MAMMOTH TRUMPET

Volume 8, Number 2
March, 1993

Center for the Study of the First Americans
Oregon State University, Corvallis, OR 97331

Department of Anthropology
ISSN 8755-6898

OHIO FOCUS ILLUMINATES WIDER PUZZLE

Conference Examines 1st Peopling of Region

The state of Ohio may constitute only about a quarter of one percent of the land mass of North and South America, but to participants in the Conference on Ohio's Early Inhabitants last November at Ohio University, the area clearly represents a microcosm of the hemispheric puzzle. While the conference, sponsored by the Ohio Archaeological Council, focused on the Ohio Valley and Great Lakes, specialists who presented papers shed light on the overall problem of the peopling of the Americas.

J. M. Adovasio opened the proceedings by noting the great interest in when humans first came to North and South America with a presentation "Early Human Populations in the Upper Ohio Valley: A View from Meadowcroft Rockshelter." Subsequent participants included Linda Shane, who outlined vegetation and climatic changes in the late Pleistocene; H. Gregory McDonald, who described late Pleistocene fauna in Ohio; Daniel C. Fisher, who discussed evidence of butchery of the Burning Tree mastodon unearthed in 1989; Kenneth B. Tankersley, who discussed chronoclines in Ohio's Paleoindian period; and David Brose, who described work at the Paleo Crossing site. Still other papers included one by Bradley T. Lepper describing problems in locating Paleoindian sites in Ohio.

Adovasio, anthropologist, geologist, director of the Mercyhurst Archaeological Institute at Mercyhurst College, Erie, Pa., and executive director of the Archaeology Research Program at Southern Methodist University, Dallas, is perhaps best known for his work at Meadowcroft Rockshelter, immediately east of the Ohio border in Washington County, Pa. "It has become increasingly apparent even to the most conservative archaeologists that the so-called 11,500 B.P. 'Clovis' threshold does *not* signal the first appearance of human populations in the New World," Adovasio says in his paper. He believes, however, it is justifiable to view claims in excess of 20,000 years "with extreme caution or downright skepticism." Noting that Meadowcroft has been one of the most controversial archaeological sites, he said the controversy has arisen because "Meadowcroft is the most-intensively studied, most-extensively published upon, and most-thoroughly dated of all the potential pre-Clovis sites in the Americas."

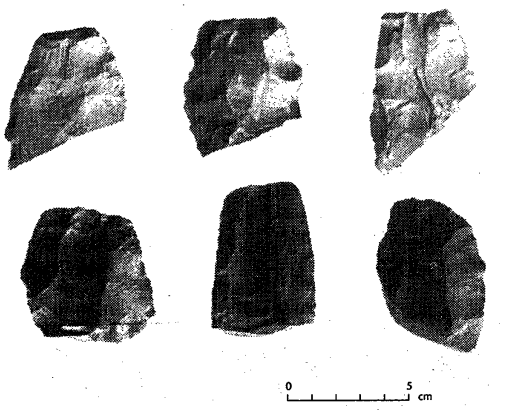
Adovasio said 52 radiocarbon dates at Meadowcroft are solid evidence. "No other New World locality and few, if any, Old World localities have so many internally consistent radiocarbon assays. The 11 attritionally and/or colluvially emplaced strata at Meadowcroft correctly afford the largest aboriginal

continued on page 3

SITES IN TENNESSEE SUGGEST CLOVIS ORIGINATED IN EAST

Archaeologists are uncovering evidence that Clovis tool-making people may have lived in the southeastern United States 12,000 years ago. If the dates survive scientific scrutiny, their discoveries mean that Clovis may have originated in the southeastern United States.

Material analyzed from the Johnson site (40DV400) on the Cumberland River east of Nashville has been dated at about 12,000 years old—the oldest so far found in Tennessee, said John Broster, middle-Tennessee regional archaeologist for the Tennessee Division of Archaeology. Broster is even more excited about another Tennessee site. He believes it, the Carson-Conn-Short site (40BN190), will provide him a lifetime of work and yield more evidence of early human habitation in the southeastern United States. So far, it has produced numerous artifacts and "demonstrated the existence of an intact Clovis deposit," Broster and colleague Mark R. Norton said in a recent article submitted to *Current Research in the Pleistocene*.



Clovis preforms from the Carson-Conn-Short site.

"I'll probably be at that site for the rest of my life," Broster said of the Carson-Conn-Short site. "I hope so," he said in a telephone interview. "And I hope to have a long life." The site is in Benton County, Tennessee, on the edge of Kentucky Lake, which was created by a dam on the Tennessee River.

The discoveries are part of a Paleoindian survey begun nearly four years ago. Broster credits amateur archaeologists who took him to the sites and shared with him artifacts and information they had collected. A visit from amateur archaeologist David Johnson resulted in what has come to be known as the Johnson site, which lies on private land along the Cumberland River about five miles northeast of Nashville.

At the Johnson site, hearths and Clovis artifacts had washed from the banks of the river near its confluence with a small creek. Among other finds recovered from 16 to 20 feet below the surface of the sloping bank were 25 fluted preforms, one nearly complete Clovis point, two nearly complete Cumberland points, numerous early-Archaic projectile points and a dozen uniface blade tools. Many of the tools were made from cobbles of Fort Wayne chert that is found in the small creek. Others were crafted of Dover chert, the source of which is about 45 miles away.

Two carbon samples taken from the level where Clovis material was found yielded dates of 12,660 ± 970 years B.P. (TX 6999), and 11,700 ± 980 years B.P. (TX 7000). While those dates hover near the 12,000-year mark, Broster is particularly excited by a third date obtained from carbon on a feature

continued on page 6

INSIDE

A Geneticist Looks at the Peopling of the Americas

Each of the many disciplines involved in the study of the peopling of the Americas brings its own specific strengths to the quest for an ultimate solution. Archaeologists catalog the physical evidence left by humans, glaciologists determine Ice Age barricades and passages, palynologists reconstruct past environments to ascertain their habitability. These and many other specialties primarily examine data from the distant past; in contrast, linguists and geneticists study evidence in modern peoples.

Physical anthropologists look both at past and present evidence, studying skeletal remains of ancient people and scrutinizing genetic markers of living populations. As a physical anthropologist specializing in genetics, Emöke J. E. Szathmary, professor at the University of Western Ontario, has long

continued on page 4

Bradley Lepper Becomes Editor of CRP Journal

The Center for the Study of the First Americans has announced a change in editorship of its annual publication of research notes, *Current Research in the Pleistocene*. Bradley T. Lepper, archaeologist with the Ohio Historical Society, takes over for Volume 10, the 1993 edition. He replaces founding editor Jim I. Mead, a Quaternary scientist at Northern Arizona University, whose editorial tenure concludes with Volume 9, which is now in press.

Lepper is planning some changes in editorial procedures in the publication, which he hopes will continue the advances made by Mead and his associate editor, David J. Meltzer of Southern Methodist University. "Jim Mead and Dave Meltzer did a great job with *CRP*, and I am only going to be building on the solid foundation they laid down," Lepper said.

"The most important change I have implemented is the creation of a board of associate editors who represent a broader range of disciplines. The goal is to present *CRP* to the widest possible audience and increase the level of participation of disciplines other than archaeology. Associate editors," Lepper said, "are Dr. Daniel Fisher of the University of Michigan's Museum of Paleontology, Dr. Linda Shane of the University of Minnesota's Limnological Research Center, Dr. Thomas Stafford of the University of Colorado's Institute of Arctic and Alpine Research, and Dr. D. Gentry Steele, a Texas A & M University physical anthropologist."

