MAMMOTH TRUMPET

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LIFE IN ICE AGE CHILE

Footprint of 8 to 10-year-old child from Monte Verde, Chile (Photo courtesy of Tom Dillehay)

Discoveries in Chile of an extensive human habitation site dated 12,500 to 13,500 years B.P. offers archaeologists an exciting new interpretation of ice age South America.

Monte Verde is an archaeological site in south-central Chile, 55 km southwest of Puerto Montt. To the west is a coastal range of mountains, to the east the Andes. This is heavily glaciated country, characterized by lakes, moraines, bogs, and till deposits. Several western-flowing rivers with their source in the Andes drain the valley. One of these is the Rio Maullin.

Monte Verde is located on a Pleistocene terrace, along both banks of the slow-flowing Chinchihuapi Creek, a tributary of the Maullin River. Now, as in Pleistocene times, the area is cold, wet, and boggy. At the site, the creek has cut into and partially exposed its earlier, filled channel.

The cultural remains of Monte Verde rest on the gravel fill of that older channel and on its sandy banks. Sometime after the occupation, peat encroaching from nearby bogs covered and sealed the site.

Archaeologist Tom Dillehay (University of Kentucky) first surveyed Monte Verde in 1976, and began conducting excavations there in 1978. With the assistance of a multinational, multidisciplinary research team, he made discoveries that may challenge some long-cherished ideas about early human life in the Americas.

Because of the wet, boggy conditions that prevail, preservation has been excellent. Materials recovered include architectural foundations, mammalian (mostly mastodon) osteological remains, wood undoubtedly worked by human hands (including the handles of two still-hafted end-scrapers), additional floral remains, and an intriguing lithic technology.

Though the inhabitants of Monte Verde had knowledge of bifacial stone working, a minimally modified pebble tool industry is dominant. The key principle on which the lithic assemblage is based is the careful selection of naturally occurring split pebbles. These were modified primarily through use.

The nature of this technology, confirmed by careful distributional studies, replicative experiments, and edgewear analysis, raises old questions about the *in situ* development of a fluted-point industry and the existence of a 'pre-projectile point' stage.

During 1983, with funding from the (U.S.) National Science Foundation, Dillehay's team had the resources necessary to undertake extensive excavation of the interior portions of the creek area for the first time. The results give us the most complete picture we have to date of daily life in this portion of South America during the Pleistocene.

In earlier field seasons, a wish-bone shaped "architectural anomaly" had been uncovered. This year's excavation of the surrounding area revealed 12 more architectural foundations, most of them joined to one another.

The foundations are made of cut wooden planks, and of small tree trunks staked in place. Bits of preserved hide (possibly mastodon) have been found

(Continued on page 3)

EARLY MAN IN PATAGONIA

Luis Alberto Borrero

The material recovered from Las Buitreras Cave, on the Río Gallegos Basin, is being subjected to new analyses. María José Figuerero Torres (Universidad de Buenos Aires), working in collaboration with J.H. Laza, M. Bond and A.C. Cicchino (Museo de La Plata), has produced a report on the paleofeces of non-human origin from levels VII-VIII, dated around 10,000 B.P.

Four paleofeces are attributed to the carnivorous-omnivorous, cf. *Dusicyon gymnocercus* and *D. griseus* (fox); containing two beetle species (*Taurocerestes patagonicus* and *Caenorhynus lineatus*), small unidentified plant fragments, and two rodent teeth (*Akodon* (sp.). A single specimen of human paleofeces is under study (Figuerero Torres *et al.* 1982).

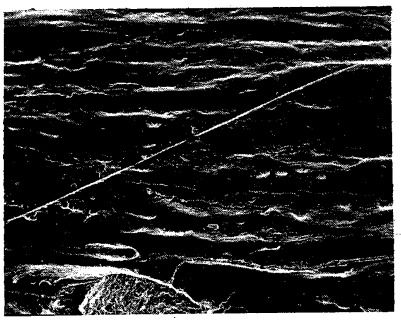
The author, in collaboration with Hugo D. Yacobaccio (Universidad de Buenos Aires), is undertaking research related to butchering marks on ground sloth (*Mylodon* cf. *M. listai*) and guanaco (*Lama glama guanicoe*) bones from levels VII and VIII. This study includes experiments to duplicate the marks on the archaeological specimens, with the aim of separating natural from cultural marks.

Other studies concern marrow consumption. *Mylodon* bones lack consumable marrow, but guanaco bones contain it in large quantities. Several models of human modification of bones for marrow consumption are being used to interpret the guanaco bone collection from Las Buitreras Cave. In order to assess the importance of this kind of modification, the archaeological bones are being classified by size and the location of the points of impact is recorded. These data will be compared with expected frequencies derived from a set of experiments, and with the different models in the literature.

(Continued on page 8)

INSIDE...

Center News 2
Mammoth Bones with a Human Touch 3
35 Years of Research on Beringia 4
Points in Sequence 4
Negative Ions and Positive Numbers 5
Conference Reports 6,7



Electron micrograph of cut mark on a bison rib from M1V1-13, Old Crow Basin, northern Yukon Territory, Canada (magnified 25.5X) (Photo courtesy of Richard Morlan)

CUT MARKS SUGGEST HUMAN PRESENCE

Richard Morlan believes he has evidence for a cut mark produced by humans on a bison rib. The bone was found at MLVL-13 in the Old Crow Basin of Canada's Yukon Territory.

Old Crow is a region known for an extraordinary quantity of faunal remains. A bison rib, as Morlan remarks, is "not an unrealistic place to find a cut mark." What makes Morlan's discovery news is that a bison femur found in association with the rib dates 72,000-77,000 years before present as determined by the uranium series method.

This is earlier, by many tens of thousands of years, than the date that most students of the problem envision human activity in this hemisphere. But Richard Morlan presents his claim without dogmatism and he backs it with a body of scientific evidence which he finds compelling.

Morlan, an archaeologist with the National Museum of Man in Ottawa, has been investigating the Old Crow region since 1967. He is part of a distinguished team of Canadian scientists, representing several disciplines, who have studied the area extensively over the past 20 years.

The Old Crow basin is a rough and inaccessible territory just over the Alaskan border. In Pleistocene times the region was the site of a large glacial lake. Today it is characterized by permafrost, peat bogs, square-looking ponds, and meandering rivers that roar once a year with the melting ice.

In the last 12,000 years, the Old Crow River has cut down through about 90 meters of frozen sediments. MLVL-13 is one of the few sites, in a region afflicted with mud slides, at which bones have been found in apparently good stratigraphic context.

Nearly 90 km from the mouth of the Old Crow River, MLVL-13 is part of a high bluff on the river's right bank. Although the dated bison femur was found about 20 m from the cut-marked rib, the bones are

(Continued on page 3)

CENTER FOCUS: THE PLEISTOCENE

The peopling of the Americas is of significance and interest for both scientists and the public. It is a subject that spans national boundaries as people try to understand their Pleistocene heritage.

Yet, archaeological research on early prehistory of the Americas before 10,000 years ago has been somewhat fragmented. Specialists on the topic are scattered across several disciplines, and relevant books and articles appear in many languages.

Recently, seed funds from Mr. Bingham's Trust for Charity have been committed to addressing some of these problems through the creation of an academic center. The Center for the Study of Early Man was founded in October, 1981, to promote research, improve education, and to disseminate information.

Center programs have been developed to fill what we feel are critical needs. Scientists need to have access to each other and to information. And the interested public needs a way to find out about what scientists are saying to each other.

