FRIGATE-BIRDS OF THE WEST AMERICAN COAST

WITH ONE ILLUSTRATION

By H. S. SWARTH

Study of the series of *Fregata* in the collection of the California Academy of Sciences and in that of the Museum of Vertebrate Zoology, undertaken in order to ascertain the nature and extent of variation obtaining in the two species occurring on the Galapagos Islands, has elicited some facts worthy of record. It seems curious that for so many years the several species of the extremely conspicuous Frigate-birds were misunderstood, all going under the name of *Fregata aquila*. Probably, however, there are not many localities where two species occur together, and in such places specific differences were obscured in the medley of plumages produced by the many young birds in various transitional stages toward the different adult plumages of the two sexes. In 1897 Ridgway (Proc. U. S. Nat. Mus., XIX, 1896 [1897], pp. 590-592) recognized two species in the Galapagos series before him, but his findings were ignored by others who collected later in the islands. It remained for the studies of Mathews (Austral Avian Record, II, 1914, pp. 117-121), Rothschild (Novit. Zool., XXII, 1915, pp. 145-146), and finally Lowe (Novit. Zool., XXXI, 1924, pp. 299-313), to give us a proper conception of the facts in the case.

The Galapagos Islands and the west coast of Mexico form a meeting ground for two species. *Magnificens*, primarily of the West Indian region and the tropical Atlantic coast of South America, extends westward to the west coast of Mexico and to the Galapagos; *minor*, primarily of the tropical Indian and Pacific oceans, reaches (in the subspecies *ridgwayi*) an eastern boundary on the Galapagos and on the west coast of Mexico.

Fregata magnificens was described (Mathews, *op. cit.*, p. 120) from the Galapagos Islands, and in the subspecific sense the name probably should be restricted to birds of that region. In this connection certain comments by Lowe (*op. cit.*, p. 304) voice my own attitude exactly. Speaking of a series of specimens from scattered points within the general range of the species, he says: "From the point of view of distribution or the study of genetics they are, for me, *F. magnificens*, but I should be quite prepared to believe that if large series were carefully measured and compared with typical examples from the Galapagos, differences might be found and subspecies established. It goes without saying that an isolated colony in say the Bahamas will not breed true to the same index figure as one in the Dutch West Indies or another in the Galapagos."

Specimens and measurements in sufficient number to demonstrate the whole situation are not to be had, but such evidence as exists tends to show the local restriction of even these birds, powerful fliers as they are. A series from Lower California (in the Museum of Vertebrate Zoology) differs appreciably in measurements from the Galapagos birds, illustrating the different "index figure" to which Lowe alludes. *Rothschildi*, from Aruba, West Indies, was described by Mathews (Birds of Australia, IV, 1915, p. 280) as differing from *magnificens* "in its smaller size, conspicuously shorter tail, and different coloration of the breeding plumes and also of the wing coverts." (This, incidentally, is the only statement I have seen implying a seasonal change of plumage in *Fregata*.) Rothschild (*in* Lowe, Novit. Zool., XXXI, 1924, p. 313) asserts that the differences between the West Indian *rothschildi* and the Galapagos *magnificens* "are solely in the length of the tail; those of the West Indian birds and the few we have from the east coast of South America consistently show much shorter tails than the Galapagos birds."

Measurements of Frigate-birds at the best are unsatisfactory. The wings in a prepared skin are difficult to measure accurately, and wings and tail both are apt to include badly worn or broken feathers, or there may be missing feathers or partly grown ones to an unsuspected degree. The bill is so shaped that different people would be unlikely to take the culmen measurement in exactly the same way; the dwarfed tarsus is practically unmeasurable; and the toes in a prepared specimen are apt to be twisted so as to be of little value for comparisons. Making all due allowance though, the Lower California birds are smaller than the Galapagos ones. As regards color I am not so sure. *Magnificens* is described as having in the adult male a predominating purplish sheen above, as compared with the greenish sheen of *minor*. This difference is clearly evident in our Galapagos series of the two species, but in the Lower California *magnificens* the purplish sheen is far less apparent. However, the entire series from Lower California is composed of birds that were salted in the field, then, months later, relaxed, washed and reshaped in the museum; and I am not sure to what extent, if any, an iridescent color might be affected by this treatment. A single male at hand from Florida is colored like the Galapagos birds.

