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Science, Society, and the Expert Town Meeting: Some Comments on Asilomar

Roger B. Dworkin
Indiana University Maurer School of Law, dworkin@indiana.edu

SCIENCE, SOCIETY, AND THE EXPERT TOWN MEETING: SOME COMMENTS ON ASILOMAR

ROGER B. DWORKIN*

Conventional legal institutions cannot cope adequately with the social issues raised by rapid scientific advance.[1] Our institutions necessarily learn of new scientific developments after they occur and have been publicized. The institutions are impotent to control the international aspects of scientific advance despite the inevitable impact of foreign developments on our well-being; they are inadequate to control those bent on misusing techniques for evil purposes, as our experience with terrorism indicates. We do not have an adequate mechanism to check the government itself if it, or some parts of it, should become committed to a generally undesired course; whatever the ability of our system to govern the governors in most matters, secrecy, incomprehensibility, and lack of built-in checks prevent that control in the scientific realm. Finally, lack of prescience about the full range of implications of new developments in science confounds every effort at intelligent control.

New institutions are needed for the social control of science. One proposed institution, the so-called Science Court,[2] has received some attention and may even be used experimentally.[3] Another new institution has already been tried without being classified as an institution. The Asilomar Conference, an expert town meeting on recombinant

* Professor of Law, Indiana University School of Law, Bloomington. A.B. 1963, Princeton University; J.D. 1966, Stanford University. The author wishes to thank Dr. Paul Berg and Mr. Daniel Singer for their kindness in making his attendance and participation at the Asilomar Conference possible. All unacknowledged statements of fact about the proceedings at Asilomar are the author's eyewitness accounts.

1. For development of the points made in this paragraph, see Dworkin, Legal Institutions and Recombinant DNA Research (ms.). *See also* Dworkin, *Biocatastrophe and the Law: Legal Aspects of Recombinant DNA Research*, in THE RECOMBINANT DNA DEBATE (D. Jackson & S. Stitch eds. forthcoming).

2. *See generally* Martin, *The Proposed "Science Court,"* 75 MICH. L. REV. 1058 (1977).

3. Task Force of the Presidential Advisory Group on Anticipated Advances in Science and Technology, *The Science Court Experiment: An Interim Report*, 193 SCIENCE 653 (1976).

DNA, represented a blend of the oldest institution of American democracy with modern elements of internationalism and expertise. We ought not to allow interest in the substantive recombinant DNA controversy to prevent us from evaluating the expert town meeting as a device for mediating the social issues posed by scientific advance.

I. THE ASILOMAR CONFERENCE

The Asilomar Conference was held in February 1975, approximately 2 years after the recombinant DNA controversy surfaced. It was organized by a committee of six distinguished scientists, four from the United States and two from abroad, with assistance from the National Academy of Sciences-National Research Council (NAS-NRC) and with funding from the National Institutes of Health (NIH) and the National Science Foundation. In addition to the organizers and the staff representatives of the NAS-NRC, the meeting was attended by eighty-two American and fifty-two foreign scientists, and four people the press insisted on describing as "lawyers." Technically, the "lawyers" were lawyers, but hardly in the sense the term suggests. Two were full-time law professors and a third was a law professor who also maintained a role in a law firm. Only one was a nonacademic practitioner, but he too was hardly typical, being both vice president of the Institute of Society, Ethics and the Life Sciences (a group devoted to the study of "bioethics") and the husband of one of the organizing scientists and original leaders in raising the issue of recombinant DNA. In addition, sixteen representatives of the press, from such diverse employers as the *New York Times*, *Science*, the Canadian Broadcasting Corporation, *Frankfurter Allgemeine*, and *Rolling Stone* attended. Conspicuously absent were representatives of the most vocal group of scientists opposed to recombinant DNA research. Rather than attend, they sent an "Open Letter"[4] to participants at the conference criticizing the "molecular biology community" for usurping decisionmaking authority and calling for direct involvement by the "general public."

