

CATALOGUE OF MAMMALS IN THE INDIAN MUSEUM (ZOOLOGICAL SURVEY.¹) II. PRIMATES : CERCOPITHECIDAE.

By H. KHAJURIA, M.Sc. Hons., Zoological Survey of India, Indian Museum, Calcutta.

(PLATES II-III.)

The general plan of the work has already been explained in Part I (Khajuria, 1953a) which also contains the explanation of the abbreviations used in the measurements of the skulls², and some other general remarks on the collection. The family Cercopithecidae is represented in this collection by forty eight forms some of which are difficult for subspecific determination for want of proper data. Out of the seventeen subspecies described from the area covered by the Fauna of India, thirteen are represented in this collection. The study has brought to light interesting individual and geographical variations and some cranial abnormalities. A false hybrid between *Papio comatus* E. Geoffroy and *Macaca nemestrina* Linnaeus has been reported upon.

I am much indebted to Drs. S. L. Hora and B. Biswas of this Department for their valuable suggestions.

2. REMARKS ON THE CLASSIFICATION OF CERCOPITHECIDAE.

Although the guenons, the macaques, the Celebes apes³, the mangabeys, the baboons, and the gelada have long since been recognized as forming a very natural group of the Primates, yet there has been no agreement whether the group should be given a family or a subfamily status, both views being backed by equally competent students. The matter is also of no great moment but it may be remarked that, though the basic differences of this group from the closely allied group of the leaf monkeys may only justify a separation into a subfamily, yet viewed as a whole, the group has deviated so much from the Colobine type⁴ that I am inclined to uphold its family rank. Elliot (1913) included the following eleven genera in the group: *Papio*, *Theropithecus*, *Cynopithecus*, *Magus*, *Simia*, *Pithecus*, *Cercocebus*, *Rhinostigma*, *Lasiopyga*, *Miopithecus*, and *Erythrocebus*. Allen (1925) split up Elliot's *Papio* into three genera, namely, *Papio*, *Comopithecus*, and *Mandrillus*; but it has now been shown that the proper name for *Papio* in Allen's sense is *Chaeropithecus* Gervais and that *Papio* Erxleben should be used for *Mandrillus* (vide Hopwood, 1947, and Ellerman and Morrison-Scott, 1951). I, however, agree with Ellerman and Morrison-Scott (*op. cit.*) that the three

¹Report No. I (Khajuria, 1953a) was published with the titles 'Catalogue of mammals, in the Zoological Survey of India'; but it has now been decided to use the words 'Indian Museum (Zool. Surv.)' instead of Zoological Survey of India.

² Only the adult skulls are measured. In several cases, the skulls were found to be so well inserted inside the skins that, in view of the fragile nature of the skins, it was not possible to take them out without badly damaging the skins. Such skulls are not measured.

³ *Cynomacaca* and *Cynopithecus*.

⁴ See for instance the astonishing modifications of such important structures as the skull, the generative organs, the tail, etc.

groups may better be considered as subgenera of *Papio*. As is now well known *Magus*, *Simia*, and *Pithecus* are all synonyms of *Macaca*, and *Rhinostigma* and *Miopithecus* are of *Cercopithecus*. Lang created *Allenopithecus* for a species described by Pocock (1907, p. 739, pl.42) as *Cercopithecus nigroviridus*. The genus has been considered valid by subsequent workers, but it has been overlooked by Pocock (1925). *Cynomacaca* has recently been created for the Celebes ashly black monkey Khajuria, 1953b).

For the diagnostic characters of the various forms included under *Cercopithecus*, *Erythrocebus*, and *Allenopithecus*, Pocock's (1907) still seems to me to be the best single work. For *Macaca* again, the species of the Indian region were quite adequately dealt with by him (Pocock, 1939). Schawrz's work on the classification of *Cercocebus* is also an outstanding contribution. For other genera and species Elliot (1913) remains to be the best basic work. Allen (1939), Chasen (1948), and Ellerman and Morrison-Scott (1951) have been of great help in following up of the changes in the nomenclature.

In the past it has been a general procedure to treat *Macaca* as more primitive than *Cercopithecus*, though the reverse appears to me to be the case. Geologically both the genera appear to be equally long in time, having originated in India in the Middle Pliocene. *Cercopithecus* lacks all the specializations exhibited by *Macaca* in the skull, the generative organs, the tail, etc. It should, thus, ordinarily be considered as an ancestral stock of *Macaca*. *Cynomacaca* and *Cynopithecus* on one hand and baboons on the other appear to me to be two independent off-shoots of *Macaca* stem which have undergone a parallel evolution with regard to their skull characters.

3. THE CATALOGUE.

SUPERFAMILY CERCOPTHECOIDEA.

FAMILY CERCOPTHECIDAE.

Cercopithecus diana roloway (Schreber).

1774. *Simia roloway* Schreber, *Säugetiere*, I, p. 109, pl. 24(Guinea).

Material—

10536	♂	Skin and skull	Zool. Gardens, Calcutta (30-12-1919).
12062	S. ad. ♂	Skin . . .	W. Rutledge (7-10-1884).
12063 (I. M. 35a)	Young ♀	Skin and skull	Do. (9-7-1878).

Remarks.—There is a marked variations in the colourations of the crown. In the adult male, it is perfectly black without any speckling. In the young female, it is darker than the parts behind, but there is a marked speckling. In the subadult male, there is no such demarcation. In the last specimen, the belly is also not so dark as in other specimens.

Distribution.—Guinae and Gold Coast.

Cercopithecus diana (subsp.?).

1758. *Simia diana* Linnaeus, *Syst. Nat.*, ed. 10, I, p. 26 (Guinae, i.e., Liberia).

Material—

11889 (I. M. 35 b)	Young♂	Skull	Purchased (18-5-1879).
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Remarks.—The skull differs from that of *C. d. roloway* in having the forehead much elevated and in the muzzle being comparatively shorter. Since the skin is not available, I am not sure about its identity ; and place it as above on the authority of Anderson (1881).

Distribution—?

Cercopithecus mitis mitis Wolf.

1822. *Cercopithecus mitis* Wolf, *Abbid. Besch. merk. naturg. Genest.*, II, p. 145, pl. 34(Angola).

Material—

12072		Skin	No history.
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Remarks.—The specimen is a flat skin from which a good deal of hairs have fallen off. It agrees closely with the description given by Pocock (1907, p. 689). There is no white spot near the eye as mentioned by Elliot (1913, p. 308).

Distribution.—West Africa.

Cercopithecus mitis kolbi Neumann.

1902. *Cercopithecus kolbi* Neumann, *Proc. zool. Soc. London.*, p. 144 (Kedong Escarpment, about 70 miles south West of Mt. Kenya, Kenya Colony).¹

Material—

11869 (I. M. 30c)	♂	Skin and skull	Purchased (26-11-1875).
12064 (I. M. 30e)	♂	Skin	Do. (17-6-1878).

Measurements of the skull. (No. 11869).—*l*, 101 ; *cb*, 80·7 ; *zw*, 70·0 ; *ow*, 49·7 ; *mw*, 32·9.

Remarks.—Certain differences from Elliot's (1913, p. 361) description have been noted. The hairs of the outer sides of the arms are not speckled with white and black but are perfectly black with lighter bases. The general speckling of the body is continued on the inner anterior parts of the upper arm. There are short tufts of white hairs on the ear.

Distribution.—Undefined.

Cercopithecus mitis albogularis (Sykes).

1831. *Semn (Opithecus)? albogularis* Sykes, *Proc. zool. Soc. London*, pt. I, p. 106 (Zanzibar).

Material—

7579	Young♀	Skin and skull	W. Rutledge (26-6-1897).
12078 (I. M. 30a)	Adol.♀	Do. (exhibited)	Rajendra Mullick (1853).
12079 (I. M. 30b)	Adol♂	Skin and skull	Purchased (16-3-1866).

¹ See Moreau, Hopkins, and Hayman (1946) who corrected the Type locality given by Allen (1939).

Remarks.—The specimen No. 7579 agrees with the description given by Pocock (1907, p. 700) except that the crown is speckled black and yellowish (a few annulations showing even a reddish tinge) instead of black and grey, and in the faint speckling of the outer sides of the thighs. Also in the lumbo-sacral region, the orange hue is more pronounced. These appear to me to be only individual variations. In the other specimens the colours have much faded away due to exposure.

Distribution.—East Africa.

Cercopithecus mitis (sub sp.?).

