MAMMOTH TRUMPET

Volume 1, Number 4 1985
Single Copy $1.50

Center for the Study of Early Man

University of Maine at Orono
495 College Ave. Orono, Maine 04473

An Interview with Christy Turner

EXTRACTING DATA FROM TEETH

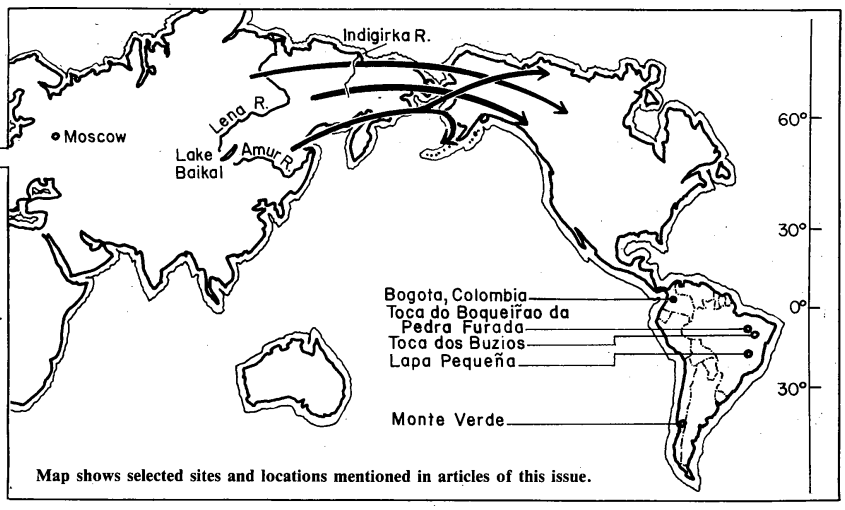
For 20 years, Christy Turner has been extracting—so to speak—information from dentition, bearing upon the biological variation of early humanity. Now, the question has become: can we take data based on teeth currently available in the many collections worldwide, and use it to pinpoint the location in the Old World from which native Americans first arose?

"Right now, it seems as if we have a pretty good shot at it," was Turner's reply in a recent interview. A more extended pronouncement to that effect took the form of an article in **Early Man in the New World,** edited by Richard Shutler, Jr. That paper represents the results of preliminary research funded by the National Geographic Society. Subsequent analysis has begun to indicate to Turner that his contentions are sound. The real answer is still gestating in the womb of a computer that, probably this May, should give birth to conclusions regarding seven hypotheses. Those hypotheses were fertilized by data gathered over the past year from about 6,000 individual specimens. The research was funded by a grant from the National Science Foundation.

All 6,000 specimens were examined by Turner himself, a demanding task to accomplish in a year's time, especially since it involved traveling over the entire globe. However, this had the advantage of reducing discrepancies in interpretation that are more or less inevitable with more than one analyst. In fact, asked about his research team, Turner answered: "Well, there's myself, my wife, and my youngest daughter." For one solid year, the latter two traveled with Turner, took skeletons out, put skeletons away, took photographs, undertook record searches, etc. Turner sat, day in, day out, and coded specimens. Data were sent to Arizona State University for processing by Research Assistant Linda Wuss.

And toward what conclusion, pending the computer analysis, does the evidence from teeth seem to point? Well, to Turner at least this much: the origin of the Paleoindians *has* to be east of Lake Baikal in Russia, most likely from the Lena River basin area (see map). Despite archaeological evidence of a relation between Paleoindian tools and European upper Paleolithic tools, the biology of the prehistoric people *west* of Lake Baikal is strictly European, including

(Continued on page 5)



Map shows selected sites and locations mentioned in articles of this issue.

HAYNES RECEIVES ARCHAEOGEOLOGY AWARD

Dr. C. Vance Haynes, Professor of Anthropology and Geology at the University of Arizona, became the second recipient of the Archaeological Geology Division Award at the 97th Annual Meeting of the Geological Society of America last November. The award, presented by Division president, Harold W. Borns, was established in 1982 to "honor individuals who contribute in an outstanding manner to the interdisciplinary field of archaeological geology."

Haynes began his career by working at John Hopkins University, and then at the Colorado School of Mines, where he received his Ph.D. in Geology in 1965. After graduation, while working on lunar rockets with the Martin Company, Haynes joined friends who were working on Paleoindian sites and Pueblo ruins in New Mexico. He applied his geological skills to the task at hand and learned the stratigraphic techniques which are essential to relative dating of buried materials. He went on to the University of Arizona as a Research Assistant and was soon appointed to the faculty there.

In accepting the award, Haynes said he wished to depart from the usual type of acceptance speech,

(Continued on page 3)

INSIDE . . .

RESEARCH SUGGESTS EARLY TOOLS NEAR SAN DIEGO

The question of when people first appeared in North America continues to challenge archaeologists. Certainly human presence by 12,000 to 11,000 yr B.P. has been established without question; however, artifactual materials in geological associations at sites in both North and South America have continued to suggest a much earlier date. If people arrived as early as 30,000 to 50,000 years ago, they probably would have carried a culture derived from the chopper-chopping tool tradition of southeast Asia.

Among those archaeologists pursuing evidence of such early North American inhabitants is Brian O.K. Reeves, Associate Professor of Archaeology at the University of Calgary (Alberta, Canada). Reeves' curiosity about early man was aroused in 1976 when, at a conference in San Diego, California he examined George Carter's collection from the area. Reeves believed the collection included some definite, early tool specimens.

During a 1977 sabbatical, he began examining sites on the mesas and sea cliffs surrounding the San Diego Texas Street site where, for years, claims have been made of human-made artifacts with extreme antiquity. "I found a lot of naturally broken-up rock," Reeves explains (see lower left photo, page 3). "But I also found a large number of formed tools—choppers and chopping tools of the southeast Asian kind, suggesting quite early occupation."

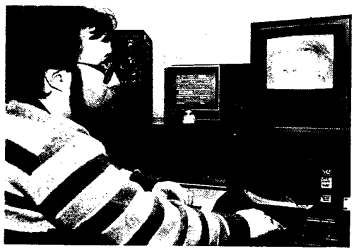
Testing three miles from the Texas Street site in Mission Valley during 1978, Reeves discovered a number of specimens exhibiting bipolar flaking, quartzite cobbles resulting from weathering and mechanical stress which apparently had been brought to the site and used as tools.

Returning to San Diego in 1981, Reeves and his crew began a systematic collection and excavation both on the coast and along the mesas of El Cajon 12 miles

(Continued on page 3)

CENTER NEWS

IN SEARCH OF THE FIRST AMERICANS



Henry Nevison adds the final touches to "In Search of the First Americans." *(Photo by Jack Walas).*

After a full year of work, the Center has completed its first documentary entitled "In Search of the First Americans." The 50 minute videotape was created by television producer Henry Nevison of the University of Maine's Public Information Service. Shooting took place during five weeks last summer as Nevison and a student assistant crisscrossed seven states and 7,000 miles with archaeological field crews from the Center. Equipment was carried up mountains into caves and everywhere in between to "get it all."

The finished tape, complete with computerized graphics and dramatic music is scheduled to be shown for the first time in early May on WABI-TV in Bangor, Maine. The project was funded primarily by the office of the Vice President for Research and the Center at the University of Maine at Orono. WABI provided post-production facilities. Nevison has high hopes for the finished production. He has won three international awards in the last three years, as well as numerous national, state and local awards for his videotapes, and sees this one as the best yet.

The tape should be available for general distribution by the time this paper reaches you. In addition, we are planning a longer feature about this project, as well as other media productions, for future issues of the **Trumpet**.

ARCHAEOLOGICAL SEDIMENTS IN CONTEXT

The Center for the Study of Early Man is proud to announce the publication of a new volume in its "Peopling of the Americas" edited volume series. **Archaeological Sediments in Context,** edited by Julie K. Stein and William R. Farrand, provides the most current information available in the newly emerging field of geoarchaeology. The volume is a result of a symposium held at the 1982 Society for American Archaeology annual meeting in Minneapolis, Minnesota. This collection of papers will be an invaluable aid to specialists in many disciplines within the Quaternary framework seeking to understand the relationship between archaeological artifacts and their contextual settings. The book will be useful not only in a professional library, but is also written to serve as a textbook for courses with substantial geoarchaeology content.

Julie K. Stein is Assistant Professor in the Department of Anthropology and adjunct Assistant Professor in the Quaternary Research Center at the University of Washington. Her research interests are primarily concerned with geoarchaeology, especially studies involving sediments found within archaeological sites.

William R. Farrand is Professor of Quaternary Geology and Curator of Geological Collections in the Museum of Anthropology at the University of Michigan. Since 1963, his research interests have led him to the Near East studying sediments of prehistoric cave and rockshelter sites.

Julie Stein

William Farrand

Discount for bulk orders to booksellers and distributors. See page 5 for additional information on this new volume.

CENTER LIBRARY

One of the goals of the Center is the development of a research library available for use by anyone needing information on the peopling of the Americas. Accordingly, your input on this project would be greatly appreciated. If you have authored or have access to books, manuscripts, articles, reviews, or abstracts—whether published or unpublished—on related subjects, please send us a copy.

We are still in the process of putting together a comprehensive bibliography on the human occupation of the Americas, for eventual publication. If you have compiled a bibliography or know of appropriate materials, please drop us a line. Address all contributions, comments, or inquiries to: Librarian, Center for the Study of Early Man, 495 College Avenue, University of Maine, Orono, ME 04473.

Corrections and Brief Comments

International Geological Congress: "The **Imyyakktakhsian,** a late Paleolithic culture (3,500 yr B.P.)". Dr. Robert E. Ackerman draws to our attention that 3,500 yr B.P. is late Neolithic, not Paleolithic and includes the following reference: Mochanov, Iu A. 1969 The Ymyiakhtakh late Neolithic culture **Arctic Anthropology.** 6(1): 115-118.

EDITOR'S NOTE

The staff at the Center for the Study of Early Man invites **MAMMOTH TRUMPET** readers to celebrate with us our first anniversary. We are delighted to report that the newspaper is a growing success, with a subscription base of over 2,000. We see ourselves as occupying a unique niche; the **MAMMOTH TRUMPET** is neither a newsletter nor an academic journal—rather, we attempt to be a bridge between the academic and the public worlds. We take no intellectual position with regard to the peopling of the Americas, but seek to present a broad range of ideas from across the Quaternary sciences.

When our first issue was published, we expected to produce two each year. In response to advice from readers, we decided to produce four a year. We have not changed the subscription rate; we are hoping to increase the number of subscriptions to accommodate the increase in price. Subscriptions are by volume and Volume 1 ends with this issue. Our next issue, which starts Volume 2, will be published this coming summer.

Please help us! We can keep our production costs down if we don't have to mail individual renewal notices. The renewal form and a reader survey are on page 7. If you support what the Center is doing, please indicate by joining at a higher level. Each dollar in excess of operating costs will be fed into our endowment fund. We are attempting to match a $500,000 endowment grant from the Bingham Trust for Charity this year and are actively searching for major gifts from individuals and foundations. If you are interested in becoming involved in this effort, please write or call us.

