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Department of Genetics
School of Medicine

November 4, 1960

Dr. Homer Newell
Chairman, Planetary and
Interplanetary Science Committee
Headquarters, National Aeronautics and
Space Administration
1520 H Street Northwest
Washington 25, D. C.

Dear Homer:

8-10

The accompanying remarks have been contrived with the great help of a session of the Space Science Board Exobiology Committee on October 29th and I am submitting them now as partial response to your request for comment on the Short Range Program. It should be read as a postscript to the item marked 8-8 which Dr. Young should be delivering to you.

At the last session of the Committee, you stressed the importance of the lead times necessary to accommodate scientific experiments on the appropriate space craft and you particularly indicated that these times would become longer the more capable and the more complex the vehicle. In these circumstances, it seems to me an urgent necessity to proceed as rapidly as possible with the development of the scientific hardware, and especially the simpler biological experiments that have not yet been checked out in space craft environments. At the present time, it may be possible to meet current schedules with carefully thought out and well tried designs but it is obvious that we have no comfortable leeway in time and the advantage we now have may be dissipated if we are not able to move promptly on the actual instrumentation. Please let me know the most effective channels to which these remarks, as coming from a University scientist outside the administration, may be directed. I need hardly point out that the Space Science Board has repeatedly urged the same views. The two basic exobiology instruments that are ready for implementation at the present time are (1) a culture device (the "multivator") which is essentially a test tube rack in which various nutrient

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media can be accomodated and changes noted. The same basic device would also be apropos for simple chemical reactions, and (2) a microscope which can be considered as one of the lens options available to any photographic system. The basic ideas behind these instruments are extremely simple and one foresees little difficulty in their implementation. However, until they are constructed so as to suit space craft requirements, we cannot be sure that considerable development work may be necessary to prepare any bugs that may develop. Meanwhile, in laboratories like my own, further work can be done with an aim to improving the sophistication of these instruments and making them more incisive for specific experimental goals. For example, we hope to investigate the potential use of microscopic spectrophotometry for the characterization of individual particles. If these efforts show the feasibility of such an instrument, it can be built on to the basic microscope just described. However, it would be rather risky to stake the early success of a program in exobiological exploration on the outcome of these trials and the basic microscope alone can be expected to furnish a substantial yield of useful data.

It should be obvious that in the course of time, our plans are bound to shift. Some programs will slip and the schedules have to be set back; on the other hand, we may suddenly observe unexpected opportunities. Again, in order to cope with the eventualities in a reasonable and effective way, it is absolutely essential that we have ready a repertoire of basic experimental devices for use in biological as well as in physical observation.

Looking forward to seeing you at the meeting on
November 15,

Yours sincerely,

/s/

Joshua Lederberg
Professor of Genetics

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