Letters

Energy Conservation

The argument of Amory B. Lovins and L. Hunter Lovins (Letters, 13 May, p. 666) for energy conservation at colleges and schools is well taken. Major expansion and energy price increases have pushed utility costs at the State University of New York (SUNY) at Buffalo up from less than $1 million in 1972 to nearly $13 million in 1982. Under the circumstances energy conservation is more than a worthwhile environmental ideal. For us it is a necessity.

Like many other schools, we began our energy conservation program in 1973, the advent of the "energy crisis." Between then and 1981 the physical plant departments on both of our campuses implemented numerous energy-saving measures resulting in estimated cumulative savings of $10 million. Last year, we reinvigorated our program and embarked on numerous additional conservation projects, including a policy to maintain cool temperatures (55° to 60°F) in our new large sports arena, indoor and outdoor delamping and relamping, reinsulation of campus steam lines, conversion of electric hot water heaters to natural gas, installation of ceiling fans and replacement "heat wheels" (for heat reclamation), and modification of laboratory fume hood exhaust systems (to reduce heat loss while maintaining safe conditions). While the latter project addresses the laboratory exhaust heat loss problem in only one of our research buildings, it is expected to save more than $100,000 per year in avoided energy costs.

This year we also embarked on a long overdue program to equip dormitory students with some "appropriate technology," namely a screwdriver-like device to permit adjustment of not-too-accessible room heater thermostats. Our "Conserve UB" energy awareness program compliments this as well as our other conservation projects by publicizing the need for energy saving and encouraging everyone to pitch in and do their part. While we still see lights left on in empty classrooms, this kind of energy waste is occurring with less frequency.

I do not want to give the impression that we have achieved perfect efficiency. The Lovinses could still find much energy waste to be mined from our over 7 million square feet of classroom, laboratory, and office space. We are, however, making progress. The fine cooperation we have had from students, faculty, and staff is attributable, in part, to conservation's tangible benefits. Last year, we were able to voluntarily give up $1.2 million from our utility budget (beyond what was taken back because of warm winter weather) in exchange for a promise of no retrenchment. New York's fiscal plight is more severe this year, and it may be impossible to entirely avoid some layoffs. However, by holding the line on energy consumption we know we will be saving some jobs, an accomplishment not lost on the SUNY Buffalo community.

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Lovins and Lovins are right. The tighter the building, the lower the fuel bills. Our group, the Damascus Energy Savers, has donated many Saturdays and evenings helping people save fuel in just that way. But lately, after working with the Department of Energy's Environmental Measurements Laboratory in New York measuring indoor radon levels in some of these homes, we are having second thoughts. The houses in which the measurements were made, although "tighter" than average, also have higher radon concentrations. We cannot find any official guidance on action levels or what to do about the problem, but many of our homes fail to meet the Swedish standards for new homes (2 picocuries per liter), and several would require immediate remedial action (more than 10 picocuries per liter) if U.S. standards were the same as those in Sweden.

The problem is not trivial. The Environmental Protection Agency estimates that between 6,700 and 13,400 people die each year in the United States from lung cancer from radon. The scientific literature, although sparse, indicates that public buildings have less radon than do homes. But whatever the levels of radon may be in the buildings the Lovinses describe, they will tend to increase as circulation with the outdoors decreases. And, no matter how low the radon is initially, any increase leads to a corresponding increase in cancer deaths, according to the currently accepted linear hypothesis on radiation dose-effects.

This collision course—a desire to save energy by weatherizing the home versus a fear of a higher probability of lung cancer—has had profound moral implications for our group. And yet the Lovinses, energy experts of world renown, do not mention this dilemma and talk only of saved BTU's and increased teacher's salaries. If the possible cost of human lives is considered, it seems that there is (still) no free lunch.

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Correct Butterfield

In my review of Colin B. Burke's *American Collegiate Populations: A Test of the Traditional View* (20 May, p. 814), I erroneously attribute *The Whig Interpretation of History* to the late Lyman H. Butterfield, distinguished editor of the John Adams papers. *The Whig Interpretation of History* was written by the English historian Herbert Butterfield. I regret the mental slip.

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Cancer Research

Harry Rubin is to be congratulated on his cautionary yet positive comments (Letters, 11 Mar., p. 1170). It is an unfortunate fact that much of cancer research during the past 40 years has been directed toward a series of specific problems that have assumed the characteristics of cancer or even "the cancer cell" to be well defined. Generalized contemplation of cancer as a disease process or in the context of pathological reactions is frowned upon as outdated thinking. Any suggestion of a role for teleological considerations would be even more disapproved. As Rubin points out, there is unqualified acceptance of the "risky assumptions" that the malignant character of cells is dependent on a gene mutation or on a chromosomal transposition. I agree that these are, indeed, risky assumptions. Further, however, I believe that the use of the term "transformation" is at the root of many of our problems. The advantages of us-