Toward that end, the **Mammoth Trumpet, Current Research** series, and annual bibliography (see articles on this page) were developed. Part of this publication program, **Peopling of the Americas,** includes books.

The first volumes in several related series will appear this year, under general editors Alan L. Bryan and Ruth Gruhn. Volume 1 in the Process Series is **Understanding Stone Tools: A Cognitive Approach** by David Young and Robson Bonnichsen (see page 5 for other forthcoming titles).

We would like to announce the debut of our fundraising program this year. Our initial funding was limited, with the expectation we would be able to raise money from donations and grant writings to continue operation of the Center's programs. We are currently seeking a challange grant to match donations received in 1984. We are a non-profit organization, and all contributions are tax-deductible.

HUMAN SKELETAL DATING PROJECT

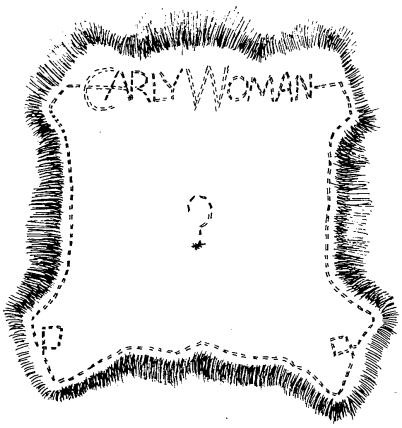
Controversy about the timing of human colonization of North and South America has revolved around problems of dating, especially of those sites yielding human skeletal remains. Dating these remains is perhaps the most direct way of documenting human presence in this hemisphere during the Pleistocene. However, many of the sites at which they were found were dug before the advent of modern radiometric dating techniques.

The recent development of carbon 14 dating by tandem particle accelerator (see story, page 4) makes it possible to date very small pieces of bone. For the first time, these early remains can be dated with minimal destruction.

The Center for the Study of Early Man has initiated the Human Skeletal Dating Project to provide uniform dating for this material. The project involves the cooperation of scientists and museum staffs throughout the Americas who have agreed to provide samples for dating. Also included are three institutions which will do the actual dating: the University of Arizona's Laboratory of Isotope Geochemistry; the Biogeosciences Laboratory at the Carnegie Institution, Washington, DC; and the Physics Department, University of Maine at Orono.

A two-step procedure is involved. First, x-ray fluorescence and amino acid analysis will be used to determine if human skeletal material and associated bones from extinct ice age animals were deposited at the same time. Next the samples themselves will be dated at the University of Arizona's particle reactor facility.

For the first time, samples of human skeletal material from all parts of the western hemisphere and the most modern dating methods available will be brought together. Center staff hopes the meeting will produce interesting and significant results. If you know of any potentially early but unpublished skeletal material, please contact the Center.



CURRENT RESEARCH SERIES PLANNED

Keeping up with current research on the peopling of the Americas is a difficult task for researchers and public alike. Pertinent research ranges across several disciplines and many national boundaries. There is a need for organizing and publicizing summaries of such work.

Peopling of the Americas: Current Research is a new publication that will be issued once a year by the Center for the Study of Early Man. Scientists from all over the world who study various aspects of Pleistocene peoples of the Americas and their environments are encouraged to submit a short summary of their most current research.

The idea of this series is a yearly, concise (note format), state-of-the-art update in a single, bound source. The scope is interdisciplinary, and will include new and significant information pertaining to early humans, their technology, and the environments in which they lived before 10,000 years ago.

Prospective contributors should submit a manuscript which may include one line drawing. Notes will be published in English, French, or Spanish. Non-English submissions will be accompanied by an English translation provided by the editorial staff. Each volume will be 15 x 23 cm (6" x 9") in size, with a soft cover.

If you are interested in submitting a summary for publication, you may obtain a copy of "Information for Contributors" by writing to Jim I. Mead, Editor Current Research, Center for the Study of Early Man, University of Maine at Orono, Orono, ME 04469, or by calling (207)581-2197.

BIBLIOGRAFITTI

Deeply lodged in the bedrock of our philosophy at the Center for the Study of Early Man is a commitment to improving access to sources of information on this subject. To this end we have begun work on a comprehensive bibliography that will be computerized, extensively indexed (by co-author, site, geographic region, and subject), and as complete and accurate as possible.

We are currently collecting entries for a retrospective volume covering the period 1839-1983. Annual updates will be published for subsequent years.

To succeed in this project we need your help. If you have written a report or published an article in this field, please send us a copy. If you have compiled a bibliography that includes information on the early human occupation of the Americas, please let us know. Address all comments, contributions or inquiries to Librarian, Center for the Study of Early Man, University of Maine, Orono, ME 04469.

INTRODUCING THE MAMMOTH TRUMPET

The **Mammoth Trumpet** was created in response to the need for communicating new discoveries and current research activities concerning human occupation of the Americas. Written for an audience which includes both scientists and interested members of the general public, the **Mammoth Trumpet** is being sent initially to about 50,000 individuals. With this large distribution, we hope to develop a subscription base to support two issues a year.

The Center for the Study of Early Man will publish the newspaper as part of its commitment to improve information dissemination among those interested in the peopling of the Americas before 10,000 years ago and human origins in general.

Center Director Robson Bonnichsen says, "Significant discoveries often go unreported in the popular press, and other discoveries which are reported are not placed in proper perspective. The result is that the public, who are the ultimate sponsors of scientific research, are poorly informed about America's earliest cultural heritage."

Early human studies is interdisciplinary and has a global scope, making it difficult to stay abreast of current issues and research. Bonnichsen observes that, "understanding how and when the Americas were peopled involves having an overview of both the archaeological record and the Quaternary history of Asia, North America, and South America. An appreciation of human responses to these ancient environmental systems requires a familiarity with a large body of literature which is widely scattered and occurs in several languages."

The **Mammoth Trumpet** will serve as a vehicle for information flow as well as a forum for airing significant issues. Beginning with this first issue, we will feature new discoveries, reports of conferences and meetings, notices of new publications, commentary, and news from the Center for the Study of Early Man.

Newspaper staff will regularly contact a wide variety of researchers for news of their own research or others they know about. It is our policy to report on discoveries only with the permission of the principal investigator.

We will invite submission of several news articles for each issue. In other cases we will interview scientists and provide a synopsis of their recent work. Our policy is not to advocate any one particular position or to interpret the issues, but to keep an "open door" to new ideas.

In the interest of improving communication while adhering to a newspaper format, we have decided to include institutional affiliations for researchers mentioned whenever possible. Although references to the literature will not generally be included in the articles, we have created a Suggestions for Further Reading section which cites one or two references pertinent to each article.

The editorial staff welcomes comments and suggestions from our readers as we begin our maiden voyage.

MAMMOTH TRUMPET

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MAMMOTH BONES WITH HUMAN TOUCH?

D. Gentry Steele and David L. Carlson

Remains of a Columbian mammoth with possible evidence of bone breakage by humans have been found in south central Texas at the Duewall-Newberry site. The bones were recovered during the 1983 summer excavation directed by D. Gentry Steele and David L. Carlson of Texas A & M University.

Preliminary studies indicate that the mammoth apparently died toward the end of the Pleistocene (about 10,000 to 12,000 years ago) on a fine sand point bar of the river. Holocene deltaic clays are found just above the point bar.

Excavation of 21 square meters of the site resulted in the recovery of the dentition and tusks of a single mammoth along with the right and left scapulae and humeri, one radius, one femur fragment, one tibia, ribs, and most of the vertebrae.

