

BIOLOGY

**Living High
Tough on Females**

► LIFE at high altitude is tough on mice, especially the females.

This is one of the findings of a University of California physiologist, Dr. S. F. Cook, who is attempting to learn more about the physical effects of thin atmosphere at high elevation.

Dr. Cook reported on experiments in which he bred mice at the 10,150-foot level at the University's White Mountain High Altitude Research Laboratory, and also in a low-pressure chamber set for an atmospheric pressure of 15,000 feet.

He continued his experiments for 12 generations at White Mountain and six generations in the pressure chamber. With each generation the adaptability of the animals to high altitude stress declined. Reproductive rate fell, growth was retarded, and there were changes in liver functions.

When the animals were returned to sea level, they became normal, or almost normal, in a single generation. Whatever the cause of the change at altitude, it was not considered a matter of heredity.

Dr. Cook said the males, while they became relatively sterile, maintained a good state of general well-being. Females, on the other hand, have a harder time, they abort readily, and their litters are of poor quality.

Dr. Cook said the double stress of pregnancy and high altitude may account for the harder time females have.

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ORNITHOLOGY

**Build Your Own
Tin Can Bird House**

► TIN CAN NEST BOXES attract tree swallows, as well as other birds, it was found in experiments conducted at the University of Wisconsin arboretum.

Two-quart cans are best for these nests, according to Robert S. Ellarson, the university wildlife management specialist who conducted the tests. These cans can be obtained from restaurants or other places that buy canned fruits and vegetables in quantity.

An entry hole one and one-half inches in diameter should be cut two-thirds of the way up the can. The edges of the hole should be bent over or filed smooth.

The top cover of the can should be cut off completely. A wooden lid should then be cut so that it projects about an inch in front and one-half inch at the sides.

Two screw-eyes, projecting downward from the bottom of the lid, one on each side of the can, make it possible to hold down the lid by passing a heavy wire through the eyes and through holes punched in the sides of the can. Using this method, the lid can be removed for cleaning the nest in the fall.

Another wire, passed through holes punched about two-thirds of the way up the can in the back, will serve to hold the can firmly to its support.

The can should then be painted green, after which it is ready for bird house-keeping.

Mr. Ellarson said that if tree swallows are wanted as occupants, the can should be placed on a post in an open area, where there are few trees or shrubs. He explained that if the nest is placed too close to trees or brush, wrens are more likely to use it and may even break up a nest started by tree swallows.

Of course, other birds will use the can nests, too, if they happen to get there first and are tough enough to defend their new home.

Of 65 can nests placed by Mr. Ellarson, tree swallows nested in 42. Wrens and bluebirds used the others.

He suggested the can nests be placed as early as possible, because tree swallows at least start looking for a home in early spring. If the birds find the nest and its surroundings to their liking, Mr. Ellarson said, they will return again.

Science News Letter, April 21, 1956

ENTOMOLOGY

**Worm Sides With
Man Against Insects**

► WORMS so tiny that an army of them can live in one cubic foot of soil will soon be fighting on the side of man in the battle against insects.

The worms are a species of nematode, normally a destructive parasite which yearly costs the United States more than half a billion dollars in crop losses. The helpful species of nematode, however, does not harm plants or animals.

U. S. Department of Agriculture entomologists expect the useful nematode to be a valuable ally because it carries bacteria that quickly kill insects, can survive most insecticides and fungicides, and is hardy.

The disease spread by the nematode has proved deadly to at least 30 insect species, including the costly boll weevil and codling moth.

The nematode larva is a silent, efficient fighter. He crawls into an insect's mouth, penetrates its intestinal wall, discards the sheath in which he has been encased, and injects the fatal bacteria. Within two to three days the insect is dead.

Conveniently, the worm's weapon also serves as his food. The nematode eats the decomposed bodies of the bacteria which kill insects.

Like good soldiers everywhere, nematodes in the larval stage can survive extremes of heat and cold, can go without food for long periods, and can travel considerable distances in search of prey.

The Department of Agriculture has devised a method of mass propagation of nematodes. A large number will be needed for field tests.

