LETTERS

Recombinant DNA Policy

Eliot Marshall's article (News and Comment, 22 Dec. 1978, p. 1265) on the changing relationship between environmentalists and scientists resulting from the federal debate on recombinant DNA research leaves the reader with a number of misconceptions.

The claim by certain scientists that those of us involved in the recombinant DNA debate were spinning out "procedural fluff" to keep ourselves busy is patent nonsense. Those involved in the debate at the Environmental Defense Fund (EDF) are interested in this issue because of the potential for harm and because its solution will be a precedent for future regulatory approaches to research and technology. Few would deny that there is a recognized need to regulate certain recombinant DNA activities, for example, those currently prohibited or sanctioned only under stringent controls. The task of delineating a workable system for regulating recombinant DNA research, contrary to Maxine Singer's claim, is little different from the other tasks we face.

EDF is not anti-science or anti-technology; nor are we secretly yearning for a return to a simpler age. We *are* interested in ensuring that the potential harmful effects of new technologies are identified and factored into policy decisions.

EDF wanted the National Institutes of Health (NIH) guidelines to ensure (i) public disclosure of information essential for oversight of the regulators and the regulated, (ii) participation on policy and oversight boards by individuals representing a range of responsible interests, and (iii) compliance with the guidelines by those carrying on recombinant DNA activities. At no time did EDF try to put itself on these committees or claim to solely represent the public. Rather, EDF has sought to ensure that a spectrum of individuals, for example, laboratory personnel and local public health officials, be given access to decision-makers. The scientific community, with a clearly vested interest in government regulation of recombinant DNA activities and established contacts within NIH and the Department of Health, Education, and Welfare (HEW), already has that access. Indeed, they had been the sole source of nongovernment input into the NIH decision-making process.

That our concerns were not adequately addressed in NIH's proposed guidelines of July 1978 is indicated by HEW Secretary Califano's convening of an extraordinary panel to review the guidelines. This panel adopted many of the suggestions we raised.

Marshall's article creates the impression that the recombinant DNA debate has caused a substantial reduction in scientists' support for environmentalists' goals generally. However, in most cases criticism has come only from a small number of scientists who have been intimately involved in recombinant DNA research. Only the most vindictive of scientists have extrapolated from their disagreement with EDF over our recombinant DNA policy to the other issues, such as energy, preservation of wildlife, or control of toxic chemical pollution, that are the mainstays of our work. Scientists' support for this work has remained strong.

Marshall suggests that employees of groups like EDF proceed without oversight or responsibility to a larger organization. This is not the case. Organizational oversight of EDF involvement has been the same, if not more intense, for work on recombinant DNA as it has been for other controversial issues. As Marshall states, our Executive Committee has systematically reviewed and approved our position on recombinant DNA. It is true that our members are not involved in approving each position taken by EDF's staff. Instead, like the majority of membership organizations, EDF staff actions are judged by members on a regular, more general basis—when it comes time to renew membership and by letters. A recent poll conducted by Resources for the Future indicated that 61 percent of EDF's members felt it was important for environmental organizations to become involved in the recombinant DNA debate. According to the same poll, a majority of EDF's members, 52 percent, supported an immediate moratorium on DNA research pending public discussion. (I wonder whether our scientist friends would want us to accept that democratic input into our decision-making process.)

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The situation reported by Eliot Marshall reflects a far larger syndrome. The conservation-environmentalist movement owes its origins primarily to laymen, not to professional biologists; we have been slow in joining it, and that is our fault. Against this, however, must be balanced the fact that environmentalists lacking biological credentials and expertise have often zealously guarded their

bailiwicks and studiously ignored—even deprecated—the biologists who have attempted to cooperate and further the cause.

Top-heavy with amateur naturalists and professional altruists, environmental organizations are apt to strongly resist input from biologists who tell them things they do not want to hear. For example, hard facts about demography—plant, animal, or human—are unpalatable compared to soft soap on organic gardening or returnable bottles.

It is exceedingly frustrating to be the sole, "token" biologist employed by a major conservation agency and bounce repeatedly off a solid wall of bureaucratic ignorance. When the ultimate decision-makers sport baccalaureates in business administration, economics, or "environmental affairs," perceptive, responsible positions on biological issues are most unlikely.

What we need to do is "biologize" the whole environmental movement. I see signs for hope in the young, aware professionals moving up in the ranks of biologists. But I fear they may be too few and reach positions of influence too late.

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Fusion: Neutral Beam Technology

We strongly disagree with the statement by William D. Metz (Letters, 27 Oct. 1978, p. 370) that "it is generally acknowledged that the neutral beam technology used at Princeton (based on positive ions) cannot be extrapolated to a reactor-level plasma because the already modest efficiency plummets when the beam energy is raised." In fact, we believe it is likely that very high energy beams will not be needed for tokamak reactors. Early assessments (*1*) of neutral beam energy requirements indeed led to Metz's conclusion. However, these were typically made for circular, cross-section plasmas with neutral beams injected tangent to the inside edge of the plasma and with some combination of large plasma size, high density, or both. Conservative assumptions were also made about the required depth of penetration for the neutral beams. The resulting rules of thumb for injection requirements are not borne out in current conceptual designs for tokamak plasmas heated to ignition.

Because of increased understanding of tokamak plasmas, recent reassessments of beam energy requirements have led to a relaxation of some of the conservative assumptions. Smaller, elongated