Material—

11842 (I. M. 32a)	.	.	.	Skull	.	.	.	Exchange with H. Lydekker (15-12-1877).
12326 (I. M. 32b.)	♀	.	.	Skeleton	.	.	.	Angola. By Exchange (21-1-1879).

Measurements of the skull—

Z.S.I.	.	.	.	<i>l cb</i>	<i>zw</i>	<i>ow</i>	<i>mw</i>	<i>c¹-m³</i>	<i>ml</i>
Reg. Nos.	.	.	.	.	.	.	.	.	.
11892	.	.	.	112.3	92.7	51	31.2	37	83.8.
12326	.	.	.	97.4	77.2	64.5	42.5	22.5	30.0 76.0

Remarks.—As the distinguishing skull characters of the species are unknown, I am unable to say much about the identity of the specimens. They are being included under this species on the authority of Anderson (1881). On the basis of the locality, No. 12326 appears to belong to the nominate race.

Distribution.—?

Cercopithecus nictitans signatus Jentink.

1886. *Cercopithecus signatus* Jentink, *Notes Leyden Mus.*, VIII, p. 55 (West Africa, perhaps from Banana Congo).

Material—

12327	.	.	.	Skin	.	.	.	No history.
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Remarks.—The specimen shows typical characters.

Distribution.—West Africa (undefined).

Cercopithecus nictitans petaurista (Schreber).

1779. *Simia petaurista* Schreber, *Säugethiere*, I, p. 103, pl. 19B (Guinea).

Material—

12069 (I.M. 34a)	Juv. ♂	.	.	Skin	.	.	.	W. Rutledge (29-10-1878).
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Remarks.—The specimens do not agree with Pocock's (1907) description inasmuch as there is no whitish stripe behind the corner of the eye; and the temple band, though well developed does not extend as a parieto-occipital stripe. But as Elliot (1913, p. 299) does not mention these characters as occurring in this species, I have no hesitation to include the specimen under this form.

Distribution.—Guinea, Gold Coast, Bandama, Ivory Coast (West Africa).

Cercopithecus nictitans ascanius (Audebert).

1799. *Simia ascanius* Audebert, *Hist. Nat. Singes Makis*, fam. 4, Sect. 2, fig. 13 (Type locality unknown).

Material—

12070 Juv.♂ Skin and skull W. Rutledge (1-12-1884).

Remarks.—The black brow and temple band is present. The hairs on the crown are speckled black and pale yellow. The pale yellow hue is gradually replaced towards the dorsal hinder quarters by orange red and then by red towards the tip of the tail. The hairs on the ears have fallen off but a few with the characteristic colour can still be made out. The nose-spot is tinted yellow.

Distribution.—Congo to Angola; Oubangui, Alima [Pousargues; Quimpampla (Santos)].

Cercopithecus nictitans nictitans (Linnaeus).

1766. *Simia nictitans* Linnaeus, *Syst. Nat.*, ed. 12, I, p. 40 (Guinae).

Material—

12071 Juv.♂ Skin . . . W. Rutledge (26-10-1884).

Remarks.—There is no black band across the collar bone as mentioned by Pocock (1907, p. 696), but its absence may perhaps be a juvenile character.

Distribution.—West Africa, Camroons to Sette Cama in French Congo, Gaboon.

Cercopithecus mona mona (Schreber).

1775. *Simia mona* Schreber, *Säugethiere*, I, p. 97, pl. 15 (Barbery).

Material—

11888 Juv.♂ Skin and skull W. Rutledge (21-12-1882).

without
lower jaw.

12067 Juv.♂ Skin Purchased (8-6-1878).
(I.M. 31a)

Remarks.—The brow band is not very clearly marked off from the crown. In 12067, the various hues on the outside of the arms, the legs and on the dorsal surface have not attained their full intensity.

Distribution.—Nigeria and Camroons.

Cercopithecus mona cambelli Waterhouse.

1838. *Cercopithecus cambelli* Waterhouse, *Proc. zool. Soc. London*, p. 61 (Sierra Leone).

Material—

12068 Juv.♂ Skin Purchased (27-11-1879).
(I.M. 31c.)

Remarks.—The specimen has acquired all the characters of the adult except that the hairs on the outside of the legs and on the lumbo-sacral region still show very faint annulations and that the tail is not black at the tip but is more or less speckled like the foreback.

Distribution.—Sierra Leone (West Africa).

Cercopithecus mona (subsp. ?).*Material—*

12224	Young ♀	In spirit	M. N. Roy. (3-3-1881).
12225	Young ♀	Do.	Do. (15-2-1881).

Remarks.—The specimens are provisionally determined as the true nature of their colour cannot be ascertained on account of their being preserved in spirit for a long time.

Distribution.—?

Cercopithecus cephus cephus (Linnaeus).

1758. *Simia cephus* Linnaeus, *Syst. Nat.*, ed. 10, I, P. 27 (America=West Africa).

Material—

7647	Juv. ♂	Skin and skull	W. Rutledge (18-11-1897).
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Remarks.—The nose is without any definite patch of white hair but is covered with a greyish pubescence which forms a diamond-shaped area around the nose. The hairs on the crown are speckled black and yellow but the black predominates. On the rest of the dorsal surface the yellow is replaced by reddish orange.

Distribution.—West Africa¹.

Cercopithecus aethiops johnstoni Pocock.

1907. *Cercopithecus pygerythrus johnstoni* Pocock, *Proc. zool. Soc. London*, p. 738 (Moshi, Kilima Njaro District, Tanganyika).

Material—

12058	♀	Skin	Zool. Gardens, Calcutta (17-11-1889).
12059 (I. M. 28c)	♂	Skin and skull	W. Rutledge (18-11-1876).
12060 (I. M. 28d)	♂	Skin	Zool. Gardens, Calcutta (29-5-1880).

Remarks.—Though there is the characteristic predominance of pale annulations on the hairs the specimens appear well speckled on the dorsal surface and on the outer side of the arms and the legs. In No. 12060, the tail is also well washed with yellowish rufous.

Distribution.—Undefined.

Cercopithecus aethiops pygerythrus (F. Cuvier).

1821. *Simia ? pygerythra* F. Cuvier, *Hist. nat. Mam.*, XXIV, p. 2, pl. 139 ("Africa").

Material—

7786		Skin and skull	W. Rutledge (19-3-1902).
7868	♂	Do.	Zool. Gardens, Calcutta (23-12-1903).
8029		Skin	J. G. Scott (22-12-1905).
12077 I. M. 28e)	Adol. ♂	Skin (exhibited)	Purchased (28-7-1869).

¹ According to Shortridge (1942) this monkey is restricted to the banks of the Orange River in Namaqualand.

Remarks.—The white on the cheeks and ventral surface is well marked in 7786 and 7868. Elliot's (1913, p. 340) remarks regarding the colouration of the rump, the limbs, the hands, and the feet do not seem to hold good in all cases. No. 12077 shows general fading of the various hues particularly of the red at the base of the tail on account of long exposure.

Distribution.—West Africa.

Cercopithecus aethiops cynosuroides (Scopli).

1786. *Simia cynosuroides* Scopli, *Deliciae Faun. et Flor. Insubrica*, I, p. 44 pl. 19 (Banana, lower Belgium Congo).

Material—

7435 Young ♂ Skin and skull W. Rutledge (4-3-1896).
(exhibited).

11890 ♀ . Skull Zool. Gardens, Calcutta.

Measurements of the skull (No. 11890).—*l*, 100.3 ; *cb*, 77.4 ; *zw*, 63.3 ; *ow*, 47.5 ; *mw*, 25.9 ; *c¹-m³*, 29.1 ; *ml*, 71.2.

Remarks.—A character which is not recorded in the descriptions available to me is that the hands, the feet, and the tail tip are quite darker. The ears appear to be rather large but this may probably be due to the faulty preparation of the skin. The skull No. 11890 is provisionally assigned to this form as the skull characters are not well known.

Distribution.—West Africa.

Cercopithecus aethiops aethiops (Linnaeus).

1758. *Simia aethiops* Linnaeus, *Syst. Nat.*, ed. 10, I, p. 28 (Ethiopia, Upper Egypt, i.e. Senaar).

