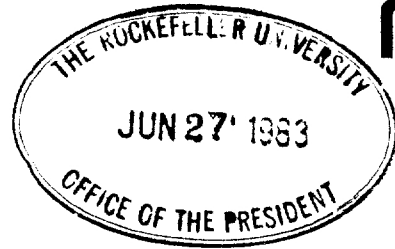


Ames Research Center
Moffett Field, California 94035



NASA

Reply to Attn of

LX:239-11

June 21, 1983

Dr. Joshua Lederberg
President
The Rockefeller University
1230 York Avenue
New York, NY 10021

Dear Dr. Lederberg:

Twenty five years have passed since you and D.B. Cowie first suggested in an article in Science (Volume 127, p. 1473, 1958) that cosmic dust containing organic matter formed in stars and interstellar clouds might be found on the Moon. As it turned out, most of the hydrogen, carbon, nitrogen and methane on the Moon's surface does appear to have originated in a star; their presence in lunar soils is the result of ion implantation by the solar wind.

During these years complex organic compounds have been discovered in interstellar clouds, and understanding of both star formation within these clouds and of ejection of matter from stars into them has grown out of new astronomical observations and theory. Moreover, the study of meteorites has revealed isotopic anomalies in the noble gases, in the rock-forming elements of mineral phases, and in the biogenic elements (H, C, N) of organic matter. These anomalies have not been understood in terms of known processes in the solar system. They are attributable, however, to origins in stars and interstellar clouds.

Just as you and D.B. Cowie anticipated 25 years ago, there is a discernable chain of events involving the major elements essential to life that extends backward in time beyond the planetary epoch to their very birth in stars. Elucidation of the links in this chain is the subject of the enclosed draft report prepared by the Study Group on the Cosmic History of the Biogenic Elements and Compounds.

The Study Group brought together for the first time scientists from diverse disciplines to consider the physical and chemical pathways taken by the biogenic elements and their compounds from origins in stars to incorporation in the building blocks of planets. This report addresses many of the pertinent scientific issues, and it identifies the opportunities that exist for

fruitful research across many disciplines. As noted in the Introduction to the report, it "is intended to serve as a scientific guide both for investigators interested in conducting research in the cosmic history context and for the Life Sciences Division of NASA Headquarters in its development of this new program component" for Exobiology.

On behalf of the Study Group and its Chairman, John Wood, I am pleased to invite you to write a preface for this report. From the historical perspective of your involvement in NASA's Exobiology program, and your early insight into this cosmic history, you seemed to be the most appropriate person to make this contribution. Your remarks from the viewpoint of a biologist would provide valuable counterpoint for a report that has been prepared by physicists, chemists and geologists. ✓

Should you decide to accept this invitation, we would like to have your contribution at Ames Research Center by the end of August in order to meet publication schedules. I will be traveling on business until July 27. During my absence, please contact John Wood at the Harvard-Smithsonian Astrophysical Observatory, 60 Garden Street, Cambridge, MA 02138, phone number (617/495-7278) if you have any questions about the report or your anticipated preface for it. ✓

With best regards.

Sincerely,

A handwritten signature in cursive script that reads "Sherwood Chang". The signature is written in black ink and is positioned below the word "Sincerely,".

Sherwood Chang
Assistant Chief for Science and Technology
Extraterrestrial Research Division

Enclosure:
As described

cc: J. Wood