MAMMOTH TRUMPET

The Mammoth Trumpet is published quarterly by the Center for the Study of Early Man, Institute for Quaternary Studies, University of Maine at Orono, Orono, ME 04473.
ISSN #8755-6898

The Center for the Study of Early Man is a non-profit organization. Subscription to the Mammoth Trumpet is by membership in the Center. Regular membership $5 ($6 foreign), Contributing membership $20, Sustaining membership $50, Patron $100, Lifetime membership $1500, Institutional membership $10.

RESEARCH SUGGESTS EARLY TOOLS NEAR SAN DIEGO

(Continued from page 1)

into the interior (sponsored by the Social Sciences and Humanities Research Council of Canada). Again, he uncovered the same crude chopper-chopping tool assemblages. Throughout his work in the San Diego area, Reeves has uncovered chopper-chopping tools replicated in a variety of rock types.

"Importantly, the artifact assemblage is not related to known Holocene records of San Dieguito (pre-7,000 yr B.P.), a late-Wisconsinan-early Holocene culture which had a bifacial technology. And the later La Jollan unifacial tool culture didn't include these large tools."

Reeves' San Diego artifact assemblages are composed of unifacial core and flake tools fitting well with the Asian chopper-chopping tool tradition. These chopping tools were a long-standing tradition in Asian Old World areas, consistent with the lifestyle of peoples living around the Pacific Rim.

View along Cuyamaca Road where test excavation is being started on left. During Wisconsinan times this was along a lake shore. Part of the site has been disturbed by highway development. Cobble stone beach deposits are one of the few local sources available because marine bay sediments underly the beach deposits.

The above illustrates use of a naturally occurring bipolar break in a quartzite cobble as a platform from which to strike flakes. This and other artifacts were found at Grossmont Mesa near the Cuyamaca Road site. *(Photos Courtesy of Bryan Reeves).*

Verifiable dating is critical to Reeves' assertions concerning early man in southern California. Working at the Scripps Tower site on the University of California-San Diego campus, Reeves radiocarbon dated an upper level to 9,200 yr B.P., placing it in the early La Jollan time frame. Unfortunately, organics in pre-Holocene levels in the coastal areas have been leached away by a naturally-occurring, highly acidic fog. However, a lower level which has the chopper-chopping tool assemblage was dated to 25,000 to 30,000 years ago using thermoluminescence techniques.

Thermoluminescence (TL) dating eliminates the need for organic materials. The technique was originally developed to date ceramics and fired clays but has recently been applied to alluvial clays and clay materials of sedimentary origin that have not been fired. When deposited out of contact with sunlight, clays begin building a photon charge that can be released by heating. The resulting measured photon emission indicates age. However, samples must be collected under "black box" conditions and must be large enough to allow retrival of a central core certain to have remained unexposed to sunlight or heat. Although still controversial, thermoluminescence is beginning to be accepted by geologists as a valid technique.

Investigating a site in the San Diego River valley called "Fletcher Wash", Reeves discovered a number of chopper-chopping tool artifacts in the gravel member associated with exhumed paleosols. Paleosols, or "buried soils", are soils that were formed during stable land conditions but were subsequently buried as land stability changed. Reeves' TL dates on these paleosols are on the same order as the Scripps Tower site.

Again, the same artifact assemblage was uncovered inland at the Cuyamaca Road site (see photo). Although undatable by absolute methods, Reeves believes the location of this primary occupation site in relation to surrounding river terraces places it at mid-Wisconsinan age (approximately 30-50,000 years ago). A San Diego County-ordered independent geological study by Roy Schlemon (Newport Beach) resulted in the same age estimate.

In addition, Reeves was able to date hearths at two San Diego sites. One site in the Torrey Pines State Reserve boasted a 30 meter alluvial cover with a series of paleosols overlying a marine abrasion platform. One exposed hearth at 10 meters with quartzite flakes in association was dated at 13,000 years ago. Artifacts were apparent in the paleosols but the area is one of the few natural environments left on the coast, and is considered too delicate to be excavated. A similar hearth with flake association was dated by TL at 1400° in the southern San Diego Otay River. With insufficient time to excavate, Reeves was unable to investigate further.

Reeves, who received his Ph.D. in archaeology from the University of Calgary in 1971, shares the frustrations of many archaeologists who are in a race against time with urban developers. Rapid urbanization in areas such as southern California often prohibits excavation and thereby forces researchers to engage in a form of "archaeo-politics" with the local land owners and officials.

Reeves hopes to excavate an intriguing site uncovered at Camp Pendleton Marine Base. A large mammoth tusk was uncovered at 12 meters deep in a paleosol. Some preserved mammal bones, flake tools, and an extensive set of hearths may yield valuable information concerning early occupation of the area.

If he is able to successfully excavate chopper-chopping tool assemblages in positive association with middle or early Wisconsinan deposits and produce convincing dates, Brian Reeves may have an important role in answering the question of the timing of human arrival into North America.

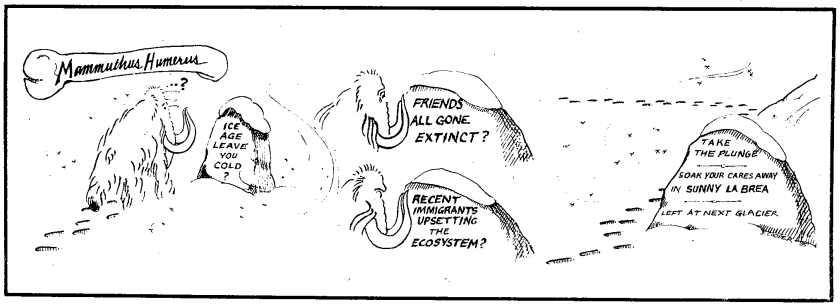
—Laura Riesenberg

HAYNES

(Continued from page 1)

and instead talk about his new project, the Clovis Origins Project. The project is an intensive, problem-oriented archaeo-geological investigation which will focus on the narrow time interval between 12,000 and 10,500 yr B.P. In describing the objectives of the project, Haynes said there is a need to more fully understand the microstratigraphic process and its patterns. He also indicated that point types need to be more precisely dated and the dispersal of lithic materials should be investigated. Haynes called for the assemblage of information about sea levels, lakes and rivers, ice margins, landscapes, environments, fauna, and vegetation in the areas of the fluted point cultures. The goal within the next decade is to achieve an understanding of the Clovis origins and to publish a series of maps for the years 12,000, 11,500, 11,000, and 10,500 yr B.P. It will require a team of dedicated specialists, he said, to help bring this information together.

—Joanne C. Turner



SOCIETY FOR AMERICAN ARCHAEOLOGY . . .

A HALF CENTURY OLD

Editor's Note: In place of our usual biography, we offer this feature on the anniversary celebration of the Society for American Archaeology which has renewed its commitment to serve professional and avocational archaeologists as it begins its next fifty years.

The Society for American Archaeology (SAA) was officially constituted on December 28, 1934 by 31 individuals in Pittsburgh, Pennsylvania. The establishment of such a society was the natural culmination of increasingly active research in American archaeology in the search for evidence of early inhabitants of the western hemisphere and the corresponding need for cooperation and communication among professionals and non-professionals.

Exciting discoveries in archaeology were almost commonplace in the early years of the twentieth century. Basketmaker, Folsom, Anasazi, Hohokam, dendrochronology—all these developments in the Southwest demanded that researchers be consistent in their methods and terminologies. As professionalism grew in the West, so too did Eastern archaeology profit and evolve. Ironically, the Depression had a positive effect on archaeology as WPA funds were appropriated for archaeological excavations.

Despite the economic trials of the early 1930s, interest blossomed in archaeology; particular interest was given toward increased professional standards, cooperation between professionals and amateurs, increased communication, and improved methodologies.

The name of the Society for American Archaeology was chosen in hopes of appealing to both the amateur and the professional—to begin meeting the goals outlined above. Additionally, a journal, **American Antiquity**, was begun in 1935 as a communication vehicle.

So, at 11:00 p.m., December 28, 1934, thanks to the far-sightedness of our predecessors, the constitution and bylaws of the proposed society were approved and the first group of officers elected.

In their honor, the SAA will celebrate its 50th anniversary at the 1985 Annual Meetings in Denver, Colorado. A series of special events and a special 50th Anniversary issue of **American Antiquity** will mark this occasion.

The SAA encourages involvement of amateur or avocational archaeologists as well as professionals. Current SAA President George Frison (Wyoming) notes the continuing need to maintain good rapport between the two groups, and that this anniversary is a good time to promote that relationship. "The SAA is well aware of the contributions of avocational archaeologists and recognizes that its beginnings were strongly influenced by both professional and amateurs alike." In response to these ties, the SAA anticipates giving a "long overdue" award for distinguished service to an avocational archaeologist at this meeting. To be called the Crabtree Award, it is expected that this award will be continued in the future.

If you wish to pre-register for the meetings, write to the SAA, 1511 K St., N.W. #716, Washington, DC 20005. On-site registration will be in the Convention Lobby of the Radisson Hotel in Denver from 4 to 8 p.m., May 1-4, and before noon on May 5. Child care service is available in cooperation with the YWCA of Metropolitan Denver.

50th Anniversary Meeting Events

Among the SAA-sponsored events scheduled for the Annual Meetings (Denver, Colorado; May 1-5, 1985) to celebrate the 50th anniversary of the organization are:

Thursday evening, May 2

Remarks by outgoing President (George C. Frison) on the founding of the Society; ceremony honoring the Society's surviving founding members:

James B. Griffin — William A. Ritchie
Wilton M. Krogman — Dorothy Schultz
Cornelius Osgood

Roundtable discussion (with moderator) on the general theme "American Archaeology in the Early Years of the Society." Participants:

James B. Griffin — Albert C. Spaulding
Emil W. Haury — H. Marie Wormington
George I. Quimby — Waldo Wedel
William G. Haag

Friday, May 3

Part 1. THEMES IN THE HISTORY OF ARCHAEOLOGY

Albert C. Spaulding	"Archaeology Interpretation 1935"
Bruce G. Trigger	"Archaeology and American Society"
Don D. Fowler	"The Conservation Ethic in American Archaeology: A Historical Overview"
Donald K. Grayson	"The European Influence on American Archaeology: The Search for our Earliest Ancestors"
William G. Haag	"Field Methods in Archaeology"
Jacob W. Gruber	"Culture and Archaeology: A Historical Retrospect"
Curtis M. Hinsley	"Writing the History of American Archaeology"

Part 2. THE STATE OF THE ART IN CONTEMPORARY ARCHAEOLOGY

Patty Jo Watson	"Archaeological Interpretation 1985"
Ruthann Knudson	"Archaeology in Contemporary Culture Resource Management"
David H. Thomas	"Hunter-Gatherer Studies"
Barbara L. Stark	"The Study of the Origins of Agriculture"
Henry T. Wright	"The Evolution of Civilization"
George L. Cowgill	"Quantitative Methods"
Mark P. Leone	"Symbolic and Structural Archaeology"

Friday evening, May 3

1. Remarks by the incoming President (Don D. Fowler)
2. Plenary session — "Views of the Development of American Archaeology"
   James D. Jennings — "American Archaeology, 1930-1980: One Person's View"
   Lewis R. Binford — Title not confirmed
   Robert C. Dunnell — "Five Decades of American Archaeology: A Critical Analysis"

See Upcoming section, page 12, for titles of other relevant symposia being held at SAA's 50th Annual Meeting.

