

A MIOCENE PETREL FROM CALIFORNIA

By LOYE MILLER

Within the lapse of three weeks time this fall (1950) there came to my hands the remains of fossil birds from two new bird-bearing localities in southern California. After more than forty years of fairly close attention to such matters in this region, it becomes almost exciting to have two such localities come to light "all at once" so to speak.

One deposit is of Pleistocene age on a beach terrace on San Nicolas Island about 75 miles off San Pedro, in Los Angeles County. The other is an exposure of Miocene shales along the sea cliff south of Capistrano Beach in Orange County. The Pleistocene material consists of seven fragments of the extinct flightless anserine, *Chendytes*, associated with one metacarpal identified as a sea otter. This material was retrieved by Robert and Kenneth Norris in the course of a study of the San Nicolas platform. There is every reason to expect that much more and, we hope, better material will be retrieved from the island deposits. For this reason, I have asked Dr. Hildegard Howard, who has made extensive studies of the avifauna of the marine Pleistocene, to take over the study of it.

The single specimen from the Capistrano Miocene locality forms the subject of this paper. I am greatly indebted to Dr. Carl L. Hubbs of the Scripps Institution of Oceanography for the opportunity of working with this fossil and I wish to thank Dr. M. N. Bramlette of the Department of Geology, University of California at Los Angeles, for an opinion regarding the nature of the Capistrano shales, and Mr. Roy Pence for his painstaking photography of the specimen. Dr. Hubbs and his graduate students have been finding the remains of fishes in the shales at Capistrano for some time past, but on October 4, 1950, he uncovered the first recognizable bird specimen from the locality. It is here designated as

Oceanodroma hubbsi, new species

Type.—No. 39979 Mus. Paleo. Univ. Calif.; from Capistrano Formation of Middle Miocene of sea cliff about one mile south of Capistrano Beach, Orange County, California. Skull, vertebrae, pelvis, and left leg represented.

Diagnosis.—Size between *Oceanodroma melania* and *O. homochroa* with stouter leg bones than either; foot larger and femur relatively longer than in any other known member of the genus.

The specimen so far as preserved represents what was a partial ligamental skeleton at the time of entombment. The entire vertebral column was intact but the thoracic assemblage including the ribs had disappeared. The pelvis and left leg are almost complete down to the metatarsal trochleae. The right femur is in place and two phalanges lie separated in the matrix. The hind toe is intact but unfortunately the cnemial crest seems to have been lost in the first cleaving of the slab. The cranium is seen in section, although part of the right orbit is indicated. The rostrum is preserved in section for about two-thirds of its length. The tip is known only from its impression in the matrix. The mandible is known only from its imperfect impression. About eight of the cervical vertebrae were destroyed at the quarry. The others are seen in section. The femora and the proximal parts of the tibiotarsus and tarsometatarsus have been crushed and therefore in all probability were broadened slightly but the narrower portions of both tibiotarsus and tarsometatarsus still show the central cavity undistorted. In these sections, the respective bones are distinctly heavier than those of any present day storm petrels from the California coast and hence it seems fair to assume that the apparent stoutness of the femur is not due entirely to post-mortem crushing.

Longitudinal dimensions and ratios of these numbers to femoral length correspond

very closely with those of males of *O. homochroa* (see table). The pelvis is however much heavier, the innominate is longer and the forward extension of the ilium is longer and broader than in *homochroa*. The skull is shorter in overall length but the beak is relatively longer and the brain case deeper. In synopsis, then, we could say that we have a petrel approximately the size of our Recent Ashy Petrel of the California coast but with heavier pelvis, hind limbs and foot, longer bill and more globular brain case.

