Letters

Chloral Hydrate Warning

It has come to my attention that thousands of children each year are given chloral hydrate as a sedative for dental and other medical practices. It is usually administered as a syrup or in fruit punch. Dentists consider this procedure safe because of the few adverse effects observed in children receiving this drug. Chloral hydrate is, however, a toxic metabolite of the rodent carcinogen trichloroethylene (TCE) and is a mutagen and chromosome-damaging agent (*1*). The dose typically administered to young children is 900 milligrams (mg). Using a typical weight of 15 kilograms (kg), I calculated this dose to be 60 mg/kg. This single dose is equivalent to drinking 1 liter of water a day contaminated with 5 parts per billion of TCE (the maximum contaminant level allowed by the Environmental Protection Agency) for 1000 years, if one assumes that half the TCE is converted to chloral hydrate in the body. These calculations indicate to me that we should be concerned about cancer induction resulting from the use of chloral hydrate in pediatrics. Further, they indicate that we may be missing a major risk factor for the induction of cancer in humans, that is, widely used, supposedly "safe" drugs, while spending inappropriate amounts of money on trivial cancer risks. State and federal regulatory agencies may therefore find it appropriate to review the use of chloral hydrate and to evaluate the health risk associated with its use.

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Magnetic Fusion

In his article "Energy R&D funding shift urged" (News & Comment, 7 Sept., p. 1101), David P. Hamilton incorrectly states that the Department of Energy's (DOE's) magnetic fusion program has suffered a constant-dollar cut of only 7% since the late 1970's. In fact, adjusted for inflation, the program's annual budget has fallen 49% since 1980.

Hamilton's article reports on a National Research Council (NRC) study, *Confronting Climate Change: Strategies for Energy Research and Development*. The study correctly points out that federal funding for energy R&D has declined greatly and that the government has not encouraged the development of alternatives to fossil fuels. Now, everyone watching the evening news is aware of the political and military costs of our dependence on fossil fuels. Someday, the economic and environmental costs of our dependence will also become generally evident.

The NRC report calls for a greater emphasis on R&D relating to solar and renewable energy sources. Indeed, significant advances have been made in these areas over the last decade, and they hold great promise for the future. Substantial progress has also been made in the development of magnetic fusion. In fact, over the past 20 years, physicists have improved the quality of magnetically confined plasmas 1 millionfold.

The progress of fusion science and technology has been such that the next steps require very large machines, costing hundreds of millions of dollars. Now, as distinct from most other energy technologies, investment for each fusion experimental device is too large, and the return on the investment too long, to expect anyone other than national governments to pay. This summer an independent review group, the Fusion Policy Advisory Committee, recognized that funding is restricting progress in fusion and has recommended to DOE that the budget for magnetic fusion energy be doubled over the next 5 years, enabling the construction of a burning plasma experiment and U.S. participation in the International Thermonuclear Experimental Reactor. Considering the progress being made and the evident future need for reliable, environmentally attractive energy sources, this is surely not the time to cut funding for magnetic fusion.

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Response: The DOE magnetic fusion budget is indeed 44% smaller in constant dollars than it was in 1979. Those cuts fell disproportionately on the capital and construction budgets. The NRC panel, however, used National Science Foundation data that excludes capital and construction costs and came up with a decrease in fusion R&D of only 7% in 11 years. (I apologize for mistakenly attributing this 7% decline to DOE's entire magnetic fusion program.) NRC study director Mahadevan Mani contends that the panel's recommendation to divert fusion spending to alternative energy programs isn't related to these budget figures, which were provided only for comparison, but to its judgment that scarce research dollars should be devoted to energy technologies with shorter time horizons.

—DAVID P. HAMILTON

International Journal of Health Services

Ann Gibbons, in her article "FDA publishes bovine growth hormone data" (News & Comment, 24 Aug., p. 852), aims at discrediting Samuel S. Epstein's critique of the Food and Drug Administration's regulatory policies by referring to the *International Journal of Health Services*—where the article by Epstein was published—as a little known (and non–peer-reviewed) journal. Gibbons' article is wrong on both counts. The *International Journal of Health Services* is one of the largest health policy journals in the United States, with the largest international readership among journals of this nature. Its board and editorial consultants include leading figures on health policy in this and other industrialized nations. It is also a peer-reviewed journal. Its quality is guaranteed by an international body of referees. All papers—including Epstein's—are reviewed by at least two referees. The ratio of rejected versus accepted articles is one of the highest among scientific journals.

