

letters

Can this dual symmetry replace the traditional asymmetry? The dual transforms proposed here have the merit that they "work." Their weak point is lack of intuitive appeal. Perhaps someone else can lend plausibility to this scheme or else find a fatal flaw therein.

Reference

1. S. A. Hojman, *et al.*, *Nature Physical Sciences* 245, 97 (1973).

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11/5/76

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Commitment to nuclear

When a team of people has worked on a development project for a considerable time, expending their best personal energy and resourcefulness in the process, the individuals usually acquire a strong commitment to seeing the fruits of their labors adopted. The degree of this commitment often goes far beyond the level that the merits of the developed product warrant, but such is human nature.

In the field of nuclear energy the United States has become so committed to light-water, enriched-uranium reactors that it is in the process of committing a series of grave errors. Let us accept as a premise that nuclear energy is necessary for the US on the scale outlined by Richard W. Roberts ("Roberts of ERDA sees need for breeder reactor," September, page 77), and that the possibility of a uranium shortage by the end of the century is very real and should be allowed for in present planning. There are then many choices that can be made, and the choice of LWR plus fast-breeder reactor is only one. The safety of fast breeders can never rival that of thermal reactors, and a bad accident, should one occur, could be much more catastrophic than the worst LWR accident. To discuss thermal and fast-reactor safety in the same paragraph is almost to cheat the reader.

Roberts mentions the development of a thorium breeder core to be installed in the Shippingport reactor outside Pittsburgh, and cautions that the thorium cycle, if successful, will only produce enough fuel for itself. Now what is wrong with that? At this stage, when there is sufficient primary fuel (U^{235}) to last until the year 2000, if all reactors would produce enough fuel for their own refueling there could be no fuel shortage for hundreds (or thousands) of years. What Roberts doesn't say, however, is that even if the thorium cycle fails as a break-even breeder it will conserve fuel much more effectively than any other thermal reactor so far manufactured. Thus the date at which the fuel shortage would appear gets postponed by very many years.

It seems absolutely scandalous that in

the light of this knowledge new LWR's continue to be built and planned. Already there exist commercial reactors with far superior fuel economy than the best LWR, but not one has been constructed in the US for routine power production. Moreover, at least one of these reactor types produces cheaper electrical power. The LWR is the world's most offensive U^{235} guzzler, analogous to the worst internal-combustion-engine gas guzzlers. Is it just a coincidence that neither of these products has been phased out?

What, regrettably, is never said is that with the LWR's out of the way the need for the fast-breeder reactor could disappear.

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10/8/76

Agency reviews

I think what G. R. Barsch *et al* (December, page 43) and others are suggesting about the reviewing procedures of NSF and other government funding agencies makes perfectly good sense. It appears only logical that the authors of a proposal should have a chance to respond to reviewers' comments before any decision is made by the agency. I also think that the agencies such as NSF should make every effort to ensure that their reviewing procedures are as uniform as possible. One way to accomplish this would be to use one panel of experts to review all proposals in each sub-area of research, with the panel selected at random from a complete list of experts in each sub-field compiled by an independent and unbiased agency.

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12/31/76

More on industrial research

Alfred Sommer's letter of advice for people engaged in industrial research (September, page 9) troubled me in several ways. First of all, he was evidently moved to write his letter because he has witnessed a number of "brilliant young men whose careers petered out as they grew older and, conversely, . . . mediocre young men who seemed to grow steadily in stature and achievement." Based on this statement alone, I question Sommer's ability to judge brilliancy and mediocrity.

The major suggestion of the letter to the researcher is to "pick the right project." I don't think the newcomer in industrial research is likely to be given such a choice at all; only the more seasoned and proven professional is usually entrusted with this freedom.

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