

## ORNITHOLOGY

**Trumpeter Swan Increases  
In Population During Year**

► THE TRUMPETER swan, believed to be an extinct species only 40 years ago, added a 60 to its comeback score during the past year. A census taken jointly by the U. S. Fish and Wildlife Service and the U. S. National Park Service shows a total of 361 birds, as compared with 301 in 1945.

Most of the known nesting sites are concentrated on the Red Rock Lakes Refuge in Montana and in one valley in the northeastern part of Yellowstone National Park. The remaining population is scattered over adjacent areas in the Northwest.

The trumpeter swan, a magnificent bird with an eight-foot wingspread, was once fairly abundant. But reckless killing for their breast skins and down during the latter part of the nineteenth century, combined with drainage and cultivation of their nesting areas, practically wiped the species out.

In 1907, a few survivors of the supposedly extinct species were discovered, and the long, slow job of helping the birds to survive was begun. Even in 1935, however, the annual August census showed only 73 birds, and the upward trend of the curve has been notched with occasional setbacks after unfavorable seasons.

*Science News Letter, November 9, 1946*

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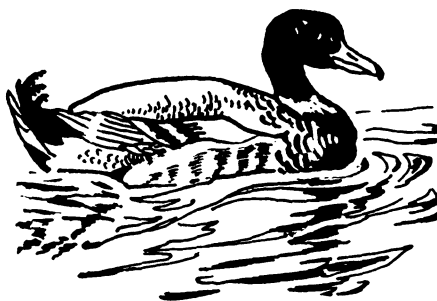
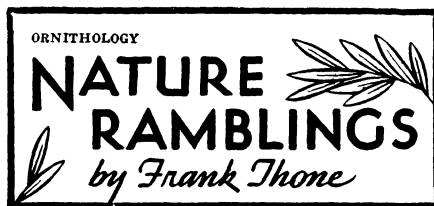
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### Roads in the Sky

► WILDFOWL have been migrating southward steadily for several weeks, and there are still some flocks to go. It is the time of year when men who like to do a day's shooting, in season, find it hard to stick to their jobs.

When the birds fly south in autumn, and again in spring when they return to their nesting grounds in the North, they do not just fly in the general direction they want to go. They have certain great migration routes, as well defined as the routes followed by commercial airlines, and they stick to them season after season. Not improbably these great flyways, as they are called, originated at the close of the Ice Age, 20,000 or 30,000 years ago.

The U.S. Fish and Wildlife Service, together with the corresponding government agencies in Canada and Mexico, have been making flyway studies for years, employing every known means for keeping track of the migrating waterfowl. Airplanes are the latest facilities for migration studies that have been placed at the disposal of these scientists of the out-of-doors.

There are four main flyways, it has been found: one along either coast, one down the Mississippi River and one along the High Plains, just east of the Rockies. A subsidiary flyway down the Great Basin area should perhaps be considered really a part of the latter. Each flyway is able to provide what the migrating birds need: landmarks visible in dim light, water areas not too far apart, for resting purposes, and opportunities to forage for food.

Since North America is a roughly triangular area, with the narrow end at the

south, there is a convergence or funneling effect on all these flyways. Ducks that fly down the Atlantic coast, winter in Florida and the West Indies, for example, converge from nesting grounds as far west as the MacKenzie river basin and as far east as the southern tip of Greenland. Other ducks from as far west as Bering strait and as far east as Baffin land use the Mississippi flyway and winter along the Gulf coast. Similar funnelings take place in the northern parts of the other two flyways, though their eastern boundaries are not quite so far east. Birds following these two flyways winter farthest south, spreading over most of Mexico and Central America and into the northern part of South America.

There is thus a good deal of overlapping, both in areas of origin and in wintering grounds. Yet the birds seem to be able to sort themselves out when they go home in the spring.

*Science News Letter, November 9, 1946*

## OPTICS

**Aluminum Surfaces  
Make Better Mirrors**

► BETTER MIRRORS, with aluminum, reflecting surfaces, are made by a simple evaporation method explained to the Optical Society of America by Noel W. Scott of the Radiation Engineering Branch of the Army Engineering Board, Fort Belvoir, Va.

Aluminum is used as the reflecting material because evaporated aluminum films have a high reflectivity in all useful spectral ranges. The method will have its principal application in making mirrors for scientific instruments.

The fine grained smooth surface is important for the deposition of effective protective coatings on the mirror and for minimizing diffuse reflection. As protection for the mirror surfaces silicon oxide layers are used.

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