

BIRD REMAINS FROM THE WEST INDIES

BY ALEXANDER WETMORE

1.—RECORDS FROM CAVE DEPOSITS ON CROOKED ISLAND, BAHAMAS

DURING the winter of 1933-34, Dr. Froelich G. Rainey while traveling with Allison Armour on the yacht "Utowana" had opportunity to make archeological studies on Crooked Island in the Bahamas. During the course of these investigations a small collection of bird bones was obtained that have come to me for identification from the Peabody Museum of Yale University. Dr. Rainey informs me that the material came from one of the Gordon Hill caves, which are along the beach on the northeast shore of the island. The deposit containing the bird bones was a relatively hard stratum about one foot in thickness, buried under from six to twelve inches of sand. In addition to bones of birds it contained ash and charcoal, many opercula of conch shells, some crude pottery, and a few bone artifacts and tortoise-shell fishhooks. The bones seem fairly old, and are considered pre-Columbian though there is no definite criterion to establish their actual age. Several distributional records of interest are included as the following list will show. Identifications are made under specific names without regard to subspecies recognized at present from this area.

MANX SHEARWATER, *Puffinus puffinus* (Brünnich).—Two metacarpals attributed to this species measure respectively 41.9 and 43.2 mm. in total length. This species is known from Bermuda but has not been reported previously from the Bahama Islands.

AUDUBON'S SHEARWATER, *Puffinus lherminieri* Lesson.—A metacarpal and a tibio-tarsus come from this small species.

BERMUDA PETREL, *Pterodroma cahow* (Nichols and Mowbray).—A metacarpal, ulna (broken into two parts) and a radius are equivalent in size to the same bones of the petrel of the Bermudas, and on this basis are identified with it. Osteological material representing this group of petrels fully is not available due to the rarity of these birds in collections, and it is barely possible that the bones listed are from an unknown species now extinct. The ulna and radius are very slightly shorter than one specimen of each of the Bermuda Petrel in the U. S. National Museum, the difference being that found between sexes in birds of this group. Otherwise they are identical with those of *P. cahow*. They are decidedly shorter than the ulna and radius preserved in skins of *Pterodroma hasitata* and *P. caribbaea*, so that these two are eliminated from consideration. From the material at hand there is no reason for not considering the species identical with that of Bermuda. The identification of *P. cahow* from Crooked Island marks an

extension of range for this species which, however, is not surprising in view of the wide distribution of other species in this group.

WHITE-BELLIED BOOBY, *Sula leucogaster* (Boddaert).—The distal end of a humerus and a coracoid are white in color and appear less old than the other material in the collection.

WHITE IBIS, *Guara alba* (Linnaeus).—The distal parts of an ulna and of a tibio-tarsus are clearly of this species. So far as I am aware this is the first record of the White Ibis for the Bahama Islands.

OSPREY, *Pandion haliaetus* (Linnaeus).—The distal end of a tibio-tarsus comes from an Osprey though there is no certainty as to the subspecies represented.

SOOTY TERN, *Sterna fuscata* Linnaeus.—Represented by two coracoids.

WHITE-CROWNED PIGEON, *Columba leucocephala* Linnaeus.—Humerus, metacarpal, coracoid and metatarsus.

BAHAMA PARROT, *Amazona leucocephala* Linnaeus.—So far as I am aware there is no modern record of the parrot from Crooked Island so that the premaxilla in the present collection is of some interest. Whether this bird was native to the island where the bone was obtained must remain uncertain though it seems probable that this is the case.

Corvus sp.—The distal end of a tibio-tarsus comes from a bird with the dimensions of the female of *Corvus leucognaphalus* of Hispaniola and Puerto Rico. It is probable that it is the same as cave material from Great Exuma Island, which I have identified as *Corvus nasicus*, a species that occurs on Great Caicos Island in the southern Bahamas.

BAHAMAN MOCKINGBIRD, *Mimus gundlachii* Cabanis.—A complete tibio-tarsus is easily identified as from this strong-legged bird.

2.—BIRD REMAINS FROM A KITCHEN MIDDEN ON PUERTO RICO

This report deals with bird bones collected by Dr. Froelich G. Rainey, in 1934, from an extensive midden deposit at Barrio Canas, a mile and a half east of Ponce on the south coast of Puerto Rico. According to information supplied by Dr. Rainey, two distinct cultures are evident in this mound. The lower one, called the crab culture, at the lowest level consists of a well-defined stratum of disintegrated land-crab shells in which were pottery remains of advanced type with red and white painted designs, rectangular stone celts and shell spoons. Above this was the later shell level, or shell culture, tentatively associated with the Arawak-speaking Indians present in Puerto Rico at the time of the Discovery. The shell deposits consist of masses of conch, oyster, clam, scallop and snail shells mixed with blackened earth and ashes, crude, poorly fired pottery and implements. This shell culture extends to within a quarter of a meter of the surface and is overlain by more modern deposits. The crab level at the base of the mound is dis-

tinctly older. In some sections of the mound the shell-culture material extended to a depth of two meters, though in other parts it was no more than a meter deep.

The list of birds identified that follows gives several interesting records, as well as further indication of the abundance of the rail, *Nesotrochis*. The depths at which material was obtained are indicated in quarter meters, and are in the shell level unless definitely stated to come from the stratum of the crab culture.

PIED-BILLED GREBE, *Podilymbus podiceps* (Linnaeus).—A left humerus, complete except for the head, was obtained at a depth of between a half and three-quarters of a meter.