Material—

7646	♂	.	.	Skin and skull	W. Rutledge (19-5-1898).
11822 (I. M. 29f)	.	.	.	Skull	By Exch. with H. Lydekkerr (5-12-1877).
11892 (I.M. 29a)	♂	.	.	Skull	C. C. Egerton (1836)
12073	.	.	.	Skin (damaged) and skull without lower jaw.	No history.
12074 (I. M. 29c)	♂	.	.	Skin	Abyssina. E. Rüppell (April 1856).
12075 (I. M. 29d)	♂	.	.	Do.	Adigrat, Tiger, Abyssinia (8,000'). W. T. Blanford (Abyssinian Exped. 1868).
12346 (I. M. 29e)	♂	.	.	Skeleton	Anseba Valley Abyssinia, 4000', 1868. W.T Blanford (Abyssinian Exped.), 1868.

Measurements of the skulls—

Z. S. I.	.	.	.	l	cb	zw	ow	mw	c ¹ m ³	ml
Reg. Nos.	.	.	.							
11822	.	.	.	98.8	82.3	63.2	44.8	25.2	35.6	72.7
11892	.	.	.	103.4	83.6	67.8	48.5	28.2	32.5	71.3
12073	.	.	.	96.9	76.8	65.2	47.5	27.5	28.6	..
12346	.	.	.	96.7	72.4	66.3	45.0	25.5	30.5	67.0

Remarks.—In Nos. 12074 and 12075 the throat, the ventral side and the inner side of the limbs have yellowish tinge instead of being white; and the outer side of the limbs has almost the same colour as the dorsal surface. In No. 12074 the hairs on the crown and the foreparts of the dorsal side are annulated orange and black.

The skull No. 11892 is being assigned to this form only under the authority of Anderson (1881), since I have not seen its skin. The specimen was identified by him as *C. sabaesus* Linn., but his *sabaesus* all belong to this form. This skull differs from other skulls of this form I have examined in the presence of a slight constriction on the bridge of the nose at the point where it meets the supraorbital ridge, in its larger size, and in having the nasals flat. These characters, though important in other groups, can be considered in the Primates generally as individual variations only.

Distributions.—Upper Nile: Abyssinia, Senaar, Kordofan.

Erythrocebus patas patas (Schreber).

1774. *Simia patas* Schreber, *Säugethiere*, I., p. 98, pl. 16 (Senegal).

Material—

7492	Young ♀	Skin	W. Rutledge (21-12-1896).
7528	Young ♀	Skin and skull	Do. (13-3-1897).
11856 (I.M. 33b)	S. ad. ♂	Skin and skull	• Do. (18-1-1879).
11873 (I.M. 33a)	S. ad.	Lower jaw	...
12065	S. ad.	Skin	Zool. Gardens, Calcutta (5-9-1882).
12066 (I. M. 33c)	Young ♀	Do.	O. L. Fraser (27-10-1880).
12223	♀	In spirit	W. Rutledge (26-2-1881).

Remarks.—Pocock (1907, p. 743) states that the hairs on the lumbo-sacral region, above the root of the tail, and on the upper parts of the thighs are uniformly red; but a close examination shows that the hairs with black tips are also present in these regions. Moreover, I do not find the tail tip appreciably paler than the rest. Pocock's (*op. cit.*, p. 744) view that the hairs on the lips turn black to white and those on the appendages from yellowish to white is borne out by my observations.

Distribution.—Senegal to Lake Chad (Africa).

Macaca¹ irus² aurea Geoffroy.

1831. *Macaca aureus* Geoffroy, *Zool. Voy. de Belanger*, pp. 56 and 76 (Pegu Burma).

Material.—

4389 (I. M. 39d)	♂, 4390 }	} Skins and skulls	Houngdarau, Moulmein Dist., Tenasserim, 10-12-1880. Limborg and J. Anderson.
(I. M. 39f),	young ♂ 4392 }		
(I. M. 39g)	♀ . }		

¹ The division of *Macaca* into several subgenera appears to be desirable but is here abandoned for the sake of convenience.

² I consider the species to be the most primitive of all the species of *Macaca* as it appears to lack all the specializations shown by others.

5236	♂	Skin	Mergui, Burma, 25-12-1881. J. Anderson.
11824 (I. M. 39b)	♂	Skin and skull	Desertion Creek, Elephant Point, Banks of Irrawady near Rangoon. J. Arm- strong (27-11-1827).
11904 (I. M. 39m) 11912 (I. M. 39i)	♀ ♀	Skulls	Arakan. A. P. Phayre (1843).
11989 (I. M. 39e)	♀	Skin and skull	Houngdarau, Moulmein Dist. Tenasserim, 10-12-1880. Limborg and J. Anderson.
11990 (I. M. 39c)	♂	Do.	Arakan, 1871, Museum Collector.

Measurements of skulls.—

1 ♂ (No. 11824) from Rangoon : *l*, 127.6 ; *cb*, 88.2 ; *zw*, 88.1 ; *ow*, 51.8 ; *mw*, 34.0 ; *c¹-m³*, 40.6 ; *ml*, 96.8.

2 ♀ (Nos. 11904 and 11912) from Arakan : *l*, 104.3-114.0 ; *cb*, 78.0-91.0 ; *zw*, 69.7-76.5 ; *ow*, 46.1-47.9 ; *mw*, 26.7-30.0 ; *c¹-m³*, 33.5-38.5 ; *ml*, 74.5-84.8.

Remarks.—The general colour of all the skins is noticeably uniform, though they have been collected from three different localities at different dates (*cf.* Pocock, 1939, p. 79). On the dorsal side the hairs have blackish and yellowish annulations. In the skull No. 11824 the brow ridges are very thick. The female skull No. 11912 is appreciably smaller than the previous records.

Distribution.—Lower Burma, Mergui Archipelago, South West Siam.

Macaca irus (subsp. ?).

1818. *Macaca irus* Cuvier, *Mem. Mus. Hist. Paris*, IV, p. 120 (Sumatra).

Material.—

3509 (I. M. 89jj)	Young ♂	In spirit	W. Rutledge (19-7-1879).
11812 (I. M. 39k)	♂	Skull	
11819 (I. M. 39a)	♂	Do.	Purchased (1844).
11821 (I. M. 39o)	♂	Skin and skull	Do.
11825 (I. M. 39p)	Adol. ♂	Skull	Do. (Dec., 1865).
11848 (I. M. 39h)	♂	Do.	
11849 (I. M. 39r)	Adol. ♂	Do.	Purchased (16-10-1868).
11850 (I. M. 39mm)	Young ♀	Do.	Do. (20-12-1867).
11859 (I. M. 39nn)	♂	Skeleton	Do. (4-1-1868).
11866 (I. M. 39oo)	Adol. ♀	Do.	Do. (8-1-1868).
11870 (I. M. 39ee)	Adol. ♂	Skin and skull	W. Rutledge (5-10-1880).
11880 (I. M. 39z)	♀	Incomplete skeleton and skin.	G. Nevill (1-7-1873).

11881 (I. M. 39aa)	♀	Incomplete skeleton and skin.	W. Rutledge (9-7-1873).
11885 (I. M. 39dd)	♂	Do.	Zool. Gardens, Calcutta. (5-8-1878).
11911 (I. M. 39j)	♂	} Skulls	
11913 (I. M. 39qq)	♀		
11914 (I. M. 39l)	♀		
11915			
11932 (I. M. 39s)	♀	Skin and skull	W. Rutledge (10-3-1868).
11991 (I. M. 39q)	♂	Do. .	Do. (12-6-1870).
11992 (I. M. 39cc)	Young ♀	In spirit	O. L. Fraser (12-6-1870).
11993 (I. M. 39gg)	Young ♂	Do.	Purchased (28-5-1870).
11994 (I. M. 39ff)	Juv. ♂	Do.	Do. (10-10-1867).
11995 (I. M. 39hh)	Young ♀ .	Do. . .	W. Rutledge (29-9-1871).
12034 (I. M. 39t)	Adol. ♂ . .	Skin (exhibited)	J. Anderson (17-4-1868).

Measurements of skulls.—

Z. S. I. Reg. Nos.	<i>cw</i>	<i>cb</i>	<i>zw</i>	<i>cw</i>	<i>mw</i>	<i>c¹-m³</i>	<i>ml</i>
11812	121.2	95.4	80.0	50.1	32.0	32.0	84.4
11819	123.0	99.0	80.0	53.2	34.4	43.5	91.3
11821	121.0	93.8	78.6	51.7	35.0	40.9	85.5
11848	121.7	97.4	83.0	53.3	32.0	40.4	90.8
11859	113.6	85.7	73.8	50.8	28.0	39.0	79.8
11870	111.4	88.3	69.0	46.9	31.3	36.8	79.4
11911	127.3	102.0	86.5	53.5	31.0	42.5	97.4
11913	89.9	72.0	60.2	42.1	22.8	31.0	66.3
11914	103.3	81.3	64.2	45.3	27.0	33.2	73.0
11932	99.4	76.0	66.0	44.1	25.8	29.6	69.0

Remarks.—The specimens are too inadequately labelled to allow subspecific determination. They probably represent a mixture of more than one form. No. 11870 is much darker on the dorsal surface and its hairs have blackish and reddish orange annulations. In the young specimens (No. 11992, 11994, and 11995) there is a prominent parting on the crown. In the skulls great variations exist in the development of brow ridges. In some they are highly developed with a deep cranial constriction behind them. In others they are nearly absent. As shown by the measurements, the length of the muzzle is also very variable.

