59.9,8(67.5)

Article IV.—PRIMATES COLLECTED BY THE AMERICAN MUSEUM CONGO EXPEDITION[1]

By J. A. Allen[2]

Plates LXXIX to CLXVII, Text Figures 1 to 3, and Map

CONTENTS

[1]Scientific Results of the Congo Expedition. Mammalogy, No. 10.

[2][Dr. Allen died on August 29, 1921. His manuscript did not take into account papers issued after December 1920. The references have been revised. Only the captions to plates and figures, and such parts as are set in square brackets and initialed "H.L." were not written by Dr. Allen. The report therefore represents Dr. Allen's final work, arranged for publication by Herbert Lang. The large and numerous tables of measurements have been reduced to averages, minima, maxima, and ratios. The original tables, however, will be deposited in the files of the Osborn Paleontological Library of The American Museum of Natural History, where they will be available to other investigators.—Ed.]

INTRODUCTION

[The primates collected by Herbert Lang and James P. Chapin during the American Museum Congo Expedition (1909–1915) number 645 specimens, of which 66 represent the Lemuridæ, 549 the Lasiopygidæ, and 30 the Pongidæ. Among them are 28 forms (25 species and 3 additional subspecies), with one species new to science. There is one new genus; and one new generic name is proposed. There are also 74 skeletons, 23 of them those of chimpanzees, and 8 specimens preserved in alcohol.

Previous to the accession of the Lang-Chapin collection the American Museum had very little material of West African primates. These representative series from a circumscribed region have added much to our knowledge of the relatively large variation pertaining in primates taken in the same locality. Only of four forms of *Colobus* can the cranial variation at present be illustrated (Pls. CXII to CLI); Pls. CII and CIII show the type skull of the new species *Colobus langi;* and Text Figs. 1 to 3, drawn by Mrs. H. Ziska, illustrate the new genus, *Allenopithecus* Lang.—H. L.]

A very welcome addition are the series of portraits representing most of the primates in the collection; these were made by Herbert Lang in the field, mostly from specimens in the flesh.

In addition to the comparative material available in The American Museum of Natural History, important series of primates have been generously loaned by the United States National Museum, through the kindness of Mr. Gerrit S. Miller, Jr., Curator of Mammals, and Mr. Ned Hollister; the Academy of Natural Sciences of Philadelphia, through the courtesy of Dr. Witmer Stone; and the Museum of Comparative Zoology of Harvard University, through the kindness of Mr. Samuel Henshaw, Director, and Dr. Glover M. Allen, Curator of Mammals; to all of whom I am much indebted. I am also grateful to Dr. T. S. Palmer, author of the 'Index Generum Mammalium,' for verification of references and transcripts from rare volumes not otherwise available.

Species and Subspecies, with Their Localities and Number of Specimens from Each Locality

	Species and Subspecies	Localities	Specimens
		Lemuridæ	
1.	*Perodicticus potto faustus*	Akenge, 6; Avakubi, 3; Medje, 18; Niangara, 2; Niapu, 6; Rungu, 1; Stanleyville, 1.	37
2.	*Galagoides demidoffii medius*	Akenge, 1; Avakubi, 2; Medje, 16; Niangara, 7; Niapu, 1; Stanleyville, 2.	29
		Lasiopygidæ	
3.	*Papio doguera tessellatus*	Akenge, 4; Avakubi, 1; Niapu, 2.	7
4.	*Papio doguera heuglini*	Aba, 1; Bafuka, 5; Faradje, 2.	8
5.	*Cercocebus agilis*	Akenge, 13; Faradje, 2; Niapu, 19; Panga, 1; Penge, 1.	36
6.	*Cercocebus albigena ituricus*	Akenge, 21; Avakubi, 5; Bafuka, 3; Gamangui, 8; Medje, 2; Ngayu, 1; Niapu, 5; Poko, 1; Risimu, 3; Ukaturaka, 2.	51
7.	*Cercocebus aterrimus*	Stanleyville, 2.	2
8.	*Rhinostigma hamlyni*	Somewhere south of Stanleyville, 1.	1
9.	*Lasiopyga brazzæ uelensis*	Avakubi, 4; Bafuka, 6; Banalia, 1; Faradje, 2; Niangara, 12; Niapu, 8; Poko, 1; Ukaturaka, 6.	40
10.	*Lasiopyga l'hæsti l'hæsti*	Babeyru, 1; Gamangui, 10; Stanleyville, 1.	12
11.	*Lasiopyga kandti*	Kisenje, 2.	2

Lasiopygidæ (*continued*)

	Species and Subspecies	Localities	Specimens
12.	*Lasiopyga leucampyx stuhlmanni*	Akenge, 25; Avakubi, 4; Gamangui, 19; Medje, 8; Niapu, 11; Risimu, 1.	68
13.	*Lasiopyga denti*	Akenge, 9; Avakubi, 3; Batama, 4; Gamangui, 14; Medje, 5; Niapu, 9; Poko, 1; Risimu, 1; Rungu, 1.	47
14.	*Lasiopyga wolfi*	Mosembe, 1.	1
15.	*Lasiopyga ascanius cirrhorhinus*	Akenge, 14; Avakubi, 2; Bafwabaka, 1; Bafwasende, 1; Bafwaboli, 4, Faradje, 1; Gamangui, 2; Kamunionge, 2; Lubilo, 3; Medje, 4; Munye Katoto, 1; Niapu, 2; Rungu, 1; Stanleyville, 1.	39
16.	*Lasiopyga ascanius pelorhinus*	Ukaturaka, 5.	5
17.	*Lasiopyga cephus*	Zambi, 1.	1
18.	*Lasiopyga pygerythra griseisticta*	Aba, 2; Faradje, 8; Vankerckhovenville, 2; Yakuluku, 3.	15
19.	*Allenopithecus nigroviridis*	Bolobo, 1.	1
20.	*Erythrocebus patas pyrronotus*	Faradje, 4; Niangara, 1.	5
21.	*Colobus tholloni*	Bolobo, 2; Lukolela, 2.	4
22.	*Colobus langi*	Risimu, 3.	3
23.	*Colobus ellioti*	Avakubi, 1.	1
24.	*Colobus powelli powelli*	Abawe, 2; Akenge, 27; Avakubi, 1; Bafwabaka, 1; Gamangui, 3; Medje, 1; Niapu, 8.	43
25.	*Colobus powelli brunneus*	Bafuka, 2, Faradje, 40.	42
26.	*Colobus abyssinicus ituricus*	Avakubi, 7; Bafuka, 1, Faradje, 38; Vankerckhovenville, 1; Yakuluku, 2.	49
27.	*Colobus angolensis cottoni*	Akenge, 23, Avakubi, 3; Gamangui, 9; Medje, 1; Niapu, 23; Poko, 4; Ukaturaka, 1; unknown locality, 2.	66

