

ORNITHOLOGY

Migration Is Not Homing

Phenomena often considered similar are in reality direct opposites. Experiments on crows show that young birds make long flights unguided.

► THE HOMING flight of pigeons and the autumnal and spring migrations of many other kinds of birds, often considered similar phenomena because both involve the unerring finding of a distant goal, are in reality direct opposites, Prof. William Rowan of the University of Alberta declares. (*Science*, Aug. 24.) Prof. Rowan is well known as the first scientist who discovered that the decreasing length of daylight hours is the physiological "trigger" that sets birds off on their long flights southward as winter approaches.

When a pigeon flies home, he points out, it really is going home—that is, to where the nest is. Pigeons never migrate. When migrating birds fly south in autumn they are turning their backs on home. Even when they come back in spring they do not usually return to the same home, in the sense of exactly the same spot. They come back to the same neighborhood or general region, and as a rule set up new homes.

It still leaves the nature of the migrating impulse, and especially the guides or landmarks by which the birds find their way, very much in the dark. The problem is made the more difficult by the fact that in many species the young of the season, which have never been south before, fly separately from, and often in advance of, the flocks of their elders, so that they have no experienced guides with them. Yet even the antarctic penguins, which migrate northward by swimming when the southern hemisphere winter closes in, reach their rookeries on the shores of South America through hundreds of miles of murky water.

Prof. Rowan relates an experiment he undertook with young crows a few years ago:

"On Nov. 9, 1940, approximately a month after the last resident crow had gone south, I liberated 54 young crows of the year near Edmonton, Alberta, from the area on which they had been hatched and subsequently trapped as juveniles in July and August. They were merely held in a spacious flying cage during the intervening period; no adults were with them.

"By Nov. 20 over 50% had been re-

taken, the farthest 250 miles southeast of the point of liberation on a line directly joining Edmonton and central Oklahoma, the wintering ground of 95% of Alberta crows. None of the birds recovered had deviated materially from this line and some of them were traveling at 50 miles per day, a remarkable rate for crows. The temperature was below zero Fahrenheit and the ground blanketed with snow."

Science News Letter, September 1, 1945

ENGINEERING

TVA's Newest Dam Performs Satisfactorily

See Front Cover

► TESTS were made on Fontana dam's spillway tunnels, shown on the front cover of this SCIENCE NEWS LETTER, over a three-hour period by spilling about 2,400 acre-feet of water at varying rates of discharge up to 20,000 cubic feet per second. Maximum design capacity is 200,000 cfs. The Fontana spillway is

unique in many respects. Unlike a conventional spillway which discharges an overflow down the face of the dam, the Fontana spillway consists of a pair of parallel tunnels drilled through the solid rock of the mountainside which forms the east abutment of the dam. Each tunnel is 34 feet in diameter and approximately 1,000 feet long. The spillway crest at the entrance to the tunnels is at elevation 1675 and the outlets, several hundred yards downstream from the dam, are at elevation 1270. Each tunnel is intersected by a horizontal sluice tunnel at elevation 1590. At the height of the discharge during the test, water raced through the spillway tunnels at about 100 feet per second (around 70 miles an hour). On hitting the huge "bucket" deflectors at the tunnel portals, the water shot more than 100 feet into the air and spread in a fan-shaped spray extending 400 feet downstream. The action of the water on the river bed moved, as was expected, about 14,000 cubic yards of rock. Wind velocities up to 40 miles an hour were recorded in the gorge. Prior to construction of Fontana Dam, exhaustive tests on scale models were conducted at the TVA hydraulic laboratory at Norris to determine the feasibility of the unique spillway.

Science News Letter, September 1, 1945

The *drone-fly* is so named because it resembles the drone honey bee in appearance.



EXCESS POWER—Shooting out from Fontana's spillways, excess waters from Tennessee Valley Authority's newest dam are dispersed into a vast spray to reduce erosion.