Distribution.—?

Macaca sinica sinica (Linnæus).

1771. *Simia sinica* Linnæus, *Mant. Plant.*, p. 521 [‘India orientali’ but locality changed to Ceylon by Hinton and Wroughton (1921)].

Material.—

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|----------------------|---|------------------|------------------------------|
| 12042
(I. M. 38a) | ♂ | Skin (exhibited) | Ceylon, R. Templeton (1848). |
|----------------------|---|------------------|------------------------------|

Remarks.—There is a marked reddish wash over the hind quarters. The hairs on the cheeks and on the forehead are very scanty probably due to pathological condition.

Distribution.—The low country dry zone from the extreme north to the extreme south of Ceylon.

Macaca sinica aurifrons Pocock.

1931. *Macaca sinica aurifrons* Pocock, *J. Bombay nat. Hist. Soc.*, XXXV, p. 286 (Rayigam Korale, Western Province, Ceylon).

Material.—

- | | | | |
|-------|--------|-------|--|
| 6773 | | Skin | Ceylon, Colombo Museum. |
| 12097 | Juv. ♀ | Skull | Mankeni, East Province, Ceylon? 1913. E. W. Mayer. |

Remarks.—The colour of the anterior fringe of the bonnet has much faded away perhaps due to the age of the specimen. The back is speckled and its general colour is dark grey. The outer sides of the limbs are reddish. In the skull the external narial aperture is laterally bordered by high bony ridges which appears to be an abnormality.

Distribution.—The low country wet zone and central hill-zone of Ceylon.

Macaca sinica (subsp. ?).*Material.*—

- | | | | |
|----------------------|--------|--------------------------|-----------------------|
| 11871
(I. M. 38d) | S. ad. | Skull without lower jaw. | Ceylon, E. L. Layard. |
| 11874
(I. M. 38c) | | Lower jaw | Ceylon. |

Remarks.—Due to the lack of sufficient material and particulars, the material cannot be subspecifically determined.

Distribution.—Ceylon.

Macaca radiata diluta Pocock.

1931. *Macaca radiata diluta* Pocock, *J. Bombay nat. Hist. Soc.*, XXXV, p. 279 (Boothapundy, North of Aramboly in Travancore, South India).

Material.—

- | | | | |
|------|---|------|---------------------------------------|
| 8495 | ♂ | Skin | Travancore, 28-11-1908. N. Annandale. |
|------|---|------|---------------------------------------|

Measurements of the skin.—*h.b.*, 545; *t*, 545; *h.f.*, 143; *e*, 40.

Remarks.—The forepart of the bonnet is greyish white. The arrangement of the hairs on the head is similar to that of the type specimen as described by Pocock (1939, p. 42). The colour on the dorsal surface is dark grey with yellowish speckling. The measurements of the skin fall within the range of the measurements of the nominate race.

Distribution.—Travancore.

Macaca radiata radiata (Geoffroy).

1812. *Cercocebus radiatus* Geoffroy, *Ann. Mus. nat. Hist. Paris*, XIX, p. 98 ('India' = South India).

<i>Material.</i> —			
7089	S. ad. ♂	Skull	Tenmalai S. Arcot, Madras. Mus. Collector (W. P. Howell).
10748		Skin	Shevaroy Hills (5,400'), Salem Dist., Madras, 25-5-1929. N. A. N. Baptista.
11826 (I. M. 37f)	Young ♀	Skin and skull	R. Swinhoe (1859).
12007	Ad.	Skin	S. Arcot, Madras. Mus. Collector.
12010 (I. M. 37n)	Juv. ♂	In spirit	Madras. Zool. Gardens, Calcutta (22-6-1880).
12041 (I. M. 37a)	♂	Skin (exhibited)	Purchased (12-6-1870).
12086	S. ad. ♂	Skin and skull	Machur, Palni Hills (4,000' Madura, Madras. G. C. McCann.
12087	♀	Skin	Dharwar (2,300'), Bombay, 14-11-1911. G. C. Shortridge.

Measurements of the skin. No. 12087.—*h.b.*, 515; *t*, 566; *h.f.*, 129; *e*, 38.

Remarks.—In No. 12041 the parting on the forehead is much more prominent than in other specimens.

Distribution.—Southern India upto Satara in the west and the Godavary River in the east but absent in Travancore.

Macaca radiata (sub. sp. ?).

<i>Material.</i> —			
4795	Juv.	In spirit	Zool. Gardens, Calcutta.
11847 (I. M. 37l)	♂	Skull	J. Anderson.
11878 (I. M. 37g)	♀	In spirit	Purchased (September, 1886)
12008 (I. M. 37h)	Juv. ♂	Skin	W. Rutledge (5-1-1875).
12009	Juv. ♂	In spirit	

Measurements of the skull. No. 11847.—*l*, 109.9; *cb*, 90.4; *zw*, 76.8; *ow*, 49.2; *mw*, 34.0; *c¹-m³*, 38.8; *ml*, 80.0.

Remarks.—In the juveniles the cheeks and the area in front of the bonnet are hairless. No further remarks on the identity of the specimens can be given.

Distribution.—?

Macaca mullata villosa True.

1894. *Macacus rhesus villosus* True, *Proc. U. S. natl. Mus.*, XVII, p. 2 (Lolab, northern end of Wular Lake, about 40 miles north-west of Srinagar, Kashmir).

Material.—

12091	♂	Skin and skull	Jirna, Ramnagar, Kumaon, Uttar Pradesh, 17-1-1914. C. M. Crump.
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Measurements.—Skin : *hb.*, 510 ; *t*, 265 ; *hf.*, 161 ; *e*, 45 ; *wt*, 16½ lbs.

Skull : *l*, 124.1 ; *cb*, 97.4 ; *zw*, 85.5 ; *iw*, 53.3 ; *mw*, 32.0 ; *c¹-m³*, 40.0.

Remarks.—There are no brow and temporal ridges in the skull (*cf.* Pocock, 1939, p. 49).

Distribution.—From southern Kashmir and upper Panjab (Murree, Dharamsala, Kangra, etc.) to Kumaon.

Macaca mullata mullata (Zimmermann).

1780. *Cercopithecus mulatta* Zimmermann, *Geogr. Gesch. Mensch.*, XX, p. 195 [“India”, but type locality fixed by Pocock (1932) as Nepal Terai].

Material.—

619 (I. M. 41m)	♀	Skin	Kakhyen Hills, Yunnan, 1868. J. Anderson.
7294	♂	Skin and skull	Sukna, Darjeeling, Bangal, 25-4-1892. Mus., Collector, W. Partridge.
7295	♂	Lower jaw	Sepoy Dora ? (3,000'), (6-6-1892). Mus., Collector, W. Partridge.
11906 (I.M. 41j)	♂	} Skins and skulls	Sundabans, Bangal, 26-4-1870. Mus., Collector.
11905 (I.M. 41i)	♂		
11907	Young ♂	Skull without lower jaw.	
11925 (I. M. 41h)	♂	Skin and skull without lower jaw.	Sundarbans, Bangal, 26-4-1870. Mus. Collector.
11928	♂	Skin and skull	Assam, Zool. Gardens, Calcutta.
11931 (I. M. 41l)	♀	Do.	Sundarbans, Bangal, 26-4-1870. Mus., Collector.
11984 (I. M. 41g)	♂	Skin	Do.
11985 (I. M. 41k)	Young ♂	Skin and skull	Do.
11986 (I. M. 41n)	Adol. ♀	Skin and skeleton	Hotha Valley, Western Yunnan, 1868. J. Anderson.
11987 (I. M. 41o)	Young ♂	Skin and skull	Samaguting, Assam, 4-10-1872. C. Butler.
12088	♀	Do.	Hkampti, Upper Chindwin, Burma (5,000'), 4-7-1914. G. C. Shortridge.
12089	S. ad. ♂	Skin	20 miles of Toungoo, Burma, 26-11-1928. J. M. Mackenzie.
12090	♂	Skin and skull	Margherita, Lakhimpur, Assam (2,000'), 14-11-1914. H. W. Wells.

