ARCHAEOLOGY

Were Spaniards Among the First Americans?

A bold proposal, based on similarities in stone tools, revives the discredited notion that ancient Europeans crossed the Atlantic to settle the New World

Back in the '30s and '40s, archaeologist Frank Hibben argued that stone points he had found in Sandia Cave in New Mexico looked a lot like those made by people in northern Spain, called Solutreans, some 20,000 years ago. Hibben suggested that people from Europe might have been among the first Americans.

But most researchers rejected the idea, because there seemed to be no easy routes from Spain to New Mexico—and because the Solutreans thrived thousands of years before the Clovis people, believed to have been the first to settle in North America some 11,500 years ago. Instead, almost all anthropologists became convinced that the first Americans arrived via the Bering land bridge from northern Asia. Nonetheless, at a meeting called "Clovis and Beyond," held last month in Santa Fe, New Mexico, Hibben's heretical idea was formally revived in a presentation by archaeologist Dennis Stanford of the Smithsonian Institution in Washington, D.C. Some archaeologists dismiss the notion—"preposterous," says Lawrence Straus of the University of New Mexico, Albuquerque—but others are intrigued. "I really do think Dennis deserves a hearing," says anthropologist Leslie Freeman of the University of Chicago, who specializes in the prehistory of northern Spain. "I don't understand these convergences, and I think they deserve much further investigation."

Anthropologists once thought that the Americas were settled when ancestors of the Clovis hunters chased mammoths across the Bering land bridge, down an "ice-free corridor" that opened about 12,000 years ago in what is now Canada, and into North America; eventually their descendants reached South America. But a controversial Chilean site called Monte Verde, dated at more than 12,500 years ago—even older than the first Clovis sites in North America—has caused many archaeologists to reassess when, how, how often, and from where people migrated from the Old World to the New. "The door's been kicked fairly wide open to anything," says Tom Dillehay of the University of Kentucky, Lexington, lead investigator at Monte Verde.

Some researchers have suggested that the first Americans boated along the Pacific coast from Asia northward, then south all the way to South America; such a marine route opens up the timing as it does not require an ice free corridor, and it fits with evidence for 10,000-plus-year-old sites near the Pacific coast of South America (*Science*, 18 September 1998, pp. 1775, 1830, 1833). Now Stanford proposes that early maritime visitors might have come from the east as well, in the person of the Solutreans, who lived in southern France, Spain, and Portugal from about 23,000 to 18,000 years ago during the height of European glaciation.

Related? Solutrean point (left) and Clovis point are both skinny and have concave bases.

Stanford came to this notion after spending most of his career looking for antecedents of the Clovis people in Alaska and Siberia, along the supposed migration route—and not finding them. "I never saw anything technologically related to Clovis," he says. He and his colleague Bruce Bradley, an independent archaeologist in Cortez, Colorado, say that Asian, Siberian, and Alaskan tool assemblages feature thick-bodied points very different from the slender Clovis blades found in the lower 48 states. Europe, he says, is where the similar points turn up.

His case—presented at the Santa Fe meeting under the gleeful slogan of "Iberia, not Siberia"—is based on what he believes is a wealth of technological parallels. Both the Solutreans and the Clovis hunters used bifacial pressure-flaked technology—a technique for shaping two-sided stone points by banging on their edges with a tool such as an antler. And Clovis and Solutrean hunters were the only ones to work a stone point by flaking a single large piece from the entire width of the blade, called outre passé, or overshot flaking. This kind of flake is created by first shaping a bump on the blade and then knocking it off, and in other cultures it is "a mistake," says Stanford. Other parallels include "spurred" end scrapers—hide-scraping stones with sharp little points rather than rounded edges, identical-looking bone spear foreshafts (a

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Australasian Roots Proposed For 'Luzia'

While archaeologists ponder the startling suggestion that ancient Americans might have arrived from Europe (see main text), Brazilian anthropologist Walter Neves offers another surprising proposal: that some early colonizers came from the same stock as did the aboriginals of Australia.

Neves, of the University of São Paulo, has been analyzing about 30 skulls dug up over the past century in central and southeastern Brazil; charcoal in the associated sediments has been dated to 9000 or more years ago. He compared features such as brow ridges and the size of nasal apertures with those of existing populations, and concluded that the ancient Brazilians look more like Australians and Melanesians than like people in northeast Asia, which is traditionally considered the original homeland of the first Americans. The oldest skull in Neves's sample has been reconstructed as the African-looking "Luzia"—named after the African australopithecine "Lucy."

Anthropologists agree that one group of Africans reached Melanesia and had boated to Australia by 50,000 years ago; now Neves suggests that some of these Australasians were among the early South American settlers, probably boating north and then down the west coast of the Americas. But many archaeologists are skeptical. Archaeologist Tom Dillehay of the University of Kentucky, Lexington, an expert in early South American sites, warns that such thinking is "very preliminary." The archaeological evidence associated with the African-looking skulls, he says, "is no different from what you see at sites with nonanomalous skeletons." University of Chicago anthropologist Leslie Freeman adds that because variations within racial groups are so great, it is "impossible" to identify an individual's roots based on sparse skeletal evidence. **–C.H.**

piece connecting the shaft to the point's socket), and limestone tablets with geometric or animal-shaped designs scratched into the surface. Both peoples also left caches of partly worked stone points, buried in red ochre, stored around the countryside.

Stanford admits that there are a couple of rather large apparent obstacles to the theory, namely the Atlantic Ocean and the at least 5000-year gap between the last Solutreans and the Clovis culture. But he argues that the Solutreans were being pushed toward the coast for survival as glaciers covered most of Europe. Long hunting trips along the southern fringe of the ice could have taken them farther and farther west—all the way to what is now New York, says Stanford. The seas would have been cold and thus relatively calm, so the trip could have been rapid—perhaps only 2 weeks, he says—and seabirds, fish, and marine mammals would have been plentiful on the edge of the ice.