Pongidæ

28.	*Pan schweinfurthii*	Aba, 3; Akenge, 4; Avakubi, 1; Faradje, 9; Gamangui, 1; Medje, 6; Ngayu, 1; Niapu, 4; Pawa, 1.	30

List of Localities,[1] with Names of the Species and Subspecies, and Number of Specimens Taken at Each Locality

Localities	Species and Subspecies	No. of Specimens	Totals
Aba	*Papio doguera heuglini*	1	
"	*Lasiopyga pygerythra griseisticta*	2	
"	*Pan schweinfurthii*	3	6
Abawe	*Colobus powelli powelli*	2	2
Akenge	*Perodicticus potto faustus*	6	
"	*Galagoides demidoffii medius*	1	
"	*Papio doguera tessellatus*	4	
"	*Cercocebus agilis*	13	
"	*Cercocebus albigena ituricus*	21	
"	*Lasiopyga leucampyx stuhlmanni*	25	
"	*Lasiopyga denti*	9	
"	*Lasiopyga ascanius cirrhorhinus*	14	
"	*Colobus powelli powelli*	27	
"	*Colobus angolensis cottoni*	23	
"	*Pan schweinfurthii*	4	147
Avakubi	*Perodicticus potto faustus*	3	
"	*Galagoides demidoffii medius*	2	
"	*Papio doguera tessellatus*	1	
"	*Cercocebus albigena ituricus*	5	
"	*Lasiopyga brazzæ uelensis*	4	
"	*Lasiopyga leucampyx stuhlmanni*	4	
"	*Lasiopyga denti*	3	
"	*Lasiopyga ascanius cirrhorhinus*	2	
"	*Colobus ellioti*	1	
"	*Colobus powelli powelli*	1	
"	*Colobus abyssinicus ituricus*	7	
"	*Colobus angolensis cottoni*	3	
"	*Pan schweinfurthii*	1	37
Babeyru	*Lasiopyga l'hæsti l'hæsti*	1	1
Bafuka	*Papio doguera heuglini*	5	
"	*Cercocebus albigena ituricus*	3	
"	*Lasiopyga brazzæ uelensis*	6	
"	*Colobus powelli brunneus*	2	
"	*Colobus abyssinicus ituricus*	1	17
Bafwabaka	*Lasiopyga ascanius cirrhorhinus*	1	
"	*Colobus powelli powelli*	1	2
Bafwasende	*Lasiopyga ascanius cirrhorhinus*	1	1
Bafwaboli	*Lasiopyga ascanius cirrhorhinus*	4	4
Banalia	*Lasiopyga brazzæ uelensis*	1	1
Batama	*Lasiopyga denti*	4	4

[1]The principal localities will be found on the map (p. 498); the location of others is indicated on page 499.

Localities	Species and Subspecies	No. of Specimens	Totals
Bolobo	*Allenopithecus nigroviridis*	1	
"	*Colobus tholloni*	2	3
Faradje	*Papio doguera heuglini*	2	
"	*Cercocebus agilis*	2	
"	*Lasiopyga brazzæ uelensis*	2	
"	*Lasiopyga ascanius cirrhorhinus*	1	
"	*Lasiopyga pygerythra griseisticta*	8	
"	*Erythrocebus patas pyrronotus*	4	
"	*Colobus powelli brunneus*	40	
"	*Colobus abyssinicus ituricus*	38	
"	*Pan schweinfurthii*	9	106
Gamangui	*Cercocebus albigena ituricus*	8	
"	*Lasiopyga l'hæsti l'hæsti*	10	
"	*Lasiopyga leucampyx stuhlmanni*	19	
"	*Lasiopyga denti*	14	
"	*Lasiopyga ascanius cirrhorhinus*	2	
"	*Colobus powelli powelli*	3	
"	*Colobus angolensis cottoni*	9	
"	*Pan schweinfurthii*	1	66
Kamunionge	*Lasiopyga ascanius cirrhorhinus*	2	2
Kisenje	*Lasiopyga kandti*	2	2
Lubilo	*Lasiopyga ascanius cirrhorhinus*	3	3
Lukolela	*Colobus tholloni*	2	2
Medje	*Perodicticus potto faustus*	18	
"	*Galagoides demidoffii medius*	16	
"	*Cercocebus albigena ituricus*	2	
"	*Lasiopyga leucampyx stuhlmanni*	8	
"	*Lasiopyga denti*	5	
"	*Lasiopyga ascanius cirrhorhinus*	4	
"	*Colobus powelli powelli*	1	
"	*Colobus angolensis cottoni*	1	
"	*Pan schweinfurthii*	6	61
Mosembe	*Lasiopyga wolfi*	1	1
Munye Katoto	*Lasiopyga ascanius cirrhorhinus*	1	1
Ngayu	*Cercocebus albigena ituricus*	1	
"	*Pan schweinfurthii*	1	2
Niangara	*Perodicticus potto faustus*	2	
"	*Galagoides demidoffii medius*	7	
"	*Lasiopyga brazzæ uelensis*	12	
"	*Erythrocebus patas pyrronotus*	1	22
Niapu	*Perodicticus potto faustus*	6	
"	*Galagoides demidoffii medius*	1	
"	*Papio doguera tessellatus*	2	
"	*Cercocebus agilis*	19	
"	*Cercocebus albigena ituricus*	5	

Localities	Species and Subspecies	No. of Specimens	Totals
Niapu	*Lasiopyga brazzæ uelensis*	8	
"	*Lasiopyga leucampyx stuhlmanni*	11	
"	*Lasiopyga denti*	9	
"	*Lasiopyga ascanius cirrhorhinus*	2	
"	*Colobus powelli powelli*	8	
"	*Colobus angolensis cottoni*	23	
"	*Pan schweinfurthii*	4	98
Panga	*Cercocebus agilis*	1	1
Pawa	*Pan schweinfurthii*	1	1
Penge	*Cercocebus agilis*	1	1
Poko	*Cercocebus albigena ituricus*	1	
"	*Lasiopyga brazzæ uelensis*	1	
"	*Lasiopyga denti*	1	
"	*Colobus angolensis cottoni*	4	7
Risimu	*Cercocebus albigena ituricus*	3	
"	*Lasiopyga leucampyx stuhlmanni*	1	
"	*Lasiopyga denti*	1	
"	*Colobus langi*	3	8
Rungu	*Perodicticus potto faustus*	1	
"	*Lasiopyga denti*	1	
"	*Lasiopyga ascanius cirrhorhinus*	1	3
Stanleyville	*Perodicticus potto faustus*	1	
"	*Galagoides demidoffii medius*	2	
"	*Cercocebus aterrimus*	2	
"	*Lasiopyga l'hæsti l'hæsti*	1	
"	*Lasiopyga ascanius cirrhorhinus*	1	7
Ukaturaka	*Cercocebus albigena ituricus*	2	
"	*Lasiopyga brazzæ uelensis*	6	
"	*Lasiopyga ascanius pelorhinus*	5	
"	*Colobus angolensis cottoni*	1	14
Vankerckhovenville	*Lasiopyga pygerythra griseisticta*	2	
"	*Colobus abyssinicus ituricus*	1	3
Yakuluku	*Lasiopyga pygerythra griseisticta*	3	
"	*Colobus abyssinicus ituricus*	2	5
Zambi	*Lasiopyga cephus*	1	1
?	*Rhinostigma hamlyni*	1	
"	*Colobus angolensis cottoni*	2	3

New Generic Names

Comopithecus. Replacing *Hamadryas* Lesson, preoccupied. Type, *Simia hamadryas* Linnæus.