Based on the recent eruption of the third molars, the fused epiphyses of the knee and elbow, and the unfused epiphyses of the hip and shoulder, it appears that the animal was an adult. Ephiphyses are the bone growth centers at the ends of the bone shaft which fuse with the shaft as an animal develops into an adult.

The sandy sediments surrounding the bones were water screened through quarter-inch hardware cloth, but no stone tools or tool production waste flakes were discovered.

The bones are disarticulated. Some bones, such as the femur fragment, have been moved a meter or more from their correct anatomical position.

Several of the bones, particularly the shafts of both humeri and the femur fragment, exhibit green bone spiral fractures. These fractures indicate the bone was hit with some force soon after the animal's death.

Because the fine sands of the point bar suggest the river flow was not turbulent, it seems unlikely these large bones could have been broken and moved around by water. Also, the long bones and ribs do not show a consistent parallel orientation as would be expected if water movement was responsible for the disturbance.

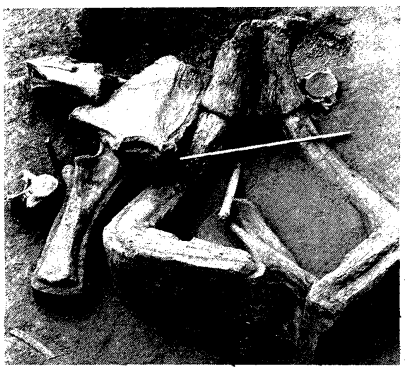
Trampling or scavenging by animals may account for some of the disturbance. However, the large (more fragile) flat scapulae were intact and no evidence of gnawing shows on the articular surfaces.

The pattern of bone breakage suggest the possibility that people broke certain skeletal parts. Only the shafts of the largest bones, the humeri and the femur, show spiral fractures. The more fragile ephiphyses of these bones and other fragile bones are unbroken. The humerus of a mammoth is approximately 15-20 cm in diameter.

Each of several large bone fragments show evidence of impact points. It appears the bone was struck with some force causing flakes to break off. A preliminary analysis shows that one 12 cm x 19 cm x 2 cm fragment appears to have had several flakes removed from both faces of the bone.

The purpose of these activities is not clear at this stage of the analysis. The bone fragments and flakes could be the result of bone marrow processing (breaking bones to extract the marrow). It could also represent the manufacture of expedient ("on the spot") bone flake tools, or the preparation of bone blanks for later manufacture into bone tools such as points, awls, scrapers, or fleshers.

On the basis of the 1983 season, Drs. Steele and Carlson plan to request funds to expand the excavations next season. The distribution of skeletal elements strongly suggests that additional parts of the same mammoth lie east and south of the present excavation.



Columbian mammoth bones from the Duewall-Newberry site, Texas. Two large tusks (overlaid with meter scale) are still intact, along with a fragment of the skull. Nearby lie the ulna, two scapulae, two vertebrae, and a rib. (Photo courtesy of Gentry Steele)

CUT MARKS

(Continued from page 1)

considered to be in association because they were both in an uneroded area of the same early Wisconsinan flood plain. Morlan and his co-workers discovered both bones by following a contact, the interface between the two different stratigraphic levels, across the face of the bluff. (This contact is known as Disconformity A.)

Also found in association was a large fragment of mammoth humerus which was broken when the bone was fresh, another possible indication of human activity in the area.

Laboratory analysis of the bison rib by Pat Shipman of Johns Hopkins University has confirmed Morlan's suspicion of a tool-produced cut-mark. Shipman, a physical anthropologist, has made an extensive study of various kinds of bone modification with the aid of electron microscopy.

First, Shipman makes a plastic cast of the specimen and then examines the cut marks using a scanning electron microscope. She can compare any given unknown cut mark with a comparative collection of roughly a thousand marks produced either experimentally or under controlled field observation.

Cut marks produced by stone tools have a distinctive set of characteristics including a series of striations inside the cut, on the walls, and on the bottom. Extensive studies by Shipman further indicate that only cutting with stone tools can produce this particular pattern of marking. It is this particular kind of striation series which is clearly visible on the bison rib from MLVL-13.

For Morlan and Shipman, the challenge posed by this specimen is clear: we can begin thinking about a very early human presence in North America, or we can start looking for "a process as yet unidentified that can make a mark that mimics a human cut mark."

"I'm not going to try to choose between those two possible outcomes," says Morlan, "What I feel we have right now is a single piece of information that is quite interesting."

For Morlan the task ahead is not to engage in controversy but to undertake follow-up studies; his plan is two-fold. First, he will make an electron microscopic analysis of other bones from the area which display possible cut marks. Secondly, because these other specimens were found re-deposited and out of stratigraphic context, Morlan plans to run accelerator radiocarbon dates on individual pieces which have confirmed cut marks.

Meanwhile, the MLVL-13 bison rib will remain situated squarely on the frontier of our knowledge, a challenge to archaeological thinking and research techniques.

ICE AGE CHILE

(Continued from page 1)

placed against some of these logs. Dillehay postulates that the structures were Alacaluf-like choza shelters - wooden frameworks covered with hide.

There are large communal hearths outside the structures, and inside each a small charcoal oven, which were made by scooping out the sandy bank on which the houses were built and lining the resulting cavity with clay. The clay was imported and people stored it for future use.

In one of these piles, archaeologists found the footprint of an 8-10 year old child - suggesting that the propensities of children, at least, have changed very little in 13,000 years.

Eight pieces of mastodon bone were found grouped close to one hearth. Some had clear cutmarks on them. Fragments of burned bone were also recovered.

Camelid bones opened a new avenue of inquiry. There are definite butchering marks on these, and they may have been broken to remove marrow.

Particularly noteworthy is the discovery of three crude wooden mortars, with wooden stakes placed around them to prevent them from shifting. Grinding stones were also excavated. These indicate that plant foods played a considerable role in the diet of the occupants.

These people were clearly selecting out edible wild plants, particularly tuberous varieties. Several pieces of wild potato have been found. Medicinal plants are also present, as well as varieties brought in from the coast, 30 km away. These coastal plants are those which retain (and yield) a very high salt content.

Monte Verde is an important site not merely for the exceptional preservation of its remains but for the unique insight it provides into a surprisingly diversified human adaptation to a late Pleistocene environment.

38 YEARS OF RESEARCH ON BERINGIA

An Interview with David Hopkins

For most of his adult life, David Hopkins has been one of the prime movers and synthesizers of research on Beringia. That tract of land (some of it now under water) between Siberia's Lena River and the MacKenzie River in the Yukon has been, he says, a common thread in his career, if not an obsession.

For the last 35 years Hopkins has made major contributions to reconstructing changes in the Beringian landscape during the Pleistocene, and analyzing the implications of these changes for the peopling of the Americas. During a recent visit to the Center for the Study of Early Man, Dr. Hopkins spoke about his career and the state of the art of Beringian research.

Hopkins' involvement with the area began in the late 1940s when he was working on Alaska's Seward Peninsula, about 100 miles from Bering Strait. Acquaintance with archaeologist Louis Giddings had rekindled a boyhood interest in human prehistory. "I've been interested in archaeology since I was a little boy and my mother bought me a book about the Stone Age," said Hopkins. His early research concerned gold placers laid down in old beach deposits during interglacials when seas were high.