Measurements.—

Skulls.—								
Sex and locality.		<i>l</i>	<i>cb</i>	<i>zw</i>	<i>iw</i>	<i>mw</i>	<i>c¹-m³</i>	<i>ml</i>
2♂ from Sundarbans	}	110.4	86.8	77.0	49.3	26.8	31.9	79.0
		to	to	to	to	to	to	to
		115.7	89.5	78.0	50.6	29.5	37.4	80.5
1♂ from Darjeeling		116.0	88.3	79.3	55.0	29.4	38.3	81.9
1♂ from Assam		127.5	102.5	92.0	61.2	37.0	45.5	95.0
1♀ from Upper Chindwin		99.6	74.7	?	48.3	24.5	33.7	?

Skin.—1♀ from upper Chindwin (No. 12088); *hb*, 515; *t*, 198; *hf.*, 140; *e*, 37
wt, 9½ lbs

Remarks.—In all the specimens from the Sundarbans the orange hue is markedly restricted to the more hinder quarters seldom extending beyond one fifth of the body length. More material from Sundarbans is, however, needed to ascertain whether the specimens from this area represent an undescribed race. In one of these specimens (No. 11984), although the fore-parts are duller than the hinder quarters, the orange red hue is curiously restricted to a few hairs on the back of the right thigh. The coat in this specimens is also much coarser and somewhat longer than in other specimens. I suspect that the presence of this specimen in the collection made from Sundarbans may be one of the reasons why Anderson (1881, No. 41e) referred a specimen, formerly considered by him (Anderson, 1872) as 'a supposed new monkey', to the form under notice. This latter specimen (No. 11999) is now considered, with consensus, as belonging to *Macaca assamensis* McClelland principally because it totally lacks the orange red hue on the hinder parts; but, since it remarkably intergrades with specimens of *M. mullata* (especially through No. 11984) from Sundarbans with regards to the important character of colouration, Anderson's later opinion should not be considered as wholly unfounded (*cf.* Hinton and Wroughton, 1921a). For the purpose of collecting more specimens of this monkey, the author personally visited the Sundarbans in the winter of 1954, but the enquiries on the spot showed that the monkey occurs only in that part of Sundarbans which at present is included in East Pakistan. The skull of the specimen No. 11928 from Assam is the largest in this collection and falls within the range of *M. m. villosa* as given by Pocock (1939). The female skull No. 12088 from Upper Chindwin is smaller than the measurements given by Pocock (*op. cit.*).

Distribution.—Northern India (in the south extending at least upto the Tapti River in the west and south of the Godavari River in the east), Burma, Siam and Indo-China.

Macaca mullatta (sub sp. ?).

<i>Material.</i> —			
11816	♂	Skull	Purchased (23-9-1869).
(I. M. 41w)			
11853	♂	Lower jaw	J. Anderson (July, 1876).
(I. M. 41k)			
11864	♀	Skeleton without lower jaw.	Do.
(I. M. 41u)			
11929	♂	Skin and skull	O. L. Fraser (17-8-1876).
11986	S. ad. ♂	In spirit	W. Rutledge.
12028	♂	Skin (exhibited)	..
(I. M. 41a)			
12029	Adult	Skull. (Do.)	..

Measurements of the skulls.—

Z. S. I. Reg. Nos.	<i>l</i>	<i>cb</i>	<i>zw</i>	<i>ow</i>	<i>mw</i>	<i>c</i> ¹ - <i>m</i> ³	<i>ml</i>
11816	115.5	90.0	84.6	56.0	34.0	39.3	83.0
11864	100.7	82.0	72.0	49.9	26.0	36.0	..
11929	123.6	94.9	85.5	53.2	33.3	40.0	90.5
12029	130.0	99.0	83.3	56.1	36.6	48.1	88.8

Remarks.—The measurements of the skulls Nos. 11929 and 12029 fall within the range of *M. m. villosa*. In No. 12029 the incisors are in pathological condition, being very weak and underdeveloped. From the development of the molars this skull appears to be fully adult but some of the sutures are still very distinct, again indicating pathological condition. In No. 11864, there is a deep depression on the frontals.

Distribution.—?

Macaca assamensis pelops Hodgson.

1840. *Macacus (Pithecus) pelops* Hodgson, *J. Asiat. Soc. Bangal*, XI, p. 1213 (Kachar, Nepal).

Material.—

12095 Adol ♂ Skin and skull Pashok, Darjeeling (3,000')
3-2-1915. C. A. Crump.

Remarks.—The skull is weak in its general build and the cranial ridges are not developed.

Distribution.—From Mussoorie to Sikkim in the Himalayas (2,000' to 6,000').

Macaca assamensis assamensis McClelland.

1839. *Macaca assamensis* McClelland in Horsfield, *Proc. zool. Soc. London*, p. 148 (Assam).

Material.—

7821	S. ad. ♀	Skin	W. Rutledge (16-12-1902).
11187	S. ad. ♂	Skin and skull	Imphal valley about four miles north of Imphal Dinapur Road, Manipur, Assam, 6-11-1945 M. L. Roonwal.
11909 (I. M. 43c)	♀	Skin and skeleton	Second Defile of Irrawady, Upper Burma. J. Anderson.
11923	S. ad. ♂	Skin and skull	W. Rutledge (19-1-1881).
11924 (I. M. 42a)	S. ad. ♂	Do.	Bhamo, Upper Burma, 1875. J. Anderson.
11999 (I. M. 41c)	♂	Skin	Sundarbans, Bangal, 26-4-1870. Mus., Collector.
12002 (I. M. 42b)	Juv. ♂	Skin and skull	Mishmi hills, Assam, 6-6-1876. J. Anderson.
12093		Skin	Mokokchung, Naga Hills, Assam, 5,000', 11-10-1919. J. M. Mills.
12094	Juv. ♂	Skin and skull	Yin, Lower Chindwin (East Bank), Burma, 15-6-1914. G. C. Shortridge and S.A. Macmillan.

Measurements of the skull No. 11909.—*l*, 113.8; *cb*, 90.4; *zw*, 73.3; *ow*, 49.4; *mw*, 28.0; *c*¹-*m*³, 40.0.

Remarks.—There are great variations in the colour of the dorsal side. In the two specimens (Nos. 11187 and 12093) from Assam the general colour is dark brown with orange tinge. The individual hairs are dark grey at the base with reddish orange annulations towards the tip. The young one (No. 12002) from the same area is, however, much paler, appearing almost yellow. Specimens Nos. 11909, and 12094 from Burma and No. 11923 are also much paler owing to the predominance of the yellowish hue. In No. 11924 the red predominates. No. 11909 which has the hairs of the back speckled was identified by Anderson (1881, p. 72, 43c) as *Macacus leoninus* Blyth (= *Macaca nemestrina leonina* Blyth), although he had on an earlier occasion (1875, p. 66) referred it to the form under report. The reason for the change of his opinion is difficult to ascertain at present, except that the measurements of skull of the specimen are smaller than those given by Pocock (1939) for *M. assamensis assamensis* and fall within the range of *M. n. leonina*. No taxonomic importance can be attached to this character, as it shows great variations in this group. Anderson's inclusion of this specimen in *M. n. leonina* caused considerable confusions to the later workers like Pocock (1931, p. 300) who found it difficult to accommodate it in this form.

Pocock (1939, p. 541) described an immature specimen from Upper Chindwin as unusually brightly tinted, almost reddish ochreous on the head, the nape and the shoulders with yellowish wash over the hind quarters and the legs with the remarks that the specimen may belong to a new race. As the specimens in our collection from Burma also differ from those from Assam in being more brightly tinted like the one described by Pocock, the possibility of their being racially distinct from the Assam specimens gains weight. A study of a number of specimens described from Upper Burma on a later occasion by Pocock (1941, Append., p. 470) leaves no doubt, however, that the brightly tinted skins only represent an individual variation.

The skull No. 11187 is remarkably smooth for the age of the specimens there being no indication of the development of the occipital and the sagittal crests. The upper canines are also very small (*cf.*, Pocock, 1939). No. 7821 is provisionally assigned to this form as I have not seen its skull; and No. 11999 may belong to an undescribed race (see Pocock, 1939, p. 54)¹.

Distribution.—From Assam to Upper Burma, Tongking and Annam.
***Macaca nemestrina leonina*² (Blyth).**

1863. *Inuus leoninus*³ Blyth, *Cat. Mam. Mus. Asiat. Soc.*, p. 7 (Northern Arakan, Burma).

