

# A CENSUS OF THE PLEISTOCENE BIRDS OF RANCHO LA BREA FROM THE COLLECTIONS OF THE LOS ANGELES MUSEUM

WITH THREE ILLUSTRATIONS

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In a recent paper, Dr. Chester Stock (Jour. Mammalogy, 10, 1929, pp. 281-289) has presented a census of the Pleistocene mammals of Rancho La Brea. At the suggestion of Dr. Stock the present paper has been prepared, presenting a similar census of the Pleistocene birds of the region. In this paper the writer has attempted as nearly as possible to follow the plan adopted by Dr. Stock in the matter of graphs, so that the two studies may be correlative.

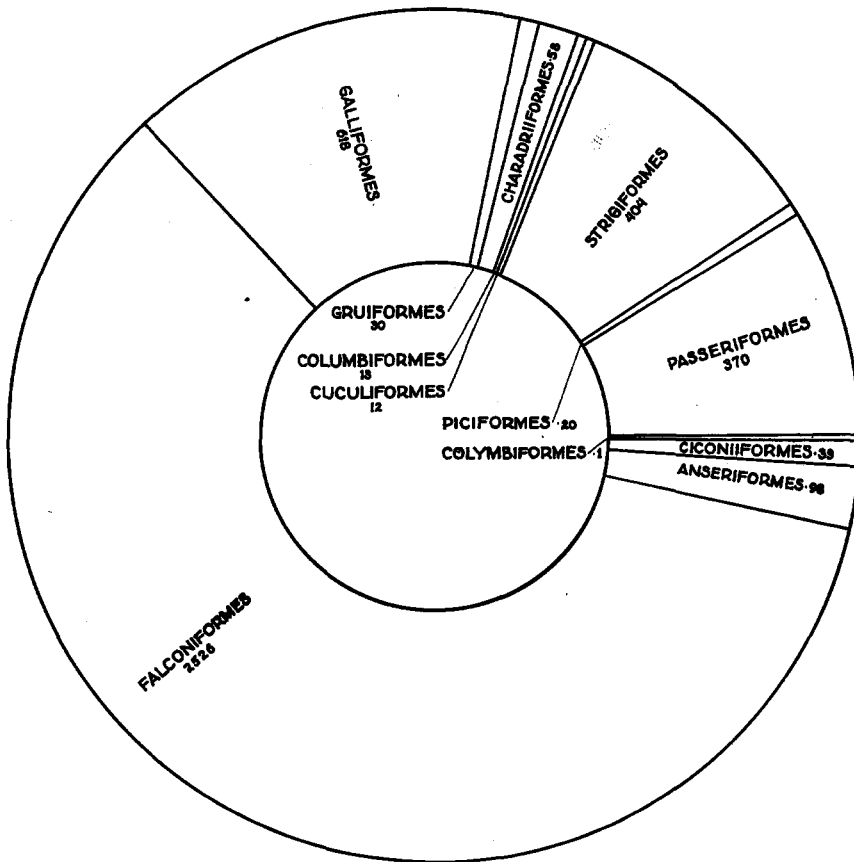


Fig. 29. DIAGRAM SHOWING THE RELATIVE ABUNDANCE OF INDIVIDUALS IN EACH ORDER OF BIRDS RECORDED FROM THE RANCHO LA BREA PLEISTOCENE.

Drawing by H. A. Wyld.

In taking a census of the birds, both young and adult individuals were considered. For each species, the left or the right of the element occurring in greatest abundance was used to make the count. In most instances the element chosen was the tarsometatarsus, though the humerus and the tibiotarsus were also considered. In all cases the specimens were counted individually and no approximate totals are given. It is probable that in many instances the totals present a minimum estimate

of the number of individuals actually represented in the collection. With regard to the small birds, it is certain that the numbers actually entrapped in the tar pits exceeded the numbers which are recorded here. The smaller bones would easily be overlooked in these excavations where so many large specimens claimed attention.