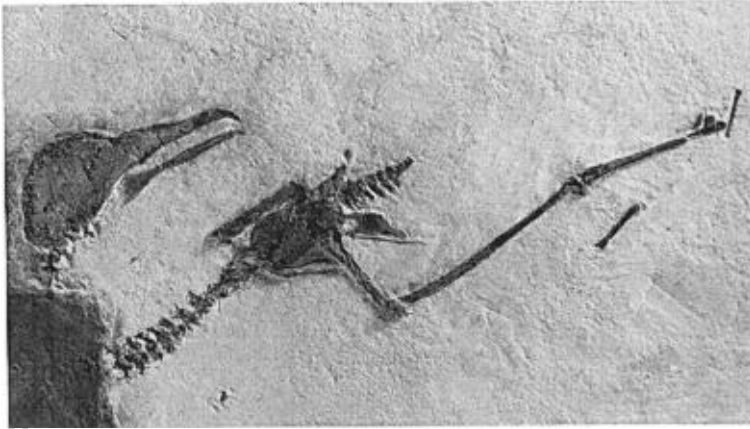


Fig. 1. *Oceanodroma hubbsi*. Type specimen, $\times 9/10$. Photograph by Ray Pence.

The measurements here recorded are taken from California specimens of *Oceanodroma*, one for each species, with the addition of those for *O. macrodactyla* reported by Murphy (Oceanic Birds of South America, 2, 1936:745).

	<i>hubbsi</i>	<i>melania</i>	<i>homochroa</i>	<i>leucorhoa</i>	<i>macrodactyla</i>
Maximum length of skull	35.0 mm.	44.0 mm.	37.0 mm.	36.0 mm.	
Length of beak	17.7	21.0	16.5	17.0	
Length of femur	16.0	17.0	14.5	14.0	18.2 mm.
Length of tibia	32.5	42.0	33.0	30.0	
Length of tarsus	22.4	32.5	22.5	20.0	
Ratio of tibia to femur	2.03:1	2.47:1	2.34:1	2.14:1	
Ratio of tarsus to femur	1.40:1	1.91:1	1.55:1	1.42:1	1.30:1

The only pre-Columbian record for *Oceanodroma* that I can discover is that of sub-fossil mummies found in the saltpeter deposits of Chile. These mummies were identified by Stresemann as *Oceanodroma hornbyi* (Ornith. Monatsber., 1924:61-63).

The matrix in which the fossil was found is a finely laminated diatomaceous shale and mudstone. The included foraminiferal fauna suggests to Dr. M. N. Bramlette a deposit accumulated on a sea floor probably below the one hundred fathom contour and indicates Upper Miocene age. Dr. Hubbs has retrieved from the very near vicinity the remains of deep sea fishes (*Cyclothone*) and a crustacean (*Pleuroncodes*). Unfortunately the slab containing the petrel had fallen from the cliff, hence the exact stratigraphic relation to the other macrofossils is not positively determinable.

My experience in collecting recent petrels at sea is that when the bird falls into the water, it takes but little movement to wet the plumage thoroughly—a plumage character doubtless correlated with the habit of keeping the wings raised while feeding on surface floats. The technical name *Oceanodroma* and the charming Spanish name of *bailarina*

derive from this habit. A dead body of a petrel would rather soon become sodden in its plumage. Breakdown of the abdominal wall under the attacks of scavenging crustacea would liberate gases and allow the carcass to sink fairly promptly to the ocean floor. This particular specimen was entombed in the fine sediments of deep water where current was practically lacking, although not until after the ligaments of the pectoral basket had been loosened allowing that part to drift away. Two segments from the toes lie but slightly removed from their proper position perhaps due to the activity of small hermit crabs.

During many years of intermittent beach combing I have never been fortunate enough to retrieve a petrel. Others have done so but the occasions are rare. Even those rare specimens were probably sick birds that had been blown close to the shore before the final spark of life flickered out. The tiny storm petrels are not recorded from any of the fossil bearing strand deposits so far as I can discover. They are birds of the open ocean that remind one of misplaced butterflies flitting among frost-capped blue hills, touching the surface as lightly as butterflies and, when their time comes, sinking into the ocean's quiet depths, rarely to be entombed in sediments and become immortalized as fossils millions of years later.

The genus *Oceanodroma* as delimited by modern systematists includes some nineteen varieties representing eleven species of the short-legged storm petrels (Peters, Check-list of Birds of the World, 1, 1931). Much of their later evolution appears to have taken place in the Pacific basin for only two of the many varieties are found on any other ocean. It seems quite fitting therefore to announce the first fossil representative of the genus as coming from deep water Miocene shales of the Pacific basin.

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