Further, Lepper said, "I am in the process of building a network of corresponding editors whose primary responsibility will be to serve as conduits for information on the latest relevant research being undertaken in all parts of the world. In addition, I am contacting recognized Pleistocene scholars in Canada, Latin America and the northeastern Asian Pacific rim to serve in this position. I would be happy to entertain recommendations for the position of corresponding editor."

Lepper plans to include the entire scientific council of **Center for the Study of the First Americans** as *de facto* corresponding editors. The scientific council consists of Marvin T. Beatty of the University of Wisconsin, Alan L. Bryan of the University of Alberta, George C. Frison of the University of Wyoming, C. Vance Haynes Jr. of the University of Arizona, David M. Hopkins of the University of Alaska, F. Clark Howell of the University of California at Berkeley, Terence J. Hughes of the University of Maine, Thomas Lynch of Cornell University,

He hopes to continue the advances made by Mead and Meltzer.

Dennis Stanford of the Smithsonian Institution, Steele, R. Ervin Taylor of the University of California at Riverside, Christy G. Turner II of Arizona State University, Mort D. Turner of the Institute of Arctic and Alpine Research, Thompson Webb III of Brown University, and H. Marie Wormington of the University of Colorado Museum.

Lepper, who is based in Newark, Ohio, at the Newark Earthworks State Memorials, has a doctorate and a master's degree in anthropology from Ohio State University. His bachelor's degree in anthropology is from the University of New Mexico. He has been curator and site archaeologist for the Ohio Historical Society since 1988 and a visiting professor at Denison University, Granville, Ohio, since 1989.

He may be best known to **Mammoth Trumpet** readers as research coordinator for the Burning Tree mastodon investigation, which resulted in the widely publicized discovery of living bacteria from the mastodon's digestive tract. That discovery, announced at a news conference May 3, 1991, received worldwide attention. (See article *Ohio Focus Illuminates Wider Puzzle* on page 1).

Assistant Director Is Helping Center Fulfill Outreach and Research Goals

Rebecca A. Foster has become Assistant Director of the **Center for the Study of the First Americans** at Oregon State University. She is managing daily operations of the Center, according to Director Robson Bonnichsen, and John Young, chairman of the anthropology department, who announced the appointment in January.

Foster, who has a master's degree in museum education from Pennsylvania State University and a bachelor's degree in history and archaeology from Lycoming College, began duties in the Center's new offices the first of February. As the "everyday boss" at the Center, Foster's responsibilities include budgets, writing applications for grants, and coordinating fund-raising activities. She will assist in the production of *Current Research in the Pleistocene*, help facilitate the involvement of volunteers in Center activities and plan traveling displays. She is expected to play an important role in carrying out the Center's goal of public outreach, as well as to further its involvement in research and education.

Foster worked for more than three years with a corporation that designs and produces scientific and historical displays for museums, zoos and visitors centers. She has also worked as a curator, editor and writer for historical societies and an association of museums.

Assistant Director Rebecca A. Foster at her desk in Oregon State University's Weniger Hall.

As Assistant Director of the Center, Foster will be assisted by Patty Good, office specialist, who will continue to handle the increasing clerical duties at the Center's office on the third floor of Weniger Hall, one of Oregon State University's principal science buildings. The Center's new laboratory space is on Weniger Hall's second floor and includes newly refurbished space for lithic, faunal, and hair-analysis laboratories.

The Center for the Study of the First Americans, with initial funding from the Bingham Trust, was designed to focus humanistic and scientific studies on resolving the great unanswered questions about the peopling of the Americas. The Center moved to Oregon State University in 1991, where it has adopted a unique organizational framework to carry out its missions of research education and public outreach. Though allied with the University's department of anthropology, where Bonnichsen holds the title of professor, the Center remains a separate entity under a partnership agreement that seeks to combine the talent and resources of the private sector with those of the academic community.

Mead Earns Thanks for Disseminating News of Research

When Jim I. Mead came to the **Center for the Study of the First Americans** in 1983, among other things, he set up a new journal that would bring together research from various disciplines related to the peopling of the Americas. Now, after nine years, Mead is stepping down as editor of the lively and vital multidisciplinary journal *Current Research in the Pleistocene*.

"I have enjoyed being editor of *CRP*," says Mead. "I am proud of it and I appreciate all the authors and readers. We all need to keep abreast; to communicate."

Mead says he started with the premise that too many researchers who study people in North America's Pleistocene were working as if in a vacuum. Analyzing the problem, he found it wasn't that researchers shunned the multidisciplinary approach but rather that they simply did not have time to read all the journals necessary to keep abreast of all developments related to their own particular interests. Thus, *Current Research in the Pleistocene* was designed to provide short communications from various disciplines.

"I did not want just an archaeological approach," Mead writes in the journal's Volume 9, which has just been published. "My approach has always been that archaeological remains are no different and no more important than the sediments, snails, bones, arthropods, pollen and so on."

Mead, now of Northern Arizona University's Quaternary Studies Program, credits David J. Meltzer of Southern Methodist University, who became his associate editor, and other colleagues for helping deal with the annual flood of manuscripts, which must be reviewed and sent to professional referees. Specifically, he cited the assistance of Larry D. Agenbroad, Stan Ahlers and R. Scott Anderson at Northern Arizona University. (Ahlers is now at the University of North Dakota.)

Volume 9 of *Current Research in the Pleistocene* is now available. See the order blank on page 7. The price remains the same as it has been for the past four years.

"Jim Mead deserves a big thank-you for his years of guidance and work on *CRP*," said Robson Bonnichsen, director of the **Center for the Study of the First Americans,** which publishes the journal. Bonnichsen also thanked David Meltzer for his able assistance.

MAMMOTH TRUMPET

The Mammoth Trumpet (ISSN 8755-6898) is published quarterly by the **Center for the Study of the First Americans,** Department of Anthropology, Oregon State University, Corvallis, OR 97331-6510. Second-class postage paid at Orono, ME 04473, and additional mailing offices.

POSTMASTER: Send address changes to:
Mammoth Trumpet
Center for the Study of the First Americans
Weniger Hall 355
Oregon State University
Corvallis, OR 97331-6510

Robson Bonnichsen	Director and General Editor
Rebecca A. Foster	Assistant Director
Patty Good	Office Specialist
Bradley T. Lepper	Editor, **Current Research in the Pleistocene**
Don Alan Hall	Editor, **Mammoth Trumpet**
C & C Wordsmiths	Layout and Design

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.**

Ohio

continued from page 1

occupational sequence available from the New World." His paper goes on to say that the upper strata span the entire Holocene while the lower strata extend well back into the Late Pleistocene.

"The validity of the 39 radiometric assays which post-date 10,850 B.C. (12,800 B.P.) have stirred little controversy, but questions have been raised repeatedly about the reliability of the older dates from the site. Most of these criticisms have revolved around the possibility of some form of contamination," Adovasio's paper says. "Suffice to note that after two decades of testing and retesting, there remains absolutely *no evidence whatsoever* for particulate or non-particulate contamination of the site." (See Suggested Readings on page 6 of this **Mammoth Trumpet**).

In conclusion, Adovasio says it is striking that Meadowcroft and related sites "are singular by their very scarcity." Calling them "practically invisible" in archaeological terms, his paper suggests that much of the invisibility may reflect "very low population densities and presumably highly mobile lifestyles of the first Americans." He goes on to suggest that "it may also be the product of conceptually or operationally inadequate survey strategies which fail to recognize such sites when they occur, or more importantly, which fail to *predict* where they might occur. In this vein, it is worth noting that simple logic dictates that other pre-Clovis localities must exist.... They may occur in deeply buried floodplains or loess prairies, sealed by meters of alluvial or aeolian sediments, or in as yet unplumbed depths of undiscovered and hence, nameless caves and rockshelters. They may exist in the submerged coastal zones now well out on the Continental Shelf, or they may exist as masked components within much larger and later locales...."

