Scientists Analyze Bones of Ancient Humans

A cave scientist in Hourglass Cave high in the Colorado Rockies negotiates a passage near where the 8,000-year-old bones of an ancient cave explorer were recovered (page 10). Those bones have been analyzed and buried, but scientists are busily analyzing other human remains and adding their findings to an extensive Smithsonian Institution database (page 1).

The Center for the Study of the First Americans fosters research and public interest in the Peopling of the Americas. The Center, an integral part of Oregon State University, promotes interdisciplinary scholarly dialogue among physical, biological and social scientists. The Mammoth Trumpet, news magazine of the Center, seeks to involve you in the late Pleistocene by reporting on developments in all pertinent sciences.
A DATABASE ON HUMANITY'S PAST

Smithsonian Team Races the Clock with Repatriation

CARSON CITY, Nev.—As the Olympic Games got under way in Atlanta last sum-
mer, a scientific contest of sorts was under way here at the Nevada State Museum. A
team of forensic anthropologists had come to Nevada's repository for historical and sci-
entific information to analyze human skele-
tonal remains.

Like Olympic athletes, members of this
team brought years of intense training and
practice to their undertaking, and like Olymp-
ic runners, they, too, were competing
against time. Much of the material they are
analyzing here and at other museums may
be subject to repatriation under the Native
American Graves Protection and Repatria-
tion Act, commonly known as NAGPRA.
Their primary goal is to secure as much
knowledge as possible about the human
past while it is available.

The team also hopes to assure various
Native Americans who seek return of hu-
man remains that they can, in fact, receive
the bones of their ancestors and not simply
any human bones. While the anthropolo-
gists race against time, the quality of their
analysis is necessarily foremost, and they
empire teamwork to gain the maximum of
individual talents. Don Tushy, curator of an-
thropology at the Nevada State Museum,
secured money to support the team in
Carson City with a grant from the James W.
Calhoun Foundation.

Douglas Owsey of the Smithsonian Insti-
tution is team leader. He has devoted much
of his professional life to the study of human
skeletons, especially those of the peoples of
the American Plains, although he has also
studied the skeletal remains of numerous
European Americans and Africans. His career has carried him beyond
North America, too, most recently to help in
the identification of victims of the genocidal
violence in Croatia.

Working here with Dr. Owsey is veteran
physical anthropologist Richard Jantz of the
University of Tennessee, who also has
lengthy experience in the study and analysis
of Great Plains peoples. Here Dr. Jantz is
specializing in the team's cranial analysis.
Completing the team are Kari Sandness of
the Smithsonian, Shannon Novak of the Uni-
versity of Utah, and Pareene Hamzavi and
Chip Clark of the Smithsonian. These work-
ers compose a team that is highly trained,
skilled, and experienced in the analysis of
America's human skeletal material.

"We process all skeletons as a team," says
Owsey, taking a brief break to explain the
project to the Mammoth Trumpet. "We do
the same thing for the prehistoric remains
that we do for the colonial burials that I've
been working on." Their system, which fo-
cuses on specific variables, has been in op-
eration for fully a decade.

One team member analyzes each indi-
vidual, carefully detailing her observations
continued on page 12
Biology Colloquium Focus: First Americans

First Americans Studies will be the focus of Oregon State University's 55th Annual Biology Colloquium, which brings leading scientists together to discuss their research before an audience of teachers, researchers, students, and public. One of the university's most prestigious scientific programs, the Biology Colloquium examines a specific and timely biological theme each year.

The all-day program will be April 24 at the LaFellis Stewart Center on the Oregon State campus in Corvallis. Experts from across North America will present evidence gathered using new approaches in molecular archaeology and physical anthropology that are broadening perceptions of who the first Americans were. Scientists will present archaeological, skeletal, and DNA findings essential to understanding America's cultural and biological heritage.

Long-accepted scientific theory holds that the first people crossed into North America from northeast Asia more than 11,000 years ago. Thus it has been generally assumed that today's Native Americans are the descendants of those first Asian travelers. However, research in skeletal morphology suggests that people in the Americas before about 9,000 years ago have looked different from later peoples. Did the earliest Americans come from somewhere other than Siberia?

Scientists who will present recent research findings at the Colloquium include Robson Bonnichsen, Director of the Center for the Study of the First Americans, Oregon State University; Dr. Gentry Steele, Department of Anthropology, Texas A&M University; Douglas Greene, Department of Anthropology, Smithsonian Institution; Anne Stone, Department of Anthropology, Pennsylvania State University; Walter Bean, Department of Agricultural Chemistry, Oregon State University; Katherine Field, Department of Microbiology, Oregon State University; and another presenter who is yet to be determined.

Dr. Bonnichsen will present an overview of the archaeological record for northeast Asia and North America and will discuss what the archaeological record has to say about the first Americans. Dr. Steele is the author of a number of papers on skeletal remains of the early Americans. Dr. D'Errico, a forensic anthropologist at the Smithsonian Institution who has developed an extensive database of human skeletal observations, Dr. Stone will give an overview of the molecular biology approach. Dr. Ream and Dr. Field, who are gathering evidence as part of Oregon State's Molecular Archaeology Project, will talk about their research on ancient DNA and what they are learning about the prehistory of human genetics in the New World. A final speaker will provide an overview as to where we are in the development of our understanding of prehistoric human genetics in the New World.

A closing panel discussion is expected to involve representatives from the National Park Service, Smithsonian Institution, National Academy of Sciences, and attorneys with expertise in cultural resource law.

The annual Biology Colloquium is sponsored by Oregon State University's Research Office, and its colleges of Agriculural Sciences, Forestry, Science, and Veterinary Medicine. Bonnichsen, Ream, and Field are organizing this year's event.

If you'd like to attend the colloquium, contact the Corvallis Convention and Visitors Bureau for information: 541-757-1544 (fax 541-753-2664), or visit the bureau's site on the World Wide Web at: WWW.visitorcorvallis.com/cvb. The bureau's mailing address is 420 NW 2nd St., Corvallis OR 97330.
1996 CSFA Field Work Retrieves Ancient Hair

Strategy Seeks New Information from Old Sites

Completion of the 1996 field season found the Center for the Study of the First Americans well-launched into molecular archaeology, its trail blazing analytical approach. Summer excavations at new and old archaeological sites produced hundreds of bags of washed sediments that are presently undergoing analysis by researchers at Oregon State University.

The three summer field projects were in Montana, Wyoming and Nebraska. Robson Bonnichsen, Professor of Anthropology at Oregon State and Director of the CSFA, is confident that the Center's molecular archaeology strategy will result in more precise and hitherto unobtainable information about Paleo-American people.

Goal of the summer's excavations was to recover new samples of small-scale biological and inorganic material by using fine-screen washing. In addition to seeds, small-mammal remains, plant macrofossils, fossil insects, lithic flakes and charcoal, the washed sediments contain ancient human and animal hairs that can be subjected to DNA analysis.

On two of the summer's field projects, the CSFA worked in collaboration with other archaeologists on previously excavated and well-studied archaeological sites. Dr. Bonnichsen says the collaboration allows the Center to draw on a significant body of previous research and tie its work to known stratigraphic, chronological and artifact records.