A full list of the species included in the Anseriformes, Charadriiformes and Passeriformes is omitted, since these groups, as represented in the Los Angeles Museum collection, have not been studied in sufficient detail to make possible a count of the number of individuals within each species. For the Anseriformes and Charadriiformes, only the total number of individuals for each order is given. For

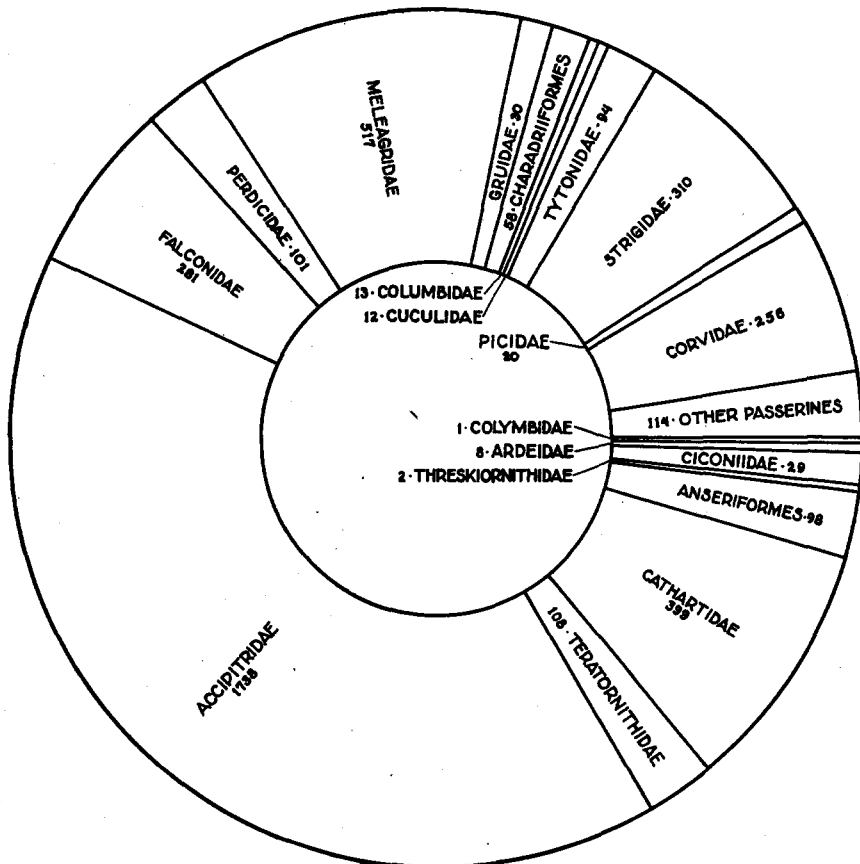


Fig. 30. DIAGRAM SHOWING THE RELATIVE ABUNDANCE OF INDIVIDUALS IN EACH FAMILY OF BIRDS RECORDED FROM THE RANCHO LA BREA PLEISTOCENE.

Drawing by H. A. Wylde.

the Passeriformes, the species under the family Corvidae are listed, all other families being grouped together. For a more detailed account of the passerines, the reader is referred to a paper by Alden H. Miller (Univ. Calif. Publ. Bull. Dept. Geol. Sci., 19, 1929, pp. 1-22) on the Rancho La Brea passerines of the University of California collections.

All species listed for the remaining orders, with the sole exception of *Mycteria americana*, are determined on the basis of specimens in the Los Angeles Museum collections. This species is represented by a single specimen of the symphyseal region

of a lower jaw, and is contained in the collections made by the Los Angeles High School. Since Dr. Loye Miller (Carnegie Inst. Wash., Publ. 349, 1925, pp. 74-75) is convinced of the close relationship of the specimen to *Mycteria americana*, though the specimen has apparently been lost, the species is included here in order to make the list complete as described to date.

The total number of individuals in the Pleistocene avian population of Rancho La Brea, as represented in the Los Angeles Museum collections, is 4189. Of this number approximately 310 are young individuals, nearly one-half of which belong to the extinct species of turkey, *Parapavo*.

The accompanying figures are designed to show the relative sizes of the orders, families, and genera and species which occur.