Allenopithecus Lang. Type, *Cercopithecus nigroviridis* Pocock.

NEW SPECIES, WITH ITS TYPE LOCALITY

Colobus langi. Risimu.

GENERAL SUMMARY

Families	Genera	Species and Subspecies	Specimens	Localities[1]
Lemuridæ	2	2	66	7
Lasiopygidæ	7	25	549	36
Pongidæ	1	1	30	9
	10	28	645	

SUBORDER LEMUROIDEA

SERIES LORISIFORMES

LORISIDÆ[2]

NOMENCLATURE OF LEMURS

Four genera of lemurs are currently recognized as occurring in Africa: *Galago* (1796), *Perodicticus* (1831), *Galagoides* (1833 = *Hemigalago* 1857), and *Arctocebus* (1863). Only *Perodicticus* and *Galagoides* are represented in the collection made by the American Museum Congo Expedition in the Rain Forest and Savannah of the northeastern Belgian Congo.

Perodicticus ranges as far west as Sierra Leone, thence southward to the French Congo and across the West African Rain Forest as far eastward as the Kakamega Forest, near Mount Elgon; it is not recorded from Angola. *Arctocebus*, as at present known, is restricted to Lower Nigeria, Southern Cameroon, and the lower Benito River. *Galago* has by far the widest distribution among the African Lemuridæ. It is known from Senegal across the Sudan, and along the coastal region of the West African Forest south to the Gaboon and Angola, eastward to Natal, thence northward to Abyssinia and Senaar. It is not recorded from the interior and northeastern section of the West African Rain Forest, but inhabits the wooded Savannahs. *Galagoides* is typical of the denser forests and contiguous forest galleries. Its range extends from Senegal southward to the Gaboon and across the Rain Forest eastward to the forests adjoining Ruwenzori and those of the volcanoes north of Lake Kivu. By far the greater number of the described forms of African lemurs are referred to the genus *Galago*.

[1]The total number of localities at which primates were collected is 37.

[2]Only African forms, the Lorisinæ and Galaginæ, are considered; the lemurs of Madagascar (Lemuridæ, Indrisidæ and Daubentoniidæ) are necessarily here excluded.

In 1829 J. B. Fischer ('Synopsis Mammalium') recorded only four species of lemurs from Africa. These are *Galago senegalensis* and *Nycticebus potto* (both described by E. Geoffroy in 1796), *Galago demidoffii* G. Fischer (1806), and *Galago crassicaudatus* E. Geoffroy (1812). No others had then been described, but four additional forms were added during the next decade, and many others later till in 1920 the number of names (including four substitute names) for species and subspecies was sixty-three. Three of the first four described species became later the genotypes respectively of *Galago, Perodicticus* and *Galagoides*. Of the fifteen names proposed for genera or subgenera four (*Potto, Macropus, Otolicnus, Hemigalago*) are substitute names, yet two of them (*Otolicnus* and *Hemigalago*) have been employed by many authors as valid names, by some in a generic, by others in a subgeneric sense. The group provisionally recognized in this connection as *Galago* has been divided by various authors into five,[1] to which (with one exception, *Euoticus* Gray) generic rank was accorded by their respective authors.[2]

D. G. Elliot, the latest reviser of the African lemurs, in his 'Review of the Primates,' Vol. I, 1913 (1912), has divided the "*Galago-Hemigalago*" group into two genera (*Galago* and *Hemigalago*), the forms referred to *Galago* being placed in three subgenera, *Otolemur, Otolicnus, Otogale*. No subgenus *Galago* is recognized but the genotype of *Galago* (*Galago senegalensis*) is placed in his subgenus *Otolicnus*, while the genotype of *Otogale* (*Otolicnus garnettii*) is relegated to his subgenus *Otolemur*. His subgenus *Otolicnus*, nomenclatorially invalid, was avowedly given by its author as a substitute name for *Galago*, on the ground that *Galago* was nonclassical. It happens furthermore that his three subgenera of *Galago* are all nomenclatorially untenable, whatever merit the groups may have taxonomically. Elliot also followed previous authors in using *Hemigalago* instead of *Galagoides*, although the latter has twenty-four years priority and the same genotype (see below, p. 302).

Elliot, in his 'Review of the Primates,' referred thirty forms to *Galago* (twenty-three species and seven subspecies) and four to *Hemigalago* (three species and one subspecies). During the eight years since his work was written four additional forms of *Galago* have been described and one added to *Hemigalago*.

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[1]Absence of material for investigation prevents a satisfactory examination of the *Galago* group in reference to the value of its subdivisions.

[2]A list of the generic, specific and subspecific names applied to African lemurs, with references to the original place of description, is given below (pp. 293, 299–303).

Lorisinæ

PERODICTICUS Bennett

1831. *Perodicticus* BENNETT, Proc. Zool. Soc. London, September 1, p. 109; Philosoph. Mag., (2) X, p. 389. Type, by monotypy, *Perodicticus geoffroyi* Bennett = *Nycticebus potto* E. Geoffroy.

1840. *Potto* LESSON, 'Spec. Mamm.,' pp. 207, 237. Type, by monotypy and by tautonomy, *Potto bosmanii* Lesson = *Nycticebus potto* E. Geoffroy.

SPECIFIC AND SUBSPECIFIC NAMES REFERABLE TO *Perodicticus*

1788. *Lemur potto* GMELIN, in Linnæus, 'Syst. Nat.,' I, p. 42. Based exclusively on the "Potto" of Bosman. The diagnosis and the single citation are: "*L. caudatus subferrugineus, cauda unicolore.* Potto. Bosman. Beschrijv. van de Guin. Kust. II, p. 30, fig. 4. Habitat in Guinea."

1812. *Nycticebus potto* E. GEOFFROY, Ann. Mus. Hist. Nat., Paris, XIX, p. 165. "Guinée." No definite locality. Based on "Potto. Bosman. Voy., p. 252, fig. 4." = *Lemur potto* Gmelin.

