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THE FOSSIL RECORD OF THE GENUS *MYCTERIA* (CICONIIDAE) IN NORTH AMERICA[1]

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Although the Wood Stork, *Mycteria americana* Linnaeus, is the only extant resident species of stork north of Mexico, fossils referable to the genus *Mycteria* are scarce in Cenozoic deposits of North America, where storks are more abundantly represented by extinct species of *Ciconia* such as *C. maltha* L. Miller, and related forms (e.g., Brodkorb 1963, Bickart 1990). Several published North American fossil records of *Mycteria* are erroneous or ambiguous; additional material reported here sheds new light on the history of this genus in the New World.

Apart from two archeological records from Florida and Venezuela, Brodkorb (1963) listed only one fossil record of *M. americana.* This was based on a right humerus identified by McCoy (1963) from deposits of Rancholabrean age in the Ichetucknee River, Columbia County, Florida (see Webb 1974:30 for the age and spelling of this locality). I re-examined this specimen (then in the collection of Pierce Brodkorb with Florida Geological Survey number V4871) and found that it is actually from a Canada Goose *Branta canadensis* (Linnaeus). This error was also noticed by Campbell (1980:121), but the correction itself was considerably confounded. In the footnotes to Campbell's table 1, numbers 4 and 5 are reversed, the former applying to *Mycteria* and the latter to *Botaurus.* Although no specimen of *Mycteria* is attributed to McCoy in the table, the footnote states that "McCoy referred this specimen, a complete humerus, to *Branta canadensis,*" whereas the opposite is true, the bone in question being from a goose but identified by McCoy as a stork.

Another record attributed to *Mycteria americana* was reported from Pleistocene deposits in Little Salt Spring, Florida (Clausen et al. 1979). My initial attempts to borrow this material for verification were unsuccessful. Later, a good portion of my unanswered letter of inquiry to Clausen (14 February 1979) appeared in Holman and Clausen (1984:151–152), where the fossils were then listed as "Cf. *Mycteria* sp. indet." Not until 1991 was I able to examine these bones—a scapula (UF 129043) that lacks the distinct knoblike coracoidal articulation of storks, and the shaft of a humerus (UF 129044) that is much too short, stout, and curved for *Mycteria.* Instead, both specimens are of the Black Vulture, *Coragyps atratus* (Bechstein).

An extinct Pleistocene species of Wood Stork, *Mycteria wetmorei* Howard, 1935, was described from the tar pits at Rancho La Brea, California. This was based on a highly diagnostic portion of a mandible and the proximal end of a tarsometatarsus. I examined these specimens (LACM K3527, K3528) and concur with Howard's diagnosis that this is a larger species than *M. americana,* with the mandible much less curved. In addition, the dorsal groove of the mandible is broader and deeper, and the lateral grooves appear deeper as well. To my knowledge, no one has questioned the validity of *M. wetmorei*; its status as a species distinct from *M. americana* seems fully justified.

Additional material from the Pleistocene of Florida is also best referred to *M. wetmorei* on the basis of size. Three specimens (distal end of left ulna, UF 15592; distal half of right tarsometatarsus lacking middle trochlea, UF 15593; and distal end of right tarsometatarsus lacking inner trochlea, UF 15594) are from the Ichetucknee River and were reported conditionally under the name *M. americana* by Campbell (1980), who acknowledged that they might be referable to *M. wetmorei.* The distal end of a left tibiotarsus (UF 14907) from the Aucilla River, Jefferson County, in the panhandle of northern Florida, also of Rancholabrean age (Webb 1974:30), I have likewise identified as *M. wetmorei.*

These specimens are larger than the equivalent elements in a modern series of skeletons of *Mycteria* (Table 1), except the smaller tarsometatarsus (UF 15593), which shows evidence of the porous bone surface characteristic of juvenile birds, thus possibly accounting for its small size. The straight mandible of *M. wetmorei* is actually more reminiscent of that in the three Old World species of *Mycteria* than the more curved mandible of *M. americana.* In size, *M. wetmorei* exceeds all of the specimens of *Mycteria* examined, but is closest to *M. leucocephala* (Table 1), although material of the Old World species was insufficient to determine the range of size variation.

A much older stork fossil, described as a new genus and species, *Dissourodes milleri* Short, 1966, was based on the distal end of a left tibiotarsus from the Crookston Bridge local fauna of the Valentine Formation in Cherry County, Nebraska, and is late Middle Miocene (late Barstovian), approximately 12 million years old (Becker 1987:39, 168). Short's (1966) diagnosis of *Dissourodes* is difficult to decipher, in part because of com-

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TABLE 1. Measurements (mm) of fossil and modern specimens of *Mycteria*. Specimens of *M. americana* are from the collections of PB, LACM, and USNM; all other modern specimens are from USNM.