Shane, of the University of Minnesota's Limnological Research Center, told conference attenders that pollen records recovered in Ohio and Indiana show that the time between 14,000 and 9,000 years ago was characterized by major vegetation changes and, by inference, major climatic shifts. In relation to the dates, Shane cautioned that the many-sided problem of radiocarbon dating requires a 500-year margin of error. "Post-glacial warming," she says in her published abstract, "led to the replacement of spruce forests and/or spruce woodland by coniferdeciduous forest over about 1,000 years around 13,000 B.P.

"Vegetation and climate were more stable until about 11,000 B.P. Between about 11,000 and 10,000, a series of intense, rapid changes on 200-year time scales led to the development of complex vegetation patterns with no modern analogs," Shane writes, adding that after 10,000 B.P. oak-dominant forests were established. Pollen analyses allow Shane to make climatic interpretations from vegetation changes, and she notes that climate gradients, both north-south and east-west, were stronger than today.

After Shane described vegetation and climate of the Paleoindian period, McDonald, of Hagerman Fossil Beds National Monument, described the animal life Ohio's Paleoindians lived among. "Paleoindians entering Ohio during the Late Pleistocene would have encountered a diverse mammalian fauna," he writes, noting that many, including mammoth, mastodon, flat-headed peccary and Jefferson's ground sloth, were widely distributed and thus would have been quite familiar to people migrating from the West. Animals that ranged the East, including giant beaver, elk and moose, would have been new and unfamiliar to newly arriving Paleoindians. He notes that many Pleistocene species became extinct in Ohio while others such as the musk ox and caribou moved far north, and still others such as the bison, elk, porcupine, beaver and black bear survived into the Holocene. "The degree of association and utilization with the extinct species by Paleoindians in Ohio is equivocal," McDonald writes in his abstract. In contrast, he notes, surviving species have been recovered from archaeological sites.

"So, although Paleoindians probably overlapped in time with many members of Ohio's extinct Pleistocene fauna, there is no evidence to indicate the degree of impact their appearance had on the reorganization of the fauna that marks the Pleistocene-Holocene transition," McDonald writes. "Many of the changes in composition of the mammalian fauna in Ohio from the Pleistocene to the Holocene can be explained as reflecting changes in vegetation and habitat, especially in regard to the disappearance of more boreal cold-adapted species and their replacement by more southern species."

Fisher, of the University of Michigan's Museum of Paleontology, presented the paper on the Burning Tree mastodon with co-authors Paul E. Hooge, of the Licking County Archaeology and Landmarks Society, and Lepper of the Ohio Historical Society. (See **Mammoth Trumpet** 6:1 *The Burning Tree Mastodon* and **Mammoth Trumpet** 6:4 *Evidence of Mastodon's Last Meal.*) "Several lines of evidence suggest that this animal was butchered by Paleoindians and that carcass units were intentionally placed in the pond, probably for storage," Fisher and his colleagues say in their abstract. "Cut marks are present on some bones, but the most conspicuous marks are shallow gouges distributed rather uniformly over the surfaces of several major muscle and tendon attachment sites." They note that aligned scratch marks on bones suggest that carcass parts were dragged over a gritty surface on the way to the pond. "Death occurred in the autumn, and preservation of live enteric bacteria suggests there was little delay prior to emplacement in the pond."

In the next presentation, Tankersley, of the Illinois State Museum's Quaternary Studies Program, told the conference that Ohio's Paleoindian period should not be treated as a single, homogeneous archaeological record. "If the Paleoindian record is examined from a temporal perspective, then four distinct chronoclines are evident: a reduction in the movement of people across the landscape; an increase in the range of raw materials procured; an increase in the stylistic diversity of the tool-kit; and an increase in the number of different environmental settings exploited," he writes in the published abstracts.

David S. Brose, of the Royal Ontario Museum and formerly with the Cleveland Museum of Natural History, gave the conference's next presentation, summarizing two years of work at the Paleo Crossing Site near Akron (**Mammoth Trumpet** 7:4 *Investigations at Ohio Site Push Back Dates for Clovis*). On the basis of new analysis, Brose says the Paleoindian occupation of the site dates to 10,900 B.P., which he believes is evidence of the earliest human habitation in the Great Lakes area.

Among afternoon presenters was Lepper, of the Ohio Historical Society's Newark Earthworks State Memorials. Lepper described a site in Clermont County, Ohio, that was found during deep testing of the Ohio River flood terrace. Work at this site, which dates to late-Paleoindian and early-Archaic occupations, has suggested new strategies for seeking early sites in the middle Ohio Valley.

Conference proceedings are being assembled for publication. William F. Dancy, archaeologist at Ohio State University and an organizer of the conference, is serving as editor for the volume. *–DAH*

MAMMOTH MEADOW EXPEDITIONS OPEN TO INTERESTED VOLUNTERS

Two 1993 First Americans Expeditions to the Mammoth Meadow site in southwest Montana have been scheduled for July 11–24 and July 28–Aug. 11, Robson Bonnichsen, principal investigator, has announced. The First Americans program provides volunteers the opportunity to be part of key research at an important site.

"Previous excavations have demonstrated that Mammoth Meadow has a unique record of habitation floors where people lived," said Bonnichsen, adding that prehistoric peoples manufactured stone tools from brightly colored local chert. "Approximately 20,000 flaked stone, bone and other artifactual remains have been recovered from the site," he said.

"Research of materials from this site promises to provide a new window to the past that will enhance our understanding of the cultural practices and biological heritage of some of the Americas' earliest people," said Bonnichsen, noting that the site has deposits that span the time from the Lewis and Clark expedition to the Ice Age.

Among the most exciting discoveries at Mammoth Meadow is the record of human and animal hair. The study of hair reveals what animals were present at the site. Further, hair can be dated and if the hair root is present, DNA can be extracted. "So far," said Bonnichsen, "we have discovered hair from 19 different species including horse, mammoth, caribou and human.

"Of particular importance is the human hair that contains old DNA. Molecular biologists plan to use the human-hair record from Mammoth Meadow to pioneer an effort to characterize the early biological populations who visited the site."

Volunteers join a seasoned research team including soil scientist Marvin T. Beatty of the University of Wisconsin, geologists Mort D. Turner and Joanne C. Turner of the University of Colorado, and archaeologist and First Americans specialist Bonnichsen of Oregon State University. On-site training and evening lectures enhance volunteer understanding of the project's mission and objectives. Volunteers assist with important excavation activities including mapping and flotation of sediments for hair and other organic remains. They also may assist with field geology.

The Mammoth Meadow camp, which is equipped with a complete mobile kitchen operated by a professional cook, is near a beautiful mountain stream. Volunteers bring their own tents, sleeping bags and personal gear. First Americans expeditions are supported by volunteer field work and financial contributions. Most of the financial contributions from volunteers can be taken as a tax-deductible charitable contribution.

Lithic Technology Journal Is Reborn

George H. Odell has announced the re-establishment of *Lithic Technology*, a journal that has not been published since about 1988. Odell, of the University of Tulsa's anthropology department, will become editor of the journal, which is scheduled to appear twice a year starting in the fall of 1993. "There will be two issues in 1993 if folks produce enough papers worth publishing," Odell said in a letter to former subscribers and contributors.

Articles will be peer reviewed, usually by two readers for each paper, Odell said, and he hopes that each issue of the journal will contain 60 to 80 pages. The University of Tulsa is providing financial support. Assisting Odell will be an editorial board consisting of Tom Hester, Harry Shafer, John Fagan, Phil Wilke, Barbara Luedtke, Randall White, Mike Scott and others. Odell said he expects to include Europeans and South Americans in the publication.

