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THE NORTH ATLANTIC HYPOTHESIS

Stanford, Bradley Think Technology Holds the Answer

The hypothesis that America's Clovis technology is linked to the earlier Solutrean culture of Europe, presented at the Clovis and Beyond Conference in Santa Fe, N.M., made widespread headlines last fall. Although it is not a new idea, American archaeologists had so thoroughly rejected it over the past half century that only researchers of the stature of Dennis Stanford, Smithsonian Institution archaeologist, and Bruce Bradley, the widely respected lithic technologist, could have brought it back into serious consideration.

Dr. Stanford, who recently stepped down as director of the Smithsonian's Anthropology Department, articulated their belief in a Solutrean-Clovis link at the conference's closing banquet Oct. 30. As a result, researchers now are considering Ice Age links between Europe and the Americas.

"I suspect . . . there will be a whole spate of work by everyone else trying to prove us wrong," Stanford told the banquet audience. "And that's great. That's what science is all about." He said that he and Bradley would be continuing to work on details of the hypothesis, and although his presentation was playful and sprinkled with laughs, the message was pro-

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Archaeologist Dennis Stanford, left, and geochronologist Thomas Stafford share the speaker's platform at the Clovis and Beyond Conference in Santa Fe. Stanford, conference co-organizer, questions Stafford about his presentation (see page 7).

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North Atlantic Hypothesis

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found. "We think that we have enough technological information that is very compelling for drawing a historical relationship between Solutrean and Clovis."

By presenting their hypothesis at Santa Fe, where many of the most prominent researchers involved with the earliest human settlement of the Americas were gathered, Stanford and Bradley certainly received the undivided attention not only of those who will work to prove them wrong,

DON ALAN HALL

Dennis Stanford's co-author, lithic technologist Bruce Bradley, left, talks with Forrest Fenn in one of the exhibit rooms at the Clovis and Beyond Conference last fall. Fenn, co-organizer of the conference, is a Santa Fe avocational archaeologist, publisher, and owner of the Fenn Cache of Clovis artifacts.

but also those who could add credence to the hypothesis of a European connection with North America's Clovis tradition. As a result of this very public presentation, archaeologists working in Eastern and Southeastern states will necessarily be considering cultural material from any sites of Clovis age and older in a new light. Further, scholars surely will be looking anew at the European upper-Paleolithic sites in general and Solutrean sites in particular. And new emphasis is likely to be focused on the environment along North Atlantic ice margins late in the Wisconsin glaciation. Further, there is likely to be new interest in the antiquity of all very early archaeological sites in the East and possibly interest in underwater archaeology at places on the East Coast.

Stanford, a Wyoming native steeped in Paleoindian archaeology, has taken his time in proposing this alternate hypothesis to explain how some of the first humans entered the Americas. As he told the banquet audience: "I was schooled, as all of us were, in the uni-lineal model with Clovis being the earliest." He said that in the late 1950s and early 1960s, he started working with archaeologists Vance Haynes and George Agogino, and became acquainted with the late Marie Wormington, then the foremost authority on Paleoindian archaeology. "I spent many happy hours at Marie's house talking about the ice-free corridor, and the northeast Asians coming down through it," Stanford told the banquet audience, "hunting mammoths—all the way to Tierra del Fuego."

Gradually, however, as he analyzed the evidence, "It didn't make that much sense to me," he said, adding: "Many of you know that as early as 1975 I started proposing that there has to be a pre-Clovis. That's as far as I went. But from Marie's training and Vance's training and everything we knew about Native Americans, they *had* to come from northeast Asia." So Stanford said he began to concentrate his work on Alaska and Siberia.

Discovery in 1966 of some fluted projectile points during a survey in northern Alaska convinced Stanford that he was on the right track. "We thought at the time they were probably pre-Clovis, but now we know they are much later than Clovis and probably even later than Folsom," he told the banquet audience, adding that he eventually spent at least 30 years, off and on, working to find pre-Clovis or Clovis sites in northwestern North America that would be evidence of the first people who came across Beringia.

