

THE BIRDS AT SOLEDAD, CUBA, AFTER A HURICANE

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THE Harvard Botanical Garden at Soledad, near Cienfuegos in Cuba, and the adjacent lands which will ultimately be included in the Garden have been for many years a wild life sanctuary. Except on occasions when the Woodpeckers become too active in damaging experimental plantations of fruit trees and when the feral Guinea-fowl become too abundant, no shooting ever takes place within this area of several hundred acres. The locality, moreover, has been under close observation by many observers during the best part of forty years, so that we know just about what the normal number of the common resident birds is, hence how many should be seen there, day by day.

On the night of Sept. 28-29, 1935, the barometer dropped to 28.60 inches. That evening at about 8 p.m., according to the account given us by Mr. Robert M. Grey, for many years the Superintendent of the Garden, the wind began to increase in velocity. Between 11 p.m. and 12 m. it was blowing between 70 and 80 miles an hour. At 1:30 a.m. on September 29 the velocity had increased to between 80 and 95 miles an hour with an occasional slight lull for a few minutes from time to time. The storm was accompanied by lightning and gusts of rain. The maximum force of these gusts can, of course, only be surmised and one person's guess is as good as another's. The velocity may well have reached 150 miles per hour to judge by the havoc wrought. The wind continued at maximum force until about 4:30 a.m. when it gradually diminished to between 60 and 65 miles per hour at 5 a.m., the lulls becoming more frequent. The hurricane began in the northwest, worked to westward, then to the south and finished in the southeast. The currents of air were extremely varied, frequently a long, steady blow would be followed by sudden, cyclonic twisters, seemingly from every direction, or a steady whirl would play on one spot for some minutes and then break into several swirls from two or three directions. The calmer intervals were of very short duration. Curiously enough the entire rainfall was but 1.69 inches, very much less than would normally be expected.

On the 15th of February we decided to make a careful estimate, over eight days, of the numbers of the species of resident birds normally to be seen in the Garden. In almost every case, with the exception of the Turkey Buzzard, the two species of Gallinules, Limpkin and the Mourning Dove, the number of common resident birds showed great diminution over normal years. Thus the common Riccordia Hummingbird was seen on but three of the eight days, two days but once, and one day twice, whereas normally the birds are constantly observable and the ordinary population of the area is probably well over twenty pairs. Of course blossoms were few, owing to

damage by the storm, but this Hummer is far from being as dependent upon flowers as are many other species. Todys were few, as also were the several species of Flycatchers. Of the common native Cuban Warbler (*Teretistris fernandinae*) but a single specimen was seen. Normally this bird abounds in what we call the Seborucal, a wild, uncultivated, wooded area adjoining the Garden on the south. The Spindalis was very scarce indeed. On four days we saw none, on two days but one, on two other days we saw but two each day. The little Ground Finches (*Tiaris olivacea*) were abundant but the numbers were certainly not more than twenty-five percent of the normal, whereas of the other species (*T. canorus*) which is never as common but still is far from being a rare bird, we never saw a single individual. Nor did we see a single specimen of the Black Finch, a bird which, in normal seasons, may be seen regularly in our little, wild forest preserve. Meadowlarks, Mockingbirds and Blue Thrushes were abundant and less obviously reduced in numbers, whereas the Herons, Hawks, and Rails were probably present in just about normal abundance.

These random notes are presented because they seem to prove definitely that the hurricanes play a tremendous part in affecting the abundance of birds for some time after they have occurred and because they record something more than impressions. One of us has had a number of occasions to visit islands in the Bahamas after hurricanes have taken place and to observe the almost complete disappearance of some native species, often for a number of years. But the Bahamas are flat and with little real forest to offer protection. In Cuba the environment is very different and birds obviously have a far better chance to survive under Cuban conditions but on the occasion of this storm at least the mortality was certainly very great.

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