Hell Gap Site, Wyoming
The National Endowment for the Humanities recently awarded archaeologist George Frison and his colleagues at the University of Wyoming funding to analyze chipped stone, faunal remains, and other data from the Hell Gap site near Guernsey in southeast Wyoming. It was at Hell Gap in the early 1960s that the Goshen cultural complex was identified. The original Hell Gap archaeological excavations were conducted by Harvard University and the University of Wyoming from 1959 to 1966. These investigations disclosed the most complete sequence of cultural remains yet recovered in the Great Plains region. The early field work collected a massive amount of data and revealed six cultural layers, including Goshen and Folsom, but only a minimal amount of this material ever underwent laboratory analysis and was described in publications.

The aim of Dr. Frison's new analysis was to characterize the hunter-gatherer adaptations represented at this significant site. Supporting analyses included chronometric dating by accelerator mass spectrometry, geology, geomorphology, and paleo.

“Not MY hair!” Molecular anthropology field workers must take precautions not to shed hairs that might be confused with ancient hair recovered from the excavations. This bewhiskered member of the CSFA team at Hell Gap was taking no chances at contaminating samples.

environmental reconstruction through pollen and phytolith studies. Geochronologist C. Vance Haynes worked on a re-assessment of the site’s stratigraphy.

The CSFA team worked closely with the project archaeologists, geochronologist and stratigrapher. Members collected fine-scale samples of sediments from two 50-centimeter-square columns for screen washing. This resulted in 300 six-liter bags of sediments that were brought back to OSU for further analysis.

Preliminary field analysis of the sediments revealed a hair record that crosscuts the occupation levels and even extends below the known archaeological record by about a meter, says Bonnichsen.

La Sena Site, Nebraska
La Sena, along with its neighboring sites of Jensen and Shafter, has produced flaked mammoth bones that appear to have been altered by humans. To date, no flaked stone artifacts have been found at these locations. Steve Holen, archaeologist for the Nebraska State Museum, and David Muy, geochronologist from
Volunteers Play Crucial Role

Volunteers play an integral role in what the Center for the Study of the First Americans is able to accomplish on its field projects. Without their help much less would get done and the work of the Center would suffer for it. As is true with almost all volunteer work, both the volunteer and the organization the volunteer works for often benefit in unexpected ways.

Shannon Dillon, a 25-year-old graduate from Seneca State University, found her two weeks at La Sena particularly meaningful because, though she is blind, she feels she was treated as a regular member of the team. She says CSFA Director Robson Bonnichsen and principal investigator Steve Holen integrated her effortlessly into the work of making a cast of a mammoth bone as well as digging and screening the soil column.

Lab work was the only thing she didn't get to do: working in the field laboratory required looking through a microscope to sort hair and other organic material from the soil matrix.

Working with people with physical limitations, Dr. Bonnichsen says, opens your eyes in a way that is possible. He has known that blind people could operate in archaeology ever since observing his college advisor who was blind. Bonnichsen was quick to accept Dillon for the project, but was not sure how to integrate her into it until they were actually on the site. Then it became self-evident. Dillon says that in her experience having a visual limitation requires a process of problem solving, just like many other aspects of life. So it is often not possible for her to say ahead of time how she proposes to deal with a problem. Once she has the opportunity to face a particular situation then the way to deal with it usually becomes clear.

Her previous archaeological experience included the initial investigation of a Guatemalan Mayan site and the historical archaeological excavation of writer Jack London's home in northern California.

Henry Katz, retired lawyer and insurance executive, volunteered two weeks of his summer to work at the Cremer Ranch site. A member of the CSFA Advisory Board, he has been interested in archaeology since high school.

the University of Northern Iowa, have dated three and other Pleistocene sites to 20,000 years ago. The sites suggest that people were processing mammoths during the last glacial maximum, when the ice sheets were as far south as the South Dakota-Nebraska border along the Missouri River (Mammoth Trumpet 10:1 "Bones of Nebraska Mammoths Imply Early Human Presence").

La Sena site was discovered in 1987 by Bob Blasing and Brad Costant during a survey of Medicine Creek Reservoir. The mammoth bones were exposed by lateral erosion from the reservoir. Excavations extend to about 3.5 meters below the surface, and so far about 25 percent of a single Columbia mammoth (Mammuthus columbi) has been exposed. Collagen from the mammoth bone has been dated to 16,000 years ago.

The CSFA crew processed over 600,000 pieces of sediment from La Sena, Jensen, and Shafter, recovering a hair record from all three. Sediments from the sites are being analyzed in Center laboratories.

Cremer Site, Montana

Work at the Cremer site, about 100 miles west of Billings, Montana, was a continuation of fieldwork done in 1995. The site, near the Crazy Mountains, is at the head of a spring and is partially sheltered by a shallow sandstone canyon. Fortunately, this area has never been glaciated; it contains Holocene and late-Pleistocene archaeological deposits that are likely to be greater than 10,000 years old, says Bonnichsen.

Fresh water and a sheltered camping area would make the site appealing to ancient as well as modern hunters and gatherers. Little information has been gathered on this part of Montana, so the
California. Due to her main interest is in American prehistory, Dillon was quite pleased to have the opportunity to work on this Nebraska Paleo-American site.

Henry Katz, from Simsbury, Conn., a retired regulatory lawyer and former vice-president of The Hartford Insurance Group, volunteered two weeks of his summer to work at the Cremer Ranch site. His interest in archaeology, dating from high school, led him to participate in other digs including one in Belize where he helped excavate the foundation of a Mayan temple.

Katz, a member of the CSFA Advisory Board, said that in addition to four graduate students from Oregon State University and a soil scientist from the University of Wisconsin, the team contained four volunteers. Besides himself and a retired Californian businessman in his early 70's who is also a CSFA board member, there were two women—a special education teacher from Oregon, and a rancher from northern Montana.

He said the excavation procedure at the Cremer Ranch began by using a backhoe to dig a trench. Next, a one-square-meter column of soil was dug out at the side of the trench to a depth of three meters. This soil was put into three-micron sieves to be pumped on a four-sided screen and washed with water pumped from the nearby creek. Whatever was left on the screen—rocks, hairs, bones—was then placed in bags and brought back to OSU for further analysis.

Care was taken, said Katz, to avoid contaminating the samples with modern human hair. Each worker wore a hair net under his or her hat, long-sleeved clothing, and gloves. During the washing phase, each wore rain gear. He said a hair sample was collected from each member of the team to be analyzed along with any hair from the dig as a further precaution to alert against inadvertent contamination.

Katz says that all the volunteers were familiar with Buodt's research in molecular archaeology. He thinks volunteers would probably need to have some archaeological experience under their belts to appreciate the subtlety of searching for ancient hair as opposed to something more self-evident such as shards of pottery or flint tools.

Katz enjoyed the overall experience of working in a group in which everyone contributes something different. He found the quiet beauty of the location was remarkable. Among the highlights of his experience was seeing three rattlesnakes, wild turkeys, a doe and fawns, sandhill cranes, antelope, and brook trout. Getting in on the ground floor of a new analytical archaeological process was particularly exciting for Katz.

