

aerospace

PHYSIOLOGY

Neon-oxygen studied for space

Laboratory rats at the Ohio State University College of Medicine in Columbus have lived for three weeks in an atmosphere of 79 percent neon and 21 percent oxygen and emerged apparently normal.

The test could mean that neon is the ideal mixer for space breathing applications. Among other combinations, nitrogen, the inert component in air, can cause narcotic effects, pure oxygen can be lethal after prolonged exposure, and helium, the other mixer candidate, causes voice distortion and increases body heat loss.

In addition, helium, usually the leading candidate to mix with oxygen, may have another drawback. "Some research studies," says Dr. Harold Weiss, a co-director of the research team, "are beginning to show that helium can be damaging to the body at some biochemical level which is not yet known." In a study done at Columbus with chick embryos and a combination of helium-oxygen, only half of the embryos survived, regardless of the manipulation of other aspects of the environment.

Neon seems to be one of the better substitutes, he says, since it does not conduct heat or cause narcosis. However, it is extremely expensive compared to helium and nitrogen, and its biological effects are much less well known.

INTERPLANETARY PROBES

Usefulness of three Pioneers doubled

When the first in the present series of interplanetary space probes, Pioneer VI, was launched in December, 1965, plans were that it and two subsequent Pioneers would transmit data for six months from a distance out to 130 million miles.

The three space probes can now be heard all the way around the sun, up to 200 million miles away, by the 210-foot NASA radio receiver at Goldstone, Calif. The three Pioneers together have amassed 55 months in solar orbit; their lives are now known to be limited only by their wearout time, thus doubling their usefulness.

EDUCATION

National aviation center proposed

An elaborate plan for a \$21.7 million national aviation center that would train some 2,000 flight and ground crewmen a year has been developed by researchers at Arizona State University in Tempe.

In a study last year for the Economic Development Association, Arizona State predicted that between 1965 and 1980 the U.S. aviation industry would need 217,981 flight crewmen and 233,875 ground technicians and mechanics. Development of a national training center was first recommended as a result of that study.

The proposed site for the center is an airfield on the Gila River Indian Reservation, about 15 miles from Phoenix. Plans include an elaborate multi-media learning system incorporating computers, dial-access audio and video communications throughout the center, projection television and other electronic devices.

In addition, and of particular interest to the Economic Development Association, the center would provide an estimated 600 jobs for the Indians in the area. Opening is proposed for September, 1969.

SPACE SUITS

Thrusters in the chest

An experimental space suit with as many as 16 maneuvering jets built into its hard fiberglass torso is being built for the U.S. Air Force.

Each of the jets will produce 1.5 pounds of thrust. Arms and legs of the 182-pound suit will be made of flexible nylon fabric.

The suit also incorporates an integrated life-support system which will permit extravehicular space walks of up to four hours. Designed for the Air Force Aeromedical Research Laboratory at Wright-Patterson Air Force Base, Ohio, the life-support system will also allow the astronaut to replenish his oxygen and propellant supplies while outside his spacecraft.

LUNAR TRANSPORTATION

Body control for jet backpack

The familiar rocket-powered back pack designed by Bell Aerosystems Co. in Buffalo, N.Y., has been adapted by Bell into an experimental vehicle controlled by the shifting of the operator's weight.

The operator stands upright on the Pogo-stick-like device, which is designed to study the use of such kinesthetic control for small vehicles on the moon.

Yaw (rotation around the pilot's vertical axis) is controlled by a hand-operated deflector that alters the direction of the thrust from the rocket nozzle. Pitch and roll, however, are controlled by the operator's leaning in the direction he wishes to go.

The test unit, intended only for evaluating the control concept, has maximum range of some 850 feet in 21 seconds. Lunar versions now envisioned by the space agency would be capable of 10 minute flights covering up to 15 miles.

ELECTRONICS

Locator for submerged rockets

A tiny radio transmitter about the size and shape of a finger has been successfully tested as an aid to locating rockets and payloads that land in water.

As soon as it hits the water, the device begins to emit a constant pinging signal that can be detected by receivers aboard recovery vessels. Batteries give the unit a lifetime of several weeks and a range of more than 4,000 yards.

The transmitter was originally a Navy-designed locator used to help in the recovery of practice mines. Some three years of work at the space agency's Langley Research Center in Hampton, Va., went into stripping it down from three pounds to 12 ounces and making it rugged enough to withstand a rocket's uncushioned splashdown.