Biomedicine

Breast cancer and sense of smell

About half of all breast cancers are estrogen-receptor positive, meaning the tumor cells require estrogen to grow. Women with estrogen-positive (ER+) breast cancers have a slight but statistically significant loss of their sense of smell, according to a report in the Aug. 10 LANCET from the Mt. Sinai School of Medicine in New York City.

Steven Lehrer and his colleagues looked at 25 women with ER+ breast cancers, 21 women with estrogen-receptor negative (ER−) cancers and 46 cancer-free women matched with these two groups for age, sex, race and smoking habits. Four ER+ women and five ER− women had received chemotherapy; none had received radiation treatments to the head.

The ER+ women scored significantly lower than the ER− and control groups on a sophisticated and sensitive scratch-and-sniff test. The difference didn't represent functional impairment, and, says Lehrer, "the women didn't seem to notice."

The biological connection between ER+ breast cancer and sense of smell may lie in the pineal gland, a small organ in the brain that secretes the hormone melatonin in response to day length. In rats, removing the pineal gland or inhibiting melatonin can induce mammary tumors; the nightly melatonin peak in women with ER+ breast cancer is lower than in other women.

"Perhaps," the researchers suggest, "both the pineal and olfactory abnormalities observed in women with ER+ breast cancer result from a single underlying defect." What it means in terms of treatment "is difficult to say," notes Lehrer. Perhaps, he speculates, a sense-of-smell test may prove a good screen.

Of vaginitis and sexual selection

Pregnant women with vaginitis caused by *Trichomonas vaginalis* or species of *Bacteroides* are more likely to deliver female babies, according to a report in the August OBSTETRICS AND GYNECOLOGY. But deliberate infection to enhance the odds of having a girl isn't a great idea — in a larger, previously reported study of low-income women the researchers found a higher rate of pregnancy complications in those with vaginal infections.

The researchers, from Downstate Medical Center in Brooklyn, took vaginal cultures in 212 women 14 weeks after conception, and found the infectious organisms in 42 percent of the women who subsequently had girls but in only 25 percent of the women who had boys. The X sperm may be better able to survive in an infected vagina, the researchers suggest. But the results need confirmation by further studies of vaginal infection around the time of conception, they note.

Money, money, who's got the money?

The fiscal year 1985 budget for the National Institutes of Health (NIH), which has traveled and retraveled a tortuous path between Congress and the White House, was finalized Aug. 16 when President Reagan signed the supplemental appropriations bill. The bill gave the final word on how much NIH can allocate in FY '85, which ends Sept. 30.

The FY '85 problems began with the President's FY 1986 budget (SN: 2/9/85, p. 85). That budget moved $238 million from NIH's already approved FY '85 budget into 1986 and 1987, an action that did not please Congress. The FY '85 budget provided NIH with enough money to fund about 6,500 grants; the President's "forward funding" plan would have left only enough for about 5,000. While Congress and the administration were grappling over the FY '85 dollars, NIH was able to okay only 5,000 grants.

The Aug. 16 bill approved a 6,200-grant limit, and the NIH began approving another 1,200 grants, a process it plans to complete before the end of the fiscal year. The extra $10 million for the 300 initially approved but eventually unfunded grants will go into NIH's FY '86 budget, an NIH spokesperson says.

Earth Sciences

Microbial foot soldiers

Some scientists have said that groundwater pollution may be one of the most serious environmental problems facing the United States (SN: 11/10/84, p. 298). But certain bacteria that live underground — known as methylotrophs — may be drafted as front-line infantry to wage war on this type of pollution. Methylotrophs produce enzymes that can catalyze the organic pollutants that frequently contaminate groundwater, but scientists have only recently begun to understand their role (SN: 11/26/83, p. 348).

One thing scientists do know is that there are not enough of these bacteria to control groundwater pollution without some help. But Stanford University microbiologist Dunja Grbic-Galic thinks she's found a way to lend them assistance by pumping water, methane and nutrients into the ground. In an experiment funded by the Environmental Protection Agency, Grbic-Galic, with Stanford civil engineers Paul Roberts and Perry McCarty, will attempt to beef up the bacterial troops living under Moffett Field Naval Air Station in the heart of California's Silicon Valley by feeding them a diet of this mixture. Grbic-Galic says she first wants to gauge the numbers of helpful bacteria already in the soil there by testing samples.

Toxic trichloroethane has been found in the groundwater underlying the Naval Air station in concentrations of 88 parts per billion, according to John Shackleton, Moffett Field's director of public information.

The trees told him so

If, as University of Washington in Seattle researcher David K. Yamaguchi says, "the past is the key to the present," it might be worth worrying a little about what Mt. St. Helens has up her sleeve. Two of the mountain's former eruptions were spaced only two years apart, Yamaguchi says, and "since it [last] let off in 1980, it has the potential to produce another eruption fairly soon."

Yamaguchi says this is what the trees — or rather their rings — told him.

Scientists have long known that a single tree ring reflects one year's growth, and tree ring dating has been used by many different kinds of scientists. Yamaguchi thinks he's the first, however, to use the technique to date volcanic eruptions. "If you can find trees that were around long ago — and that's easy in the Pacific Northwest, where trees live for a long time — you can tell what's happened in the last 1,000 years," he says. For events that happened fewer than 1,000 years ago, tree ring dating is more accurate than radiocarbon dating, which, he says, has a 100-year margin of error.

Two years ago, Yamaguchi obtained pencil-thin cross sections of trees growing amidst a layer of volcanic debris known to predate the 1980 eruption, and established that a major eruption had occurred in 1480.

Trees in the Pacific Northwest, Yamaguchi says, are for the most part "very happy and well fed, and their rings reflect it." But trees that survived a Mt. St. Helens eruption — when, he says, "chunks of pumice and rocks would come crashing down on the forest" — were "hurting real bad." Their rings for that year would be narrow or even nonexistent — enabling him to recognize anomalies. Yamaguchi says he had familiarized himself with some "control group" ring patterns in trees he knew had not been in the way of any eruptions.

His newer finding, published in the August GEOLOGY, leads him to conclude that another eruption occurred in 1481 or 1482. Yamaguchi says he determined this by applying the same technique to a stand of old Douglas fir growing in a layer of volcanic debris geologists had known was deposited more recently than the 1480 debris. "I expect," he says, "that my finding may cause quite a stir."