

An Untenable Theory of Bird Migration

BY WELLS W. COOKE

SOME years ago Palmen advanced his theories of bird migration, which have not received much support among American ornithologists. One phase of his belief was favorably commented upon by a scientist in this country and has lately been brought so prominently into notice that a few words in regard to it at this time seem advisable, before the error makes further headway.

Palmen's theory has been stated as follows: "The annual migration route of a species indicates the way by which it originally immigrated into its present breeding home."^a

A few months ago Mr. C. C. Adams, of the University of Michigan, used this theory to explain the migration route of the Kirtland warbler (*Dendroica kirtlandi*).^b In conversation with Mr. Adams I told him that I did not believe that theory was correct and he said he hoped I would write out its refutation.

At the outset one is met by the fact that several species have different migration routes spring and fall. The Connecticut warbler (*Geothlypis agilis*) is one of the best known examples among land birds and the golden plover (*Charadrius dominicus*) among the water birds. Evidently both routes cannot be the original path of immigration and the theory will not hold for such species.

The species Mr. Adams selects, the prothonotary warbler (*Protonotaria citrea*), is probably as good as any one that could be chosen to show the strong points in the belief. According to the theory, the prothonotary warblers of the Mississippi Valley spread northward following the retreating ice of the Glacial Period, and gradually worked up the river bottom, following the lead of the swampy bottom lands that form their natural home. Now year by year they follow back and forth over these river courses that marked their original entry into the country. However plausible this may seem to one who looks at the map of the Mississippi Valley and notes how the whole great river system seems especially adapted for a natural highway of bird migration, yet the argument fails when it attempts to answer the question: how did the birds originally get to the mouth of the Mississippi River to begin their extension up its watershed? It happens to be known that the prothonotary warblers of the Mississippi Valley pass neither to the west along the coast of Texas, nor to the east through Florida, but on arriving at the coast they make a flight across the Gulf of Mexico, here nearly at the widest.

To my mind it seems an impossibility that any land bird should voluntarily take a flight across water for an unseen shore, unless it had previously learned the route by a gradual extension from a shorter flight, or was in company with some bird who had so learned it. Two suppositions are possible. First, that formerly a chain of islands extended across the Gulf of Mexico, and that the birds having learned the way from southern Mexico to the United States, by way of these islands, continue to travel the same route after the islands have disappeared. Against this supposition is the fact that the Gulf of Mexico off the mouth of the Mississippi River is a vast abyss, with no indication that any of its central portion has been above water since bird life appeared on the earth. This first supposition then may be considered not available as an explanation of the manner in which the birds learned their course across the Gulf of Mexico. Recourse must be

^a Stejneger, American Naturalist, XXXIII, 1899, p. 68.

^b Bull. Mich. Orn. Club, V, 1904, pp. 14-21.

had, therefore, to the second supposition which is that the birds learned this course gradually by an extension of a shorter course.

It is known that at one time the Gulf of Mexico extended north approximately to what is now the mouth of the Ohio River. It is a fair presumption that at this time migrants passed by land from Mexico through what is now Texas to their summer homes in the Mississippi Valley. This course would be but little longer than the direct course across the Gulf. As time passed and the land began to appear to the south of the mouth of the Ohio, the bird's route would turn more and more to the east in northern Texas, while at the same time it is probable that the climatic conditions in southern Texas and northwestern Mexico became less favorable to the support of a large population of forest loving birds. These two causes together probably induced the birds at first to follow close along the Texas coast to shorten the distance and obtain food; later to make short flights over the water, near to the shore, and still later to lengthen these flights, carrying the path of the flight continually to the eastward, until finally they adopted their present route across the full width of the Gulf of Mexico.

It is believed by some that many of the birds of the eastern United States reached their present breeding grounds by way of a former extension of Honduras toward Cuba, and thence across that island to the Bahamas and Florida. The argument is just the same whether it is supposed the route began in Texas and moved eastward or commenced in Cuba and moved westward. In either case the migration route now used does not indicate the way by which the species "originally immigrated into its present breeding home."

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Old Fort Tejon

BY JOSEPH GRINNELL

SCARCELY any locality in California could be named which would fail to afford at least a modicum of interest to the nature student. Yet Old Fort Tejon possesses an added attraction due to its position in the early history of California and its zoology, which cannot fail to continually draw more explorers in its direction in the future.

Fort Tejon lies in a well watered valley which leads down from Tejon Pass towards the San Joaquin Valley. This Pass is the lowest one of the southern Sierras, 4200 feet, and was the one selected by the forty-niners who entered California by the way of the Mojave Desert. The Pass itself is in the extreme north-western corner of Los Angeles county, but Fort Tejon, five miles north, is beyond the boundry, in Kern county, and about a thousand feet lower. The old immigrant trail still shows in places, but is now for the most part replaced by the well graded State road which leads up from Antelope Valley (the extreme westward arm of the Mojave Desert) over Tejon Pass, down the valley and past Castac Lake (now dry) and Fort Tejon, and on down the steep and narrow Cañada de las Uvas out into the San Joaquin Valley by the way of Rose's Station to Bakersfield.

They tell us that the military post was established at this point about 1850 in order to furnish protection to the immigrants through the mountains which were at that time infested with bands of Mexican bandits and renegade Indians. The ruins of the Fort buildings cover considerable ground, and point to the great im-