1820. *Galago guineensis* DESMAREST, 'Mamm.,' I, p. 104. Substitute name for *Nycticebus potto* E. Geoffroy.

1831. *Perodicticus geoffroyi* BENNETT, Proc. Zool. Soc. London, p. 109. Substitute name for *Nycticebus potto* E. Geoffroy.

1840. *Potto bosmanii* LESSON, 'Spec. Mamm.,' p. 238. Substitute name for *Nycticebus potto* E. Geoffroy.

1879. "*Perodicticus potto edwardsi* BOUVIER, 'Guide du Naturaliste,' p. 1." (Not seen.) French Congo; no definite locality. "Type not in Paris Museum" (Elliot, 'Rev. Primates,' I, p. 42).

1902. *Perodicticus batesi* DE WINTON, Ann. Mag. Nat. Hist., (7) IX, January, p. 48. Benito River (15 miles from mouth), French Congo. Type, female skin and skull.

1910. *Perodicticus ibeanus* THOMAS, Abstr. Proc. Zool. Soc. London, No. 81, March 22, p. 17; Proc. Zool. Soc. London, August, p. 536. Kakamega Forest, near Mt. Elgon, British East Africa. Altitude 6000 feet. Type, a young adult male, skin and skull.

1910. *Perodicticus ju-ju* THOMAS, Ann. Mag. Nat. Hist., (8) V, April, p. 351. Southern Nigeria. No definite locality. Type, an adult male, skin and skull.

1910. *Perodicticus faustus* THOMAS, Ann. Mag. Nat. Hist., (8) VI, October, p. 426. Irneti, Bompona, Maringa River, Northwestern Belgian Congo. Type, a subadult female, skin and skull.

1917. *Perodictius* [sic] *arrhenii* LÖNNBERG, Kungl. Sven. Vet. Ak. Handl., Stockholm, LVIII, No. 2, September 1, p. 45. Masisi, west of Lake Kivu, Belgian Congo. Adult male skin and skull.

1917. *Periodicticus* [sic] *nebulosus* LORENZ, Ann. Naturhist. Hofmus., Wien, XXXI, p. 239. Ukaika, Ituri Forest. Type (unique) an adult male.

Perodicticus potto faustus Thomas

Plates LXXIX, LXXX

Perodicticus faustus THOMAS, 1910, Ann. Mag. Nat. Hist., (8) VI, October, p. 426. Irneti, Bompona, Maringa River, northwestern Belgian Congo. Type and only specimen, a subadult female, skin and skull.

Perodicticus faustus THOMAS, 1915, Ann. Mag. Nat. Hist., (8) XVI, December, p. 467. Belgian Congo: Medje (1), Poko (8 specimens).

Perodicticus arrhenii LÖNNBERG, 1919, Rev. Zool. Africaine, VII, p. 154, part. States that specimens from "Haut Congo" and Panga, Stanleyville district, should be included in *arrhenii*. Panga lies within the area of Thomas' *P. p. faustus*.

The only form of *Perodicticus* collected by the American Museum Congo Expedition is represented by 37 specimens, of which 12 are adult males and 12 are adult females; 6 specimens are accompanied by skeletons; also one is in alcohol; collected as follows:

Niangara, 2 (adult ♂ and ♀), December 2, 19, 1910.

Rungu, 1 (young ♂), June 28, 1913.

Akenge, 6 (4 ♂, 2 ♀), September 29–October 29, 1913.

Niapu, 6 (all adult, 3 ♂, 3 ♀), November 16–December 22, 1913.

Medje, 18 (all adult but 3), April 15–September 28, 1910; April 23, June 24, 1914.

Avakubi, 3 (2 adult, 1 young), October 26, 1909; June 23, 1914.

Stanleyville, 1 (adult ♀), August 17, 1909.

The external measurements—average (minimum-maximum)—of twenty-one adults of *Perodicticus potto faustus*, taken from animals in the flesh, are as follows:

	Total Length	Head and Body	Tail Vertebræ	Hind Foot	Ear
11 ♂	426(383–470)	352(322–383)	72(55– 90)	78(73–85)	26(25–29)
10 ♀	431(400–460)	356(325–385)	75(56–100)	78(70–86)	25(24–28)

The cranial measurements—average (minimum-maximum)—of twenty-four adults of *Perodicticus potto faustus* are as follows:

	Greatest Length	Condylobasal Length	Occipitonasal Length
12 ♂	64.6(61.3–66.0)	63.5(58.7–66.2)	63.7(61.3–65.2)
12 ♀	63.2(60.0–66.7)	61.9(58.8–66.5)	62.3(58.8–66.6)

	Zygomatic Breadth	Interorb. Breadth	Postorb. Constr.
12 ♂	47.1(43.2–51.2)	11.0(10.0–12.3)	23.5(21.2–25.3)
12 ♀	46.3(42.2–50.0)	10.2(8.0–11.8)	22.1(20.0–24.6)

	Mastoid Breadth	Length Nasals	Upper Toothrow	Upper Molars
12 ♂	38.3(33.7–41.2)	16.2(14.3–19.2)	20.9(18.3–23.0)	8.7(7.8–9.5)
12 ♀	38.1(35.6–41.6)	16.2(14.0–19.0)	20.8(19.5–21.5)	8.8(7.6–9.8)

SEXUAL VARIATION.—It is evident from the above that there is no appreciable sexual difference in size in the present series of twenty-four adult specimens, in which the sexes are equally represented and all of comparable age, although the skull measurements show a slightly greater average for males.

INDIVIDUAL VARIATION IN CRANIAL CHARACTERS.—No. 52690, a senile male, has the shortest toothrow and next to the greatest zygomatic breadth of any of the males but is below the average in general size. The teeth are greatly worn, only the roots of the upper incisors, premolars and canines remaining, and the crowns of the molars are greatly worn. No. 52703, the largest of the males, is a middle-aged specimen in which the teeth are but little worn and the basal and parietal sutures are still unankylosed. Five young adult males (not included in the table of measurements), in which all the permanent teeth are present (the canines and some of the cheek-teeth not fully developed), have the greatest length of skull from 55.2 to 57.8 mm., or about 6 to 9 mm. less than in adults. In the largest female skull (No. 52692) the principal cranial sutures are all open, the teeth fully developed but unworn. The smallest female skull (No. 52700) has the cranial sutures obliterated and the teeth practically unworn. It is thus evident that the variation in cranial measurements is not due to age and is therefore individual.

