

ORNITHOLOGY

Nests With Awnings

The Allen hummingbird lays its eggs when the nest is a mere platform and they might easily roll out. All the work is done by the female.

See Front Cover

► THE ALLEN hummingbird, native to California, continues to build its nest until the young birds leave, states Dr. Elmer C. Aldrich of the Museum of Vertebrate Zoology in Berkeley, Calif. Some females lay eggs when the nest is a mere platform and the eggs could easily roll out, Dr. Aldrich reports in *Condor*.

The nest is built, the eggs hatched and the young reared solely by the female. The "unemployed" males may form bachelor societies around choice feeding areas. The female bird on the cover of this SCIENCE NEWS LETTER is shown in normal incubation position.

Awnings in the form of a branch a foot or so above the nest seem to be considered desirable to shade and protect the eggs. Nesting sites usually are chosen because they provide many separate supports for the first materials that are to be laid down. Nests are placed from one to 50 feet above the ground. Dense tangles are favorite sites.

Eucalyptus and cypress trees, oaks and shrubs and vines of streamside thickets provide suitable places for the nests, Dr. Aldrich says. Rather than build on a solid support, the Allen hummingbird tends to build where part of the supporting structure can be incorporated into the sides of the nest.

In eucalyptus trees the nest is built far out on an overhanging branch where the limbs are less than one inch in diameter. Sometimes the nest is saddled between two fruits or on the slender stems of leaves. Occasionally it is placed on a horizontal leaf attached to a vertical stem. Sometimes, instead of choosing one of these swaying locations, the bird places her nest between pieces of loose bark on the main trunk of the tree.

Spiderwebs are essential in building a nest, as they are used to hold the layers as well as the whole nest in place. The webs are gathered from trees, faces of rocks, out of the air, or any place the bird can find them. Webs usually are taken while the hummingbird is on the wing and hovering, reports Dr. Aldrich. They are grasped between the tips of the bill and the fibers are tangled irregularly over all of the bill and sometimes on the

forehead and throat. Quick backward movements pull the webs from their moorings.

Down from willow seed is used to line the nest. In gathering the down, the bird makes intermittent stabs and short, backward flights until it has a loose ball about half an inch in diameter in its bill. Feathers, shredded leaves, grass fibers and hair are also used in the nests. Ninety percent of the material is obtained within 25 yards of the nest.

In about nine-tenths of the nests studied by Dr. Aldrich, moss made up the largest part of the outer layer, thus giving the outside of the nest its characteristic greenish color. The nests were invariably decorated on the outside with lichens. Rains tend to keep the mosses and lichens green and fresh.

Practically always two eggs are laid in each nest, being laid on alternate rather than on successive days. The eggs are pure, glossless white. Incubation begins with the laying of the first egg and lasts from 17 to 22 days. The bird sets with her back toward the source of light.

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ELECTRONICS

Better Fluorescent Lamps From New Technique

► BETTER and brighter fluorescent lamps will come from a relatively new electronic method of applying to the inner walls of their tubes the essential phosphor coatings that transform the invisible ultraviolet rays emitted inside the tubes into visible light. The new process also simplifies and speeds production, improves the color of the light, and increases the emission efficiency by about 4%.

The new technique was developed by Daniel S. Gustin in the lamp division of Westinghouse Electric Corporation. In reality, it is an electrostatic precipitation onto the inside wall of a tube of the tiny particles of the phosphor from a phosphor "smoke" put in the tube. The method is controllable, produces a uniform coating neither too thin nor too thick. Drying or high-temperature baking is not required, and the coating, when once applied, sticks.



INSECURE—The nest is precariously attached to curled tips of bracken fern. A heavy rain caused the nest to stretch. Later both young fell out.

To form the "smoke," Mr. Gustin ground the phosphor finer than talcum powder, inserted the pulverized material in a proper container and passed a jet of air through it. A little of this dusty air is put into the tube to be coated. Then a rounded, pencil-thick rod with a sharpened tip is pulled through the tube. This rod serves as an electrode, introducing into the tube the high voltage necessary to pluck the phosphor particles out of the smoke and precipitate them on the wall of the tube.

When the rod is drawn along the tube interior, the powder particles rushing into its sharpened point become electrically charged with a positive charge. Immediately they are pulled away by electric attraction of the negatively-charged, electrically-conducting heated wall of the tube. The force of the impact causes the particles to adhere to the glass. There they take on an insulating property leaving only clear glass to attract more powder. This gives the even distribution.

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The fixation in soils of *nitrogen* from the air depends upon the presence of liberal amounts of organic residues in the earth as a source of bacterial energy.