single individuals can cause real problems."