The setting for the Asilomar Conference was an idyllic beach-front location near Pacific Grove, California, on the Monterey Peninsula. Participants lived together in motel-like accommodations with assigned roommates. They ate together at appointed meal hours in a general dining hall. Both the structure of the conference and the location and

4. Open Letter from Genetic Engineering Group of Science for the People to the Asilomar Conference on Hazards of Recombinant DNA (1975).

nature of Asilomar discouraged the participants from leaving the grounds.

The conference ran from 8:30 a.m., Monday, February 24, 1975, to noon, Thursday, February 27. Scheduled sessions occurred in the morning, afternoon, and night. As everyone knew, the conference had been called to debate whether to lift the moratorium on certain kinds of recombinant DNA research and to propose guidelines for the acceptable performance of any permitted recombinant DNA experiments. That is, the purpose of the meeting was to make scientific policy and propose public policy. Despite that purpose, the only times specifically allotted to policy discussion were a short period on Monday afternoon when Professor Harold Green of the George Washington University National Law Center presented "A Public Policy Perspective" and Wednesday night when the three remaining "lawyers" spoke and all four of the "lawyers" sat as a panel to answer questions. The rest of the meeting, except for the last morning session, was virtually indistinguishable from an ordinary scientific meeting held for the purpose of exchanging information. The final morning was devoted to discussion and adoption of the conference statement.

The conference began with David Baltimore[5] from the Massachusetts Institute of Technology (MIT) stating the history and purpose of the meeting. The opening address was followed by 3 days of exclusively scientific discussion. Distinguished investigators presented data, showed slides, and asked each other technical questions. Occasional inquiries from the floor about public policy implications were ignored or ruled out of order as questioners were reminded that the group would consider those matters on Wednesday night. The exception to this lack of interest in policy was the oft repeated statement that it was crucial to avoid outside control. While the official sessions stuck to science, a select group apparently worked well into the nights attempting to draft the conference statement. To the author's knowledge, this group neither sought nor received any information or assistance from the "lawyers."

After 3 days of science, public policy was finally considered on Wednesday night. Each of the three speakers was allotted 20 minutes. Daniel Singer, a Washington, D.C., lawyer with family and institutional connections mentioned above, spoke generally on the role of ethics in policymaking and the social responsibility of the scientist.

5. David Baltimore was awarded the Nobel Prize for Medicine in 1975 for discoveries concerning interaction between tumor viruses and genetic material of the cell.

Professor Alexander Capron of the University of Pennsylvania Law School discussed regulatory options and institutional avenues available for the control of recombinant DNA research. This author discussed tort, workmen's compensation, and Occupational, Safety and Health Act (OSHA)[6] aspects of recombinant DNA research.

Only Professor Capron criticized the participants for failing to come to grips with the policy issues they were supposed to address. Although his speech roused the participants, they responded most strongly when this author told them that they might be held liable if anyone were injured as a result of their work. What a legal audience would have regarded as commonplace, elementary, and obvious, struck the distinguished scientists as novel, shocking, and frightening. Calling the researchers' attention to their potential liability induced a fear in them akin to a layperson's fear of virulent bugs crawling out of a laboratory. Moreover, pointing out the potential liability was widely interpreted as glorying in it and as manifesting opposition to recombinant DNA research, despite attempts to be of assistance by suggesting that the scientists would be well-advised to err on the side of overregulating themselves if they really wished to avoid outside control.

The drafters of the conference statement worked most of Wednesday night to finish their product. On Thursday, several of them told the author that the legal discussion the night before had had a major impact on their thinking and on the statement.[7] The statement lifted the moratorium and described the safeguards considered appropriate for recombinant DNA experiments. The procedure by which the statement was adopted was remarkable. The 2500-word document was distributed to the participants Thursday morning at 8:30 a.m., and discussion began at 9:00. The meeting had to end by noon. Dr. Paul Berg, the principal conference organizer, presented the statement. The group then discussed and voted on each provision separately. Several amendments were offered from the floor. These were stated so rapidly that it was difficult, if not impossible, to write them down. Requests for repetition, fuller discussion, amendments to amendments, and so forth were met with constant reminders of the need to finish by noon and by the iterated and reiterated assertion that the language did not have to be perfect because the statement was not a "legal" document. Nobel laureate Joshua Lederberg complained that the group was being

6. Pub. L. No. 91-596, 84 Stat. 1590 (1970)(codified in scattered sections of 5, 15, 18, 21, 42, 49 U.S.C.).

7. *See* Provisional Statement of the Conference Proceedings, Feb. 27, 1975.