At some point, Hopkins' geologic research and his interest in archaeology came together. It occurred to him that these Pleistocene beach deposits disclosed a record of fluctuating sea levels. Hopkins realized that if he could chart the changing sea levels in the Bering Strait, he might be able to answer the questions of whether there had indeed been a Bering Land Bridge and what role this might have played in human dispersals.

"When glaciers have been large on land," says Hopkins, "they have been large at the expense of the sea. The bigger the glaciers get, the more sea level falls." About 18,000 years ago, sea levels in the Bering Strait were some 300 feet lower than they are at present, exposing a land mass measuring almost 600 miles north to south. Dry land persisted until 14,000 years ago. As recently as 9,000 years ago two very narrow crossings existed.

"To recreate a landscape, green with life or windswept and barren, and then to repopulate it with animals and men is a formidable task."

The earlier record is less clear: inundations of the Strait probably occurred 60,000 and 80,000 years ago, and perhaps also at 35,000 and 42,000 years ago.

Hopkins edited the now classic synthesis of research on this subject - succinctly entitled **The Bering Land Bridge** which appeared in 1967. A complementary volume, **The Paleoecology of Beringia** (edited by Hopkins along with John Matthews, Charles Schweger and Steven Young) appeared fifteen years later. The titles reflect a shift in Hopkin's thinking about the subject.

David Hopkins

Over the years, the existence of an actual land bridge came to seem less important to him. "Small bodies of water haven't been a real barrier to human dispersals for 40,000 years or more."

Today the Bering Strait is impassable in winter. It freezes, but forms no smooth solid surface. Moved by fierce currents, the ice is exceptionally rough. But if the water in the straight was only 5-10 meters deep, our Pleistocene forebears would have faced a very passable expanse of smooth, winter, shorefast ice.

Accordingly, Hopkins shifted the focus of his research from the existence of the land bridge itself to a broader concern with the Beringian environment on both sides of the strait. He speaks about this long-vanished environment with contagious enthusiasm.

The Beringian landscape was like nothing we know today, with features that characterize both contemporary tundra and steppe environments. It was dry, unlike most of the modern-day Alaska. There were no trees, and vegetation was sparce. There were sand dunes and "a lot of sand blowing around." It was, needless to say, cold.

Reconstructing this vanished environment involves considerable ingenuity. One important technique is the study of fossil pollen, derived mostly from cores taken from lake bottoms. This gives us a gross idea of what plants were present - we can tell genera from this kind of analysis but not species. The presence of wind-blown pollen may also skew results.

More exact notions of the ice age vegetation result from the study of fossil seeds and leaves. Wherever peat is preserved, plant remains are found that are identifiable to the species level with the aid of a low-power microscope.

Insect remains provide another key to our understanding of the paleoenvironment. Beetles are especially helpful. They preserve well, are easily identifiable to genus and sometimes to species, and have an extraordinarily stable evolutionary history. "The only extinct species is named after me," Hopkins jokes. This stability makes inferences on the preferred habitats of Pleistocene beetles possible. Because they can easily disperse to more congenial climes, they are very sensitive indicators of environmental change.

Of course, the subject of the Pleistocene environment of Beringia is critical for theories of early human migrations. This is a topic on which Hopkins confesses to a chronic ambivalence. The best model, he says, isn't necessarily the right model but the one that best accommodates our odd accumulation of facts and 'factoids' on the peopling of the Americas.

The theory to which he presently gives at least partial assent has humans beginning to hunt in the Arctic about 35,000 years ago. This means that an essentially modern population migrated with all the equipment it needed.

"When I tell you something, you shouldn't necessarily believe me. But you should think about what I say."

There were no mass migrations, Hopkins feels. As population expanded, bands would bud off and range a little farther to the east and south. When the land bridge was close to its greatest extent, Hopkins points out, the transition from one continent to another would be imperceptible. The crossing would seem like business as usual.

Postulation of such an early migration, before the fullest extent of North American glaciation (25,000-30,000 years ago), is controversial. But the strength of this kind of model is that it allows ample time for a gradual dispersal of populations from the north before the dates (11,000-13,000 years before present) of the earliest sites in South America.

David Hopkins, however, remains both flexible in his thinking and unfazed by authority - even his own. "When I tell you something," he says, "you shouldn't necessarily believe me. But you should think about what I say." In his long and exceptionally fruitful career, Dr. Hopkins has given us all plenty food for thought.

POINTS IN SEQUENCE *A WELL-STRATIFIED SE TEXAS SITE*

L.W. Patterson

The first season of excavation has been completed by the Houston Archaeological Society on a unique, well-stratified site, 41WH19, at a location 50 miles southwest of Houston, Texas. This site starts during the early Paleoindian period and continues through the late Prehistoric. It appears that over 10,000 years of prehistory are represented here.

This is the first time that a site with well-stratified Paleoindian components has been found in southeastern Texas. The total site depth is 2.5 meters, with 80 cm of Paleoindian materials at the bottom, just above the sterile Pleistocene Beaumont Formation. Carbon samples are available for dating, and hopefully a funding source can be found so that radiocarbon dating can proceed. There are also many burned clay lumps that may be useful for thermoluminescence dating.

This site appears to interface Plains and eastern Paleoindian projectile point traditions (*see below). The Plains tradition is represented by Folsom, Plainview, and Angostura-like points, all *in situ* in the expected stratigraphic order. A Scottsbluff point was also found nearby, in an eroded area. The eastern Paleoindian tradition is represented by a San Patrice point and a variety of side and corner notched points, all with ground basal edges. The San Patrice point was found *in situ*, above a Plainview point and below an Angostura-like point.

Surprisingly, the earliest side-notched point occurs 5 cm *below* a Folsom point. This may explain why Folsom points have never been found before on the upper Texas coast, because other point types were being made instead of Folsom during the same time period.

Several varieties of side-notched points have been found *in situ* at this site, above a Folsom point and below a Plainview point. This is the third site in Texas where side-notched points have been found below Plainview points. A San Patrice point was found below Plainview at the Horn Shelter site on the upper Brazos River. Several side-notched points have been found below Plainview points at the Wilson-Leonard Site, north of Austin, Texas.

The Angostura-like point possibly represents the terminal late Paleoindian period here. Above this, in the early Archaic period, notched point styles seem to be displaced by straight-stem styles, all with ground basal edges.

A number of sites have been found in the last few years in southeastern Texas with projectile point types that indicate very long occupation sequences, from the Paleoindian period through the late Prehistoric. A long-time stable settlement pattern is indicated for the inland portion of the upper Texas coastal plain.

NEGATIVE IONS AND POSITIVE NUMBERS

NEW RADIOCARBON DATING METHOD OFFERS HOPE FOR ARCHAEOLOGISTS

The plague of Pleistocene archaeology has been to accurately and directly determine the age of sites. More often than not lithic artifacts are all that remain of butchering and habitation localities. Researchers of ice age sites are understandably ecstatic when charcoal or wood is recovered at the excavation site.

Conventional methods of determining the radiocarbon age of organics recovered from Pleistocene sites involved amassing enough material to produce at least one gram of elemental carbon. This is enough to fill one 35 mm film can full to the brim.

To obtain this required sample size, the archaeologist painstakingly picks flecks of charcoal from over a wide area of the site, if he or she is lucky enough to have any charcoal. Such a collecting technique may contaminate (by adding older or younger foreign organics) the sample. Sometimes the collected "charcoal" is really only caramelized wood, another potential source of chronological contaminants.

Another problem is the nature of the dating methods themselves: it destroys the sample in the process of dating. So rarely are human skeletal remains found in a Paleoindian context, that scientists are unwilling to commit a significant portion of these scarce finds to the dating process.

