RANDOM SAMPLES

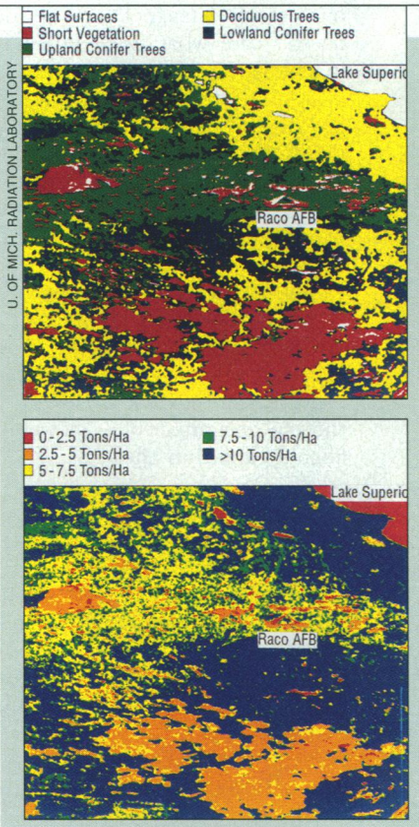
edited by CONSTANCE HOLDEN

Running Afoul of German Biotech Regs

In Germany, molecular biologists had better think twice before they decide to skip over regulatory guidelines covering genetic recombination work, no matter how innocuous the experiments. Biochemist Carl-Wilhelm Vogel is learning this the hard way after authorities paid an unexpected visit to his laboratory at Hamburg University's Institute of Biochemistry and Food Chemistry. What they found might scarcely raise an eyebrow in most countries, but in Germany, where genetic experiments are viewed with suspicion by many, it has turned into a tempest in a test tube.

Vogel was trying to clone the gene that codes for cobra venom factor, a protein that could help prevent the rejection of organ transplants, and had set up a Class 1 lab (the category denoting the least risk) to do so. But German law requires a researcher to get permission from authorities for such a lab, and to wait 2 months between publicly announcing intended experiments and carrying them out—giving authorities a chance to object. Vogel had ignored both of these requirements. So officials from Hamburg's environmental agency were taken aback when, during a visit to a nearby lab, they looked in at Vogel's setup as well. Their reaction was to put a temporary halt on the work.

Vogel, who belatedly filed an application to carry out the work, could face a fine of up to $60,000. But even that may not be the end of the matter. People living near the university were already riled up over concerns about the safety of a newly built institute for molecular neurobiology, and when Hamburg's senator for science, Leonhard Hajen, heard about Vogel's case he called on the university to conduct "a most severe investigation." The university's explanation of the episode and how it plans to avoid any repeats was due on 15 April. Says Tom Janssen of Hamburg's agency for science and research: "Researchers have to realize that what they think is normal is seen quite differently by people outside the lab."



U. OF MICH. RADIATION LABORATORY

Seeing the Trees And the Forest

Products of the most elaborate space-based radar yet, these maps of vegetation type and biomass for a 30-km swath of Michigan's upper peninsula are based on data collected on 9 April by the Space Radar Laboratory aboard the space shuttle Endeavor. The radar, a prototype for technologies that might eventually fly on an unmanned satellite, broadcasts at three different frequencies, with the radar waves polarized (oriented) in two different directions. How much energy is scattered back to the shuttle radar at each frequency and polarization depends on surface roughness (from ice-covered lakes to various kinds of forest), individual plant shapes (from symmetrical pines to disorderly oaks), and moisture (a measure of biomass). As a result, computer algorithms developed at the University of Michigan were able to turn the scatter patterns into the information displayed in these maps.

Horsing With High Tech

Some of the competitors preparing for the 1996 Summer Olympic Games in Atlanta, Georgia, will have their health carefully monitored so they don't suffer too much from that southern state's heat and humidity. These athletes are the horses training for equestrian events.

Scientists from the Animal Health Trust in Newmarket, United Kingdom, say it can be dangerous to thrust equines from temperate climes into hot, sticky conditions and work them hard. "Unlike human athletes, it is not up to the horse how far it will exert itself. A rider may push a horse too far in the excitement of the competition," says physiologist David Marlin of the Trust. Marlin put horses from chilly, damp environs through their paces on a treadmill in a temperature of 30°C (86°F) and 80% humidity. He found that humidity was a particular problem because it slows evaporation of sweat—horses sweat more than twice as much as humans do—which leads to dangerous overheating.

The results prompted him to test some high-tech ways to monitor the equine athletes during their Olympic training. The first is a combined heart-rate meter, blood-oxygen sensor, and thermometer. The device is mounted under the horse's tail where it beams a light through the skin into an artery near the surface. The spectrum and intensity of the light reflected back gives information on blood oxygen levels and pulse rate, which is then radioed to a nearby observer. Researchers envisage using this device, developed by a company called York Equimed, in combination with another gizmo: the first horse speedometer. A sensor affixed to the rider's helmet emits microwaves that are reflected back by nearby objects and picked up by a signal processor mounted behind the saddle. The speed is then displayed on a wristwatch worn by the rider.

Next August, and again in 1995, Marlin will be taking about 20 horses from across Europe to Atlanta for monitoring. He says that with all these gimmicks, horse fitness tests and clinical exercise tests that are currently done indoors "can be reproduced outside in field conditions."

