

## WING ELEMENTS ASSIGNED TO CHENDYTES

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The continued recovery of leg bones of the large diving duck, *Chendytes lawi* Miller, in Pleistocene deposits of California, with no accompanying evidence of its wing bones, has been a matter of considerable interest to those of us working in avian paleontology. This peculiar overemphasis on the hind limb elements has naturally led to the suspicion that the bird had a degenerate type of wing, with bones either so fragile that they did not preserve well or so small as to be mistaken for other species of ducks.

In 1936 confirmation of this suspicion was suggested in the recovery of a fragment of an anseriform coracoid in the Del Rey Pleistocene deposit. This coracoid is about the size of that of a small scoter, but very much flattened and misshapen. The specimen is so fragmentary, however, that I did not consider it advisable to discuss its possible relationships when publishing upon the Del Rey avifauna (Howard, Condor, 38, 1936: 211-214).



Fig. 15. Coracoid (L. A. Mus. no. 2042) from the Pleistocene near Newport Bay, Orange County, California, assigned to *Chendytes lawi*;  $\times 2$ .

Recently Mr. George Kanakoff of the Los Angeles Museum has recovered two unusual avian specimens from a Pleistocene deposit near Newport Bay. This deposit, which he visits weekly, has yielded a number of bird bones, and will be the subject of a more detailed paper in the near future. It should be stated here, however, that the collection from this locality includes a preponderance of *Chendytes* leg bones. The two remarkable specimens are a coracoid and humerus, obviously degenerate in nature.

The coracoid, which is intermediate in size between those of the White-winged and Surf scoters, has the unevenly contoured furcular facet characteristic of the diving ducks. The fossil bone, however, is markedly flattened and considerably distorted as

compared with the modern forms. Most interesting is the fact that it shows the same modifications exhibited by the fragment from Del Rey and is sufficiently well preserved to reveal the characteristics clearly. In a very general way the modifications parallel those found in the coracoid of the Flightless Cormorant (*Nannopterum harrisi*), although the fossil bones are much more flattened, both through the head and through the shaft. The furcular facet is rotated slightly inward and upward, the scapular facet projects away from the shaft, and the humeral facet is reduced in size. The great reduction of this latter facet in both the Newport Bay and the Del Rey coracoids is of especial import in connection with the finding of the humerus which I believe to be associated with the same bird.

The humerus is even more degenerate than the coracoid, and less well preserved. Both proximal and distal ends are badly eroded. The deltoid crest appears to be sufficiently intact to warrant the statement that it is nothing more than a slightly raised area slanting around to the center of the shaft on the palmar side. In the bicapital area, the furrow is well depressed and irregularly margined; the area of the crest is broken away. On the palmar side the pneumatic fossa is present but the breakage of the bicapital crest has destroyed its marginal contour. The palmar surface adjacent to the fossa is flat and smooth. At the distal end the impression of the brachialis anticus lies well toward the internal margin of the bone. In size this humerus approximates that of the Ruddy Duck (*Erismatura jamaicensis*), but no exact measurements can be taken except breadth and depth of shaft (4.0 and 3.4 mm., respectively).

Alone, the humerus probably could not be allocated. Taken with the coracoid, and associated in the deposit with several specimens of hind limb bones of *Chendytes*, I am convinced that the humerus, as well as the coracoid, may be assigned to that great diving bird. The proportions of both wing elements are smaller with respect to the leg bones of *Chendytes* than are the comparable proportions in *Nannopterum*. Moreover, the fossil bones are considerably more degenerate than those of the Flightless Cormorant. It appears now that the suspicions regarding the flightlessness of *Chendytes* are at last confirmed.

A complete survey of all avian specimens from the Pleistocene marine deposits of southern California is now under way, and it is possible that more evidence bearing upon this subject will be forthcoming as the material is reviewed.

Table 1

Measurements of Coracoid of *Chendytes lawi*

	L.A.M. no. 2042 from Newport	L.A.M. no. 984 from Del Rey
Distance: posterior rim of scapular facet to tip of head	14.7 mm.	.....
Breadth of shaft between furcular and scapular facets	7.3	.....
Breadth of furcular facet	6.7	.....
Dorsoventral depth of head	3.4	.....
Breadth of humeral facet	4.0	4.0 mm.
Length of humeral facet	8.1	7.6
Breadth of shaft below procoracoid	3.3	3.3
Depth of shaft below procoracoid	4.8	4.8

*Los Angeles Museum, Los Angeles, California, November 14, 1946.*