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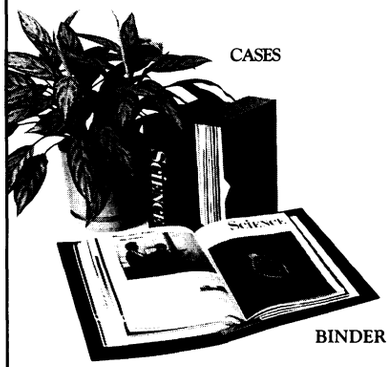

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conductor such that the vortex core could sit in it.' " Taubes also writes that "the best tool for drilling a hole . . . suggested by IBM physicist Alan Marwick, was a high-energy ion, which could plow a long track through the material's crystal structure."

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.

Bernard Raveau
Laboratoire de Cristallographie et Science des Matériaux, Centre National de la Recherche Scientifique, Institut des Sciences de le Matière et du Rayonnement, 6 Boulevard du Maréchal Juin, 14050 Caen Cedex, France

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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."

Alex Apostolou
Toxicology Consultant, 5201 Yosemite Drive, Rockville, MD 20853

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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**

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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.