The teeth vary greatly in size and details of structure in skulls of practically the same sex, age and dimensions. This is well shown in two females (Nos. 52711, 52712) collected at Niapu, November 28 and December 6, 1913. In No. 52712 the cheek-teeth are of about average size and form; in No. 52711 the upper molars are much larger than in the former, although the two skulls are of the same size and proportions, differing less than 2 mm. in any of the principal measurements. In No. 52712 the transverse axis of m^1 and m^2 forms a right angle to the axis of the toothrow. In many skulls it is directed more or less obtusely oblique to the axis of the toothrow, as in No. 52711, which is an extreme example of such divergence. The general outline of m^1 and m^2 is obtusely V-shaped in No. 52712, as it is in many other skulls of this series, but nearly as frequently the posterior corner of the inner heel is strongly developed, broadening backward and materially changing the inner outline of these teeth, especially of m^2, as in No. 52711, which is an extreme illustration of such modification. Other skulls of this series exhibit the intervening stages and show that Nos. 52711 and 52712 are merely extremes in a normal range of individual variation of the molar teeth.

AGE VARIATION.—In skulls of old individuals of both sexes the parietal ridges are a marked feature, and increase with age to the senile stage, as shown in No. 52690, a male from Medje, and in No. 52682, a female from Akenge. They begin to develop at the time the last permanent teeth appear and before the canines, p_3, and m^3 are fully developed. At no stage can the sexes be distinguished by any cranial feature, not

even by the size of the canines. The zygomatic arches increase in thickness and in convexity with age, the skulls of young adults being slenderer and narrower than those of older individuals, in correlation with the progressive ossification of the skull.

INDIVIDUAL COLOR VARIATION.—In coloration the present series presents a wide range of variation, due largely to age and the condition of the pelage, but color variation is not to any appreciable extent related to locality.

IMMATURE PELAGE.—A single specimen (No. 51023, ♂, Medje, April 23, 1914), a nursling, is in first pelage (Pl. LXXX, fig. 2). (Total length, 155 mm.; tail, 28; hind foot, 38; greatest skull length, 35; posterior teeth still enclosed in the gum.) The entire body is white, the pelage soft and woolly, the tips of the hairs on the crown tinged with pale fawn; tail, wrists and ankles faintly smoke-gray; feet mummy-brown. No other specimen shows any trace of the first coat, the next in age being young adults with all the permanent teeth functionally developed.

ADULT PELAGE.—A series of five specimens, all from Medje, may be taken as illustrative of the striking range of color variation. Three of them are young adults, not quite mature as to size, with the canines and some of the cheek-teeth not fully grown, but all the teeth functional. The other two are old adults. It may be premised that the head and nape are more or less different in color from the rest of the upperparts in a larger proportion of the specimens, taking the entire series of more than thirty skins available for direct comparison, the two areas being often strongly contrasting; in others the whole upper surface is nearly uniformly colored. Another striking feature of variation is the presence or absence of white hair-tips from the shoulders posteriorly to the end of the tail and on the outside of the limbs.

A young adult male (No. 52699, Medje, May 28, 1910) has the cheeks and whole upper surface of the head and nape vandyke-brown in general effect, darker on the crown and sides of the head, paler on the nape, with a sprinkling of minute black hair-tips. A still darker zone of considerable breadth with a profusion of longer black hair-tips separates the head area from the back, which from the shoulders to the rump is prevailingly white, due to the abundance of long white hair-tips that dominate the general effect. The pelage is long and thick, and the individual hairs are slate-gray at base with a subbasal zone of pale russet, a broad subapical zone of deep black, and a still broader apical band of pure white. The average length of the pelage on the middle of the back is about 50 to 60

mm.; the basal half (the two lower color zones) is woolly, or "under-fur." The outside of the fore and hind limbs and the tail are similar in general color effect but the pelage is here much shorter and the several color zones much narrower. The chin and throat are brownish buff, contrasting with the rest of the ventral area and inside of limbs, which are superficially grayish white with a broad basal zone of slate-gray.

No. 52705 (♂, Medje, September 29, 1910) is an almost exact duplicate of the specimen above described as regards the coloration of the upperparts, but the ventral area and inside of limbs instead of being grayish white are strongly washed with pale tawny, deepest on the throat, foreneck and chest, the gular region not in strong contrast with the rest of the underparts.

No. 52704 (♂, Medje, September 20, 1910) has a profusion of broadly white-tipped hairs on the fore-back, but much fewer on lower back, rump and limbs. The head, nape and scapular region are dull whitish gray, sprinkled with long, stiff black hairs, with an irregular wash of dark brown on the cheeks, interorbital region, behind the ears, and over the shoulders. The gular region is faintly tawny, in contrast with the dull grayish white of the rest of the underparts. The difference between this specimen and the one last described may be due in large part to wear and fading, yet they are of practically the same age (as shown by the skulls), and both are males, taken at the same locality, the worn specimen nine days earlier than the other.

Middle-aged and old adults differ from the above-described specimens in being more uniformly colored, the pelage for the most part lacking the long white hair-tips and wholly woolly in character. Usually the head and nape area differs but little in general color from the back. Thus No. 52707 (♂, Medje, June 24, 1910) is almost entirely without the long white-tipped hairs of the three specimens described above, and the head and nape region are only a little paler than the back, through the absence of the narrow subapical blackish zone which gives a slight blackish tone to the back. On the head the hairs are uniformly colored to the basal slaty zone; on the back the long, conspicuous white hair-tips present in younger animals are reduced to minute points or wholly absent, and the subapical dark zone is sufficient to give only a slightly dusky tone to the general tint of reddish brown. On the occiput are scattered long bristly tactile hairs, mostly black but with a few white ones interspersed, while many have none. The underparts are dull grayish white.

No. 52692 (♀, Medje, March 11, 1910) is similar to the preceding but the pelage is less worn and the color tones much stronger, the upper-

parts being reddish brown darkened with blackish particularly on the crown and foreback, and the whole underparts are pale buff. On the middle of the back the hairs have short, glistening white tips. The long, scattered tactile hairs on the crown are white, and project 20 to 25 mm. above the general surface of the pelage. A few usually shorter black hairs are intermixed.

Most of the older adults fall between these two phases, varying in different individuals from the pale to the richly colored type. In some the glistening minute white tips of the hairs of the back are obsolescent, in others conspicuous. In the richer colored ones the pelage usually appears less worn than in the paler examples, so that it seems fair to infer that the color differences in the middle-aged and old adults are due in part to abrasion and fading.

Apparently no very large series of these animals has been previously available for study. Elliot, in describing *Perodicticus potto edwardsi* Bouvier, comments (1913, 'Rev. Primates,' I, (1912), p. 43) on this form as "a very variable species, examples from the same locality differing in this respect [color] from each other. There are six specimens of this Potto in the British Museum from the Benito and Ja rivers in the French Congo, West Africa, differing very considerably from each other in the hue and marking of their coats. The prevailing color above is black and chestnut red, but the underparts vary from dark gray mixed with red to ashy gray, and one mounted example from the Benito River, which however may have faded somewhat, has no black at all on the upperparts which are yellowish gray about the shoulders, becoming red on lower back and thighs." He adds that "The ends of the tails in some specimens are black as described by Bouvier." It may be noted that in some specimens the tail is wholly pale brown. In most specimens in the present Congo series the hairs of the end of the tail are black for the greater part of their length and tipped with white. Abrasion of the hairs at the end of the tail might easily give a black tip.