Material.—

11823 (I. M. 43a)	♂	Skin	Arakan, 1844. A. P. Phayre (Type of the form).
11863 (I. M. 43b)	Adol.♂	Skin and skeleton	Purchased (1867).

¹ In an attempt to clarify the position regarding the identity of this specimen, the author recently visited that part of Sundarbans which is now included in the Indian Union. Personal investigation and the enquiries on the spot, however, revealed that the monkey is apparently absent from this part of Sundarbans.

² Chasen (1940) has used *andamanensis* Bartlett as a subspecific name for this macaque, apparently in ignorance of the views of Pocock (1939, p. 60).

³ Pocock's (1939) statement that the form was originally described by Blyth as *Macacus leoninus* is an error.

11908 (I. M. 43d)	♂	Skull .	Purchased (1867).
11926 (I. M. 43e)	Young♂	Skin and skull	Perak, 6-1-1878. O. L. Fraser.
12030 (I. M. 44f)	S. ad.♂	Skin (exhibited)	Purchased (9-11-1866).
12031 (I. M. 44i)		Do.	Do. (27-8-1867).
12096	Young♀	Skin	Bankachon, V. P. Tenasserim 29-12-1919. G. C. Shortridge.

Measurements of the skull No. 11908.—*l*, 128.0; *cb*, 101.0; *zw*, 94.4; *ow*, 57.4; *mw*, 35.5; *c*¹-*m*³, 45.0; *ml*, 94.8.

Remarks.—In a very young male (No. 11926) the tail is very thinly haired and does not show the characteristic black upper surface. In No. 11863, the skull (Pl. II) has its muzzle greatly distorted towards the left side. The dorsal and the ventral views (Pl. II, figs. 1—3) show that the distortion begins at about the level of the posterior roots of the zygomatic arches and effects the size and position of all bones lying anterior to this plane. A line joining the middle of the anterior end of the basioccipital with the anteriormost point on the premaxillary symphysis makes an angle of about 21° with the line running through the middle of the foramen magnum and the basioccipital which are intact. Such a distortion of the cranial bones appears to be very rare in mammals. At present no explanation can be offered as to the cause of this abnormality. According to Anderson the skull No. 11908 probably belongs to the skin No. 11863.

Distribution.—Upper Burma to Tenasserim, the Mergui Archipelago and Siam.

***Macaca nemestrina nemestrina* (Linnæus).**

1766. *Simia nemestrina* Linnæus, *Syst. Nat.*, ed. 12, I, p. 35 (Sumatra).

Material.—

11817 (I. M. 44e)	♂ . .	Skeleton	Purchased (1843-52).
11818 (I. M. 44k ?)	♂ . .	Skull .	Do.
11855 (I. M. 44o)	♂ . .	Skin and skull	Zool. Gardens, Calcutta (17-3-1877).
11858 (I. M. 44p)	♂ . .	Skull and incomplete skeleton.	Purchased (1865).
11861 (I. M. 44z)	♂ . .	Skeleton .	Do.
11893 (I. M. 44u)	♂ . .	Skull .	Do.
11894	♂	Do.	Zool. Gardens, Calcutta 23-2-(1909 ?).
11895 (I. M. 44b)	♂	Do.	W. Rutledge (10-5-1870).
11896 (I. M. 44n)	♂	Do.	Do. (3-11-1878).
11897	♂	Skin and skull	Zool. Gardens, Calcutta (1882).
11898 (I. M. 44t)	Adol.♂	Skull	Purchased (1882).
11910	♂	Skin	Zool. Gardens, Calcutta
11982 (I. M. 44c)	♂	Skull	Purchased (1843).
12000 (I. M. 44j)	♂	Skin (damaged) and skull.	Do. (28-10-1869).
12001	Ad.	Skull (damaged)	Do.
12003	Young♂	Skin and skull	Purchased (25-6-1869).

Measurements of the skulls.—

Z. S. I. Reg. Nos.	<i>l</i>	<i>cb</i>	<i>zw</i>	<i>ow</i>	<i>mw</i>	<i>c¹-m³</i>	<i>m_i</i>
11817	145.5	115.0	90.0	61.2	43.0	48.0	104.0
11818	152.0	120.6	94.0	57.5	41.8	48.2	112.0
11855	148.7	120.0	101.2	59.2	46.1	47.5	110.0
11858	143.8	?	96.0	64.5	42.0	49.6	107.3
11861	158.2	125.4	101.0	?	48.0	49.5	118.4
11893	161.8	128.0	105.0	62.0	45.4	51.0	117.4
11894	145.0	116.0	98.6	61.7	38.0	44.7	107.5
11895	153.2	121.8	102.0	62.0	47.3	47.5	117.0
11896	158.5	127.8	102.0	66.7	50.9	54.6	117.5
11897	142.0	119.0	95.3	60.7	44.8	51.8	111.4
11910	154.4	126.4	105.8	60.2	45.5	47.5	116.0
11982	155.0	121.2	95.0	66.2	50.8	50.0	113.0

Remarks.—These specimens have been referred to this form mainly on the grounds of the skull characters. The skin characters (colour and annulations of hairs) which are supposed to distinguish this form from *blythi* Pocock do not seem to be much reliable. Only in one skin (No. 12003) the annulations of the hairs are conspicuously absent. There are, however, no prominent annulations in the hairs of the chest in these skins which are supposed to be present in *blythi*. The measurements as recorded here show great variations in size and proportions.

Distribution.—Malay Peninsula (north to about Trang), Borneo, Banga Island, and Sumatra.

Macaca nemestrina (sub. sp. ?).*Material.*—

7644	♂	. Imperfect skin .	W. Rutledge.
11827	Adol.♀	. . Skull . . .	....
(I. M. 44b) 11854 (I. M. 44m)	Young ♀	. Skin (damaged) and skull.	and O. L. Fraser (29-4-1876).
11889 (I. M. 44w ?)	. . . .	. Viscera in spirit .	W. Rutledge.
11900 (I. M. 44v)	. . . .	. Do. . . .	Purchased (1867).
12032 (I. M. 44a)	. ♂ . . . .	. Imperfect skin and skull.	and Do. (13-7-1867)

Remarks.—The material is too inadequate to enable me to place it under subspecies correctly.

Distribution.—?

Macaca silenus (Linnæus).

1858. *Simia silenus* Linnæus, *Syst. Nat.*, ed. 10, p. 23 (South India).

Material.—

7749	♀	}	Skins and skulls.	. W. Rutledge.
7750	♀			
7751	♀			
7752	♀			
7753	♀			
8045	Ad.	Skin	.	J. G. Scott.
10880	Ad.	.	Skin (exhibited)	. Zool. Gardens, Calcutta.
11851 (I. M. 40e)	Adol.♂)	Skin and skull		Rajendra Mullick (19-12-1871).
11852 (I. M. 40f)	Adol.♀	Skull		Purchased (12-2-1866).
11901		Viscera in spirit	.	....
11916 (I. M. 40j)	Adol.♀	Skull	.	....
12004	.	Skin	.	....
12005 (I. M. 40c)	Young♂	Do.	.	Malabar Coast. Purchased (1848).
12006 (I. M. 40b)	Adol.♂	Do.	.	J. McClelland.
12025 (I. M. 40a)	S. ad.♂	Skeleton (exhibited)	.	Barrackpore Menagerie (1843).

Remarks.—In Nos. 8045 and 12025 the caps on the crown are ill-defined.

Distribution.—South India, 14°N lat. to Cape Comorin.

Macaca speciosa speciosa F. Cuvier.

1825. (*Macacus*) *speciosus* F. Cuvier, *Hist. nat. Mam.*, 46 (East Indies).

Material.—

11902	.	Viscera in spirit	.	Kakhyen Hills, Bhamo Upper Burma. J. Anderson.
11996 (I. M. 45e)	Young♀	Skin	.	Tipperah, East Pakistan. Zool. Gardens, Calcutta (17-10-1878).
11997 (I. M. 45a)	♂	Do.	.	Kakhyen Hills, Bhamo, Upper Burma. J. Ander- son.
12033 (I. M. 45b)	Young♂	Do. (exhibited)	.	Do.
12214 (I. M. 45c)	.	Do. In spirit	.	?Sadiya, Assam J. Ander- son (30-6-1876).