The *International Journal of Health Services* does not support or reject any of the conclusions reached by its contributors. Two well-regarded scientists who refereed Epstein's paper advised its publication. We will soon publish Monsanto's response and responses from other contributors regarding the issues raised in Epstein's article.

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Biotechnology, Human Disease, and the FDA

It was disconcerting to learn from Leslie Robert's excellent article "L-Tryptophan puzzle takes new twist (Research News, 31 Aug., p. 988) that the Food and Drug Administration (FDA) has known for months of the potential link between contaminated L-tryptophan and genetic engi-

neering but did not disclose the information to the public. According to the article, FDA officials were "apparently hoping to keep the recombinant link quiet until they could determine whether it in fact did play a role in the outbreak [of eosinophilia myalgia]." Furthermore, an FDA scientist quoted in the article gave the "impact on the industry" as a reason for delaying release of the information.

The idea of FDA scientists suppressing vital health information out of a concern for the impact on the biotechnology industry does little to inspire confidence in the FDA as a regulator of this new technology. At a minimum, it raises the question of whether other potential links exist between genetic engineering and human disease that FDA is hoping to keep quiet. Beyond that, it highlights the FDA's conflicting roles as both promoter and regulator of biotechnology.

It is well known that the FDA has been an energetic advocate for the biotechnology industry. The FDA's representatives have appeared in many forums extolling biotechnology's benefits and glossing over its risks. Considering its enthusiasm for the technology, FDA's apparent desire to protect the industry from the black eye of a potential connection to a major disease outbreak is no surprise. But, in fact, such efforts do the industry no favor. The public will not accept this technology unless it is confident that government regulators are committed to prevent its risks. That confidence is undermined where the FDA appears to be protecting the biotechology industry rather than the public health.

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International Congress of Entomology

Socrates was condemned for "popularizing science that might lead to skepticism or disbelief." Science continues to be the victim of censorship by nonscientific institutions. Religious authorities suppressed progress in astronomy, attacked evolutionary theory, and have even promoted legislation against the teaching of evolution. Hitler and Stalin imposed political dogma on geneticists and anthropologists. In the United States, physicists have been persecuted for political reasons, and today creationists mix religion and science with abandon. Scientists cannot escape or ignore institutional intrusion on the scientific functions of the world community.

Scientists must defend the freedom to express ideas, not just about genetics, anthropology, or physics, but any idea honestly presented for debate. We need not dwell on the repression of the past, but we must demand that scientific meetings be held in an atmosphere of intellectual freedom. We must not allow ourselves or our scientific societies to be used to legitimatize repressive governments.

The government of the People's Republic of China, through the Entomological Society of China, is seeking endorsement of the International Congress of Entomology that is scheduled for Beijing in 1992. That same government drove astrophysicist Fang Lizhi into refuge in the U.S. embassy, killed or imprisoned student protestors, severely limited foreign travel by university graduates and sent the freshman class of Beijing University away for a year of indoctrination.

We believe that, as scientists, we all have a special obligation to protect freedom of expression, in the same way that attorneys have a special obligation to protect the rule of law. The obligation is not partisan, it is a fundamental professional ethic. Open discussion is an integral part of the scientific process. Entomological societies must withhold approval of meeting in Beijing, and other disciplines should avoid meetings there until it becomes clear that new ideas can be expressed without fear of reprisal.

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Erratum: In the report "Structural transitions upon ligand binding in a cooperative dimeric hemoglobin" by William E. Royer *et al.* (3 Aug., p. 518), the fourth sentence of the last paragraph on page 518 was incorrectly printed. It should have read, "In the CO structure, the phenyl group is extruded from the heme pocket and is instead in the subunit interface in close contact with $Thr^{72'}$."

Erratum: In the report "Birth of projection neurons in adult avian brain may be related to perceptual or motor learning" by Arturo Alvarez-Buylla *et al.* (21 Sept., p. 1444), parts B and C in figure 1 were transposed. The legend is correct.