Hellebreker's study (1945. *Zool. Meded. Leiden*, 24:243) of 574 (!) *Cochlearius* eggs in the Penard Collection is substantially in agreement with the observations of Belcher and Smooker. The color is described as bluish when fresh, fading to dirty white with age, and very slightly spotted at the large end. Hellebreker reports no unmarked eggs, nor any with "splashes" of color. Measurements (in mm.) of 50 eggs were: average, 50.25 × 35.25; minimum, 44.9 × 33.9, 49.1 × 33.2; maximum, 57.1 × 36.6, 49.4 × 38.9. The breeding season in Dutch Guiana is June and July.

Through the courtesy of Mr. Karl Plath the Chicago Natural History Museum recently acquired four eggs of this heron laid in the Brookfield Zoo by a captive bird that is believed to represent the nominate race. These eggs are unusual in several respects. All four, and two additional eggs (retained by the zoo) laid by the same bird, are pale bluish-white, without the slightest evidence of spotting or other marking, The six eggs were laid from December 20 to January 15, inclusive, as compared with the June–August breeding records of wild birds. Partial verification of the Belcher and Smooker inference that two eggs comprise a clutch is suggested by the paired spacing of the first eggs (December 20, 23; January 5, 9, 12, 15). Measurements of four eggs: 46.3 × 36.3 mm.; 46.0 × 35.8; 44.4 × 35.7; 45.2 × 36.2.—EMMET R. BLAKE, *Chicago Natural History Museum, Chicago 5, Illinois, January 30, 1956.*

The aftershaft in jacamars and puff-birds.—The presence of an aftershaft in the Jacamars (Galbulidae) and its alleged absence in the closely-related Puff-birds (Bucconidae) has long been used as an important character separating these two piciform families. The supposed absence of the structure in puff-birds apparently originated with the statement by Nitzsch (1840:94–95) who examined the species known today (Peters, 1948) as *Bucco tamatia, B. capensis, Nystalus chacuru* and *Malacoptila fusca.* Forbes' diagnosis of the family in the monograph by Sclater (1882) also indicated the aftershaft as absent. In subsequent publications Sclater (1891; 1909) used the same diagnosis. Ridgway (1914:371), apparently following Sclater, used "contour feathers without aftershafts" as a character separating the puff-birds from the jacamars. Beddard (1898:189) recorded that in the puff-bird *Malacoptila fusca* "the aftershaft is absent." Beddard's statement is probably the source of Stresemann's (1927–1934:839) notation that *Malacoptila* is without an aftershaft. Stresemann's statement is so worded as to imply that this is the only genus of jacamars and puff-birds entirely lacking an aftershaft.

In an attempt to resolve the seemingly differing opinions as to the occurrence of the aftershaft in the Bucconidae, ventral contour feathers from several species of puff-birds have been examined. Several members of the Galbulidae have been studied for comparison.

In all of the jacamars examined the aftershaft is present and originates as a single shaft from the proximal margin of the superior umbilicus. This single shaft subdivides to form a tuft of approximately 15 (12 to 17 counted) barbs. The barbules lack hamuli and this downy tuft constitutes the vane of the aftershaft. The junction of the hyporhachis with the rhachis of the main feather is discrete and well separated from the proximal barbs of the vane of the main feather.

In the puff-birds the condition of the aftershaft is somewhat different. Instead of arising from a single shaft there is a group of barbs, each arising separately from the proximal margin of the superior umbilicus. That these barbs are homologous to the well-formed aftershaft of the jacamars is indicated by their position, their number (approximately 12) and their direction, namely, parallel to the rhachis of the main feather, not lateral to it as with the barbs of the vane. There is not, however, a

sharp break between the lateral barbs and those forming the aftershaft group. The most proximal lateral barbs originate progressively toward the ventral midline of the feather and thus gradually come into alignment with the aftershaft group. It may have been this situation which led Forbes to the conclusion that no aftershaft was present. A point of difference between the aftershaft barbs and the lateral vane barbs lies in the structure of the axis or shafts of these barbs. The shafts of the aftershaft group are fine, round filaments; those of the lateral barbs are relatively broad and flat.

Additional evidence that this group of barbs is homologous to a true aftershaft is found in the studies of Lillie and Juhn (1937) on the origin of the aftershaft. Their observations indicate that barbs arising in the center of the "ventral triangle," and having a vertical arrangement, are properly considered homologous with the aftershaft.

If, in view of this evidence, the aftershaft in the Galbulidae is regarded as homologous to the group of barbs described above in the Bucconidae, the latter group should be diagnosed as possessing an aftershaft. The marked and consistent differences in aftershaft structure however, still provide a mutually exclusive pair of diagnostic family characters.

The species examined were as follows: Galbulidae: *Galbalcyrhynchus leucotis, Brachygalba lugubris, Jacamaralcyon tridactyla, Galbula albirostris, Galbula galbula, Galbula tombacea, Galbula ruficauda, Galbula leucogastra, Galbula dea* and *Jacamerops aurea.* Bucconidae: *Notharcus macrorhynchos, Notharcus pectoralis, Notharcus tectus, Bucco macrodactylus, Bucco tamatia, Bucco capensis, Hypnelus ruficollis, Malacoptila striata, Malacoptila panamensis, Malacoptila mystacalis, Monasa atra* and *Chelidoptera tenebrosa.*

All specimens were examined with a 20× binocular microscope.

Literature Cited

Beddard, F.
1898 The structure and classification of birds. Longmans, Green, and Co., London.

Lillie, F. R. and M. Juhn
1937 The origin of the after-feather in fowl: a process of twinning. *Science*, 86:38–39.

Nitzsch, C. L.
1840 System der pterylographie. English translation by P. L. Sclater, 1867. Ray Society, London.

Peters, J. L.
1948 Check-list of birds of the world. Vol. 6. Harvard Univ. Press, Cambridge.

Ridgway, R.
1914 The birds of north and middle America. Part 6. *U.S. Nat. Mus. Bull.*, 50.

Sclater, P. L.
1882 A monograph of the jacamars and puff-birds, or families Galbulidae and Bucconidae. Porter, London.
1891 Catalogue of the birds in the British Museum. Volume 19. British Museum, London.
1909 Fam. Galbulidae. *In*, Wytsman, Genera Avium. V. Verteneuil and L. Desmet, Brussels.

Stresemann, E.
1927-1934 Aves. *In*, Kukenthal and Krumbach, Handbuch der Zoologie, vol. 7. Walter de Gruyter and Co., Berlin and Leipzig.

Charles G. Sibley, *Department of Conservation, Cornell University, Ithaca, New York, March 6, 1956.*