As for the timing, Stanford points out several eastern Clovis sites that, although controversial, may be as ancient as the Solutreans. At Meadowcroft Rock Shelter in Pennsylvania, for example, deposits dated at 16,000 years ago contain unfluted projectile points that Stanford says "could represent a transitional technology between Solutrean and Clovis."

Even if the Solutreans crossed the Atlantic, Stanford agrees that Asians also must have discovered America, as DNA data show that today's Native Americans have Asian roots. But he notes that some Native Americans carry a mitochondrial DNA marker known as haplotype X, which has been traced back to Europe (*Science*, 24 April 1998, p. 520).

Reactions to the Solutrean solution often seem to depend on researchers' openness to alternatives to the Bering land bridge scenario. "I love it," says biological anthropologist Richard Jantz of the University of Tennessee, Knoxville, who has noted a few skeletal similarities between paleo-Indians and Europeans. Dillehay thinks the Solutrean link is at least as plausible as the idea of skirting ice sheets in boats along the Pacific coast to America. So does archaeologist Reid Ferring of the University of North Texas in Denton. "If we just pretended there were no oceans, we would immediately be drawn to Western Europe" as a likely point of origin for the Clovis people, he says.

But other anthropologists, including those skeptical of pre-Clovis ideas, tend to be wary of the Solutreans. The time gap alone makes it implausible, says archaeologist Stuart Fiedel of John Milner Associates in Arlington, Virginia, who authored a scathing critique of the Monte Verde work (*Science*, 22 October, p. 657) and also doubts the Meadowcroft dates: "It's an old idea that has been rejected at least twice." And some experts in European archaeology completely reject the idea. New Mexico's Straus says the Solutreans had a "vast diversity" of tools, most of which "don't bear any resemblance to Clovis." And they left "no evidence" of boating or deep-sea fishing, much less the ability to take 5000-kilometer cruises. He considers the similar tools a simple case of technological convergence.

Stanford admits that the Solutreans created many kinds of artifacts that aren't found in Clovis sites, but "there's very little in Clovis that is not found in Solutrean," he insists.

Despite the strong critiques, other researchers say that the lively interest in the idea is a sign of changing times, as anthropologists begin to consider alternative routes to the Americas. "If [Stanford] had gotten up 10 years ago and started talking about wandering Spaniards," says James Adovasio of Mercyhurst Archaeological Institute in Erie, Pennsylvania, lead excavator at Meadowcroft, "he would have been laughed out of the room." **–CONSTANCE HOLDEN**

RICE BIOTECHNOLOGY

Rockefeller to End Network After 15 Years of Success

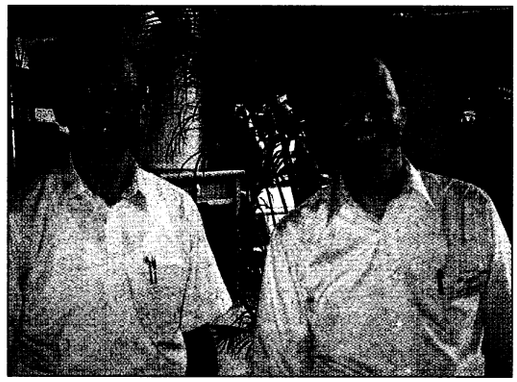
The Rockefeller Foundation is closing the books on an ambitious $100 million effort to develop and disseminate new molecular tools to improve rice

PHUKET, THAILAND—Nobody threw rice. After all, it was the end, not the beginning, of a relationship. But tossing a few grains would not have been out of place as rice scientists from around the world gathered*—perhaps for the last time—to celebrate a 15-year effort by The Rockefeller Foundation linking the revolution in molecular biology to Asia's most important food crop and to mark the next phase of the venture. Most of the nearly 400 who met here recently were trained with Rockefeller money. But now they're on their own: The foundation has decided to shift its agricultural resources to problems facing subsistence farmers, with an emphasis on traits rather than specific crops and a focus on sub-Saharan Africa.

The International Program on Rice Biotechnology has disbursed $100 million since 1984 to foster cutting-edge genetics research aimed at helping rice farmers in the developing world. Its legacy: a community of rice researchers that has created more prolific, robust, and nutritious strains. "The Rockefeller Foundation rice biotech program is an outstanding example of a well-planned and -executed funding program," says Gurdev Khush, principal plant breeder at the International Rice Research Institute (IRRI) in Los Baños, the Philippines. "Other funding agencies could learn a lesson from [its] success."

Rockefeller already had a track record in agriculture before it began the rice initiative, beginning with work in China in the 1930s and extending to IRRI's creation in 1960. But in the early 1980s, foundation officials began to worry that the increased yields and improved nutrition promised by the genetic engineering of plants were not going to be applied to rice. "At that time, there was essentially no research being conducted in rice molecular biology outside of Japan," says Gary Toenniessen, deputy director of the foundation's Agricultural Science Division. The foundation hoped to reverse that pattern by enticing leading plant science laboratories in advanced countries to work with rice, while building up the capacity of developing countries to carry out biotechnology research and integrate those efforts into national rice-breeding programs.

The two-pronged strategy was spectacularly successful in attracting the interest of topflight scientists. The foundation lured 46 labs in the industrialized world into the program, and by 1987 it was spending nearly $5 million a year on these ef-



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Rice colonels. Robert Herdt, left, and Gary Toenniessen manage Rockefeller program.

* General Meeting of the International Program on Rice Biotechnology, 20 to 24 September, Phuket, Thailand.