Science News Letter, April 21, 1956

IN SCIEN

CHEMISTRY

**Air-Refreshing Chemical
Made Commercially**

► THE CHEMICAL filling the canisters that allow divers and fire fighters to breathe where there is no air is now made in quantity.

A fine-grained yellow powder, a superoxide of the metal potassium, absorbs carbon dioxide and gives off the oxygen needed to sustain life.

Moisture in the breath is sufficient to keep this chemical interchange going, so that a man can carry in his respiration canister a continually operating air re-conditioner.

Use of the chemical to keep air supply breathable under conditions of extreme exercise" was reported by Dr. C. B. Jackson of the Mine Safety Appliances Co., Callery, Pa., at the American Chemical Society's division of industrial and engineering chemistry meeting in Dallas, Tex.

Dr. Jackson also described the process, developed by himself and Dr. R. C. Werner, for making the superoxide by atomizing molten potassium with air.

A continuous process for making the pure potassium metal and alloys of potassium and sodium of any desired composition was described at the same meeting by Dr. Werner. Sodium vapor and molten potassium chloride are used to produce the light metals.

Science News Letter, April 21, 1956

TECHNOLOGY

**Fence Post Preservative
Developed for Home Use**

► IF YOU, like thousands of other United States home owners, have been plagued each year or two with rotting fence posts, you will probably welcome the preservative process developed by the U. S. Department of Agriculture.

The method gives protection against termites as well as decay.

The process consists of soaking fence posts in two solutions, one of copper sulfate, the other of sodium chromate.

The posts should be soaked two days in 18 pounds of copper sulfate crystals dissolved in 24 gallons of water, and one day in 18 pounds of powdered sodium chromate dissolved in 26 gallons of water.

The two chemicals combine in the wood and form copper chromate. Copper chromate is deadly to fungi and insects, practically insoluble in water, and will remain in wood even though the posts may be in damp soil.

The chemicals are poisonous and can cause irritation to unprotected skin.

Science News Letter, April 21, 1956

CE FIELDS

AERONAUTICS

Atomic Planes in 1959 And Aerial Locomotives

► ATOMIC-POWERED military aircraft should make their appearance in three years, and, atomic-powered commercial aircraft in ten years, Lee A. Ohlinger of Northrop Aircraft, Inc., predicted in New York.

Tomorrow's atomic airliners, he told the Society of Automotive Engineers' National Aeronautic meeting, will be "locomotives of the sky." The "engine" would be a giant atomic-powered fuel-plane. The "coaches" would be smaller ships coupled in mid-air to the locomotive.

With this set-up, Mr. Ohlinger said, indefinite shuttle service could be maintained, limited only by the crew's endurance.

The airborne nuclear train would fly its course, with commercial airliners "unhooking" on arrival at their terminal airport, where other passenger aircraft would "latch on" for new airports of call.

Airliners or air freighters, thus relieved of carrying full fuel loads, Mr. Ohlinger said, could haul larger passenger and pay loads. The tow plane concept, he said, also solves the problem of shielding passengers from radiation emitted by a nuclear engine.

Mr. Ohlinger foresaw a military application of atomic aircraft by what he called "Project Opossum," in which an atomic-powered, supersonic bomber would carry a fighter escort on its back, much like a female opossum carries her young.

When on target or attacked, the bomber would launch its fighters to set up a defensive screen.

Science News Letter, April 21, 1956

STATISTICS

American Women Now Are Younger Mothers

► AMERICAN WOMEN today are marrying and becoming mothers at a younger age than their mothers did.

These two facts are the reasons for the increase in the number of the nation's children during the last ten years and not the popular belief that large families are back in fashion, P. K. Whelpton, director of the Scripps Foundation for Research in Population Problems at Miami University, Oxford, Ohio, reports.

About 50% of the women reaching ages 20 to 24 had already married in 1915, as compared to 60% for the same age group in 1945 and 70% in 1955.

Among these married women, Mr. Whelpton reports, the percentage childless declined from about 27 in 1945 to 17 in 1955. This decrease, he states, was almost exactly balanced by an increase in the

percentage with two children from about 20 in 1945 to 29 in 1955.