A new technique of using an accelerator to determine the radiocarbon age is the breakthrough so urgently needed by the researcher of Paleoindian materials. Both now-standard procedures of radiocarbon dating are based on measurements of beta particles emitted by the carbon 14 nucleus in the process of decay. One technique creates carbon dioxide by burning the sample in an oxygen-filled environment, and uses a particle counter to give an estimate of the carbon 14 concentration present in the sample. The liquid scintillation technique, on the other hand, converts the carboniferous material to benzene and counts light emissions created by beta particles as they pass through a phosphorescent liquid.

In contrast, the new technique uses a linear accelerator and a mass spectrometer to measure the mass of carbon 14 present in the material to be dated. Because the carbon compound to be dated is a negative ion, the tandem mass spectrometer is employed for determining and isolating the carbon 14 isotope.

A plus for the archaeologist is that only 0.001 gram of carbon is needed - that is, enough to cover the head of a pin. Even small specks of charcoal, or the isolated minute seed, or the fragment of the rare human skeleton from a Pleistocene site can now be dated.

This, in turn, means that multiple dates are now possible for sites not previously datable at all. Multiple dating is desirable in order to develop a better resolution of the timing and occupation of these sites.

Only three facilities in North America are currently working on radiometric dating using the tandem accelerator. They are located at the University of Arizona, Chalk River (Ontario), and the University of Toronto. The first two are functioning now and the third will be soon.

There are drawbacks to this new technique, as there are to any dating method. The process is still in its infancy. The Arizona laboratory is still "debugging" the new machine to reduce the statistical error (the plus or minus figure, or one standard deviation, attached to each radiocarbon date) to satisfactory levels.

The process is slow and expensive. It takes one or two lab assistants to prepare the samples, and four physicists and geochemists to analyze each targetted date. The number of samples handled right now is small and limited to top priority items. At the present time, the accelerator technique is only accurate for dating carbon less than 40,000 years old.

Tandem accelerator dating does not replace conventional techniques, but is a method of dating very small samples of very precious, unexpendable material. It provides a way of reducing the contaminant potential, and a means for producing multiple dates for sites where only limited organic material has been found. It furnishes an important tool for the student of early human life in the Americas.

Thanks to C. Vance Haynes for much of the information in this article. **Trumpet** *staff interviewed him and excerpted parts of his presentation at the 1983 Eastern States Archeological Federation meeting. He is the senior archaeologist associated with the tandem accelerator, Laboratory of Isotope Geochemistry, Department of Geosciences, University of Arizona, Tucson.*

SUGGESTED READINGS

On Monte Verde

Dillehay, Thomas. 1984 The cultural relationships of Monte Verde: A late Pleistocene site in the subarctic forest of south-central Chile. In **New Evidence for the Pleistocene Peopling of the Americas,** edited by A.L. Bryan. Orono, Maine: Center for the Study of Early Man. (in press)

On Old Crow

Morlan, Richard. 1980 **Taphonomy and Archaeology in the Upper Pleistocene of the Northern Yukon Territory: A glimpse of the peopling of the New World.** Mercury Series Paper No. 94, National Museum of Man, Ottawa.

Shipman, Pat and Jennie Rose. 1983 Early hominid hunting, butchering, and carcass processing behaviors. **Anthropological Archaeology** 2:57-98.

On Carbon 14 Accelerator Dating

Haynes, C. Vance. 1984 Application of accelerator C-14 dating to fluted-point sites. In New Experiments Upon the Record of Eastern Paleo-Indian Culture, edited by R. Michael Gramly and John R. Grimes. **Archaeology of Eastern North America** 12. (forthcoming)

On Beringia

Hopkins, David (editor). 1967 **The Bering Land Bridge.** Stanford: Stanford University Press.

Hopkins, David, John V. Matthews, Jr., Charles E. Schweger, and Steven B. Young. 1982 **The Paleoecology of Beringia.** New York: Academic Press. (Italicized quote on p. 3 of newspaper taken from p. 425 of above volume.)

On Points in Sequence

Patterson, L.W. and J.D. Hudgins. 1983 A preliminary summary of excavations at site 41WH19, Wharton County, Texas. **Journal of the Houston Archaeological Society,** vol. 77, December.

(still one of the best sources on tool types)
Wormington, H.M. 1957 **Ancient Man in North America.** Denver: Denver Museum of Natural History.

Projectile Point Features

Folsom: lanceolate form, concave base, full-length flutes.

Plainview: triangular lanceolate form, slightly convex base expanding into blade.

Scottsbluff: lanceolate form, straight stem, straight base.

San Patrice: expanding stemmed point with triangular blade.

Angostura: slender lanceolate form with convex expanding base.

CONFERENCES

XI International Congress of Anthropological and Ethnological Sciences

A symposium about Early Man in Western North America, organized by Brian Reeves, was held at the XI ICAES Congress in Vancouver, (August, 1983). Papers described research in the mountain, desert, and coastal regions.

Dr. Leslie B. Davis (Montana State University) reported on Indian Creek site, a deeply stratified Paleoindian site in the mountains south of Helena, Montana. There are over 10 occupations, the earliest of which dates ca. 11,000 to 10,800 years ago, and is associated with Clovis and Folsom technologies. Associated fauna includes large numbers of butchered yellow-bellied marmots.

Emma Lou Davis and Clark Brott (Great Basin Foundation) presented their work with the large boulder outline animal figurines from the Panamint Valley of California. Davis and Brott believe these monuments were constructed as the last pluvial lakes receded.

Fred Budinger (Calico Early Man Site) updated recent geochronological research at Calico (dating ca. 200,000 B.P.). A set of artifact casts were brought for participants to examine.

Patty Casper (San Bernardino County Museum) presented a paper on behalf of R.D. Simpson, concerning the Lake Mannix industry, a series of surface sites geochronologically dated to ca. 20,000 B.P.

Herbert Minshall (San Diego County Archaeological Society) summarized early man research in San Diego. Louis Payen's (University of California, Riverside) presentation dealt with the problem of the origins of Carter's Texas Street "Blade Core Industry." Payen's research suggested it appears to be of pyrogenic origin, associated with extensive fires.

Brian Reeves (University of Calgary) presented a paper summarizing recent field research in San Diego. The project was designed to resolve and define natural vs cultural processes which produced the late Pleistocene assemblages.

R.E. Taylor (University of California, Riverside) reappraised the amino acid dating of southern California human skeletal material. Reanalysis by Uranium/Thorium (U/Th) and radiocarbon (conventional and accelerator) dating strongly suggests the amino acid dates are in error.

The proceedings of the symposium will be published, including papers by several people who arrived on the wrong day due to Congress scheduling errors: Roy J. Schlemon (Schlemon Associates) on desert geoarchaelogy; Robson Bonnichsen, Marcella Sorg (both, Center for the Study of Early Man), Mary Rusco (Nevada State Museum), Jonathan Davis (Desert Research Institute) and Don Tuohy (Nevada State Museum) on human activity from Rye Patch Reservoir; and M. Glasillow and D. Johnson (University of Illinois, Urbana) on the Channel Islands.

