Letters

Transferring Solar Technology

Allen L. Hammond's proposal for a cooperative international effort to share the costs and benefits of a rapid expansion in deployment of on-site solar power systems (Editorial, 12 Aug., p. 623) is both timely and compelling.

However, at least until recently, most attempts to transfer solar and other nonconventional energy technologies to the developing countries have enjoyed short-lived success. Ever since the first solar irrigation pump was installed along the Nile River in 1913, such devices have usually fallen into disuse shortly after the Western technologists who introduced them left for home. Lack of spare parts, failure to perpetuate maintenance and repair procedures, and an insensitivity to local needs and customs have resulted in the perception that "appropriate" energy technology devices do not work, when in fact it is the process of technology transfer that has usually been at fault. Even today, we have only a particularly poor understanding of this process, especially the process of technology transfer to small communities. Worse, we have an equally poor understanding of how local capacities for technological development can be stimulated. Recent successes, such as achieved with the French irrigation pumps which Hammond mentions, offer hope that these problems can, with considerable effort and care, be understood and overcome (*1*).

Widespread adoption of new energy technologies involves considerable unknowns for both developed and developing countries. Many unknowns (costs, integration with conventional energy systems, social and economic effects, and so forth) will be common to both groups of countries. A solar energy development partnership is logical and would be mutually advantageous. But Hammond is correct in implying that it would have to be a partnership of equals, with both sides actively applying the knowledge gained to their own particular situations.

Such an approach could yield a marked improvement in the climate of political and economic relations between the industralized and developing worlds. It could also have a significant influence on the manner of future international cooperation in science and technology. It would be a boon to economic development and progress in satisfying basic human needs. And by contributing to the reduction in cost of an environmentally and socially benign alternative to petroleum energy, it would be in the common interest of us all.

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San Joaquin River Misplaced

Luther J. Carter's timely article (News and Comment, 12 Aug., p. 643) on the problems of Auburn Dam contains some interesting and even startling disclosures. But much the most startling information is provided by the accompanying map which shows the San Juaquin [sic] River originating at Sacramento at the confluence of the American and Sacramento rivers.

Californians know theirs is a tectonically active state and accept earthquakes, erosion of the coast, tilting of the land, and changes in drainage patterns as continuing geologic processes. Nevertheless, to discover that almost overnight our largest and best-known north-flowing river has reversed its course and that its point of origin is near the state capital is somewhat disquieting!

For the benefit of those readers of *Science* whose knowledge of California geography may coincide with that of the cartographer, the San Joaquin is still flowing northwestward (albeit, as the result of the prolonged drought, with diminished flow) and still originates in the south-central Sierra Nevada in the vicinity of Sequoia National Park. Meanwhile, the Sacramento River continues to flow southward past Sacramento (where it is augmented by the American River) to a confluence with the San Joaquin in "the Delta area," whence the combined waters empty westward into Suisun Bay and thence eventually into San Francisco Bay.

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Seveso: "Encouraging Evidence"?

The nature, the extent, and the possible responsibilities involved in the tragedy of Seveso, Italy, have been reported and discussed both in Europe (*1*) and the United States (*2*). According to a report in *Nature* (*3*), the pharmaceutical company Hoffman–LaRoche has recently given wide publicity to its own internal newsletter, in what seems to be an effort to counteract criticisms directed toward its subsidiary, the Givaudan Corporation, which owns the plant where the accident occurred. Almost simultaneously, *Science* (News and Comment, 8 July, p. 143) printed a report that cites "encouraging evidence" and "grounds for optimism" concerning the situation in Seveso, admittedly originating from the Hoffman–LaRoche newsletter. We believe the American scientific community deserves less biased and more critical information.

The "encouraging evidence" cited in *Science* concerns the children (number not given) affected by chloracne, of which all but three of those visited (number not given) by specialists are now said to be expected to recover completely. The article then refers to the degree of safety achieved by reclaiming some houses and gardens in an unspecified extension of the "less affected" area according to an undescribed wipe test.

