RANDOM SAMPLES

edited by CONSTANCE HOLDEN

Sex and Olfaction

Human pheromones are alive and well and serving evolutionary theory, according to an ethologist who recently reported on studies showing that smells, even when not consciously registered, affect the sexes' perceptions of each other.

Most research on "signals" between men and women focuses on visual or behavioral cues—"Olfaction is a neglected signal system," says Karl Grammer, an ethologist at the Ludwig-Bolzmann-Institut in Vienna. But in a talk at the annual meeting last month of the Human Behavior and Evolution Society in Evanston, Illinois, Grammer recounted two experiments suggesting that smell is indeed a rich area of inquiry.

The first study involved androstenol, found in male sweat, and androstenone, to which it oxidizes. Research has shown that women like the dry musky smell of androstenol, but find androstenone to have a chemical, urinelike odor. Why, then, would nature make that the dominant component in male sweat? To address this, 290 young women were asked to smell samples of androstenone. Most reacted negatively—but not the ones who were ovulating. Their reaction, according to Grammer, was "neutral." His conclusion: Androstenone acts as a pheromone, implementing one of evolution's little strategies by sorting women so that those most susceptible to fertilization are also less likely to resist sexual overtures.

The second study used copulines, which occur in female vaginal secretions. Sixty-six young nonsmoking men were exposed, via 5 minutes with an inhalator, to copulines taken from three parts of the female cycle: menstrual, ovulatory, and premenstrual. Water was used as a control; neither experimenter nor subject knew what was coming through the inhalator. The men were then shown photos of five women of varying degrees of age and attractiveness and asked to rate them. Grammer reported that exposure to all copulines tended to upgrade men's assessments of female beauty. And the least attractive women benefited the most, thus gaining a competitive boost in the reproduction game. Again, though, fertile females had an advantage, suggesting that humans' "concealed" ovulation is not a total secret: The ovulatory hormones were the only ones to cause rises in men's salivary testosterone levels.

Many meeting attendees said that they were impressed with the rigor of Grammer's research. Says ethologist Bill Charlesworth, professor emeritus at the University of Minnesota: "I was agnostic about pheromones, but he has demonstrated that people are aware of smells, even if only subconsciously, and their preferences are influenced by them."

Invulnerable Vole Found at Chernobyl

Little more than a month after describing high rates of mutations in two species of voles living in the area contaminated by the Chernobyl nuclear power plant, researchers have learned that not all vole species were equally affected.

Amanda J. Wright and Lara E. Wiggins, students working with molecular biologist Robert Baker at Texas Tech University in Lubbock and Ron Chesser of the University of Georgia, reported at last month's meeting of the Society for the Study of Evolution and the Society of Systematic Biologists in St. Louis that they have found a third species that appears to be radiation-resistant.

HEIDI BRODNER

Radiation resistant. Unlike its relatives, this vole lives near the Chernobyl power plant without suffering from high mutation rates.

This third vole, *Microtus oeconomus*, did not have the high mutation rates reported in the 25 April *Nature* for two closely related voles, despite having comparable levels of radiation exposure, says Baker. But this vole does have one genetic abnormality in common with its cousins. At the meeting, James Andrew DeWoody, also on Baker's team, reported that 95% of all three voles from the contaminated areas had an otherwise rare allele of the gene for an enzyme called isocitrate dehydrogenase. This allele may be more effective at dealing with the oxidative damage caused by exposure to radiation and other contaminants and thus may have been selected for in the early years after the 1986 accident, says Baker.

But one species shows neither altered bases in the mitochondrial gene cytochrome b nor excessive breakage in its chromosomes, which suggests that "we don't really understand the basis for the [high] mutation rate" found in the other two (*M. arvalis* and *M. rossiaemeridionalis*), says James Bull, an evolutionary biologist at the University of Texas, Austin. It could be that *M. oeconomus* is better at DNA repair or that slight differences in its lifestyle—it seems to spend more time by water than the other two voles—minimize its exposure to heavy metals or other pollutants, Baker suggests. With or without high mutation rates, voles and other rodents seem to be thriving despite radiation and other post-Chernobyl toxins (*Science*, 21 July 1995, p. 304).

