the patients? Have we ever tried to develop a cancer-prone patient profile as we did with cardiovascular patients? We don't know what produces a coronary incident, but we know who is physically, biochemically, and emotionally likely to become a victim—and instead of curing the disease we have a chance to prevent it. (Predictive medicine?) Isn't it time for someone at NIH or another institution to become patient-oriented rather than disease-oriented?

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Captive Audience

Nonsmokers are a captive audience at scientific meetings. They must tolerate the annoyance and unpleasantness of being soaked in polluted air for many hours. I propose a simple solution in which the rights of both nonsmokers and smokers are respected. Smokers should be permitted to sit in only one part of the lecture room. For example, if signs are posted and ashtrays are distributed to show that smoking is allowed on the left side only, a convention would soon be established. It might even spread to other public gatherings.

This suggested segregation of smokers from nonsmokers is already in effect on trains and some airplanes. It has been tried without objection at one meeting. Smokers must appreciate how extremely unpleasant their habit is to many people.

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Fusion by 1990?

The Creutz-Hosmer colloquy "How soon for fusion?" (News and Comment, 7 Jan., p. 43) exposes a fatuous rationale for accelerating the rate of controlled thermonuclear research; fusion by 1990 instead of 2000 would be "exciting" for the citizenry and would make plasma physicists "feel good."

There is, however, a truly compelling reason for increasing the fusion budget. Commercial fusion in 1990 would render the fast breeder (fission) reactor obsolete less than a decade after approximately $4 billion in public funds had made it feasible. If the fusion optimists are correct, then the development of breeders may and should be bypassed—a strategy with manifold environmental advantages.

According to Deborah Shapley (News and Comment, 9 Apr. 1971, p. 143), a power economy based on breeders would produce, by the year 2000, 720,000 kilograms of plutonium under civilian control, and a likely worldwide black market in plutonium. International security hazards aside, this would pose a public health problem of terrifying magnitude; the maximum permissible body burden of plutonium is less than a microgram. A quarter century of effort has still not yielded a safe, permanent storage method for the highly radioactive waste from fission reactors.

The most cogent argument *for* breeders is that continued deployment of current (nonbreeding) reactors will exhaust U.S. supplies of ^{235}U by the 1990's. Put this way, the argument suggests a moratorium on the deployment of nonbreeding reactors.

What kind of new power plants before 1990? One possibility is to redirect the funds for the breeder program to subsidization of pollution controls on fossil-fueled plants. U.S. coal reserves will be sufficient for centuries (*1*).

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Reference

1. H. H. Landsberg and S. H. Schura, *Energy in the United States* (Random House, New York, 1968), p. 82.

In "How soon for fusion?" my questioning of Edward C. Creutz of the National Science Foundation is characterized as that of a skeptic "who chided scientists for their proclivity to do what seems possible mainly because it seems possible." The unabridged record of this colloquy during Joint Committee on Atomic Energy hearings clearly indicates that my questions simply sought to elicit any compelling reasons for spending the extra resources required to implement Creutz's plea to accelerate the advent of electric power from controlled fusion by about 10 years, from 2000 to 1990. To do so would mean diversion of substantial sums from other scientific and nonscientific priorities. Its costs and benefits deserve the forthright

analysis that I was seeking but did not get.

The fact that this colloquy was presented in such a distorted and superficial context has caused me grief. Several readers of *Science* have written accusing me of such assorted sins as witness badgering. technical ignorance, and blasphemy in the Temple of Science. Everyone failed (as did Creutz) to spot my question about a moratorium on experimental CTR work pending further theoretical exploration as an allusion to the 1965 Allison Report, which took some U.S. programs to task for excessive "tin bending" at the expense of theoretical effort. My question invited but did not receive an answer describing the improved balance of today's programs.

There are all too few in the Congress who, like myself, labor long and hard to get compelling facts on the record of pertinent hearings to support generous public funding of scientific research. It is not a particularly commendable occasion when the editors of *Science* figuratively toss one such "Christian" to the anti-intellectual lions.

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I have seen Congressman Hosmer in action on a number of occasions and know that he can take care of himself. The editors of *Science* had no intention of tossing Christian Hosmer to the anti-intellectual lions. If they have done so inadvertently it is the lions who are in need of sympathy.

—P.H.A.

"Necessity or Chance"

Jacques Monod's fascinating book *Chance and Necessity* deserves both the lengthy review by Dobzhansky (7 Jan., p. 49) and serious consideration by readers, but Milton (*1*) said it all in two short lines: "Necessity or chance/ approach not me; and what I will is fate."

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Reference

1. J. Milton, in N. Webster, *New Twentieth Century Dictionary of the English Language* (unabridged) (World, New York, 1950), see "fate," p. 638.