"But we never did."

With the collapse of the Soviet Union, Stanford and Bradley eagerly went to Siberia looking for clues. They looked at a lot of collections of lithic artifacts, but came home disappointed. "We never found *anything* we thought was *technologically* related to Clovis," he told the banquet audience. "And, in fact, we never saw anything in *Alaska* that I think is technologically related to Clovis, although I know there is disagreement in this room." He spent three months searching in China with other prominent American scientists, but still did not see artifacts that appeared technologically related to Clovis.

"After 30 years, even a hardheaded Wyoming boy like myself gives up and thinks, 'Well, there must be some other answer to it.'" He considered the clues. In eastern Asia as far south as China, and from Japan northward to the Kamchatka Peninsula, archaeologists have found microblade technology—small blades struck from wedge-shaped cores to be fitted into shafts to create deadly arrows or spears. Bifacially flaked points there, he said, tend to be pointed on both ends. Makers of these bi-pointed bifaces, Stanford said, had "a technological mindset for a thick point. In other words, the width-thickness ratio is much higher than Clovis, which is, basically, a flat or a thin point."

He conceded that there are big-blade traditions of the Eurasian middle Paleolithic that resemble Clovis. "That material is way over here," he said, pointing out the region around Lake Baikal on a slide projected on a screen in the banquet room. "Bruce is very fond of saying, 'You know, it's farther from the farthest-east big-blade site over here in central Asia to Fairbanks, Alaska, and the Nenana culture than it is from Fairbanks to Miami.' And," Stanford said, "there's nothing in between that really looks like Clovis. In fact," he added, "much of this big-blade middle-Paleolithic material really looks to us like it is more oriented toward Europe, and I suspect it is."

Turning to North America and the Clovis complex, Stanford pointed out that there tend to be large blades and blade cores in the Southeastern states. Using a map to illustrate the proposition that Clovis may have spread westward and northward, he noted that there are fewer and fewer blades or blade cores in Clovis sites as one moves westward from the Southeast, where they were a strong technological component.

Stanford said he and Bradley asked themselves: "Where else does this kind of technology occur?" He continued: "Of course it's in Iberia. And more specifically, within the Solutrean constellation of technology." The term "Solutrean" is

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not well defined. It means different things in different geographical areas. However, from about Bordeaux, France, southward around the Bay of Biscay across northern Spain, he said, are materials that look very Clovis-like. Showing a slide of an apparent Clovis point, Stanford pointed out fluting by pressure flaking and evidence of some basal grinding. "How do you like this Clovis point, gang?" he quipped. "This is from northern Spain." He emphasized that he and Bradley were not simply seeing the morphological similarities between Clovis and Solutrean materials, but were analyzing details of the methods the Clovis and Solutrean knappers had employed to create them.

What ultimately encouraged the two researchers to go to Europe in their search for a Clovis predecessor wasn't their lack of success in finding a precursor for Clovis in Asia or even the amazing parallels between Clovis and the older Solutrean. The final nudge was a report on mitochondrial DNA research that suggested some Native Americans and a few Europeans might share a genetic marker. Now, however, the best evidence seems to be the suite of correlations they have found between artifacts from Iberia and those from American sites such as Cactus Hill in Virginia. He showed the audience a number of slides illustrating affinities between Solutrean artifacts and tools discovered at sites in Eastern states, most notably Cactus Hill. "Pressure flaking?" he asked. "Pressure flaking was invented by Solutrean people. And in fact we see stage heat treating, just like in Clovis."

Stanford continued: "There's a lot about the way Solutrean people handled lithic technology that I think is really remarkable." First, he said, they liked exotic raw materials and would go great distances to get them. "Very much like our Clovis guys." Perhaps Solutrean people weren't as mobile as Clovis people, but they were still importing raw materials. He said that when Spanish and Portuguese archaeologists start seeing exotic raw material, they know they're in a Solutrean site even before they find a diagnostic artifact.

