# Briefings

*edited by DAVID P. HAMILTON*

## Four Mathematicians Win Field Medals

Whether through spite, sloppiness, or disinterest, Alfred Nobel neglected to create a prize for mathematics—but that oversight hasn't stopped mathematicians from giving prizes to themselves. The most prestigious, the Fields Medals, are awarded every 4 years to mathematicians under 40, and carry a cash award of $15,000 Canadian.

This year's winners include:

- Vladimir Drinfeld of the Institute for Low Temperature Physics and Engineering in Kharkov, U.S.S.R. Drinfeld's recent work has focused on the theory of quantum groups, a branch of mathematical physics.
- Vaughan Jones of the University of California at Berkeley. He discovered the "Jones polynomial," an equation that provides the best method to date for helping mathematicians to distinguish knots from one another.
- Shigefumi Mori of Kyoto University in Japan, whose work in algebraic three-dimensional manifolds recently resulted in the extension of classical theory of algebraic surfaces to three dimensions.
- Edward Witten of the Institute for Advanced Study at Princeton. Most recently, Witten has explored the relations between quantum field theory and the differential topology of two- and three-dimensional manifolds.

## From Crackhouse to Freakhouse

Some cocaine prices have more than doubled recently, leading law enforcement officials to congratulate themselves that drug interdiction efforts are making it harder to buy the stuff. But New York street anthropologist Ansley Hamid (see *Science*, 15 December 1989, p. 1376), offers another, even more felicitous explanation for the price rise: a dwindling pool of crack users.

Hamid, who teaches at the John Jay College of Criminal Justice, says that even before the price increase last year, field workers had trouble finding users who started after 1987. He says that's because a lot of young people have figured out that crack is bad news and aren't being "initiated" into it. So distributors are raising prices to keep their profits up.

But crack-spawned social pathologies are multiplying as dealers adapt to a smaller clientele. Among the disturbing "social organizational developments" observed by Hamid is the "freakhouse," the apartment of an older, crack-using man who supports a resident "harem" of women providing him with sex and drugs. The women also attract male clients, who pay the older man for the privilege of using drugs and "freaking"—an act Hamid describes as "using any and all women sexually."

The freakhouse is a logical response to the contraction of the crack market, Hamid says, since it efficiently organizes the remnants of the crack population by bringing together women who must perform more sex to pay for higher priced crack. Hamid says the setup also demonstrates the higher status of older men, whose income and benefits have tripled in the last two decades, while young women are getting poorer and young men usually can't get welfare.

## Congress Cites Agent Orange Coverup

When a House subcommittee recently reopened the Pandora's box labeled "Agent Orange," it not only sparked a new round of mudslinging over the Centers for Disease Control's aborted 5-year study, it spiced it with suggestions of conspiracy. "A secret 1984 White House strategy to deny federal liability in toxic exposure cases led to the cancellation of a major federal Agent Orange study," states a press release describing the panel's report.* But have congressional watchdogs vented their ire in the wrong direction?

Much of the dispute revolves around arcane issues of epidemiology. In an ideal world, CDC would have matched troop movements with Agent Orange spraying patterns—thereby creating what's called an "exposure index"—and then tested a group of veterans with likely exposure histories for dioxin. Such a process would have allowed CDC to ensure the validity of its exposure index, which could then have been used to correlate Agent Orange exposure with later health problems. When run through a blood test, however, less than 4% of 646 subjects tested positive for dioxin, so the CDC judged that its exposure index was worthless, and the study impossible to conclude.

But after a 14-month investigation chaired by Representative Ted Weiss (D—NY), the committee became convinced that this decision was grievously flawed. Among its charges: CDC ignored advice from an Institute of Medicine panel and improperly excluded from its study servicemen who were most likely to have been exposed to Agent Orange, thereby warping its exposure index; CDC compounded its error by using a flawed blood test for dioxin to validate the index; and the White House obstructed the study's progress—later halting it altogether—because of concerns over the cost of paying compensation to veterans.

Former Reagan Administration officials have denied any wrongdoing. Even leaving aside the question of conspiracy, however, the scientific merits of the Weiss committee's case seem dubious. "Our recommendation, had we been asked, would have been to scrub the study," says Paul Stolley of the University of Pennsylvania, who chaired the IOM advisory panel. "If you can't correctly classify people [as exposed or not exposed], you're out of business. All the error in that study would be in the direction of 'no risk.'"

*"The Agent Orange Coverup: A Case of Flawed Science and Political Manipulation," House Report 101-672, U.S. Government Printing Office, 1990.

## Recombinant Vaccine Finally Gets a Chance

After years of false starts and public relations gaffes, a field trial of a genetically engineered rabies vaccine finally got under way last week on an isolated island off the Virginia shore.

The Wistar Institute, which developed the vaccine, won approval from Virginia health officials more than a year ago to conduct the field test on raccoons (*Science*, 14 July 1989, p. 126) after South Carolina turned thumbs down on the project (*Science*, 30 June 1989, p. 1535). But it's taken the last year to convince the Nature Conservancy, which owns Parramore Island, to go along with the trial.

Susan Bourmique

**Parramore Island**

The vaccine consists of a glycoprotein from the rabies virus inserted into an attenuated strain of the vaccinia virus. The vaccine was injected into fish bait and distributed around the island. Any uneaten bait will be removed after 14 days. Researchers will then observe the raccoon population over the next year for the presence of antibodies to the rabies virus.