Table of Contents for the 50th Anniversary Issue AMERICAN ANTIQUITY (Volume 50, Number 2; April 1985)

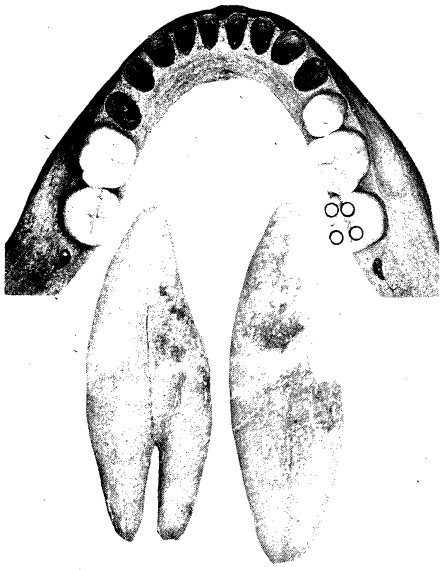
Photographs accompanying this article are of WPA excavations at the Macon Group, Mound D (date unknown). Digs such as these in the early 1930's employed hundreds of laborers in five states. Interest generated by such archaeological projects, both professional and amateur, led to the formation of the SAA in 1935. (Photo courtesy of David Meltzer from the Frank Setzler Papers, National Anthropological Archives, Washington, D.C.)

EXTRACTING DATA FROM TEETH (Continued from page 1)

all of the Cro-Magnon material the Soviets have from Malta, near Lake Baikal, all the way to Moscow. Immediately, as one goes east of Lake Baikal, the population shows Mongoloid characteristics similar to those of the New World Paleoindians. Turner has examined all proposed Paleoindian specimens—only about 25 in all, ranging from one tooth to 7-10 incomplete skeletons in Chile. Geographic origin of the Paleoindian is the hoped-for resolution of one to the seven hypotheses, to each of which Turner plans to devote a separate published article.

What about origin in time? This may be the answer to a second hypothesis proposing rates of dental change. If the rate of dental micro-evolution the study establishes holds, Turner will have a mechanism possibly reflect upon the ultimate question of human origins. Turner has identified two Asian dental populations, which he names Sinodont and Sundadont. Sinodonts represent the Northeast Asian ("Mongolian") population, stopping just to the east of Lake Baikal (see map), and show a more modern, evolved dentition. The less evolved, more ancient Sundadonts include prehistoric Southeast Asians. All American Indians, Turner claims, are Sinodont, although not as evolved as the Aleut/Eskimo and Na-Dene.

If specimens appear which would close the apparent gap in the New World fossil record before 15,000 years ago, Turner would expect them to possess different characteristics depending upon how far back in time they went. At 20,000 years, they would already



Above, Valeri Alexeev (left), physical anthropologist from Moscow working with Christy Turner (right) in Novosibirsk at IHPP on dental anthropology procedures.

Top right, mandible from the Siberian site of Krasnoyarsk (west of Lake Baikal) showing the 4-cusped lower second molar which is more common in Europeans than in Asians.

Lower right, lower canines from another Krasnoyarsk Siberian showing the 2-rooted trait (upper photo) which occurs in low frequencies in Europeans but is effectively absent (lower photo) in Asians and Native Americas. (Roots on left) *(Photos courtesy of Christy Turner)*

ample, the original excavator of the Siberian group refused to analyze the Malta children (in Siberia) because he deemed them pathological; actually, the deformation he had noticed was due to the weight of the sediment combined with the somber fact that the children had starved to death over a period of 2-3 months. Most cases are less extreme however, and the effects of external influences can be filtered out of the analysis. Beyond that, Turner needs only a sufficient number of specimens to establish some dating, a number that varies according to the age of the specimens. To date in the 12-15,000 range, he would require at least five individuals; but in the 30-40,000 year range, only *one,* because the entire configuration of the teeth would be different.

for determining at least relative ages: i.e., this series must be at least so much older than that one for so much evolution to have occurred. Similar considerations lead him to disagree with Emoke Szathmary's theory that, for example, Eskimos and Indians branched apart about 10,000 years ago after already arriving in Alaska. Degree of dental evolution, he says, requires them to have separated further back in time, about 15,000 years ago, which would probably push them back into Siberia at the time of branching.

The geographical and chronological indicators thus far have led Turner to entertain a three-migration hypothesis for the peopling of the New World (see map on page 1). He proposes the Paleoindian group migrated from the Lena Basin, the later Na-Dene group originated in the northeast Siberial forests, and the Aleut/Eskimos came last from the Amur Basin. Turner has also included Greenland population data in order to test Robert McGee's suggestion of an original eastern, not western, Eskimo penetration. His claim is that other studies appear to support dentition analysis regarding the three-migration theory. He cites the work of Robert Williams, Joseph Greenburg, and of Stephen Zegura. Turner feels that Michael Crawford's studies (highlighted in **Mammoth Trumpet**'s second issue, Summer, 1984) have not supported the three-wave pattern because prehistoric dentition analysis is more sensitive than biochemical analysis of modern populations (Crawford proposes a two-wave migration model). He suggests two reasons for this. One is that teeth are not so strongly influenced by natural selection, and consequently they change more slowly. The other reason is that modern Indian blood samples have the inherent problem of including European admixture, which he estimates can run as high as 30% before becoming detectable.

If the dental evolution rates (termed "dentochronology") hold, Turner's data may provide input about where and when the Siberian immigrants themselves originated, and in its furthest reaches may most likely deviate significantly from the Sinodont; at 30,000, they would lie somewhere between the two types; and at 40,000, he would expect Sundadont traits. As a result, he tends to discount most of the New World claims to great antiquity. The Del Mar specimen, previously dated at 30-40,000 years, could not possibly be so old without bearing the Sundadont or Sundadont-precursor traits it does not have; indeed, Turner was inclined to grant it not more than 5-6,000 years in line with its more recent dating. This does strike at what is perhaps the most serious methodological dilemma that faces Turner's type of study: to some degree, at least, conclusions are necessarily built upon the foundation of the original excavators' opinions and datings—opinions and datings Turner himself has shown can be fallible.

What are the differences in teeth Turner discriminates? In establishing the prehistoric European-Mongoloid dental contrast, he compared separate characteristics. An important example is number of roots. Asiatics have a high frequency of three rooted lower first molars; the European frequency is practically zero. Conversely, about 10% of Europeans have two roots on their lower first canine (see figure); Asian and New World individuals have only one. Number of cusps also follows a genetic pattern; on the lower second molar, Europeans tend to have four, Asiatics five or six (see figure). Though there are always obscurities produced by wear and pathology, shapes of teeth are also significant. Europeans have fairly flat incisors on the tongue side; Asian people have a ridged surface, termed "shovel-shaped." All American Indians and effectively no Europeans have shovel-shaped incisors.

Turner readily concedes that tooth data is epigenetic—there is always a component of environmental influence. Yet not only is that influence much less than for skeletal features, but Turner feels that with teeth, anomalies and external factors can be readily weeded out from evolutionary changes. For example, the original excavator of the Siberian group refused to analyze the Malta children (in Siberia) because he deemed them pathological; actually, the deformation he had noticed was due to the weight of the sediment combined with the somber fact that the children had starved to death over a period of 2-3 months. Most cases are less extreme however, and the effects of external influences can be filtered out of the analysis. Beyond that, Turner needs only a sufficient number of specimens to establish some dating, a number that varies according to the age of the specimens. To date in the 12-15,000 range, he would require at least five individuals; but in the 30-40,000 year range, only *one,* because the entire configuration of the teeth would be different.

Turner has examined every individual he could, in Southeast Asia from Bangkok to Hokkaido, including the Philippines, Taiwan, Hong Kong, Bangkok, central Thailand, and Japan. He received enthusiastic co-operation in the U.S.S.R.

One of the most compelling facts to emerge from his exhaustive tour of the world's collections is that there are literally thousands of collections of skeletons, in both the Old and New Worlds, that lie gathering dust, virtually unstudied. It is much more exciting to go out into the field than sit in a laboratory and analyze, he points out. And yet he feels that almost any museum in the country is capable of yielding him at least a few bits of new information.

While waiting for the completion of his computer analyses, Turner has been working on a couple of subpapers, inspired by his year-long whirlwind tour of skeleton collections: one showing that modern Taiwanese aborigines are not representative of the prehistoric Taiwan population; secondly, a Hong Kong study related to the Sino-Sundadont contrast. In addition to the article in the Shutler volume, and an important paper in Russian, he also has an article on these studies appearing in two places, with two titles. One is in the journal **Anthropogenetica** (1984) from India, in an article entitled "Advances in the Dental Search for Native American Origins." The other is "The Dental Search for Native American Origins," in a volume resulting from a symposium at the XIth International Congress of Anthropology and Ethnological Sciences, edited by Robert Kirk and Emoke Szarthmary called **Out of Asia: The Peopling of the Americas and the Pacific.** When his initial computer data analysis is complete, Turner can then use the second year of his National Science Foundation grant to further analyze the data and present it in a series of further publications. **Mammoth Trumpet** readers can only await the results with anticipation.

—Michael Dolzani

HAS YOUR I

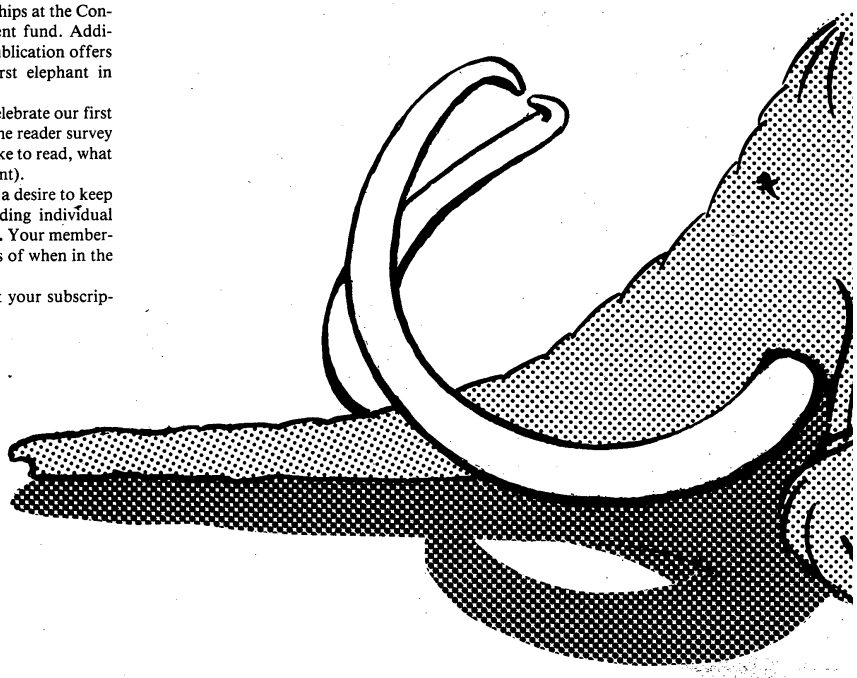
This is the last issue of Volume 1. We hope you enjoy receiving the news we gather for you. Reports and photos of discoveries from places as far-flung as Patagonia and Siberia, exclusive interviews with leading investigators in the multidisciplinary field of Pleistocene studies, advances in research and news of conferences are only part of what you get when you subscribe to the **Mammoth Trumpet** and become a member of the Center for the Study of Early Man.