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Montana rancher George Cremer in his backhoe, opposite, digs a trench at the Cremer site for CSFA researchers who are studying the stratigraphy and depositional history and collecting hair and other biological evidence. Cultural deposits extend more than two meters below the surface. Dustin White, above, examines soil profiles while Misty Weitzel takes notes. Weitzel and White are graduate students at Oregon State University. Property owner Cremer is a member of the CSFA Advisory Board.

Shannon Dillon works at the Jensen site, near Nebraska's La Sena site. The Shorert Park, Calif., resident has a bachelor's degree in anthropology; her main interest is American prehistory.

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A drilling program conducted in 1987 revealed that cultural deposits extend at least 3.5 meters below the present surface and date back to the end of the last Ice Age. At least three buried soils and four occupation levels were exposed.

A large charcoal sample and an associated flake buried with it at the bottom of a section are awaiting radiocarbon dating. The screen-washing process from the 1996 fieldwork resulted in 256 six-liter bags of sediment that are undergoing laboratory analysis.

A variety of personnel worked on the various field projects this summer including scientists, graduate students, allied professionals and volunteers.
RECENT WORK ON HUMAN DNA and related genetic topics has two Janus-like faces, looking in opposite directions. The more engaging of the two vistas to Mammoth Trumpet readers is the new research on the peopling of the Americas. For the other vista, difficulties persist in deciding which facts are "true facts" and which are "false facts," presenting a foggy landscape. Both conceptual and technical questions plague this field of research, still in its infancy, and it is important for those interested in the peopling of the Americas not to assume that genetics can, by itself, answer most of the questions concerning human dispersal into the Americas. But genetic studies can help to develop new models as well as help to test models devised from other fields.

Researchers study human DNA from two sources: DNA of living people taken from samples of blood or other tissue, and DNA of ancient peoples recovered from hair, teeth, bones, or mummified tissue. These two categories offer quite different approaches to an understanding of the peopling of the Americas.

By studying living people it is possible to obtain enough genetic material to be certain that the DNA is properly identified. If ambiguous results from an analysis occur, it is possible to go back to the subject and obtain additional samples, and try again. In addition, the cultural as well as the geographic provenance of a living subject can be ascertained. In theory, living populations can be sampled in scientifically appropriate designs, and studies can meet usual scientific criteria: the studies should be repeatable by other scientists, and the results should be the same. In practice, however, ethical considerations make it essential to obtain the permission of subjects for analysis of their DNA, and it is difficult to take a truly random statistical sample of a population. Investigators using living subjects do have the advantage of knowledge about their sample and its cultural group; such information makes it possible to evaluate the sample's representativeness.

On the negative side, living populations cannot be expected to represent past populations perfectly. Native Americans, for example, are many, many generations away from the earliest immigrants, and microevolutionary processes undoubtedly have had significant impacts upon any population. In a period of 10,000 to 20,000 years, it is likely that many genes have been lost due to natural selection or to chance events affecting small, mobile bands. Epidemics of European diseases took a heavy toll of Native American peoples, theoretically altering the genetic character of the surviving populations. The extent of intermarriage over the past 300 years between Americans and immigrants from Europe, Asia, Africa, and the Pacific cannot always be ascertained in cultural or biological surveys, so genes from outsider peoples could skew results.

By contrast, data on ancient DNA, especially if obtained from remnant materials dating to 9,000 or 10,000 years ago, would avoid the possibility of skewed results from intermarriage with recent immigrants. And ancient DNA may inform us about traits of people who lack living descendants. On the negative side, using ancient DNA to ascertain closeness to the earliest Americans raises sampling problems because it is not possible to know how representative a single individual was of his or her population. And there are technical problems, too, because ancient DNA tends to be degraded and there may not be enough remaining in a sample of ancient bone, hair, or tissue to test or to allow a second test if initial lab results are ambiguous.

DNA Studies with Contemporary People

For many years, anthropologists have examined the relationships among language, culture and biological features of populations and have studied the affinity—and sometimes the lack of affinity—between language and genealogy. A number of recent scientific publications have addressed genetic and linguistic issues about the first Americans, but it is still unclear whether major linguistic groupings coincide with biological populations that represent ancestral migrations—a topic

7.1 "Folsomians and DNA"
7.2 "A Geneticist Looks at the Peopling of the Americas"
7.3 "Genetic Maps for the Americas"
7.4 "New Wave in Archaeology: Hair"
7.5 "New Focus, Molecular Archaeology"
7.6 "Viruses May Offer New Line of Evidence"

In this article, we review recently published research articles; references are included.
discussed in an article in the Oct. 4, 1996 issue of Science [References, Gibbons].

Questions scientists are asking include:

- How many ancestral populations colonized the Americas?
- Do these populations correspond to current linguistic groups?
- What was the timing of the colonization(s)?

Some early data pertaining to these questions led to controversy, and newer data are not sufficient to answer these questions fully. Still, recent developments add spice to the issues involved.

To consider contemporary Native Americans, what does recent research tell us about their unity over a long period of time?

R. H. Ward and coworkers reported in a 1993 article that languages appear to have changed faster in North American peoples than have their genes (DNA). They suggest that linguistic differences, such as those between Amerindian and Na-Dene language groups, do not coincide with genetic differences. This position tends to discount the "three wave" theory of linguistically distinct groups: first the large Amerind language group, then the Na-Dene peoples, and lastly the Aleut-Eskimo peoples (Mammath Trumpet 7:3 "Linguist Finds Evidence for Early Peopling of the Americas"). Joseph Lorenzo and David Glenn Smith, in a well-illustrated November 1996 article, review mtDNA studies from many populations in North and South America, examining geography and language family as possible factors explaining the distribution of the four commonly studied genetic features (referred to as lineages or haplogroups). Maps summarizing their findings are helpful in convincing readers of the authors' conclusions that both factors appear to affect genetic distributions to some extent, in some areas. The biggest weakness of the three-wave language category appears to be in the patently oldest, least specific, and most widely distributed group, known as Amerind; the authors (page 318) say that their data "do not support" Joseph Greenberg's concept of the cay of Amerind.

In contrast to the three-wave theory, D. A. Merriwether and colleagues have supported a single-wave of migration (or migration from a single source) into the Americas. They have identified nine different founding types (so-called haplotypes) of mitochondrial DNA. Although the frequencies of these types turn out to differ between contemporary and ancient DNA samples in some regions, the nine types are widespread throughout the Americas and also exist among East Asian populations. The nine types do not demarcate American linguistic subdivisions and thus do not support a two- or three-wave model of successive migrations.

The discovery of nine founding types (or even more than nine, as suggested by Bianchi and Rothhammer), supports the idea of substantial genetic diversity in the original American colonizers. This contrasts with the "four lineages" model put forth previously by other researchers such as Torroni and Wallace in their 1995 article.

Further, Merriwether and colleagues tend to reject Siberia as being the source of the first Americans, despite its eastern edge facing the Bering Sea. There are two reasons. Siberian groups generally have only a small subset of the founding types, and two of the nine founding types do not occur in any Siberian group studied so far. (Of course, the Siberians have other haplotypes, as do Europeans and Africans). Because their Mongolian sample possesses a larger proportion of the founding types than does any Siberian sample, these authors favor Mongolia or a nearby area as the source of Native Americans.