ing tissue cultures for much cancer research are obvious; their disadvantages, once much discussed, are ignored. The loss is, of course, of our ability to understand the dynamic course of the neoplastic process. In the whole animal system there is a progressive development of a series of lesions—well recorded in many organs. These neoplastic lesions have many end points, including regression (more and more commonly perceived), a benign state, invasiveness, and metastasis. Changing carcinogenic stimuli quantitatively or qualitatively can entirely alter the outcome. It is possible to induce lesions that mainly regress, are primarily benign, or predominantly malignant at will. This is not an all-or-nothing phenomenon; it is a pathological response to intracellular injury and clearly, from the range of well-known inciting agents, relatively nonspecific. The complexities of experiments in which many tumors regress are conveniently ignored as unorthodox happenings that must not be allowed to confuse established views.

I have previously suggested that the facts before us suggest that neoplasia may be the intracellular counterpart of inflammation that is predominantly extracellular (*1*). More and more facts have accumulated that are consistent with this hypothesis. It is essential that the incredible advances in molecular biology be used in a broader and more imaginative fashion and that there be a greater willingness to interpret findings in more ways than one.

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Evaluating Clinch River

In his Briefing of 13 May (News and Comment, p. 698), Eliot Marshall describes the expected abundance of electric generating capacity in the southeastern United States into the forseeable future, which has the consequence that the region's electric utilities are not eager to purchase the future production of power from the Clinch River Breeder Reactor (CRBR). The thrust of this description is that the power will not be needed and that it would be expensive in any event. In reality the economics of the project have always been expected to be unfavorable and are irrelevant to its basic justification—which is as an experiment necessary for the ultimate development of a commercial breeder reactor technology. At one time the advocates of the project used its expected near-favorable economics as a sweetening argument for its advancement, and detractors of the project have similarly used its escalating costs as a basis of opposition.

The proper context for evaluation of the CRBR is that of the U.S. breeder reactor program. The proper questions to be asked are whether such a program is needed and, if so, whether the CRBR represents an efficient use of resources for its advancement.

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Game Ranching

M. L. Oldfield (Letters, 7 Jan., p. 8) correctly points out the absence of genetically improved trypanotolerant cattle for use in African tsetse zones. However, her suggestion that wild game ranching provides an alternative to the introduction of cattle should be treated with caution. There are several reasons for this.

1) The economic, cultural, health, and administrative barriers to game ranching and cropping operations are great and have limited their success to anomolous high-income European enclaves in Africa. As a former employee of the Tanzanian Game Division, I am personally aware of the difference between the optimism of the theory and the failure of the practice. Marks (*1*) has provided a review of such issues.

2) Many locations likely to benefit from the spread of trypanotolerant cattle are not suitable game ranching targets. Areas with extensive human settlement claims are unlikely to be amenable to such extensive land uses. The rainforest zone does not share the abundance of large game animals observed in the savanna environments, and its people have heretofore been largely unable to take advantage of mixed farming regimens with a cattle component. Their diets are often deficient in protein, and their crops lack the benefits of manure.

3) Even if game ranching is successful, it does not fully address the range of benefits that are derived from the addition of cattle to a farming system. Of the big four—milk, meat, manure, and motive power—game ranching is designed to provide only meat. Trypanotolerant cattle have a greater potential for providing these other development benefits to subsistence farming systems that lack them today.

4) Organized ranching schemes are likely to divert bushmeat consumption from the diets of the poor to the diets of the rich. Many African people in sparsely populated areas obtain substantial amounts of protein through informal harvesting arrangements; the intrusion of managed ranching would be likely to prevent effective access to protein resources because traditional activities would be labeled poaching and a price tag would be attached to commercial bushmeat.

5) The fear of overgrazing, developed from the very real consequences of cattle population expansion in the wake of tsetse control, need not be automatically transferred to the case of trypanotolerant cattle development. The social structure of traditional herding societies is entirely different from that of societies in the cattle-free tsetse zone. The problem of very low rates of stock slaughter, fostered by the complex social role of cattle in herding societies, is likely to be reversed in societies where cattle are not kept. Here, they are likely to be slaughtered or sold at a rate greater than that of reproduction, as people have little experience with the discipline of herd management. Many attempts to introduce draft animals in tsetse zones have been cut short by a feast. In short, one cannot infer the same consequences from introducing trypanotolerant cattle into tsetse zones as have been observed from the expansion of pastoralists' herds after the removal of tsetse along the margins of traditional rangelands.

There are many reasons to continue work with game ranching, cropping, and domestication schemes. There is a possibility they will find a place in the mix of development strategies for Africa. For the near future, bushmeat will be in diets largely as a result of hunting activities. Likewise, the work with trypanotolerant cattle must proceed so that the potential benefits of such undertakings can be explored as well (*2*). Trypanotolerant cattle are no panacea, but neither is game ranching.

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2. G. E. Matzke, *Soc. Sci. Med.*, in press.