Stanford told the audience, as he showed slides to help him illustrate the techniques, that what Bradley was excited about was the consistent and deliberate use by Solutrean knappers of *outre passé*, or overshot flaking and their reduction of points from bifaces. An *outre passé* flake, he explained, "comes all the way across a large biface, and it takes off the opposite edge. And what we see in Solutrean is a series of these flakes—sometimes three or four can actually reduce a very large biface." He said that many of the large bifaces that had been exhibited at the Clovis and Beyond Conference indicated a deliberate use of the *outre passé* technique.

Stanford quipped that he didn't want to bore his audience about the intricacies of *outre passé* flaking "because there's only about three of us in the room that really get off on it," but he made it clear that it was a very deliberate and carefully controlled technique that leaves unmistakable evidence in the archaeological record. Such flakes found in sites other than Clovis and Solutrean, he said, were mistakes. "When that flintknapper took

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off that *outre passé* flake, he probably said a whole bunch of bad words." Not so in Clovis and Solutrean. "So this is one of the hallmarks. We see them in Solutrean material and Clovis material," he said, showing slides of the characteristic ends of *outre passé* flakes. "When you find these in your next Cody site," he joked, referring to the widely known late-Paleoindian tradition found at a number of places on the High Plains and Rockies, "let me know." After the laugher subsided, he drew more laughter by adding: "When you find a whole bunch of them at your next Cody site, like we find at Clovis sites, then maybe we'll re-evaluate our position on this technology." His clear message: after Clovis time, ancient knappers did *not* deliberately use the *outre passé* or overshot flaking technique.

Using slides, Stanford pointed out how toolmakers prepared their "platform," the specific point where flaking pressure is applied. "It's just absolutely done the same way in Solutrean and Clovis. And as far as we know, by no one else." He noted that archaeologists who survey for Paleoindian sites, especially in the Southwest, know about the distinctive flakes left by this particular flaking technology. Surveying blowouts, he noted, "where you don't stand a chance of finding an arrowhead because every arrowhead collector in the world's been there, you can actually *identify* a Clovis site on the basis of these platforms—very wide, very well set up, and very heavily ground." They are very different, he said, from flakes found at a Folsom site. He used the example of surveying out in Colorado's San Luis Valley where there are many sites: "We can nail a site as being Clovis long before we ever turn a diagnostic artifact."

"Our friends in Portugal told us, 'We can nail a Solutrean site . . . on the basis of those platforms long before we ever find a diagnostic artifact.' Think about that."

Stanford then turned to the topic of Clovis caches, the puzzling collections of often large, bifacially flaked artifacts. He and Bradley believe that caches may indicate a strategy for optimizing raw materials. "This is an intentional technology where you take one of these very large bifaces and you can use it as a core," said Stanford. "It is a handy way of moving raw material around the country. I think we're seeing a lot of that in Clovis and I know we're seeing a lot of it in Solutrean." Large bifaces, he said, could be made into tools, scrapers or projectile points.

Stanford said the spectacularly large points found in France, Spain, and Portugal as well as in North America also suggest an affinity between Clovis and Solutrean traditions. "I think we're beginning to move into things beyond technology. We've got art—we've got mobile art."

DON ALAN HALL

Archaeologists Tom D. Dillehay, left, of the University of Kentucky, and Dennis Stanford of the Smithsonian Institution chat after Stanford's banquet presentation.

Solutrean people, he continued, were very advanced in "soft technology," the weaving, basketry, ropes, nets and the like, which seldom are preserved in archaeological sites. Solutrean needles, he said, were extremely tiny and had delicate eyes that would accept modern thread very nicely. "We also get them in Folsom." Such needles, he said, certainly would not have been used for sewing animal hides. They suggest cloth, although experts believe such needles were employed in weaving and basket making, too. Solutrean people, said Stanford, evidently had a very advanced soft technology and were "real innovators." Further, there "probably was a lot of soft technology we don't know about."

With all the similarities in lithic and soft technologies linking Solutrean and early American cultures, what are the problems with the Stanford-Bradley hypothesis?