BROWN PELICAN, *Pelecanus occidentalis* Linnaeus.—Represented by the posterior angle of a lower jaw and the head of a humerus found above a depth of three-quarters of a meter.

WHITE IBIS, *Guara alba* (Linnaeus).—A right coracoid nearly complete was obtained in the older deposits of the crab culture. Modern records for this bird in Puerto Rico have been few, though the species is still found in the swamps of the Dominican Republic to the westward.

GLOSSY IBIS, *Plegadis falcinellus* (Linnaeus).—Represented by the distal half of a humerus found at the level of the crab culture.

FLAMINGO, *Phoenicopterus ruber* Linnaeus.—The distal end of a humerus comes from the crab-culture level. The Flamingo has not been seen in Puerto Rico in many years.

WEST INDIAN TREE-DUCK, *Dendrocygna arborea* (Linnaeus).—Bones of this tree-duck come from both shell and crab cultures extending from a depth of half a meter downward.

BLACK-BELLIED TREE-DUCK, *Dendrocygna autumnalis* (Linnaeus).—Three broken humeri found near the surface and in the older, lower levels are distinguished from similar bones of *Dendrocygna arborea* by slightly smaller size and more slender form. This species has been found only in small numbers in modern times in the island.

RED-TAILED HAWK, *Buteo jamaicensis* (Gmelin).—The distal part of a humerus was found in the shell level.

BROAD-WINGED HAWK, *Buteo platypterus* (Vieillot).—A complete right tibio-tarsus was excavated in the shell level. The species is rare in the forests of Puerto Rico at the present time.

DEBOOY'S RAIL, *Nesotrochis debooyi* Wetmore.—Of this, the most abundantly represented bird throughout these deposits, there are numerous bones ranging from just below the surface of the mound in deposits apparently quite modern, to the deepest layers of midden material in the crab culture. Apparently this curious bird was common in this area and was much sought by the aborigines.

The collection includes one left humerus in good state of preservation that illustrates fully the peculiarities of relatively small size and reduced crest for the attachment of flying muscles characteristic of this bird. This specimen has the following measurements: total length, 64.3; transverse breadth of distal end, 10.2; transverse breadth of shaft at center, 4.3 mm. The bone is slightly larger than one seen from St. Croix.

Fragments of the metatarsus are numerous and include four complete specimens as well as one from a young individual in which ossification is not yet complete. Measurements, including what is available from broken specimens as well as from four complete individuals, are as follows:

Total length, 74.6, 75.3, 83.3, 83.4 mm.

Transverse breadth of head, 13.9, 14.0, 14.2, 14.5, 15.0, 15.3 mm.

Transverse breadth of trochlea, 6.3, 6.7, 14.1, 14.2, 14.7, 14.9, 15.1, 15.8, 15.9 mm.

Transverse breadth of shaft at center, 5.8, 6.0, 6.3, 6.4, 6.8 mm.

This material is especially important as heretofore only one complete metatarsus has been found. The measurements are all slightly larger than those of the single complete specimen seen from St. Croix.

The remaining bones are from the tibio-tarsus and femur which are well known and require no special comment, except to note that the humerus and metatarsus seem slightly larger than specimens examined from St. Croix (see Wetmore, A., *Journ. Agric., Univ. Puerto Rico*, January, 1937, pp. 9-10). Possibly two geographic races are concerned, but the differences are so slight that study of more material is required to settle this.

PURPLE GALLINULE, *Ionornis martinica* Linnaeus.—One metatarsus, with the head missing, from the shell level.

WILLET, *Catoptrophorus semipalmatus* Gmelin.—A complete left humerus from a depth of about a meter.

ROYAL TERN, *Thalasseus maximus* (Boddaert).—A nearly complete ulna from the same level as the Willet.

SCALED PIGEON, *Columba squamosa* Bonnaterre.—Represented by humerus and ulna from a depth of between a quarter and a half a meter.

PUERTO RICAN PIGEON, *Columba inornata* Vigors.—Several bones come from the same depth as those of the Scaled Pigeon.

Numerous other pigeon bones, principally of the ulna, were found throughout the entire depth of the midden but are not specifically identified. Part of them belong in the genus *Columba*.

ZENAIDA DOVE, *Zenaida zenaida* (Bonaparte).—A humerus was found between a quarter and a half a meter below the surface, and a metacarpal in the crab level.

RUDDY QUAIL-DOVE, *Oreopeleia montana* (Linnaeus).—A coracoid was excavated from the level of the crab culture.

PUERTO RICAN QUAIL-DOVE, *Oreopeleia larva* Wetmore.—Two bones of

this extinct species come from depths of between a quarter and a half meter. An ulna is slightly larger and more robust than that bone in *Oreo-peleia montana*, measuring 43.3 mm. in total length. A complete tibio-tarsus, while preserving the slender, elongated form of the modern species, *montana*, is distinctly larger. It measures as follows: total length, 58.5; transverse breadth of distal end, 6.0; transverse breadth of shaft near center, 2.9 mm. Right and left humeri were obtained in the oldest levels, in the crab culture, one perfect and the other nearly so. They measure as follows: total length, 36.9, 37.3; transverse breadth through head, 13.0, 13.0; transverse breadth of distal end, 9.3, 9.3; transverse breadth of shaft at center, 4.4, 4.8 mm. The additional record of this species, known only from bones obtained in cavern and midden deposits, is of importance.

PUERTO RICAN CROW, *Corvus leucognaphalus* Daudin.—A complete ulna was secured at a depth of between a half and three-quarters of a meter from the surface.

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