

SPACE BIOLOGICAL KNOWLEDGE

AND PROBLEMS x)

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by. R. C von SORSTEL xx)

Space research can always be justified simply on the basis of the knowledge we expect to gain on the nature of the universe. The knowledge gained will be principally in the fields of astrophysics, meteorology, geology, and biology. The field of biology in space research can be separated into three categories: ^{68:} interaction of living material with the space environment, the search for extraterrestrial life, and interstellar communication.

When the living organism interacts with the space environment, several space-flight factors are encountered. These are principally weightlessness, cosmic radiations, and the vibrations and accelerations associated with launching and re-entry into the terrestrial atmosphere.

Weightlessness exerts certain effects on the cardiovascular system and bones. The heart does not have to work as

hard and it becomes "deconditioned" the bones become demineralized. At the cellular level, weightlessness appears to disrupt some of the cell division processes. The vibrations associated with launching and re-entry appear to induce chromosome breakage and possibly other genetic defects. Evidence has been presented that space-flight factors acts synergetically and antagonistically with.

radiation to enhance chromosome breakage and reduce gene mutation frequencies.

The search for extraterrestrial life is bound closely to the problems of origins of life and of detection of signs of life. There is still a controversy over whether signs of life can be detected in carbonaceous meteorites. Mars is regarded as the best candidate besides earth for being a life - supporting planet in our solar system. Programs are already being organized to search for life there between 1969 and 1973. Two considerations are that we neither wish to contaminate Mars with life from earth, nor wish to start a plague with living material imported from Mars.

Interstellar communication with intelligent beings in other solar systems is now technically feasible. The uncertainty remains whether advanced civilization exists elsewhere in the galaxy. One cannot even guess at probabilities now since there is no knowledge of a general biology that extends beyond the earth itself.

x) Lecture presented at the N.B.I. Sept. 30, 1967

xx) Oak Ridge National Laboratory, Oak Ridge, Tennessee,
U. S. A.