June 10, 1949.

Dr. Hugo C. Wolfe,
Administrative Chairman,
Federation of American Scientists,
1749 L Street, N.W.,
Washington 6, D. C.

Dear Dr. Wolfe,

I have had an opportunity to study, and to a limited extent to reflect upon, the report of the FAS committee on biological warfare, which you brought to my attention about two weeks ago. I was a little surprised that my reactions were wanted, because I have no special information on the problem, and my acquaintanceship with it is limited to a reading of Rosebury & Kabat's review article which appeared two years ago in the Journal of Immunology.

To the extent that the report was based necessarily upon published material, one must have considerable reservations concerning the possibility of technical advances which might override the difficulties now seen in certain specific applications of BW. As a geneticist, I can see this possibility most acutely in respect to the development of fungus pathogens, especially rusts, which might become suitable for military attacks on enemy cereal agriculture. The problem of retreaction is not insurmountable because a) it is quite likely that the technique of in vitro cultivation of rusts will soon be perfected, if it has not been already, b) the predominant varieties adapted to climatic conditions of different countries show marked differences in susceptibility to different races of the pathogen, and c) it should not be difficult to

harvest spores in isolation plots at seasons (or under glass) when their spread can be controlled. The genetics of pathogenicity is better understood in the rusts than in any other microbe, and theproblem of developing pathogens which would be specifically active against the enemy's agriculture would here most readily be solved. Although admittedly this type of attack is not sufficiently reliable to be used as a primary weapon, the expectation of success should certainly be high enough that it would justify the relatively small investment needed.

With regard to BW against man, the point is rightly made both here and in the Rosebury-Kabat article, that retroaction may be the chief consideration. I have been impressed with the possibility, however, that in desperation, one country might be willing to assume the risks of using highly retroactive agents (such as, for example, pneumonic plague) although such use would make military occupation impossible. However, it seems likely that this kind of sterilisation can be effected nearly as efficiently with radioactive poisons. The use of BW in this way might therefore be expected to originate from countries which have been attacked with a preponderance of military power in the form of atomic weapons, and for whom BW might be the only recourse.

I cannot envisage the possibility of effective international control of BW research. In contrast to atomic development, BW would require a minimum of industrial equipment, so that inspection could not be possible unless every house in every village could be searched. To hope to restrict the importation of anthropoids seems no more realistic than an effort to control the agar industry, or the distribution of embryonated eggs.

There is no doubt that there is great need for public education on the problem of BW. Fortunately, I don't believe that the sensational publicity has been taken very seriously. But it could certainly do a great deal of good to emphasize the need for expanded public health services, and the fact that a great deal of research is undoubtedly being carried on on defensive

aspects of BW, and that this work may be of public benefit far beyond its applications to military security.

As far as endorsement of a public report is concerned, however, I cannot help but feel that themilitary program holds the ace. Whatever an outside group might say would necessarily be subject to modification depending on the progress being made in the BW laboratories. Would it not be most useful, therefore, to seek an official endorsement of a report such as this, or to press for a comparable but authoritative statement from the Secretary of Defense?

Sincerely,

Joshua Lederberg,
Assistant Professor of Genetics.