Says Bell, "This parallelism thing is a lot harder than anybody thought it would be."

Bell and other critics point to several areas they think have been slighted in the development of massively parallel computers. One is the need for "balanced" hardware—systems in which processing speed is matched by ample memory and channels for moving data between processors and memory. Another is the art of writing software for massively parallel systems. Parallelism "won't come into its own until there are decent languages and operating systems to lace processors together," asserts George Michael, a long-time supercomputer leader at Lawrence Livermore National Laboratory.

Squires argues that DARPA has kept all these issues in mind over the years, but it couldn't fund solutions to every problem at the same time. These days, though, ARPA is devoting more attention to developing software and training people to write it. ARPA is "just in the process of changing," agrees Jeffrey Kalb, chief executive officer of MasPar Computer Corp. in Sunnyvale, California. "We'd like to see [that trend] continue."

Squires and his colleagues are working hard to defuse the other criticisms of DARPA's track record, as well. The GAO report will point to steps that ARPA should take to ensure that the contracting process seems fair and open to all. But already ARPA seems to be taking the hints. Last year, sources say, the agency began working with congressional aides to write legislation that would create a "fast track" for buying hardware not originally funded by the agency, opening opportunities for companies outside the ARPA fold. "We think the problem that we and others have had seems to have gone away," nCUBE's Meirer told *Science* in February. Others are more cautious: The GAO plans to keep a sharp eye on government support of high-performance computing.

Squires contends that nerves and feelings will always be raw when the government pushes the envelope of technology. "When you're going after fundamental change, you're going to have dislocations," he says. There's only one sure way to eliminate the tension, points out Kenneth W. Kennedy, director of the Center for Research on Parallel Computation at Rice University: simply not to support any technologies. But many believe, he adds, that "if we're not number one in computing, we may come in second in everything else." As a result, "you'll just have to learn to live with the problems and make sure the process is totally fair."

–Elizabeth Corcoran

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PALEOANTHROPOLOGY

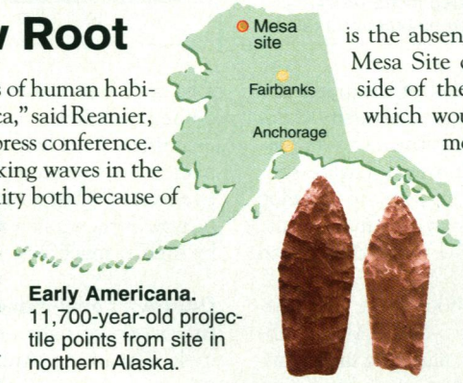
American Family Tree Gets New Root

When archeologist Michael Kunz first spied the 200-foot-high mesa in Alaska's remote Northern Slope in 1978, he would have bet his Bureau of Land Management paycheck that it harbored an ancient cultural site. Kunz had to wait a long time to step up to his imaginary pay window to collect. In fact, it took 14 years of intermittent excavation, sample collection, and analysis. But last Wednesday he announced at a Washington, D.C., press conference that his dig had hit the equivalent of an archeological trifecta: what appears to be the oldest well-documented human campsite in Alaska, if not in all of North America.

The artifacts from the site seem to confirm a commonly held theory that several different migratory groups crossed the land bridge from Siberia to populate the Americas. Yet the findings also seem to complicate the picture, because they confuse accepted notions of when the Paleoindian cultures that infiltrated lower reaches of the Americas were established. What these findings don't promise to do, however, is settle the hottest controversy in the peopling of the Americas: the long-running "pre-Clovis" debate over whether the Americas were inhabited by human beings before they were settled about 11,000 years ago by big-game hunters whose remains were first found near Clovis, New Mexico.

Atop the mesa, which rises abruptly above the flat tundra like a ship at sea, Kunz and his collaborators, including Richard Reanier of the University of Washington, discovered projectile points and hearths whose charcoal remains yielded radio-carbon dates of between 9700 and 11,700 years ago. Add to that the pristine, untouched status of the prehistoric hunting lookout site and you've got the makings of a strong claim for one of "the oldest well-documented sites of human habitation in North America," said Reanier, who also spoke at the press conference.

The site is now making waves in the archeological community both because of what it resembles—and because of what it does not resemble. On one hand, artifacts from the site do not resemble material from other ancient sites in Alaska such as the more southern Nenana complex, which also is at least 11,000 years old. That would suggest that more than one cultural group migrated from Asia, across a now-submerged land mass known as Beringia, before diverging into the Paleoindian cultures of more southern American regions, notes George Washington University anthropologist Robert Humphrey, who has examined the artifacts.



Early Americana. 11,700-year-old projectile points from site in northern Alaska.

ILLUSTRATION: D. DEFRANCESCO

On the other hand, says Kunz, the artifacts do bear a strong resemblance to those from the oldest undisputed sites of Paleoindians in the "lower 48," whose cultures, which date from about 11,000 years ago, presumably developed from earlier Northern predecessors. "The most important thing about the find," says Humphrey, "is that it once and for all establishes a Paleoindian presence in Alaska." As a result, the site offers a link between Paleoindians in the high plains of the Southwest and their presumed Northern predecessors.

But with a full-blown Paleoindian culture already in place in Alaska 11,700 years ago as the Mesa site suggests, Kunz argues, that commonly held chronology looks much too simple. Fodder for more speculation, he adds, is the absence of evidence for the Mesa Site culture on the eastern side of the Bering Land Bridge, which would have easily accommodated two-way traffic until it closed off about 10,000 years ago.

The find also raises intriguing new questions, adds Paleoindian researcher George Frison of the University of Wyoming in Laramie, who examined the Mesa site artifacts last month during a visit by Kunz and Reanier. "There definitely is [a culture] up there that we didn't know anything about," he says. Yet "[the artifacts] appear close to [Paleoindian artifacts in] the Agate Basin complex" in eastern Wyoming. He and other scientists will have an opportunity to test that conjecture in late June when they are scheduled to visit the Mesa site.

Whatever the researchers find then, "we're not sure yet what [the Mesa site] might mean for the 'pre-Clovis' controversy," says David Meltzer of Southern Methodist University in Dallas, who is on speaking terms with proponents of both sides. That passionate debate (*Science*, 17 August 1990, p. 738) centers on sites such as Monte Verde in Chile, which some paleoanthropologists argue shows signs of human habitation well before the 12,000 year benchmark for the entry of Clovis peoples to the Americas. Others, however, vigorously disagree that human beings were present in the Americas much before that date.

Even if the payoff on Kunz's mental wager doesn't help to resolve that question, the information it does provide is a striking enough reward for his 14 years of patient excavating.

–Ivan Amato