A FOSSIL GOOSE FROM THE RICARDO PLIOCENE

WITH ONE ILLUSTRATION

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The heterogeneous group of strata in the Mohave Desert area of California known as the Rosamond series has for twenty years been the object of occasional visits by parties from the University of California. The most intensive work resulted in a general bulletin by Merriam (Univ. Calif. Publ. Bull. Dept. Geol. Sci., 11, 1919, pp. 437-585) which divided the series into an eastern, late Miocene accumulation called the Barstow Syncline, and a western, early Pliocene series called the Ricardo or Red Rock Cañon.

Since the explorations leading to Merriam's paper, various parties have used the formations for field instruction purposes and have added from time to time certain species to the faunal lists. Mammals have dominated the faunal picture thus far to the almost total exclusion of other classes of vertebrates. One tortoise and two indeterminate species of buteonid hawks were recorded by Merriam as the only non-mammalian vertebrates encountered in the Barstow. Fragmentary testudinate remains are the only non-mammalian specimens thus far recorded from the Ricardo.

A field party from the University of California at Los Angeles during the fall of 1929 collected the first avian specimen from the Ricardo, a single fragment representing a species of goose of the genus *Branta*.

Branta howardae, new species[1]

Type specimen, no. 28811, Univ. Calif. Mus. Paleo., fragment of left carpometacarpus. Lower Pliocene, Ricardo formation, California. Size medium for the genus; distal condyle of metacarpal III, a ridge with nearly parallel sides.

Previously there were known to American paleontology seven species of the genus *Branta*, only two of them occurring as early as Pliocene. Both these species, *esmeralda* Burt (Univ. Calif. Publ. Bull. Dept. Geol. Sci., 18, 1929, p. 222) and *minuscula* Wetmore (Proc. U. S. Nat. Mus., 64, 1924, p. 6), are markedly smaller than the specimen from Ricardo. In turn, the Ricardo bird is distinctly smaller than any of the extinct Pleistocene species except *propinqua* Shufeldt (Journ. Acad. Nat. Sci. Phila., ser. 2, 9, 1892, p. 389). The size corresponds very closely with that of the Recent *B. canadensis canadensis*, but it differs from this species in the angle at which the distal condyle of metacarpal III lies, and in the greater depth of the groove radial to this condyle. The condyle itself is more sharply a ridge and less a bulbous articular surface. A marked excavation appears on the dorso-ulnar surface immediately proximal to the condyle. *B. canadensis* lacks this excavation. This character approaches the condition seen in the genus *Anser*.

It is interesting to find the Pliocene geese of the genus *Branta* ranging in size from the small bird, *B. minuscula*, to a large *B. howardae*, with an intermediate *B. esmeralda*, to see the Pleistocene producing the gigantic *B. dickeyi* L. Miller (Condor, 26, 1924, p. 179) and the smaller *B. propinqua*, while in the Recent *B. canadensis* there occurs a varietal range from the pigmy *minima* to the largest true *canadensis*.

Is the Recent species not destined, if it survive, to break into distinct species?

[1] The specific designation is given in honor of Dr. Hildegarde Howard with whom it has been a pleasure to work for some years in the field of avian paleontology.

Or perhaps, and more disturbing, had we only a few scattered bones of the various Recent varieties, would we not call them all species?

Fig. 74. TYPE SPECIMEN, FRAGMENT OF LEFT CARPOMETACARPUS, OF BRANTA HOWARDAE.

The geese are birds which winter in southern California today and are at times found feeding on grassy lands some distance from the nearest open water. Merriam considers the mammal fauna, which includes grazing horses and camels, to be strongly suggestive of open grassy plains as being the Pliocene environment. The near-by presence of petrified trunks and stumps of broad-leaved trees in fairly close stand suggests a greater degree of humidity in the local climate than pertains today. During Pliocene (Fernando) the sea encroached far upon the land and the Sierra Madre mountain barrier was much less elevated than it later became. In all probability the moisture laden sea breezes had fairly free access to the Ricardo region in Pliocene time.

Some time during the Pleistocene epoch there occurred a marked uplift of the mountain barrier and also a recession of the coastline to more nearly its present place. These movements probably conspired to bring about the desert conditions that now prevail in the southern Mohave area, and the land ceased to be hospitable to grazing mammal or to equally grass-loving goose.

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