

THE TIBIO-TARSUS OF THE FOSSIL HAWK *BUTEO TYPHOIUS*

WITH FOUR FIGURES

By ALEXANDER WETMORE

MR. HAROLD J. COOK has forwarded recently the lower half of a right tibio-tarsus of a hawk secured in fossil beds near Agate, Nebraska, with the statement that it was secured in the *Stenomylus* Quarry, located about two miles southeast of the Agate Springs fossil site. It comes from the fossil horizon about 60 feet below the top of the Lower Harrison beds, from a deposit that has yielded a number of skeletons of the small cameloid *Stenomylus* that has given the quarry its name. The specimen (collection Harold J. Cook, no. HC 477) was found exposed with the upper end broken off and gone. It is grayish white in color, well fossilized and has a somewhat roughened, porous appearance on part of the shaft, indicating that it comes from a juvenile bird in which the limb bones were not wholly hardened. Its characters are, however, fully developed.

This bone (figs. 58 to 61) is of characteristic buteonine form and after due comparison is identified as *Buteo typhoïus* Wetmore (Bull. Amer. Mus. Nat. Hist., vol



Fig. 58



Fig. 59



Fig. 60



Fig. 61

BUTEO TYPHOIUS: Fig. 58, ANTERIOR VIEW OF RIGHT TIBIO-TARSUS; fig. 59, INTERNAL FACE OF RIGHT TIBIO-TARSUS; fig. 60, EXTERNAL FACE OF RIGHT TIBIO-TARSUS; fig. 61, VIEW OF DISTAL ARTICULAR SURFACE. ALL FIGURES NATURAL SIZE.

48, Dec. 3, 1923, p. 489) described from a broken metatarsus secured from the Upper Miocene level of the Snake Creek beds, twenty-three miles south of Agate, Sioux County, Nebraska.

The lower ends of the tibio-tarsus in modern *Buteo borealis* and *Geranoaëtus*

melanoleucus are very similar in form. *Buteo borealis* in the material at hand has the internal tubercle for the oblique ligament more heavily developed, while in *Geranoaëtus* the area immediately above the tendinal bridge is relatively broader and more concave. In *Buteo* the proximal margins of internal and external condyles also have a somewhat more pronounced overhang or projection.

In all of these points the fossil agrees with *Buteo borealis*, differing from that species in the relatively larger external condyle and somewhat heavier internal condyle. In the fossil there is a distinct impression marking the attachment of the lower end of the fibula, but the fibula itself is entirely gone. The lack of ankylosis at this point is explained by evident immaturity.

The fossil specimen, which is only slightly larger than largest females of *Buteo borealis*, is from an individual slightly smaller than the type of *Buteo typhoius* but is within the range of individual variation usual in the genus. Its characters are shown in the accompanying figures. Measurements are as follows: transverse breadth across condyles 15.0 mm., depth of internal condyle 10.8, depth of external condyle 11.0 (approximate), smallest transverse diameter of shaft 7.7 mm.

The outer face of the external condyle is rounded in outline but is flattened distally; the proximal anterior margin forms a sharp angle with the shaft; posterior margin somewhat broken; outer face concave, bounded distally by a heavy, rounded margin with an elongated ridge on the lower end of the shaft immediately above the depression; internal condyle rounded, but more flattened than the outer, with a more distinctly projecting margin; a strongly marked central tubercle projecting nipple-like with abrupt sides; proximal margin of inner tubercle extended as an inward sloping ridge to join the shaft at a point slightly above the level of termination of the proximal margin of the external tubercle; intercondylar fossa broad and open in front, slightly raised above level of shaft, with outer margin more abrupt and inner margin gently sloping; intercondylar sulcus shallow; tendinal bridge moderately strong, arched, with a strongly marked excavation beneath the margin of the internal condyle; tendinal groove broad, merging gradually above into level of shaft; shaft flattened below, somewhat heavier above, with a groove on outer face at lower end for attachment of fibula.

As this record comes from the Lower Harrison beds according to present concept it is representative of Lower Miocene time, a spatial extension of range since the type of *Buteo typhoius* is described from Upper Miocene material. The allocation of the bone under discussion has been made only after careful study with due consideration of the differences in mammalian faunas for the two horizons in question. It is possible that with more material the Lower Harrison *Buteo* may prove distinct, but there is nothing in the bone at hand to warrant its separation.

The drawings illustrating this paper have been made by Mr. Sydney Prentice.

United States National Museum, Washington, D. C., October 12, 1927.