**Buteo conterminus** from the early Pliocene of Nebraska is larger than *Spizaetus schultzi*, has the facet for metatarsal I more proximally situated, the outer ridge of the external trochlea less extended posteriorly, and the trochleae less arched (Wetmore 1923).

**Buteo typhoïus** from the Upper Miocene of Nebraska (Wetmore 1923) has a more distinct anterior groove on the face of the shaft, the shaft thicker antero-posteriorly, and the external trochlea larger and more blunted posteriorly than in *Spizaetus schultzi*.

**Buteo flaviaticus** (Miller and Sibley, Condor 44:39-40, 1942) from the Oligocene of Colorado has the shaft of the tarsometatarsus wider above the trochlea, the middle trochlea larger, and the trochleae less strongly arched than in *S. schultzi*.

**Buteo antecursor** (Wetmore, Bull. Mus. Comp. Zool. 75:297-311, 1933) from the Upper Oligocene of Wyoming has a less elongate tarsometatarsus than *Spizaetus schultzi*, and *B. ales* (Wetmore, Ann. Carnegie Mus. 16:403-408, 1926) from the lower Miocene of Nebraska is smaller and has the trochleae less arched.

This is the second record of *Spizaetus* from the Central Great Plains and the oldest reported occurrence of the genus. The other record from this region and the next oldest occurrence is *S. tanneri* from the Blancan of Nebraska (Martin, Condor 73:248-250, 1971). North American fossil species of *Spizaetus* fall into 2 groups: large massive forms which seem similar to *Aquila* (S. tanneri, *S. willetti*, and *S. pliogryps*), and smaller more lightly built forms (*S. schultzi* and *S. grinnelli*).

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**The bony stapes in the Upupidae and Phoeniculidae: evidence for common ancestry.**—Krause (Die Columella der Vögel, Berlin, R. Friedländer and Sohn, 1901) examined the form of the avian bony stapes in a number of groups, but no comprehensive study has yet been achieved. As I reported earlier (Feduccia, Auk 91:427-429, 1974), most of the nonpasserine orders, and the entire “oscine” passerine assemblage of birds possess a bony stapes resembling the primitive reptilian condition, with a flat footplate, and a straight bony shaft. This type of stapes (Fig. 1) no doubt represents the retention of the primitive condition. Both the New and Old World suboscines possess a characteristic derived morphology of the bony stapes, and this I interpreted (op. cit.) as evidence for common ancestry of the Old and New World groups. In the examination of the coraciiform families (to be presented in detail later) I discovered that the Hoopoe (Upupidae: *Upupa epops*) and the wood-hoopoes (Phoeniculidae: *Phoeniculus purpureus* and *Rhinopomastos cyanomelas*) also possess a common derived morphology of the bony stapes which is found in no other of the more than 1000 species I have examined. This type of stapes (Fig. 1) is characterized by a flat bony footplate, but with a short but wide shaft that bifurcates into 2 processes. There is a long, laterally directed thin process, and a shorter, broad process, both of which connect to the tympanic membrane via extracolumellar ligaments, and no doubt function in a complex lever system.

The possession of this bizarre type of stapes in both the Upupidae and Phoeniculidae I interpret as a strong indication of monophyly of the 2 groups that points a fortiori to
FIG. 1. Alizarin-stained stapes of A, Upupa epops (Upupidae); B, Phoeniculus purpureus (Phoeniculidae); C, Leptosomus discolor (Leptosomatidae); D, Coracias noevia (Coraciidae); and E, Berenicornis albocristatus (Bucerotidae). The stapes of Phoeniculus is slightly damaged. C, D, and E represent the primitive condition for birds; Colius has a similar stapes. All approximately × 10–30.

their uniqueness. Because of this very unusual common character, and because there are few “good” characters to ally them with the other members of the Coraciiformes, I suggest that they are best treated as 2 families within an order Upupiformes, as Stresemann (Aves. In Handbuch du Zoologie, vol. 7, No. 2, W. deGruyter, Berlin, 1927-34) suggested, but that the hornbills (Bucerotidae) not be included within the order until evidence for evolutionary affinity can be aptly demonstrated. Whether or not the wood- hoopoes and Hoopoe are considered as separate families or subfamilies of a Upupidae is a matter of arbitrary decision.

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