

## ZOOLOGY

# Birds Aid Space Study

Birds that can survive for long periods of time without water are being studied with an eye to the problems of survival in outer space.

► DROUGHT-RESISTANT desert birds may one day be useful in studying problems of long-term survival in outer space, a Syracuse University scientist believes.

Dr. Thomas J. Cade, associate professor of zoology at Syracuse University, is studying tiny seed-eating birds that can survive without water for long periods of time in the desert.

Some of the questions he hopes to answer:

What internal mechanism enables these birds to reduce the normal body loss of water due to respiration and excretion?

How are they able to continue eating dried seeds without becoming thirsty? Birds usually reduce the amount of food if the water supply is reduced.

How does this affect the aging process? Animals systematically deprived of food and water seem to have longer life-spans than animals receiving excessive amounts of food.

Do the infrequent desert rains provide the stimulus for a breeding season, similar to the onset of spring weather and increased daylight in this climate?

Dr. Cade believes his research may one day be useful as background information in the study of other organisms that have

adjusted to extreme environmental conditions. It could also result in the use of new types of animal subjects for experimental research in the extreme conditions of outer space.

For example, through Dr. Cade's original interest in desert creatures, the National Aeronautics and Space Administration is supporting research in California on a small desert mouse, the pocket mouse, which becomes dormant more or less on a daily basis. If the mouse's food and water supply is reduced, it stays dormant for longer periods of time.

One of Dr. Cade's assistants, a graduate student at Syracuse University, is studying these same mechanisms in small desert antelopes, the spring buck, the steen buck and the duiker, that are able to survive without water for long periods. Some of the desert-adapted African antelopes may eventually be domesticated for use as livestock in arid regions.

Dr. Cade is conducting his research in the Kalahari and Namib deserts of southwest Africa under a grant from the U.S. Public Health Service.

He had previously studied American seed-

eating desert birds while a graduate student at the University of California at Los Angeles. He concluded that the American birds depend on surface water for survival and have made no significant physiological adaptations to desert life.

• Science News Letter, 88:37 July 17, 1965

## TECHNOLOGY

## Apollo Fuel Cell Part Approved for Space Use

► WITHOUT even duplicating the weightlessness of space, scientists have tested and approved part of the Apollo moonship for use while floating in zero gravity.

The part is a small but important one—the condenser for the fuel cell. A fuel cell combines two or more chemicals to produce electricity, which in Apollo will be used to run instruments on board. As it works, the fuel cell produces water and heat as by-products, both of which must be removed to prevent their slowing down and finally stopping the cell. This is the condenser's job.

Once the fuel cell is aboard the spacecraft and working at full power, it will be producing 2,200 watts. Making this much power creates a lot of by-product water—almost two and a half pounds an hour—and it is therefore particularly important that the lack of gravity not slow up the process.

The condenser works by passing a glycol-water solution through a radiator to remove heat from the stream of hot hydrogen and water vapor entering the condenser from the fuel cell. The water vapor condenses on the cold surfaces of 260 tubes, from which, in the actual Apollo capsule, it will be recycled and used for drinking water.

National Aeronautics and Space Administration scientists at Lewis Research Center in Cleveland made continuous movies of the water condensing on the tubes during 11 experiments lasting more than two and a half months. They found that no matter how fast the water was condensing, it always formed individual droplets instead of a continuous stream running out of the tubes.

This is just what is needed for Apollo, since it means that surface tension of the water drops rather than gravity controls removing water from the condenser. Surface tension remains constant despite the lack of gravity in space, the scientists noted in a report to NASA.

• Science News Letter, 88:37 July 17, 1965

## TECHNOLOGY

## New Acoustic Generator Simulates Launching

► A NEWLY DEVELOPED acoustic generator can produce sound pressures more than a million times greater than the human ear can withstand.

The device is being used to test the effects of noise on operating personnel and electronic systems of the Apollo lunar orbital spacecraft. Random noise levels simulate the environment of actual launch conditions, and thus test fatigue properties of structures and materials in advance. It is a product of the Norair Division of Northrop Corporation, Hawthorne, Calif.

• Science News Letter, 88:37 July 17, 1965



NASA

**BAJA CALIFORNIA**—Among the photographs of the earth terrain taken from the National Aeronautics and Space Administration's Gemini 4 spacecraft during its June 3-7 orbital mission was this view of the north end of the Gulf of California showing the mouth of the Colorado River.