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Letter From the Desk Of David Challinor
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Some tantalizing information about early man has recently appeared in scientific journals and the national press. The most amazing for me was the account of the preliminary analysis of the skull of the "Kennewick Man." The discovery and subsequent legal wrangling over the disposition of the remains of a 9,300-year-old man were fascinatingly described by Douglas Preston in The New Yorker, 16 June 1997, pp. 70-81. Another surprising discovery resulted from the mitochondrial DNA analysis of bone from a Neandertal skeleton that was accidentally uncovered in a cave in 1856. These two glimpses into our past and the consequent cultural and political turmoil that have ensued are the subjects of this month's letter.

Last summer (1996) near Kennewick, Washington two students found a skull in shallow water of the Columbia River. They turned it over to the county coroner who, with a local anthropologist, subsequently retrieved a nearly complete skeleton. The remains were identified as a 5'9" male Caucasoid (an anthropological term that describes certain physical features of some European and South Asian groups) about 50 years old. This identification was important because under a law passed in 1990 the remains of all Native Americans found on government property (as in this case) must be turned over to appropriate local tribes for disposition.

Imbedded in the skeleton's pelvis was the tip of a stone spear blade that was similar to that used 5000 to 9000 years ago. Other anthropologists also identified the skull as Caucasoid, but a month after its discovery its age was estimated to be between 9300 and 9600 years old. When the news reached the public the Corps of Engineers (COE) demanded the bones and forbade any further work on them. A local Indian group prepared to accept the skeleton from the COE and announced that it would be buried secretly. A group of scientists, including two from the Smithsonian, brought suit as citizens against the government claiming that the remains were unrelated to any existing Indian tribe and thus did not come under the law requiring repatriation. This month the Federal District Court in Portland, Oregon ordered the COE to reopen the case. Although scientists cannot immediately study the skeleton, the court held that they had a legitimate claim to do so. The COE must now answer a series of questions about the skeleton before the court makes its final decision.

So much for the politics. What does this discovery mean? According to Doug Owsley of the Smithsonian's Division of Physical Anthropology, only about six other skeletons of this age have been found in North America and they all appear to have similar cranial characteristics. If further discoveries continue to support the evidence that the first humans in the New World were of Caucasoid stock, then the long-held theory that the initial immigrants who crossed the Bering land bridge were Asians of Mongolian descent may no longer hold true. However, the factors involved in tracing lineal origin are many and complicated.

The small sample of skeletons available indicates that these people of 9,500 years ago were similar to the Ainu of northern Japan and, surprisingly, to medieval Norsemen, not to contemporary Native Americans. We know, however, that so-called racial characteristics are transitory and can change rapidly over generations through interbreeding. Therefore, supporting evidence for lineage must be found elsewhere. Paleo-anthropologists have thus studied similarities in stone tools in their quest to find relationships between groups of early people.

The United States' expert on stone tools is Bruce Blakely, who in the early 1970's studied the stone artifacts of the Solutreans who lived near the present border of France and Spain about 16,000 to 20,000 years ago. When he studied the spear points of the Clovis group (the earliest known humans in North America), he was surprised to see that they were virtually identical to those of the Solutreans. Blakely determined that the stone blades of both the Solutrean and Clovis people were made the same way. It is possible that the identical blade manufacturing techniques were pure coincidence, but additional examples of close similarities appear in the design and decoration of bone and ivory artifacts of the two people.

How to explain this startling coincidence? Suppose the Clovis in New Mexico were indeed the same people as the Solutreans. How can the vast geographical distance from southern France to the U.S. and the five millennia time difference be explained? Bill Fitzhugh, a Smithsonian archeologist specializing in Arctic people, points out that at the time of the Solutreans Europe was in the Ice Age and one could walk across the English Channel. The ocean was then frozen from the north tip (John O'Groats) of Scotland all the way to Iceland, Greenland and northeast Canada. Although this would be an incredible trek, it might not have been any more daunting than walking from Siberia across the Bering bridge and into North America from the west. Perhaps the first immigrants arrived from both directions, but what is evident so far is that the peopling of North America was a complicated and confounding process that may never be completely sorted out.

As scientists attempt new dating technologies and exploit genetic analysis, some of these mysteries might be explained. For example, human hair is a good source for DNA and it can last for millennia in the ground. Humans shed hair constantly and if some can be found at a Solutrean site, its DNA could be compared with that of pre-Clovis hair, if that too could be found.