Findings of geneticist James Neel and others also point to Mongolian populations as relatives of Amerindians. In a 1994 paper, they described the geographic distribution of a human virus (HTLV II). Neel's group and other workers have found HTLV II in native North and South Americans and in Mongolians, but not in Siberians; Neel's group concluded that the Mongolia/Manchuria region was a very likely source area for the founding population of Americans.

But various viewpoints exist concerning the number of source populations and the points of origin. In their 1995 paper, Torroni and Wallace voiced skepticism about there being more than four founding haplotypes, although Forster and colleagues have now modified this view somewhat. And others have remained skeptical about the only entry point to the Americas being Beringia.

Rebecca L. Cann and J. R. Lahn have studied the DNA of Pacific populations and compared their results with these on the DNA of native Americans. Several mitochondrial DNA "lineages" occur both in the Pacific area and in Amerindian samples. This finding is consistent with two differing interpretations. Either it signals the retention of very old lineages in both areas, or it signals direct oceanic contact. Cann and Lahn
argue that their results leave open the possibility of direct, seafarer contact (presumably pre-Columbian). In contrast, S. L. Bonatto and coworkers regard the former possibility (a remote, shared Asian origin) as being more likely.

As to the time of the first colonization of the Americas, geneticists are far from agreement [References; Cann 1994]. X. M. Weiss wrote in a 1994 article that an estimate of 22,000 to 26,000 years ago, for example, may actually derive from a much-earlier or a much-later arrival, depending on assumptions about the number of migrant groups, their genetic heterogeneity, their group size(s), and other matters.

Much of the recent research in living populations focuses on mitochondrial DNA, which is inherited primarily through the female lineage, but newer research is focusing on genes on the Y chromosome, transmitted universally from father to son. Researchers in Brazil and their collaborators (Santos et al.) are using this approach to develop models concerning migrations into the American. They report that for their samples of Native American males from Central and South America, 70 percent have the Y-chromosome DNA variant called haplogroup IIA, while only 38 percent of males of the Muskoke (Creek) of Oklahoma have the same variant. Researchers attribute the latter group's lower frequency to outbreeding, presumably with people from Europe, in the last few centuries. In contrast, only 10 percent of Brazilian Euro-Americans have haplogroup IIA. The authors see their findings on the Y chromosome as supporting the idea, first reached on the basis of maternally inherited mitochondrial DNA, that both North and South Americans came from the same Asian Pleistocene population, with haplogroup IIA being the predomi-
nant, or, only founding Y chromosome for American populations.

In addition to mtDNA and Y-chromosome genes, HLA alleles (variants of immunological genes) are being used to study relationships between living American Indians and Asians in an attempt to infer the former's origins. In a recent report, a group of Japanese researchers (Bannai et al.) compared HLA alleles in Alu people of northern Japan with those in Ameri-

Can you please provide the references mentioned in the text?
Annual Journal Goes to Press

Current Research in the Pleistocene, the CSFA's annual journal of research notes, has gone to press and should be in the mail to CRP subscribers within a few weeks. With the production of CRP 13, can CRP 14 be far behind? Scientists on the CRP mailing list will be receiving editor Bradley Lepper's call for papers soon. If you want to submit a paper and if you have not received his letter, contact the CSFA office, by e-mail (balladilla@est.edu) if possible. Deadline for submissions is March 15.

The journal publishes brief papers on research in a variety of disciplines focusing on late-Pleistocene time. CRP offers Pleistocene researchers a chance to report on their recent findings and work in progress, and to read about research in other, related, disciplines.

If you have not yet ordered the 1996 issue, it's not too late. And many back issues are still available. Use the order blanks in this issue of the Mammoth Trumpet.

expressed concern that the restricted samples in ancient DNA may make it difficult to develop a meaningful story of migration history. Similar views have been stated by other researchers, such as Cann, who have worked primarily with DNA from living populations. Cann's 1994 article stressed the need for careful attention to how and where living populations are sampled, when doing comparisons over time. Similarly, Weiss cautioned that eventually genetic, archaeological, geological, and other data will have to be placed correctly in the jigsaw puzzle, before a realistic picture can emerge. Weiss's comments indicate the need to see DNA studies within the context of other anthropological and paleoenvironmental research. As Bianchi and Rothhammer wrote, DNA methodology is not a panacea that will resolve all anthropological doubts.

The origin, timing, and number of colonization of the Americas constitute an arena of ongoing research stung with conundrums about both ancient and modern DNA. While connections between results from DNA studies of living and ancient populations are being attempted, it is probably much too early to expect a synthesis of such data.
Very few physical remains of the earliest residents of the Americas exist, despite a substantial and growing archaeological record attesting to their presence. All the biological, chemical and geological forces that make the record of other species of the past rare are working against preservation of physical remains of early humans. The late Pleistocene and early Holocene were particularly tumultuous times climatically and geologically, initially producing environments unfavorable to preservation of bone, and ultimately assuring that any that were preserved are nearly impossible to find.

One environment that possesses special advantages for preservation is a high-altitude cave. Such an environment could not be a permanent dwelling site, with the accoutrements of daily living; nor would there ever be large numbers of prehistoric people in such a place. However, a discovery high in the Rocky Mountains suggests that archaeologists seeking clues to the earliest North American people might do well to consider cases as investigation sites, with the assistance of qualified cave explorers. Though relatively few archaeologists have expertise in cave environments, Patty Jo Watson of Washington University in St. Louis is a notable exception.

Because of her long involvement with cave archaeology, Dr. Watson was contacted in 1988 when three cavers discovered skeletal remains of an ancient cave explorer in Hourglass Cave at an altitude above 10,000 feet in the southern Rocky Mountains. The cavers, Cynthia Mosch, Tom Sharrill and Richard Wollert, began to map Hourglass Cave soon after they discovered it. In what had appeared to be an untraveled passage, they found disarticulated human bones, and the nature of their exploration immediately expanded. They contacted Watson, who came to the site and brought along Charles Hildebolt, a physical anthropologist at Washington University who also is a caver; Dr. Hildebolt, along with Watson and the discoverers of Hourglass Cave, documented the remains, and invited other experts to help them understand the man who died there.

The first members of the interdisciplinary team were Keny Posnanski, Native American Cultural Heritage Representative, who is the Forest Service Liaison with the Ute Tribe; and William Kight, the local U.S. Forest Service archaeologist. Team members directly concerned with providing a biological analysis of the Hourglass Cave man were Anne Stone of Pennsylvania State University, who analyzed DNA extracted from the left thumb; A. M. Harasewych of Arizona State University, who studied the dentition; Tan Rasimus and Ellen Miller of Washington University, who made casts of the bones; Sam Stout of the University of Missouri-Columbia, who performed histological analyses on a sample of bone from the midshaft of the femur; William Murphy of the Anderson Cancer Center, who did radiologic analysis of the bones.

In addition to physical anthropological researchers, the interdisciplinary team includes a cartographer (Michael Goar), a paleontologist (Rickard Toomey III), a geomorphologist (Fred Nials), speleologists (Tom Sharrill and Neil Sharrill), a cave-gating specialist (Marion Vilenoe), a speleologist and data manager (Richard Wollert), a stratigrapher (Fernando DuChene), a pictograph/petroglyph-dating expert (Alan Watchman) to attempt to date possible ancient torch smudges on the cave walls, and project coordinator and assistant coordinator (William Kight and Sue Struthers of the White River and Routt National Forests respectively).