Additional "grounds for optimism" given in the *Science* article include an announcement from the local authorities that 600 evacuees will finally be able to go home soon and the comment by Hoffman–LaRoche that these people will be in no danger, since they had lived in their houses for 3 weeks before they were decontaminated, allegedly "without ill effects." The article does not remind the readers that the delay in evacuation might be related to the fact that dioxin

was not mentioned by the company managers until 10 days after the explosion and to the consequent disbelief and confusion—after it was disclosed that dioxin had been released—of the local authorities. Nor does it note that a legal inquiry is being made by an Italian court to establish who is financially responsible for the accident and whether any criminal charges should be made.

Neither the toxicity nor the cumulative, long-term effects of dioxin need to be proved. The comprehensible desire of the local people to go home and forget their nightmare should not be exploited by using them as "guinea pigs," nor should it be reinforced with unsubstantiated claims by scientists. The suggestion by Hoffman–LaRoche that growth of surface vegetation would accelerate the breakdown of dioxin and thus solve the problem of Seveso represents such a scientific breakthrough as to deserve some experimental support. Finally, the "grounds for optimism" claimed in the *Science* article need to be supported by more convincing evidence that the consequences of the tragic industrial accident are dealt with seriously, and not whitewashed.

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The Golden Fleece Award: A Control?

I have read a number of items in *Science* about Senator Proxmire's "golden fleece" awards, yet no one has suggested what I would call the scientific approach to the situation. The scientific community is permitting this uncontrolled experiment to continue when it seems relatively easy to create a control group.

Once a month a senior member of the scientific community would announce the "congressional golden fleece of the month award." After reviewing the appropriations Congress has made that month, the scientist would select one that the scientific community felt was a waste of federal funds which might better have gone to support scientific research. The public would then be able to decide whether an individually chosen scientific report was really aberrant when compared with an individually chosen gob of money from Congress.

A few final thoughts about the experimental design are necessary. There appears to be no way of balancing for congressional immunity when Senator Proxmire makes remarks on the floor of Congress unless a spokesperson within Congress could be found for the control part of the study. Thus "senior members of the scientific community" should be senior in age as well as reputation to discourage any interaction between the two halves of the study. This study design is offered freely to any member or members of the scientific community who wish to pursue it in its current or some modified form; I am now busy with other research.

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Electron Probe Microanalysis: Uses in Plant Physiology

In his interesting and informative article "Electron probe microanalysis: New uses in physiology" (Research News, 22 July, p. 356) Thomas H. Maugh II makes no mention of the important applications of this technique to plant physiology. The method is ideally suited to the study of the pathways and partitioning of mineral elements in the plant, down to the level of the cell and its organelles. Use of the method in plant physiology was pioneered in 1966 by Läuchli and Schwander (*1*). As early as 1968, Läuchli (*2*) and Rasmussen *et al.* (*3*) could review a considerable amount of research done with this new tool, and it is coming into increasingly widespread use.

Maugh emphasizes the difficulty of artifacts arising from the movement of elements in solution within (animal) tissues and cells, during their preparation for electron probe analysis. The same problem must be overcome in applications of the technique to the study of the distribution of elements in plant materials (*4*). Freeze-substitution has been found suitable (*5*), and so have use of deep-frozen, hydrated specimens (*6*) and precipitation techniques (*7*).

Significant findings include evidence that xylem parenchyma cells play a role in the transfer of inorganic ions to the vessels, where they then move toward the shoot (*8*), and confirmation of the function of the potassium ion in the opening of stomates in light (*9*).

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Flickering Schoolchildren

Norway is oversupplied with long nights, narrow roads, hazardous surface conditions, and a growing population of aggressive drivers. The result is approximately one traffic fatality per 10,000 inhabitants per year, and many such casualties are very likely pedestrians hit in darkness.

Most people who walk about in darkness—and this includes all schoolchildren on fall and winter mornings—have good reason to fear for their safety. Hence most pedestrians in this country wear a reflective tag the size of a visiting card dangling from a coat pocket, school satchel, or briefcase. Schools hand them out, garages sell them, and firms distribute them instead of ballpoint pens. Even cats and dogs wear them, although their eyes—as most motorists know—have the reflective tag built in.

On a wet and black November morning, a file of schoolchildren is picked up in an automobile's headlights as dancing fireflies at a safe distance, instead of not at all. I am surprised that such a simple, safe, efficient, and cheap lifesaver has not caught on elsewhere. Are there too few pedestrians left in the United States?

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