Remarks.—The colour on the dorsal surface shows intermingling of yellowish, reddish, and blackish hues, the individual hair being yellowish at the base and blackish towards the tip with a reddish tinge throughout. No. 11997 has been described in life by Anderson (1881, p. 75). In this specimen, however, the red has become a markedly prominent colour. In No. 12033 which is the type of *M. brunneus* Anderson, there is a parting on the forehead.

Distribution.—Assam, Upper Burma, South China, Tongking and Annam.

Macaca speciosa (sub. sp. ?).

Material.—

7653	Young	Skin and skull	W. Rutledge.
11933	Young♀ .	Skin and skull without lower jaw.	Zool. Gardens, Calcutta.
11998 (I. M. 45f)	Young♀ . . .	In spirit . . .	Purchased (20-3-1879).

Remarks.—In No. 7653 the coat is thin, the upper parts are darker with a reddish shade, and the ventral surface and the bases of the dorsal hairs are yellowish.

Distribution.—?

Macaca maura F. Cuvier.

1823. *Macacus maurus* F. Cuvier, *Hist. nat. Mam.*, pl. xl (Celebes).

Material.—

7582	♀ .	} Skins and skulls	. W. Rutledge.
7583	♀ . .		
7584	♂ . .		
11820 (I. M. 46g)	♀ . .	Do. . .	Do. (1880).
11865	♀ . .	Skull without lower jaw.	Purchased.
11875 (I. M. 46a)	Adol.♂ . .	Lower jaw only	W. Rutledge (5-6-1871).
11887 (I. M. 46b)	♂ . .	Bones of trunk . .	O. L. Fraser (28-10-1881).
11921 (I. M. 46c)	♂ . .	Skin and skull . .	W. Rutledge (8-6-1881).
11922	♀ . .	Do. . .	Purchased.
11942 (I. M. 46e)	♀ . .	Do. . .	W. Rutledge.
12011 (I. M. 46h)	Juv.♂ . .	Skin . . .	Do. (4-7-1880).
12012 (I. M. 46f)	S. ad.♀ . .	Do. . .	O. L. Fraser (21-11-1880)
12035	♀ . .	Skeleton without skull	W. Rutledge (21-11-1880).
12219	Young♂ . .	In spirit . . .	...

Measurements of the skulls.—

Z. S. I. Reg. Nos.	<i>l</i>	<i>cb</i>	<i>zw</i>	<i>ow</i>	<i>mw</i>	<i>c¹-m³</i>	<i>ml</i>
11820	115.0	89.0	76.0	49.1	30.0	38.6	80.8
11865	118.0	90.6	76.5	50.2	29.0	37.0	?
11921	147.6	115.0	95.7	57.7	37.5	43.4	104.4
11942	121.0	93.7	76.5	51.0	31.0	41.9	85.5

Remarks.—See under *Cynomacaca ochreata*.

Distribution.—South-western peninsula of the Celebes and Aru Island (Elliot, 1913).

***Cynomacaca*¹ *ochreata* (Ogilby).**

1840. *Papio ochreatus* Ogilby, *Proc. zool. Soc. London*, p. 56 (Celebes).

Material.—

7559	Young ♂, 7581 ♂	} Skins and skulls.	. W. Rutledge.	
7590	Young ♂ .			Do. (exhibited).	Zool. Gardens, Calcutta (18-1-1898).
7910	. .	Skin and skull .	. W. Rutledge.	
8420,	10534 ♂ .	} Do. . . .	. Zool. Gardens, Calcutta.	
11918	Adol. ♂			Skull . . .	Do. (25-8-1878).
(I. M. 47c)	11919	Adol. ♂ .	Do. . . .	Maharaja of Burdwan (1858).
(I. M. 47a)	11920	Adol. ♂	Skull without lower jaw.	W. Rutledge (22-2-1880).
(I. M. 47b)	12013	Young ♂ .	Skin and lower jaw .	Do.
(I. M. 47b)	12014	Young	Skin . . .	....
	12015	♂ .	Skin and skull	Zool. Gardens, Calcutta (17-2-1929).
	12016	.	Skull . . .	....
	12036	Young .	Skin and skull (exhibited).	....

Measurements of the skull (No. 12015).—*l*, 144.8; *cb*, 116.0; *zw*, 92.7; *ow*, 57.4; *mw*, 41.3; *c¹-m³*, 49.1; *ml*, 102.6.

Remarks.—*Cynomacaca ochreata* and *Macaca maura* have long since been considered as very closely related forms. It was, however, recently discovered (Khajuria, 1953b) that the two forms belong to separate genera. A few more observations regarding the colouration which is very similar in the two species may be of interest. The young ones at birth are said to be brownish in both the species. As they grow up,

¹ See Khajuria (1953b).

they develop, in *C. ochreata*, an intense ashy black colour on the back, the nape, the crown, and on the outer surface of the limbs. In *M. maura*, the colour on these parts remains much paler, but in certain cases (No. 11921, p. 120) the colouration may be just intermediate between the two extremes. Again the legs and forearm may become paler in old individuals of *C. ochreata*. In the young ♂ No. 12013, the arms and the legs, including the hands and the feet, are much paler. I find it difficult to agree with Elliot (1913, p. 168) that the colour of the hands and the feet is a distinguishing character between the two species.

Distribution.—South eastern parts of Celebes and the islands of Muna and Buton.

*Cynopithecus*¹ *niger* Desmarest.

1820. *Cynopithecus niger* Desmarest, Mammal., 3. 534 (Celebes).

Material.—

11881	♀	Skeleton	W. Rutledge (29-10-1871).
(I. M. 48m)			
11882	♀	Skin and bones of trunk.	Do. (16-1-1872).
(I. M. 48b)			
11883	Adol.♂	Skeleton	W. Rutledge (9-7-1873).
(I. M. 48k)			
12017	Young♀	Skin and skull	Do. (5-6-1871).
(I. M. 48f)			
12018	♂	Skin	Zool. Gardens, Calcutta (9-8-1880).
(I. M. 48g)			
12020	Young♂	Skeleton without skull	W. Rutledge (3-6-1872).
(I. M. 48o)			
12037	Young♀	Skin (exhibited)	Do. (28-2-1871).
(I. M. 48d)			
12056	Young♀	Skeleton	Do. (13-1-1872).
(I. M. 48n)			
12057	Young♀	Skin (exhibited)	Do. (11-4-1871).
(I. M. 48e)			

Measurements of the skull (No. 11881).—*l*, 115.3; *cb*, 87.0; *zw*, 71.0; *ow*, 47.1; *mw*, 31.0; *c¹-m³*, 39.0; *ml.*, 80.0.

Remarks.—The colour of both the young and the adult is black. In some (Nos. 11882 and 12037) the hands and the feet are darker.

Distribution.—Northern peninsula of Celebes and down the western coast to Balanipa, Batchian, and Menadoptoua islands.

Cercocebus torquatus atys (Audebert).

1797. *Simia atys* Audebert, *Hist. nat. Singes Makis*, fam. 4, Sect. 2, p. 13 pl. 8 ("Afrique occidentale").

Material.—

11860	Adol.♂	Skin and skeleton	Purchased (May, 1879).
(I. M. 36a)			
11963	♂	Skin and skull without lower jaw.	Zool. Gardens, Calcutta.
12019	Adol.♂	Skin	O. L. Fraser (14-10-1880).
(I. M. 36b)			

¹ Only one species of this genus has with consensus been recognized; but Sody (1949) has created another, *C. togeanus* from Malengie, Togeian group, east of Celebes. Sody's conception of genus *Cynopithecus* appears, however, to be very different as he has included *Macaca maura* in this genus.

The photographs of the skull of this monkey published by Elliot (1913, II, pl. XVIII), cannot by any chance belong to this species.

Remarks.—There is no sagittal line along the back. In only one of the skins (No. 11860) the face is flesh coloured. None of the skins has any parting on the crown. The hairs on the back are speckled but not conspicuously. The tail tip is not paler. In No. 11860 there is an accessory cusplet on the second lower molar. The hairs are quite long.

Distribution.—French Guinae to Liberia.

Papio doguera (Pucheron). Subgenus *Chaeropithecus*.

1856. *Cynocephalus doguera* Pucheron, *Rev. Mag. Zool.*, (2) VIII, p. 96 (Abyssinia).