Dating of any North American prehistoric remains is always crucial to their interpretation. Beta Analytic and the University of Arizona provided radiocarbon dates that took the Hourglass Cave skeleton back to what many scientists con-
The team recovered both nuclear and mitochondrial DNA from the bones; researchers believe that the cold and the constant environment of the cave enhanced preservation. DNA analyses produced no surprises. They confirmed the sex estimate made from the pelvic bones, and the features of the DNA linked the Hourglass Cave man to living American populations, but to no specific tribe. Molecular studies of the mitochondrial DNA indicated the presence of a nine-base-pair deletion in the canine 5' UTR region, a feature found in a number of contemporary American Indian populations. Examination of the mtDNA control region sequence from nucleotide position 10048 to 16400 indicated other mtDNA features that also have been reported in the modern Non-Chul-Niitlh, Maya, Yakama, and Yanyantama populations, but not in many of the other peoples of the world. The Hourglass Cave man, while not the earliest human skeleton from North America, is one of very few from the early Holocene. He lived approximately 500 years after the time—8,500 years ago—that physical anthropologists Gentry Steele and Joseph Powell have defined as the youngest age for Paleolithicans (Mammoth Trumpet 7:2 "Paleoamerican Skeletal Data Re-examined"). Powell and Steele would consider this skeleton in the general cultural period known as early Archaic. Time periods and cultural associations are provisional; however, and some investigators use a later time period as a benchmark, one closer to the Hourglass Cave man's age.

Too little is known of these early North American cultures and of the physical features of the people of both eras for any definite distinctions between them, and thus any information concerning the physical features adds considerably to our understanding of these First Americans. His presence high in the mountains, deep in a cave, offers some interesting information and poses questions regarding his purpose and use of the high-altitude resources.

Moesch, who is an expert cave explorer as well as a cave scientist, says that entering the cave requires crawling and "wigging" in a prone position for the first 18 meters before one can stand upright. She says the way is difficult—all of twists, turns, climbs, crawls, and dead-end side passages. Geological analysis indicates the general aspect of the cave has not changed since the time of the ancient explorer; the passageways and chambers are as they have been for thousands of years. Because the ancient explorer was found about 320 meters from the cave entrance, he must have had a strong determination to go into the cave where passage was so difficult, dark, cold and damp.

Smudged marks have been noted along the passageway, apparently the marks of a torch or torch used by prehistoric visitors. Radiocarbon dates on charcoal found near the cave entrance indicate an age of about 2,200 years, six millennia after the man died there. The research team hopes to date smudge marks they found farther back in the cave and also the fragments gathered from the floor below the smudges. These may help to tell the story of the Hourglass Cave man's trip into the cave, or reveal whether there were other visitors, earlier or later.

Watson reports that available evidence in the cave does not indicate whether this visitor had been there previously or had been out alone and simply discovered the cave opening or decided to explore it on a whim, afterwards perhaps becoming continued on page 18.
Racing Repatriation

continued from page 1

on one of nine printed forms. Unlike phy-

icians, who can question their patients

about problems and symptoms, these

physical anthropologists necessarily

gather their information from observa-

tion and measurement. After Sandness,

Novak and Hamzavi record specific mea-

surements and traits. Owley discusses

with them each individual skeleton. They

work toward consensus on details such as

the person's age, and include any number

of distinguishing characteristics such as

the cause of death, physical traits, pathol-

ogy, and morphology.

Respect and Enthusiasm

Two things are evident to one watching

Owley and his team at work: each

member's personal regard for the indi-

viduals they are analyzing, and enthusi-

asm for the intellectual challenges each

skeleton offers.

At times, Owley seems to be conduct-

ing a postgraduate seminar in osteology

or taphonomy. He challenges certain de-

tails of the observations that another team

member has made and explains reasons

for his doubt; he also notes points of

agreement. She argues her point. How-

ever slight, differences in observation or

interpretation become points of intense

interest because team members agree on

the vast majority of elements. Before

analysis of one particular individual is

complete, they reach consensus.

They are quite at home in the company

of each individual whose remains they are

examining. Extensive experience witnessing

the marks of tribal illnesses and injuries, and

nonfatal disease and wounds does not

prevent team members from relating to

the pains, and admiring the strengths of

the people whose bones they study. As

they work, team members remark on

troubling dental problems such as unusu-

ally heavy wear or painful abscesses.

They speak of the obvious strengths of

the individuals who had lived with the

pain of diseases, injuries and deformities.

They remind the observer of a team of

medical doctors paying professional visits

to hospitalized patients. The museum re-

possession set in desert scrub land near the

base of the Verras becomes their hospi-

tal, and bones arrayed on tables become

their patients. Words they use are often

too technical to be understood by one

not intimate with anatomical terms; peri-

ods of intense discussion are followed by

periods of quiet punctuated only by an

occasional murmur of puzzlement or en-

lightenment.

Jantz's work station includes several

instruments for making delicate measure-

ments of crania. Much of the time he

works quietly, making the many intricate

observations that can provide detailed

descriptions of an individual's physical

heritage, life, health and, possibly, death.

Occasionally his gentle Southern voice

joins a discussion regarding some par-

ticular aspect of an individual.

All the while, Clark is photographing

bones, aware that the images he makes

may be all that scientists will have to

see of the individuals being analyzed. Op-

erating a small portable studio of his own

design, the Smithsonian photographer
Richard Jantz uses a notebook computer to demonstrate his program that compares skull measurements with statistical averages of ancient skulls from a variety of peoples around the globe. Dr. Jantz is a University of Tennessee physical anthropologist. Among those watching during a break from work at the Nevada State Museum is Kari Kindness, right, at the Smithsonian.

Places each item from the smallest bone fragment to the largest skull or femur in position to be perfectly illuminated by his diffused strobe lights. When he's satisfied with the placement, he photographs them with fine-grained film, both for color transparencies and black-and-white negatives. He usually sees precisely what must be depicted, but occasionally he questions one of the anthropologists about the significant aspect of the bone to be photographed.

Remains Cataloged

The team's starting point is an inventory of the skeletal material. Here at Carson City, Amy Dansie, anthropologist at the Nevada State Museum, had previously prepared a detailed listing of the 655 human remains catalogued here and at the Nevada Historical Society and Lost City Museum. This inventory was not merely a tally of skeletons, but a highly detailed accounting of each individual set of remains organized in a sophisticated computer database program. Dansie had devoted much of her time during the past year to compiling the list and assuring that it complies with the terms of NAGPRA, which requires museums to identify all fragments of human remains and associated funerary objects, describe how and when each was acquired, and to identify tribal origins, or likely tribal origins of each.

Before Owsley's team arrived, Dansie had painstakingly worked through the museum's NAGPRA database three times, entering all available information about each individual. Preparing for the Smithsonian team, she designated all the individuals she knew would be the most valuable, for example, ones for which there were good records of provenience, ones that were of known antiquity, and ones that were relatively complete. These included two individuals that date to Paleo-american times, a group of skeletons representing the Lowbeek culture dating back to about 4,000 years, and a group of more-recent remains of Paiute.

