

FURTHER BIRD REMAINS FROM THE UPPER SAN PEDRO PLEISTOCENE

WITH ONE ILLUSTRATION

By LOYE MILLER

My first visit to the San Pedro formation was in company with Dr. Frank C. Clark of Los Angeles who had taken fragments of bird bones while screening the matrix for fossil shells. To Dr. Clark, then, is due the discovery of San Pedro as a bird-bearing horizon. Arnold's Memoir (Arnold, R., Mem. Calif. Acad. Sci., 3, 1903, p. 346) mentions fish remains, but not those of birds. Dr. Arnold in conversation told me that he had sent some vertebrate remains to the United States National Museum for identification. Among them he thought there were some birds, but I examined this material several years later while in Washington and found nothing ascribable to the class Aves.

Several week-end visits were made to San Pedro with Dr. Clark, and then the Museum of Paleontology of the University of California appropriated a small fund to employ a laborer for screening the matrix in our search for vertebrates. Accordingly, a young student of the Los Angeles Seminary, Mr. Morris Parker, spent three weeks at the work, camping on top of the hill which has since been eaten up by the steam shovel and converted into water-front real estate in the tremendous development of the San Pedro Harbor district. The results of this early exploration were discussed in a bulletin (Miller, L., Univ. Calif. Publ., Bull. Dept. Geol. Sci., 8, 1914, pp. 31-38) which recorded fourteen species of birds.

During the last six or eight years I have used what is left of the original hill exposure for field observation by a large class in elementary paleontology, visiting the site each fall. On each visit a premium has been placed on vertebrate remains, and out of the tons of molluscan fossils hurriedly looked over there have been assembled some interesting vertebrates.

Sting rays are fairly common, as already reported by Arnold. A goodly number of fragments from testudinate shells comparable to the common mud turtle have been collected. Sea lion, horse, bison, camel, saber-tooth, ground sloth, elephant, rodent, and whale are some of the mammals represented, while five additional species of birds are now to be recorded—a new segment (femur) of the skeleton of *Chendytes lawi* is made known, and the first fossil gull from the state of California makes its appearance.

Very positive emphasis is also given to the anomalies in the Upper San Pedro fauna. Pholas-drilled stones with the shells still present, giant long-necked clams with valves still fitted together, urchins, rays, sea lions and whales, all seem appropriate enough to a marine deposit, but there is only one solitary bone of a gull. Scoters, two shearwaters, cormorants, Western Grebes, loons, and two albatrosses are proper associates; but whence came three specimens of quail, the Meadowlark, Turkey Vulture, and Bald Eagle? Add to these the elephant, mud turtle, camel, sloth and bison, and the ecologic picture is a bit confused.

A shallow-water marine association with estuarine, fluvial and sand dune admixtures is the only plausible explanation of such a combination. There were probably slight crustal movements up and down with comparative frequency so as to bring all within a narrow vertical range in the deposits and utterly destroy any regularity of stratification.

The picture drawn upon my own mind is not greatly different from that at

Point Mugu, Ventura County, today, where I have repeatedly combed the beach in close contact with ocean, lagoon, grass land, rocky point, and fresh water tule marsh, and where the fauna includes Raccoon, Harbor Seal, Bald Eagle, Cañon Wren, Townsend Warbler, Rhinoceros Auklet, and American Egret, not to mention other anomalies.

Aechmophorus occidentalis (Lawrence). The surprising fact in connection with this species is that it has not been taken in these beds earlier and more abundantly. The strand today receives a multitude of their bodies cast up by the winter tides. Only two bones have been collected, an almost complete humerus and a distal fragment of the same segment. The more perfect specimen is slightly larger than the Recent birds available for comparison.

Larus glaucescens Naumann. A single tarsometatarsus, perfect except for the proximal articular surface, was collected by one of my students this fall. It conforms in detail and dimensions with the Recent species, and constitutes the first record of a fossil longipennine from the state of California. In a previous note (Condor, 26, Sept., 1924, pp. 173-174) comment was made on the anomalous distribution of gulls during Pleistocene time. This single specimen out of some hundred thousand taken from the fourteen or fifteen California horizons does not markedly affect the interest of that discussion¹.

Diomedea, sp. The single specimen formerly reported from San Pedro was approximately the size of *Diomedea nigripes*, being slightly larger. A second and fragmentary specimen of a tarsometatarsus is now available which almost equals in size the great *Diomedea exulans*, being slightly smaller. A series of tarsi of *D. exulans* is extremely hard to assemble, but two specimens taken from discarded museum skins show very slight variation in size, quite opposite to what one would expect in any species approaching gigantism. The Short-tailed and the Yellow-nosed albatrosses are not available for study. The shell middens of the California Indians produce the remains of a large albatross, but unfortunately there are no specimens of the tarsus in the collection.

