

Gene-Splicing: Cambridge Citizens OK Research but Want More Safety

Cambridge, Massachusetts. Another eventful scene was played out last week in the attempt by the City of Cambridge to control the gene-splicing technique known as recombinant DNA research.

Since last July, Harvard and MIT have been asked to observe a moratorium on the two most hazardous categories of experiment while the city council decides what to do about it. At a council meeting last week a citizens' review board undercut scientists' worst fears by recommending that research should go forward despite the risks, although under more stringent safety conditions than those specified by the National Institutes of Health.

The verdict, praised by all sides but not yet endorsed by any, removes some of the tension created by Mayor Alfred Vellucci's colorful threats to ban all research for two years. Scientists within Cambridge have been talking of moving elsewhere, while those outside have been afraid that Vellucci's example would be copied by other local leaders.

Despite the Review Board's report, the situation in Cambridge is far from settled. Last week the council extended its existing moratorium on moderate (P3) and high risk (P4) research for another month while it decides what action to take. Should it accept the Review Board's recommendations, the issue will be whether Harvard and MIT accept them too, and whether the National Institutes of Health is prepared to pay for such items as the health monitoring of laboratory workers. "We have laid our cards on the table," says Councillor David Clem, a moderate and perhaps pivotal member of the council faction opposed to Vellucci's. "The NIH and Cambridge had better respond because if they are not willing to negotiate I will join with the most vociferous critics."

The dispute between the city and Harvard has risen to national attention but is firmly rooted in the local soil. The antagonism between the two is of long standing. Harvard and MIT own much of the prime land in Cambridge, pay no taxes, and put pressure on the local housing market. Vellucci, during his quarter-century career in city politics, has often harried the institutions, usually with a purpose more serious than his rhetoric. His threat to pave over Harvard Yard

did result (according to Vellucci) in the university's building more student parking facilities to relieve congestion in the city streets.

It was a tactical error on Harvard's part not to tell the mayor of its plans to conduct recombinant DNA research. Vellucci first learned from an alternative paper, the *Boston Phoenix*, that Harvard intended to construct a moderate risk or "P3" containment laboratory. Reviewing the possible hazards of the research, the article discussed the lack of consultation with the city, alluded to the intense competition among researchers to get busy with the technique, and suggested that the Harvard Biological Laboratories, located in a heavily populated area, subject to frequent floods, and infested with an ineradicable insect pest known as the pharaoh ant, was perhaps the worst possible place for the P3 lab to be built.

Just after reading the article, Vellucci was visited by two inhabitants of the Bio-Labs, George Wald and Ruth Hubbard, who expressed their concern about the dangers of the research. Grumbling of monsters and Dr. Frankenstein, Vellucci got his council to agree by a 9-to-0 vote to hold public hearings, meanwhile announcing that he wanted an absolute assurance of no risk if the research was to take place within city limits. "We want to be damned sure the people of Cambridge won't be affected by anything that would crawl out of that laboratory," Vellucci declared.

The mayor's words aroused consternation throughout the scientific community. A deluge of letters descended on City Hall from Nobel prize winners instructing the mayor to relent. Paul Berg of Stanford, a central figure in the development and discussion of the gene-splicing technique, wrote of his concern that the city council "is considering suppression of a serious and responsible search for new knowledge." Vellucci had everyone's attention.

Yet at two days of hearings held on 23 June and 7 July he probably weakened his strength on the issue with his council by his divisive style and penchant for theatrics. The first hearing opened to a rendition of "This Land Is Your Land" by the Cambridge Public High School choir. At both sessions Vellucci clearly

took delight in having the intellectuals of the "Harvard team," as he called the proponents, by the short hairs. "You see, we caught Harvard," he exulted at one stage.

The proponents, put on the defensive, lost several debating points, while the opponents of the research, such as Ruth Hubbard, George Wald, and Richard Lewontin of Harvard, and Jonathan King of MIT, made a generally more articulate presentation. Even so, Vellucci failed to get passed his resolution to ban all recombinant DNA research for two years. Instead, the council approved by a 5-to-4 vote a resolution by Clem calling for a three-month "good faith" moratorium—the city possibly lacks the legal authority to do more—applying only to P3 and P4 research, the two most dangerous categories.

The moratorium, extended for a further three months in September, has so far been of no practical consequence to Harvard, where the 30 or so researchers engaged in P1 and P2 experiments have not been affected, and construction of the P3 laboratory has gone ahead as planned. MIT already has a P3 laboratory at its Cancer Research Center, and at least one researcher has had to hold off planned experiments during the moratorium.

At the same time as passing the moratorium, the city council at its 7 July hearing voted to set up a citizens' board to review the issue of whether P3 research—there are no plans to do P4 research—should proceed, and if so under what conditions. The members of the board were chosen by the city manager, not the mayor. In the light of the Review Board's endorsement of scientific inquiry, its membership is of some interest.

The chairman is Daniel J. Hayes, a former mayor and owner of a heating oil firm. Other members are Mary Nicoloso, a community activist and cousin of Vellucci; Sister Mary Lucille Banach, a hospital nurse; Sheldon Krimsky, a professor of urban policy at Tufts University; William J. Le Messurier, a structural engineer; Cornelia Wheeler, a former city councillor; John L. Brusch, a physician specializing in infectious disease; and Constance Hughes, a nurse and social worker.