Figure 29 is a diagrammatical presentation of the relative sizes of the twelve orders recorded at Rancho La Brea. The Falconiformes are most abundant, with 2526 individuals. Next in number to the Falconiformes are the Galliformes with a total of 618. The latter are followed by the Strigiformes with 404 and by the Passeriformes with 370. Following these in order of greatest abundance are the Anseriformes (98), Charadriiformes (58), Ciconiiformes (39), Gruiformes (30), Piciformes (20), Columbiformes (13), Cuculiformes (12), and lastly the Colymbiformes with but a single specimen.

In figure 30, the relative sizes of the families of birds from the asphalt are diagrammatically illustrated. The hawks and eagles (Accipitridae) are most abundant, not only of the raptorial birds, but of the entire assemblage. The number of individuals totals 1738, or 68.8% of the order Falconiformes. Next in abundance are the New World Vultures, including in this category the Teratornithidae as well as the Cathartidae, since the sole representative of the former family, *Teratornis*, shows affinity with the true cathartids. The remaining falconiform family, as well as the two families of owls, are subordinated to the Meleagridae, whose 517 individuals make up approximately 12% of the total avian population. A second family of gallinaceous birds occurring here. (Perdidae) is of smaller size, approaching in number the Tytonidae, or Barn Owls. Of the passerines, the Corvidae are fairly abundant, having 256 individuals, or 69% of the total passerine population. Each of the remaining families is represented by not more than thirty individuals, the cranes totalling 30, followed by the storks with 29, the woodpeckers 20, doves and pigeons 13, cuckoos 12, herons 8, ibises 2, and grebes 1. Since the Anseriformes and Charadriiformes have not been studied in detail, no attempt has been made in the diagram to divide these orders into families.

Figure 31 indicates the various genera and species recorded from Rancho La Brea Pleistocene; an asterisk marks those species which are now extinct. The identity of *Florida caerulea* is questioned because of possible confusion with *Hydranassa tricolor*. The two genera of storks are listed together since the writer experienced some difficulty in distinguishing between them. Those specimens identified as *Buteo borealis* may possibly include *Buteo regalis* as well; for this reason the determination which has been made is tentative. "*Buteo* sp." refers to a group of individuals somewhat resembling *B. lineatus* in general proportions, but which have been set apart from that species (Miller, L., Carnegie Inst. Wash., Publ. 349, 1925, p. 95). The identification of *Asyndesmus lewisi* is questioned because of a possibility of confusion with *Balanosphyra*. The jay, *Aphelocoma*, has not been identified as to species.

