BIOPHYSICS

Gravity Affects Mice

➤ SPACE TRAVEL will subject living creatures to conditions of high and low gravity vastly different from anything encountered on earth. Two experiments reported to the Biophysical Society meeting in Cambridge, Mass., discussed the effect of simulated high gravity conditions on mice and smaller animals.

Dr. Charles C. Wunder, department of physiology, College of Medicine, State University of Iowa, reported that three-week-old white mice survive being exposed to three and one-half and seven times normal gravitational pull as long as eight days, but their growth is stunted. The artificially high gravity was produced by whirling the mice around in a centrifuge.

Gravity slightly greater than seven times normal produces death within an hour, Dr. Wunder said. The stunting of growth is due mostly to the fact that the high-gravity mice do not eat as much food as mice under normal conditions, he explained. However, when the mice are returned to normal conditions, they continue to develop almost normally. Growth is slowed up most in the mice exposed to seven times normal gravity, but both groups of mice actually lose weight during their first two days in the centrifuge.

The effect of gravity upon the growth of mice, Dr. Wunder said, is more drastic and also more complex than that which has been reported for simpler forms of life, such as fly larvae.

Speaking at the same meeting, Dr. D. E. Beischer of the U. S. Naval School of Aviation Medicine reported experiments in which animals were immersed in water to protect against the effects of extremely high acceleration forces.

Mice immersed in water and breathing oxygen were able to survive forces 1,500 times normal gravity for half a minute, while small fish survived 10,000 times gravity for the same period of time.

Single-celled animals known as Euglena were still alive after the water in which they were suspended was exposed to a force half a million times gravity in an ultracentrifuge for several hours.

Dr. Beischer discussed the limitations of this method for larger animals, including man, and mentioned that the immersion principle can be used to simulate the no-gravity conditions of a satellite in its orbit.

Science News Letter, February 15, 1958

GEOPHYSICS

Bigger Satellites Will Serve Many Purposes

➤ BIGGER and better earth satellites will soon be serving the world as multi-purpose stations in space.

They will be composite weather, television, telephone and science stations. Later, they will also be stopover points for travel to the moon and the planets.

These are the "earth-satellites-for-peace" uses. There are also potential war uses, such as making a space station as an interplanetary fort for raining missiles down on the earth.

There will be two stages in putting earth satellites to work for man as stations in space. First are the unmanned satellites, such as those now whirling around the earth, which will be followed by larger and more complex vehicles.

The second stage will be manned earth satellites. The first of these will probably carry only one man. From there, however, it will be a short time before teamed satellites will be whirling in space. One way this could be accomplished would be to hurl one man in a rocket into orbit, then he could be joined with others.

Today's satellites are already science stations, collecting information heretofore unknown to man and sending it back to earth. Soon they will be weather stations, also. One planned U. S. satellite is designed to measure the earth's heat balance which will tell weathermen just how much radiation the earth is actually receiving. Future proposals are to chart cloud cover, thus following the movements of great storms, including hurricanes.

These same satellites of tomorrow will serve as television and telephone relay points, whereby programs and conversations will be rebroadcast between New York and Moscow, or any other points on earth.

When man is settled on a satellite he will become an interplanetary astronomer, weatherman, physicist, and builder of space ships. This will give man more information about his environment than all the knowledge he has amassed in his earthbound centuries.

Science News Letter, February 15, 1958

DECOMPRESSION CHAMBER—A decompression chamber that simulates, for indefinite periods of time, the atmospheric conditions existing at altitude of 18,000 feet has been developed. Dr. Enrique Valdivia, designer of the chamber and instructor in pathology at the University of Wisconsin Medical School, is shown placing a guinea pig in the chamber. John McFee, right, who helped in its building, makes an adjustment in the humidity control apparatus. In six-month study of guinea pigs kept at 18,000 feet, Dr. Valdivia found the animals' right ventricle enlarged greatly.

CHEMISTRY

New Metal-Glass Fiber Makes Plastic Stronger

➤ FIBERS from a new type of glass that partially turns into a metal during production make reinforced plastic structural materials stronger, longer-lasting, the Society of the Plastics Industry, Inc., meeting in Chicago, was told.

The fibers are drawn from glass containing up to 20% copper oxide which is converted to metallic copper when the glass is heated and drawn in an atmosphere of nitrogen gas. Plastics form a tighter bond with copper surfaces than they do with ordinary glass surfaces, J. Frees Brossy, Armand Houze and Albert H. Lasday, Houze Glass Corporation, Pt. Marion, Pa., and James W. Case, Navy Bureau of Ordnance, reported.

The copper-coated glass fibers still are difficult to make and they contain too many imperfections for immediate use, but the scientists believe further work will result in fibers that not only can be used in laminated plastics, but could be used for reinforcing metals as well.

Science News Letter, February 15, 1958