From the present large series from the Upper Congo examples can be selected that perfectly conform to Elliot's descriptions of the color characters of *Perodicticus potto*, *P. ju-ju* and *P. edwardsi*, and also with *P. arrhenii* Lönnberg. It is not to be assumed, however, that these names do not represent geographical forms, but it cannot be admitted that they are all well founded until large series from their respective type localities have been compared. I have however synonymized *P. arrhenii* in so far as specimens from Panga, Stanleyville District, are concerned. Lönnberg[1] considers them as belonging to his *arrhenii* and

[1]1919, Rev. Zool. Africaine, VII, p. 154.

adds that this species "is distributed fairly widely in the great Congo forests."

The single specimen in the present collection from Stanleyville, an adult female, is a little below the average size of the present series as a whole, but in color characters can be perfectly matched by specimens from Medje, Akenge, and Niapu.

Perodicticus faustus Thomas was based on a young female from the Maringa River, about 300 miles west of Medje. Later the same author referred a series of nine specimens (one from Medje, eight from Poko) to the same form, without comment. As a large part of the present series was collected at Medje and the rest at neighboring localities all are here referred to *faustus*, which seems to be merely a subspecies of *P. potto*.

ARCTOCEBUS Gray

1863. *Arctocebus* GRAY, Proc. Zool. Soc. London, p. 150. Type, by monotypy, *Perodicticus calabarensis* Smith.

SPECIFIC NAMES REFERABLE TO *Arctocebus*

1860. *Perodicticus calabarensis* SMITH, Proc. Roy. Phys. Soc. Edinburgh, p. 172, figs. 1–4 (hands and head). Old Calabar, West Africa.

1902. *Arctocebus aureus* DE WINTON, Ann. Mag. Nat. Hist., (7) IX, January, p. 48. Benito River, 50 miles from mouth, French Congo. Type (and only specimen), skin and imperfect skull.

1913. *Arctocebus ruficeps* THOMAS, Ann. Mag. Nat. Hist., (8) XII, October, p. 387. Metet, near the Nyong River, South Cameroon. Type, subadult female, skin and skull.

Galaginæ

GALAGO E. Geoffroy

1796. *Galago* E. GEOFFROY, 'Mag. Encyclop.,' I, p. 49, Pl. I. Type, by tautonomy, *Lemur galago* G. Cuvier = *Galago senegalensis* E. Geoffroy.

1811. *Otolicnus* ILLIGER, 'Prodr. Syst. Mamm. et Avium,' p. 74. Type, by monotypy, "*Lemur galago* Schreber." Substitute name for *Galago* E. Geoffroy.

1811. *Macropus* G FISCHER, Mém. Soc. Imp. Nat. Moscou, I, Ed. 2, p. 12, Pl. II. Type by monotypy and original designation, "le *Galago* d'Adanson" = *Galago senegalensis* E. Geoffroy. Hence *Macropus* is a new name for *Galago* E. Geoffroy, antedated by *Macropus* Shaw (1790) for a genus of Marsupials. Plate II carries the legend "*Macropus demidovii*," mentioned on p. 11 as "*Galago demidovii*," implying an earlier description of the species (not seen by me), as follows: "*Galago Demidovii*, nova species quadrimanorum, observatis anatomicis illustrata. Vide Acta Societatis physico-medicæ mosquensis. Tom. I. p. 57–59."

1854. *Chirosciurus* GERVAIS, 'Hist. Nat. Mamm.,' I, p. 159. Type, *Galago senegalensis*.

1859. *Otolemur* COQUEREL, Rev. Mag. Zool., (2) XI, pp. 458–460, Pls. XVII, XVIII. Type, by monotypy, *Otolemur agisymbanus* Coquerel = a subspecies or synonym of *Galago crassicaudatus* E. Geoffroy.

1863. *Callotus* GRAY, Proc. Zool. Soc. London, pp. 132, 145. Type, by monotypy, *Callotus monteiri* Gray.

1863. *Otogale* GRAY, Proc. Zool. Soc. London, pp. 132, 139. Type, by subsequent designation (W. L. Sclater, 1900), *Otolicnus garnettii* Ogilby.

1863. *Euoticus* (subgenus of *Otogale*) GRAY, Proc. Zool. Soc. London, p. 140, Pl. XIX and text figure. Type, by monotypy, *Otogale pallida* Gray.

1872. *Sciurocheirus* GRAY, Proc. Zool. Soc. London, p. 857. Type, by monotypy, *Galago alleni* Waterhouse.

SPECIFIC AND SUBSPECIFIC NAMES REFERABLE TO *Galago*

1796. *Galago senegalensis* E. GEOFFROY, 'Mag. Encyclop.,' I, pp. 38–41, Pl. I (animal and dentition). "Senegal," without definite locality. Based on a specimen collected by Adanson, who gave "Galago" as the native name.

1798. *Lemur galago* G. CUVIER, 'Tabl. Élémen. Hist. Nat. Anim.,' p. 101 = *Galago senegalensis* E. Geoffroy. Also named *Lemur galago* by Shaw in 1800 ('Gen. Zool.,' I, p. 108). There is no "*Lemur galago* Schreber, Säug., pl. XXXVIII B," repeatedly cited by authors. Pl. XXXVIII B was not published till 1804 (fide Sherborn), is legended "*Galago senegalensis*," and is a copy of Geoffroy's. Wagner cites "*Lemur galago* Schreb. tab. XXXVIII B." *Lemur galago* has also been erroneously attributed to Gmelin.

1806. *Galago geoffroyi* G. FISCHER, Mém. Soc. Imp. Nat. Moscou, I, p. 25. (Not seen.) Substitute name for *Galago senegalensis* E. Geoffroy.

1812. *Galago crassicaudatus* E. GEOFFROY, Ann. Mus. Hist. Nat., Paris, XIX, p. 166. No specimen mentioned; type locality unknown. "Type in Paris Museum" (Elliot, 1913, 'Rev. Primates,' I, (1912), p. 55).

1836. *Galago moholi* A. SMITH, 'App. Rept. Exped. Explor. South Africa,' June, p. 42; 1849, 'Illustr. Zool. South Africa,' Mamm., text and Pls. VIII (animal) and VIII bis (anatomy). Limpopo River, South Africa (lat. 25° S.). Nine specimens.

1837. *Galago alleni* WATERHOUSE, Proc. Zool. Soc. London, October 3, p. 87. Fernando Po, West Africa.