Berkeley Chancellor Plans to Move On

Chang-Lin Tien—chancellor of the University of California (UC), Berkeley, and the first Asian American to lead a major U.S. research university—shocked the campus community last week by announcing that he will step down within the next year, after 7 years in the job.

"I'm very upset about it," says Berkeley biologist Robert Tjian, chair of the Chancellor's Advisory Council on Biology. Despite state budget cuts, Tjian says, Tien "was able to use what resources he had in the most effective way for retention and hiring of the highest quality faculty."

Tien

Tien's popularity goes far beyond scientists. "This is a guy who really made a difference," says Patrick Callan, director of the Higher Education Policy Center, in San Jose. The 60-year-old mechanical engineer won favor with faculty and students by standing up for affirmative action and faculty quality. In 1994 he threatened to resign over early retirement incentives offered by the UC regents that would have decimated Berkeley's distinguished faculty. That forced the regents to make changes at Berkeley estimated to have retained up to 30 professors (*Science*, 20 May 1994, p. 1074). Then last year he almost resigned again over the regents' ban on affirmative action (*Science*, 29 March, p. 1902).

Tien says his decision "has nothing to do with the affirmative-action issue or any other issue." Rather, he says he's leaving now because "the campus is at a high point in its history," having maintained its excellence despite budget cuts, and put in place programs that he believes will continue to foster diversity.

Chinese-born Tien has used

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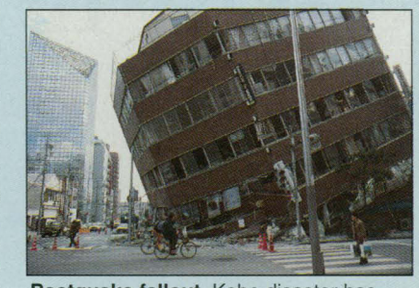
Kobe Earthquake Continues to Rattle Walls

A year and a half after causing 5500 deaths and $100 billion in damage, the 6.9-magnitude earthquake that rocked Kobe, Japan, is continuing to topple walls—only now they are the figurative barriers separating Japanese earthquake researchers.



PATRICK ROBERT/SYGMA

Postquake fallout. Kobe disaster has shaken information loose.

In what is a first for seismological data in Japan, the National Research Institute for Earth Science and Disaster Prevention in Tsukuba is making the data from its nationwide network of 1000 strong-motion seismometers publicly available. On 3 June it began posting quake data on its World Wide Web page (http://www.k-net.bosai.go.jp) in both English and Japanese.

Japanese institutions have traditionally reserved first use of such data for their own projects, says Keiichi Ohtani, manager of the institute's network, and outside researchers typically had to wait a couple of years to get a crack at it. But in the aftermath of Kobe, the closed-mouth approach came to be seen as withholding potentially life-saving information.

Researchers outside the institute are delighted. "It's epoch-making that this data is finally open to everybody," says Masayuki Kikuchi, a professor at the University of Tokyo's Earthquake Research Institute. The new Earthquake Research Promotion Office of the Science and Technology Agency, with which the Tsukuba institute is affiliated, hopes to get other institutions to follow suit—there are at least 16 other groups in Japan with seismological networks.

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the respect he commands in Asia to bring in millions of dollars in donations to Berkeley. Recently part of an official U.S. delegation to Taiwan, Tien wouldn't comment on speculation that the Administration may offer him a diplomatic post.

Making Molds for Plastic Antibodies

Just as an artist might make a cast of a sculpture, so chemists are casting molecules in plastic, opening up new possibilities for screening or purifying materials. Molecules such as antibodies lock onto specific proteins because of the antibodies' particular shapes. So to pick a molecule out of a solution, Swedish chemist Klaus Mosbach and his team at Lund University are mimicking nature and forming the molecules' shapes in plastic.

