TAXONOMIC STATUS OF THE CELEBES ASHY-BLACK MONKEY—A REMARKABLE CASE OF CONVERGENCE.

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The ashy-black monkey of Celebes was first described by Ogilby [1] as *Papio ochreatus* [2]. The original description is, however, too inadequate to strictly apply to this monkey, as the most important and conspicuous external character, the extreme reduction of the tail, is not mentioned at all [3]. Sclater [4], however, appears to be sure of the identity of Ogilby's *Papio ochreatus*, and was the first to assign it to the genus *Macaca* after giving a clear definition of its characters. Elliot,[5] realizing the great similarity between the Celebes moor macaque and the form under report, especially with regard to the extreme reduction of tail, separated them under a separate genus, *Magus*, which, as shown by Allen [6], is inadmissible. After a commendable study of the external characters of the Catarrhini, Pocock [7] gave a careful definition of the genus *Macaca* and showed that there was no sound reason for separating the two above-mentioned species under a distinct genus, as proposed by Elliot (*op. cit.*), an opinion readily accepted by subsequent workers; but he (Pocock) appeared to be in favour of recognizing a separate subgenus, *Gymnopyga* Gray, for these forms. The most important point of interest in Pocock's conclusions, however, lies in the fact that his keen observations could not discern any appreciable difference between the two Celebes "macaques" and he remarked "the two forms are probably at most subspecifically distinct." The scope of his observations fully justifies his views which are also supported by those of other workers like Reichenbach [8] and Forbes[9]. In support may also be mentioned a statement by Bartlett (quoted by Murie[10]) who "purchased

[1] Ogilby, W., *Proc. Zool. Soc. London*, p. 56 (1840).

[2] Elliot's (*Rev. Primat.*, II, p. 167, 1913) statement that the species was first described as *Macaca ochreata* is an error.

[3] In this connection it may be pointed out that Ogilby's description of *Papio melanotus* (*Proc. Zool. Soc. London*, 1839, p. 31), barring the supposed locality (Madras), is more applicable to this species, though there is some likelihood of its being confused with the description of *Macaca speciosa* Cuvier also.

[4] Sclater, P. L., *Proc. Zool. Soc. London*, p. 420 (1860).

[5] Elliot, D. G., *Rev. Primat*, II, p. 167 (1913).

[6] Allen, J. A., *Bull. Amer. Mus. Nat. Hist.*, xxxv, p. 50 (1916).

[7] Pocock, R. I., *Proc. Zool. Soc. London*, p. 1569 (1925).

[8] Reichenbach, H. G. L., *Vollstand. Naturg. Affen.*, p. 142, fig. 408 (1862)—not seen in original.

[9] Forbes, H. O., *Handbook Primat.*, p. 12 (1894).

[10] Murie, J., *Proc. Zool. Soc. London*, p. 723 (1872).

two young animals which he, in every way, regarded as representatives of the Bornean Ape (*Macacus inornatus ?=M. maurus*). Much was his astonishment, therefore, to find one of them develop into a typical ashy-black macaque (*M. ochreatus*)". A similar instance has also been given by Sclater [1].

I had also formed an opinion similar to those given above, when I was surprised to find the skull of the ashy-black monkey (Plate I, fig. 2) to be totally different from that of the moor macaque (Plate I, fig. 1). As far as the literature accessible to me shows, no figure of the skull of the former has so far been published, and Elliot's (*op. cit.*) plate alleged to be of the former probably refers to the latter form. The most striking feature of the skull of the ashy-black monkey is the great elongation and flattening of the muzzle in which there is a distinct tendency towards the development of maxillary ridges similar to those present in the skulls of *Cynopithecus* Geoffroy (Plate I, fig. 3) and baboons. Since the latest authoritative definition of the genus *Macaca* as given by Pocock (*op. cit.*) clearly states that the muzzle in this genus is "convex above and without maxillary ridges", the present form cannot be included in the genus. Resemblances with the skull of *Cynopithecus* are considerably more important than those with the other genera; but still the form cannot be considered as a species of that genus as the differences from the only species included in the genus (*C. niger Desmarest*) are much more than those obtaining between the species (see p. 298). It is evident, however, that the ashy-black monkey of the Celebes is more related to *Cynopithecus* than to *Macaca*, and that its remarkable external resemblances with *Macaca maura* Cuvier are of secondary significance. Its affinities with *Cynopithecus* are further attested by the fact that in some young specimens there is a tendency to develop a hairy crest on the crown.

De Beaux [2] describes and figures the penis of a species which he identifies as *Cynopithecus ochreatus* (Ogilby). Pocock (*op.cit.*) is of opinion that as the young ones of *Cynopithecus niger* and the form under discussion are not always easily distinguishable, de Beaux's account probably refers to the former. The original work of de Beaux is not available to me, but I feel almost certain that, though he has not given reasons for transferring this monkey to the genus *Cynopithecus*, he appears to have noticed its affinities with this genus by the study of the male generative organs. Further investigations for the clarification of this point as well as for other anatomical resemblances which this monkey may bear to *Cynopithecus* on one hand and *Macaca* on the other are, however, necessary; and, it is hoped, would be of the utmost interest. But as far as our present knowledge goes it seems reasonable to signify the interesting position of the Celebes ashy-black monkey between the Macaques and the dog-faced monkeys (*Cynopithecus*, baboons, etc.) by distinguishing a separate genus for the species. *Gymnopyga* Gray, having been created for *M. maura*, is unavailable and I, therefore, propose to call it

[1] Sclater, P. L., *Proc. Zool. Soc. London*, p. 223 (1871).
[2] Beaux, O. de, *G. Morf.*, I, fasc. 1, p. 9 (1917).

