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COVER: Gene scientists, on a backdrop of magnified bacterial DNA, grapple with the wording of the Asilomar document, which will limit the future of gene transplant research. From left: Maxine Singer of NIH, Norton Zinder of Rockefeller University, Sydney Brenner of the MRC in England, Paul Berg of Stanford University. See p. 194. (Photo: National Academy of Sciences)

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Rise to Responsibility at Asilomar

By agreeing on safety guidelines for gene-transplant research, the international group of biologists meeting at Asilomar have performed a service of practical and symbolic importance to themselves, to science and to society.

The benefits to society are readily apparent when one considers the dangers of accidental release of newly created microorganisms unconstrained by normal evolutionary pressure or of common organisms in which genes for antibiotic resistance, cancer or toxin formation have been inserted. Adding a certain exotic twist to the deliberations was the fact that until last July, the general public, and indeed many of the scientists doing the research, had been virtually unaware of the possibility of these dangers. It is a case, not altogether absent in the history of science, but nevertheless perhaps too rare, of the social concern of scientists about a new capability that has both good and bad potentialities preceding the actual large-scale exercise of that capability. It is refreshing, frankly, to see scientists grappling with the moral consequences of their work before the picketers, pamphleteers and other representatives of polarized interest groups enter the arena with their particular brand of well-intentioned but sometimes misguided efforts that often tend more to confuse than to clarify a complicated scientific or technological issue. With their conference and the guidelines that came out of it, the scientists have helped create a needed atmosphere of confidence that their research on recombinant DNA will be carried out with an appropriate sense of care and moral responsibility. The guidelines ensure that most kinds of gene-transplant research can proceed, with suitable safeguards, thus protecting the public while assuring the continuation of an intellectually exciting and, potentially, immensely beneficial field of research.

One shouldn't be too sanctimonious about this. An agreement on guidelines, as Janet H. Weinberg's article on page 194, "Decision at Asilomar," clearly shows, was far from foreordained. Only a short time before it was due to end, the conference still tottered precariously between consensus on proposed guidelines or dissolution into disunity. It could have gone either way. But in the end, thanks to the moral leadership of scientists like Paul Berg, David Baltimore and Sydney Brenner and of lawyer participants who emphasized some of the out-of-the-laboratory realities of the issue, the conference was brought back to its central purpose, and a realistic set of guidelines was agreed to. There is an additional side lesson here for those who think of science in a coldly mechanical way. Science, whether in the laboratory or the conference hall, is an intensely human enterprise, a product of the mingling of personalities, emotions and consciences, as well as the intellect.

As for the guidelines themselves, they appropriately recognize that there are varying degrees of risk in the different types of experiments envisioned. They thus recommend varying degrees of containment. High-risk experiments will require the greatest degree of containment and will thus proceed only very cautiously and slowly, if at all. Other kinds of work fall into low- or moderate-risk categories, the latter involving some delays. This seems a simple and obvious idea. But experience with regulatory activities in certain other areas of science and technology, where matters of risk are often considered monolithically, any risk unacceptable regardless of relative degree, shows that it is not always self-evident. The Asilomar guidelines have a hierarchical realism that can help shape a more sophisticated public view of the differences and subtleties among the kinds of experiments involved and also perhaps set a more intelligent pattern for considering other risks and benefits in this scientific and technological age.

The Asilomar participants were also wise to keep their guidelines general, thus avoiding the pitfalls of an overly rigid approach to the subject at this very early stage of its development. Of course this flexibility was a luxury possible only because the scientists in this case were ahead of the legislators. Their guidelines are an appeal to the highest moral interests of their peers rather than a legally defined pronouncement of restrictions.

All in all, the Asilomar guidelines should fulfill their practical purpose of allowing gene-transplant research to continue under safeguards. They should also stand as a symbol that life scientists, with their new and powerful biotools, are concerned members of the world citizenry with a full awareness of the responsibilities brought about by their loss of innocence.

—Kendrick Frazier

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