There are two genera, namely *Lophortyx* and *Speotyto*, whose apparent rarity

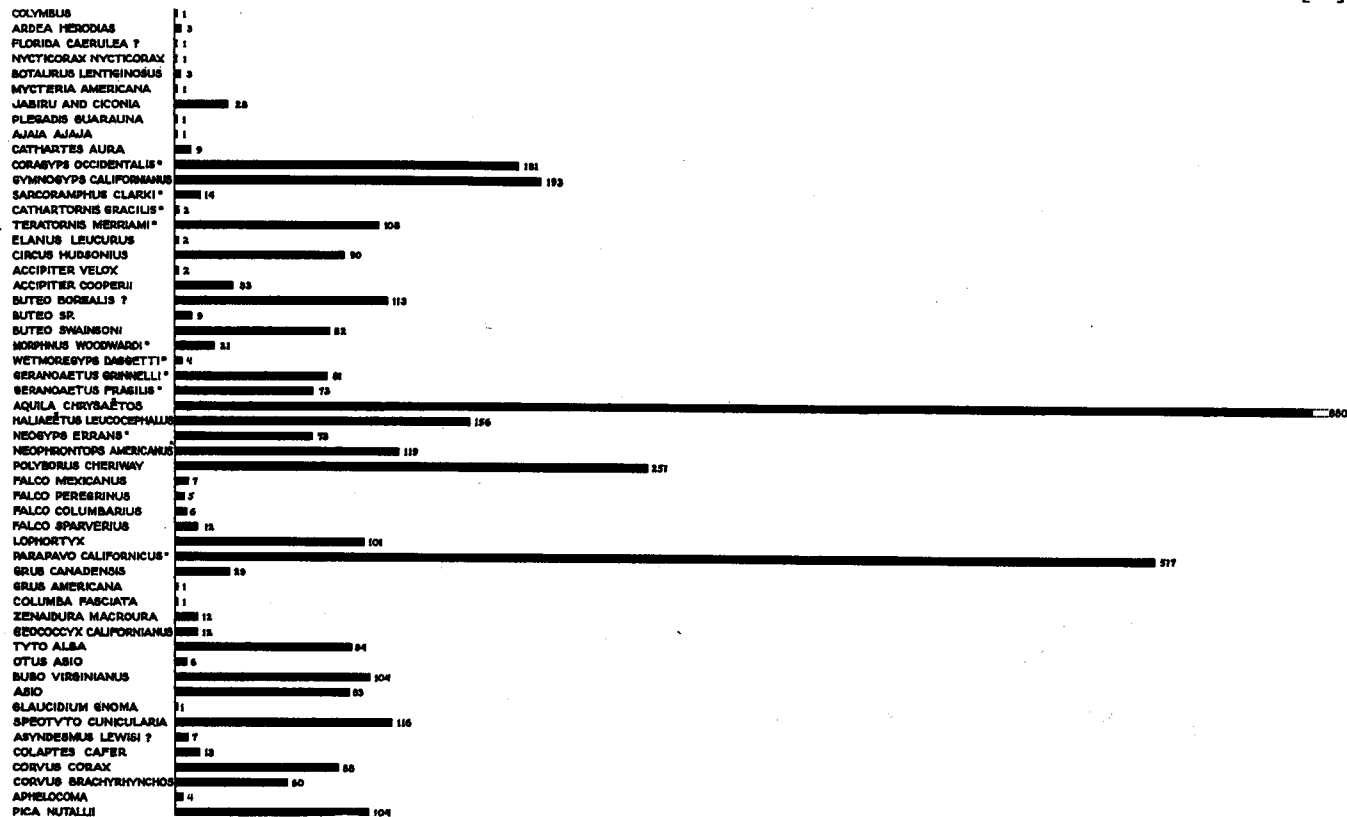


Fig. 31. GRAPH INDICATING THE NUMBER OF INDIVIDUALS IN EACH GENUS AND SPECIES RECORDED FROM THE RANCHO LA BREA PLEISTOCENE. (\*Extinct.)

Drawing by H. A. Wyld.

in the Rancho La Brea assemblage has hitherto caused comment (Miller, L., Carnegie Inst. Wash., Publ. 349, 1925, pp. 79, 104). These are now found to approach their expected abundance.

The number of individuals of the genus *Lophortyx* still does not equal that of its larger relative, *Parapavo*; but this does not necessarily indicate that the quail was not as abundant, considering the small size of a quail bone as compared with that of a turkey. For, as we have previously remarked, it is not improbable that many of the smaller bones escaped notice in excavation. It is worthy of comment, in this regard, that the quail is more abundant than any species of small raptorial bird with the exception of *Speotyto*, and is third in abundance of all the smaller birds, *Pica nutallii* exceeding it by three individuals.

In a deposit such as that at Rancho La Brea, it is apparent that certain abnormalities in occurrence may exist, due to differences in species in degree of wariness or of susceptibility to the attractions of the traps.

A consideration of the bird assemblage immediately reveals an abnormality in the relative numbers of raptorial and non-raptorial species. This superabundance of predators, which is also notable in the mammalian assemblage, has been remarked upon frequently by various writers as resulting from the peculiar method of accumulation of specimens in the tar pits, these pits constituting huge traps baited at intervals with animals which had become mired in the tar. Of the twelve orders into which the birds of the Rancho La Brea avifauna are grouped, the two orders of raptors, the Falconiformes and the Strigiformes, contain 69.9% of the total number of individuals, or 2930. Of this number, nearly seven-eighths are falconiforms, and of the Falconiformes approximately 85% are of the larger types, the hawks and small falcons being decidedly in the minority. Miller (Carnegie Inst. Wash., Publ. 349, 1925, p. 103) has offered two suggestions in this regard: (1) That the "cooling of the asphalt at night may have rendered the trap less dangerous to owls than to birds hunting by day", and (2) that "more copious outpour [of asphalt] during the Pleistocene may have resulted in rapid entombment of small forms, leaving only the larger victims exposed to view. Results of this more rapid entombment would be that the small hawks and the owls would find bait less constantly before them." Another point of note with regard to the predatory birds is that only one-half of the individuals recorded are of species which are strictly carrion feeders. This fact is not altogether surprising, however, when we consider that, until the head was submerged, the mired animals probably remained alive and continued to attract attention by their struggles.