Most archaeologists would cite both time and space—Solutrean sites tend to be a few thousand years older than Clovis—and they're on the opposite side of the Atlantic Ocean.

The Solutrean sites are dated to 16,000–20,000 radiocarbon years ago while Clovis sites date to no more than 11,500 radiocarbon years. Stanford readily concedes that the 6,000-year time gap is a problem. But Bradley and Stanford observe that the Clovis precursors proposed by some experts in Central Asia have about a 30,000-year time gap. "So I like our 6,000 years just fine," said Stanford, adding that when pre-Clovis sites such as Meadowcroft and Cactus Hill are considered, the timing may prove not to be a problem because early radiocarbon dates for pre-Clovis levels at those sites are similar to late dates for Solutrean. "I suggest that the earlier dates probably will hang in there and those overlap the Solutrean," he said.

"So what's left?" he rhetorically asked the banquet audience. "You've got to get them across the Atlantic! That's a major problem for all of us folks that are from Wyoming," he conceded. But showing a slide depicting an astronaut's-eye view of the North Atlantic as it would have appeared late in the Pleistocene, Stanford argued that from the point of view of the people commonly referred to as Eskimos, the crossing wouldn't have been an insurmountable problem. The slide

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showed France mostly under glacial ice and a rim of ice circling the Atlantic to North America.

"A quick measurement from land to land is about 1,400 miles—maybe a three-week trip for an Eskimo, he said. "It's not that far," he continued, and chided the banquet audience: "And here you want pre-Clovis and Clovis people to trek the 7,000 miles from Lake Baikal to Nome, Alaska? On foot? Come on! Carrying all their stuff?" Audience laughter indicated that most people were following his argument whether or not they were fully accepting it. He went on to describe his experience traveling with Native Americans on the Arctic Ocean, and pointed out that cold, icy oceans are relatively calm. And if weather does get bad, people can hole up on the ice in a snow cave or igloo until it improves.

He suggested that Solutrean people may have had a strong incentive to venture out along the ice margins of the Atlantic. As the last Ice Age deepened and life grew more difficult, he said, "I suspect that they were moving out along the now-submerged coast line, continuing to adapt more and more to this type of environment. It's just a hypothesis," he conceded. "Probably can't be tested."

However, he said that Solutrean sites contain mollusk shells, bones of deep-sea fish, and occasional seal remains, all indicating that the people were "really thinking about the ocean or else they were out *on* that ocean." They were, he said, "adapting to a marine, littoral type of environment, collecting shells, mussels, and fishing." Through time, some Solutrean people may have come to rely on sea resources, he suggested, and exploiting a coastal environment could have taken them on the northwesterly arc alongside ice floes all the way to North America.

What will be the result of this hypothesis and its presentation to the Clovis and Beyond Conference? "I think the whole idea here is to get people thinking broadly and I've been considering multiple migrations from multiple geographic areas," Stanford said. "The bottom line is that we're going to know a whole lot more about both Clovis and Solutrean when we're done, and archaeology will be a long way farther down the road."