The picture is very similar for married women aged 25 to 29, Mr. Whelpton states. Whereas one-fifth of these women were childless in 1945 the figure has dropped to one-tenth today. One-child families have also become less common, decreasing from one-third of all families in 1945 to one-fourth at present.

In most cases these changes mean a shift to two- or three-children families. There has been little increase in those with five or six children.

Science News Letter, April 21, 1956

PUBLIC HEALTH

Predicts Continued Hospital Cost Rise

► HOSPITAL COSTS will continue to rise at about five percent a year for many years, Ray E. Brown, president of the American Hospital Association, predicted in Chicago.

Personnel salaries are the crux of the problem. These must be increased as general salary levels increase. Hospitals, however, are service institutions with little or no opportunity to increase income by making a product that can be sold, he explained.

Before World War II most hospital employees were women and the lack of competition for female help kept hospital wage scales low.

Increases in hospital services calling for added equipment and personnel are another factor in the rising cost picture, Mr. Brown said. The number of routine procedures per patient day has increased more than 30% in the past nine years.

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MARINE BIOLOGY

Sea Creature Spits Up Offspring When Crowded

► AN ARCTIC SEA CREATURE that spews offspring out of its mouth when it gets in trouble has been reported by Prof. G. E. MacGinitie, principal investigator of ocean fauna at the Navy's Arctic Research Laboratory at Point Barrow, Alaska.

The peach-colored, plant-like invertebrate, a sea anemone related to coral polyps, concerns itself chiefly with preserving its species when it gets in trouble.

"When it was subjected to unfavorable conditions, such as over-crowding in a pan or jar of sea water," Prof. MacGinitie said, "it cast out through the mouth a translucent white inner lining, with translucent, stubby tentacles. This offspring was somewhat suggestive of a pickled onion. If conditions remained adverse, more offspring were cast off, each one becoming smaller than its predecessor."

When immature specimens of these offspring were first dredged from the sea bottom, they were mistaken for a new species, Prof. MacGinitie reported to the Smithsonian Institution.

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ENTOMOLOGY

"Yale" Butterflies Released in Florida

► A BUTTERFLY caught this spring with the word "Yale" stamped on its wings is not a college gag. It is part of a study by Yale University scientists.

They are trying to find the route and travel speed of the orange and brown Monarch butterfly. The butterfly is thought to migrate northward each spring.

It is known to wing southward in the fall and settle down in Florida and even the West Indies, the same as people and birds. Much less is known about the return trip north.

In an attempt to answer some of the questions about the Monarch's flight plans, Dr. Charles L. Remington, a Yale zoologist, and his wife Jeanne, have been tagging Monarchs in Florida with the word, "Yale."

It is hoped that the tagged Monarchs, if caught, will be sent to Yale with a report of the place and time of capture.

The study may lead to an attempt to find the mechanism that causes the butterflies to travel.

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AERONAUTICS

Pilot Errors Cause Air Force Accidents

► PILOT ERRORS were the greatest cause of U. S. Air Force accidents in 1955, Col. H. G. Moseley, chief of the Air Force's Aero Medical Safety Division, told the Society of Automotive Engineers' National Aeronautic meeting in New York.

Of the "cause determined" accidents in 1955, Col. Moseley reported, 67% could be blamed on the human factor. This figure includes pilot error, as well as maintenance and supervisory errors.

"Pilot error," Col. Moseley explained, does not necessarily imply any neglect or fault on the pilot's part. The pilot, he said, sometimes makes errors leading to aircraft accidents as a result of poor physical conditions, by having his physiological tolerances overwhelmed or due to irregularities in behavior.

However, most pilot errors, he said, are due to the pilot's inability to meet the routine demands of flying, and this inability is due to understandable causes.

These causes he listed as unfamiliarity with the aircraft, derelictions in attention, improper attitudes, faulty aids in flying and other distractions.

Col. Moseley expressed surprise that there were not more unsafe acts committed by pilots than there are. He said pilots today are functioning in an environment and under circumstances that have no present or historical comparison.

The Air Force medical officer said most of the causes for accidents could be remedied.

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