Lithic Technology is to have spring and fall editions with a yearly subscription rate of $17. For information, Odell may be contacted at the Department of Anthropology, University of Tulsa, Tulsa, OK 74104-3189, phone (918) 631-3082, FAX (918) 631-2540.

Szathmary

continued from page 1

been interested in the origins of native Americans. Her extensive studies of genetic similarities between North America's arctic and subarctic peoples (*Assessing Eskimo and Indian Affinities*, **Mammoth Trumpet** 2:3) provide her with necessary background to construct an extensive synthesis of research relating to peopling of the Americas. Results include her paper "Ancient Migrations from Asia to North America," a keynote presentation in Tokyo at the First World Conference on Prehistoric Mongoloid Dispersals, and another paper, "The Genetics of Aboriginal North Americans," being published in *Evolutionary Anthropology* 1:6, 1993.

Although genetic studies are highly technical and published descriptions may seem arcane, Szathmary's *Evolutionary Anthropology* paper is a lucid review of genetic contributions set within the context of environmental, archaeological, linguistic and cultural studies done over a period of 40 years. Several of her insights, provided in that paper or offered as answers to questions from the **Mammoth Trumpet**, are of particular interest to readers of this newspaper. For example, Szathmary's research leads her to believe that the scenario of a group of people moving through snowy wilderness from Asia to discover North America is unrealistic. She notes that hypothetical representations of the coming of the first Americans, such as the trudging humans and mammoths atop the front page of the **Trumpet**, undoubtedly reflect seasonal movements in Beringia, but probably not a long-range resettlement of people. Those who study genetics of living populations bring a very different perspective to the concepts of "migrations" and "waves" than those who examine other kinds of evidence. (We will come back to that subject later.)

"Genetic data show that the roots of native North Americans lie in Asia," Szathmary states unequivocally. "The ancestors of modern Indians and Eskimos entered North America by way of Beringia, but dispute remains about the timing and process of that entry."

She agrees that genetic studies do not possess the Silver Bullet that will slay all inaccurate models of the peopling of the Americas. But it is true that genetic data are more compatible with some models than with others.

A model in which people, originally from Asia, are living in North America before the maximum glaciation of late Wisconsin time is the most readily compatible with current genetic findings. These people would have been isolated by glaciers for an extensive time from other people living in Beringia. However, she notes that other models for peopling the Americas might be compatible, too, given the right set of delimitations.

"Genetic data show that the roots of native North Americans lie in Asia."

Szathmary's own research has suggested that the people commonly called Eskimos are closely related to certain northwest peoples—Haida, Tlingit and Athapaskan—while other Native Americans, including some from the northwest as well as the eastern Subarctic, are genetically more distant. The difference could be explained by these peoples, who are often termed "Na-Dene," being north of the ice sheet in Late Wisconsin time while the latter peoples were separated from them, south of the glaciers.

Thus, Szathmary agrees, the widely accepted Clovis-first, late-entry model, which holds that the earliest Americans arrived from Beringia about 11,500 years ago, does not fit very well with available genetic information. The late-entry model, she says, "does not explain the extreme genetic distances one finds when one compares southern aboriginal groups with northwesterners." Available genetic data do not absolutely refute the Clovis model, however.

The finding of extreme genetic distance between certain northwest peoples and other aboriginal populations in North America is based on currently available information, which, Szathmary cautions, "is not optimum either in the number of populations or the number of loci required for definitive analyses." In other words, investigations are needed of more genes in more native groups before a strong case could be made that people were in North America before Clovis time.

However, the genetic loci examined in the groups that have been studied indicate that there is a great deal of heterogeneity among native Americans. The amount of observed genetic variation suggests that people have been on the continent for a very long time or that the continent was peopled by three, four or more different populations that came from Asia.

From genetic studies of modern descendants, would one group that came to North America early be difficult to distinguish from several groups or from a few genetically heterogeneous groups that came late?

"It depends on how early," Szathmary replies. "Also, all human groups display internal genetic heterogeneity, since very many genetic loci are polymorphic. Thus, even early groups would be polymorphic." (It must be remembered that even closely related individuals differ in their genetic codes.) Further, she says that a model of many groups coming late, as an explanation for the heterogeneity, is not very realistic.

So what about that migration? What about the "waves" of people moving east and south in the tracks of mammoths and other megafauna?

"In reviewing the evidence I argue that migration needs to be conceptualized as a process of demic expansion occurring over a long time period rather than as a rapid event that served to import genes virtually immune from evolutionary pressures," she writes in the abstract of her *Evolutionary Anthropology* paper. She sees local populations of people expanding gradually, exporting descendants, as it were, not groups of people on the prod on the trail of game. In the same paper she says: "Biologists consider migration in terms of its involvement in bringing about gene-frequency change, thus migration means population expansion that may or may not involve gene exchange. Clearly, colonizers of an uninhabited region are restricted to partners from within their own group."

The problem for geneticists, she says, "is attributing the cause of existing genetic diversity: is it the genetic residue of ancient migrations or the product of genetic differentiation?

"The archaeological view of migration as an event," she continues, "lends itself to the idea of a discrete Asian group exporting specific marker genes that remain entrenched in descendant populations, virtually immune from evolutionary forces. Migration viewed as a process of patterned human behavior is more diffuse, has more elements and is more amenable to the idea that the evolutionary process operates as population expands."

Szathmary goes on to observe that a single Asian group bound for North America might bear genes

Genetic Field Work Is Demanding

Genetic information of special interest to questions of the peopling of the Americas can be divided into two general classes: That derived from living subjects and that derived from "ancient" sources. Ancient DNA might be extracted from hair roots after hair is recovered from archaeological sites.

Most of the interest is focused on "living" DNA. The goal of this research is to find what Dr. Emöke Szathmary terms the "genetic residue" in living people that reveals the geographical origin of their ancestors. The task is to locate genetic markers that are unique to specific geographical areas, and it is complicated by the fact that all *Homo sapiens* are remarkably alike in their genetic make-up.

To assemble meaningful data on the colonization of the Americas it is critical for scientists to choose their sample populations carefully. Isolated groups would be ideal because they would contain an intact set of ancestral DNA, unmixed with outsiders. But with burgeoning world populations and the ease of travel, such ideal groups no longer exist. Indeed, some doubt that they ever did exist. For statistical validity, larger collections of data are preferable to smaller ones, but as in any research, more data mean higher costs and more complexity.

Field work for a geneticist usually means drawing blood samples from members of the sample population in its home area, often far from modern laboratories. Frequently this genetic work is an adjunct to an unrelated medical study of the sample group, or it may be done through a medical clinic that serves members of the group.

For some genetic studies, only a "finger-prick" amount of blood is needed: The very small amount of DNA obtained is then amplified by the action of certain enzymes in the laboratory to produce a sample sufficient to run a limited number of tests. This procedure, however, is less likely to reveal rare and geographically unique genetic variants than if a larger sample of blood (20 ml) is taken. With this latter procedure, not only can the blood be tested directly for genetic variants but white cells (B lymphocytes) in the blood sample can be grown under laboratory conditions to provide an almost unlimited series of living-cell cultures. Some of these are then frozen and saved for later testing while others are used to extract large amounts of DNA, enough to search the whole human genetic apparatus for unusual and historically diagnostic traits.

Blood samples, kept at room temperature, need to be shipped to the DNA testing laboratory within 48 hours in order to obtain good cell cultures. Some researchers, however, prefer not to make cell cultures but to extract and amplify the DNA directly from the 20 ml sample. For that procedure, travel time to the laboratory can be up to one week, according to Mark Stoneking, a geneticist at Pennsylvania State University.