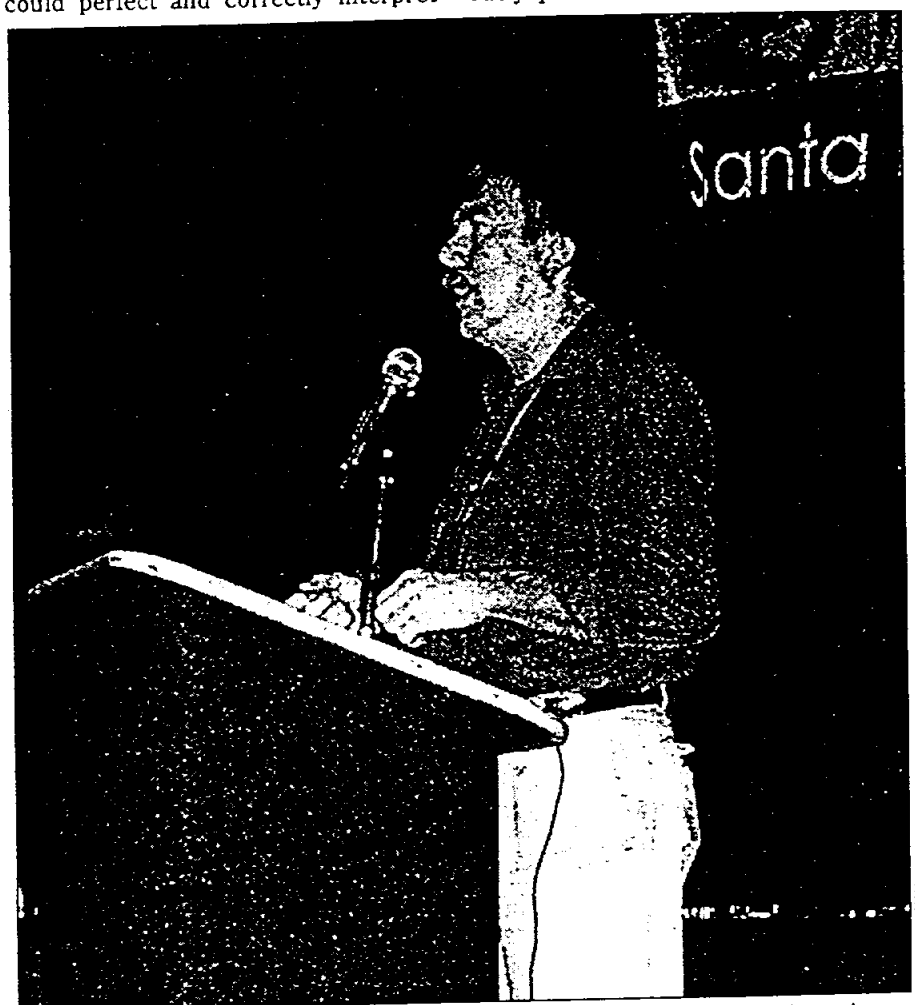
–Don Alan Hall

Perfecting Our Chronologies Could Solve Big Controversies

Stafford Foresees Higher Accuracy, Many More Dates

Some of the most contentious scientific arguments that divide American archaeologists would cease to exist if scientists could perfect and correctly interpret chronologies, says one of America's most trusted geochronologists. Thomas W. Stafford, Jr., also predicts that the next decade will produce critically needed advances in radiocarbon and other dating methods. The result will be a much better understanding of the antiquity of the earliest evidence of humans in the Americas.

In a summary presentation on the question "How Can We Develop Better Chronologies of the Past?" Dr. Stafford expressed both optimistic and pessimistic opinions for the archaeologists gathered for last fall's Clovis and Beyond Conference in Santa Fe, N.M. He challenged archaeologists to demand more information from their geochronological laboratories, and also to continuously question the dates labs provide for their archaeological samples. He emphasized that a thorough understanding of stratigraphy, radiometric dating and archaeology are crucial for establishing



DON ALAN HALL

Thomas W. Stafford, Jr., geochronologist, isotope geochemist, stratigrapher, and founder of Stafford Research Laboratories, addresses the Clovis & Beyond Conference in Santa Fe.

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Seeking Proof of Pre-Clovis in the West

A prospecting archaeologist points to a buried dune deposit near the coast of Baja California, one of the places in the West where geoarchaeologist Mike Waters suggests looking for archaeological deposits older than Clovis. Our report begins on page 9.

MICHAEL R. WATERS

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Physical Anthropology

The Kennewick Man: A First Multivariate Analysis

James C. Chatters, Walter A. Neves, and Max Blum

In 1996, the nearly complete, superbly preserved skeleton of an adult human male with discrete features dissimilar from modern Amerinds and northeast Asian Mongoloids was found along the Columbia River in Kennewick, Washington (Chatters 1997). A radiocarbon date of 8,410 ± 60 yr B.P. (UCR-3476/CAMS-29578; Taylor et al. 1998) was obtained on a bone from the left hand and has been corroborated by preliminary geoarchaeological studies and the early Cascade style of the projectile point found embedded in the pelvis (Chatters et al. 1999). Newspaper reports that confused the description of the remains as "Caucasoid-like" with an assertion that the skull was European led to speculation that this find suggested migration of people directly from Europe to North America in the latest Pleistocene or early Holocene (e.g., Lahr 1997). To quell speculation, explore the possible affinities of the Kennewick man with modern human populations, and gain initial insight into the implications of his features for theories about the peopling of the Americas, we conducted a multivariate comparison between this skull and a sample of modern human groups.

