

ANCIENT DNA

No Sex Please, We're Neandertals

COLD SPRING HARBOR, NEW YORK—Did Neandertals and modern humans interbreed? Last year, that question took on new life when two groups of researchers reported the first results from sequencing parts of a Neandertal's nuclear genome. The answer, however, was equivocal: One group reported no evidence of interbreeding; the other reported tantalizing hints of mating (*Science*, 17 November 2006, p. 1068). Now, a paper presented last week at the Biology of Genomes meeting here gives the evidence a strong shove in the direction of the no-sex camp.

The new findings also push back the date that Neandertals split from the human branch of the primate tree by 200,000 years—to 800,000 years ago. And another study shows that this ancient human ranged 2000 kilometers farther east—into southern Siberia—something anthropologists have suspected but not confirmed.

These findings come out of an ongoing effort by Svante Pääbo of the Max Planck Institute for Evolutionary Anthropology in Leipzig, Germany, to sequence the Neandertal genome. Until last year, researchers had only been able to extract and decipher mitochondrial DNA from Neandertal fossils. But in 2006, Pääbo and, using a different approach, James Noonan of Lawrence Berkeley National Laboratory in California and Edward Rubin, director of the Department of Energy Joint Genome Institute in Walnut Creek, California, sequenced nuclear DNA from a Neandertal bone from Croatia.

Rubin and Noonan found no support for interbreeding in 65,000 bases their group sequenced, a finding in line with conclusions from mitochondrial DNA studies. Pääbo, however, found enough so-called single-nucleotide polymorphisms (SNPs) shared with humans, but not chimps, among the million bases his group sequenced to question that conclusion.

In that study, Pääbo used preexisting databases of human variation. Because those databases focus on common SNPs, Pääbo worried that biases might skew the analysis. So David Reich of Harvard Medical School in Boston and James Mullikin of the National Human Genome Research Institute in Bethesda, Maryland, have now compared SNPs in new

Neandertal sequences to random SNPs obtained from one African and from one European. The result: "There's no indication of gene flow," Pääbo reported. Pääbo and his group got the same result when they examined variation in the Y chromosome, looking for signs of *Homo sapiens* DNA embedded in the Neandertal sequence.

It may never be possible to prove beyond doubt that interbreeding did not occur. "But if I were to make a guess, I would say more



DNA donor. This Croatian fossil is part of the Neandertal genome sequencing project.

sequence will just confirm [these results]," says Noonan. "It convinces me."

Last year, based on comparisons with the human and chimp genomes, Pääbo's group estimated that Neandertals split off from the human lineage about 600,000 years ago. But they have since found that that estimate changes by 400,000 years depending on the order in which they match up each species' sequence. A new three-way comparison that doesn't give one pairing priority over another comes out at 800,000 years, Pääbo and his Max Planck Institute colleague Richard Green reported at the meeting.

In a side project, Pääbo and his graduate student Johannes Krause have examined 30,000- to 38,000-year-old human fossils from Uzbekistan and the Altai region of southern Siberia whose identities were a mystery. When the researchers compared the bones' mitochondrial DNA with that from more than a half-dozen Neandertals, they found that the Asian fossils were clearly Neandertal. "It tells us that Neandertals were much more widespread than we thought," says Pääbo.

Neandertals may have roamed far and wide, but when it came to sex, they apparently stuck to their own. **—ELIZABETH PENNISI**

No Smoking, Says California Faculty

Last week, the University of California (UC) faculty senate voted 43–4 against a university-wide ban on tobacco money for research. But antitobacco crusaders haven't given up their 4-year fight. Benjamin Allen, a UC Berkeley law student and future student member of UC's governing body, the regents, is campaigning for a sterner review process for all tobacco industry-funded grants.

Advocates of the ban say that tobacco firms sponsor questionable research and strong-arm fundees. But critics worry that such a ban would curtail academic freedom and threaten other corporate-funded research. The regents put off a vote in January pending the faculty senate's action (*Science*, 26 January, p. 447) and are expected to reject the ban at their July meeting.

Allen's proposal includes an additional level of grant review and a new faculty board to analyze research. Also offered is the chance for individual UC units such as the UC San Diego Cancer Center to ban tobacco money—an action the faculty senate outlawed in 2005. "UC is the only institution in the world that forbids its academic units from declining tobacco money," says Stanton Glantz, a bioengineer at UC San Francisco and a key force behind the proposed ban. Stanford is debating a similar ban and could vote on it as early as this week.

—DAVID GRIMM

Iranians Back Into ACS Fold

The American Chemical Society (ACS) has reinstated 36 Iranian members dumped in January because of the U.S. trade embargo. But ACS will continue to withhold certain member benefits until it obtains a government license.

Although U.S. organizations are prohibited from doing business with anybody in Iran, Cuba, or North Korea, an exemption enables U.S. scholarly societies to have members in those countries. But late last year, ACS officials decided that the full range of membership benefits—which includes discounted journal subscriptions, career counseling, meeting invitations, and insurance—crossed the line.

That ruling drew protest from scores of ACS members. And ACS Executive Director Madeleine Jacobs says she was not part of the decision. "I learned about the move from *Science*," she says (*Science*, 30 March, p. 1777). Last week, the society reversed its decision. But it could be months before ACS obtains a license that would enable it to provide Iranian members with discounted meeting registrations and career-development services.

—YUDHIJIT BHATTACHARJEE