

General Disclaimer

One or more of the Following Statements may affect this Document

- This document has been reproduced from the best copy furnished by the organizational source. It is being released in the interest of making available as much information as possible.
- This document may contain data, which exceeds the sheet parameters. It was furnished in this condition by the organizational source and is the best copy available.
- This document may contain tone-on-tone or color graphs, charts and/or pictures, which have been reproduced in black and white.
- This document is paginated as submitted by the original source.
- Portions of this document are not fully legible due to the historical nature of some of the material. However, it is the best reproduction available from the original submission.

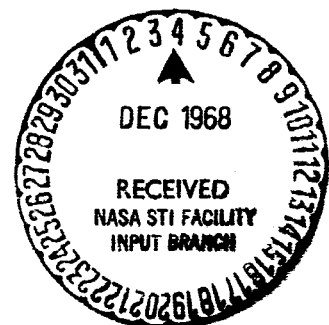
SC
File

National Aeronautics and Space Administration
Goddard Space Flight Center
Contract No. NAS-5-12487

ST-PR-SB-10773

BIOLOGICAL INVESTIGATIONS IN OUTER SPACE
(ZOND-5)

Press Release
(USSR)



FACILITY FORM 602

9-11830 (ACCESSION NUMBER)	
4 (PAGES)	(THRU)
OK-97775 (NASA CR OR TMX OR AD NUMBER)	(CODE)
	04 (CATEGORY)

19 NOVEMBER 1968

BIOLOGICAL INVESTIGATIONS IN OUTER SPACE
(ZOND-5)

Newspaper "PRAVDA"
No.320 (18367)
Moscow, 15 November 1968

Newspaper Column by
O. Gazenko, M-C
of the USSR Ac.of Sc.
P. Saksonov, Professor
V. Antipov, G. Parfenov
Senior science coworkers

*
* *

AS ALREADY COMMUNICATED ON 21 SEPTEMBER 1968, "AS ZOND-5" SPLASHED DOWN IN THE INDIAN OCEAN AFTER FLYING AROUND THE MOON. AMONG NUMEROUS SCIENTIFIC INSTRUMENTS, CONTAINERS WITH BIOLOGICAL OBJECTS WERE ALSO PLACED

*
* *

ABSTRACT

After some digression on the subject-matter of biological research in space in general, the authors give a preliminary account of the results obtained aboard ZOND-5 after its successful flight around the Moon, splash down in the Indian Ocean and recovery of the containers with scientific apparatus, subsequently flown to Moscow for laboratory investigations.

In the present translated version we shall limit ourselves to the results obtained on ZOND-5, omitting the general digressions on space biology designed for public consumption. The main interest of the experiment centers on the effects of circumlunar flight on turtles. These lost 10% in weight, were particularly active upon return and have shown a great appetite. Other biological observations are given, which bear an essentially preliminary character, since the study of the container content is only beginning.

*
* *

The experiment conducted aboard the automatic station (AS) ZOND-5 constituted a new step in the realization of the program of biological, and, in particular, radiobiological investigations in outer space. A substantial interest was, for example, aroused by the spacecraft's flight through the radiation belts and its pursuit beyond the Earth's magnetic field. Following were the living objects placed aboard ZOND-5: turtles No.22 and No.37, drosophilae, flour beetles, Tradescantia with flower buds, seeds of various higher plants, such as wheat, pine, barley, chlorellae in various feeding media, various forms of lysogene bacteria and others.

The physical parameters and the aggregate cosmic radiation dose were investigated and registered with the aid of various types of dosimeters (direct reading dosimeters, thermoluminescent glass, photodosimeters, nuclear emulsions, and so forth).

Therefore, complete successiveness was achieved in this experiment, relative to objects and methodical receptions of investigations previously conducted in various flights. This was prerequisite for a more effective analysis of the data again received. At the same time, the program of the new experiment foresaw the utilization of methods that would allow us, for example, to evaluate certain biophysical peculiarities of the effect of corpuscular radiation of Earth's radiation belts.

In particular, for the analysis of the mechanisms of radiobiological effects, various pharmaco-chemical anti-radiation means, such as cystamine and others were used more widely and in a new aspect (by comparison with the previous experiments). New containers were also successfully tested, of which the construction took into account the long duration of content in flights of such a kind in such objects as *Drosophyllae*, *Tradescantia*, lysogene bacteria of different types and others.

The first, and obviously the most difficult stage of this unique experiment with circumlunar flight and return to Earth was successfully completed. The biological objects have been delivered to laboratory in good state, and a large group of scientists undertook immediately the most valuable material processing. Analysis has just begun, so that at present, we are only in a position to present the very preliminary results.

Thus the aggregate dose of radiation registered with the aid of dosimeters placed at spots where biocontainers are fastened, constituted a few rad. which corresponds to computed data. Despite the fact that the dose is not large, its evaluation will offer to radiobiologists a specific interest from the standpoint of its biological (genetic) effectiveness, inasmuch as it was mainly obtained during the crossing by the organisms of Earth's radiation belts.

Upon return to Earth, turtles were active: they moved extensively and ate with appetite. They lost 10 percent in weight in the course of the flight. The investigation of certain blood indicators (number of leucocytes, erythrocytes, hemoglobin) failed to make apparent any substantial differences in experimental animals by comparison with the reference (control) ones. At the same time, during the histochemical analysis of a series of organs and tissues, conducted for 20 days after splashdown, an increased glycogen and iron content in liver tissue of experimental turtles was revealed. The complex of flight factors exerted also a definite effect on the structure of animals' liver.

The preliminary analysis of lysogene bacteria culture has disclosed that the flight on the automatic station exerted a well expressed induction influence on microbe (germ) phagoproduction. There is basis to hope that the final processing of the material will provide us with new, quite interesting

data on the biological (genetic) effectiveness of factors of near-terrestrial and near-lunar space. The biological experiment of AS "ZOND-5", prepared and conducted by means of efforts of a number of Soviet biologists and physicists, will make a substantial contribution to the further development of the main directions of space biology.

***** T H E E N D *****

Contract No. NAS-5-12487
VOLT INFORMATION SCIENCES, INC.
1145 - 19th St. NW
WASHINGTON D.C. 20036.
Tel.: 223-6700 (X-36)

Translated by ANDRE L. BRICHANT
on 19 November 1968