You also help sustain the continued existence and operation of the Center itself, as a resource for all who are interested in the peopling of the Americas. A large portion of all Center memberships at the Contributing level or higher will help build our endowment fund. Additionally, members receive reduced rates through pre-publication offers on our publications. (And who showed you the first elephant in mammoth "genes"?)

The **Mammoth Trumpet** is one year old. Help us celebrate our first birthday by renewing your membership and returning the reader survey below. We want to hear from you, to know what you like to read, what you want to know, (and even what you find irrelevant).

Due to limited funds, increased mailing costs, and a desire to keep your subscription rates from rising, we are not sending individual renewal notices. **PLEASE SUBSCRIBE RIGHT NOW.** Your membership expires before the next (Summer) issue, regardless of when in the last year you joined.

Please, don't become a part of our past; don't let your subscription to the **Mammoth Trumpet** become extinct!



PEOPLING OF THE AMERICAS PUBLICATIONS

Just Published!

ARCHAEOLOGICAL SEDIMENTS IN CONTEXT

Edited by

Julie K. Stein and William R. Farrand

Context and Geoarchaeology: An Introduction
Julie K. Stein and William R. Farrand

Interpreting Sediments in Cultural Settings
Julie K. Stein

Rockshelter and Cave Sediments
William R. Farrand

On the Interpretation of Archaeological Sites in Alluvial Settings
Bruce G. Gladfelter

Fluvial Systems and Geoarchaeology in Arid Lands: With Examples from North Africa, the Near East, and the American Southwest
Fekri A. Hassan

The Little Platte Drainage, Missouri: A Model for Locating Temporal Surfaces in a Fluvial Environment
George D. Gardner and Jack Donahue

Geoarchaeological Interpretation of Great Lakes Coastal Environments
Curtis E. Larson

Marine Environments: Paleogeographic Reconstructions in the Littoral Region
John C. Kraft

Geoarchaeology of Northern Regions: Lessons from Cryoturbation at Onion Portage, Alaska
Charles Schweger

FORTHCOMING TITLES

Environments and Extinctions: Man in Late Glacial North America
Jim I. Mead and David Meltzer, editors.

New Evidence for the Pleistocene Peopling of the Americas
Alan L. Bryan, editor.

Animal Remains from Archaeological Sites
D. Gentry Steele and B. Miles Gilbert, editors.

CURRENT RESEARCH IN THE PLEISTOCENE

An annual journal of notes which summarize research on the Pleistocene peopli of the Western Hemisphere. Published annually each May. ISSN #8755-898X. Ill trated, indexed.
Volume 1 (1984): 112 pages. $5.00 individual; $12.00 institutional.
Volume 2 (1985): 140 pages. $8.00 individual; $15.00 institutional.
Please add $6.00 for shipping outside North America, prices effective May 1, 19

UNDERSTANDING STONE TOOLS: A COGNITIVE APPROACH

David Young and Robson Bonnichsen, authors. Theory and method linking cog tion, behavior and material products. Contemporary experiments are used to int pret flaking patterns on prehistoric stone tools.
ISBN #0-912933-00-3 (1984), 312 pages, index, extensive illustrations.
Price, including shipping: $27.00 in North America/$37.00 elsewhere.

ARCHAEOLOGICAL SEDIMENTS IN CONTEXT

Julie K. Stein and William R. Farrand, editors. Please see page 2 for descriptive art and above for complete table of contents.
ISBN #0-912933-01-1 (1985). 147 pages, 64 figures, references and extensive ind
Price, including shipping: $19.00 in North America/$29.00 elsewhere. Members the Center receive 10% discount for orders postmarked by May 30, 1985.

BONE MODIFICATION CONFERENCE ABSTRACTS

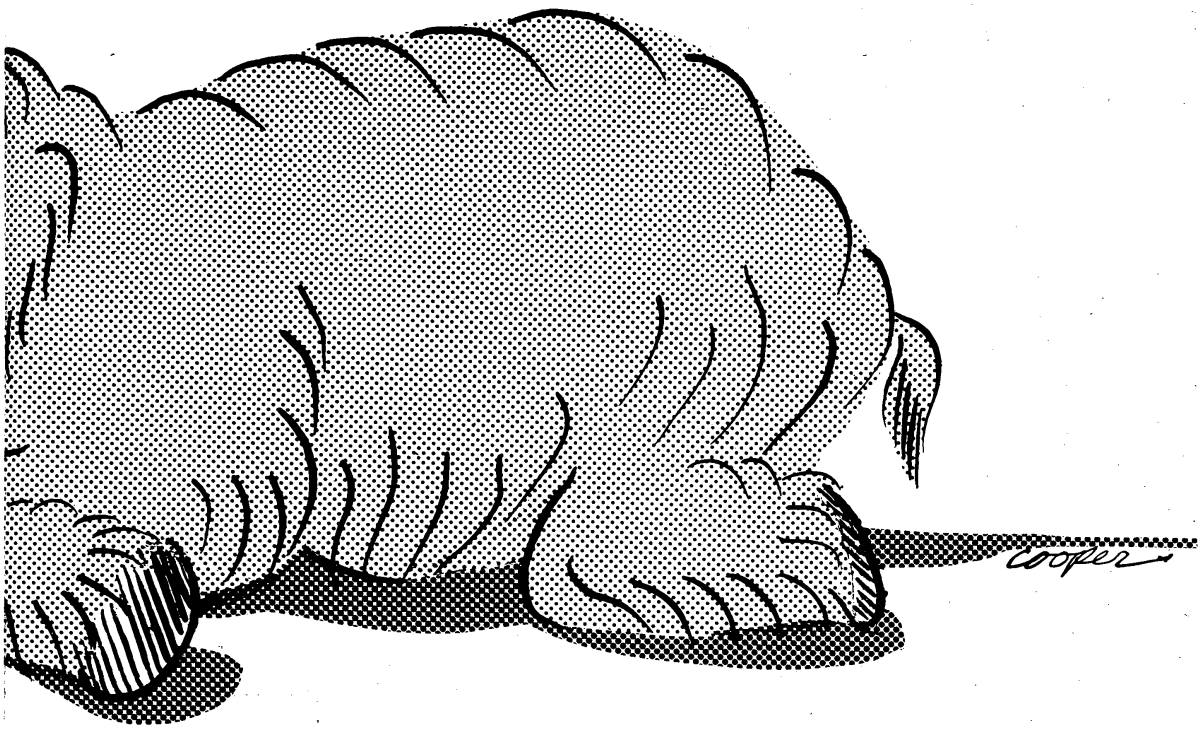
Long abstracts by international specialists in the discrimination of bone modifi tions by human versus other agencies. Conference was held August, 1984, in Cars City, Nevada. 38 pages, references.
Price, including shipping: $4.00 in North America/$6.00 elsewhere.

MAMMOTH TRUMPET

Subscription is by membership in the Center for the Study of Early Man. All memb receive the **Mammoth Trumpet** quarterly, notice of upcoming publications, an 10% pre-publication discount on books.

Membership Categories		☐ New ☐ Renewal Membership #_____
Regular	$ 5.00	($6.00 outside U.S.)
Contributing	20.00	(includes cloisonne mammoth pin)
Sustaining	50.00	(includes pin, additional 10% publication discount)
Patron	100.00	(includes pin, 10% discount, 1 free book)
Lifetime	1,500.00	(includes pin, 10% discount, 1 free book each year
Institution	10.00	(same outside U.S.)

IAMMOTH EXPIRED?



ORDER FORM

	QTY.	AMT.
Current Research in the Pleistocene		
Volume 1, 1984	_____	_____
Volume 2, 1985	_____	_____
Understanding Stone Tools	_____	_____
Archaeological Sediments in Context	_____	_____
(minus member discount before June 1, 1985)	_____	_____
Bone Conference Abstracts	_____	_____
Mammoth Trumpet		
Regular	_____	_____
Contributing	_____	_____
Sustaining	_____	_____
Patron	_____	_____
Lifetime	_____	_____
Institutional	_____	_____
Maine residents: please add 5% sales tax to books and conference abstracts		_____
TOTAL ENCLOSED		_____

Name _____

Address _____

_____

_____

Please enter a standing order(s) for:

_____

_____

Please note: Make checks, money order or purchase order payable in U.S. dollars to the Center for the Study of Early Man. Send to the Center at: 495 College Avenue, University of Maine at Orono, Orono, ME 04473. Allow 6-8 weeks for delivery. Booksellers and distributors, please write to the center for information on bulk order discounts.

SURVEY

We appreciate all the notes, letters, and news you have sent us during the past year. Please take this opportunity to fill out the questionnaire below. Feel free to use other sheet(s) if the space provided is not enough. Additional comments are welcomed.

1. What can we (the Center and the **Trumpet**) do better?_____

_____

2. How can we reach the public more effectively?_____

_____

3. What is missing?_____

_____

4. What do you like most about the **Trumpet**?_____

_____

5. Would you use:

☐Film and videotape library rental services?

☐International program of speakers on subjects related to the Quaternary sciences?

6. How can we best expand and deliver the services of our reference library to you?

_____

_____

7. Who are you?

☐ professional in the Quaternary sciences (discipline _____)

☐ avocational archaeologist

☐ interested member of the general public (occupation _____)

☐ graduate student (discipline _____)

☐ other (specify _____)

Alan Bryan and Ruth Gruhn

WORKING TO CHANGE THE TIDE OF AMERICAN ARCHAEOLOGY

Excavating three squares at Toca de Manoel Latão in northeastern Brazil revealed bones of extinct animals in association with simple bone and stone artifacts.

Alan Bryan started his career with the intention of understanding early human lifestyles and artifacts in the Americas. In 1960, he accepted an invitation by the National Museum in Rio de Janiero to study a shell mound site on the coast of Brazil, similar to ones in the Puget Sound area on which he had just finished a University of Washington master's thesis. The Forte Marechal Luz site was to be the turning point of Bryan's career.

The 4,000 year age of the site is not particularly remarkable. However, the fact that by all the evidence, the people of Forte Mareschal Luz did not flake stone until about 900 years ago is noteworthy. Such a phenomenon tended to be considered so improbable as to be discounted as missing evidence or improper analysis. Yet Bryan had screened all the material himself, and, in the face of skepticism, felt that his analysis was correct. There are plenty of quartz tools naturally sharpened or slightly reshaped, but no flaked stone. It would seem then, these people simply did not possess the stone tool industry that most North American students of prehistory routinely learn to identify.