**Words Supplement Numbers**

**CARSON CITY, Nev.—On a table beside the 8,000-year-old skeleton of a man, a notebook computer displays a popular word-processing program. One member of the Smithsonian Institution's multiple databases cannot convey the considered impressions of experienced workers. Thus, in addition to numerical measurements and other quantitative observations, team members also write their observations.

"We want them to go into an archive," Douglas Owsley says of the written notes. "We want them to have a life beyond us in case somebody wants to look at them—including the Indian child who grows up to be a physical anthropologist."
Honoring Ancestors...

Analysis by Don Allen Noll, Editor, Mammoth Trumpet

ALTHOUGH UNIFIED STATES Federal law and some state laws call for return of Native American remains and grave goods to the appropriate tribal groups, physical anthropologist Douglas Oxley and many other scientists see human bones as a repository of information on the human species that is available nowhere else. Further, human skeletal material provides data on specific groups through time and across the continent. They're solid evidence of the great array of human diversity.

"When you bury these collections, you're reinforcing the view that American history began with Columbus," Oxley says. "As they rebury their past, they're really burying a source of information of the past."

North American scientists who specialize in the study of that information face a serious public image problem. Historically, Native Americans have been oppressed peoples; public policy may seek to right past wrongs. Further, traditions and religions typically frown on taking scientific, rather than spiritual, responses to human remains. The public may not be particularly sympathetic to science when anthropologists are portrayed in news reports as digging up, mistreating bones of ancestors from the descendants. Much of the human skeletal material from archaeological sites predates the arrival of Europeans, and some of it is linked directly to existing tribal groups. Even scientific evidence that there is no biological affiliation between an ancient skeleton and a tribal group may not seem important to government agencies when tribal groups plead to be the guardians of all past peoples in their present-day territories.

The challenge to scientists is to convince Native Americans and the general public as well that the knowledge available to humankind from extensive collections of ancient bones far outweighs the value of the remains of a single individual.

It's a hard sell. But in a sense, scientific collections of human remains are libraries of information on our species. Physical anthropologists are acutely concerned about the possibility of losing the knowledge contained in that library, even the most careful analysis and recording of data cannot be the same as preservation of the bones themselves. Some might regard the analyses of physical anthropologists as rather like reading the books and taking notes about them before the library is burned.

Rapidly improving technology probably means that ancient human remains will have increasing—not decreasing—scientific value in the future. As new techniques are developed and applied, new, more accurate interpretations of human history are likely to be revealed.

When you bury these collections, you're reinforcing the view that American history began with Columbus..."
or Burning Libraries?

Just as molecular biologists have developed new means to recover and analyze DNA from ancient bones, osteologists who examine the bones are using new techniques of measurement. "The way we look at a skeleton today is radically different than Howell's," he says, referring to Harvard University's W. H. Howell, the physical anthropologist who pioneered sophisticated techniques for statistical analysis of human crania. "I think we are better able to identify and understand how different activities are affecting the skeletons."

And Owsley is confident that cranial morphology reveals obvious differences among various populations. "Through carefully designed statistical comparisons, we can answer historical questions. We can look at the relationships between groups. It's not going to tell us everything, but it's not going to tell us everything either."

Owsley notes that earlier scientists were often pursuing fundamental questions such as, "Who were the mound builders?" Without their baseline research, we might still think of the mound builders as the people who came before Indians." Scientists such as A. B. Hrdlicka (1869-1943), who served as Smithsonian curator, collected skeletons because they were probing the question of human destiny. "There certainly were remains that shouldn't have been recovered — that should be returned," Owsley says. An example would be burials from late in the last century that had been exhumed after the present of descendents. "But when we get into taking off the prehistoric material and putting it in the ground — and when we get into the realm of even pushing it to this age, he continues, gesturing to the remains of a man who lived in Nevada more than 9,000 years ago, "we're destroying the past."

The angle of wear was puzzling because it was on the lingual slope rather than on the buccal — these jaw teeth were worn down more on the tongue side than on the cheek side. "That is exactly opposite of what you normally see."

Not Time Enough for Everything

Owsley regrets not being able to measure the angle of the plane to which teeth are worn. "It takes time. It's one of those things I wish we could do as we score these teeth planes. I feel badly about the opportunity we're missing because there is such tremendous difference between time periods and groups. What we do now is so labor intensive that if we measured the angle we'd just never get done."

The detailed scoring of tooth wear, however, is providing future researchers with a vast store of data. There are big differences in tooth wear from population to population. "When you get into historic groups that had a European diet, the wear cuts down tremendously." Archaic peoples of the Great Plains, however, exhibit a rapid rate of wear.

Form 5 records the team's cranial measurements. Besides standard measurements, it employs a system of couples, measurements and angles developed and used by W. H. Howell, Harvard University biological anthropologist. "We have worked for years to develop a cranio- metric database that includes all the Plains groups. Dr. Jantz has worked on it ever since his dissertation, and his students, such as Pat Key, have carried on, and I've assisted in that endeavor as much as possible."

To illustrate how the shape of an individual's skull can identify his or her individual's group, Owsley moves to another table and points out obvious differences between the skull of a person from a Numin-Paints group and one from a Shoshoni site. "You can often identify these populations by the craniofacial proportions," he said. "That is not to say that they all don't have a general set of features that you'd say, 'That's Native American,' but there are very distinct differences among populations."

Cranial studies make it obvious to Owsley that some groups have completely replaced other groups. He cites work Novak has done with Utah collections that chronicles a difference between peoples identified as Archaic and later peoples. "The people from this and Fremont are not the same. One doesn't come out of the other." The team's studies also find microevolutionary changes within a population through time, and there are regional differences. Fremont, for example, has a distinctive morphology with recognizable differences through time and by region. But Fremont individuals appear totally unrelated to Numin speakers such as Paints and Ute.

Postcranial Measurements

Postcranial measurements — all bones except the skull — are covered by the Smithsonian team's Form 6. "We have been taking this series of measurements for years. This is the same set we take at the Smithsonian on our repatriation
The Basic Tools

Basic Measurement Tools

Richard Jantz uses in his osteometric studies are pictured on his work table at the Nevada State Museum. These tools include generalized measurement instruments and tools developed specifically for the study of human bones. Skulls in particular require special devices because they have complex curved surfaces; individuals and groups differ in shape as well as size.

A is simply a short metric rule that is used simply to measure short distances. B and C are sliding calipers that give precise measures between any two points that can be touched in a straight line and differ in the way the measurement is shown — on a dial (B) or on a line on the scale (C). D is a spreading caliper that can go around a curved surface, for example, to measure the breadth of a skull. E is a coordinate caliper, which adds to the sliding caliper a rule (F) that calculates the distance from, for example, the surface of the skull to the line between the two measured points (2 to 3). A specialized version of the coordinate caliper is the radiocimeter (G), which has round, bullet-like structures (4 and 5) that insert into the two auditory meatuses (ear holes) of a skull. This allows the investigator to make a number of measurements of positions on the surface of the skull to the same central point within the skull.