In spite of the spectacular occurrence of the raptors, there are certain other smaller groups which present a more accurate and more natural picture of the environment of Rancho La Brea.

The scarcity of birds of water associations has been commented upon by previous writers. In the present census these birds are found to make up only 5.3% of the total assemblage. Considering the abundance of water birds in deposits of a similar nature at McKittrick, their rare occurrence at Rancho La Brea can hardly be attributed to wariness, but would seem to point, rather, to their scarcity in the immediate neighborhood. This scarcity of water birds has been noted by Miller (Carnegie Inst. Wash., Publ. 349, 1925, p. 71) as indicative of the ephemeral nature of such bodies of water as may have existed in the vicinity of the tar pits during the Pleistocene. Possibly, during the rainy months, water accumulated to a depth of a few inches over the asphalt much as it does in the pool exposed at Rancho La Brea today. Granville Ashcroft has reported to the writer a similar instance near

Tampico, where an artificial asphalt lake becomes covered with water to a depth of 1 to 3 inches during rainy weather, and where water birds attracted to the lake at this time alight upon its water-covered surface and are trapped. In dry weather the surface becomes slightly hardened and covered by dust and leaves so that it appears as solid as the surrounding country.

There is also evidence that some of the Pleistocene water birds were not merely transient visitors to Rancho La Brea, but that they were actually breeding in the region. This evidence is based upon the presence of incompletely ossified bones of very young individuals. The groups so represented and the number of young noted are: White-faced Glossy Ibis 1, ducks 14, cranes 4, charadriiforms 2. Such evidence would indicate the presence of water not far from, or even at the edges of, some of the pits. The presence of one young of the Great Blue Heron, and nine of the storks, though not in itself indicative of water nearby, is certainly not contradictory of this supposition. The evidence presented by the occurrence of young birds is in keeping with Miller's statement as to the ephemeral nature of the water bodies of this region. Had water always been plentiful there, the number of young represented in the pits would presumably have been greater.

Other breeding residents of the vicinity of the tar traps, as indicated by the presence of young, were *Parapavo* (152), *Lophortyx* (10), *Zenaidura* (4), and *Geococcyx* (7), as well as ten species of raptors.

In view of the abundance of specimens of the genus *Parapavo*, not only of adult, but of young birds as well, there can be no doubt as to the suitability of the region for this turkey-like bird. The living wild turkeys of North and South America, with which *Parapavo* is structurally similar, inhabit wooded areas. The food of the Merriam Turkey in New Mexico in winter is said to consist of pinyon nuts, acorns, and juniper berries (Bailey, F. M., *The Birds of New Mexico*, 1928, p. 233). Possibly *Parapavo* subsisted on a somewhat similar diet, a supposition which is in line with the facts regarding the flora of the region as brought out by Frost (*Univ. Calif. Publ. Botany*, 14, 1927, pp. 73-96). According to Frost the most abundant trees of the Rancho La Brea region in the Pleistocene were the La Brea Juniper and the Coast Live Oak, with the Blue Elderberry, Knob Cone Pine and Monterey Cypress also represented. The indications are that the juniper and live oak grew close to the pits, or at least to certain of the pits in which branches, and even a trunk of the juniper tree, are found.

Such an environment as is represented by the flora recorded by Frost was suitable also for the Road-runner, the Mourning Dove, and the Pigeon, though the latter was apparently a rare visitor to the region. Even the doves are of surprisingly rare occurrence in view of their ground habits which, it would be supposed, would have led them to be particularly susceptible to entrapment. There is again the possibility that the small size of their bones caused them to be overlooked during the excavations.