Bryan recalls that the reaction to this apparent anomaly taught him something about human behavior, that is, the tendency to disregard or explain away any evidence that does not fit the current explanatory paradigm. However, reports began to accumulate from the Tennessee Valley, northern Alabama, and Idaho, all of them citing something very similar, a culture with bone artifacts but, until the relatively recent past, no flaked stone. "I think anomalies are important to examine, not to try to explain away. This is a very important part of the study of early man." Alan Bryan and Ruth Gruhn, his colleague and wife, have since spent their careers investigating the anomalous and the inadequately understood early human artifacts. (see photo, page 12)

Within archaeology of the western hemisphere, 'inadequately understood' may almost be equated with 'South America.' In 1970, on their first sabbatical, Bryan and Gruhn took a Land Rover from New York south through Central and South America all the way to Patagonia, then back north to Brazil, examining all the known early sites along that route. On this trip they developed the opinion that caves have the best potential for finding early materials. Further, the best place to find suitable caves seems to be eastern Brazil, which is tectonically and climatically stable. Even in the Pleistocene, presumably the area was never extremely cold, consequently there was comparatively little frost action. Still, most of the caves have collapsed over time, making it extremely difficult and time-consuming to penetrate the rockfall under which ancient human material may be buried. Difficulty in getting permission from South American governments to excavate may also complicate archaeological investigations in some countries.

In 1976, on their second sabbatical, they settled upon a small Brazilian rockshelter, the Lapa Pequeña site, and began to teach themselves how to analyze artifacts they say are so simple that many archaeologists might not even recognize them *as* artifacts. And yet Bryan and Gruhn suspect that such artifacts occur in North America as well. In fact, they feel it is plausible to assume that, if people were in the New World before 12,000 years ago, their tools would probably resemble those of the more recent South American cultures. Therefore, the so-called "gap" in the New World human record before 12,000 is no gap at all, but a blind spot in archaeological vision.

Gruhn explains that the kind of material they deal with in South America could well be appearing quite regularly in the United States but is largely ignored. "Well, it just doesn't shine when it's next to some beautifully flaked stuff or well-trimmed end scrapers or projectile points. Very few of the Brazilian artifacts are deliberately shaped. They'll just take a chunk and make little nodes on it maybe, or just use a flake and shape it that way. There are very few *formal* categories of artifacts. Down in Brazil that's all you get, and you *had* to learn how to handle it. To look at each piece, because they're all distinctive, and look at them very

(Continued on next page)

TROPICAL LOWLAND SOUTH AMERICAN ARCHAEOLOGICAL SITES WITH RADIOCARBON DATES GREATER THAN 11,000 YR B.P.

Mucao, Falcón, Venezuela	14,300 ± 500 (0-999) 16,375 ± 400 (M-1068)	cut and burned mastodon bone	Cruxent, J.M. 1961, **IVIC Depto. de Antropologia Boletín Informativo** 2:20-21.
Taima-Taima, Falcón, Venezuela	15 C14 dates ranging between 12,580 ± 150 and 14,200 ± 300	butchered mastodon; El Jobo projectile point fragment	Bryan et al. 1978, **Science** 200:1275-1277; Ochsenius and Gruhn (eds.) n.d. **Taima-Taima: Final Report,** Programa CIPICS, Univ. Francisco de Miranda, Coro. In press.
Alice Boër, São Paulo, Brazil	14,200 ± 1,150 (SI-1208)	stemmed projectile point; uniface chert tools	Beltrão, M. 1974, **Anais da Academia Brasileira de Ciencias** 46:211-251. Bryan and Beltrão 1978, in A.L. Bryan (ed.) **Early Man in America from a Circum-Pacific Perspective.**
Lapa Vermelha IV, Minas Gerais, Brazil	11,680 ± 500 (Gif-3726) 12,960 ± 300 (Gif-3906) 15,300 ± 400 (Gif-3905) 25,000	quartz flakes and cores	Laming-Emperaire et al. 1975, **Cahiers d'Archeologie d'Amerique du Sud.** Prous, A. 1985, in A.L. Bryan (ed.) **New Evidence for the Pleistocene Peopling of the Americas.** In press.
Abrigo de Santana do Riacho, Minas Gerais, Brazil	11,960 ± 250 (Gif-5089)	hearth; quartz crystal flakes, red ochre fragments	Prous, A. 1981, **Journal da la Société des Americanistes** 67:163-183. Prous, A. 1985, in A.L. Bryan (ed.) **New Evidence for the Pleistocene Peopling of the Americas.** In press.
Lapa do Boquete, Minas Gerais, Brazil	11,000 ± 1,100	thick plano-convex unifaces, flake scrapers – utilized chert flakes, bone tools below stalagmitic floor under dated level	Prous, A. 1985, in A.L. Bryan (ed.) **New Evidence for the Pleistocene Peopling of the Americas.** In press.
Toca do Boqueirão da Pedra Furada, Piauí, Brazil	14,300 ± 210 (Gif-) 17,000 ± 400 (Gif-5397) >25,000 (Gif-5648) >25,000 (Gif-5398) 26,300 ± 600 (Gif-5963) 26,400 ± 500 (Gif-5962) 31,500 ± 950 (Gif-6041)	hearths; quartz choppers, scrapers, other uniface tools; flake tools; evidence of rock art at 17,000 yrs B.P. and 27,000 yrs B.P.	Guidon, N. 1985, in A.L. Bryan (ed.) **New Evidence for the Pleistocene Peopling of the Americas.** In press.
Toca do Sitio do Meio, Piauí, Brazil	12,200 ± 600 (Gif-4628) 13,900 ± 300 (Gif-4927)	quartz cores, utilized flakes, choppers, hammerstones	Guidon, N. 1985, in A.L. Bryan (ed.) **New Evidence for the Pleistocene Peopling of the Americas.** In press.

(Continued from preceding page)

carefully; look at the edges and see how they were flaked, see the wear patterns, how the things were used to gouge or scrape or whatever—a lot of it is use-flaking. And it was just a tremendous experience."

In short, Gruhn and Bryan learned to appreciate very simple types of artifacts and very subtle types of wear patterns. The wear Gruhn is speaking of is so slight it often cannot be detected even under a normal microscope.

On the next and most recent of their sabbaticals, in 1983, Bryan and Gruhn focused upon two Brazilian sites, Toca dos Buzios and Toca de Manoel Latão. Significantly, both sites may be old. Extinct fauna (two horses and a giant peccary at Toca dos Buzios; a giant armadillo at Toca de Manoel Latão, in addition to a horse carpal with two sharp cut marks, point to a late Pleistocene date. Unfortunately, radiocarbon dating is not possible because the bones are too mineralized. Again, however, the phenomenon they describe as an *edge-trimmed tool tradition* has appeared, that is, no artifacts shaped by intentional flaking, only quartz artifacts shaped either naturally or according to a very simple bipolar flaking technique. The closest parallels are examples from Bogota, Colombia, which have been dated to 11,600-12,000 yr B.P. There is also some resemblance to the materials from the Monte Verde site (Chile) excavated by Tom Dillehay [see **Mammoth Trumpet** 1(1) and "Mammoth Briefs" 1(3)].

In fact, some truly intriguing dates have begun to surface in South America. In 1983, Bryan and Gruhn visited a site some 200 km north of their own in the southern part of the state of Piauí, one excavated since 1978 by Niède Guidon. The site, called Toca do Boqueirão da Pedra Furada exhibits a similar quartz and quartzite pebble and flaked tool industry and has a series of well-stratified occupation floors with hearths and associated artifacts dating back to more than 31,500 years (see chart below). And Guidon has now excavated even below that. Gruhn and Bryan note there may presently be some half-dozen dates from South America older than 23,000 years, including the lower occupation at Monte Verde. As Gruhn says, "The implications of course for North American early man studies are absolutely tremendous . . . ."

Those implications are not hard to understand. Alan Bryan draws the conclusions explicitly, "All of the people in South America, any South American Indian, their ancestors had to come through North America." (Gruhn interjects, "We're not ready to accept a route through Antarctica *yet*."). "Therefore, what is available in South America should be a clue as to what to look for in North America." In other words, if South American dates go back between 30,000 and 40,000 years, North American dates must logically go back at least that far also, if not farther.

Gruhn says, "When you think about it, it was simply a historical accident that the first early man material which was recognized as such was discovered in North America. It was discovered on the High Plains; it was material associated with a specialized big-game hunting culture with fairly sophisticated lithic technology. And as a result of that historical accident we have a model developed here that has lasted so many years, a conception that the earliest people of North America must have been big-game hunters with a sophisticated lithic technology." Bryan and Gruhn believe that a change in paradigm is badly needed, one which includes the South American data. They believe that archaeologists must modify their conceptions about what the earliest materials should look like.

On the whole, the South American public is not particularly interested in early humans. As North Americans did 100 years ago, many European descendants there still look upon living Indians as primitives, and consequently have little curiosity about their possible ancestors. The situation produces the accidental advantage, however, that few of the sites have been disturbed. South America is still largely an unexplored territory, where the minute, nearly undetectable kind of characteristics Bryan and Gruhn are looking for have not been tampered with.

Preservation of sites, of which Bryan and Gruhn now have at least five, helps compensate for the list of disadvantages of North Americans working in South America. Such disadvantages include isolation and rugged inaccesibility, the unglamorous nature of the artifacts, as well as a language barrier. Further, the amount of manual labor in which these two have engaged is impressive.

To highlight the pressing need for more work in South America, and to move northward what information has already been gathered, Alan Bryan has edited the proceedings of a 1981 conference, into which there was a great deal of South American input on these questions. Called **New Evidence for the Pleistocene Peopling of the Americas,** it will be published by the Center for the Study of Early Man.

—Michael Dolzani

NEW REFERENCES AND RESOURCES

JOURNAL OF ETHNOBIOLOGY

Editor's Note: Although the ***Mammoth Trumpet*** *does not offer critical reviews of books and articles or advertisements, we are interested in announcing new references and resources as they come to our attention.*

Paleoenvironmental reconstruction, the use of plants and animals by Paleoindians to recent cultures in the New World, paleonutrition, ethnobotany, and ethnozoology—these are just a few of the subjects that are explored in a new interdisciplinary journal, the **Journal of Ethnobiology.** Lyndon L. Hargrave, a prominent pioneer in this field, defined ethnobiology as the "study of any kind of biological material, in whole or in part, used by any kind of man or people, at any place in any time." Hargrave was an outstanding archaeologist and ornithologist, therefore, it was fitting that the First Annual Conference on Ethnobiology was held in his honor in Prescott, Arizona, in April 1978.

This coming year, the Society of Ethnobiology, a non-profit professional organization that now publishes the journal, will hold its eighth annual conference in the Boston area in May (see "Upcoming" page12). Since the Society was formed, membership has been steadily growing. The journal is now completing its fourth year of publication and, though it is still only published twice each year, it is likely to become a quarterly publication in the near future.

Besides offering a diversity of articles on original research, the journal keeps readers up to date on current events with a "News and Comments" section, and book review section. Recently, a section on dissertation abstracts was initiated to keep subscribers informed on recent, but unpublished, studies that have been completed in ethnobiology. Obituaries of well known ethnobiologists are also published on occasion and have included those of Alfred F. Whiting, an early Southwestern ethnobotanist, and Raymond M. Gilmore, an ethnozoologist with an interest in early man and the peopling of the New World.