Materials and Methods

We carried out the assessment of the morphological affinities between the Kennewick skull and the modern populations of Howells (1989) using Principal Components analysis (size and shape, and shape alone) on the SPSS software program. For the analysis based on shape only, we applied the size correction method proposed by Darroch and Mosimann (1985).

In 1996, one of us (JCC) measured the original skull following Bass (1987) and in 1998 measured a first-generation high-resolution polyurethane cast following Howells's (1973, 1989) specifications (Chatters et al., 1999). Comparable skull and cast measurements were consistent to within 1 mm, so we

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deemed the cast measurements to be suitable for this analysis. In all, 41 variables could be matched between this skull and the 19 modern populations included in the comparison. Of those populations, 18 are the groups asserted by Howells (1989) to represent the core of human cranial variation on the planet and thus suitable for comparative analysis. In this work we have added one more population, the Ainu, because of reported similarities between this population and other Paleoamerican skulls (e.g., Jantz and Owsley 1997) and the general similarity of appearance between the Kennewick skull and Jomon material.

Results and Final Remarks

The results are depicted in Figure 1. In Figure 1A, Principal Component 1 (PC1) primarily expresses information about size. Mastoid Width (MDB), Nasion-Subtense Fraction (FRF) and Malar Length Inferior (IML) are the most influential variables on Principal Component 2 (PC2). Together, these two components explain 46.13 percent of the original information and show