After perfecting the method with small and simple molecules (*Science*, 4 March 1994, p. 1221), they report in the June issue of *Chemistry and Biology* that they have now built a "plastic antibody" that seizes on a group of anti-inflammatory drugs known as the corticosteroids.

The corticosteroid is used as a template. Polymer precursor is dissolved in a solvent containing the molecule so that as the polymer chains form, they pack around the template. The polymer is then cured with an agent that builds bridges between chains, and the template is dissolved, leaving corticosteroid-shaped pockets. The result is a solid polymer with tiny pores—Mosbach calls them "memory sites"—the shape and size of the template molecule. The plastic can then be used, like a natural antibody, to single out the corticosteroid from a mixture of similar compounds.

Christopher Lowe, director of the Institute of Biotechnology at Cambridge University, hails the new plastic antibodies as major time- and money-savers. It takes only a day to build one, while engineering a biological antibody can take months, he says: "The application to a brand-new class of compounds bodes well for [the development of] a generic technology." Mosbach hopes that industry will be using plastic antibodies as biological assays, sensors, and filters within a few years.

"Sociobiology" to History's Dustbin?

The members of the Human Behavior and Evolution Society (HBES) voted at their meeting last month to change the name of their journal, *Ethology and Sociobiology*, even as the scientist who put the latter term on the map, Harvard's E. O. Wilson, gave the Evanston, Illinois, meeting's keynote address, and scolded the society for intellectual cowardice. The journal, for the past 3 years the official one of the 8-year-old HBES, was founded 15 years ago by neuroscientist Michael McGuire of the University of California, Los Angeles (UCLA). Starting next January, it will go by the name *Evolution and Human Behavior*. When Wilson published his book, *Sociobiology*, in 1976, it raised a sustained furor in academia. Now, he said, "we are supposedly victors" in the battle to recognize that biology is a strong force in human behavior. He chastised the group for instead displaying a "failure of nerve"—caving in to critics who still label sociobiology as "racist and determinist."

Wilson

HBES members cite a variety of reasons for changing the journal name, explaining that the new moniker more accurately reflects the breadth of HBES's concerns. But UCLA anthropologist Nicholas Blurton-Jones, an associate editor, admits that " 'sociobiology' raised too many hackles and got us into too much trouble."

Harvard and China Probe Disease Genes

A grand program that combines the talents of cutting-edge gene mappers with the epidemiological riches of the world's most populous country is taking shape at Harvard University.

Launched in May, the new Program for Population Genetics (PPG) is designed to address "complex genetic diseases," harnessing resources ranging from the Jackson Labs in Bar Harbor, Maine, where a mouse model for gallstones is under development, to asthmatics in mainland China. Director of the PPG is Harvard physician and epidemiologist Xiping Xu, who says the program will have access to 200 million Chinese through collaboration with six Chinese medical centers. The program will look at "diseases of civilization," says PPG's associate director, population biologist Nicholas Schork of Harvard and Case Western Reserve University, including diabetes, hypertension, obesity, early-onset heart disease, arthritis, schizophrenia, and some infectious diseases.

Schork notes that China offers a low-cost research venue where the huge population may allow scientists to spot genes that exert very small effects, and the country has "very marked urban and rural contrasts" that will make it possible to look at the health effects of rural-urban migration.

Geneticist Neil Risch of Stanford University says the PPG reflects "the realization that finding genes for these disorders may be quite difficult and might require very large samples." He cautions, however, that "large-scale studies [don't] guarantee the quality of the information. ... It's unlikely the genes we're looking for are likely to have very large effects, so any amount of noise [such as diagnostic errors] is very detrimental."

The PPG hopes to expand to a budget of up to $10 million a year by 1997. Several drug-company-funded projects are already under way, including an asthma gene search that involves screening 6 million Chinese.