The editor of the journal for the past two years is Willard Van Asdall of the Arizona State Museum, Tucson. Originally, the journal was founded by biologist Steven D. Emslie and Anthropologist Steven A. Weber, then graduate students at Northern Arizona University. The first issue, published in May 1981, contains the proceedings of the Second Annual Conference on Ethnobiology held in Flagstaff in April, 1979. This founding issue includes articles on archaeobotany, archaeozoology, palynology, ethnonutrition, plant domestication, ethnoentomology, and folk classification. The diversity of subject matter in the journal continues in the issues that follow. The journal is not restricted to New World studies and often includes articles from authors worldwide.

Authors interested in submitting an article to the journal should consult a recent issue, or contact Dr. Willard Van Asdall at the Arizona State Museum, University of Arizona, Tucson, 85721. Instructions to authors are printed in each issue of the journal.

Individuals interested in joining the Society, and receiving the journal, can send a check, payable to **Journal of Ethnobiology,** to: Steven D. Emslie, Secretary/Treasurer, Department of Zoology, University of Florida, Gainesville, FL 32611. Membership is $17.00 regular, $35.00 institutional. Outside North America add $8.00 postage.

ATTENTION TEACHERS!

How often do you find a publication of real value that is also free? Here is one that many teachers will find useful in teaching anthropology, history, and even current events.

Anthro Notes is a newsletter that has been published three times a year by the Smithsonian Institution since 1979. The purpose is to share new ideas in the teaching of anthropology at the pre-collegiate level and, to that end, **AN** is very successful. Major contributions are the contacts they provide to current research and media presentations rather than their quantity of information. They are a supplementary resource.

The scope of the newsletter is broad and the subjects are generally of current interest. Topics range from the Paleolithic period to modern times and there are many useful book reviews, lesson plans, and creative ideas from teachers. Some of the issues contain material that teachers in the various disciplines can use immediately with little modification. Notification, previews, and discussions of upcoming TV specials are among the other services **AN** provides. The interesting reviews, articles, and bibliographic resources they make available are valuable for keeping one up to date. The Smithsonian also has many wonderful opportunities and programs to enhance the anthropological effort in the area schools.

To get on the mailing list write: Ann Kaupp, Department of Anthropology, National Museum of National History, Stop 112, Smithsonian Institution, Washington, DC 20560.

—Dave Cook

The Archaeology of Colorado by E. Steve Cassells. Drawing from unpublished reports and personal communications with other archaeologists, his own field work, and review of literature, Cassells examines the significant sites for every cultural stage of Colorado's prehistory. This 326-page book includes maps, charts, drawings, and photographs; it is supplemented by an extensive bibliography. Price is $14.95 paper, $22.95 cloth, from: Johnson Books, 1880 South 57th Court, Boulder CO 80301.

How to Make and Use the Atlatl - The Ancient Weapon of the Ice Age Hunters by Roderick D. Laird. This book shows the reader what materials are needed and graphically explains how to make and throw an atlatl, as well as how to enter the World Open Atlatl contest held in Saratoga, Wyoming. Extensively illustrated, Price is $7.50, plus $1.00 postage and handling, from: Atlatl Press, P.O. Box 703, Saratoga, WY 82331.

Quaternary Paleoclimatology: Methods of Paleoclimatic Reconstruction by R.S. Bradley. The contents are organized along methodological lines; each method is clearly explained and no prior knowledge is assumed. The text is complemented by many illustrations and is fully referenced (more than 1,100 entries); indexed. Price is $24.95 paper, $50.00 cloth, plus $1.50 shipping, from: Allen and Urwin, 50 Cross Street, Winchester, MA 01890.

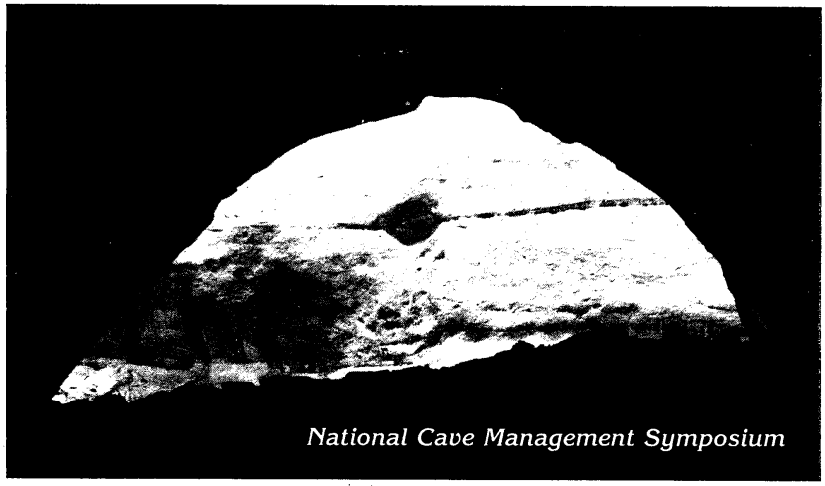
Disclosing the Past: An Autobiography by Mary Leakey. A 256-page chronicle tracing the life of Dr. Mary Leakey. $15.95 from Doubleday.

Out of Asia: Peopling the Americas and the Pacific by R.L. Kirk and J.E. Szathmary. A collection of papers from two symposia focusing on this topic. Includes articles from the sub-disciplines of physical anthropology, linguistics, and archaeology. Published by the Journal of Pacific History Press (Canberra), this volume will soon be available in the United States.

The Archaeology, Geology, and Paleobiology of Stanton's Cave: Grand Canyon National Park, Arizona edited by Robert C. Euler presents a complete overview of the multidisciplinary project undertaken at Stanton's Cave, Grand Canyon. Extensively illustrated. Available from the Grand Canyon Natural History Association (as Monograph Number 6), Grand Canyon, AZ.

The Past, Present and Future of Hominid Evolutionary Studies edited by P.V. Tobias is the published proceedings of the Taung Diamond Jubilee International Symposium and should be available by the end of July, 1985. Published by Alan Liss, New York City.

CONFERENCES



National Cave Management Symposium

Caves are non-renewable natural resources and their preservation, conservation, and management is a primary concern for a variety of governmental and private agencies, groups, and individuals from different disciplines. However, caves have many unique properties that set them apart from other natural resources and consequently require special consideration. The 1984 National Cave Management Symposium was held at the University of Missouri-Rolla in order to address these concerns. Sponsors of the conference were the Missouri Department of Natural Resources and the Ozark Scenic Riverways (National Park Service).

The symposium consisted of two days (October 11 and 13, 1984) of technical sessions covering a wide diversity of topics. The papers presented at the technical sessions can be categorized as those dealing with cave systems and management in general, and with the management of natural resources within caves. A series of day-long field trips to many of Missouri's caves were taken on the day between the technical sessions.

Management of Cave Systems

Papers on managing agencies dealt with their structure, organization, and management responsibilities. One of the primary problems discussed in this session was the need for coordination and communication between the agencies in order to minimize redundancy and maximize effectiveness. Jer Thornton (American Cave Conservation Association) and George Huppert (University of Wisconsin-La Crosse) suggested that a formal National Cave Management Committee should be formed to resolve this problem.

Computers will play a primary role in facilitating communication between agencies, and several papers at the symposium dealt with this aspect of cave management. However, before communication between electronic files can be accomplished, cave data files must be standardized. At present most speleological surveys have included data files for their own needs. According to Jerry D. Vineyard and Tami L. Martin (Missouri Department of Natural Resources) the computerization of cave files has been a catalytic factor in bringing speleology into environmental decision-making because of the fast and efficient means of retrieving information. According to Rob Stitt (National Speleological Society), the microcomputer is the standard tool used by most managing agencies to electronically capture cave data.

Cave rescue exemplifies the need for coordination and communication between various agencies and groups. Presentations by Jeff Scott (Boone County Fire District), John C. Hempel (National Cave Rescue Commission), and Don Paquette (NCRC) outlined different ramifications of this need.

Other papers outlined management problems at specific caves. For example, Katharine M. Rohde (National Park Service) discussed planning for cave management at Wind Cave, Hot Springs, South Dakota. The problems of visitor regulation at Fitton Cave, Arkansas were addressed by Steve Chaney (National Park Service).

Natural Resources Within Caves

Caves serve as repositories for many natural resources. Cavernous networks act as conduits for groundwater. Minerals (e.g., speleothems) and economic deposits (e.g., guano, saltpeter, etc.) are formed and retained in cave environments. Caves are frequently self-contained ecosystems which provide refuge for many endangered species. Many caves contain prehistoric cultural and paleontological resources which are part of our natural heritage. These natural resources are the focus of many cave management programs.

A series of papers by Tom and Cathy Aley (Ozark Underground Laboratory), James E. Vandike (Missouri Department of Natural Resources), and James F. Quinlan (Mammoth Cave National Park) reported the results of ground water tracing studies with the use of fluorescent dyes. Such studies are fundamental in assessing the impacts to ground water systems.

The plight of minerals and economic deposits in caves was not given much attention. Tom and Cathy Aley presented the results of their study on exotic plant growth in Carlsbad Caverns, New Mexico. Obviously any attempts to recover economic deposits from caves will have severe impacts on other resources in the cave. Caves are relatively fragile ecological systems and many of the species in cave biotas are frequently known from only a few localities. As reported by Ronald Crankhilton (Missouri Department of Conservation), the adverse effects on Meramec Spring by a liquid fertilizer lead is a clear example. James E. Gardner (Missouri Department of Conservation) noted that 413 invertebrate species have been identified from a recent biological inventory of 436 caves.

Perhaps the most common organism associated with caves are bats. Papers on the protection of bat colonies focused on the design and implementation of cave gates. As with the management of any multipurpose features with various resources, there are always going to be conflicts of interest. This was the case recently at the John Guilday Cave Preserve in West Virginia (see discussions in the **National Speleological Society Bulletin**). Biologists wished to protect the bat species that utilized the cave, but paleontologists wanted to recover fossils from the cave. An agreement was reached by the different parties by closing part of the cave, while allowing paleontologists to continue their research in restricted areas.

A paper by R. Bruce McMillan (Illinois State Museum) provided an overview of cultural resources and cave environments. Caves have served many purposes for human populations throughout their evolution. Caves are nature's "time capsules" and often offer optimal opportunities for interdisciplinary studies of the dynamic interactions between hominid populations and Quaternary landscapes and biotas. The interdisciplinary nature of cave studies is clearly illustrated by numerous environmental and archaeological projects, especially recent studies by Cinq-Mars and Morlan at Blue Fish Caves, Yukon Territory; Bonnichsen and Young in the Pryor Mountains, Montana; McMillan, Kay, and Wood at Rodgers Rockshelter, Missouri; Styles and Fowler at Modoc Rockshelter, Illinois; and Adovasio et al. at Meadowcroft Rockshelter.

A wide variety of fossil resources ranging from durable remains (teeth, bones, and shells) to perishable items (dung, hair, plants, etc.) and including extremely fragile traces such as footprints can be preserved in caves. Like cultural resources, the effective management of fossil sites requires the cooperation of academics, managers, and laymen.

One of the primary management concerns for cultural resources in caves is the indiscriminate looting of sites by "pothunters" for personal gains or the spelunker who buries surface finds to "preserve" the specimen. Unfortunately, this type of activity has increased at an alarming rate in the last few decades. It is especially difficult to monitor and control on private land but all efforts must be made to insure that, for the public good, future destruction is minimized.