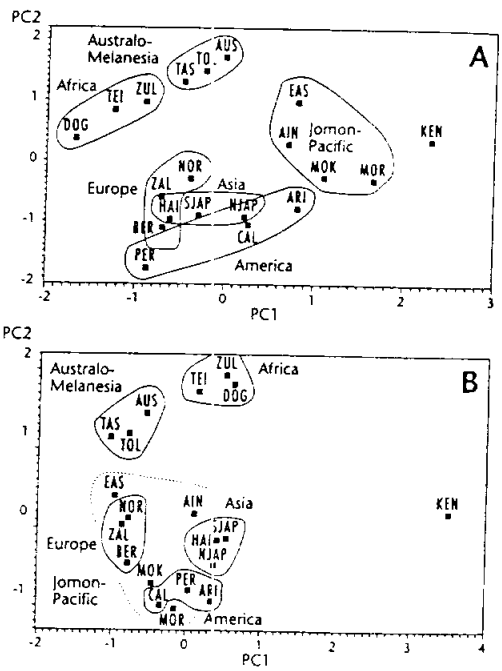

Figure 1. Two-dimensional plots comparing Kennewick Man (KEN) with 19 modern populations: **A**, Plot of Principal Component scores (PC1 and PC2) based on size and shape; **B**, Plot of Principal Component scores based on shape information alone. Variables: GOL (Glabello-Occipital Length); NOL (Nasio-Occipital Length); BNL (Basion-Nasion Length); BBH (Basion-Bregma Height); XCB (Maximum Cranial Breadth); ZYB (Bizygomatic Breadth); AUB (Biauricular Breadth); WCB (Minimum Cranial Breadth); BPL (Basion-Prosthion Length); NPH (Nasion-Prosthion Height); NLH (Nasal Height); JUB (Bijugal Breadth); NLB (Nasal Breadth); MAB (Palate Breadth); MDB (Mastoid Width); OBH (Orbit Height, left); OBB (Orbit Breadth, left); DKB (Interorbital Breadth); NDS (Naso-Dacryal Subtense); ZMB (Bimaxillary Breadth); SSS (Zygomaxillary Subtense); FMB (Bifrontal Breadth); NAS (Naiso-Frontal Subtense); EKB (Biorbital Breadth); IML (Malar Length Inferior); XML (Malar Length Maximum); MLS (Malar Subtense); WMH (Cheek Height); SOS (Supraorbital Projection); GLS (Glabella Projection); STB (Bistephanic Breadth); FRC (Nasion-Bregma Chord); FRS (Nasion-Bregma Subtense); FRF (Nasion-Subtense Fraction); PAC (Bregma-Lambda Chord); PAS (Bregma-Lambda Subtense); PAF (Bregma-Subtense Fraction); OCC (Lambda-Opisthion Chord); OCS (Lambda-Opisthion Subtense); OCF (Lambda-Subtense Fraction); FOL (Foramen Magnum Length). Populations: Norse (NOR), Zalavar (ZAL), Berg (BER), Teita (TEI), Dogon (DOG), Zulu (ZUL), Australians (AUS), Tasmania (TAS), Tolai (TOL), Mokapu (MOK), Peru (PER), Easter Island (EAS), Arikara (ARI), Ainu (AIN), South Japan (SJAP), North Japan (NJAP), Hainan (HAI), Moriori (MOR) and Santa Cruz (CAL).

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a strong tendency for geographic grouping. A clear association can be seen between the Kennewick skull (KEN) and the Jomon-Pacific cluster (MOK, MOR, EAS, AIN; Brace and Hunt 1984).

When shape alone is considered (Figure 1B), Principal Component 1 (PC1) is mainly influenced by Lambda-Opisthion Chord (OCC), Orbit Height (OBH) and Bijugal Breadth (JUB). Principal Component 2 (PC2) is mainly influenced by cranial breadth (Biauricular Breadth [AUB], parietal length (Bregma-Lambda Chord–PAC) and Nasal Breadth (NLB). These two factors together explain 47.26 percent of the original information. Except for the Jomon-Pacific cluster, the geographic groups are more discrete than they were with size included. In this case, the Kennewick skull can be seen as a clear outlier.

The morphological affinities among the Kennewick skull, Polynesian populations (EAS, MOK, MOR) and the Ainu (AIN) suggest an alternative interpretation for the colonization of the Americas. The hypothesis proposed by Turner (1983) and Greenberg et al. (1986) is not sufficient to explain the new findings of non-Mongoloid or generalized Mongoloid biological stocks in the hemisphere (Lahr, 1995; Neves and Pucciarelli, 1989, 1991; Neves et al., 1996a, 1996b, 1997, 1998; Powell and Steele, 1992; Steele and Powell, 1992, 1993). In this context, the Kennewick specimen, featuring a morphology close to the Polynesians when size and shape are considered (Figure 1A) and being an outlier when shape alone is studied (Figure 1B), joins information from other Paleoamerican skeletons in indicating that a more complex model for the peopling of the Americas is needed. On the other hand, our analysis dismisses the idea that Kennewick Man represents an early European immigrant, since the Kennewick skull does not show any cranial morphological affinities with Europeans, at least when quantitative analysis based on metric variation is performed.

References Cited

Brace, C. L., and K. D. Hunt 1990 A Nonracial Craniofacial Perspective on Human Variation: A(ustralia) to Z(uni). *American Journal of Physical Anthropology*, 82:341–360.

Chatters, J. C. 1997 Encounter with an Ancestor. *Anthropology Newsletter*, 38(1):9–10.

Chatters, J. C., et al. 1999 The Recovery and First Analysis of an Early Holocene Human Skeleton from Kennewick, Washington. Submitted to *American Antiquity*, March, 1999.

Darroch, J. N., and J. E. Mosimann 1985 Canonical and Principal Components of Shape. *Biometrika*, 72:241–252.

Greenberg, J. H., C. G. Turner, and S. L. Zegura 1986 The Settlement of the Americas: A Comparison of Linguistic, Dental and Genetic Evidence. *Current Anthropology*, 27:477–497.

