LETTERS

The Tris Ban

Philip H. Abelson's editorial "The Tris controversy" (8 July, p. 113) may leave the reader with the impression that the Consumer Product Safety Commission's (CPSC) ban on Tris-treated sleepwear was taken in haste, that the chain of evidence leading to the ban was weak, and that the case against Tris, particularly in the legal arena, is tenuous. To the contrary, the evidence establishing Tris as a potent carcinogen, together with the legal precedents that have been established in similar cases, should sustain the ban of Tris-treated children's sleepwear.

Although Abelson suggests that the National Cancer Institute (NCI) tests on Tris were weak, the NCI Clearinghouse on Environmental Carcinogens (a committee of outside experts) concluded that the tests unambiguously demonstrated Tris to be a carcinogen. As for the applicability of these tests to predicting human carcinogenicity, at least three federal regulatory agencies (the Environmental Protection Agency, the Occupational Safety and Health Administration, and the Food and Drug Administration) and NCI have espoused the position that animal tests provide the best currently available evidence about the potential of chemicals to cause cancer in humans (*1*). In addition, the courts have increasingly agreed that "[a]lthough extrapolation of data from mice to men may be quantitatively imprecise, it is sufficient to establish a 'substantial likelihood' that harm will result" (*2*). Moreover, "where the harm envisaged is cancer, courts have recognized the need for action based upon lower standards of proof than otherwise applicable" (*3*). Thus, Abelson's references to weaknesses in the evidence should not be read to suggest that the courts will require more of a showing by CPSC to justify the ban on Tris. Instead of requiring what have been characterized by the courts as "impossible proofs" (*4*), it becomes ever more apparent that in the area of protecting the public against exposures to carcinogens, "the statutes—and common sense—demand regulatory action to prevent harm, even if the regulator is less than certain that harm is otherwise inevitable" (*5*).

The NCI carcinogenicity evidence, the capability of Tris to produce heritable mutations in eukaryotic cells (*6*), the demonstrated ability of Tris to be absorbed from treated fabric through human skin (*7*), and the observation that Tris applied to the skin of rabbits caused

aspermatogenesis should be ample evidence of the possible tragedy which may result from having used Tris as a flame retardant in children's sleepwear. If anyone can be criticized for the Tris imbroglio, it is Congress for not requiring that flame-retardant chemicals be demonstrated to be safe, and the industry for not testing Tris before exposing more than 60 million children to it.

ROBERT H. HARRIS
Toxic Chemicals Program,
Environmental Defense Fund,
Washington, D.C. 20036

References and Notes

1. *Fed. Reg.* **42**, 19997 (15 April 1977); *ibid.* **41**, 21402 (25 May 1976); *General Criteria for Assessing the Evidence for Carcinogenicity of Chemical Substances* (Subcommittee on Environmental Carcinogenesis, National Cancer Advisory Board, Washington, D.C., 1976); Occupational Safety and Health Administration, *Draft Notice of Proposed Rulemaking, Regulation of Certain Toxic Materials: Identification, Classification and Regulation of Toxic Materials Posing a Potential Occupational Cancer Risk to Workers* (Washington, D.C., 1977).
2. Environmental Defense Fund *v.* Environmental Protection Agency, 510 Fed. Rep., 2nd ser. 1292 (U.S. Cir. Ct., D.C., 1975), p. 1299 (for aldrin and dieldrin). See also Society of the Plastics Industry, Inc. *v.* Occupational Safety and Health Administration, 509 Fed. Rep., 2nd ser. 1301 (2nd Cir. Ct., 1975), p. 1308; Synthetic Organic Chemical Manufacturing Association *v.* Brennan, 506 Fed. Rep., 2nd ser. 385 (3rd Cir. Ct., 1974); certiorari denied, 96 Supreme Ct. 163 (1975).
3. Certified Color Manufacturers Association *v.* Mathews, 543 Fed. Rep., 2nd ser. 284 (U.S. Cir. Ct., D.C., 1976), pp. 297–298.
4. Environmental Defense Fund *v.* Environmental Protection Agency, 510 Fed. Rep., 2nd ser. 1292 (U.S. Cir. Ct., D.C., 1976).
5. Ethyl Corporation *v.* Environmental Protection Agency, 541 Fed. Rep., 2nd ser. 25 (U.S. Cir. Ct., D.C., 1976).
6. A. Blum and B. N. Ames, *Science* **195**, 17 (1977).
7. R. W. Morrow, C. S. Hornberger, A. M. Kligman, H. I. Maibach, *Am. Ind. Hyg. Assoc. J.* **37**, 192 (1976).

Lovins on "Lovins' Fever"

In response to Robert Nathans' three points supporting his diagnosis of "Lovins' fever" (Letters, 12 Aug., p. 618) in the excellent article by Allen L. Hammond and William D. Metz (Research News, 15 July, p. 241):

1) It is hard to make a persuasive case that appropriate design and capital-transfer schemes cannot make dispersed solar systems as attractive in cities and for poor people as in suburbs and for rich people. Higher load density may even improve the economics (*1*). It is also difficult to reconcile the uncited "examination" of decentralized solar systems Nathans mentions with the tenor of the Office of Technology Assessment's new study on solar energy (*2*).

2) Since detailed assessment of end-use-matched solar technologies has barely begun, Nathans can speculate unconstrainedly about their possible effects. Those he suggests, however, need not arise. The systems I have discussed, for example, need no utility backup, displace utility capacity only at the margin, and do not encourage commercial or industrial dispersion. Further, disruption in case of breakdowns would be less than for a centralized system (*3*).

3) I envisage continued reliance on existing, therefore largely centralized, energy facilities until they are mostly replaced—through normal attrition over the next 50 years or so—by soft technologies where these are most convenient to start with and by transitional fossil-fuel technologies elsewhere. All degrees of centralization would coexist, and their proportions would change, during the transition. In the end, the scale spectrum would match that of end-use, virtually eliminating the costs and losses of distribution. The hybrid system Nathans urges is thus consistent with my thesis—so long as he is not proposing to build *additional* centralized systems, which would be unnecessary and uneconomic.

AMORY B. LOVINS
11 Village Close, Belsize Lane,
London NW3, 5AH, England

References

1. K.G.T. Hollands and J. F. Orgil, *Potential for Solar Heating in Canada* (University of Waterloo, Waterloo, Ontario, February 1977).
2. *Application of Solar Technology to Today's Energy Needs* (Office of Technology Assessment, Washington, D.C., June 1977).
3. A. B. Lovins, *New York Times*, 24 July 1977, sec. 4, p. 17.

Nutrition and IQ

Winick, Meyer, and Harris (19 Dec. 1975, p. 1173) have reported an interesting set of data relating the IQ's and school achievement scores of adopted Korean children in American homes to degree of early nutrition as indexed by height and weight before age 2. The purpose of this note is to question the authors' interpretations of their findings.

The authors state that their objective is to investigate whether "enriching the environment of previously malnourished children might result in improved development. To test this hypothesis, we have examined the current status of a group of Korean orphans who were adopted during early life by U.S. parents and who had therefore undergone a total change in environment." In order to test this hypothesis it is necessary to have not only a group which receives "enrichment" but also a control group that does not.