The contextual record, or undisturbed location of paleontological and archaeological resources, is as important as the specimens themselves. Contextual relationships can provide information on the origin and inherent biases of the accumulations, on special relationships (e.g., predator/prey) between organisms preserved in fossil deposits, on the use of caves by fossil animals and humans (dens, hibernacula, mortuary and ritual activities, etc.), and on a variety of other phenomena. Therefore, fossil and archaeological specimens should only be removed from caves in the case of emergencies or under the supervision of trained specialists.

In addition to management, educational programs must be developed to alert the public to this problem. Charles M. Niquette (Cultural Research Analysts) and Emily S. Brown (United States Army) reported on recent efforts by the army to preserve and manage cultural resources in caves on Fort Leonard Wood, Missouri. Russell W. Graham (Illinois State Museum) evaluated caves as primary sites for paleontological resources which document biotas and environments of the past.

Case-studies presented by James S. Oliver (Illinois State Museum), Neal Woodman (University of Kansas), and James E. Vandike clearly documented many of the points outlined by McMillan and Graham. James Oliver's presentation on bone accumulations in Shield Trap Cave, Pryor Mountains, Montana underscored the significance of contextual information for interpreting taphonomic processes. The presentation by Neil Woodman on the micromammal fauna from False Cougar Cave, also in the Pryor Mountains of Montana, showed the value of microvertebrate remains for paleoecological reconstructions. Both of these papers also reinforced the benefits of cooperative programs between academic groups (e.g., universities and museums) and management agencies (e.g., U.S. Forest Service). James E. Vandike discussed the recently found footprints of an extinct lion, *Felis atrox,* in a south-central Missouri cave. He also outlined many of the difficulties involved in protecting these resources.

Caves, without a doubt, are an extremely important part of our environment. Efforts must continue to open dialogue between academics, managers, decision-makers, and the general public with respect to this unique natural resource. The Cave Management Symposia have provided a forum for this dialogue but people from various disciplines must be willing to attend and participate in these meetings in order to make them successful.

—Russell W. Graham, Quaternary Studies Center
Illinois State Museum, Springfield, IL 62706

UPCOMING CONFERENCES
See page 12

Geological Society of America Symposium

TIME AND CIRCUMSTANCES OF THE PEOPLING OF SOUTH AMERICA

David M. Hopkins: *"South American prehistory is at the edge of the vision of most North Americans—so close to the edge that it is very nearly invisible. I want to explain that in the 1940s, when I was a graduate student, I took a seminar in structural geology from a very authoritarian man. He introduced the seminar by telling us all the ideas that were nutty. One of them was continental drift. He was so authoritarian that many of his students became firm believers in the various theories that he told us didn't deserve the slightest bit of consideration, and I responded in that way to the ideas of continental drift . . . You can guess the moral of this story. You are invited to listen very carefully to what you hear today and to think hard about it, and to open your mind to new ideas."*

And the more than 100 attendees did just that as they listened to nine scientists present papers citing evidence of human occupation ranging from 10,000 yr B.P. to more than 30,000 yr B.P., from locations as diverse as the tropical Amazonian jungles to the Andes mountains.

Alan Bryan (University of Alberta) co-chairperson of the meeting held November 6, 1984 in Reno, Nevada, began with a report on early occupation of tropical South America. He listed eight lowland sites with dates older than 11,000 years. Two are kill sites in northern Venezuela dating 16,000 to 13,000 years old; six are occupation sites in eastern Brazil, with dates ranging back to 31,500 yr B.P. Bryan said that while the archaeological evidence for early human presence is firm, the paleoenvironmental evidence for human circumstances in the tropical zone of South America during the late Pleistocene is still very thin. This frontier for paleoenvironmental research in South America may be an exciting one if the archaeological evidence becomes clear for the reputed 30,000 years of human occupation. Bryan then reported on what he called the oldest site known to date, Toca do Boqueirão da Pedra Furada, located Piauí, Brazil. This site has been excavated by Dr. N. Guidon since 1981. Rock art in the cave has been dated through association of pigment fragments from the paintings with hearths radiocarbon dated to 17,000 and 27,000 yr B.P. The oldest date so far is 31,500 yr B.P.; however, there are four lower occupation levels with hearths on which dates are now pending. The record indicates continuous occupation until 2,000 years ago, which could make this site one of the longest, continuously human-occupied and dated locality in the New World.

The evidence from these and other sites would seem to indicate that the earliest populations in eastern Brazil had a simple bone and stone technology. Bryan concluded from the dates on these early sites that we must expect to find evidence of human populations in North America prior to 30,000 years ago. "In my opinion," he said, "this material and the evidence from Monte Verde, Chile, will break the log jam which has held up the study of early man in the Americas."

Monte Verde is an open-air occupation site dated between 12,500 and 13,500 yr B.P. Tom Dillehay (University of Kentucky) is the project director of this site which is located near Puerto Monte in southern Chile. Temporally, Monte Verde belongs to the Paleoindian period. Cultural materials were found in distinct clusters indicating activity areas. These include a pebble tool industry, mastodon and camelid remains, and several foundations of huts. More than 30 specialists are analyzing materials in this multidisciplinary project. [A detailed article on this site appears in the **Mammoth Trumpet** 1(1)].

Mario Piño (Universidad Austral de Chile; Gottingen, Germany) is the geologist for the Monte Verde site. The site is on a Pleistocene terrace along Chinchihuapi Creek. Piño's stratigraphic research agrees with both the radiocarbon sequence at the site and with 60 dates from other geologists working in the region. The archaeological material is buried beneath a peat layer which dates 12,000 to 13,000 yr B.P. the peat indicates a warming trend which would have provided an optimal climate for humans.

Calvin J. Heusser (New York University) reported on the pollen from Monte Verde. Eight samples of the Monte Verde peat dated at 12,500 to 13,900 yr B.P., provide evidence which indicates an open, patchy forest in transition from subantarctic to Valdevian. Analyses from other sites in Chile, both to the south and to the north, concur with these results.

Allan Ashworth (North Dakota State University) and John Hoganson (North Dakota Geological Survey) have studied the fossil beetles found in the 12,000 to 13,000 yr B.P. peat bed that seals the cultural horizon at Monte Verde. Ashworth described the types of beetles found in the samples, emphasizing their habitats. Some live in running water only, others on wood, one species in weed-choked water, another on fungus, while still others are open-ground fauna; however, cluster analyses imply climate during the peat deposition was similar to that of today. The existing fauna of the region achieved its modern assemblage about 14,000 yr B.P. Consequently, Ashworth's evidence tends to disagree with Heusser's pollen analysis which indicates a 5-7° cooler-than-present climate at Monte Verde during the Pleistocene. However, Ashworth also reported that there were no dung or carcas beetles, two species which are usually prevalent at most archaeological sites. He said that the insect analyses of the Monte Verde material is still preliminary.

In discussions immediately following the Monte Verde papers, Dillehay mentioned that Monte Verde was a catchment area within a larger regional open vegetation climate. Pollen accumulates from a larger area than beetles, which may account for the conflict in the preliminary analyses of the paleoecological materials.

Several scholars presented papers summarizing more regional paleoenvironmental reconstructions. John Mercer (Ohio State University) outlined the geological history of the glacial and interglacial episodes in the Andes. Referring to the area in which the Monte Verde archaeological site is located (near latitude 42°S), Mercer gave the details of glacial advance and retreat in the area. Apparently, the piedmont glaciers reached their outermost positions shortly after 19,500 yr B.P. and then receded only to advance one more to their final full-glacial maxima about 14,500 yr B.P. Rapid deglaciation followed during the next 1,000 years. The entire glacial-interglacial transition took place in 3,500 years (between 14,500 and 11,000 years ago).

Paul Colinveaux (Ohio State University) has worked with sediment cores from a number of lakes in northern South America. These 7,000 to 8,000 year old cores range from the high Andes to the tropical areas. The cores indicate significant changes in rainfall during the Holocene. Colinveaux's analyses show the Andean forests on the steep slopes and valleys by the year 6,000 yr B.P., and an increase in species diversity since that time. Based on maize pollen, it would seem that agriculture was prevalent, even on the steeper slopes. He concluded that the area has a long history of environmental fluctuation, with many local variants. As to the relevance of this work to early human studies, Colinveaux feels that there was no particular limiting environment in either Amazonian or the Andean uplands.

Vera Markgraf (INSTARR) reported on her pollen and environmental reconstruction work in southern South America. From her work with sloth dung, Markgraf concludes that environmental control of extinction seems unlikely. The sloth diet does not seem to have changed significantly over the time period at the end of the Pleistocene. However, she also says there is little evidence for excessive human predation upon the extinct fauna. She suggests either a mutual tolerance between the species or, at most, a gradual process of human-caused extinction.

In her analysis of the peopling of the high southern latitudes of Patagonia, Tierra del Fuego, she examined the records of many other workers in various disciplines. The oldest evidence of humans in the archaeological record is 12,600 yr B.P., but there is evidence of abundant population prior to 11,000 years ago. Faunal remains are also abundant.

John Rick (Stanford University) summarized the existing data on human occupation of Andea and coastal Peru during the late Pleistocene and early Holocene. He analyzed the temporal and geographic clustering of radiometric dates on reliable materials in clear association with cultural remains. His analysis provides little support for human occupation before 12,000 yr B.P. Rick considers the earliest dates as aberrant occurrences in the distributions. He concluded that room should be left for some form of an early occupation of Peru. However, he suggests that Peru may not have been the southbound highway, and that the earlier remains further south have to be explained by other routes of travel.

David Hopkins in summary: *". . . Finally I want to talk about rigor. We have to deal with our data with rigor. Some of us are less rigorous than others and there are three choices: one is to be always optimistic. A second is to be extremely rigorous and to admit nothing to your consciousness that cannot be explained; admit nothing to your thoughts about human history that cannot possibly be explained in some other way. A third thing is for us all to discipline ourselves to be able to change our minds or to entertain ambiguity; to have one foot in one camp, but at least a toe in the other. And it is important for us to maintain as much of an open mind as we can without its turning into a sieve. The other danger is that we will blind ourselves and we'll walk across things that are significant, that are the clues to discoveries. So we have to be at least willing to admit possibilities."*

—Joanne Turner

3rd Workshop on Paleoclimates and Evolution

The third in a series of closed workshops on global pulses of environmental change as related to evolutionary events was held in South Africa, February 6-7, at Bophuthatswana. The workshop series is being funded through a grant to one of the principle organizers, Professor Timothy Partridge (University of the Witwatersrand) by the South African Council for Scientific and Industrial Research. Focusing on the southern hemisphere, the organizers are looking for the answers to three questions: (1) Are there synchronous pulses in the climate? (2) Are there pulses hemisphere-wide? and (3) Are they related causally to patterns of speciation and extinction in plants and animals?