Howells, W. W. 1973 *Cranial Variation in Man. A Study of Multivariate Analysis of Patterns of Difference Among Human Populations*. Papers of the Peabody Museum of Archaeology and Ethnology, Harvard University Press, Cambridge.

——— 1989 *Skull Shapes and the Map. Craniometric Analysis in the Dispersion of Modern Homo*. Papers of the Peabody Museum of Archaeology and Ethnology, Harvard University Press, Cambridge.

Jantz, R. L., and D. W. Owsley 1997 Pathology, Taphonomy, and Cranial Morphometrics of the Spirit Cave Mummy. *Nevada State Historical Quarterly*, 40:62–84.

Lahr, M. M. 1995 Patterns of Modern Human Diversification: Implications for Amerindian Origins. *Yearbook of Physical Anthropology*, 38:163–198.

——— 1997 History in the Bones. *Evolutionary Anthropology*, 6:2–6.

Neves, W. A., D. Meyer, and H. M. Pucciarelli 1996a Early Skeletal Remains and the Peopling of the Americas. *Revista de Antropologia*, 39:121–139.

Neves, W. A., D. Munford, and M. C. Zanini 1996b Cranial Morphological Variation and the Colonization of the New World: Towards a Four Migration Model. *American Journal of Physical Anthropology*, Supplement 22:176.

Neves, W. A., J. F. Powell, A. Prous, and E. G. Ozolins 1998 Lapa Vermelha IV, Hominid 1: Morphological Affinities of the Earliest Known American. *American Journal of Physical Anthropology*, Supplement 26:169.

Neves, W. A., and H. M. Pucciarelli 1989 Extra-continental Biological Relationships of Early South American Remains: A Multivariate Analysis. *Ciencia e Cultura*, 41:566–575.

——— 1991 Morphological Affinities of the First Americans: An Exploratory Analysis Based on Early South American Human Remains. *Journal of Human Evolution*, 21:261–273.

Neves, W. A., M. C. Zanini, D. Munford, and H. M. Pucciarelli 1997 O Povoamento da America Luz da Morfologia Craniana. *Revista USP*, 34:96–105.

Steele, D. G., and J. F. Powell 1992 Peopling of the Americas: The Paleobiological Evidence. *Human Biology*, 64:303–336.

——— 1993 Paleobiology of the First Americans. *Evolutionary Anthropology*, 2:138–146.

Taylor, R. E., D. L. Kirner, J. R. Southon, and J. C. Chatters 1998 Radiocarbon Dates of Kennewick Man. *Science* 280:1171–1172.

Turner, C. G. 1983 Dental Evidence for the Peopling of the Americas. In *Early Man in the New World*, edited by Richard Shutler, Sage Publications, Beverly Hills, pp. 147–157.

Were the Fuegians Relicts of a Paleoindian Nonspecialized Morphology in the Americas?

Walter A. Neves, Max Blum, and Lyvia Kozameh

For the last decade, one of us (WAN) has been generating mounting evidence for the presence in South America of a morphologically nonspecialized group that migrated to the continent prior to colonizers showing classical Mongoloid morphology (Neves and Pucciarelli 1989, 1991; Neves et al. 1996a, 1996b, 1998). Physical anthropologists working with North American ancient material have found similar results (Powell and Steele 1992; Steele and Powell 1992, 1993, 1994).

The hypothesis that two or more different waves of migration came to the Americas in early times received an important contribution by Lahr (1995),

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The New York Times Magazine

APRIL 2, 2000 / SECTION 6

A KOSOVO HORROR, AN AMERICAN ON TRIAL
By Steven Erlanger

Why Men Are Different

The defining power of testosterone.

By Andrew Sullivan

The New York Times Magazine

APRIL 2, 2000

"There are few things more challenging to the question of what the difference between men and women really is than to see the difference injected into your hip." FROM "THE HE HORMONE," BY ANDREW SULLIVAN, PAGE 46.

The Way We Live Now

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This page: Carson Daly on the MTV bandstand. Photograph by Jake Chessum for The New York Times.

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