The live oak and juniper may also have offered suitable nesting sites to certain of the raptors whose young are noted in the assemblage. These are: *Polyborus* (25), *Neophrontops* (8), *Tyto* (8), *Geranoaëtus fragilis* (3), *Buteo swainsoni* (3), *Accipiter cooperii* (1), *Falco columbarius* (1), and *Falco sparverius* (1). Twenty-five young of *Coragyps occidentalis* also are present. Since this is an extinct species, its nesting habits cannot be ascertained, but presumably its behavior was similar to that of its modern relative, *C. urubu*, which nests under the branches of bushes, or in hollow logs. Either of these nesting sites was undoubtedly available

in the Rancho La Brea region in the Pleistocene, the low brush affording breeding places for the quail as well.

That the entire area surrounding the tar traps was not wooded is attested by the presence of *Speotyto*, which is associated with more open country. Of the 116 individuals of *Speotyto*, 37 are young.

[For previous references to the Rancho La Brea birds in relation to their environment, see Miller, L., Univ. Calif. Publ. Geol., 7, 1912, pp. 103-105, 108-111, as well as Miller, L., Carnegie Inst. Wash., Publ. 349, 1925, pp. 66-106.]

It will be noted that, unlike the mammals, the extinct species of birds are not in all cases the most abundantly represented of their respective families. In the Accipitridae, the Golden Eagle (*Aquila chrysaetos*) is more abundant than all of the remaining accipitrids together. In the Cathartidae, *Gymnogyps californianus* is more abundant than *Sarcoramphus clarki* and *Cathartornis gracilis*, or even *Coragyps occidentalis*, which latter does not differ decidedly from *Coragyps urubu*, the Black Vulture now living. The families Meleagridae and Teratornithidae are each represented by a single species now extinct. However, if *Teratornis* be compared with the most closely related living species, *Gymnogyps californianus*, the latter is found to surpass it in number of individuals by about 85. The remaining twelve families have no extinct representatives.

The ratio of the number of individuals belonging to extinct species, to the total number of individuals, cannot be compared with a similar ratio in mammals since the smaller mammals have not been included in Dr. Stock's mammal census. We may, however, compare the predatory birds with the predatory mammals, both of which, by reason of the peculiar conditions of their entrapment, are more completely represented than any other group of birds or mammals. The ratio of extinct to living in the predatory birds, on the basis of numbers of individuals, is 23.8%, in the mammals 93.1%.

A similar discrepancy may be noted in the relative number of extinct predatory species. Though actually the birds number three more extinct species, they also number fifteen more non-extinct species, than do the mammals. Thus, relatively 31.2% of the species of predatory birds are extinct, as against 50% of the mammals.

This discrepancy recalls a fact, often noted, that in birds changes occur more slowly, and species are longer lived, than in mammals, a condition undoubtedly associated with the power of flight. This point should be taken into consideration in attempting to use birds as indicators of the age of a deposit. For short geological intervals, they are of little value, but over longer periods, if available, they may serve as a valuable check upon the evidence presented by the mammalian fauna. In the present instance, the evidence furnished by the abundance of large Falconiformes as compared with the few species now existing, appears to be the greatest contribution which birds offer in determining the age of the Rancho La Brea beds. Two-thirds of the species of large falconiforms of the asphalt are now extinct. The extinction of these species was probably, in part at least, the result of the extinction or decrease in numbers of mammalian forms, or of other species of birds, such as the turkey, *Parapavo*. That the extinction of the larger raptors is continuing today may be observed by the ever decreasing numbers of *Gymnogyps californianus* and *Haliaeetus leucocephalus*, as well as the southerly limitation of *Polyborus* and of the generic types most closely related to the Pleistocene condors and eagles. The occurrence of the more ancient types in the southern hemispheres has often been noted, and its significance is recalled in this instance upon observing the greater abundance of falconiform birds now living in South and Central America as com-

pared with North America. In brief, the extinction of the large Falconiformes appears to have begun with the diminishing in number of the species upon which they preyed, and has not yet reached its culmination. To the writer, this evidence indicates the limitation of the age of the Rancho La Brea deposits to the middle, or to the early part of the late Pleistocene.

*Los Angeles Museum, Los Angeles, California, December 30, 1929.*