

## BIOLOGY

# Unusual Galapagos

Birds that do not fly and fish with four eyes are strange sights on the lonely Galapagos islands where Darwin made some of his most important studies—By Barbara Tufty

## See Front Cover

► CREATURES DO STRANGE things when left to themselves for eons as on the lonely Galapagos islands in the Pacific, where Darwin made some of his most important studies on evolution. Birds do not fly, lizards swim in cool water, and fish have four eyes.

On the unmolested lava islands, a special breed of cormorant birds have only rudimentary wings and cannot fly. They do not have to, for they have no land enemies there.

The frigate bird, seen on this week's front cover, is one of 13 rare species that inhabit Culpepper Island in the Galapagos. The members of the Galapagos International Scientific Project, who explored this island for the first time recently, were greeted by thousands of birds that never before had seen man and were completely unafraid.

Unlike most lizards, the giant marine iguanas of the Galapagos area are sluggish when basking in the warm sun and lively when swimming in cool water.

Then there are the little-known fish with four eyes—the *Dialommus fuscus*.

Perhaps for viewing the four corners of the sea, these tiny fish have developed eyes that are divided vertically into four sight organs. Scientists do not yet know for sure what purpose this multiple-vision adaptation serves.

These and other unusual specimens were closely observed by about 50 scientists from several nations who inspected plant and animal life, geology and weather on the equatorial islands, 600 miles off the coast of Ecuador.

The five-week expedition in January and February was conducted by the University of California Extension at Berkeley. Its main purpose was to study the natural behavior of the islands' flora and fauna and also to underscore the importance of establishing an effective protection for the rare finds on this living museum of past ages.

Ecuador owns the islands and helps support the Darwin Foundation whose center is the Darwin Research Station at Academy Bay, on the island of Santa Cruz.

For centuries life on the Galapagos islands has evolved in a world of its own, with only rare contact from the mainland of South America. The islands, made famous by naturalist Charles Darwin's observations on evolution in 1835, breed unique creatures that are found in no other place in the world.

Giant tortoises and lizards, wild tomatoes and cotton and other plants have evolved in undisturbed isolation from pressures and forces working in other parts of the world.

For instance, the large bristle-crested, sea-going lizards, the marine iguanas, are found nowhere else on earth. Called "imps of darkness" by Darwin's shipmates on the *Beagle*, these iguanas are reported to behave differently from other lizards. They become more active in cool temperatures, instead of more sluggish and they tend to move more slowly in the hot sun.

An odd method of regulating their body temperatures was recently observed by Dr. George A. Bartholomew of the University of California, Los Angeles, and Dr. Charles C. Carpenter of the University of Oklahoma.

When the weather is too hot for them, they lift their heads and shoulders, face straight into the sun, and let the cooler air flow under their shaded bodies. It is an odd sight to see thousands of these imps on the rocks, all facing in precisely the same solar direction, like prehistoric automatons.

These bulky iguanas dive as deep as 35 feet under the ocean in search for food, seaweed.

The flightless cormorant is another strange creature adapted through the centuries to a life of ample food in the sea and no

enemies on land. These big birds, found only on these islands, developed only rudimentary wings and an awkward waddle since no animal exists to prey on them. But in the sea, where they feed on fish, they are graceful divers and powerful swimmers.

Now that tuna fishermen, tourists and settlers are beginning to come frequently to the Galapagos, scientists feel an urgent need for immediate protection of the cormorants, as well as other birds and beasts which show little or no fear of man.

• Science News Letter, 85:151 March 7, 1964

## AGRICULTURE

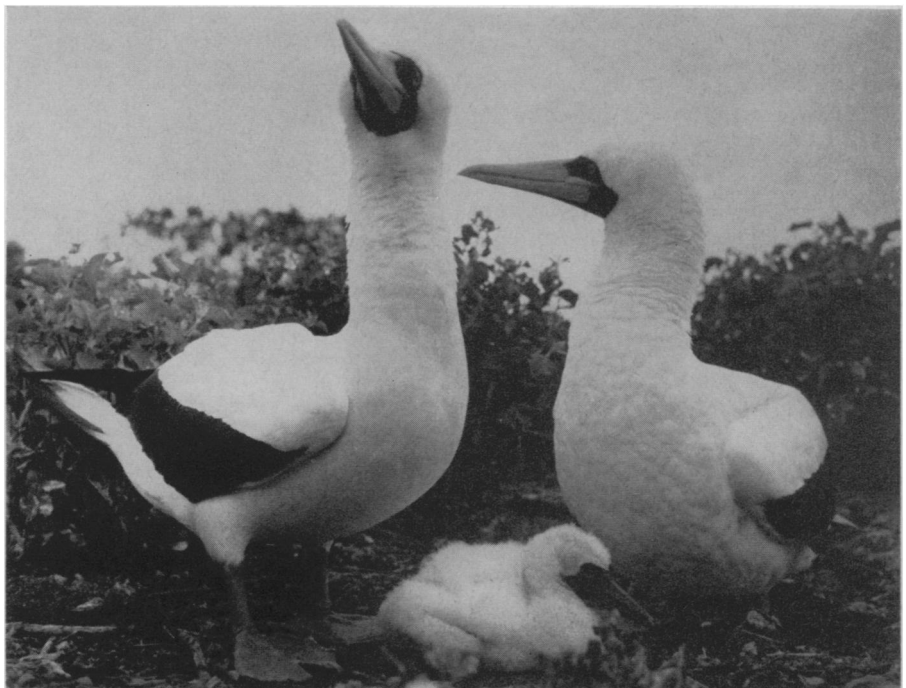
### Nearby Fragrant Shrubs Harm Cucumber Seedling

► THE TINY ROOTS of a young cucumber seed stop growing when they come in contact with a volatile chemical produced from aromatic shrubs.

Grass seedlings also seem to be affected by this material, produced in leaves of the shrubs *Salvia leucophylla*, *S. apiana* and *Artemisia californica*. In grassland fields in the Santa Inez Valley of California, bare soil stretches under and beyond the canopy of the shrub branches.

Evaporation from uninjured shrub leaves is deposited or trapped in dew, which comes in contact with the seedlings and stops them from growing, biologists Cornelius H. Muller, Walter H. Muller and Bruce L. Haines of the University of California, Santa Barbara, reported in *Science*, 143:471, 1964.

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University of California

**UNUSUAL SPECIES**—This close-up photograph of a family of the rare masked boobies was made during the first exploration of Culpepper Island in the Galapagos islands by members of the Galapagos International Scientific Project conducted by the University of California Extension. All birds on this island regard man without fear.