The second astonishing discovery has helped us understand the place of Neandertals in human evolution. It is extraordinarily difficult to "tease out" DNA from a sample without contaminating it with the DNA of the researcher. However, a major breakthrough occurred recently (Science 277:176-178,1997) when a team of scientists from the Universities of Munich and Penn State analyzed bone from the Neandertal skeleton referred to in my opening paragraph. The DNA analysis was done from mitochondria cells, a significant fact because mitochondria are passed down only through mothers and do not normally recombine their genes (except when a mutation occurs). Without going into detail, mitochondrial DNA is particularly useful in studying differences in populations. The result of this painstaking work was that the one extracted Neandertal DNA sequence was different from all the known sequences of both chimpanzees and Homo sapiens. What this tells us, in the words of Svante Pääbo, the team leader, is that it is "highly unlikely that Neandertals contributed to the human mitochondrial DNA pool." Further research indicated that the mitochondrial DNA sequence ancestral to both Neandertals and modern man diverged some 600,000 years ago. Put another way, the last common ancestor of both lines is four times older than the last ancestor of modern humans. Thus modern people appear to have replaced the Neandertals rather than extinguished them by interbreeding.

The results from just one skeletal sample are clearly not conclusive and an immense amount of work remains to be done. However, the discovery of the Kennewick skeleton and the Neandertal DNA sequence opens a murky screen that has blocked our insight into where and how we humans came to our present condition. Our future as a species is even more hidden, but knowledge of our past could allow us to set our course with great confidence.

Subsequent to my writing this letter, I read an interesting Op Ed piece in the July 27th issue of The New York Times; I have reproduced this article on the reverse. I was particularly struck by the authors' emphasis on how genetically close are all humans.

David Challinor
202/673-4705
202/673-4607 FAX

Neanderthals on the Run

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By Chris Stringer and Robin McKie

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They were big, brawny and, despite the bad publicity, fairly brainy as well. But the role and fate of Europe's most famous cavemen, the Neanderthals, have puzzled scientists for decades.

Were these ancient folks the ancestors of all people of European origin living today? Or were they only evolutionary cousins, a different species destined to die out 30,000 years ago in caves in France and Spain?

For years, those who held the former view dominated academe, but in the last decade they have been forced to concede ground, often acrimoniously, to the latter theory: that Neanderthals, despite modern, humanlike behavior — care of their injured and burial of their dead, for example — were not our ancestors.

Skull shapes, measurements of leg and arm bones, and the dating of fossil finds all indicate that Europeans did not evolve from Neanderthals, but from the people who replaced the Neanderthals. And recent work led by Dr. Svante Paabo at Munich University may have ended the debate.

Dr. Paabo's team has extracted and cloned Neanderthal DNA and shown that it is markedly different from ours, and certainly not the DNA of a species that is supposed to be an immediate forebear of Homo sapiens. We can now say from their genes that the Neanderthal line began to separate from ours more than a half million years ago.

But whose genes do we possess? If they are not from Neanderthal, what is their origin? These are questions that have been largely ignored in the wake of Dr. Paabo's exciting work. Yet the answers are important, for they tell us much about our own nature and identity: that we all have a recent African origin.

> We're all alike but not like them.

The people who replaced the Neanderthals 40 millennia ago, the Cro-Magnons, began to emerge from Africa less than 100,000 years ago. The African emigrants eventually replaced all other hominid species — Neanderthals in Europe, Solo Man in Java and the descendants of Peking Man in China.

The implications for the idea of race are profound. If modern humanity is made up of people who are *all* recent descendants of a few African pioneers, it is equally clear that Homo sapiens must be a startlingly homogenous species. We simply have not had time to diverge genetically in any meaningful manner.

And that, indeed, is the case. If we compare ourselves with our nearest evolutionary cousin, the common chimpanzee of Central Africa, we find it has three subspecies, "races" that — using a genetic analysis — are almost 10 times as different from each other as are the African, European and Asian categories of Homo sapiens.

In the past, the races were assumed to be the vestiges of million-year-old cleavages in the human family tree. Race had a profound biological meaning by that reckoning. But now it has become apparent that our differentiation into Eskimos, Bushmen, Australians, Scandinavians and so on occurred only in the last 50,000 years, and that race is a short and superficial coda to the long song of evolution.

Nevertheless, some scientists and those with narrow political agendas have put forward arguments to sustain the idea that races exist with fundamental biological differences.

Instead of concocting divisive theories, we would be better served to recognize the importance of recent data that will help us find the attributes that separated Homo sapiens from other early humans like the Neanderthals. The bones and blood of the dead and the living now provide the broad outlines of how we began and then prospered.

Our DNA lineage points unmistakably to a common ancestor whose offspring evolved into Homo sapiens shortly before the African exodus. Though modern humans may not look exactly alike, we are indeed all Africans under the skin. □

Chris Stringer, paleoanthropologist at London's Natural History Museum, and Robin McKie, science editor of The Observer, are the authors of "African Exodus."