Since blood samples can contain viruses (including the HIV virus that causes AIDS), any blood sample is treated with circumspection at all times. Moreover, in the case of "genetic" blood samples, it is also important that no foreign DNA contaminate the sample. Since we all have our own DNA on our skin—from the turnover of skin cells—the human DNA on the hands of the handlers of blood samples must be kept away from the sample itself by use of surgical gloves.

Blood is not the only available source of genetic information. Most types of human cells can be collected for the extraction of DNA, but non-invasive collection techniques are preferred by cell donors. Two types of cells can be collected quickly and non-invasively: A few human hairs, tugged out by the roots, provide the first type, and a gentle scraping of the mouth cavity provides the second. Both the cells in hair roots and the cells sloughed off from the buccal lining inside the cheeks yield DNA.

Geneticists have made advances in laboratory techniques in recent years, so much so that possible weaknesses in the samples may be all but forgotten in the excitement.

Ethical problems about genetic surveys of human groups may occur at various stages of a study. They may also have different degrees of importance in different cultures. Obtaining what the medical community calls informed consent may be difficult for the geneticist trying to collect blood or other cell samples. To mention only one such problem in achieving informed consent, many non-urban, native groups around the world are not familiar with the terms "genes," "DNA," or even "cells." Among a variety of other problems that may crop up, one that has become evident to many geneticists in recent years involves access to data. The question of whether blood—or cell—samples will be made available to all interested research workers is especially pertinent if the initial field and laboratory work was supported by public funds. Fortunately, the trend is to make samples freely available to all workers; this trend has the positive effect of enlarging the worldwide network of investigators interested in studies of human evolution. There is also a growing recognition that the results of these genetic studies should be made known to the world community, thereby helping to provide small, native groups with a sense of self-esteem and belonging on a broad scale.

–Dee Baer

that would appear to make their descendants seem to have come from differing groups. "An Asian source population that was polymorphic at one locus could produce American descendant populations with discrete and differing distributions of only the ancestral genes." She also notes there are several ways that might occur. "It is worth keeping in mind that the crossing of Beringia was not accomplished quickly. There is good evidence that this vast area was occupied for a minimum of 3,000 years and perhaps as long as 12,000 years before the recession of the Laurentide and Cordilleran glaciers. Either interval is sufficient for a considerable amount of genetic differentiation to have taken place within Beringia itself. In addition each is long enough to have permitted gene exchange among nomadic hunting bands, whether or not these were linked by language and culture."

Genetic studies do not possess the Silver Bullet that will slay all inaccurate models of the peopling of the Americas.

Having argued that "migration" to North America probably was not accomplished in the traditionally pictured fashion, Szathmary reviews studies of mitochondrial DNA and poses the question: Does mtDNA evidence support the notion of separate "waves" of migration?

"In my view, no," she concludes. "The weight of cumulative evidence, both theoretical and population-based, rules against that idea. As information about mtDNA accumulates, so do questions about the utility of this genome for tracing ancient overland migrations that involve thousands of years of demic expansion. The likelihood of ancestral polymorphism, the long presence of humans in the Americas, the existence of mutation-drift equilibrium, and modern haplotype diversity all suggest that the mtDNA distributions we see arose within the Americas."

Szathmary takes issue with the notion that only archaeologists can solve the puzzle of the peopling of the Americas. "While it is true that currently only archaeological evidence can provide the date of colonization, the date itself does not yield any insights into biological history. In my view it remains important to identify genetic roots and their network of relationships, because this is the key to understanding the nature of the source populations and the process involved in the colonization of America.

"Ancient Beringia is under water and inaccessible to exploration, but the story can still be revealed through the exploration of the genes of the people whose ancestors took dominion over North America."

Genetics, she told the **Mammoth Trumpet**, provides its own insights to the puzzle, and the interpretations provided by geneticists also have implications for archaeological reconstruction. "Whatever the demand for irrefutable proof, I am not content to wait until all archaeologists give the green light for biological reconstruction of the peopling of America in an archaeological context." Concerning archaeological evidence for entry before the 11,500-year Clovis threshold, she said: "Frankly, I don't care whether Meadowcroft, Monte Verde, or Pedra Furada 'proves' pre-Clovis. I think an unreasonable amount of evidence is being required by the most ardent critics, most of which amounts to nothing more than a demand for a 'pattern of early sites.' Should it transpire that only one site ever meets all criticisms, would archaeologists ignore it because it remains just an 'outlier'?"

–Don Alan Hall

TOKYO CONFERENCE HAS FOCUS ON PEOPLING OF AMERICAS

Seven Foreign Scientists Invited To Give Keynote Papers

Japanese organizers recently brought together scientists from several disciplines for the First World Conference on Prehistoric Mongoloid Dispersals, held in Tokyo Nov. 16–21. A primary objective of the conference was to present the results of four years' research by the Japanese conference participants. Scientists from eight other countries were involved; their primary disciplines included archaeology, physical and cultural anthropology, human genetics, ethnology, geomorphology, and isotope and computer sciences.

Studies of the peopling of the Americas played a prominent role in the conference.

Seven foreign scientists gave keynote presentations. On the opening day, three keynoters addressed origins of human populations in Asia, offering a diversity of views. They were Milford H. Wolpoff of the University of Michigan, who advocates multiregional evolution of the human species and postulates an Asian branch of great antiquity; Rebecca L. Cann of the University of Hawaii, a geneticist whose molecular studies support the view that all modern humans originated in Africa; and Merritt Ruhlen, a California linguist who has made extensive investigations of linguistic relationships among modern languages.

Other keynoters were C. Loring Brace of the University of Michigan's Museum of Anthropology, Emöke J. E. Szathmary of the University of Western Ontario, Robson Bonnichsen of the **Center for the Study of the First Americans** at Oregon State University, and Peter Bellwood of Australian National University.

By focusing on the peopling of Asia, the Japanese conference serves to emphasize the importance of early Asian populations. . . . East Asia has only recently become a focus for testing theories of human evolution.

Physical anthropologists tracing the development of the human species from the Paleolithic traditionally have emphasized the importance of Neanderthals—found in Europe and the Near East—and have given much less attention to Paleolithic peoples of Asia. By focusing on the peopling of Asia, the Japanese conference serves to emphasize the importance of early Asian populations. In the context of the conference, the term "Mongoloid" pertains to east Asian peoples in general.

As a vocal adherent of the multiregional evolution of humans, Wolpoff was an obvious choice to open the Tokyo conference. In his model for the origin of the human species, modern Asians developed in Asia and have genetic linkages with pre-sapiens *Homo erectus* of Asia, while modern Africans developed primarily in Africa with some gene flow between the continents. In contrast, the replacement model suggests that modern humans emerged in one site—probably Africa—between 100,000 and 200,000 years ago and spread to the other continents later.

Noting that East Asia has only recently become a focus for testing theories of human evolution, Wolpoff credited the rapidly growing fossil record from the region, plus increasing interest in the regional theory of human evolution, with attracting attention in recent years. Further, he noted that paleoanthropologists are recognizing that the European framework should not be used to interpret the fossil record in other parts of the world.

"The theories of human evolution and the origins of modern populations debated over most of this century were developed by Europeans in a European context," Wolpoff said in his written abstract, "and almost invariably focused on the Neandertal issue. These include the now-discredited 'stages' theory, in which all populations were said to evolve from Neandertals, and the justifiably renounced Coon theory of parallel evolution for the human races, in which different rates of evolution were attributed to the various races. The modern debate has progressed far from these, and contrasts an explanation of modern human origins by multiregional evolution against a theory of complete replacement by Africans."