The South Africa workshop included eighteen presentations on vegetation, plankton, foraminifera, vertebrates and changes in climate, sea temperature, sea level, and tectonic activity. This was followed by a series of discussions on specific time periods. The tenor of these discussion was that more of a pattern seemed evident when dealing with longer time periods. But results have been mixed. Although some researchers detect evolutionary events at these times, particularly at 2.4 million years ago, many are finding their data information bases inadequate to answer the question. The palynologists, in particular, expressed difficulty in obtaining information sufficient for the resolution of shorter term patterns. Many participants seemed to feel that some correlation could be seen between changes in terrestrial biota and climatic changes around, 5.0, 2.4, and 0.9 million years. This has been a stimulus for more research. For example, the South African Society for Quaternary Research as asked Timothy Partridge to convene a group of researchers to systematically investigate a series of sites and fill in some of the gaps in the temporal record.

The next workshop is scheduled for May 20-24 at Lamont Geological Observatory at Columbia University. The focus is "The Neogene History of the Antarctic Ice Sheet." An expanded coverage of the South Africa workshop can be found in *Science* 227:1325-1327.

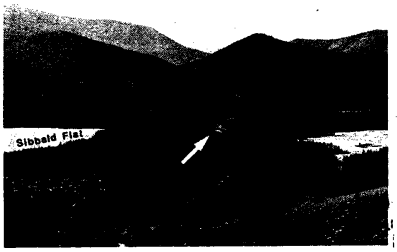
Thanks to Alan Turner (Transvaal Museum) and George Denton (University of Maine-Orono) for providing information about the workshop.

MAMMOTH BRIEFS

Eugene M. Gryba reports the recovery of two fluted points from the shallow, multicomponent Sibbald Creek site (EgPr-2), located in the Rocky Mountain foothills 72 km west of Calgary, Alberta, Canada. The points were found near the base of 45 cm of poorly stratified deposits. The site contained material ranging from Paleoindian to the Historic period. No faunal remains were recovered from the bottom of the cultural deposits.

One small, multiple fluted example from Sibbald Creek is reminiscent of the point recovered by Fladmark from the Charlie Lake site near Fort St. John in northeastern British Columbia [see **Mammoth Trumpet** 1(1)].

The Sibbald Creek site is located on a terrace remnant nestled high against the south side of a small knoll and overlooks a large open meadow which dominates



The Sibbald Creek site (arrow) at the edge of the high forested Foothills, facing west. The Front Range of the Rocky Mountains is faintly visible to the left of center beyond the deep, V-shaped valley of Jumping-pound Creek.

the valley floor of Sibbald and Jumpingpound creeks (see photo). That southwestern Alberta was occupied at a relatively early time by a *resident* human population whose members were quite familiar with the range of alternatives available in this part of North America is suggested by the use of good quality, locally derived siltstone for the manufacture of one of the fluted points, the protected, southern aspect of the campsite, and its regional setting in the Foothills off the open Plains and in an area frequented by chinooks.

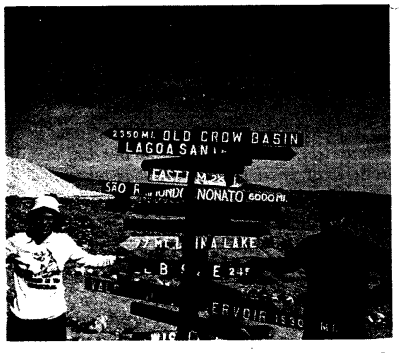
A 219-page report on the 1980 salvage excavations at EgPr-2 has been prepared. **Sibbald Creek: A Record of 11,000 Years of Human Utilization of the Southern Alberta Foothills**, by Eugene Gryba, with Appendix II by Donald A. Barnett. Published as Archaeological Survey of Alberta Occasional Paper No. 22 (1983). Alberta Culture, Edmonton.

Andrey V. Sher (Moscow), with colleagues from the Moscow University, have excavated a mid-Pleistocene site on the Keremesit River, a tributary of the lower Indigirka R, (see map on page 1) this past summer. They have collected and begun study of numerous fossils of large mammals, rodents, and insects adding enormously to the understanding of the history of the Berigian fauna and environment of the area which was previously very poorly known.

They plan excavations next summer of a wooly mammoth site presumed to be late Wisconsin age, on the same river. Many of the mammoth bones are fractured, but probably by natural rather than human processes.

Huang Wanpo (Institute of Vertebrate Paleontology and Paleoanthropology, Beijing, China) reports completion of a review of mammalian faunas and climatic change during late Pleistocene and Holocene times in eastern China. The review shows variations in climate accompanied by rapid sea-level fluctuation during the late glacial and post glacial. Studies of the Chinese Penghu, Hsiaonanhai, and Shinnongjia faunas reveal a widespread drop in air temperature during the period 15,000 to 10,000 yr B.P. During the cold stages, mammals such as the wooly rhinoceros, mammoth, horse, roe deer, and mole-rat migrated from northern to southern China.

Australian National University Quaternary Studies Programme and the **Institute of Vertebrate Paleontology and Paleoanthropology** (Beijing, China), have an on-going research program to compare human skeletal materials from China and Australia in order to understand the development, chronology, and distribution of Pleistocene and early Recent human populations in the Pacific region. Leaders of the program are Wu Rukang (IVPP) and A.G. Thorne (ANU). Research indicates there are morphological similarities between late Pleistocene cranial remains from southeastern Australia and those from the Chinese site of Liukiang and the Upper Cave at Zhoucoudian suggesting a direct relationship of the two populations. Work is underway on a film about Pleistocene human populations in China, Indonesia, and Australia and their relationships. (from **The East Asian Tertiary/Quaternary Newsletter**, No. 1, 1984).



Ruth Gruhn and Alan Bryan stand at the crossroads of South and North American archaeology, both literally and professionally. The signpost stands at the Calico site in southern California and points the way to several other early sites in both the northern and southern hemisphere. See page 1 for a map and page 7 for an article detailing Bryan and Gruhn's work in South America. *(Photo by George Carter, courtesy of Alan Bryan).*

SUGGESTED READINGS

On Dental Evidence for the Peopling of the Americas

Turner, Christy, G. II. 1983 Dental evidence for the peopling of the Americas. In R. Shutler (ed.), **Early Man in the New World.** Beverly Hills: Sage.

TO THE ENDS OF THE EARTH . . .

We will go to great lengths, to the places indicated on the signpost at Calico (see photo, left) and beyond, to bring you the latest news and research about the peopling of the Americas. But no matter how far we go or what we find when we get there, we still have one more step to take to get the news to you and for that we need your help. That step is you subscribing to the **Mammoth Trumpet.** This is the last issue in Volume 1; Volume 2 will begin with the next issue, due out this summer. Due to our limited funds, we cannot send out individual notices to all our loyal members. Please take the time to make sure your subscription is up to date so you won't miss a single issue of the **Trumpet.** For more information and a convenient renewal form, please open to page 5.

University of Maine at Orono
Center for the Study of Early Man
495 College Ave.
Orono, ME 04473

UPCOMING CONFERENCES

Apr. 24-27, 1985 18th ANNUAL CONFERENCE OF CANADIAN ARCHAEOLOGICAL ASSOCIATION, Hotel Fort Garry, Winnipeg, Manitoba, Canada.
For further information please contact the conference coordinator Elizabeth Snow, 621 Academy Road, Winnipeg, Manitoba R3N 0E7, Canada.

May 1-5, 1985 50th ANNUAL MEETING SOCIETY FOR AMERICAN ARCHAEOLOGY, Denver Hilton Hotel, Denver, Colorado.
Selected symposia include: "Research in Zooarchaeology, Faunal Analysis, and Taphonomy (P. Bumstead, chairperson); "Regional Perspectives on the Pleistocene Prehistory of the Old World" (O. Soffer, chairperson); "Early Man in South America" (A. Bryan chairperson); "Archaeological Research in the Paleoindian Period" (P. Spoerl, chairperson); and "10,000 B.P.: The End of the Paleolithic in the Old World" (L. Straus, chairperson). Contact Dee F. Green, USDA Forest Service, 517 Gold Avenue, SW, Albuquerque, NM 87102.
For additional information about SAA's 50th anniversary meeting, see article on page 6.

May 4-5, 1985 EXPERIMENTAL ARCHAEOLOGY WORKSHOP, Gulf Branch Nature Center, Arlington, Virginia.
Workshop for people interested in prehistoric technologies, including flintknapping, fire making, hafting, pottery firing, and other tool manufacture. Contact Scott Silsby (703/558-2340, days; 703/671-7313, evenings and weekends) or Gulf Branch Nature Center, 3608 North Military Road, Arlington, VA 22207.

May 8-10, 1985 ETHNOBIOLOGY CONFERENCE, 8th MEETING, Boston, Massachusetts.
The meetings are co-sponsored by the Massachusetts Institute of Technology, Harvard University, and the University of Massachusetts. For more information, contact Dr. Fred Wiseman, Center for Material Resource Archaeology and Ethnology, Massachusetts Institute of Technology, Cambridge, MA 02139.

June 9-13, 1985 AMERICAN ASSOCIATION OF MUSEUMS ANNUAL MEETING, Detroit, Michigan.
The conference will focus on the AAMs newly published report, **Museums for a New Century.** Contact American Association of Museums, P.O. Box 33399, Washington, DC 20033.

July 19-21, 1985 CAMP PALEO FLINTKNAPPING DEMONSTRATIONS AND THE 5th ANNUAL WORLD OPEN ATLATL CONTEST, Saratoga, Wyoming.
For more information on this lively, part-educational, part-recreational gathering, please contact Ada Bouril Jackson, Box 703, Saratoga, Wyoming 82331.

Sept. 10-13, 1985 AMERICAN ASSOCIATION FOR STATE AND LOCAL HISTORY ANNUAL MEETING, Topeka, Kansas.
For more information, please contact the American Association for State and Local History, 708 Berry Road, Nashville, TN 37204.

May 19-24, 1986 INTERNATIONAL SYMPOSIUM ON ARCHAEOMETRY, Nuclear Research Centre, Athens, Greece.
Topics include: non-metals, dating of organic materials (e.g., radiocarbon and other cosmogenic nuclides, dendrochronology, amino acid dating), and dating of inorganic materials (e.g., thermoluminescence, ESR, fission track, uranium series, archaeomagnetism). Deadline for submitted abstracts is mid-November, 1985. Contact Dr. Yannis Maniatis, Archaeometry Symposium, NRC Demokritos, 153 10-GR aghia Paraskevi, Attiki, Greece.

Aug. 25-29, 1986 5th INTERNATIONAL CONFERENCE ON ARCHAEOZOOLOGY, Bordeaux, France.
The conference is soliciting papers and ideas in the field of archaeozoology, defined as, "the study of animal remains connected with the settlements of ancient human groups." Contact Dr. Pierre Ducos, Ve Conférence ICAZ, C.R.E.P., St. André de Cruzières, France.

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

July 31-Aug. 9, 1987 12th CONGRESS, INQUA, Ottawa, Ontario, Canada.
Contact Dr. Alan V. Morgan, Department of Earth Sciences, University of Waterloo, Waterloo, Ontario, N2L 3G1, Canada.

GEOLOGICAL SOCIETY OF AMERICA MEETINGS
1985 Orlando, Florida (Oct. 28-31)
1986 San Antonio, Texas (Nov. 10-13)
1987 Phoenix, Arizona (Oct. 26-29)
1988 Denver, Colorado (Oct. 31-Nov. 3)

Non-Profit Organization
US Postage
PAID
Orono, ME 04473
Permit No. 8