Instrument G is a mandibulometer used for making several measurements of the lower jaw, or mandible. A movable vertical surface that hinges along the calibrated surface of a half-circle allows the researcher to measure the angle of the jaw; calibrations along the vertical surface allow measurement of the height of the jaw, and a horizontal sliding surface makes it possible to measure the depth of the jaw. H is an osteometric board, the only anthropometric device normally made of wood. A long bone (for example, humerus or femur) is positioned between the fixed vertical surface on the left and the sliding vertical surface on the right; the measurement is read on the metric rule on the surface of the board.

The team searches for micro-evolutionary changes in a population over time.

Reading Ancient Lies

For an example, Oswey turns through several pages of a pathology form for one individual and points to a line of numbers. "That's saying that he's got porosities (flammation of the bone surface), it is moderate in severity, it's located on the distal third of the right tibia diaphysis. Its 'state' is Code 1, which means that it is active, so it's got porosity that is actively remodeling and it's localized."

Data on growth are the subject of Form 9, the final questionnaire the team employs to record details from human skeletal remains. It takes advantage of the melancholy fact that more than 1,700 of the individuals the Smithsonian group has analyzed died as children. "We look at dental calcification," Overly explained. "Each tooth is scored as to its stage of development. And in relation to that, we have long-bone lengths."

He points out, for example, on one form indicating a particular child's right radius was 203 mm long. Having determined the child's age at death from tooth development, the size of bones provides information on rate of growth. "We're building a database that will look at growth in different regions through time," he says, noting that big differences in growth and size of various populations already is evident.

X-rays and CAT Scans

Although it's a monumental task, recording scores of measurements on forms that will be entered into computer databases is not all the Smithsonian team does. "When we have the opportunity, we take standard X-rays," says Oswey. The X-rays include dentitions, which provide information on dental calcification, necessary to determine the age of children. The Smithsonian has an X-ray machine available, but "I have to buy whatever X-ray film I use." In addition to X-ray analysis, the Smithsonian recently acquired a CAT (computerized axial tomography) scanner that produces three-dimensional images of bones.

Money, however, is always a problem for Oswey. "I'm always short of cash." Funds that are available often can't be spent on analysis of the most interesting individuals. One of his current studies involves a series of 18th-century burials. "It's easy for me to get money to analyze those because they've been hit by construction projects or whatever, but," he says, gesturing to the skeleton of a 9,000-year-old Nevada man, "it's very difficult to get money to support our studies on prehistoric people like this."

"We're doing it out of sincere interest in it, and we piece together whatever little bit of funding we can get. We are anthropologists and in that sense we are good scavengers."

During their work here in Carson City, the Smithsonian team studied 57 individuals. They hope to return in March to analyze approximately 20 more they believe offer good research potential.

—Don Alan Hall

Who Was It? Murder Victim? Police Ask

When human skeletal remains are accidently encountered outside the context of an archaeological excavation, the discovery is dealt with as a police matter. Seldom are the circumstances of death obvious, and law-enforcement officials must suspect foul play until assured otherwise. After some examination of the crime scene, police and coroners gather the bones and contact an anthropologist. Some law-enforcement agencies have forensic anthropologists on their staff or on call at the state medical examiner's office, but many rely on physical anthropologists employed in teaching or research.

Inevitably, the first question involves categorizing the person whose remains were found as a recent homicide or a prehistoric burial. Bones from ancient individuals appear obviously old, stained and weathered to the consulting scientists, and in such cases the police quickly lose interest in the case. In the past, skeletons determined not to be those of modern missing persons were left with college anthropology departments or museums. They could remain boxed in store rooms and closets because neither government officials nor nearby tribal groups have been interested enough to take them. Scientists have neglected such skeletons because they lack information about provenience, and often there is neither money nor time to go through the trouble.
Mochanov Proposes International Effort

Russian archaeologist Yuri A. Mochanov is calling for an international effort to consider human origins and study Paleolithic sites including Diring Yuriyokh on the Lena River. Dr. Mochanov, an academician of the Russian Academy of Science, visited the United States three years ago to describe discoveries at Diring, where he has recovered more than 5,000 pebble artifacts in 37 toolmaking areas (Mammoth Trumpet 53: Siberian Site Defies Theory of Peopling). "Mochanov Shows, Tells us U.S. Tour."

A veteran of 30 years of field work, he remained convinced that the pebble tools at Diring, where he recently completed his 15th field season, date between 3.2 and 1.8 million years ago. If so, they are at least as old as the most ancient tools in Africa.

He would like to contact fellow archaeologists who are working on human origins and is promoting a series of exchanges that would allow him to visit Paleolithic sites in Europe and Asia and bring other authorities to Yakutsk.

Could humans have originated simultaneously in Siberia and Africa? "Let us work together to solve the mystery of the origins of man," says Mochanov. "Defending his theory on Siberian origins, he says: "Let the experts come in and prove me wrong."

Mochanov can be reached by e-mail, oga@nauka.yacc.yakutia.su, or fax, 011-7-095-230-3019.

Cave Skeleton

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disoriented or succumbing to an injury that his partial skeleton does not reveal. Frost believes that the Hourglass Cave man was familiar with the region, including the cave, had been inside the cave previously, and made his last trip into it intending to die there, as he did.

Because Hourglass Cave is on U.S. Forest Service land, because the remains of a Native American were found inside it, the Forest Service declared the cave a sacred site and closed it to the public. Watson says that provisions of the 1990 Native American Graves Protection and Repatriation Act apply to the cave and the remains, which meant that the decision about final disposition of the bones was made by the Native American representative to the Forest Service in consultation with the regional Forest Service officials.

The remains of the Hourglass Cave man have been held by the Southern Ute tribe, but the interdisciplinary research team gathered and preserved a substantial amount of information regarding this early resident of the Americas. Their research will be valuable for comparison with existing data on early American as well as Paleolithic peoples and cultures.

The discovery itself suggests the importance of cave sites, high in the mountains, as protectors and preservers of rare and physical cultural information concerning the First Americans.


The 9,300-Year-Old Bones of a man found last summer in a park along the Columbia River in Kennewick, Wash., are the center of a controversy swirling around Native American rights and inquiry into the origins of the first Americans. Unless an amicable solution to the deadlock is reached it appears likely the skeleton will have its day in court in a renewed collision of science and religion.

Meanwhile, the skeleton that is described in news reports as “Kennewick man” or “Richland man” remains in federal custody at the Battelle Pacific Northwest National Laboratories in Richland, Wash., according to James Chatters of Applied Paleoscience. A forensic anthropologist and archaeologist, Dr. Chatters was called by local officials after the skeleton was found on July 28 by two men attending a boat race. The area is administered by the U.S. Army Corps of Engineers.

Native American tribes are demanding that they be allowed to bury the bones before further scientific analysis is done. “Our tribe was not properly notified,” said Armand Minthorn, religious leader of the Confederated Tribes of the Umatilla Indian Reservation. “And if we had been, this difficult situation might have been avoided.”

The skeleton, missing only a few foot bones, is practically the oldest ever found in the Pacific Northwest, according to Chatters, who adds that the only other skeletal material in the region consists of fragmentary human remains of cremated skeletons from the Marmes Rockshelter on the Palouse River in southeast Washington that date to 10,900 years B.P. The Kennewick bones, Chatters has told reporters, hold secrets to human life as it was being lived when the last of the Ice Age glaciers were retreating from the continent. Such ancient bones offer a rare opportunity, he says, to learn more about the early inhabitants of North America, where they came from and how they got here.