Puffinus griseus (Gmelin). A perfect carpometacarpus represents this species, the second shearwater recorded from the San Pedro. The genus has persisted so consistently from the Miocene of Lompoc that one is not surprised at finding two of the Recent species in Pleistocene strata.

Phalacrocorax near *penicillatus* (Brandt). A fragmentary tarsometatarsus may be assigned to this category already tentatively recorded on the basis of a poorly preserved femur.

Anas platyrhynchos Linnaeus. A carpometacarpus, an ulna, a fragmentary humerus, and a fragmentary coracoid increase the representation of this species four-fold. It is interesting to note that this non-maritime duck is represented by five specimens and *Nettion* by four, while the one larine species yields but a single bone. These ducks serve to emphasize the fresh water factor in the accumulation of the Upper San Pedro.

Oidemia perspicillata (Linnaeus). The occurrence of this species, previously announced on the basis of humerus and coracoid, is further strengthened by the proximal end of a humerus.

Chendytes lawi L. H. Miller. This extinct anserine was first made known (Condor, 27, July, 1925, pp. 145-147) from the Santa Monica exposure of the

¹ Since this paper went to press, Dr. Hildegard Howard has called to my attention a single fragment of a humerus, undoubtedly of some species of *Larus*, that she found in the Rancho La Brea collection at the Los Angeles Museum.

Upper San Pedro, and the description was based on the tibiotarsus and the tarsometatarsus. Two years later, a member of our field class at the Lumber Yard Station (of Arnold's monograph) picked up a complete tarsometatarsus that corresponds in every detail with the cotype from Santa Monica. Since that time four additional specimens representing tarsus and femur have been added to the collections from Santa Monica and from the Lumber Yard, one of them again being donated by Dr. Frank C. Clark. The femur is assigned to the same species as the type specimens purely on the basis of its size and its osteologic characters, for there is only the remotest association in the deposit. All specimens are from the rather haphazard accumulation of a strand and dune deposit.

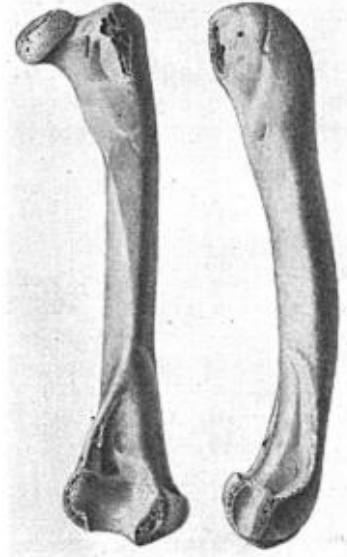


Fig. 45. FEMUR OF *Chendytes lawi*, APPROXIMATELY $\times 1$, VIEWED FROM THE EXTERIOR AND THE POSTERIOR ASPECTS.

The femur is smaller than the largest race of *Branta canadensis* and is almost exactly equal to *Chen hyperboreus*. From all the geese it differs in the marked curvature of the shaft in both longitudinal planes. Here again is noticeable the similarity to the diving ducks (*Oidemia*) that suggested the generic name. The trochanteric area is suggestive of *Oidemia*, the popliteal area is of maximum depth, and the muscular scar of the gastrocnemius and plantaris is pronounced and reaches one-third the way up the shaft. Here again is a marked resemblance to the diving ducks, but there is a decided difference in that this scar turns backward in *Chendytes*, and spirals to a point on the median line of the shaft at the linea aspera. Other active diving ducks, such as *Erismatura*, show the same tendency to attach the muscles farther up the femur. Altogether the evidence seems to warrant assigning these femora to the same specific category as the type and cotype of *Chendytes*.

Lophortyx californica (Shaw.) It is rather interesting to find a perfect humerus of this species to add to the coracoid and fragment of humerus previously reported. Some brushy area in the near vicinity, or not too far up stream, must have harbored these birds.

Haliaeetus leucocephalus (Linnaeus). A single coracoid, almost complete, represents this "beach comber" eagle. I have repeatedly observed this bird along the sand spit at Point Mugu near Hueneme, California, where a strand accumulation is building up that strongly resembles parts of the Upper San Pedro.

University of California at Los Angeles, December 18, 1929.