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LETTERS

Frog Endangerment

In their letter "Tropical poison frogs," Charles W. Myers and John W. Daly (19 Nov., p. 1193), who are undoubtedly experts in the biology of dendrobatid frogs, provide incorrect information about the meaning of the frogs' listing under the Convention on International Trade in Endangered Species (CITES).

All dendrobatid frogs of the genera *Dendrobates* and *Phyllobates* are listed in CITES Appendix II, which does *not* equate to "threatened" status, nor does it require evidence of "endangerment." The listing, designed to regulate trade in vulnerable species, does require that an exporting country first make a judgment that trade will not be detrimental to the species before issuing an export permit. If range countries are refusing to issue such permits, it may be because they have made determinations that trade from their populations is not sustainable, or because they have other, stricter domestic measures separate from CITES which ban such trade, a sovereign right of every nation with or without international treaties.

Perhaps we in the regulatory agencies need to do a better job in working with the scientific community to explain what trade is regulated internationally, and why. Cooperative efforts between scientific researchers and conservationists are crucial if we are to conserve tropical biodiversity and the genetic bank it encompasses.

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Smallpox Virus Stocks

Having thus far stayed out of the debate about smallpox destruction, I am moved to comment on the thoughtful Policy Forums published recently in *Science* (19 Nov., pp. 1223 and 1225) where two sets of eminent virologists (B. W. J. Mahy *et al.* and W. K. Joklik *et al.*) come to such opposite conclusions.

I am persuaded by the arguments of Mahy *et al.* for destroying existing stocks of the virus. The opponents are not really arguing against destruction, but rather for continued research. They might even agree that if no research is being done on the virus, it might as well be destroyed.

I find it hard to believe that we need to, or even will, continue research on a virus whose release from containment would be such a disaster while its present threat is nil. The opponents of its destruction propose a broad program of "studying in detail [smallpox's] molecular pathogenesis." They apparently believe that this can be done in a secure P4 facility. I have seen such facilities, and they are cumbersome, to say the least. I cannot see carrying out a wide-ranging program of molecular analysis on an eradicated disease in such a difficult and expensive facility. If any other facility were used, the problem of security would be serious: the opponents of destruction themselves note that in the laboratory in Birmingham, England, where escape occurred, "simple but essential administrative precautions were ignored." The sole insurance against a repeat would be the type of vigilance that only a P4 facility can maintain over the long haul.

While I agree that a deeper understanding of pathogenesis will help counter microbial infections, I doubt that we so desperately need to study smallpox that it would be worth the risk inherent in the experimentation. Much of the value of research can be gained from studying related viruses, especially vaccinia. Eradication of the virus as well as its disease will better serve the long-term interests of humanity as the proponents of destruction have argued.

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The Importance of Restaurants in Superconductivity Research

We were surprised to read in Gary Taubes' Research News article "Holding the lines in high-temperature superconductors" (17 Sep., p. 1521) that the "ultimate solution to the problem" of pinning in high-T_c superconductors "was suggested at a Chinese restaurant in Anaheim, California, in March 1990" when "[John] Clem suggested that since a vortex is a linear object, 'a really keen way to immobilize it' . . . would be to create . . . 'a line-like potential well, a line of normal non-superconducting material, a microscopic hole through the super-

conductor such that the vortex core could sit in it.' " Taubes also writes that "the best tool for drilling a hole . . . suggested by IBM physicist Alan Marwick, was a high-energy ion, which could plow a long track through the material's crystal structure."

We must emphasize that this idea of a "hole solution" did not originate in the United States, but in France, and not in 1990, but in 1988. The researchers in our group (Laboratoire de Cristallographie et Science des Matériaux–l'Institut des Sciences de la Matière et du Rayonnement and the Centre Interdisciplinaire de Recherche sur les Ions Lourds) had several meetings in April 1988, not in a restaurant (although we also appreciate restaurants!), but at the University of Caen to discuss the possible pinning of vortices by creating nuclear tracks by heavy ions in YBCO. The first experiments were carried out 3 months later at the Grand Accélérateur National d'Ions Lourds by bombarding the "123" superconductor with xenon ions.

The first results were submitted at the end of 1988 and published early in 1989 (*1*). In these two articles, the creation of columnar defects (nuclear tracks) in a high-T_c superconductor is shown for the first time, and the increase of the critical current of YBCO by a factor of 3.5 by heavy ion bombardment is also demonstrated.

Our group also performed lead ion bombardments on YBCO in 1990 (maybe while our American colleagues were having discussions at the Chinese restaurant) that was published at the beginning of 1991 (*2*).

The next time we visit California, we will try this famous Chinese restaurant (if we can get the address), and perhaps there we will get some new ideas for the research and improvement of high-T_c superconductors.

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References

1. D. Bourgault *et al.*, *Phys. Rev. B* **39**, 6549 (1989); D. Bourgault *et al.*, *Nucl. Instrum. Methods Phys. Res.* **B42**, 61 (1989).
2. V. Hardy *et al.*, *ibid.* **B54**, 472 (1991).

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Is Dioxin a Human Carcinogen?

The statement in the article "Dioxin tied to endometriosis" by Ann Gibbons (Research News, 26 Nov., p.1373) that "[i]n human beings, there is evidence that high doses of [dioxin] cause cancer. . ." is incorrect. Dioxin's link with human cancer has not been established. Among others, the International Agency of Research for Cancer (IARC) considers the data "inadequate" for such a conclusion (*1*), and the particular publication that Gibbons' article is based on (*2*) clearly states that "[a]lthough dioxin is a carcinogen and teratogen in rodents . . . the true biologic effects . . . in humans are not clear."

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References

1. *Evaluation of the Carcinogenic Risk of Chemicals to Humans* (IARC Monogr. Suppl. 7, International Agency for Research on Cancer, Lyons, France, 1987), p. 350.
2. S. E. Rier, D. C. Martin, R. E. Bowman, W. P. Dmowski, J. L. Becker, *Fundam. Appl. Toxicol.* **21**, 433 (1993).

Response: Five recent epidemiological studies (*1*) show an increased risk of cancer for humans who have been exposed to high concentrations of dioxin. Several studies also have shown that dioxin causes cancer in both sexes of four species of animals exposed to dioxin—mice, rats, guinea pigs, and fish. A panel of outside experts in epidemiology recently reviewed the data on dioxin and agreed that "the human data are compatible with the animal data," says toxicologist Linda Birnbaum, director of the Environmental Toxicology Division at the Environmental Protection Agency's Health Effects Research Laboratory and one of the leaders of the agency's reassessment of dioxin risk.—***Ann Gibbons***

References

1. P. A. Bertazzi *et al.*, *Epidemiology* **4**, 398 (1993); M. A. Fingerhut *et al.*, *N. Engl. J. Med.* **324**, 212 (1991); M. Kogevinas *et al.*, *Cancer Causes Control* **4**, 547 (1993); A. Manz *et al.*, *Lancet* **338**, 959 (1991); A. Zober *et al.*, *Int. Arch. Occup. Environ. Health* **62**, 139 (1990).

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Accelerator Power Plants

An accelerator-driven energy production system at Los Alamos, as described by Peter Aldhous in News & Comment article "Rubbia floats a plan for accelerator power plants" (26 Nov., p. 1368), could provide an "unlimited" energy source and concurrently burn both long-lived fission products and highly radioactive actinide waste. The system essentially would have no long-term high-level waste stream. The thorium-uranium cycle would be much more practical in this regard than is the uranium-plutonium cycle. We also believe it could be economically competitive.