Geneticist Cann, who had been a member of Allan Wilson's University of California team that pioneered the analysis of human mitochondrial DNA to suggest that all living humans descended from a single African "Eve," presented the conference with an evaluation of recent refinements in the analysis of mtDNA. Noting criticisms of human mtDNA analysis, she contended that new findings on anatomical traits are consistent with the African-origins model.

Linguist Ruhlen said that competing theories of human origin make different predictions for languages of the world's peoples. Multiregional evolution, he said, predicts that human languages evolved in more than one population over half a million years ago. "Given such independent creation of language," Ruhlen wrote in his conference abstract, "there would be no reason to expect different populations to have chosen similar words for similar meanings since the *arbitrary* connection between sound and meaning is in fact the defining characteristic of human language. The Out of Africa theory, on the other hand, predicts that all extant languages may share a common origin within the past 100,000 years, if present-day languages all derive from the language of the population which spread out of Africa and populated the world." So which theory fits linguistic evidence? Ruhlen said recent research suggests that all language families share similarities in words "such that a common origin for all these families (and hence all languages) must be presumed." While that might seem to rule out the multiregional model, Ruhlen cautioned that "there is at present no linguistic evidence that the homeland of this original language was in Africa. The evolutionary tree of what appears to be a single linguistic family remains a task for future research."

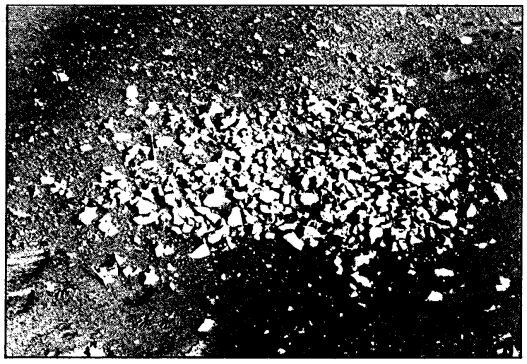
Paleoanthropologist Brace opened the second day of the conference by describing fossil evidence for the origins of modern humans, a definition based largely on brain size. Brace presented the view, first offered decades ago by Weidenreich, that gene flow among Old World populations maintained the unity of the human species over several hundred thousand years. The day's presentations focused on evolution and dispersals of humans in East Asia. The following day's presentations were related to human dispersals in the Far North—Siberia and Alaska.

Szathmary opened that session with her keynote presentation on ancient migrations from Asia to North America. She noted that genetic data show indisputably that the roots of aboriginal peoples of North America lie in Asia. More significant, genetic data suggest that the Asian descendants entered the heart of North America before continental glaciers coalesced during the peak period of late Wisconsin glaciation. (See *A Geneticist Looks At the Peopling of the Americas* on page 1.)

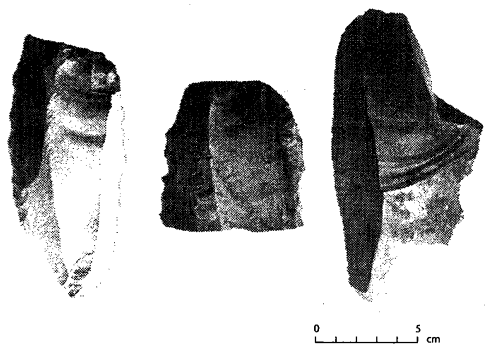
Later in the same session R. Dale Guthrie of the University of Alaska's Institute of Arctic Biology suggested that humans might not have been able to reach North America prior to the end of the Pleistocene. In his presentation on the ecological context of

continued on page 8

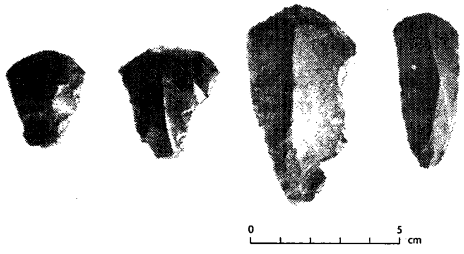
An area of exposed hearth scatter at the edge of Kentucky Lake.



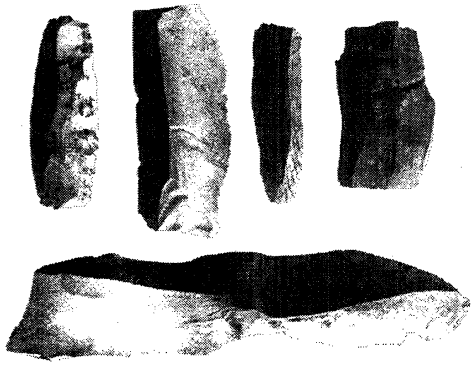
One of 43 deflated, exposed hearths at the Carson-Conn-Short site on Kentucky Lake in west-central Tennessee.



Uniface scrapers.



Uniface end scrapers.



Blade tools.

ALL PHOTOS: JOHN BROSTER

Tennessee

continued from page 1

from the same level and containing two Clovis fluted preforms. It came back as 11,950 ± 110 years B.P. (TX 7454). "I like that date because of a low sigma," Broster said of the 110-year margin of error. Further, he noted that these dates suggest the fluted material from the Southeast may well be as old as or older than that found at Blackwater Draw, the "Clovis" type-site in New Mexico.

Some have questioned the validity of dates from the Johnson site by suggesting that background carbon in the alluvial units from which the material was taken could have skewed the readings. Broster doesn't argue about that; he remains cautious and agrees that the site needs more excavation and radiocarbon dates before it can be confirmed as the earliest Clovis typology. "I want more dating from test pits and more profile drawings," he said of the site, which is approximately 150 m in length. "In a couple of more seasons out there, I anticipate we will get quite a bit more information."

Broster has high expectations for the Carson-Conn-Short site, which also was brought to his attention by amateur archaeologists for whom the site was named—H. "Kit" Carson, Gary Conn and Hal Short. "They have been extremely generous," Broster said of the trio of amateurs. "They not only showed us the site, but they gave us their collections from it for study and they don't want them back. They want to see it done properly and published."

Initial testing has produced finds including blade tools, a uniface scraper, channel flakes, and one Clovis point tip. Broster said it may be the largest known Clovis site in the East, and it possibly is comparable to the Quad site in Alabama. "We are getting a pure Clovis assemblage," said Broster, who expects to get as many as 10,000 tools from a part of the site that he says will become the focus of a "point provenience pickup." To date, the surface collection from this site contains three Clovis projectile point bases, 32 Clovis preforms, 231 blades/blade knives, 134 uniface tools and 32 blade cores. This represents less than five percent of the total artifacts exposed on the surface.

"It's beginning to look like the Tennessee River area is one of the densest locations for Clovis material we've ever seen."

Broster reports 43 deflated, exposed hearths on the site that could yield a considerable amount of datable material. "It's beginning to look like the Tennessee River area is one of the densest locations for Clovis material we've ever seen."

No kill sites have been found in the Southeast, Broster said. He suspects that in Tennessee, such sites may have been flooded by the damming of rivers. No human remains have been found in either the Carson-Conn-Short or Johnson sites.

Although dates of occupation of those sites may not yet be positively determined, Broster is able to make some educated speculations about the sites. He says that unlike Clovis kill sites in the West, these Southeast sites appear to represent locations for manufacture and maintenance of stone tools. The people appear to have located close to the rivers, bringing back large bifaces and cores to their camps and finishing the tools there. "I suspect from the use wear on the tools, they were doing a lot of hunting in these areas."

Broster hopes that continuing research will corroborate the 12,000-year-old dates. "Maybe the origin of Clovis was in the East," he suggested, "and maybe they moved out West."