Another symposium, entitled "Early Man in South America," was organized by William J. Mayer-Oakes and Ernesto Salazar. Unfortunately, despite funding assistance from the conference organizing committee and the Center for the Study of Early Man, many of the South American participants were unable to attend. Bill Mayer-Oakes plans to submit the following papers from the symposium for publication, including those of people who were unable to come:

- Michael Snarskis (Museo Nacional de Costa Rica). New Data from Costa Rica in a Central America Perspective on Early Man
- Jose Cruxent (Museo de Hombre, Coro, Estada Falcón, Venezuela). Fluted Point Sites in Venezuela (in Spanish)
- Thomas Myers (University of Nebraska Museum) and Wesley R. Hurt (University of Indiana). Pre-Clovis Occupations of South America
- Ernesto Salazar (Museo de Banco Central, Quito, Ecuador). Early Man in Ecuador (in Spanish)
- John Rick (Stanford). New Data from Peru in a Central Andean Perspective on Early Man
- Lautaro Nuñez (Universidad de Norte, Antofagasta, Chile). New Data from Chile in a Southern Andean Perspective on Early Man (in Spanish)
- Luis Alberto Borrero (Universidad de Buenos Aires, Brazil). Discontinuous Distributions of Projectile Points in South America
- Thomas F. Lynch (Cornell). Survey of the Laguna de Punta Grande, Northern Chile
- William J. Mayer-Oakes (Texas Tech). The Significance of El Inga Fluted Points
- Michael Malpass (St. Lawrence University, Canton, New York). Early Lithic Technologies of Coastal Peru

Geological Society of America Archaeological Division

The 1983 annual meeting of the Geological Society of America, held in Indianapolis October 31-November 3, included a symposium on Late Glacial Environments in North America. Organized by Harold W. Borns, Jr. and Robson Bonnichsen of the Institute of Quaternary Studies at the University of Maine at Orono, the session was designed to focus attention on the role of ice-marginal environments in human adaptive strategies.

In his opening comments, Borns emphasized that "the artifacts are not the whole story. In order to facilitate an understanding of human colonization of and adaptation to recently deglaciated landscapes, it is imperative to understand the geological, paleoecological, and cultural aspects of those environments in which humans were but one component."

Bonnichsen reported on several as yet undated Paleoindian (fluted point) workshop sites in the Munsungun Lake Basin in northern Maine. He and his co-workers propose that human occupation occurred in this periglacial environment adjacent to melting ice, and that ice-marginal environments may have had greater productivity than previously suspected.

George L. Jacobson presented new synoptic maps based on hundreds of pollen diagrams documenting the location of individual tree species in eastern North America relative to the margins of the Laurentide ice sheet from 14,000 to 10,000 years ago.

Robert Stuckenrath emphasized the central role radiocarbon dating plays in integrating records produced by teams of collaborating scientists, but emphasized the importance of documenting sedimentary contexts of charcoal samples.

C.R. Harington presented a review of the last 20 years of vertebrate paleontological research in the northern Yukon. Peter Stork and Q. Hugh J. Gwyn co-delivered a paper depicting the relationships between ice margins, glacial Lake Algonquin and archaeological sites in southern Ontario.

Adrien Hannus presented evidence for human-induced bone breakage and bone flaking at the Lange-Ferguson Clovis-age mammoth butchery site. This site, located just east of the Black Hills of South Dakota, and southeastern Idaho's Wasden site (under investigation by Susanne Miller and Wakefield Dort) represent the first known occurrence of mammoth bone breakage and flaking activities at Clovis-age sites.

Reporting on the Birch Creek Valley of Idaho and adjacent areas, Wakefield Dort proposed that landforms produced by glacial environments could have been the scene of human habitation.

Jack Donahue reported on the local and regional geological history of the Meadowcroft Rockshelter. He outlined the position of the rockshelter relative to the ice margin, the conditions that led to its creation, and sedimentation conditions responsible for its filling.

Harold W. Borns, Jr. compared the quite different reconstructed environments of the Debert site in Nova Scotia and the Munsungun Lake site in northern Maine.

Plains Conference

Proceedings at the 41st annual Plains Conference (Rapid City, SD, November, 1983) included a Paleoindian symposium organized by L. Adrien Hannus entitled "Pleistocene/Holocene Interface - The Changing Game?"

In his opening comments, Robson Bonnichsen (Center for the Study of Early Man) pointed out that the Plains vertebrate record is important to Quaternary sciences in general, not just archaeology. Both the quantity and quality of this record make the region significant for understanding how animals responded to late Pleistocene and Holocene climate changes. Because the archaeological record from the area is also relatively detailed, the Plains present a natural laboratory for the study of human-animal relationships through time.

In setting the stage for a consideration of these relationships during the late Pleistocene, Richard E. Morlan (National Museum of Man, Ottawa) discussed mammoth bones presumably altered by humans which have been found in the Old Crow Flats region, Yukon Territory.

L. Adrien Hannus (Augustana College, SD) and E.M. White, in two separate but integrated presentations, provided background on the Lange-Ferguson site, a Clovis-age (ca. 11,000 years before present) mammoth butchery site located east of South Dakota's Black Hills. White discussed the soils and geomorphic context of the discovery. Hannus explained the stratigraphy and excavation technique. Of particular interest is the association of a fluted point, a utilized flake, and broken and flaked mammoth bone at this site.

In a very crisp and informative presentation, Larry Tieszen (Augustana College, SD) made a case for the value of C3 and C4 studies to the archaeologist attempting to reconstruct prehistoric diet change. Certain types of plants have different (C3 versus C4) photosynthetic pathways which are revealed by analyzing the bones of the animals eating them.

Robson Bonnichsen presented an overview of interdisciplinary research which a joint University of Alberta-University of Maine research team has been conducting for the past five years in Montana's Pryor Mountains. Discussion focused on a long stratigraphic record from False Cougar Cave, located on top of East Pryor Mountain.

Stephen Chomko reported on his recent work on Little Mountain, Wyoming. Excavation at Eagle Shelter has produced four occupation levels below a level radiocarbon data to 10,000 years before present.

George Frison (University of Wyoming) reviewed several Paleoindian research projects underway in Wyoming. Perhaps of greatest interest were several recently concluded experiments designed to investigate the behavior of bone under hydrological conditions similar to those thought to have existed at the Colby site. Colby is a mammoth butchery site along the western flank of the Big Horn Mountains, Wyoming.

Danny Walker (University of Wyoming) reported on his re-excavation of Little Box Elder Cave, Wyoming, where he has found a rich and varied late Pleistocene fauna in undisturbed deposits.

Russell Graham (Illinois State Museum) concluded the symposium with a theoretical discussion of ideas important to the understanding of human settlement patterns during the environmental transition from the Pleistocene to the Holocene.

Eastern States Archeological Federation

A two-part symposium, "New Experiments Upon the Record of Eastern Paleoindian Culture," was held during the 50th annual meeting of the Eastern States Archeological Federation. The three day session was held November 4 - 6 in Salem, Massachusetts. R. Michael Gramly and John R. Grimes were chairpersons for the symposium, and will edit the manuscripts submitted as a monograph to be published in **Archaeology of Eastern North America** vol. 12, in the fall of 1984. Included in this volume will be an in-depth glossary of 'pet terms' often used in eastern Paleoindian studies.

The symposium was followed by a guest lecture from William J. Mayer-Oakes (Texas Tech University): "Fluted Projectile Points: A North American Shibboleth Viewed in South American Perspective."

Commenting on the symposium as a whole, discussant David Sanger noted that despite the continuing scarcity of paleoenvironmental data on these sites, there were now more "players in the game" doing research in the northeast. "This," he says, "provides a lot of new data on a much wider distribution of sites and stimulates new interpretations."

