the wake of the troubles.

Still, this latest departure appears to be part of a general changing of the guard, which includes the replacement last summer of chief financial officer William Massey, and a subsequent reorganization of the university controller's office that unseated both controller Frank Riddle and assistant controller Janet Sweet.

Rat and Mouse Care

A federal district court judge ruled on 8 January that mice, rats, and birds must no longer be excluded from the protection given research animals in the Animal Welfare Act of 1971. In response to a suit brought by the Animal Legal Defense Fund and the Humane Society of the U.S., Judge Charles R. Richey ruled that the Department of Agriculture had been "arbitrary and capricious" in excluding such animals from protection.

Animal welfare groups have argued for years that failure to cover rats, mice, and birds has been one of the most serious flaws in the act. Valerie Stanley, attorney for the plaintiffs, said the decision "marks a watershed for the animal rights movement."

Other observers see it less dramatically. They say the ruling will increase the paperwork load for animal users but will not have a great impact on the treatment of research animals. Barbara Rich of the National Association for Biomedical Research notes that scientists who get money from the Public Health Service (PHS) have to abide by PHS guidelines, and these already cover housing and treatment of birds and rodents. Veterinarian Richard Simmons of the University of Nevada adds that "small [non-PHS funded] labs that have never used anything but rats and mice" will have to set up animal care and use committees and gear up for more paperwork.

Another possible repercussion of the ruling, says Simmons, is that scientists could find themselves facing much higher prices for rats and mice—which are about 85% of all research animals—in the future, since some breeders may have to enlarge housing facilities.

But Simmons says, "The biggest economic impact will be on the USDA." And indeed the agency has argued that such regulations could double demands on its already overstrained enforcement capabilities. But as of 23 January, USDA officials were still considering whether to appeal the ruling.

Shock Therapy Helps Kill Cancer Tumors

No, it's not a miracle cure for cancer, but French researchers working for the National Scientific Research Center (CNRS) in Paris believe they are on the way to cracking a major conundrum of cancer chemotherapy: how to use a high enough dose of drug to kill the cancer cells but not the patient. Getting the drug right inside the tumor cells could be one way around the problem. But as Luis Mir of the CNRS team found, some of the best anticancer drugs, like bleomycin, can't get past the membranes of certain cancer cells. "You only need a few hundred molecules of bleomycin inside the cell to destroy it, but the cell membrane can be a formidable barrier," says Mir.

The team has found, however, that zapping human cancer cells in culture with short bursts of electricity will open the membranes long enough to allow drug molecules to enter and do their lethal work. And in mice, an intravenous injection of bleomycin, followed by 100-microsecond electrical pulses delivered through electrodes, killed drug-resistant tumors.

Now the Paris team has announced, in the proceedings of the French Academy of Sciences, the results of what they believe is the first human trial of "electrochemotherapy." Seven elderly men with untreatable cancers of the head and neck were given intravenous bleomycin followed by electrical pulses delivered directly to the tumors. Of 34 "shocked" tumors, 17 disappeared completely within a few days and seven more showed partial regression.

Unfortunately, it was too late to save these patients—the cancers had already spread to other parts of the body. But the CNRS researchers, buoyed by the results, are now planning larger trials of their novel treatment.

Homosexuality and Cognition

The hypothesis that there is a neurobiological basis for sexual orientation has received substantial attention recently—examples being the anatomical difference found in the brains of some male homosexuals; new evidence of a strong genetic role in homosexuality, and the association found between homosexuality and left-handedness. Now, the hypothesis has gotten a boost from yet another direction—research bearing on sex differences in cognitive abilities.

Scientists at McMaster University in Ontario report in the latest issue of *Psychoneuroendocrinology* that on measures of visual-spatial ability where consistent differences have been observed between males and females, male homosexuals fall between the two sexes. "It is as if, in some cognitive respects, they are neurologically a third sex," says neuroscientist Sandra Witelson, who co-authored the paper with psychologist Cheryl M. McCormick (now at McGill University).

The researchers administered three tests of spatial ability (where males excel) and two measuring verbal fluency (where females show a small advantage) to three groups of 38 subjects each: homosexual men, heterosexual men, and heterosexual women. "The cognitive pattern of homosexual men was significantly different from heterosexual men but not significantly different from that of heterosexual women," says Witelson. The results—like those from other studies on homosexuality—are consistent with the hypothesis that homosexuals are exposed to atypical levels of prenatal sex hormones.

MICHAEL DISMATSEK

Sandra Witelson. *Are homosexuals in some ways neurologically "a third sex"?*

In the spatial tests, heterosexual males had the highest scores, followed by homosexual males, and then females. This pattern was particularly pronounced among right-handers in a test where subjects had to visualize the water level in a tilted glass. In a measure of verbal fluency, the order was reversed: Women scored highest, followed by the homosexuals, and then the heterosexual men.

Witelson believes that evidence from anatomical, genetic, hormonal, and neuropsychological research is converging to suggest that "sexual orientation... is part of a larger constellation of cognitive attributes." She adds that all this may lead to an explanation for "the apparently greater prevalence and ability of homosexual men compared to heterosexual men in some professions." But the bewilderingly complex relationships between brain anatomy, prenatal sex hormones, handedness, and homosexuality still need a lot more sorting out.