ens (D). It would relieve the concerns of scientists to be assured that genetic engineering will not be applied to the construction of highly dangerous biological warfare agents.

We look forward to further discussion of this issue at the session scheduled for Tuesday, 19 January, at the 1989 AAAS Annual Meeting.

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REFERENCES

1. R. J. Smith, *Science* **226**, 1176 (1984).

*Co-signers include the following members of the University of Utah faculty: Cedric I. Davern (deceased), David Goldenberg, Mario R. Capecchi, Theodore Gurney, Elizabeth Gurney, and Tulle Hazelrigg, Department of Biology; Sherwood R. Casjens and Glenn S. Herrick, Department of Cellular, Viral, and Molecular Biology, School of Medicine; Elvera Ehrenfeld, Department of Biochemistry, School of Medicine; David Low, Department of Pathology, School of Medicine, Kenneth N. Buchi, Department of Medicine, School of Medicine; John F. Ash, Department of Anatomy, School of Medicine.

Energy Options

David Bodansky (Letters, 21 Oct., p. 348) appears to miss the point of the earlier letter by my colleagues Bill Keepin and Gregory Kats (26 Aug., p. 1027). Energy options are not to be chosen like dishes from a Chinese restaurant menu—one from column A and one from column B—but rather by marginal costs and benefits. In this marginalist calculus, whenever nuclear power costs more than efficient end-use of electricity, buying nuclear power instead of efficiency increases carbon emissions and worsens global warming compared to what least-cost investment of the same dollars would have achieved.

Specifically, if displacing a coal-fired kilowatt-hour costs seven times as much with a new nuclear plant as with a new superefficient light, motor, window, and so forth (the actual ratio might arguably be between 2.5 and 25 and is very probably 7+ today), then every dollar spent on the nuclear plant results in releasing six times more carbon than if the same dollar had been spent on efficiency. Bodansky's recommended nuclear exploitation "to the fullest extent practical" is thus not "prudent" but dangerously counterproductive (*1*).

Efficiency holds the edge in speed as well as cost. During 1973–1986 (1979–1986) inclusive, Bodansky's reference 1 (*2*) shows that energy savings increased U.S. energy supplies by 7.1 (12.7) times as much as nuclear expansion (*3*). Merely continuing historic rates of savings would thus yield the same climatic benefits as an order-of-magnitude scale-up of nuclear programs (*4*)—yet is much cheaper, safer, easier, and surer. Again, why keep diverting scarce resources from a winning option to a losing one?

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REFERENCES AND NOTES

1. A paper by B. Keepin and G. Kats [*Energy Policy* **16**, 538 (1988)] further shows that even if nuclear plants can be built twice as fast as they now can in the United States, then even in a low-energy scenario (a 2025 global primary energy demand of only 1.1 times the 1988 level), the sixfold nuclear expansion required to displace all coal-fired electricity by 2025 would require 1600 gigawatts (GW) of nuclear plants. These would have to be built at a rate averaging one 1-GW plant per 7.5 days (3.1 times the 1970–1985 global rate), yet they would reduce global warming by only ~15%. This suggests the question, Wouldn't it work even better to invest the nuclear plants' $1.6-trillion cost (at $1 per watt, a third the actual U.S. cost today) in efficiency instead?
2. Energy Information Administration Report, *Monthly Energy Review* [DOE/EIA-0035 (88/05), Department of Energy, Washington, DC, May 1988].
3. This comparison generously counts nuclear output at its primary (steam) value; in terms of delivered energy, efficiency's speed advantage was about three times larger still. Most of the savings were in oil and gas, not electricity, but for artifactual reasons unrelated to the feasibility, availability, or economic advantages of electric end-use efficiency [A. B. Lovins, "Eleven reasons why we're saving electricity more slowly than direct fuels" (Rocky Mountain Institute, Old Snowmass, CO, 1988); *Negawatts for Arkansas* (Rocky Mountain Institute, Old Snowmass, CO, 1988).
4. C. K. Komanoff, "Greenhouse effect amelioration—efficiency vs. nuclear" (Memo, KEA, New York, 24 August 1988).

FDA Approval of HTLV-I Tests

I would like to set the record straight regarding the Food and Drug Administration (FDA) approval process for clinical studies aimed at estimating the prevalence of HTLV-I antibodies among random U.S. blood donors. Deborah Barnes' Research News article (21 Oct., p. 312) states that "none of the companies strictly adhered to FDA regulations for using their unlicensed assays in a large-scale study. This meant that the FDA had not approved the study before it was started."

The clinical study described was a large-scale, nationwide study conducted by the national headquarters of the American Red Cross. Gerald Sandler of the American Red Cross contacted our firm in late 1985 to discuss the possibility of our participation in the study. We discussed the study protocol, and I described to Sandler how we would first be required to file the appropriate applications at the U.S. FDA. Neither Sandler nor I were willing to bypass the FDA review process. Accordingly, our firm filed the required Application for an Investigational Exemption (IDE) on 26 December 1986, and we did not initiate the study until official notification was received from the FDA indicating that the study had been reviewed and approved.

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Response: The statement from my article that is partially quoted by Montagna—"Enzyme-linked immunoassays from Du Pont, Cellular Products, and, later, Abbott were used to test for antibodies against HTLV-I in the blood samples, but none of the companies strictly adhered to FDA regulations for using their unlicensed assays in a large-scale study"—is correct with respect to Cellular Products but incorrect with respect to Abbott. FDA officials have reaffirmed that Cellular Products was in technical violation of FDA regulations by distributing unlicensed investigational assay kits for diagnostic purposes prior to formal receipt of FDA approval. However, the FDA did not consider it serious. The inclusion of Abbott in the same sentence is incorrect because Abbott did not distribute its assay kits until after it had obtained FDA permission to do so.—DEBORAH BARNES

Retraction

I have decided to retract the paper "Virus-specific splicing inhibitor in extracts from cells infected with HIV-1" by D. Gutman and myself published in the 16 September 1988 issue of *Science* (volume 241, p. 1492). The data in that paper should no longer be considered reliable.

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Erratum: Jean L. Marx, in her article "The 1988 Nobel Prize for Physiology or Medicine" (Research News, 28 Oct., p. 516) referred on page 517 to "the late James Ahlqvist" as one of the pioneers in the development of β-blocker drugs. The investigator's correct name is Raymond Ahlquist. He was on the faculty of the Medical College of Georgia in Augusta.

Erratum: In the News & Comment article "Soviet-based global foundation takes shape" by Constance Holden (25 Nov., p. 1122), Frank von Hippel was incorrectly identified. He is at Princeton University and is the co-chairman of the International Security Committee with Roald Sagdeev.

Erratum: The fourth sentence of the abstract of the report "The *elav* gene product of *Drosophila*, required in neurons, has three RNP consensus motifs" by S. Robinow *et al.* (16 Dec., p. 1570), should have read, "DNA sequence data presented in this report suggest that the *elav* gene product is an RNA binding protein, based on the presence of RNP (ribonucleoprotein) consensus sequences."