–George Wisner

UPCOMING CONFERENCES

March 25–27—Southern Anthropological Society, Annual Meeting, Savannah, GA.
Contact: Daryl White, Box 247, Spelman College, Atlanta, GA 30314. (404) 223-7573

March 25–27—Northeastern Anthropological Association, Annual Meeting, Danbury, CT.
Contact: Laurie Weinstein-Farson, Anthropology, Dept. of Social Sciences, Western Connecticut State University, 181 White St., Danbury, CT 06810; (203) 797-4093.

March 26–28—Northwest Anthropology Conference, Bellingham, WA.
Contact: James Loucky, Dept. of Anthropology, Western Washington University, Bellingham, WA 98225. (206) 676-3620.

April 5–8—Computer Applications and Quantitative Methods in Archaeology Conference, Stoke-on-Trent, UK.
Contact: John Wilcock, School of Computing, Staffordshire University, The Octagon, Beaconside, Stafford ST18 OAD, UK. 44-785-52331, ext. 5446 Fax: 44-785-55334.

April 8–10—Alaska Anthropological Association, 20th Annual Conference, Anchorage, AK
Contact: Theresa Thibault, Conference Chair, National Park Service, 2525 Gambell, Anchorage, AK 99503. (907) 257-2431 Fax: (907) 257-2510.

April 14–18—Society for Archaeological Sciences, Annual Meeting, St. Louis, MO.
Contact: R. E. Taylor, Radiocarbon Laboratory, University of California, Riverside, CA 92521. (714) 787-5521 Fax: (714) 787-5409

April 14–17—American Association of Physical Anthropologists, Annual Meeting, Toronto, Ontario.
Contact: Jere Haas, Division of Nutritional Sciences, 211 Savage Hall, Cornell University, Ithica, NY, 14853-6301. (607) 255-4419.

April 18–21—Applied Quaternary Research Meeting, Victoria, British Columbia.
Contact: Environmental Geology Section, B.C. Geological Survey Branch, 553 Superior St. Victoria, B.C. Canada V8V 1X4. (604) 387-6249 Fax: (604) 356-8153.

April 23–25—National Coalition of Independent Scholars, First National Conference, Washington, D.C.
Contact: NCIS, 3314 Brooklawn Terrace, Chevy Chase, MD 20815-3901. (301) 652-7116.

May 5–9—Canadian Archaeological Association, 26th Annual Meeting, Montreal, Quebec.
Contact: Françoise Dugay, Association des Archéologues du Québec, 4061, rue Saint-Hubert, Montreal, Quebec H2L 4A7. Telephone and Fax: (514) 525-7071.

May 9–14—Society for Imaging Science & Technology, 46th Annual Conference, Cambridge, MA.
Contact: William M. Aitken, Polaroid Corp., 565 Technology Square-4, Cambridge, MA 02139. (617) 577-2369 Fax: (617) 494-5243.

May 18–21—Conference on Computing for the Social Sciences, Annual Conference. Urbana, IL.
Contact: Bruce Tonn, Oak Ridge National Laboratory, Oak Ridge, TN 37831-6207. (615) 574-4041 Fax: (615) 574-3895.

June 11–15—International Association for Impact Assessment, 12th Annual Meeting, Shanghai, China.
Sessions on cultural resources and remote sensing. Contact: E. Pendleton Banks, Wake Forest University, P.O. Box 7807, Winston-Salem, NC 27109.

June 14–16—Lithic Analysis Conference, Tulsa, OK.
Contact: George H. Odell, Department of Anthropology, University of Tulsa, Tulsa, OK 74104. (918) 631-3082.

July 5–9—Fifth International Conference on Fluvial Sedimentology, Brisbane, Australia.
Modern and ancient fluvial sedimentology—their importance to humans. Contact: Continuing Professional Education, University of Queensland, Queensland 4072, Australia. 61-7-365-7100 Fax: 61-7-365-7099.

July 26–31—15th International Conference for Caribbean Archaeology, San Juan, PR.
Topics include prehistoric and historic archaeology. Contact: Miguel Rodriguez, Instituto de Cultura Puertorriquena, Apartado 4184, San Juan, PR 00902-4184. (809) 724-1844.

July 28–Aug. 5—International Union of Anthropological and Ethnological Sciences, 13th Congress, Mexico City.
Cultural and biological dimensions of global change. Contact: Linda Manzanilla, Instituto de Investigaciones Antopologicas, Universidad Nacional Autonoma de Mexico, Ciudad Universitaria, Coyoacan D.F. 04510, Mexico. 52-5-548-78-28 Fax: 52-5-554-04-67.

Aug. 17–23—Seventh International Conference on Hunting & Gathering Societies, Moscow, Russia.
Deadline for abstracts: April 15. Contact: Linda Ellana, Department of Anthropology, University of Alaska, Fairbanks, AK 99775. (907) 474-6751 Fax: (907) 474-5817.

Aug. 23–31—International Symposium on the Origins and Evolution of Ethnocultural Processes in Asia, Novosibirsk, Russia.
Contact: Academician Anatoly Panteleevich Derevyanko, Institute of Archaeology & Ethnography SD RAS, Acad. Lavrent'yev Avenue, 17, Novosibirsk-90, 630090, Russia (RF) USS. Fax: 007-383-235-7791.

Sept. 19–24—Sixth Nordic Conference on the Application of Scientific Methods in Archaeology, Esbjerg, Denmark.
Contact: Vagn Mejdahl, The Nordic Laboratory for Luminescence Dating, Riso National Laboratory, DK-4000, Roskilde, Denmark, 15(2)1.

Nov. 12–15—25th Annual Chacmool Conference, Calgary, Alberta.
Plenary speakers: Alice Kehoe, David Kelley, Robert Janes and Jeremy Sabloff. Contact: Department of Archaeology, University of Calgary, Calgary, Alberta TN2 1N4. (403) 220-5227 Fax: (403) 282-9567.

SUGGESTED READINGS

ON Ohio Focus Illuminates Wider Puzzle

Adovasio, J. M. et al. 1990 The Meadowcroft Rockshelter Radiocarbon Chronology 1975–1990, *American Antiquity* 55(2):348–354.

Adavasio, J. M. et al. 1992 Never Say Never Again: Some Thoughts and Could Haves and Might Have Beens, *American Antiquity* 57(2):327–331.

Tankersley, K. B., and Cheryl Ann Munson 1992 Comments on the Meadowcroft Rockshelter Radiocarbon Chronology and the Recognition of Coal Contaminants, *American Antiquity* 57(2):321–326.

ON Sites in Tennessee Suggest Clovis Origin in East

Broster, John B. and Mark R. Norton 1992 The Puckett Site (40SW228) A Paleoindian/Early Archaic Occupation on the Cumberland River, Stewart County, Tennessee, *Current Research in the Pleistocene* 9:34–35.

ON A Geneticist Looks at the Peopling of the Americas

Szathmary, E. J. E. 1993 Genetics of Aboriginal North Americans, *Evolutionary Anthropology.* In press.

Laughlin, W. S. and A. B. Harper (editors) 1979 *The First Americans: Origins, Affinities, and Adaptations.* Gustav Fischer, New York.

Kirk, R. L. and Szathmary, E. J. E. (editors) 1985 *Out of Asia.* Journal of Pacific History, Canberra.

ON Genetic Field Work Is Demanding

Brown, T. and K. Brown 1992 Ancient DNA and the Archaeologist, *Antiquity* 66:10–23.