Material.—

7915	.. ♀	.. Skin	..	Zool. Gardens, Calcutta (June, 1902)
10991	.. ♂	.. Do. (exhibited)	..	Do. (1-5-1937).
11815	.. ♂	Skull	..	W. Rutledge.
11828 (T.M. 51c)	Adol. ♀	.. Skin and skull	..	Zool. Gardens, (29-10-1880) Calcutta.
11927 (I.M. 50c)	.. ♀	.. Incomplete skeleton	..	W. Rutledge (30-6-1876)
11955	♂	.. Skin and skull without lower jaw.	..	Do. (12-5-1885).
11956	.. ♂?	.. Skin (damaged) and skull.	..	Do. (18-1-1886).
11957	♂	.. Skin and skull	..	Do. (24-7-1881).
12023 (I.M. 50b)	♂	.. Skin (damaged)	..	Do. (14-6-1876).
12039 (I.M. 50d)	Ad. ♂?	.. Incomplete skeleton	..	Do. (15-8-1876).

Measurements of the skulls.—

Z. S. I. Reg. Nos.		<i>l</i>	<i>cb</i>	<i>zw</i>	<i>ow</i>	<i>mw</i>	<i>c¹-m³</i>	<i>ml</i>
11815	.. ..	230 (approx.)	185.0	136.0	77.6	60.8	73.0	160.0
11927	.. ..	183.8 (approx.)	148.9	114.3	64.6	42.6	61.9	135.0
11955	.. ..	217.0	174.3	128.0	74.9	57.5	70.4	..
11956	.. ..	225.5	177.0	113.0	71.1	55.6	70.5	164.3
11957	.. ..	217.0	179.8	120.8	78.1	59.6	75.3	162.8
12039	.. ..	185.6	146.0	113.8	62.0	43.7	59.2	137.9

Remarks.—The males fairly agree with the description of *P.d. tessellatus* Elliot as given by Elliot (1913) and Allen (1925) but the skulls of these specimens are smaller. In the females the annulations of the hairs are not well marked, and so the general appearance is less checkered. In both the female skins the coat is everywhere very long and coarse and the hairs of the napes have very long terminal black bands. A patch

of hairs with the long terminal black band arises in front of the ear and sweeps backward below the ear to join the hairs of the nape. No. 11828 was identified by Anderson (1881, No. 81c) as *Cynocephalus porcarius* Bodd. Although the character of the nose cannot be studied in made-up skins, the length of the tail clearly shows that it was a mistake. Regarding this specimen Anderson (*loc. cit.*) remarked as follows: "Although this animal was far from being adult, it had huge swellings around the vaginal orifice while alive. The bones of the skull are enormously thickened and heavy but those of face are softened. The animals lived in the Zoological Gardens, Calcutta for some years and during that period appeared quite healthy". For lack of material for comparison, I am unable to refer the material to any subspecific category.

Distribution—Abyssinia.

Papio comatus E. Geoffroy.

1812 *Papio comatus* E. Geoffroy, *Ann. Mus. Hist. nat. Paris*, XIX, p. 103 (Cape of Good Hope).

Material—

11814 (I.M. 51b).	Young ♂	Skull without lower jaw.	Purchased (1846).
12024 (I.M. 51d).	juv. ♂	In spirit	Rajendar Mullick (1862).
12040 (I.M. 50a)	♂	.. Skin (exhibited)	Purchased (8-2-1870).

Remarks.—Anderson (1881, No. 50a) determined No. 12040 as *Cynocephalus doguera*. However, since the nose is projected beyond the upper lip, I place it under the present species. No. 12024 (Plate III) was stated by him (*op. cit.*, No. 51d) to be a hybrid between this species and *Macaca nemestrina*, but it is not on record which species represents which parent. As far as it can be judged from the spirit-preserved specimen, it resembles the present species in all its external characters excepting perhaps the hands and the feet about which nothing can be said with certainty. If Anderson's statement is taken as correct, I suspect that it may be a case of a 'false hybrid'. False hybrids have been reported in several plants, invertebrates, and some lower vertebrates, but not, as far as I am aware, in mammals.¹

Distribution.—South Africa.

Papio hamadryas hamadryas (Linnaeus). Subgenus *Comopithecus*.

1758. *Simia hamadryas* Linnaeus, *Syst. Nat.*, ed. 10, I, p. 27 (Egypt. where now extinct).

Material—

12022	♂	Skin and skull	Hadoda, near Annesley Bay, Abyssinia (1868). W. T. Blanford (Abyssinian Exped.).
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¹See Wilson (1928, p. 467). Also see Zuckerman (1931, p. 338) where a hybrid between *Mandrillus spinx* and *Macaca irus* has been recorded.

12026 (I.M.49d)	♂	}	Skulls (exhibited)	Lebka Valley, Abyssinia, 1868. W. T. Blanford (Abyssinian Exped.).
12027 (I. M. 49e)	♂			
12038 (I. M. 49a)	♂	..	Skin (exhibited)	Purchased (6-10-1866).

Measurements of the skulls—

2♂ from Abyssinia : *l*, 183. 2-195. 4 ; *cb*, 139. 2-153. 0 ; *zw*, 111. 0-115. 6 ; *ow*, 56. 9-62.5 ; *mu*, 46.6-49.6 ; *c¹-m³*, 60. 6-61. 0 ; *ml*, 134. 6-145. 6.

Remarks.—A study of the skulls of this species renders the validity of *P. brockmani* Elliot doubtful as they combine the characters of both the species.

Distribution.—Eastern Ethiopia and eastern Sudan.

Papio hamadryas (sub sp.?).*Material.*—

7448	Young ♂	Skin and skull (damaged).	W. Rutledge.
11001	S. ad. ♂	Skeleton (exhibited)	Zool. Gardens, Calcutta.
11903	♂	Penis in spirit	O. L. Fraser (13-4-1866).
12038 (I. M. 49a)	.. ♂	Skin (exhibited)	.. Purchased (6-10-1866).
12053 (I.M. 49b)	Adol. ♂	Incomplete skin and skull.	Do. (29-1-1867).
12054 (I. M. 49h).	Adol. ♂	Skin	Do. (5-1-1878).
12055 (I. M. 49g).	Young ♀	Skin and skull	W Rutledge (11-3-1877).

Remarks.—The young ♀, No. 7448, is provisionally assigned to this species as the characters of the adult have not so far appeared. The general colour of this specimen is brownish yellow and the hairs are faintly annulated. The mane is just beginning to appear. In the young ♂ No. 12055 also the speckling is very faint. In the case of No. 12054, Anderson (1881) states that the skull and scapulae are quite light and friable and the scapulae are thrown into folds as it were a piece of paper mache. This condition of bones is attributed by him to its being reared from an early age in captivity.

Distribution.—?

Papio sphinx (Linnaeus). Subgenus *Papio*.

1758. *Simia sphinx* Linnaeus, *Syst. Nat.*, ed. 10, I, p. 25 (Borneo-West Africa).

Material.—

10447	♂	..	Skeleton (exhibited)	Zool. Gardens, Calcutta.
12021	♂	..	Skin (damaged)	.. W. Rutledge (15-6-1886).

Measurements of the skull.—*l*, 230.0 ; *cb*, 173.0 ; *zw*, 136.0 ; *ow*, 77.0 ; *mw*, 66.0 ; *c¹-m³*, 78.0 ; *ml*, 158.0.

Remarks.—The skull furnishes some good diagnostic characters, the most conspicuous of which is the peculiar development of the maxillary ridges and highly developed occipital crest. The maxillary ridges as they arise from below the orbit are very thick and marked with longitudinal ridges and furrows. They then become thinner and sweep inward and forward leaving a wide depression on the side of the muzzle. Their height is the greatest in the middle of the muzzle. The occipital crest slopes downward and forward. The forehead is very broad and the orbits are semicircular. The various colours on the face, the callosities, and the anal and genital region have faded away.

Distribution.—Senegamula to Congo, West Africa (Elliot).

Papio leucophaeus (F. Cuvier).

1817. *Simia leucophaeus* F. Cuvier, *Ann. Mus. Hist. nat., Paris*, XIX, p. 47 (Probablement des cotes d' Afrique).

Material.—

7824	.. ♂	..	Skin (damaged) and skull	Zool. Gardens, Calcutta (4.1.1903).
8494	.. ♂	..	Skin and skull (exhibited)	Zool. Gardens, Calcutta.
11953	Young ♀		Skull without lower jaw	W. Rutledge (11.5 1875).

Remarks.—The red colour of the lower lip and the greenish brown of the sides of the crown as given by Elliot (1913, p. 153) are not discernable, apparently due to the age of the specimen. The general colour of the upper parts and the outside of the limbs is dark brown. The ventral aspects and the inner surfaces of the limbs are paler.

Distribution.—North Camroon, Konje Farm near Mundame, and Victoria (Elliot).

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