Letters

Recombinant DNA Release: European Regulation

The first two sentences of David Dickson's News & Comment article, "Europe splits over gene regulation" (2 Oct., p. 18), illustrate some of the confusion that reigns over the question of the "newness" of genetically manipulated organisms. In the first sentence, Dickson cites the recent "*first* publicly approved release of a genetically altered organism in Europe" (emphasis added), a small-scale field trial of baculovirus containing a cloned genetic marker. Assuming that he is taking into account the vast experience and monumental successes with pre–recombinant-DNA genetic manipulation of human and veterinary vaccines (*1*) and with gene transfer in crop plants (*2*), Dickson seems to imply that only recombinant DNA manipulations cause organisms to be "genetically altered." However, the definition of genetic manipulation mutates in the very next sentence, which refers to a "field test of a genetically manipulated *Rhizobium* bacterium," manipulated not by recombinant DNA techniques but by using conventional in vivo methods.

The article mirrors the confusion that plagues attempts in Europe to devise political solutions to scientific questions about planned introductions into the environment. Perhaps European regulators should look to the *scientific* answers to the questions provided by a recent U.S. National Academy of Sciences (NAS) report (*3*) that is clear and authoritative; its conclusions and recommendations include the following.

- Recombinant DNA techniques constitute a powerful and safe new means for the modification of organisms.
- Genetically modified organisms will contribute substantially to improved health care, agricultural efficiency, and the amelioration of many pressing environmental problems that have resulted from the extensive reliance on chemicals in both agriculture and industry.
- There is no evidence that unique hazards exist either in the use of recombinant DNA techniques or in the movement of genes between unrelated organisms.
- The risks associated with the introduction of recombinant DNA–engineered organisms are the same in kind as those associated with the introduction of unmodified organisms and organisms modified by other methods.
- The assessment of risks associated with introducing recombinant DNA organisms into the environment should be based on the nature of the organism and on the environment into which the organism is to be introduced. It should be independent of the method of engineering per se.

We can summarize the current situation regarding the regulation of new genetic engineering products in a syllogism. There exists substantial experience with the testing—including field trials—and use of products genetically engineered with older, more crude techniques. Protection of public health and the environment have been compatible with the stimulation of academic and industrial innovation under existing societal regulatory schemes. As noted, there is no evidence that unique hazards exist either in the use of recombinant DNA techniques or in the movement of genes between unrelated organisms. Therefore, there is no need for additional regulatory mechanisms *specific for the new techniques* to be superimposed on existing adequate regulatory mechanisms.

The simple, unassailably logical precepts of the NAS report provide clear perspectives on field trials of recombinant DNA–manipulated organisms. If put into practice by the European Economic Community and others, they could introduce a high level of rationality and enlightenment into societal oversight of the field testing of genetically engineered organisms.

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REFERENCES

1. E. D. Kilbourne, *Banbury Rep. 22* (1985), p. 103.
2. R. M. Goodman *et al.*, *Science* **236**, 48 (1987).
3. *Introduction of Recombinant DNA–Engineered Organisms into the Environment* (National Academy Press, Washington, DC, 1987).

Response: My article described the variety of approaches in European countries to regulating the environmental release of these organisms. Some countries have adopted a line close to that proposed in the NAS report; others, at least provisionally, have assessed the situation differently and have chosen not to. Young and Miller clearly disagree—as many in Europe's biotechnology industry do—with those who have adopted the second strategy. The purpose of the article was merely to demonstrate that it is a debate with several points of view.

—DAVID DICKSON

China's Population Program

The article "Fertility policy in China: Future options" by Susan Greenhalgh and John Bongaarts (6 Mar., p. 1167) seems to announce that China's present population policy has broken down and that to retain it is "the least desirable strategy." China has advocated later marriage and later childbearing since the early 1970s. Yet, the authors say, delayed childbearing is neglected in China. They list a variety of timing options for minimum age at first birth and minimum spacing intervals between births and conclude that one of the two most advantageous policies is for China to adopt a 27-4 option (that is, to have the first birth at the age of 27 with a 4-year spacing before the second birth). The reason for such a recommendation appears to be that "introduction of a 27-4 policy in 1985 would produce total fertility rates of 0.44, 1.34, and 1.68, respectively, for the periods 1985 to 1990, 1990 to 1995, and 1995 to 2000," thus keeping "the total population from ever reaching 1.2 billion" by the end of the century. The authors' statistics and projections appear to be accurate as mathematical exercises. One wonders, however, if they have taken into consideration the realities of cultural conditioning and the drives of human nature, especially as they relate to wishes concerning the time of marriage and childbearing in China's vast rural areas. As far as I know, there is not likely to be a single woman in the rural area who would wish to delay having her first child until the age of 27! Generally speaking, the majority of rural people marry as soon as they reach the legal age of marriage (20 for women and 22 for men), or perhaps 1 or 2 years earlier, at the nominal age reckoned by the traditional method (that is, considering a person 1 year old at birth and adding a year each lunar new year). The conventional practice is to have a child right after marriage. Nowadays, many people would follow the government's advocacy of delaying childbearing for a few years, but not until the age of 27.

With regard to the author's other suggested alternative, "a stop-at-two-and-space policy that sets no restrictions on the timing of the first birth but sets a minimum age at second birth of 30 years," even people in developed countries like the United States would be unlikely to follow this practice, not to mention the people in rural China.

The nucleus of China's present population program is its family planning policy. Its aim is to control population quantity and to improve its quality (in terms of health and education) so that population growth may be in keeping with socioeconomic development and commensurate with the utilization of natural resources and environmental protection. Its main points are (i) to promote late marriage and later, fewer, but healthier births with prevention of genetic and birth defects; (ii) to advocate the practice of "one