

## Animal patent report lacks support

Last April, the U.S. Patent and Trademark Office ruled that genetically engineered animals may be patented as "compositions of matter," triggering a heated debate over the economic and ethical implications of private ownership of genetic traits. In response to the ruling, members of the House and Senate introduced bills to put a two-year moratorium on the granting of such patents, and a House subcommittee solicited testimony from more than 30 expert witnesses (SN: 8/1/87, p.69).

Last week, with moratorium legislation still pending, the House Subcommittee on Courts, Civil Liberties and the Administration of Justice opted to defer discussion on a draft report summarizing nearly a year of congressional fact-finding. The controversial report, written by the staff of the subcommittee's chairman, Robert W. Kastenmeier (D-Wis.), concludes that a moratorium on animal patents would be "unwise and unnecessary." Indeed, it says, farmers and others should expect to pay royalties for the use of genetically engineered animals, and perhaps for any offspring they produce.

The subcommittee postponed discussion of the 225-page report at the last minute, apparently because some ranking members found its conclusions unacceptable. Some staff say the report appears dead. The stalemate, which features an unusual alliance of farmers and animal rights activists, is evidence of the political, economic and moral complexity of the animal patent issue.

"I think there's a lot of people for a lot of different reasons who think that maybe we are moving much too quickly into an uncharted area," says Howard Lyman, a consultant for the National Farmers Union, a Washington, D.C.-based group that supports a moratorium on animal patenting. "I would not be a bit surprised if some members of the committee who support the moratorium bill will now move for action on that."

A spokesperson for Kastenmeier denies the report is dead, saying, "Members haven't had time to carefully review the draft, so it was put off." But several sources familiar with the report's release told SCIENCE NEWS that discussion was canceled when it became clear that there was insufficient subcommittee support for its conclusions. "I don't think the report is going to be brought up again," says one congressional aide. "It got brought up all of a sudden and it got dropped all of a sudden." In any case, critics say, the report leaves unresolved a number of questions.

"I see [the report] as a mass of obfuscation and an attempt to open the door for the biotechnology industry prematurely," says Michael Fox, scientific adviser to the Washington, D.C.-based Humane Society

of the United States, which supports a moratorium. "It says that animals have been improved through genetic manipulation. Well, that's not the complete story."

Fox says researchers are not only perfecting ways of engineering healthier animals, but also developing for research purposes animals with a variety of painful diseases. In addition, opponents of animal patents have expressed concern that such patents may result in an extraordinary concentration of economic power among a few corporations. The report counters that a patent only precludes others from taking advantage of a proprietary technology, without necessarily condoning its use. It contends that such concerns can be dealt with by current animal care guidelines and by appropriate regulatory agencies.

The report does recommend minor legislative amendments to current patent law, including a special exemption that would allow small farmers to breed pat-

ented animals for their own use without liability. That exemption has the support of some farm groups, including the Washington, D.C.-based American Farm Bureau Federation, which opposes a moratorium. Others, however, note that nowhere in the report are "small farmers" defined.

Overall, the report argues, "adoption of a moratorium would stifle — if not extinguish — important innovations in medical research and agriculture without justification." It says that without the 17-year guarantee of exclusive rights conferred by a patent, companies would lose incentive to use experimental gene-transfer techniques to produce beneficial "transgenic" animals — animals created with genes from unrelated species. Such techniques, still far from perfected, so far have been used to create mice that can secrete medically useful drugs in their milk and pigs with leaner meat.

Seventeen applications for patents on animals are pending in the Patent and Trademark Office, according to officials there. Reviews of the first applications may be completed this year. — R. Weiss

## Legacy of fire: The soil strikes back

Slash-and-burn agriculture has been taking much heat from scientists concerned with the loss of tropical rain forests and with the accumulation of carbon dioxide in the atmosphere. But new studies of experimental forest fires in California are suggesting that widespread burning of vegetation may be even more dangerous to the environment than scientists had expected.

Researchers have long known that fire is a factory for chemicals. As biological material burns, the combustion process produces carbon dioxide, methane, nitric oxide, nitrous oxide and other chemicals that play important roles in the atmosphere. Now, evidence indicates that months after the flames are gone, the burned soil continues to emit high levels of nitric oxide (NO) and nitrous oxide (N<sub>2</sub>O).

"Nitrous oxide and nitric oxide are two of the most environmentally important gases in the atmosphere," says Joel S. Levine, an atmospheric chemist at NASA Langley in Hampton, Va. Nitrous oxide is a "greenhouse" gas that traps infrared radiation from the earth, leading to a global temperature increase. In the stratosphere, this gas also converts to a form that helps destroy ozone. Nitric oxide, on the other hand, contributes to acid precipitation.

According to Levine, microbes living in the burned soil produce these two gases. The soil is enriched in ammonium, created when heat breaks down protein in the burning vegetation. The bacteria convert the ammonium's nitrogen into N<sub>2</sub>O and NO.

These findings, which will appear in the April 20 JOURNAL OF GEOPHYSICAL RESEARCH, are based on studies of a 1986 chaparral fire in California (SN: 10/4/86, p.213). Levine and colleague Iris Anderson, a visiting researcher at Langley, found that gas emissions from burned areas were often 10 times higher than the levels coming from the unburned areas. And the levels remained high for up to six months.

Between 2 and 5 percent of the globe is set aflame each year, largely because of agricultural practices. While farmers burn rain forests in the Amazon region to create new croplands, herders in the savanna regions of Africa and South America routinely burn the tall grass there to create space for grazing grass.

Such burning produces long-term effects that scientists will have to consider when studying large vegetation burns, Levine says. Other scientists agree that the California study does suggest fires can increase microbial gas production from soils. However, some of these researchers say they suspect the situation may be different in the tropics, where most vegetation is burned.

One study, soon to be reported in THE JOURNAL OF ATMOSPHERIC CHEMISTRY, indicates that burned areas on the tropical savanna do *not* emit higher levels of trace gases after the fire. According to one of the investigators in that study, Wei Min Hao of the Max Planck Institute for Chemistry in Mainz, West Germany, scientists will have to focus experiments on the tropics to understand how burning affects the atmosphere. — R. Monastersky