

## COMPARISON OF FOSSIL AND RECENT SPECIES: SOME DIFFICULTIES

By DEAN AMADON

The large South American hawk called the Gray Eagle-buzzard, or as by W. H. Hudson (1920:48) the Gray Eagle, is usually placed in a monotypic genus *Geranoaetus*, and in most publications, for example Peters' Check-list of Birds of the World (1931: 227) will be found listed as *G. melanoleucus*. It is an open country species of general distribution in southern South America and Perú, extending north on the slopes of the Andes to the Mérida Alps of Venezuela. Wetmore (1956:42) lists a Pleistocene record of the species from Cuba.

Hellmayr and Conover (1949:144) placed this species in the genus *Buteo*, as had been done also in some older works, and changed the species name to *fuscescens*. This latter change based on the discredited principle of line priority was wholly unnecessary.

In my opinion the genus *Geranoaetus* should be retained. Its one species differs from *Buteo* in the following particulars: (1) The tail is relatively short (although no more so than in one or two species of *Buteo*) and is slightly graduated or wedge-shaped. It was this latter character, along with its large size, that led some European students at an earlier day to place *melanoleucus* in the genus *Haliaeetus* of which the wedge-tailed Gray Sea Eagle (*Haliaeetus albicilla*) is the type. (2) The black feathers of the breast are lengthened and overhang the white ones below like a cape. (3) The feathers of the nape are somewhat lengthened and pointed.

The color pattern is unusual. The black chest is sharply marked off from the rest of the underparts which are white and narrowly barred, in one of the two subspecies, with gray. Dorsally there is a sharply defined central area of black on head, scapulars, mid-back and tail which is set off from the gray shoulders. This color pattern is not particularly buteo-like; rather there is some resemblance to such a species as the Barred Hawk (*Leucopternis princeps*). The immature plumage of the Eagle-buzzard is also rather variegated for a *Buteo* and recalls rather that of such a species as the Great Black Hawk (*Buteogallus urubitinga*).

The Eagle-buzzard, as the name implies, is large, larger than any *Buteo*. The late J. L. Peters (1923:305) gave the wing expanse of a female of the species which he collected in Patagonia as 5 feet, 11 inches.

Although none of the characters mentioned is in itself decisive, taken together they make it desirable, or so it would seem, to keep *Geranoaetus* separate from *Buteo*. An equally important consideration is, as implied previously, that *Geranoaetus* may be closer to other South American buteonine genera, notably *Buteogallus* and *Leucopternis* than it is to *Buteo* proper. If we merge *Geranoaetus* with *Buteo*, we may for the sake of consistency be obliged to include the two other genera mentioned, as well as *Parabuteo*, *Kaupifalco* (Africa), and perhaps others. The question then arises as to whether *Buteo* itself can be kept apart from *Aquila*! Some might say "so much the better"; but to throw all these forms into one genus would merely conceal what is known of their relationships. *Leucopternis*, for example, is a natural group of about ten species.

I had decided for the reasons mentioned that *Geranoaetus* should be recognized before noticing that Hellmayr and Conover gave as their authority for uniting it with *Buteo* a note published by Wetmore (1933). Wetmore pointed out that six fossil species from western North America ranging in age from Pleistocene to Miocene have been referred to or described in *Geranoaetus*, three of them by Wetmore himself. Yet when he compared the skeleton of the one living species of this genus with those of various living species of *Buteo* he could find no clear-cut difference except larger size. He re-

marked that the stated generic distinctions of *Geranoaetus* are the large size and the short tail. Since size is not a valid basis for generic distinction and since one African species of *Buteo* is equally short-tailed, we should, he concluded, merge *Geranoaetus* with *Buteo*. But as we have shown *Geranoaetus* has better claims to generic separation than the two mentioned by Dr. Wetmore.

At one time two fossil bones from the California Pleistocene were assigned, although with a query, by L. H. Miller (1912:75) to the living species, *Geranoaetus melano-leucus*. While such was believed to be the case, there was little need for hesitation in assigning fossil remains from North America to the genus. Later, however, Howard (1932:25) re-examined this material (a coracoid and a humerus) and transferred it to the genus *Urubitinga* [= *Buteogallus*], at the same time bestowing a new species name, *milleri*, upon it.

I agree with Wetmore that it is misleading to extend the geographical range of a genus to another continent on the basis of more or less uncertain allocation of fragmentary fossils. But is it the best solution in this case to do away with the genus *Geranoaetus* as based on the living South American species? Rather, the fossil species can be assigned, if necessary with a query, to the cosmopolitan genus *Buteo*.

Such a point of view was advocated by A. H. Miller and C. G. Sibley (1942:39), who, in describing a new fossil hawk from the Oligocene of Colorado, placed it in the genus *Buteo* with the following comment: "As suggested by Dr. Wetmore, the bone has the characters of the genus *Buteo* in its broadest sense and is best allocated to that group. In general the fossil is more different from typical *Buteo* than are the aberrant buteonids, such as those of the *Geranoaëtus* group. Nothing is gained, however, by erecting a new genus."

As a further indication of difficulties in assigning fossil material, which among birds is more often than not fragmentary and lacking the skull, one may note that two of the six species which Wetmore in 1933 transferred from *Geranoaetus* to *Buteo* were later placed in other genera. One became *Buteogallus fragilis*, the other *Spizaetus grinnelli* (Wetmore, 1956:45-46).

Although the writer is neither an anatomist nor a paleontologist, perhaps he can hazard a few comments on the problem of equating recent and fossil birds. Ideally, genera based on living species should be so distinct osteologically that it is possible to determine whether any reasonably well preserved fossil belongs to a recent genus and if so which one. It was this approach that Wetmore (1933), acting in his role as paleontologist, used in merging *Geranoaetus* with *Buteo*. Before this can be done consistently, however, we shall require a great many detailed osteological studies of Recent birds, based on ample material. Such material is often lacking. We can only hope at first for a few pilot studies. As Dr. Bobb Schaeffer, who was kind enough to read this paper, has pointed out to me, work in other classes of vertebrates has shown that good constant generic characters can often be found in various parts of the skeleton if one looks hard enough. Probably the same is true of birds. For the time being, however, we are obliged to define many recent genera primarily on the basis of plumage, color pattern, external anatomy, type of nest and eggs, and habits. Many genera based only on such evidence seem to be natural phyletic groups, probably of considerable geological antiquity. Since we often know much more about these Recent genera than we do about the usually fragmentary fossils, the latter should be fitted in to the generic classification based on the living species and not vice versa. This should be done in a suitably tentative manner so as not to give misleading impressions as to the distribution or antiquity of genera or other Recent taxons. This does not mean that a new name must be proposed every

time there is the least doubt about assigning a fossil to a taxon based on Recent species. But if the assignment is doubtful this should be indicated, preferably by placing a question mark next to the name and not by a statement in the text which may be overlooked.

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