RANDOM SAMPLES

edited by CONSTANCE HOLDEN

A Marker for Female Homosexuality?

Scientists claim to have found the first sign of a possible physiological difference between homosexual and heterosexual women: the ear's response to brief sounds. The finding, they say, suggests that receptor cells in the cochleas of some homosexual and bisexual women may be more like men's than like straight women's, perhaps as a result of the brain's prenatal exposure to hormones.

Scientists already knew that women tend to have more sensitive hearing than men and that tiny "echoes"—called otoacoustic emissions (OAEs)—produced by their inner ears are stronger. Reasoning that the sex difference might be caused by prenatal male hormones, psychologist Dennis McFadden of the University of Texas, Austin, in 1993 tested college-aged girls with a male twin and found that their OAEs were more like those of males than those of nontwin girls. This was in line with evidence that mammalian female fetuses are affected by androgens from male womb-mates, says McFadden.

From the twin study, he says, "it wasn't very far to make the jump to homosexuality." He and colleague Edward Pasanen exposed 237 subjects in their 20s, divided roughly equally among male and female hetero-, homo-, and bisexuals, to clicks at the rate of about 10 per second, using a sensitive microphone to pick up ear echoes. The average strength of the OAEs produced by lesbians and bisexual women fell between those of the men and the straight women, they report in the 2 March issue of the *Proceedings of the National Academy of Sciences*. There was no difference between gay and straight men.

The authors conclude that high prenatal exposure to androgens may lead to "a partial masculinization" of the inner ear as well as brain structures implicated in sexual preference.

Other researchers are cautiously intrigued with the finding. Psychologist Michael Bailey of Northwestern University near Chicago, who has done twin studies showing a genetic influence in homosexuality, says "it needs to be replicated before I'd stake much on it." Molecular biologist Dean Hamer of the National Cancer Institute, who identified the first candidate region for a "gay gene" in 1993, thinks the finding is a "fascinating" one that if verified might offer a potential "marker for hormonal exposure."

Tsar's Final Resting Place

The Russian government on 27 February ordered the controversial remains of Russia's last tsar, Nicholas II, to be interred in St. Petersburg with his predecessors. The decision came after a commission on 30 January endorsed DNA and anthropological evidence showing that unidentified bones dug up in 1991 are indeed those of the tsar and four family members. But Orthodox Church leaders are skeptical and may ask for new tests before the interment, slated for 17 July—the 80th anniversary of the murders.

After 3 years of DNA testing, researchers in 1996 decisively identified bone fragments that had been unearthed near Yekaterinburg, where Nicholas, his family, and four servants were said to have been murdered. By comparing mitochondrial DNA (mtDNA) in the bones with that from remains of the tsar's brother, scientists found that both brothers had inherited two different mtDNA sequences from their mother—a rare condition called heteroplasmy. Then last January, a team led by molecular geneticist Evgeny Rogaev of the National Research Center for Mental Health in Moscow reported that DNA samples from a nephew of Nicholas who died in 1993 matched DNA from the bones.

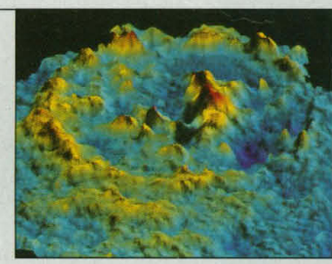
The tsar's bones are to be interred at the holy Peter and Paul Fortress, which puts pressure on the Russian Orthodox Church to canonize the remains. But the church is still unconvinced by the DNA evidence. If authorities want further proof, "we still have time to do more tests," says Rogaev—such as probing for similarities on the Y chromosomes inherited by the family males.

Ocean Sighting Confirmed

Images released last week of Jupiter's moon, Europa, show that at least some of its icy surface formed when an ocean lay a few kilometers beneath the crust. "I think I'm finally sold on an ocean," says planetary geologist Robert Pappalardo of Brown University. And where there was liquid water there may have been life.

Scientists say stereo images taken from the Galileo spacecraft of the 26-kilometer-wide impact crater, Pwyll, reveal that its floor is level with the surrounding surface (coded blue in the image above) instead of being 1.6 kilometers deep, as it would have been if Europa's ice were rock hard. That suggests that water or slushy ice flowed in and filled the crater. The new high-resolution images also confirm the identity of kilometer-sized icebergs locked in a sea of frozen slush.

The new images "certainly make me feel more confident we're dealing with water below the surface," says Brown team member James Head. But whether Europa's ocean has frozen throughout since it flooded the surface is a question to be resolved by geologists, who must divine the flooding's age from craters made by a steady rain of comets on Europa's face.



JPL/NASA

Telltale crater. Europa's surface with NASA-enhanced vertical relief and added color.

TOP 10 HOT PAPERS FOR 1997

Rank/Topic	Author	Reference	# Cites
1. apoptosis	J. Yang *et al.*	*Science*, 21 Feb.	56
2. apoptosis	R. M. Kluck *et al.*	*Science*, 21 Feb.	55
3. oncogenes	T. R. Franke *et al.*	*Science*, 31 Jan.	54
4. ataxia	O. Zuchenko *et al.*	*Nature Genetics*, Jan.	47
5. *BRCA*1	R. Scully *et al.*	*Cell*, 24 Jan.	46
6. neuron survival	H. Dudek *et al.*	*Science*, 31 Jan.	41
7. cell death	A. M. Chinnalyan *et al.*	*Science*, 21 Feb.	40
8. apoptosis	A. Kauffmann-Zeh *et al.*	*Nature*, 6 Feb.	40
9. presenilins	M. Citron *et al.*	*Nature Medicine*, Jan.	38
10. Dolly	I. Wilmut *et al.*	*Nature*, 27 Feb.	37

Cell death riding high. Apoptosis, or programmed cell death, was the dominant theme among the top 10 hot papers for 1997, beating out even Dolly, the cloned lamb, in the citation count. All the 40 most cited papers in the tally, done by the Institute for Scientific Information in Philadelphia, had the advantage of being published early in the year. The most cited researcher (gauged by the number of highly cited papers over a 2-year period) was geneticist Ronald M. Evans, a Howard Hughes investigator at the Salk Institute, with six.