Tomato of Tomorrow

A ripening controversy over vegetables is about to hit the market. After almost a decade of research, development, and bureaucratic travails, Calgene, Inc. of Davis, California is about to start marketing the "Flavr Savr" tomato, the first food to be genetically altered via molecular biology. At a Food and Drug Administration hearing earlier this month, commissioner David Kessler said approval could come within 90 days.

Foods such as milk and cheese already benefit from the use of biotechnology to enhance production or processing. But Calgene's tomato is the first food to have new genes that could not be gained by conventional plant breeding. One is an antisense or

Seeing red. New, improved tomato looks like a tomato, despite some biotech critics' fears.

"reverse" copy of a gene that codes for the expression of polygalacturonase, an enzyme that breaks down cell walls. This stalls the softening of tomatoes, allowing them to ripen at a more leisurely pace on the vine, enhancing their flavor. (Ordinary tomatoes are picked green and ripened with a blast of ethylene.) The second gene produces a protein which confers resistance to the antibiotic kanamycin, allowing researchers to use the drug to identify successful recombinant plants at an early stage of development; plant cells without the gene are killed when exposed to the drug.

It was the resistance gene that provoked controversy among critics of genetic engineering, as some thought it might be passed on to humans, jeopardizing kanamycin's use as an antibacterial. But studies done by Calgene and others confirmed that "there was no reasonable probability of this happening" because the gene's products get destroyed in digestion, says Tom Churchwell, president of Calgene Fresh, the marketing company based in Evanston, Illinois.

Approval, says Churchwell, will come none to soon. Flavr Savrs, planted last fall in Mexico, California, and Florida, have been harvested since early March, and a "significant quantity" were plowed under while the approval process dragged on. The tomatoes' new gene prolongs marketable life by a week, but scientists have yet to develop life forms that move as slowly as the federal bureaucracy.

New Man in Congress For NIH Funding

As mourners gathered in Kentucky earlier this month for the funeral of former House Appropriations Committee chairman William Natcher (D–KY), who until last month also headed the subcommittee that makes the House's decisions on the National Institutes of Health (NIH) budget, colleagues were picking another low-profile old-timer to replace him on the health appropriations subcommittee. This week Congress was expected to formally vote in the winner: Neal Smith, a low-key Iowa Democrat who has been in Congress since 1959.

What Smith's hand on the NIH purse strings will mean for the agency and biomedical research in general is hard to gauge; he has rarely spoken out on research issues. Tom Dawson, his health aide, says Smith has in the past taken some interest in vaccination programs, women's health (lupus in particular), and rural health initiatives, but that Smith is generally opposed to targeting research to specific diseases for fear of disrupting the overall balance.

Unlike Natcher, Smith will not also head the full committee, which controls all federal science funding. That job has gone to David Obey (D–WI), a younger, more outspoken legislator. Obey is best known in research circles as a vocal opponent of the space station. But for NIH, his impact may be felt most in his support for the Low-Income Energy Assistance Program, which is funded out of the same pot as NIH and is a key issue for voters in Obey's chilly Wisconsin. Although Obey has been generally supportive of health research, more money for the energy program often means less for NIH. With funding expected to be especially tight this year, biomedical lobbyists are bracing for a battle between the new chairmen.

Going gentle on the ozone. McDonnell Douglas idea for new SST.

Second Coming for SST?

As plans for a space station twist in the Congressional winds, the National Aeronautics and Space Administration (NASA) is setting its sights lower in the atmosphere, envisaging up to a thousand supersonic planes crisscrossing the skies by 2015. And a new report from the National Research Council (NRC) on NASA's environmental assessment says that goal is drawing closer.

NASA's High Speed Civil Transport program, budgeted at $197 million this year, isn't a new idea: 20 years ago, similar schemes wilted amid fears about the effects of a supersonic fleet on the ozone layer. SSTs emit oxides of nitrogen (NO_x), which can catalyze ozone destruction. But according to the report, "a new understanding of stratospheric dynamics"—including evidence that chemical reactions can convert NO_x into non-destructive compounds—suggests that ozone and climate may not be as vulnerable as previously thought. What's more, says NASA program director Louis Williams, new combustors for supersonic engines are showing greatly reduced levels of NO_x emissions in NASA tests, and the ability to optimize such engines on computers has raced ahead of '70s technology.

The NRC report, "Atmospheric Effects of Stratospheric Aircraft," did find a few things wanting. For example, it said NASA's use of two-dimensional models could not adequately deal with the circulation and mixing of pollutants in the atmosphere. And there are still plenty of technical obstacles to be overcome, not the least of them being the noise problem. But on the whole, NASA's doing "an excellent job," says William Chameides of the Georgia Institute of Technology, chairman of NRC's committee on atmospheric chemistry.

The economic incentive for a new generation of SSTs is powerful: NASA and U.S. aerospace companies estimate a $200-billion world market for long-haul supersonic passenger jets by 2015. Europeans are also looking to a reborn SST—a consortium of aerospace companies recently announced that it, too, would start looking into a successor to the Concorde.

In the Wings

Last week's announcement that President Clinton will nominate psychologist and statistician Anne Petersen as deputy director of the National Science Foundation (NSF) fulfills the administration's commitment to breaking a 44-year male stranglehold on the top two posts at the foundation (*Science*, 4 February, p. 599). Petersen, vice president for research and dean of the graduate school at the University of Minnesota, was the White House's top choice after a search said to have focused almost exclusively on women. Confirmation is expected by the Senate shortly.

Petersen