RANDOM SAMPLES

edited by CONSTANCE HOLDEN

Canadian Research Council Won't Appeal

An Indian-born physicist has blackened the eye of Canada's National Research Council (NRC) by winning a case of racial discrimination that he brought before the country's Human Rights Commission 5 years ago. The NRC has decided not to appeal the 21 August ruling by the commission's three-person tribunal.

The NRC has agreed to a variety of acts of restitution, including a public apology to the scientist, Chander P. Grover. It has appointed him to a management position and awarded him $5,000 for hurt feelings. It has been ordered to pay Grover's legal fees, which could top $70,000.

Furthermore, in a first for the Human Rights Commission, the tribunal has recommended that evidence be turned over to the attorney general for criminal prosecution of several NRC employees under the Canadian Human Rights Act.

Grover, 50, came to Canada in 1978 and joined the NRC in 1981. He started having problems with the management after the death of his supervisor, world-renowned optics expert Gunter Wyszecki. Grover first lodged a complaint in 1987 alleging discrimination on the basis of his race, color, and national origin, after he was passed over for promotion and then deprived of responsibilities and laboratory space. At the time, none of the approximately 43 key management jobs at NRC was held by a member of a "visible minority."

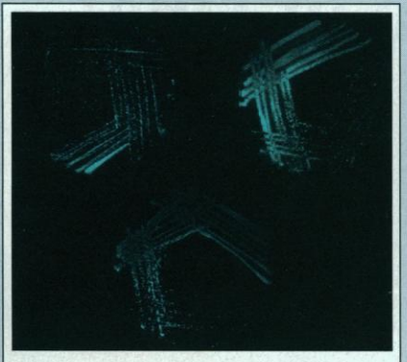
According to the ruling by the human rights tribunal, the actions of Grover's supervisors were "deliberate and calculated to demean his career status." The ruling depicts NRC management as unreliable and evasive, and says it attempted to coerce witnesses. It portrays some NRC witnesses as delivering evidence that was "in many instances vague, contradictory, and lacking in detail."

Nevertheless, Grover is still unhappy, claiming that the NRC is attempting to evade the thrust of the tribunal's ruling. Both apologies fail to acknowledge discrimination, he says, complaining that the mea culpas only cite budget restrictions, organizational restructuring, and shifts in research priorities. Furthermore, Grover downplays his appointment as head of a new research team, saying it is only a "make-work group" whose budget is a rejuggling of existing salaries. And he says the NRC is also continuing petty acts of discrimination. Why not quit? "I cannot give up the fight," he says.

Fireflies May Light Future for Biosensors

Toxicologists have long dreamed of a fast, cheap way to measure minute quantities of contaminants in the environment. Thanks to some glow-in-the-dark bacteria, they soon may have it.

McGill University microbiologist Michael DuBow is developing genetically modified strains of *Escherichia coli* that glow when challenged with aluminum and other metals. DuBow's system relies on luciferase, an enzyme that lights up fireflies and several species of marine bacteria. Using a technique developed in the mid-1980s, DuBow and graduate students Lina Guzzo and Scott Briscoe randomly inserted the gene that codes for luciferase (*lux*) into *E. coli* and created a library of about 3000 clones. They exposed the clones to aluminum and found that one began to luminesce at a rate higher than the others. It turned out that aluminum—as well as some other metals—was able to increase transcription of a gene that codes for flagellin, a protein important to bacteria motility. The *lux* gene was inserted in the flagellin gene, so it too switched on in the presence of metal ions.



M. DUBOW

Blazing biosensors. *E. coli* colonies glow in the presence of aluminum.

Armed with batches of *E. coli* that express the *lux* genes, DuBow is constructing *E. coli* biosensors that he hopes will be able to detect metals in the environment. Currently, he's testing a prototype in aluminum-laced tap water. Similar efforts are afoot elsewhere. Georges Belfort, director of the bioseparations research center at Rensselaer Polytechnic Institute, and graduate student Lia Tescione are developing an *E. coli* system that contains a gene sensitive to mercury.

The challenge will be to make these biosensors work in the field, says Jim Kramer, an aquatic geochemist at McMaster University, who cautions: "Just about every kind of fancy sensor is prone to artifacts." In the event that his glowing biosensor does fail, DuBow says he sees another potential use for his souped-up *E. coli*: identifying human genes that are induced by metals.

GAO Shoots Down Army on Patriot

It has taken 19 months for the smoke to clear, but a new analysis by the General Accounting Office (GAO) indicates that critics were right on target when they took aim at the purported prowess of Patriot missiles during the Persian Gulf war.

The hyping of the Patriot began during the conflict when the media reported official Administration statements to the effect that the missiles were downing most of the Scud warheads that Iraq fired at Israel and Saudi Arabia. After the war, it was the Army and the Patriot's manufacturer, Raytheon, that claimed the missile had managed to kill more than 90% of the Scuds. But, as reported in *Science* (3 May 1991, p. 640), Theodore Postol, a weapons expert at the Massachusetts Institute of Technology, found weaknesses in this esti-mate and charged that few, if any, Patriots had actually destroyed Scud warheads.

Postol argued that it would be a mistake for Congress, which was considering putting more money into antimissile technology, to rely on the advocates of a technology to assess its performance. He then called for an independent review.

Responding to the criticism, U.S. officials dropped the Patriot's estimated warhead kill rate to 80% in Saudi Arabia and 50% in Israel. Later, during a congressional inquiry chaired by Representative John Conyers (D–MI), they lowered the numbers further—to 70% and 40%.

Last week, the GAO released its own findings from a review of Army data, as requested by Conyers. The conclusion: There is "strong evidence" in only 9% of cases that Scud warheads were stopped by Patriot missiles, and weaker evidence for the success of an additional 16% of anti-Scud attacks. The GAO report confirms another point Postol sought to make—that relatively simple eccentricities in the Scud's behavior made them very difficult to target.

The Defense Department isn't buying GAO's conclusions. It says the report is based on "the opinion of one auditor, supervised by three others," whereas the Army's analysis was produced by 27 technical experts and a "jury" of nine judges. But the Pentagon grasps at one positive aspect of the new study, saying it "repudiates critics who claim no evidence exists to support a single successful Patriot engagement during the Gulf war."