1838. *Otolicnus garnettii* OGILBY, Proc. Zool. Soc. London, July, p. 6. Port Natal, Southeast Africa.

1840. *Galago acaciarum* LESSON, 'Spec. Mamm.,' p. 246. New name for *Galago senegalensis* E. Geoffroy.

1842. *Otolicnus teng* SUNDEVALL, Kungl. Sven. Vet. Ak. Handl., Stockholm, p. 201. (Not seen.)

1850. *Galago conspicillatus* I. GEOFFROY, Compt. Rend. Ac. Sci. Paris, XXXI, p. 876; 1851, 'Cat. Méth. Coll. Mamm. Mus. Paris,' p. 81. Port Natal. Type, a male.

1855. *Otolicnus galago*, *α sennariensis* WAGNER, Schreber's Säugthiere,' Suppl., V, p. 158. New name for *Otolicnus teng* Sundevall. There is no "*Galago acaciarum* var. C. *sennaariensis* Lesson" as cited by Elliot (1913, 'Rev. Primates,' I, (1912), pp. 47, 74). Lesson indicated a "var. C" but did not give it a technical name.

1855. *Otolicnus galago* var. *australis* WAGNER, Schreber's 'Säugthiere,' Suppl., V, p. 158. New name for *Galago moholi* A. Smith.

1857. *Microcebus elegantulus* LE CONTE, Proc. Ac. Nat. Sci. Philadelphia, p. 10 "Western Africa [Du Chaillu Coll.] = French Congo."

1859. *Galago murinus* MURRAY, Edinburgh New Philos. Journ., (new ser.) X, pp. 243–251, Pl. XI. Old Calabar, West Africa. Type, a specimen in spirits.

1859. *Otolemur agisymbanus* COQUEREL, Rev. Mag. Zool., (2) XI, p. 459, Pls. XVII (animal), XVIII (skull). Agisymbana Island, East Africa. Type, a skin and skull.

1860. *Otolicnus apicalis* DU CHAILLU, Proc. Boston Soc. Nat. Hist., VII, November, p. 361. French Congo, "mountains of the interior near the equator."

1863. *Callotus monteiri* (*ex* Bartlett Mss.) GRAY, Proc. Zool. Soc. London, p. 145. *Galago monteiri* Bartlett, idem, p. 231, Pl. XXVIII; P. L. Sclater, idem, 1864, p. 711. Cuio Bay, south of Loanda, Angola, West Africa.

1863. *Galago allenii* var. *gabonensis* GRAY, Proc. Zool. Soc. London, p. 146. Gaboon, West Africa. Type, a skin and skull.

1863. *Otogale pallida* GRAY, Proc. Zool. Soc. London, p. 140, Pl. XIX. Fernando Po, West Africa. Type, a skin and skull.

1864. *Otogale crassicaudata* var. *kirkii* GRAY, Proc. Zool. Soc. London, p. 456. Quilimane, Mozambique. Type, a skin and skull.

1876. *O.* [*tolicnus*] *mossambicus* PETERS, Monatsb. Ak. Wiss. Berlin, p. 473, footnote = *O. senegalensis* Peters of earlier date. Mozambique.

1876. *Otolicnus alleni cameronensis* PETERS, Monatsb. Ak. Wiss. Berlin, p. 472. Aqua Town, Cameroon.

1876. *Galago lasiotis* PETERS, Monatsb. Ak. Wiss. Berlin, p. 912. Mombasa, East Africa. Young male, last (third) molars still in alveoli.

1893. *Galago zanzibaricus* MATSCHIE, Sitzungsb. Ges. Naturf. Fr. Berlin, p. 111. Mojoni, Zanzibar. Three specimens.

1901. *Galago gallarum* THOMAS, Ann. Mag. Nat. Hist., (7) VIII, July, p. 27. Webi Dau, Boran Galla Country. Type, a skin and skull; also a paratype from Lake Stephanie, altitude 3000 feet.

1905. *Otolemur panganiensis* MATSCHIE, Sitzungsb. Ges. Naturf. Fr. Berlin, December, p. 278. Aruscha, near Mount Kilimanjaro. Type, a female.

1905. *Otolemur badius* MATSCHIE, Sitzungsb. Ges. Naturf. Fr. Berlin, December, p. 277. Ugalla River, German East Africa. Type, a skin and skull; sex not indicated.

1907. *Galago granti* THOMAS AND WROUGHTON, Proc. Zool. Soc. London, August, p. 286. Coguno, Inhambane, South Africa. Type, an adult male, skin and skull.

1907. *Galago zuluensis* ELLIOT, Ann. Mag. Nat. Hist., (7) XX, September, p. 186. Zululand, Southeast Africa. No definite locality. Type, a skin and skull (sex not given); no other specimen mentioned.

1907. *Galago hindei* [sic] ELLIOT, Ann. Mag. Nat. Hist., (7) XX, September, p. 186. = *Galago hindsi* Elliot (1913, 'Rev. Primates,' I, (1912), p. 62). Kitui, Athi River, British East Africa. Altitude 3500 feet. Type, a skin and skull (sex not stated), and a paratype.

1907. *Galago braccatus* ELLIOT, Ann. Mag. Nat. Hist., (7) XX, September, p. 187. Mount Kilimanjaro, East Africa. Type (and only specimen mentioned), a skin and skull, sex not stated.

1907. *Galago gabonensis batesi* ELLIOT, Ann. Mag. Nat. Hist., (7) XX, September, p. 187. Como River, Gaboon, West Africa. Type (and only specimen mentioned), a skin and skull (sex not indicated).

1907. *Galago nyasæ* ELLIOT, Ann. Mag. Nat. Hist., (7) XX, September, p. 188. Mountains south of Lake Nyasa, East Africa. Type, a skin and skull (sex not indicated); another specimen in alcohol from Zomba, Nyasaland.

1909. *Galago braccatus albipes* DOLLMAN, Ann. Mag. Nat. Hist., (8) IV, December, p. 549. Kirui, Elgon, British East Africa. Altitude 6000 feet. Type, an adult male, skin and skull.

1910. *Galago elegantulus tonsor* DOLLMAN, Ann. Mag. Nat. Hist., (8) V, January, p. 94. Fifteen miles from mouth of Benito River, Spanish Guinea, West Africa. Type, an adult female, skin and skull. Also one topotype and two specimens from Efulen, Cameroon.

1910. *Galago dunni* DOLLMAN, Ann. Mag. Nat. Hist., (8) V, January, p. 92. Fafan, 35 miles east of Harrar, Somaliland. Type, an old male, skin and skull.

1910. *Galago talboti* DOLLMAN, Ann. Mag. Nat. Hist., (8) V, January, p. 93. Nkami, Southern Nigeria. Type, an adult male, skin and skull.