- Robert E. Funk (N.Y. State Museum) and Beth Wellman (N.Y. State Museum). The Corditaipe Site: A Small, Isolated Paleoindian Camp in the Upper Mohawk Valley
- Mary Lou Curran (University of Massachusetts, Amherst). The Whipple Site and Paleoindian Toolkit Variability: A Comparison of Intrasite Structuring
- Brian Deller (McGill University) and Chris Ellis (Simon Fraser University). A Paleoindian Ritual Feature in Southwestern Ontario
- Richard Michael Gramly (Buffalo Museum of Science) and Jonathan Lothrop (SUNY, Binghamton). Archaeological Excavations at the Potts Paleoindian Site, Oswego County, New York
- John Grimes (Peabody Museum, Salem), William Eldridge, Beth G. Grimes, Antonio Vaccaro, Frank Vaccaro, Joseph Vaccaro, Nicola Vaccaro, and Antonio Orsini. Bull Brook II
- C. Vance Haynes, Jr. (University of Arizona), D.J. Donahue, A.J.T. Jull, and T.H. Zabel. Application of Accelerator ^{14}C Dating to Fluted Point Sites

- Discussants for Part I: Frederick H. West (R.S. Peabody Foundation) and David Sanger (University of Maine at Orono)
- David Keenlyside (Archaeological Survey of Canada). Late Paleoindian Evidence from the Southern Gulf of St. Lawrence
- Stanley W. Lantz (Carnegie Museum of Natural History). Distribution of Paleoindian Projectile Points from Western Pennsylvania: Implications for Regional Differences
- Arthur Roberts (Simon Fraser University). Paleoindian Adaptations on the North Shore of Lake Ontario.
- Peter Stork (Royal Ontario Museum). Recent Early Man Research in South Central Ontario
- Robert E. Funk (N.Y. State Museum) and Beth Wellman (N.Y. State Museum). Early Archaic Johnsen Three Site, Susquehana Valley, New York.
- Discussants for Part II: Roger Moeller (American Indian Archaeological Institute) and Jay Custer (University of Delaware)

L.S.B. Leakey Foundation Members' Workshop

The L.S.B. Leakey Foundation held its first Members' Workshop at the California Institute of Technology on October 30. The theme was "Human Beginnings in the New World." The day's events - which included two general presentations and a number of small workshops - were designed to permit a number of professional researchers to discuss current activities and common concerns, and also to allow the Foundation's members to explore the topic of human beginnings in the New World.

Professional participants included: Jeffrey Bada (Scripps Institute of Oceanography), Rainer Berger (University of California, Los Angeles), Lewis Binford (University of New Mexico), C. Vance Haynes (University of Arizona), Gail Kennedy (University of California, Los Angeles), Richard Morlan (National Museum of Man, Ottawa), and Nicholas Toth (University of California, Berkeley).

Abstracts of the presentations are to be published in the Foundation's newsletter, **AnthroQuest.**

Society for American Archaeology

Numbered among the proceedings at last spring's Pittsburgh meeting of the Society for American Archaeology was a symposium of "Paleoindians in Eastern North America" organized by David J. Meltzer and Albert C. Goodyear. Subtitled "New Looks at an Old Problem," the aim of the session was to document variability in eastern fluted point materials, and then to advance explanations for that variation.

The session marked a maturing of some fruitful new approaches. As organizer Meltzer notes, "For some time we have simply taken fluted point materials and thrown them in the box marked 'Paleo.' What was clear from this symposium and evident in other work now coming out, is that the texture of the eastern fluted point occupations is much richer than previously imagined. From my view, the alleged homogeneity of the fluted point lifestyle is very much a thing of the past."

- Russell W. Graham (Illinois State Museum). Paleoenvironmental Gradients, Faunal Resources and Clovis Adaptations
- Dena F. Dincauze (University of Massachusetts, Amherst) and Mary Lou Curran (University of Massachusetts, Amherst). Paleoindians as Generalists: an Ecological Perspective
- David J. Meltzer (University of Washington). Variation in Eastern Fluted Projectile Points
- Chris J. Ellis (Simon Fraser Unviersity). Paleoindian Lithic Technological Organization in the Lower Great Lakes Area
- Peter L. Stork (Royal Ontario Museum). Fluted Point Technology at the Fisher Site, Ontario, and Early Paleoindian Cultural Relationships
- Albert C. Goodyear (University of South Carolina). Pièces Esquillées or Bipolar Cores? Looking at Toolkit Entropy Among Paleoindian Lithic Assemblages
- William M. Gardner (Catholic University of America). The Flint Run Complex Revisited
- D. Brian Deller (McGill Unversity). Crowfiled AfHj-31: A Paleoindian Ritual Feature in Southwestern Ontario
- Don Simons (Michigan Archaeological Society), Michael Shott (University of Michigan), and Henry T. Wright (University of Michigan). The Gainey Site (1979-1982): Variability in a Great Lakes Paleoindian Assemblages.

BONE MODIFICATION CONFERENCE

Archaeologists who study both human origins and the peopling of the Americas have proposed that bone modified by humans can be used as an indicator of human presence at early archaeological sites. Within archaeological circles this proposal is being hotly debated. The central question under consideration is: Can bones modified by humans who use (for example) cutting, grinding, and polishing techniques be distinguished from products created by natural processes?

With the objective of addressing this fundamental problem in mind, Robson Bonnichsen and Jim I. Mead of the Center for the Study of Early Man are organizing the First International Conference and Workshop on Human Vs. Natural Bone Modification. The conference will be held at Carson City, Nevada, from August 17 to 19. Authorities from Africa, Asia, Europe, and North America will be invited to participate. These specialists will give theoretical papers on how contemporary case studies can be used to interpret the prehistoric record. In addition, case studies will be presented which outline the newest evidence, detail the most recent advances, and discuss interpretive problems that plague the archaeological analyst.

Interested specialists and non-specialists are welcome to attend these presentations. The conference will conclude with a closed session in which invited participants will consider ways to further scientific knowledge in this area.

Advance registration materials can be obtained by writing to Donald R. Tuohy, Local Arrangements Chairperson, Nevada State Museum, Capitol City Complex, Carson City, NV 89701 (phone: 702-885-4810). Conference proceedings will be published by the Center for the Study of Early Man.

UPCOMING...

Jan. 3 - Mar. 6, 1984 UNIVERSITY OF WASHINGTON. QUATERNARY RESEARCH CENTER SEMINAR (Winter Quarter).
"Early Hominids: Evolution and Environmental Settings." Scheduled speakers are: Richard F. Key, Tim D. White, Richard L. Hay, Lewis R. Binford, Glynn L. Isaac, F. Clark Howell, George Kukla, Richard G. West, J. Desmond Clark, and G. Philip Rightmire. Contact Stephen C. Porter, Quarternary Research Center, University of Washington, Seattle, WA 98195.

Feb. 6 - 10, 1984 Gordon Research Conference. DIET AND HUMAN EVOLUTION, Ventura, CA.
Contact Michael DeNiro, Dept. of Earth & Space Sciences, Univ. of California, Los Angeles, CA 90024; Glynn Isaac, Dept. of Anthropology, University of California, Berkeley, CA 94720; or Alan Walker, Dept. of Cell Biology & Anatomy, School of Medicine, Johns Hopkins University, Baltimore, MD 21205.

Mar. 27 - May 29, 1984 UNIVERSITY OF WASHINGTON. QUARTERNARY RESEARCH CENTER SEMINAR (Spring Quarter).
"Early Hominids: Evolution and Environments Settings." Scheduled speakers are: Wighart von Koenigswald, Bjorn Kurten, Jan F. Simek, William R. Farrand, Richard G. Klein, Stephen C. Porter, Robson Bonnichsen, R. Dale Guthrie, Donald K. Grayson, and John Terrell. (See listing above for details.)