"railroaded"[8] but the other participants did not complain. Shortly before noon the group overwhelmingly adopted the conference statement. The statement was redrafted and submitted to the NIH on May 20, 1975.[9] It served as the basis for the now famous "NIH Guidelines" for recombinant DNA research,[10] which remain the principal legal control mechanism in this field.

II. THE EXPERT TOWN MEETING: ASILOMAR AND BEYOND

What is one to make of the Asilomar Conference? Ought it to serve as a model for future efforts at the social control of science?

To a person intellectually and emotionally immersed in the American legal system, Asilomar was nearly beyond belief. Given, however, that the American legal system is inadequate to cope with rapid scientific advance,[11] the observation that the Conference procedures bore little resemblance to traditional methods of decisionmaking is not necessarily a criticism. Moreover, the Conference in some ways represented almost classic and long abandoned American notions of democratic rule.

Asilomar was organized by self-appointed leaders (albeit with the sanction of the federal bureaucracy) whose claims to legitimacy in their leadership roles rested on scientific distinction and moral foresight and commitment. It was financed by the government, which intended to use the Conference's conclusions as the basis for governmental action. Asilomar was attended by experts in the scientific disciplines being studied, but it was boycotted by those who represented the strongest negative viewpoints. The scientific experts in attendance neither possessed nor claimed to possess any expertise in matters of law, ethics, or any of the other policy arts. The policy experts were outnumbered approximately thirty-five to one, represented very limited spheres of policy making concern, and were largely "ghettoized" and put off until a point in the agenda at which they could have little impact.

8. Wash. Post, Mar. 9, 1975, § B, at 4, col. 4.

9. Berg, Baltimore, Brenner, Roblin, & Singer, *Summary Statement of the Asilomar Conference on Recombinant DNA Molecules*, 72 PROC. NAT'L ACAD. SCI. USA 1981 (1975), *reprinted in* 188 SCIENCE 991 (1975).

10. National Institutes of Health, Guidelines for Research Involving Recombinant DNA Molecules, 41 Fed. Reg. 27,911 (1976). *See also* National Institutes of Health, Recombinant DNA Research, Proposed Revised Guidelines, 43 Fed. Reg. 33,042 (1978).

11. *See* note 1 *supra*.

The policy discussion of the scientific experts was, as one might expect, largely nonexistent. Being human, the scientists discussed the subject they know and like—science. When forced to decide matters of policy, they reached a solution that may well make *scientific* sense, but was tempered only by the two policy constraints they understood—the twin terrors of personal liability and external control. The scientists achieved consensus (almost unanimity) without the benefit of orderly procedure, careful attention to specifics of language, or significant debate about their position. The conclusions were then *redrafted* before being submitted for governmental action.

This is incredible! Is it bad?

At the outset, one must state that the Asilomar Conference was not "bad" in any moral sense of the term. The organizers can perhaps be characterized as self-serving competitors in the race for scientific glory[12] and as self-appointed arbiters of the risks the rest of us must bear, but the fact remains that they imposed a voluntary, 2-year moratorium on their own work, alerted the public to recombinant DNA problems, organized a meeting to deal with those problems, invited their opponents to attend, invited the press to attend, and risked incurring the collective wrath of their professional colleagues by opening the sacred halls of science to public scrutiny. It is hard to believe that any of them is better off now than he would have been had he left well enough alone. Furthermore, criticism of the Asilomar organizers for not adequately involving the "general public" may be meant as a moral criticism; but properly understood, it is simply a criticism of six scientists for lacking the same transcendent social wisdom that all humanity has lacked throughout its history.