The skeleton has undergone only limited analysis. Dating of bone collagen from a little finger, the left fifth metacarpal, done by the University of California at Riverside yielded an unadjusted radiocarbon date of 6,410 ± 60 years (OCR 3478). The adjusted age indicates the skeleton is about 9,300 years old, far older than Chatters had initially believed. He agrees that further dating would be advisable. "One test sample is not ordinarily sufficient for something this old," Chatters said in a recent telephone interview.

Preliminary analysis by Chatters and two other anthropologists provided intriguing information, however. This ancient American apparently died from infection caused by a basalt projectile point imbedded in his right side. Chatters says it was a Cascade point, a willow-leaf projectile two inches long and one inch wide with rounded base and serrated edges. The radiocarbon age of the skeleton would be consistent with the oldest temporal boundary ascribed to the Cascade-point tradition.

Until the wound and its cause were found, the skeleton seemed to belong to a historic-era man of European heritage. In a letter to the local coroner, Catherine J. MacMillan of the Bone-Apart Agency in Eillsburg, Wash., wrote, "I was stunned when I examined the pelvic bone and the projectile point associated with it." After reexamining the skull, however, she agreed with her initial identification: "Caucasian male." Dr. MacMillan is professor emeritus at Central Washington State University.

Grover S. Krantz, physical anthropologist at Washington State University, reached a similar conclusion after studying the skeleton at Chatters' place for an hour on Aug. 30. "The skeleton would be almost impossible to match among any of the western American Indian tribes," he wrote in a Sept. 2 report to Chatters. But, he said, the tall body type does match that of recent Native Americans on the Great Plains and older derivations east of the Mississippi River. Dr. Krantz said scientists have evidence that the entire Columbia Plateau was depopulated shortly after 9,000 years ago and repopulated a few thousand years later by people from elsewhere.

"The descendents of the Richland man did not move out and return," he told Chatters. "Clearly the Richland man belonged to a native culture that no longer exists, and one that has no living descendents." He expressed the opinion that the Native American Graves Protection and Repatriation Act of 1990 (NAGPRA) has no more applicability to the skeleton than it would to the remains of a Chinese individual left behind by some ancient expedition. "The actual affiliation of the skeleton continues to be a problem that should be studied, not ignored, if we are to fully understand the early prehistory of America," said Dr. Krantz.

Other details revealed by initial analysis indicate that the man:

was 5 feet 9 inches tall and between 45 and 50 years old;

had a long, narrow head and face and a very long nose;
did not have a flat place on the back of his skull that might suggest he had been carried on a cradle board as an infant; had suffered severe rib fractures that left bones unable to knit and caused his left arm to be atrophied; had a healed break in the lower spine indicating he had not carried much weight.

Study of the skeleton snapped abruptly when the Corps of Engineers locked it up after the Confederated Tribes of the Umatilla, Colville Confederated Tribes, Nez Perce Tribe, and Yakama Indian Nation claimed it under the terms of NAGPRA. The Colville tribe indicated a willingness to have the skeleton studied further, but the others wanted it reburied immediately.

When it appeared that the skeleton was in immediate danger of being lost to all further study, several scientists filed a lawsuit to seek authority to examine the skeleton and to block implementation of NAGPRA pending a complete review of all relevant evidence, according to Portland lawyer Alan L. Schneider. As part of the suit, the scientists have secured a court order saying that the Corps of Engineers must give them 14 days' notice before turning the remains over to Native Americans. Such notice, said Schneider, would push the matter into court for further hearings.


Individual plaintiffs in the suit are Robson Bonnichsen, director of the Center for the Study of the First Americans; C. Loring Brace, University of Michigan; George Gill, University of Wyoming; C. Vance Havnes, University of Arizona; Richard Jantz, University of Tennessee; Douglas Owsley and Dennis Stanford, Smithsonian Institution; and D. Gentry Steele, Texas A & M University. Their institutions are not involved in the suit.

The issue, Dr. Bonnichsen told The New York Times, is a battle over who controls America's past. And many Native Americans believe the past should remain with them and not with scientists.

In an op-ed column in the Nov. 2 New York Times, novelist M. Scott Moncrief wrote that Indians must, as a matter of "identity, dignity and spirit," use the powerful legal tool of NAGPRA to fight back at previous injustices.

Mithom told The New York Times that Umatilla oral history goes back 10,000 years. "We know how time began and how Indian people were created. They can say whatever they want, the scientists. They are being disrespectful." In a tribal position paper, Mithom added that many Indians of the Columbia River Plateau do not believe that their ancestors migrated from another continent. "From our oral histories, we know that our people have been part of this land since the beginning of time."

"We also do not agree with the notion that this individual is Caucasian," Mithom continued. "We believe that humans and animals change over time to adapt to their environment. And our elders have told us that Indian people did not always look the way we look today." Besides urging immediate reburyal, Mithom said that tribal policies, procedures, and religious beliefs prohibit scientific testing of human remains. "We have a responsibility to protect all human burials, regardless of race."

While the debate swirls, the Corps of Engineers is reviewing a growing number of requests from other individuals and groups seeking standing in the case, according to Meier. He would not say how many such applications are being reviewed, but he indicated that it could take "weeks or months" to reach a determination.

Chatters would like to see more non-invasive tests of the skeleton, such as detailed skull measurements and documentation of skeletal and dental pathology. A complete DNA study could add to understanding of the genetic history of North Americans, and dietary information would be available from isotope studies. Chatters also notes that radiographs and photographs for later study would be useful.

"I don't see why we can't work both ways so that we could get the knowledge and they could get the skeleton," said Chatters. "Frustration exists in his voice. "This was not to be a polarizing issue. I looked at it as bringing us closer together."

Mithom is skeptical of those who speak of compromise. "We remind them that not only has this individual already been compromised, but our religious beliefs have once again been compromised." —George Wissner

COMING CONFERENCES

March 26-29 20th Annual Ethnobiology Conference, University of Georgia, Athens.

Contact: Sylvia Souleider, Dept. of Anthropology, Florida Museum of Natural History, University of Florida, Gainesville, FL 32611-7800.

April 1-2 Annual Meeting, Human Biology Association, Adams' Mark Hotel, St. Louis.


April 2-3, 66th Annual Meeting, American Association of Physical Anthropologists, Adams' Mark Hotel, St. Louis.

Contact: Charles Hildebolt, Washington University, 314-362-8410. hildebol@mitfok.wustl.edu.

April 2-4 Annual Meeting, Society for American Archaeology, Opeland, Nashville TN.


April 17-19 50th Annual Northwest Anthropological Conference, Ellensburg, WA.

Contact: Steven Hackenberger, Dept. of Anthropology, Central Washington University, 400 E. 8th Ave. Ellensburg, WA 98926-7544. hackenber@cwcu.edu.

May 22-24 Third International Conference on Soils, Geomorphology and Archaeology, Lurey, VA.

Field trips to Thunderbird Paleolithic site and several marl locations. Abstracts due Feb. 15. Contact: Joan Walker, Thunderbird Archaeological Associates, 128 E High St, Woodstock VA 22664.

Send conference notices to the Mammoth Trumpet, 37112 Mass Rock Drive, Corvallis OR 97330.