

June 2, 1965

Dr. Joseph Rothblat  
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Dear Joe:

Enclosed is the revised copy of the working paper which I prepared for the Trieste meeting. If possible, I would prefer that this version, rather than the original one, appear in the Proceedings of the Conference.

Sincerely yours,

Matthew Meselson

MM:mjr  
Enc.

REPORT OF THIRD SESSION OF THE PUGWASH STUDY GROUP  
ON BIOLOGICAL WARFARE

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Trieste, 8 - 10 April, 1965

Having considered the consequences of the possible use of biological and chemical weapons, we reiterate our concern about the danger for mankind in the further development and use of these weapons. A total ban on such weapons, as well as of nuclear weapons, must be accomplished in achieving our final aim of complete and general disarmament under strict international verification.

The dangers to world security posed by all classes of biological and chemical weapons are closely interrelated. Both in public opinion and in military practice it does not appear possible to maintain any lasting distinction between incapacitating and lethal weapons, or between biological and chemical warfare. The great variety of possible agents forms a continuous spectrum starting from those that are temporarily incapacitating and ending with highly lethal ones. If the restraints on the practice of any kind of biological or chemical warfare are broken down, the entire spectrum of these weapons may come into use.

Although the problems of preventing the use of biological and chemical weapons are interrelated, we have confined our discussion to means for preventing the use of biological weapons. This is so because the far greater destructive potential of biological weapons qualifies them for attack on large civilian populations. In our opinion, the human destructive potential of biological weapons could, with continued research and development, eventually rival that of nuclear weapons. Furthermore, once they are perfected, devastating biological weapons may be far cheaper and easier to produce than nuclear weapons, thus placing great destructive capability in the hands of many nations.

At present there are reasons to believe that biological weapons have not been brought to a degree of perfection which would make them operational for any but limited military ends. However, a number of states are known to be working in this field. In this situation, it is important to consider means for inhibiting the further development of biological weapons. A variety of proposals for accomplishing this have been discussed at meetings of the Pugwash Study Group for B. W. at Karlovy Vary in September 1964, in Geneva in January 1965 and here in Trieste.

We have reviewed carefully the working documents submitted by members of the Study Group and a clarification of views was obtained on many of the subjects discussed. In addition to this report a more complete set of minutes of the meeting will be prepared for circulation to the participants. This should serve as a record of the many valuable thoughts and ideas that

~~emerged during the discussions~~, but are not covered in this report.

A brief discussion took place regarding the Geneva Protocol of 1925 banning the first use of biological and chemical weapons. We feel that the effectiveness of this Protocol would be greatly increased if those states which have not yet adhered to it were to do so. We wish to emphasize our conviction however, that arrangements going beyond the Geneva Protocol will be needed if the development and production of biological weapons are to be avoided.

We examined two specific questions as suggested at our last meeting in Geneva two months ago. These were:

- (a) the question of activating an international inspection team for allegations of attack with microbiological weapons;
- (b) problems associated with arriving at a pilot agreement between a group of European countries representative of Eastern, Western and non-aligned nations, not to develop biological weapons.

We have agreed upon the desirability of establishing and implementing such a pilot agreement amongst a group of European states. We have discussed specific measures for providing assurance that the terms of the agreement are being observed. We consider that such assurance can largely be provided by minimizing secrecy in all biological research, and by mutually beneficial exchange and co-operation in areas of medical and agricultural interest which border on problems of possible military interest. Such arrangements would act to remove suspicion that secret military biological programmes are underway. Moreover, the success of such a pilot agreement could have a powerful effect in inducing other nations, including the great powers, to follow suit.

We consider that a particularly appropriate co-operative undertaking would be joint efforts to work on the problem of very rapid detection and identification of micro-organisms (including viruses). We feel that the availability of efficient methods for the detection and identification of micro-organisms in air and water might discourage the development and use of B. W. weapons, as well as giving nations a measure of confidence in their ability to defend themselves against B. W. attacks. Moreover, the development of such detection devices would be of great value for epidemiological and health studies and the combatting of diseases of man, animals and crops.

Devices for the rapid detection and identification of micro-organisms might, for example, depend upon analysis of particle size distributions and on specific staining, especially with fluorescent antibody. Many important and interesting problems in biology and automation remain to be solved in the

application of these and other techniques to the design of compact and dependable detection equipment.

We recommend that another meeting should take place within the next six months, preferably in Stockholm, at which additional participants would be invited. These should include influential individuals and experts from various countries, who would consider the proposals formulated at the several meetings of the Pugwash Study Group on B. W. We would hope that as a result of such a meeting, the implementation of specific steps would follow to begin a series of pilot activities aimed at minimizing secrecy, building mutual trust and confidence, and implementing an agreement not to do research and development on biological weapons.

Preparations for this meeting should include a critical review of pertinent information on problems of detection and identification of micro-organisms referred to previously. The Group should begin to evaluate the merits of these methods.

At its next meeting the Study Group should also examine problems connected with the dissemination of B. W. weapons.

We repeat that the most important immediate effect to be worked for in the interest of all nations is to slow down and, if possible, completely stop all research and development on B. W. weapons. A secondary contribution might be the elaboration of an inspection mechanism for investigations of allegations of B. W. attack. The constitution and effective work of such a mechanism at this time presents considerable political difficulties and requires careful study, particularly by the larger powers. The reason for this is that any agreement for the creation of an inspection team for allegations of B. W. attack would require the agreement and initiative of the great powers in the U. N. Security Council.

It is recommended that funds for the next meeting of the Study Group be provided out of the remaining funds kindly made available in Sweden, and from other possible voluntary sources.

#### Members of Group

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