Even if Asilomar cannot fairly be deemed a moral failure, it may still be a failure in practical, institutional terms. The Asilomar Conference was a meeting of experts trying as a group to make social policy about matters within their sphere of knowledge. The Conference resembled nothing so much as a New England town meeting of the 17th or 18th century except that at Asilomar the "town" was, to use the label provided by its opponents, the "molecular biology community."[13]

The molecular biology community, or at least that part of it that attended Asilomar, was, like an 18th century New England town:

12. For the classic demonstration of the race and the glory, see J. WATSON, THE DOUBLE HELIX (1968). For a current account of another race that led to glory, see Wade, *Gulllemin and Schally: The Three-Lap Race to Stockholm*, 200 SCIENCE 279, 411, 510 (1978).

13. *See* note 4 and accompanying text *supra*.

> "small and compact, the congregations watchful; every person was tuned to the movements of his neighbor." Residential arrangements . . . "made for close living" among others "visible and ever present," and the deployment of social space was precisely paralleled by the use of time: there was "frequent daily intercourse of neighbors and townfolk," . . . and "enforced frequent sabbatarian communion." Together the utilization of time and the arrangement of space contributed to what Conrad Arensburg called . . . "a dense collective experience."[14]

As with a New England town, this "dense collective experience" led, not surprisingly, to an overwhelming need and desire for peace and agreement among the townsfolk. "[T]he private consciences of the community had to be brought into concert."[15] As a practical matter, the town achieved both consensus and peace by remitting primary authority to the town's selectmen and simply ratifying the selectmen's decisions.[16] The Asilomar participants followed the same course.

The Asilomar participants comprised a subgroup of individuals who were even closer in their viewpoints than the already close scientific community at large. The subgroup lived for 3 days in very close contact with each other, in each other's constant view, essentially in "enforced . . . communion."[17] They had to reach agreement. The time constraints of the conference, the expectations of the funding agencies, the public attention provided by the press, and the need to get on with their own work all demanded it. The Conference participants' response to these factors was to adopt the same techniques as did the 17th or 18th century New England town: the "selectmen" (organizers) proposed and the "townspeople" (conference participants) adopted. The achieved solidarity, mutuality of respect, and appearance of democracy made the work product of the group "morally binding" on all who participated.

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14. M. ZUCKERMAN, PEACEABLE KINGDOMS 48 (1970) (quoting K. ERIKSON, WAYWARD PURITANS: A STUDY IN THE SOCIOLOGY OF DEVIANCE 170 (1966)).

15. *Id.* at 50.

> Distinctive elements and common ones came together in the institution and idea of the covenant. . . . Unanimous consent was its form and the pledge of peace an essential part of its substance; by it a divine sanction was secured for the "mutual love and respect" thus sworn by a community "bound up together in a bundle of life." And because such accords were voluntarily subscribed and then morally binding upon their subscribers, they . . . conferred a special solidarity upon the social and institutional arrangements of the communities.

Id. at 54-55.

16. Lockridge & Kreider, *The Evolution of Massachusetts Town Government 1640 to 1740*, in COLONIAL AMERICA: ESSAYS IN POLITICS AND SOCIAL DEVELOPMENT 203, 206-08 (S. Katz ed. 1971).

17. M. ZUCKERMAN, *supra* note 14.

Of course, it was not morally binding on those who refused to attend. One may speculate about whether the refusal to attend might not have been an effort to avoid being morally bound. After all, the dissidents could only have achieved one of four things had they attended: They could have prevented the conference from adopting any statement; they could have caused the adoption of a statement opposing recombinant DNA research; they could have joined in a modified, compromise statement; or they could have dissented from the statement adopted. The latter two options would have defeated the objectives of the dissenters by giving moral legitimacy to an adopted statement, sacrificing their goal of public participation, and permitting recombinant DNA research to proceed. Unless the dissidents thought they had the strength to prevent any statement or to adopt an anti-recombinant DNA position, they chose the only practical course open to them—boycotting the Conference.

In fact, however, the absence of binding moral effect on the dissenters is only important to evaluating the Asilomar Conference as an institution. The dissenters oppose all recombinant DNA research, and, therefore, one need not fear that they will do research in ways more dangerous than the Asilomar statement proposed. What is significant is that their absence prevented the statement from silencing their criticisms.

