simply support what geneticists have long known: Living humans are strangely homogeneous genetically, presumably because they originated recently from a small group or their ancestors underwent a population bottleneck that wiped out many variations. Thus, genetically diverse ancient populations could have intermingled long ago, then over time modern humans lost many of those genetic variants.

That's why multiregional partisans say it's not possible to rule out their theory with data on a single sequence from one individual. "This is an extremely important piece of work. They're first. But we just don't have the data to answer the question of whether it supports one hypothesis or another," says paleoanthropologist Milford Wolpoff of the University of Michigan, Ann Arbor. He argues that Neandertals may have contributed to the modern gene pool, but their sequences disappeared through random genetic loss, selection, or both. Or the particular Neandertal sequence analyzed might be at one extreme of a diverse spectrum in Neandertals that includes other, more modernlike sequences. But most population geneticists consider these possibilities remote, says anthropological geneticist John Relethford at the State University of New York College at Oneonta.

And of course, because mtDNA comes only from the mother, it's possible that Neandertal fathers—but not mothers—contributed nuclear genes to the modern gene pool. Most researchers think such a one-sided genetic interchange is quite unlikely or "odd," as Ruvolo puts it. But it's impossible to test directly, as the chances of recovering nuclear DNA are basically nil, says Pääbo—a fact sure to disappoint potential entrepreneurs dreaming of "Neandertal Park," as resurrecting any extinct creature would require intact nuclear DNA, among other impossibilities.

Other population geneticists say they would like to see more data to be sure. "The icing on the cake would be Neandertal number two," says Penn State's Blair. "Get one of those North African Neandertals or something really far away, and see if it clusters with this one." Genetic data from archaic moderns would also be helpful. Says Relethford, "I'd like to see DNA from the first undisputed early modern Europeans, the Cro Magnon from about 30,000 years ago. That's a real good test. Their mtDNA should look more like us."

No one has that, quite, but Bryan Sykes of Oxford University and Stringer think they have isolated mtDNA from a 10,000-year-old late Cro Magnon from Cheddar, England—and it shows only one base pair difference from that of modern humans. This as yet unpublished work shows that "we can put Cro Magnons at 10,000 nicely in the present variation," says Stringer.

But although Pääbo's group has shown that it is possible to get believable results with ancient, human DNA, he and others call for caution in going after more. Fossils are precious, and it's crucial to test the preservation of tiny samples or of animal bones found with human fossils before grinding them up, says Ward. What's more, adds London's Thomas, "all [researchers] have to do is read the paper closely to see it's a vast amount of work to do this right."

Even if the new result doesn't quite settle the debate about whether Neandertals mixed with modern humans, it does underscore how different they were from our own lineage. And that implies that "up to 200,000 or 300,000 years ago, humans evolved just like gorillas and everything else," says Ward, perhaps with several contemporaneous, diverse human species. That picture is emerging from other new lines of evidence, too. For example, new dates on *Homo erectus* fossils in Asia show that this species also coexisted with modern humans until as recently as 30,000 years ago. These results are forcing paleoanthropologists to renounce the once-preferred linear model of human evolution in which a single primitive species gradually gave rise to the most advanced form—us. Rather, it seems, there was once a bushy human family tree—and all the branches but one went extinct.

"It's what happens to [other kinds of] populations," says paleontologist Rob Foley of Cambridge University in the United Kingdom. "But in the case of Neandertals, we get excited about it." So it seems that the Neandertal sequence reinforces what this skeleton told the world when it was first discovered: that humans evolve just like everything else.

–Patricia Kahn and Ann Gibbons

ASTRONOMY

Interference Sharpens the View

Last week, astronomers released the first images made with the help of a new orbiting radio telescope. Although the images—which show a powerful jet of subatomic particles spewing from a quasar—are not groundbreaking themselves, they are a powerful demonstration of the new system, indicating that it can provide detailed views of some of the most energetic and mysterious objects in the universe.

The radio antenna, called HALCA, is the first space-based one designed for interferometry, a technique that allows scientists to combine data from far-flung telescopes and create the equivalent of an enormous collecting dish. The larger the dish, the more detailed the images. HALCA works in concert with ground-based telescopes, allowing astronomers to simulate a dish with a diameter greater than 30,000 kilometers and a resolving power—the ability to detect fine details—more than 100 times that of the Hubble Space Telescope.

The image to the left (reduced in size for comparison) was taken by the Very Long Baseline Array (VLBA), a collection of ground-based radio telescopes. It shows quasar 1156+295, which is 6.5 billion light-years from Earth. The image to the right is a view of the same quasar in which data from HALCA are combined with those from the VLBA. It shows in unprecedented detail the particle jet emanating from the quasar, which may harbor a black hole, says astronomer Jonathan Romney of the National Radio Astronomy Observatory in Socorro, New Mexico, which is part of the international team that uses HALCA. No one is sure how the jets are formed, he says, but a clearer picture of their source may help scientists solve that mystery.

Astronomers hope that HALCA, built by scientists at the Japanese Institute for Space and Astronautical Science and launched in February (*Science*, 31 January, p. 620), will allow them to make the most precise observations yet of objects that emit radio waves, including other quasars and black holes.

–Gretchen Vogel