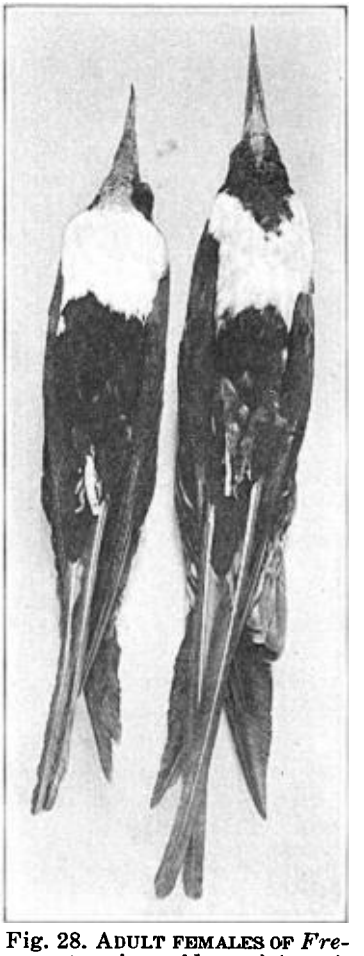

Fig. 28. ADULT FEMALES OF *Fregata minor ridgwayi* (LEFT) AND *F. magnificens magnificens* (RIGHT). THE GRAY THROAT OF ONE AND THE BLACK THROAT OF THE OTHER ARE FEATURES THAT ARE READILY SEEN IN THE LIVING BIRD.

My conclusions are that the Galapagos colony of *Fregata magnificens* is isolated and apart from the Mexican west coast population. Differences exist between the two, slight in degree but consistent enough in mode of occurrence to justify restriction of the name *F. m. magnificens* to the Galapagos bird. The Mexican west coast bird, so far as I can now see, shows the described characters of *F. m. rothschildi*, and should bear that name.

Local distribution of the two species, *F. magnificens* and *F. minor ridgwayi*, is of interest. On the Galapagos they are apparently apart in their breeding activities. The two large nesting colonies of which I have detailed information were each composed solely of *ridgwayi*. I have no exact data on breeding *magnificens* that was recognized as such. I do not recall any reliable published statement of the occurrence of a form of *Fregata minor* on the coast of Mexico, but specimens and data at hand indicate the occupation of San Benedicto, Revillagigedo Islands, by that species. The collection of the California Academy of Sciences contains one adult and two near adult males and one immature taken from a breeding colony on San Benedicto, and two immatures from Clarion. A photograph published by Bent in his "Life Histories" (U. S. Nat. Mus. Bull. 121, 1922, pl. 67) of a breeding colony of Frigate-

birds on San Benedicto is clearly of *Fregata minor*; unpublished photographs in the possession of the Academy taken upon the Revillagigedo Islands, are, where the species is recognizable, all of *minor*.

Comparison of our small series from the Mexican islands with those from the Galapagos shows no differences that I can recognize, and I am calling them all *Fregata minor ridgwayi*. This is on the assumption, which I have no means of testing, that *ridgwayi* is a distinguishable form of *Fregata minor*.

In the collection of the Museum of Vertebrate Zoology there are Frigate-birds from the following points in Lower California: Santa Margarita Island (June), 17 miles south of Todos Santos (October), La Paz (May, July); and also from Isabela Island, Nayarit, Mexico (May). These are all *Fregata magnificens rothschildi*. The specimens from Isabela Island were collected in 1929; in the California Academy of Sciences collection of photographs there is one taken on Isabela Island in 1925, showing a female Frigate-bird on the nest, clearly of the species *magnificens*. In an article entitled "A rookery of man-o'-war birds" by Walter E. Bryant (Nidiologist, I, 1893, pp. 1-3), describing the colony on Santa Margarita Island, a female pictured on the nest is also recognizable as *magnificens*. It is hard to avoid ambiguity in such statements as the foregoing, but of course it is assumed that Lower California birds are all of the subspecies *rothschildi*. Photographs, however, show only the specific characters contrasting the two species, *magnificens* and *minor*, and are alluded to in such terms.

I am publishing these notes largely for the purpose of urging upon others, and enabling them, to specifically identify the Frigate-birds of any west coast colony they may visit. Various ornithologists have visited the Mexican coast and islands of recent years and presumably others will follow, and it is important that such opportunities be improved to increase our knowledge of these birds. There must be a number of Frigate-birds' eggs in collections labelled "*Fregata aquila*," the specific identity of which can never be learned. The two west coast species are fairly easily distinguished in flight, easily recognized upon their nests. The accompanying "key" will serve to indicate their outstanding differences.

I wish to express here my appreciation of the privilege I have received of studying the Lower California series of *Fregata* in the Museum of Vertebrate Zoology, a series that has not otherwise been published upon. I am grateful as well to Mr. Joseph Mailliard for the photograph that is reproduced herewith.

Fregata magnificens magnificens and *F. m. rothschildi*	*Fregata minor ridgwayi*
Adult male	
Iridescence on back prevailingly purplish; outer surface of wing uniformly dark (no rusty bar on coverts).	Iridescence on back prevailingly green; outer surface of wing with rusty bar on coverts.
Adult female	
Head and neck black all around; black of neck extending downward in a point on center of breast.	Top and sides of head blackish; throat pale gray almost white, continuous with white breast.
Immature	
Entire head, neck and lower parts white; no tinge of rufous.	Head, neck and lower parts white, but suffused with rufous to a varying degree; head sometimes almost solidly cinnamon.

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