If Asilomar had some of the features of a New England town meeting, it also had many differences. This Article shall mention only the important ones. First, the Asilomar Conference was an *expert* town meeting. Except for the four "lawyers," all the participants were experts in the subject under consideration. Second, although Asilomar had only four participants from outside the molecular biology community, it had a large representation from outside the United States. Thus, its "jurisdiction" was much larger than that of the traditional town meeting. At the same time, however, the power of the conference was less than that of the town meeting. Even if the New England town's decisions gained most of their strength from unanimity and moral suasion, they also had the force of law. The Asilomar statement had no legal stature outside the United States and was only advisory to a federal agency here.

III. ASILOMAR AS A MODEL

The Asilomar-style expert town meeting is an exciting, but ultimately unsatisfactory attempt at devising a new institution to cope with

rapid scientific change. The Asilomar Conference demonstrates the possibility of self-restraint and the consideration by decisionmakers of ends other than their own. In this age of cynicism, that demonstration alone makes the Asilomar Conference worthwhile. To criticize the Conference because its participants considered their own ends as well as those of others is unfair, because their ends are no less deserving of consideration than anyone else's. Similarly, it is inappropriate to criticize the Conference as an institution simply because it recommended lifting the moratorium on recombinant DNA research. Such a criticism can be leveled at any institution that reaches a result with which one disagrees. The criticism has no force unless the decision to lift the moratorium was incorrect on the merits. It is too early to tell whether it was incorrect, and this author is hardly qualified to make the judgment. Since 1975, however, some of the promised benefits[18] and none of the threatened harms[19] of recombinant DNA research have begun to emerge.

Asilomar was also a healthy step in the direction of recognizing and confronting our institutional inadequacy to deal with the international aspects of science. By including foreign representatives in the Conference, the organizers gained those individuals' insights, strengthened the international moral force of the restrictions they proposed, and probably reduced foreign scientists' fears of American scientists rushing unrestrained toward new breakthroughs. This, in turn, should increase the likelihood that other nations will also proceed slowly, thus providing some worldwide increase in safety.

Despite these advantages, the expert town meeting, if Asilomar is a good model, is not a very promising addition to our institutional ability to control science. The expert town meeting cannot address some of the things that an effective institution must confront, and performs inadequately those things that it does attempt.

The basic failing of an Asilomar-type expert town meeting is its lack of power. Moral suasion is wonderful, but it is not enough. A real town meeting had the power to make law; the Asilomar conferees, however, could not bind anyone. A legal institution with only moral power is not much of a legal institution.

18. *See* Ullrich, Shine, Chirgwin, Pictet, Tischer, Rutter, & Goodman, *Rat Insulin Genes: Construction of Plasmids Containing the Coding Sequences*, 196 SCIENCE 1313 (1977).

19. Decision of the Director, National Institutes of Health, to Issue Revised Guidelines for Recombinant DNA Research, 42 Fed. Reg. 33,043, 33,044 (1978).

Of course, society could create expert town meetings by statute or constitutional amendment in order to overcome the lack of authority. I suggest that this would be a serious mistake. The real town meeting gained its legal, as well as its moral, authority from the existence of consensus.[20] No such consensus exists with respect to the social issues posed by modern science. Asilomar presented the appearance of consensus only because the dissenters stayed away. The appearance of consensus, however, is no basis for the rule of law, and forced participation in a "democratic" process hardly bodes well. In any event, even if all the experts participate and agree, the case for empowering the expert body to make ultimate decisions cannot be made.

Social decisions about scientific matters are precisely that—*social* decisions. Scientific information is relevant to such decisions, but not controlling.[21] Questions of economics, ethics, administrative convenience, and a wide range of other concerns, including (even if the scientists shudder) those of language and linguistic precision, are part of any sound decisionmaking process. Aside from questions of legitimacy, scientists as a group have neither training nor inclination for the consideration and integration of those concerns; Asilomar demonstrated that. The participants neither wanted, nor were able, to discuss nonscientific matters. They reacted to law with fear, to language with contempt, and to ethics with tolerant disregard. Other relevant policy perspectives were never even raised. Remitting decisionmaking in matters of science policy to the scientific experts comes very close to guaranteeing unidimensional decisionmaking. Given the many facets of all social problems, unidimensional decisionmaking will almost always be inadequate.