	Distal width of tibiotarsus	Distance from middle trochlea to proximal end of hallux scar	Distal width of tarsometatarsus	Distal depth of ulna
M. wetmorei				
UF 14907	15.6	–	–	–
UF 15594	–	38.1	–	–
UF 15593	–	–	19.5	–
UF 15592	–	–	–	15.8
M. americana	12.2–14.1 (13.2) (n = 31)	26.1–33.2 (30.2) (n = 26)	17.4–20.6 (19.0) (n = 26)	12.9–15.3 (13.9) (n = 36)
M. ibis (n = 4)	12.4–13.5 (12.8)	30.0–32.7 (31.1)	17.1–19.5 (18.3)	12.7–13.7 (13.0)
M. cinerea (n = 2)	11.9–13.4 (12.6)	28.3–31.7 (30.0)	17.5–19.5 (18.5)	12.8–14.3 (13.5)
M. leucocephala (n = 2)	13.2–15.1 (14.1)	32.4–36.1 (34.2)	18.4–20.5 (19.4)	13.6–14.7 (14.1)

FIGURE 1. Distal ends of left tibiotarsi of storks in anterior (upper row) and distal (lower row) views: A, modern *Ciconia ciconia* (USNM 605012); B, cast of holotype of *Dissourodes* (=*Mycteria*) *milleri* (USNM 23843); C, fossil specimen from Aucilla River, Florida, referred to *Mycteria wetmorei* (UF 14907); D, modern *M. americana* (USNM 500889). Arrow indicates the proximal incision of the external condyle characteristic of the genus *Mycteria*. Note also in distal view (lower) the narrower intercondylar sulcus of *Mycteria* versus that of *Ciconia*. Scale = 3 cm.

parisons with numerous modern genera that are no longer considered valid (see Kahl 1971, 1972, 1979). Short considered *Mycteria* and *Ibis* (the latter now included in *Mycteria*) to be peculiar and to differ from *Dissourodes* in having the intercondylar groove "V-shaped anteriorly but sharply shifting to a U-shape near the base of the groove." Perhaps this refers to the characteristic shape of the intercondylar fossa in *Mycteria* caused by the marked incision of the proximomedial margin of the external condyle. A cast of the holotype of *Dissourodes milleri* shows this feature to be present and well-developed, however (Fig. 1B). This cast agrees further with *Mycteria,* and differs from *Ciconia* (sensu lato), in the narrower intercondylar sulcus, as seen in distal view (Fig. 1).

In comparing *Dissourodes milleri* with the tibiotarsus referred to *Mycteria wetmorei* (Fig. 1), I could detect no significant differences in qualitative features except the more robust shaft in *D. milleri.* The measurements of the Pleistocene fossil correspond very closely with those given by Short for *D. milleri.* If these fossils were of equivalent age, they might well be assigned to the same species. Considering the much greater age of *D. milleri,* such an action would be precipitate in view of the limited amount of fossil material. I can see no justification, however, for separate generic status for *D. milleri.* Consequently the genus *Dissourodes* Short, 1966, may be regarded as a junior subjective synonym of *Mycteria* Linnaeus, 1758, and its only included species should hence be known as *Mycteria milleri* (Short), **new combination.**

Unless *Mycteria americana* decreased markedly in size since the end of the Pleistocene, all fossils of *Mycteria* yet found in North America are referable to *M. wetmorei*; there is thus no confirmed Pleistocene occurrence for the Wood Stork. The fossil record may eventually show that these two species co-existed in North America. On the other hand, it is also possible that *M. americana* is a relatively recent immigrant from South America that arrived after *M. wetmorei* became extinct at the end of the Pleistocene.

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LITERATURE CITED

BECKER, J. J. 1987. Neogene avian localities of North America. Smithsonian Institution Press, Washington, DC.

BICKART, K. J. 1990. The birds of the late Miocene-early Pliocene Big Sandy Formation, Mohave County, Arizona, p. 1–72. *In* Recent advances in the study of Neogene fossil birds. Orn. Monog. 44.

BRODKORB, P. 1963. Catalogue of fossil birds. Part 1 (Archaeopterygiformes through Ardeiformes). Bull. Florida State Mus., Biol. Sci. 7:179–273.

CAMPBELL, K. E., JR. 1980. A review of the Rancholabrean avifauna of the Itchtucknee River, Florida. Contrib. Sci. Natur. Hist. Mus. Los Angeles County 330:119–129.

CLAUSEN, C. J., A. D. COHEN, C. EMILIANI, J. A. HOLMAN, AND J. J. STIPP. 1979. Little Salt Spring, Florida: a unique underwater site. Science 203: 609–614.

HOLMAN, J. A., AND C. J. CLAUSEN. 1984. Fossil vertebrates associated with paleo-indian artifact at Little Salt Spring, Florida. J. Vert. Paleont. 4:146–154.

HOWARD, H. 1935. The Rancho La Brea wood ibis. Condor 37:251–253.

KAHL, M. P. 1971. Social behavior and taxonomic relationships of the storks. Living Bird 10:151–170.

KAHL, M. P. 1972. A revision of the family Ciconiidae (Aves). J. Zool. (Proc. Zool. Soc. London) 167:451–461.

KAHL, M. P. 1979. Family Ciconiidae, p. 245–252. *In* E. Mayr and G. W. Cottrell, [eds.], Check-list of birds of the world. Vol. 1. 2nd ed. Museum of Comparative Zoology, Cambridge, MA.

MCCOY, J. J. 1963. The fossil avifauna of Itchtucknee River, Florida. Auk 80:335–351.

SHORT, L. L. 1966. A new Pliocene stork from Nebraska. Smithsonian Misc. Coll. 149(9):1–11.

WEBB, S. D., [ED.] 1974. Pleistocene mammals of Florida. Univer. Presses of Florida, Gainesville, FL.