Apr. 11 - 14, 1984 SOCIETY FOR AMERICAN ARCHAEOLOGY Annual Meeting. Portland Hilton Hotel, Portland, OR.
Program Chair: Leslie Davis, Dept. of Sociology, Montana State Univ., Bozeman, MT 59717.

Apr. 12 - 14, 1984 AMERICAN ASSOCIATION OF PHYSICAL ANTHROPOLOGISTS, 53rd Annual Meeting, Franklin Plaza Hotel, Philadelphia, PA.
Program Chair: George J. Armelagos, Dept. of Anthropology, Univ. of Massachusetts, Amherst, MA 01003.

Aug. 4 - 14, 1984 27th INTERNATIONAL GEOLOGICAL CONGRESS, Moscow, USSR.
Quaternary Geology & Geomorphology Section, Quaternary Chronostratigraphy of Eurasia subsection will feature papers on prehistoric humans and traces of their activity as stratigraphic elements.

Aug. 13 - 15, 1984 AMQUA 8th Biennial Meeting. University of Colorado, Boulder, Co.
Theme is "Seasonal Climatic Responses in the Quaternary;" focus areas are Equitorial Africa/ India, Southwest USA & Mexico, Mid-continent USA & Canada, and Alaska-British Columbia-Northwest USA. Contact P.W. Birkeland, Dept. of Geological Sciences, Univ. of Colorado, Boulder, CO 80907.

Aug. 17 - 19, 1984 1st INTERNATIONAL CONFERENCE & WORKSHOP ON HUMAN VERSUS NATURAL MODIFICATION OF BONE. Ornsby House, Carson City, NV.
Contact Donald R. Tuohy, Nevada State Museum, Capitol City Complex, Carson City, NV 89701.

Sept. 1 - 7, 1986 UNION INTERNATIONALE DES SCIENCES PREHISTORIQUES ET PROTOHISTORIQUES. XIth Congress, Southampton and London, England.
Contact Peter Ucko, Dept. of Archaeology, Univ. of Southampton, Southampton S09 5NH, England.

MAMMOTH BRIEFS

Knut Fladmark (Simon Fraser University) reports that his 1983 summer fieldwork at Peace River (northeastern British Columbia, near Fort St. John) has yielded a small assemblage of tools including a fluted point, a side scraper, a large quartzite core tool, a small schist bead biconically perforated, and some debitage. An associated faunal assemblage includes several large bison, some small mammals, birds, and fish. The site is stratified with essentially continuous occupation throughout the levels. The basal component, about 3.5 to 4.0 m below the surface, is being dated by a series of carbon 14 samples. A provisional bone collagen sample of associated bison bone has yielded a date of 10,460 ± 400 years before present. Further analysis by Fladmark and his associates is pending.

Albert Goodyear (University of South Carolina) is undertaking some of the first work done in the southeast to systematically characterize lithic procurement reduction and transport patterns. He is conducting an aerial survey of the South Carolina coastal plain in search of cherts of fine-grained rock used as raw material for stone tools from Clovis times on. He is studying tool-making (reduction) strategies and how chert distribution is related to settlement patterns. The rocks from specific chert sources are being analyzed to determine their composition and structure.

Eileen Johnson (Museum, Texas Tech University) and Vance T. Holliday (University of Wisconsin, Madison) continued their work at the Lubbock Lake site in Texas. During the summer 1983 field season they discovered two new early cultural levels. One, which dated at least 10,000 years ago based on carbon 14 dates, contains a previously unrecognized and unnamed projectile point type. Initial exploration at another level (part of the site's earliest culture-bearing stratum) revealed a Clovis-age occupation. Bison and mammoth bones found here have cut marks which may be the result of butchering activity. Research at Lubbock Lake has been funded by the National Science Foundation, the Museum of Texas Tech University, and the West Texas Museum Association.

Christy Turner (Arizona State University) is in Asia this year, studying dental traits in some 4,000 east Asian and Pacific skulls. By describing and analyzing Mongoloid tooth morphology, he hopes to better understand the origins of the earliest Americans. Using 30 specific traits, Turner will continue to refine the definition of the "Mongoloid dental complex." He currently divides native American dental variation into three categories: Aleut-Eskimo, Na-Dene Indian, and Other Indian. He suggests these patterns are due to three separate migration waves from Asia. Turner's research is funded by the National Science Foundation.

EARLY MAN IN PATAGONIA

(Continued from page 1)

A search for ancient sites is being conducted under the leadership of A.C. Sanguinetti in the region between the Río Gallegos and the Río Chico basins. Las Buitreras Cave, located in the former, and Fells and Palli-Aike caves in the latter, are excellent indicators of the important presence of early man in the region at least about 11,000 to 10,500 B.P.

Recent digs in the crater of an extinct volcano (El Volcán 2 and 4) located between both basins have failed to produce early dates. The findings by Lehmann-Nitsche (1904) suggest that these places are good potential early man sites. Lehmann-Nitsche found fossil horse bones and lithic tools in a small cave inside a crater at Markatsch Aiken (near El Volcán), a situation by all means congruent with the horse findings at Las Buitreras and Fells caves.

It is well-known that the late Junius B. Bird found several dozen "fishtail" projectile points (now appropriately named "Fell's Cave points" by W. Mayer-Oakes) in Fells Cave. The concentration of these points (most of them broken) at a single site, plus some scattered findings in an area with a radius less than 5-6 km from the cave, suggest that the cave itself was the single center of production of the points (Borrero 1983)! Several social implications could be derived from this situation.

Augusto Cardich (Museo de La Plata) reported a site located 150 km south of Los Toldos Cave (Río Deseado Basin). It is a small cave (El Ceibo 7) with a deep stratigraphy showing the association of fossil horse (*Onohippidium (Parahipparion)* sp.) and lithic tools. On typological grounds Cardich correlates the lower levels of the cave with his "Nivel 11 industry" from Los Toldos (dated 12,000 ± 600 B.P.) (Cardich *et al.* 1981-1982).

As a general commentary it must be stressed that fossil horse appears as a regular association for early man in southern Patagonia.

References

Borrero, L.A. 1983 Discontinuous Distributions of Projectile Points in South America. Paper presented at the Symposium "Early Man in South America" (Org. by W. Mayer-Oakes and E. Salazar), XI ICAES, Vancouver.

Cardich, A., M.E. Mansur-Franchomme, M. Giesso, and V.A. Duran. 1981-1982 Arqueología de las cuevas de "El Ceibo". *Relaciones* XIV(2) (NS):173-209, Buenos Aires.

Figuerero Torres, M.J., J.H. Laza, M. Bond, and A.C. Cicchino. 1982 Los coprolitos como indicadores paleoambientales en arqueología. Paper presented at Primer Reunión Nacional de Ciencias del Hombre en Zonas Aridas, Mendoza.

Lehmann-Nitsche, R. 1904 Hallazgos antropológicos de la caverna Markatsch Aiken. *Revista del Museo de La Plata* XI:173-176.

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Great Basin Foundation
Geological Society of America
Idaho Archaeological Society
Illinois Assn. for Advancement of Archaeology
L.S.B. Leakey Foundation
Maine Archaeological Society
Manitoba Archaeological Society
Massachusetts Archaeological Society
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Saskatchewan Archaeological Society
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