Decisional inadequacies are compounded by the appearance of impropriety and the resultant weakening in the moral authority of the expert town meeting and its product. When scientists decide what controls will apply to scientists, they leave themselves open to the charge of being foxes sent to guard the chicken coop. A conflict of interest may not result in evil, but the appearance of evil cannot be avoided. Thus, one need not assume that scientists will regulate in their own interest to disqualify them from the role of governing science. They are disqualified by the ease of making the charge and the impossibility of defend-

20. *See* M. ZUCKERMAN, *supra* note 14, *passim*.

21. An example of what happens when legal institutions remit too much authority to experts and of one court's efforts to regain control is the history of the insanity defense in the District of Columbia Circuit. *Compare* Durham v. United States, 214 F.2d 862 (D.C. Cir. 1954) *with* United States v. Brawner, 471 F.2d 969 (D.C. Cir. 1972).

ing against it. In issues as controversial as those posed by scientific advance, the decisionmaker cannot bear the weight of an unanswerable criticism, whether well founded or not.

More serious than the expert town meeting's inadequacies in the area where it functions is its inability to address the most serious inadequacies in our present institutional response to science. The recombinant DNA episode is seemingly the high-water mark of scientific responsibility and early awareness of the social implications of a scientific development. One can hardly imagine a policy forum of any kind, including an expert town meeting, occurring earlier in the development of a technology than did Asilomar. This is especially true when one remembers that the moratorium halted important aspects of recombinant DNA technology for 2 years while the conference was being organized.

Despite this early involvement, the Conference came too late. By the time of the Asilomar Conference, recombinant DNA technology existed, had been publicized, and had generated excitement. Indeed, existence and awareness were prerequisites to the Asilomar Conference. But the existence and awareness rendered the Conference impotent. The most basic questions—should this research be allowed? ever? by anyone? anywhere?—had already been answered. The thought of not doing recombinant DNA research never surfaced at Asilomar. Given the rush of events, it would have been a meaningless issue to consider. So it always is in science policy. The expert town meeting may be useful for backing and filling and for moderating foregone conclusions, but our greatest need is for an institution that can anticipate problems before options are foreclosed. The expert town meeting cannot fill that need.

The second greatest need in establishing control of science is to develop an institution that can govern the government. The history of human experimentation[22] and of other developments[23] suggests that the government is the most likely abuser of science. A meeting of experts, whatever its legislative mandate, and even if it were not funded by the government, is not likely to impose meaningful controls on the state. What is needed is a major rethinking of both power distribu-

22. *See, e.g., U.S. Injected Plutonium in 18 Persons in Experiment to Determine its Effects*, Louisville Courier J., Feb. 23, 1976, § A, at 8, col. 1.

23. For a report of a conference to evaluate the propriety of a potentially useful medical technique that poses serious legal and ethical problems held *after* the government itself had begun using the technique, see NATIONAL INSTITUTES OF HEALTH, SINGLE DONOR PLATELET TRANSFUSIONS: SCIENTIFIC, LEGAL, AND ETHICAL CONSIDERATIONS (1975).

tions and the role of government in the science process. That too is a big order, which the expert town meeting cannot fill.

Of course, the expert town meeting cannot cope with terrorism and can deal only on a moral level with the establishment of international controls. Those deficiencies, however, pale to insignificance beside the inability to anticipate problems and to control the government.

Clear articulation of our institutional deficiencies in coping with science along with bold, creative thinking about new institutions should be high on the national and international agendas. The Science Court and the expert town meeting at Asilomar are two healthy examples of institutional innovations. If, however, these developments are not particularly useful, then further innovations are required. Science will not wait for the institutions; the institutions must be created soon to deal with emerging science.