

May 16, 1958

Professor V. D. ^mTinakov
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Soljanka Li,
Moscow

Dear Professor Tinakov:

Dr. C.-G. Heden of the International Congress of Microbiology has forwarded your letter signifying your interest in a discussion of some general aspects of microbiological research in space.

I can well understand that my remarks might be unclear after having been transmitted second or third hand, and I am happy to take this opportunity, at Dr. Heden's suggestion, of first hand correspondence with you. An exchange of views by letter, prior to the Congress, might be most helpful .

First let me stress that my own interests are in biological and medical research, and that I have no connection with the rocket and satellite program in this country. Official policy on these matters is at present within the jurisdiction of the Department of Defense, although it is likely that legislation now pending in the U.S. Congress will transfer basic research functions to a new civilian agency, already abbreviated "NASA". This has, however, not yet been approved by the Congress. My views are therefore entirely personal. I speak only as a scientist, and not as an official representative, and I have furthermore no access to any unpublished or secret information in this field.

My chief concern is that a lack of liaison between biological and physical scientists may lead to an unfortunate loss of certain opportunities for future microbiological research. For example, the question whether the planet Mars is inhabited by living organisms will be extremely pertinent to our conceptions of the origin and distribution of life in the universe. Furthermore, during the next few decades, when it becomes possible to analyse the Martian microflora, its biochemical constitution will be of the most extraordinary interest. My fear is that in the haste to accumulate data for the physical sciences in space research, and to demonstrate the capabilities of interplanetary vehicles, these biological objectives may be overlooked in the planning of rocket missions. A possible result might then be the inadvertent contamination of a planet such as Mars by micro-organisms carried from the earth.

This is an event which might be expected to occur in the very near future. The possibility of retrieval of samples from another planet is much more distant, though its ultimate attainment can hardly be doubted. If, say 25

years later the problems have been solved, we face the possibility that microorganisms resembling those on our Earth may be found on Mars. The interpretation of such a finding will be most difficult unless we have some assurances that inadvertent contamination from earlier visits by one-way vehicles had been excluded.

The same considerations apply to the moon, although we can hardly believe that this is a habitat for active life. The only way that spores might occur on the moon would be through interplanetary dissemination, as had been suggested for example by Arrhenius fifty years ago. Your able compatriot, A.I. Oparin has summarized the arguments against such a possibility in his recently revised book "Origin of Life on the Earth". His objections are entirely convincing, but I would be very sorry if the opportunity to make an experimental test were to be needlessly spoiled.

I am enclosing some materials such as clippings from newspapers that may give you some idea of the extent to which these ideas have been received in the U.S. In view, however, of the pre-eminent position held by the USSR in the production of artificial satellites of such a magnitude that they could certainly be propelled to the moon by your existing rocket motors, the interest of U.S. biologists in this question will be futile unless we can make a common cause with our fellow-scientists in the biological sciences in the USSR.

This particular question, I should mention, is being taken up through more official channels, for example by the committee which has been convened by Florin (Liege, Belgium). However, if such groups are ~~EMX~~ to have necessary advice from microbiologists, both as to the nature of possible problems that may not yet have been thought of, and as to the methods for their solution, it will be necessary to bring these questions to the attention of our many scientific colleagues. I have been assured that Professor Florin's committee would welcome suggestions from many sources.

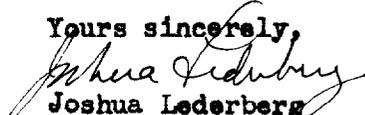
One difficulty is that I have no way of knowing which scientists in Russia may be most interested in these questions. If you have an occasion to introduce them to Academician Oparin, I would be very pleased to have his views also.

I have one last favor to ask. I must apologize for having essentially no knowledge of the Russian language, and unfortunately the facilities for translation in this community are, I am sure, inferior to yours. My wife has been studying Russian recently, but would have great difficulty at this stage. If it is at all possible or convenient, I would ask that we communicate in English, or in French or German if you would prefer either of these.

I am sure that Dr. Haden would welcome your suggestions as to microbiologists in other countries who might be asked to participate in the discussions. I do not know who else among the professional microbiologists in the U.S. would be interested, but perhaps during the next few months I can learn something of them.

Are you acquainted with Dr. K.V. Kossikov or Dr. N.D. Ierusalimsky of the Academy of Sciences? I had the good fortune to meet them at a CIBA conference in London, and hope you may transmit my regards if you know them.

Yours sincerely,


Joshua Lederberg

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(Member, National Academy of Sciences, U.S.)