The Review Board, having heard some 75 hours of testimony from both sides, planned to make known its findings at 7 p.m. on 5 January, hoping to get its message over to the public without Vellucci's help. The mayor upstaged the board by calling a council meeting for 6:30 p.m.; the meeting went into recess while the board gave its press confer-

ence. "Some people say it's going to be a circus but I don't think it is," Vellucci said while watching the TV camera crews set up their gear. "What we did in this city council was to cause communities throughout the world to look into this kind of experimentation. I think the City of Cambridge should receive world honors, maybe the Nobel Prize."

Although Vellucci was in charge, the Review Board stole the show. It may well be judged to have proved its belief "that a predominantly lay citizen group can face a technical scientific matter of general and deep public concern, educate itself appropriately to the task, and reach a fair decision." It did not fall captive to the arguments of either side. The proponents had implied that restriction of the work would impede discovery of a cure for cancer. The Review Board decided that "the benefits to be derived from this research are uncertain at this time," although the possibility for advancement certainly exists. The opponents had said that since no containment could be absolute the research should not take place within a city, if at all. The Review Board decided that absolute assurance was an impossible expectation. The Review Board did not define precisely what degree of risk was acceptable, but it at least grasped the metal that has so far been too hot for any other group to handle. "Knowledge, whether for its own sake or for its potential benefits to humankind, cannot serve as a justification for introducing risks to the public unless an informed citizenry is willing to accept those risks."

The Review Board decided unanimously that it was prepared to accept those risks. The P3 research, it said, should go ahead. Nevertheless, the board, although praising the NIH guidelines governing gene-splicing research, recommended some further conditions of its own:

- Institutions doing the research shall prepare a safety manual, and safety training shall be a must for everyone involved.

- The institutional biohazards committees required by the NIH guidelines shall include a member representing the technicians and at least one member from the community.

- All P3 experiments shall be done with at least EK2 biological containment (that is, shall use genetically disabled *Escherichia coli* and not the standard laboratory strain).

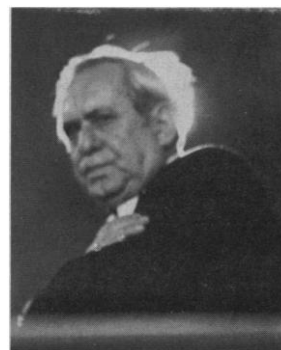
- The purity of the host organisms used in experiments shall be screened, and the organisms resulting from the experiments shall be tested for their resistance to antibiotics.



Daniel Hayes



David Clem



James Photos
Alfred Vellucci

- Institutions "shall in good faith make every attempt, subject to the limitation of available technology, to monitor the survival and escape of the host organism or any component thereof in the laboratory worker."

The Review Board also recommends that the city set up a Cambridge Biohazards Committee to oversee all gene-splicing research conducted in the city. Also a city ordinance should be passed to the effect that any recombinant DNA experiment not in strict adherence to both the NIH guidelines and the Review Board's extra conditions be held to constitute a health hazard to the city.

It is too early to say how well the Review Board's recommendations will be received, but the omens are favorable. Representatives from Harvard and MIT who attended the council meeting refused to make any comment, but Review Board chairman Hayes says that MIT has already prepared a draft safety manual and that he believes Harvard and MIT will not find the other conditions hard to comply with. David Baltimore, director of MIT's cancer center, says that the conditions, though unnecessary, are not a major problem.

Opponents of the research, such as Harvard's Ruth Hubbard and George Wald, and MIT's Jonathan King, consider that the Review Board's report is good as far as it goes—Wald called the report "sober, thoughtful and conscientious"—but does not go far enough. In a statement issued at the hearing they and other opponents argued that it is a mistake to let the work proliferate at this stage in many different universities; that the insertion of plant and insect genes into bacteria, permitted by the NIH guidelines, presents a major hazard to the environment; and that the impending capability for human genetic engineering "will require social decisions for which our political process is not ready."

Much depends now on what the council will do. Unless the institutions reject the report, Vellucci probably does not have the votes to carry the complete ban

on P3 and P4 experiments that he still prefers. There seems a reasonable chance that the Review Board's report will constitute the peace treaty between the city and the scientists.

Another sign of peace appeared last week in Boston in the form of an article on recombinant DNA research in *The Pilot*, the official newspaper of the Archdiocese of Boston. Creation of new forms of life is a matter on which the church might be expected to have something to say. But the article, by Bishop Thomas J. Riley, studiously avoids the issue, concluding instead that the problems of recombinant DNA research "can be definitely settled only by scientists themselves." Vellucci, however, has scheduled a meeting between Riley and the other four Catholic members of the council, and he has been trying to bring the issue to the attention of the office of Cardinal Medeiros across the river.

The Cambridge Experimentation Review Board based its report solely on public health aspects and, like all its predecessors, decided that the deeper issues raised by the gene-splicing technique lay beyond its scope. Chairman Hayes, however, believes one should strive for the goal of conquering all disease and face any risks as they materialize rather than hold back for fear of hypothetical dangers.

Another view is that of Councillor Clem. "I have a gut feeling that 10 to 15 years from now I am going to regret having worked toward a compromise on this issue, because I think we are stretching our limits of being able to respond in a civilized way to the fruits of knowledge. We are becoming fat with all this knowledge, so fat and bloated we may not survive."

Vellucci may have caused an unnecessary amount of agitation among some of his constituents, but he has at least created the conditions for others to have their say, and it was probably not too soon that somebody should ask the public for its unaided opinion.

—NICHOLAS WADE