Cynomacaca, gen. nov.

Muzzle elongated and flattened with a tendency to develop maxillary ridges. Facial profile concave. Adults without hairy crest on crown. Penis, according to de Beaux, without baculum; glans button shaped, short, deep, with their posterior lateral edges convex (not emarginate); shaft attached to glans by very narrow neck.

Genotype.—Papio ochreatus Ogilby.

The principal changes in the taxonomic status of *Cynomacaca ochreata* are indicated below :—

1840. *Papio ochreatus*, Ogilby, *Proc. Zool. Soc. London*, p. 56.

1860. *Macacus ochreatus*, Sclater, *Proc. Zool. Soc. London*, p. 420, pl. lxxxii.

1862. *Macacus maurus ochreatus*, Reichenbach, *Vollstand. Naturg. Affen*· p. 142, fig. 408.

1894. *Macacus maurus*, Forbes, *Handbook Primat.*, p. 12.

1913. *Magus ochreatus*, Elliot, *Rev. Primat.*, II, p. 167, pl. xix.

1917. *Cynopithecus ochreatus* (?), Beaux, *G. Morf.*, I, f. 1, p. 9.

1925. *Macaca maura* (*ochreata*), Pocock, *Proc. Zool. Soc. London*, p. 1560.

The following table, giving the skull measurements [1] and the important characters of *Macaca maura*, *Cynomacaca ochreata*, and *Cynopithecus niger*, will show the distinctness of the three species.

Measurements of skulls.

	Macaca maura	*Cynomacaca ochreata*	*Cynopithecus niger*
Total length . .	147·6	144·8	115·3[2]
Condylobasal length	115·0 (78·0)[3]	116·0 (80·1)	87·0 (75·5)
Zygomatic width . .	95·7 (64·8)	92·7 (64·0)	71·0 (61·6)
Orbital width . .	57·4 (38·1)	57·4 (39·6)	47·1 (40·8)
Maxillary width .	37·5 (25·4)	41·3 (29·9)	31·0 (26·9)
Upper cheek teeth .	43·4 (29·4)	49·1 (33·9)	39·0 (33·8)
Mandibular length .	104·4 (70·7)	102·6 (70·9)	80·0 (69·4)

(Continued on next page.)

Though the phenomenon of convergent evolution is quite widespread in animals, the cases where two different genera may become so closely approximated superficially as to obliterate differences even of subspecific nature and thus mislead even the best experts on the subject,

[1] Measurements are in millimeters and are the shortest distances between the two points defined, that is the measurements of chords. They are taken as follows :—
Total length, measured from anteriormost point on premaxillary symphysis to posteriormost point on occipital surface; *zygomatic width*, greatest distance between outer surfaces of zygomatic arches at right angles to axis of skull; *orbital width*, maximum distance between inner surfaces of outer borders of orbits at right angles to axis of skull; *maxillary width*, measured across outer surfaces of bases of upper canines; *upper cheek teeth*, measured from front of root of upper canine to back of root of last upper molar of that side; *mandibular length*, measured from posteriormost point on mandibular condyle to anteriormost point on symphysis of two rami.

[2] In the case of *Cynopithecus niger*, the skull studied is of a female.

[3] Figure in parenthesis indicates the measurement as a percentage of the total length

Macaca maura	*Cynomacaca ochreata*	*Cynopithecus niger*
Muzzle short, weak, convex above without any indication of maxillary ridges and lateral depressions.	Muzzle long, robust, much flattened above with a distinct tendency towards development of maxillary ridges and lateral depressions.	Muzzle similar to *Cynomacaca ochreata* but maxillary ridges and lateral depressions greatly developed.
Facial profile strongly concave.	Facial profile concave.	Facial profile nearly straight.
Supraorbital ridges highly developed with a very deep depression behind them on sides of cranium.	Supraorbital ridges similar to *Macaca maura*.	Supraorbital ridges very weak and the lateral cranial depressions behind them very shallow.
In the male skull examined sagittal and lambdoidal ridges greatly developed.	Only the lambdoidal ridges developed.	Cranium smooth.
Glans with upper surface long and slightly constricted posteriorly. A well developed baculum.	Glans button-shaped, short, deep with its posterior lateral edge convex (not emarginate). Shaft unique in having no baculum and attached to glans by a very narrow neck.	Not studied.
No hairy crest on crown.	Hairy crest on crown developed on some young ones.	A well marked hairy crest on crown.
Larger, bulky with a macaque-like build. Colour blackish brown.	Similar to *M. maura* but colour in adults turning to ashy-black on certain parts.	Smaller and of slender build. Colour black.

are, I think, very rare, especially among such well known animals as monkeys. The present case, besides furnishing a very instructive case of an extreme degree of convergence, will, it is hoped, also serve as an eye-opener against basing conclusions on external characters alone.

As no critical study of the environment, in which the Celebes monkeys live, has so far been made, it has not been possible to dwell on factors which could possibly bring about this convergence.

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