

DATE: August 23, 1974

TO : Dr. Robert Stone
Director, NIH

FROM : Joshua Lederberg
Professor of Genetics

SUBJECT: DNA Biohazards

I hardly need to say that the major thrust of Dr. Berg's committee was entirely commendable and whatever critical remarks I have to make are confined to one specific strategy of statement. That is the emphasis on the asserted novelty of these kinds of proceedings. The statement that self-regulation in science has little or no precedent has certain latent implications about the scientific process which a number of critics have in fact been quick to understand and seize upon. The implication is obviously that scientists have been inherently irresponsible in the past and that unless some regulatory framework is laid on they will act like mischievous little boys flying off in all directions throwing firecrackers into gasoline tanks. I know that was very far from the intentions of authors of statements about the novelty of self-regulation; but nevertheless it already has happened to a substantial degree and I wanted to spread some word of warning about undesirable side-effects of careless statements of this kind in the future.

The fact is that like every other activity science has been sharply constrained by social sanctions of many, many kinds and that the so-called doctrine of pursuing every experiment wherever it leads regardless of consequences has never in fact been operational, nor could it be in an ethical or lawful society. The fact is that scientists are so lawabiding and generally so responsive to social sanctions that many of these concerns have been internalized, are accepted informally without great fuss and question, or are part of the overall legal framework in which every citizen operates. Now, plainly there are some unprecedented aspects of work with DNA molecules, but the basic issues are hardly different from those which faced the early bacteriologists when they were handling very dangerous microbes indeed with the aim of developing means of controlling them. And I do not argue the point that we perhaps may need some new institutional safeguards in the present circumstances, although I suspect that very much more stringent ones that are necessary will be forced upon us partly in consequence of careless language about the situation.

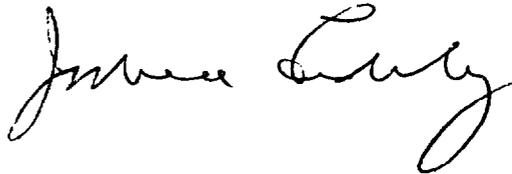
I am reminded, too, of any number of very explicit precedents for the very careful examination of risks before major experiments were undertaken; just as, of course, one can point to many cases both within science and more often outside of it where major ventures were undertaken without such pre-examination.

One that I have been particularly involved with and therefore know more about but have never believed to be without precedent in the history of science concerns the hazards of interplanetary quarantine (contamination of the planets and back contamination of the earth). In fact there is a fairly close analogy to the issues raised by the biohazards committee. I am referring to cautions about planetary quarantine, both with respect to restraints on transmitting

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organisms from earth to the other planets and perhaps the more nearly analogous situation of concerns about back contamination of the earth from Mars and elsewhere. We have indeed developed very specific institutional mechanisms for dealing with these concerns, going even to the point of setting specific standards of risk with respect to planetary contamination that are a part of fairly formal agreements between governments involved in the exploration of space. Of course there are great differences in the detail of sources of hazard in these various circumstances which may make it easier to focus on operational standards in the context of space exploration than in molecular biology. This is not the time or place to go into detailed comment about the proposed moratorium or more enduring restraints on certain aspects of molecular biology research, but I am very deeply concerned that carelessness about the details of enforcement and compliance may result in a smothering blanket that goes far beyond any needs that are reasonable for the problem intended to be addressed. That kind of over-reaction can only be encouraged by implications that the scientific community has been incapable of dealing with its responsibilities to the community in the past, that concern about social hazards to the community has been habitually out of mind on the part of responsible scientists and that therefore we must look systematically for means to police such nefarious activities in an ever widening area.

Sincerely yours,



cc: Paul Berg
David Hogness
Stan Cohen
Arthur Kornberg

Enclosure: Article 9 of 1966 treaty on space exploration