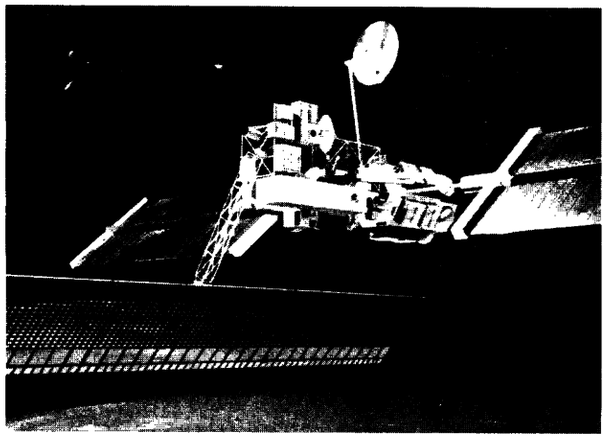
The committee's recommendations hardly reflect these scientific concerns. The panel would require the Department of Defense to create an exposure index based on troop records it says the CDC ignored. This index would then be used by a private organization to carry out a full epidemiological study of Agent Orange's health effects.

## A Round of Applause (Sort of) for EOS

NASA hasn't been hearing many kind words of late, but on 21 August the agency did earn a few plaudits from the National Academy of Sciences. A new NAS report* on federal global change research gave the agency generally high marks on its plans for the Earth Observing System (EOS), a complex of new remote sensing satellites expected to cost some $30 billion over the next 15 years.

"NASA is approaching this in the right way," says the Academy's EOS panel chairman, D. James Baker of the Joint Oceanographic Institutions, Inc.

In particular, Baker and his fellow panelists tentatively defended the agency's much criticized plan to concentrate most of its new remote sensing instruments on a handful of massive platforms in polar orbit. Many space scientists have argued that it would be far better to distribute the instruments among maybe half a dozen smaller satellites, lest a single burned-out widget decimate half the program. Breaking up the instrument package would also allow NASA to place satellites in orbits optimally suited for their particular instruments.



While many panel members were indeed suspicious of NASA's tendency to gold-plate its projects, they finally concluded that the EOS-A platform, now planned for launch in 1998, is a good idea because so many of its cameras and sounding instruments will be looking at the same place at the same time. But the panel saw considerably less need to cluster instruments on EOS-B, now planned for launch in 2000, and urged NASA to consider dividing them up.

The panel also urged NASA to give continuing high priority to a series of small, specialized "Earth Probes" intended to monitor ozone depletion, tropical rainfall, and other such climatological indicators in the 1990s—even if tight budgets force a delay in the polar platforms. "The group felt very strongly about that," says Baker. "These probes are essential for the global change program."

*"The U.S. Global Change Research Program: An Assessment of the FY 1991 Plans," National Academy Press, Washington, D.C., July 1990.

## A Fishy Kind of Pollution Detector

Coal miners, the stories go, used to take canaries into the mines to check for gas leaks. If the canaries stopped singing, the miners knew it was time for a speedy exit. Now, scientists in Bournemouth, England, have taken the same idea underwater, where they're using an African fish to look out for river pollutants.

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Trout are the fish of choice to monitor pollutants because toxins cause changes in their breathing. But because they can prove elusive—and because they're lethargic when the water gets cold—the British ecologists have settled instead on the West African elephant fish, *Gnathonemus petersii*. These exotic sounding creatures produce electrical discharges that make them easy to track. Better yet, they never get sluggish, because they are tropical fish that must live at a balmy 27°C all year round.

In its native Nigeria, the 4-inch fish, named for its trunk-like lower lip, lives in water so muddy that eyes are of little use. Instead, it gathers information by emitting a continuous stream of electrical pulses from modified muscles around its tail. A contented fish puts out between 300 and 500 pulses a minute, but if it becomes distressed by the presence of pollutants, the rate shoots up to more than 1000 pulses a minute.

The water company for Bournemouth, on England's south coast, has enlisted a team of 20 elephant fish to monitor the water the company extracts from the River Stour. Each fish at the company's laboratory lives in its own small tank which is continuously fed with warmed river water. Sensors in the tanks pick up the electrical pulses and pass them to a computer. If more than half the fish suddenly increase their electrical pulse rate, the computer sounds an alarm. Scientists then step in to assay the water and, if necessary, stop the pumps.

## A New Fight Over Fetal Tissue?

Fetal tissue research is back in the headlines. Representative Henry A. Waxman (D–CA) last week announced his intention to override the Bush Administration's funding ban on fetal tissue transplant research. By inserting the override provision into legislation needed to keep the National Institutes of Health in business, Waxman has declared that he's spoiling for a fight to reverse the ban this year.

Secretary of Health and Human Services Louis W. Sullivan imposed the funding ban on 2 November, despite the judgment of an HHS advisory panel that such research, properly conducted, would not encourage abortions (*Science*, 10 November 1989, p. 752).

In addition to reversing the ban, Waxman's legislation would sharply curtail Sullivan's ability to restrict fetal tissue research. HHS would be limited to contesting specific research protocols, and then only if the secretary convenes a new advisory body to examine the ethical issues particular to the research at hand.

The legislation faces an uphill battle. The Bush Administration has shown no sign of changing its tune on the fetal tissue issue, and congressmen opposed to any kind of research on fetal tissue from induced abortion are certain to contest Waxman's plan when it reaches the floor of the House.