

PROGRESS REPORT

NASA ORDER NO. R-39

CONDUCT RESEARCH ON THE EFFECT OF VERY STRONG FIELDS
AND OF MAGNETIC FIELD-FREE ENVIRONMENTS ON MAN AND ANIMALS

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NASA R-59 PROGRESS REPORT

Biological effects of strong magnetic fields

1. A report on Sea Urchin Mitosis in High Magnetic Fields has been completed by Dr. Reno (1). He found that mitosis in sea urchin eggs is retarded following exposure to magnetic fields higher than 70,000 gauss with gradients greater than 4200 gauss/cm. The effect is strongest during early stages of cell division. It seems reasonable to assume that the synthesis of DNA is effected by the strong magnetic field. The serious consequences to the cell and to its progeny of tampering with a process so vital to its well-being as the synthesis of DNA make it imperative that any future exposure of man to high magnetic fields be made with full awareness of the potential hazards involved.

2. A main experimental effort was concentrated on cardiac performance in a strong magnetic field. Experimental preparations and the building of the apparatus have been completed and measurements of electrical and mechanical effects will be started in the near future.

3. Investigation of cerebral effects of strong magnetic fields was begun with Squirrel monkeys are in the process of being trained for a complicated visual task. Their performance in the strong magnetic field will be compared with the control performance in the earth's field. The EEG will be measured simultaneously. The experiment will be performed in March at the National Magnet Laboratory, Cambridge, Massachusetts.

Magnetic field-free environment

The construction of the shielded room has been delayed and is expected to be completed in May. In the meantime a number of testing methods for the subjects to be exposed to the field-free environment are being developed.

References

1. Reno, V. R., Sea Urchin Mitosis in High Magnetic Fields. NAMI-754.
NASA Order R-39. Pensacola, Fla.: U. S. Naval Aerospace Medical
Institute, 1966.