ORDER FORM

	Qty.	USA	Outside	Subtotal
I. CENTER PUBLICATIONS				
1. *Taima Taima	_____	$10.00	$12.00	_____
2. *Clovis: Origins and Adaptations	_____	$38.00	$43.00	_____
3. *Bone Modification	_____	$65.00	$70.00	_____
4. *Taphonomy: A Bibliographic Guide to the Literature	_____	$15.00	$17.00	_____
5. *New Evidence for the Pleistocene Peopling of the Americas	_____	$35.00	$40.00	_____
6. *Archaeological Sediments in Context	_____	$22.00	$26.00	_____
7. *Understanding Stone Tools: A Cognitive Approach	_____	$27.00	$32.00	_____
8. *Environments and Extinctions: Man in Late Glacial N. America	____	$25.00	$30.00	_____
9. *Current Research in the Pleistocene				
Volume 4	_____	$17.00	$21.00	_____
Volume 5	_____	$20.00	$24.00	_____
Volume 6	_____	$20.00	$24.00	_____
Volume 7	_____	$20.00	$24.00	_____
Volume 8	_____	$20.00	$24.00	_____
Volume 9	_____	$20.00	$24.00	_____
10. Mammoth Trumpet				
One year regular	_____	$15.00	$15.00	_____
Three years regular	_____	$40.00	$40.00	_____
II. NEVADA STATE MUSEUM PUBLICATIONS				
11. Pleistocene Studies in Southern Nevada	_____	$14.50	$16.00	_____
12. The Archaeology of Smith Creek Canyon, Eastern Nevada	_____	$16.50	$18.00	_____
13. Studies in Archaeology, Geology, and Paleontology at Rye Patch Reservoir, Pershing County, Nevada	_____	$16.00	$17.00	_____
14. Early Human Occupation in Far Western North America	_____	$18.50	$20.00	_____
III. SMITHSONIAN PUBLICATIONS				
15. Geochronology of Sandia Cave	_____	$4.50	$6.00	_____
IV. OTHER				
16. Megafauna and Man: Discovery of America's Heartland	_____	$15.50	$17.00	_____
17. Americans Before Columbus: Ice Age Origins	_____	$16.50	$18.00	_____
18. Late Pleistocene and Early Holocene Paleoecology and Archaeology of the Eastern Great Lakes Region	_____	$34.50	$36.00	_____
19. The Hudson-Meng Site: An Alberta Bison Kill in the Nebraska High Plains	_____	$16.50	$18.00	_____

If ordering 5 or more CENTER publications, take 20% discount.

See other side for more publications and payment instructions

Tokyo Conference

continued from page 5

northern dispersals into the New World, Guthrie described the Pleistocene environment of a vast region of northern Eurasia and North America termed the Mammoth Steppe—an arid, windy grassland. Barriers of severe aridity and bitter cold inhibited the spread of various woodland animals into the Mammoth Steppe except during relatively warm and wet interglacial periods. "These same barriers apparently prevented human colonization of the Eurasian far north, and hence the New World, until the Holocene," says Guthrie in his published abstract.

Bonnichsen opened the session on Mongoloid dispersals into the Americas with a presentation on dating early New World populations. After an overview, he focused on dating archaeological sites by their hair record. The use of accelerator mass spectrometer techniques to date individual strands of hair promises to allow archaeologists to bypass all the arguments about association and establish absolute dates, he noted. Further, Bonnichsen said that preliminary investigations indicate DNA might be extracted from ancient hair preserved in archaeological sites. If so, genetic analysis of the ancient hair can be compared with studies done on living populations. He described new methodology for floating ancient hair from clay-rich archaeological deposits and said he and his crews have recovered hair from humans as well as other mammals large and small at the Mammoth Meadow site in southwestern Montana.

The session also included a number of other papers on the peopling of the Americas. The first, by Lionel E. Jackson and Alejandra Duk-Rodkin of the Geological Survey of Canada, was on the geology of the ice-free corridor, the hypothetical region between the great Laurentide ice sheet that blanketed most of the north part of the continent and the Cordilleran ice sheet that covered mountain ranges of the northwest. They said that the ice-free corridor was closed both north and south for an extensive period when Laurentide ice pressed against mountains on the west. They dated the closure at about 30,000–25,000 years ago in the north and 29,000–23,000 years ago in the south with reopening sometime before 16,000 years ago in the north and about 14,000–12,000 years ago in the south. Jackson and Duk-Rodkin emphasized that geological conditions in the south make many published dates for an earlier ice-free corridor suspect.

Russell W. Graham of the Illinois State Museum gave a presentation on mammal resources available to first human immigrants to North America. He described how computer mapping of data available on each species is adding to the understanding of the environments late in the Pleistocene and into the Holocene. (See *Archaeology Has Adopted Computers*, **Mammoth Trumpet** 7:4). Graham said computer-generated maps document that mammal communities did not respond as a unit to the ending of the Ice Age, but each separate species responded along environmental gradients affecting its own needs. Thus these conditions lack modern analogs. Extension of the megafauna and emergence of new landscapes combined to contribute to the evolution of human settlement and subsistence patterns, he said, adding that the change to "less patchy" environments may have been a primary factor that influenced subsistence patterns. Graham said that understanding environmental changes at the end of the Pleistocene might give an insight into future changes in the climate.

Robert L. Kelly, a University of Louisville anthropologist, discussed a model for explaining the puzzling differences between Paleoindian sites in South America and those in North America. Kelly noted that the earliest sites seem to be in South America, and he outlined other apparent inconsistencies presented by the archaeological record. "Theoretical arguments and empirical data still suggest a rapid movement from North to South America when we compare the data," said Kelly.

"The theories of human evolution and the origins of modern populations debated over most of this century were developed by Europeans in a European context."

Judith Ann Willig of INFOTEC Research, Eugene, Ore., offered insights on the Clovis tradition, noting that what can be termed "Western Clovis" does not fit the model of wide-ranging bands of megafauna hunters. Western Clovis sites are associated with a wide variety of environmental settings, occurring mostly along the margins of shallow lake-marsh-stream systems of the late Pleistocene and early Holocene. She said they suggest a more "tethered" mobility pattern.

After Willig, the session's focus moved to South America with presentations by Lautario Núñez, of Chile's Catholic University of the North, and Hugo Nami, of Argentina's Prehistoric Studies Program (see *Paleoindians of Patagonia Used Pleistocene Animals*, **Mammoth Trumpet** 8:1). Then Tom D. Dillehay of the University of Kentucky gave a presentation on human migration and late-Pleistocene changes in culture in South America.

Noting that change is characteristic of all late-Pleistocene human cultures in the Americas, Dillehay suggested that a fundamental goal of those studying the peopling of the Americas should be understanding the process of long-term change in South America. He presented existing models for the peopling of South America and discussed cultural diversity there in Paleoindian times. Dillehay described findings at his own Monte Verde site in Chile and compared these with findings at various other parts of South America.

The final presentation of the day devoted to the Americas was by Satoshi Horai of Japan's National Institute of Genetics, who described research that led him and two co-investigators to conclude that the Americas were founded by four major lineages of mitochondrial DNA. "We postulate that respective four ancestral populations gave rise to different waves of migration to the New World. From the estimated coalescence time of the Asian and Native American lineages, we infer that the first migration across the Bering land bridge took place around 21,000 to 14,000 years ago," Horai, Shunro Sonoda of Kagoshima University's virology department, and Kazuo Tajima of the Aichi Cancer Center Research Institute said in their published abstract. (The research of Horai and his colleagues will be featured in the **Mammoth Trumpet's** next issue.)

The First World Conference on Prehistoric Mongoloid Dispersals concluded the following day with nine presentations on human dispersals into Pacific islands.

Oxford University Press is scheduled to publish a book on the proceedings, but abstracts of presentations may still be requested through the Prehistoric Mongoloid Dispersals Project office, Department of Anthropology and Prehistory, The University Museum, University of Tokyo, Hongo 7-3-1, Bunkyo-ku, Tokyo 113, Japan.

–DAH