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COVER: The nuclear power complex at Marcoule, France, lies just outside Avignon, surrounded by the wine vineyards of Côtes du Rhône. Here the world's largest operating breeder reactor, called *Phénix*, is generating electricity for commercial use as scientists work to design larger breeders that can compete in the world energy market. By some accounts, the United States lags behind other countries by 10 years in breeder technology, and a fierce debate is growing as to whether the project should be continued at all. See p. 59. (Photo: John H. Douglas)

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COMMENT

Reasoning about Reactors

The time has come to put some reason back into the nuclear power debate. As the contest has become more explicitly political, consideration of the fundamental technological issues has given way to a power struggle, with antinuclear forces mounting public demonstrations and industry spokesmen retaliating through massive lobbying and advertising campaigns. In researching our series of articles on reactors (see p. 59), we have been appalled by the rising level of demagoguery, slander and distortion of facts in this debate.

In June, California voters will decide by referendum whether the country's most populous state should essentially forbid use of nuclear power as it now exists. If passed, the initiative would not allow reactors to operate unless the Federal limitation on insurance liability (the Price-Anderson Act) were repealed and certain safety provisions were developed to the satisfaction of two-thirds of the state legislature—neither of which is likely to happen. Whatever its merits as an exercise in participatory democracy, the referendum is being subjected to the full glory of rough-and-tumble California politics, and climaxes a debate based increasingly on fear more than facts.

On the one side, antinuclear forces raise the fear of inevitable death and destruction from a power source run on radioactive materials. On the other, industries and some unions mount a specter of inevitable joblessness and poverty unless nuclear energy is pursued as fast as possible. We have no desire to referee *that* argument; but a recent experience may illustrate a neglected truth.

As we reviewed the mass of conflicting charges on this long-standing issue, we quickly learned to ignore the more exaggerated claims, such as the allegation that radioactive wastes lying in a trench in Washington State are in danger of spontaneously exploding. But when an environmentalist friend presented us with documentation purporting to prove that nuclear reactors really produce less power than is used to construct them and process their fuel, our curiosity got the better of us.

It took more than four hours of pondering the Government's seven-volume environmental impact statement to find a partial answer. (No self-respecting bureaucrat would dare to index one of these things, for then someone besides environmentalists, journalists and fools might try use them.) Finding eventually that the charge was curtly dismissed as "an absurdity," we called some scientists and finally collected more specific figures: A 1,000-megawatt nuclear power plant running at 75 percent availability (a little high) produces roughly 6.57 billion kilowatt-hours of electricity each year. The total electrical *input* to the whole nuclear cycle, from mining to reprocessing, is only 0.27 billion kilowatt-hours, while purely thermal input and amortized "energy capital" input (from building the reactor) are negligible even compared to this. Like the man said, the charge is absurd, even after considerable finagling.

This is a fairly benign example of some of the charges and counter-charges the voters of California will soon have to wade through. They have our sympathy, as do the environmentalists and industry scientists who are working hard and honestly on opposite sides of a strongly felt issue. But not the purveyors of claptrap! We don't doubt our friend's sincerity in presenting us his data; but someplace back in his 101 cited references, someone who should have known better was pulling a fast one. An attitude of "keep 'em honest" on such things as net energy is fine, but a totally negative approach or one based on spurious data is self-defeating. (In this week's "Energy Notes," we summarize the results of two attempts to seriously evaluate the breeder; without prejudging the correctness of the analyses, one can at least applaud the level of dialogue they engender. See p. 58.)

Technical matters can only be decided on the basis of accurately derived, fairly reported data. Absurdities usually have a short life span, but they can raise prodigious mischief while they last. Likewise, the political process can wisely resolve social issues only when they are honestly defined and clearly presented. If the United States is to refrain from building breeder reactors while the rest of the industrialized nations develop them for all their worth, the available alternatives must be very critically considered and probable changes implied for the American way of life, honestly faced.

Environmentalists (and we include ourselves) should act as positive forces, seeking out and promoting technologies and life-styles that promote harmony among men and nature. This is an inherently more difficult and less profitable task than that befalling a commercial-interest group trying to promote their own particular expedient. It also demands a broader view and a passionate integrity. The current conduct of the great nuclear power debate does little credit to that ideal.

—John H. Douglas