1910. *Galago pupulus* ELLIOT, Ann. Mag. Nat. Hist., (8) V, January, p. 77. Yola, Nigeria. Type (and only specimen), an adult male, skin and skull.

1912. *Galago moholi cocos* HELLER, Smithsonian Misc. Coll., LX, No. 12, November, p. 1. Mazeras, British East Africa. Type, an adult male, skin and skull, and five topotypes.

1912. *Galago (Otolemur) kikuyuensis* LÖNNBERG, Ann. Mag. Nat. Hist., (8) IX, January, p. 64. Escarpment Station, British East Africa.

1913. *Galago argentatus* LÖNNBERG, Ann. Mag. Nat. Hist., (8) XI, p. 167. Ukina, near Schirati, east of Victoria Nyanza. Type, an old male, skin and skull.

1917. *Galago crassicaudatus umbrosus* THOMAS, Ann. Mag. Nat. Hist., (8) XX, July, p. 49. Tzaneen Estate, Zoutpansburg District, northern Transvaal. Type, an old female, skin and skull.

1920. *Galago sotikæ* HOLLISTER, Smithsonian Misc. Coll., LXXII, No. 2, January 22, p. 1. Telek River, Sotik, British East Africa. Type, an adult male, skin and skull. Also two topotypes.

GALAGOIDES A. Smith

1833. *Galagoides* A. SMITH, South African Quart. Journ., (2) II, December, p. 32. Type, by subsequent designation (Elliot, 1913, 'Rev. Primates,' I, (1912), p. xxix), *Galago demidoffii* G. Fischer. *Galagoides* contained two species, (1) *Galago senegalensis* E. Geoffroy (type of *Galago*) and (2) *Galago demidoffii* G. Fischer.

1857. *Hemigalago* DAHLBOM, Zool. Studier, I, Tredje Heft, pp. 224, 230, Pl. x. Type, by monotypy, *Galago demidoffii* G. Fischer.

SPECIFIC AND SUBSPECIFIC NAMES REFERABLE TO *Galagoides*

1798. *Lemur minutus* G. CUVIER, 'Tabl. Élémen. Hist. Nat. Anim.,' p. 101. Senegal. Unidentifiable. The entire description consists of six words: "Gris de souris, a petites oreilles." The context implies that Senegal is the habitat. Some authors have synonymized the species with *Galago demidoffii* G. Fischer, described eight years later.

1806. *Galago demidoffii* G. FISCHER, "Mém. Soc. Imp. Nat. Moscou, I, p. 24, fig. animal." (Not seen.) "Senegal," without definite locality. In the second edition of this volume of the Mémoirs (1811, p. 11 and on the plate) the specific name is spelled *demidovii*. (See above under the generic name *Macropus*.)

1806. *Galago cuvieri* G. FISCHER, "Mém. Soc. Imp. Nat. Moscou, I, 1806, p. 23." (Not seen.) New name for *Lemur minutus* G. Cuvier. Recognized by Fitzinger (1870) as a distinct species allied to *Galago demidoffii* G. Fischer.

1840. *Mioxicebus rufus* LESSON, 'Spec. Mamm.,' p. 219. The "habitat" is erroneously given as "L'île de Madagascar." New name for *Galago demidoffii* G. Fischer.

1853. *Octolicnus* [sic] *peli* TEMMINCK, 'Esquiss. Zool.,' p. 42. Dabocrom, coast of Guinea. Three specimens, adult male, adult female, semi-adult female.

1876. *Otolicnus pusillus* PETERS, Monatsb. Ak. Wiss. Berlin, p. 473. Dongila, Gaboon. Based on two specimens.

1893. *Galago* (*Hemigalago*) *anomurus* POUSARGUES, Bull. Soc. Zool. France, XVIII, p. 51; Nouv. Arch. Mus. Hist. Nat., Paris, (3) VI, pp. 157–167, Pl. II (animal). Upper Kemo River, right affluent of the Ubangi, French Congo. Type, adult male, skin and skull; also a female paratype.

1904. *Galago demidoffi poensis* THOMAS, Abstr. Proc. Zool. Soc. London, No. 10, November 22, p. 12; idem, II, April, p. 186. Bantabiri (altitude 1800 m.), Fernando Po, West Africa. Type, an adult male, skin and skull, and three topotypes.

1907. *Galago* (*Hemigalago*) *thomasi* ELLIOT, Ann. Mag. Nat. Hist., (7) XX, September, p. 189. Fort Beni, Semliki River, on the boundary line of Uganda and Belgian Congo. Type, a skin and skull (sex not stated). A second specimen from Dumo, Uganda.

1915. *Hemigalago demidoffi medius* THOMAS, Ann. Mag. Nat. Hist., (8) XVI, December, p. 466. Poko, Belgian Congo. Type, a male, skin and skull; also 9 paratypes from Poko and 2 paratypes from Medje, Belgian Congo.

1917. *Galago matschiei* LORENZ, Ann. Naturhist. Hofmus., Wien, XXXI, p. 237. Moëra, Ituri Forest. Three adult males, skins and skulls.

Galagoides[1] **demidoffii medius** (Thomas)

Plate LXXXI

Galago demidoffi THOMAS, 1888, Proc. Zool. Soc. London, p. 5. Monbuttu (2 specimens).

Hemigalago demidoffi ELLIOT, 1913, 'Rev. Primates,' I, (1912), p. 82 (part; Monbuttu).

Hemigalago demidoffi medius THOMAS, 1915, Ann. Mag. Nat. Hist., (8) XVI, December, p. 466. Type, a male, skin and skull, from Poko; also 9 paratypes from Poko and 2 paratypes from Medje, Belgian Congo.

Hemigalago demidoffi medius LÖNNBERG, 1917, Kungl. Sven. Vet. Ak. Handl., Stockholm, LVIII, No. 2, September 1, p. 47. Masisi, west of Lake Kivu (1 specimen).

Represented by 29 specimens (26 skins and skulls and 4 in alcohol), of which 23 are adult and 6 immature, collected as follows:

Niangara, 7 (2 young ♂, 5 adult ♀), November 10–December 19, 1910.

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[1]For the use of *Galagoides* in place of *Hemigalago* see above, p. 292.

Akenge, 1 (adult ♂), October 31, 1913.

Niapu, 1 (young ♂), December 7, 1913.

Medje, 16 (9 adult and 4 young ♂, 3 adult ♀), January 23–25, August 3, October 11, 1910; March 24, June 1, July 8, 1914.

Avakubi, 2 (adult ♂ and ♀), October 15, 1909; October 12, 1913.

Stanleyville, 2 (1 adult ♀, skin and skull, and 1 in alcohol), August 25, 1909; December 16, 1914.

The external measurements—average (minimum-maximum)—of nineteen adults of *Galagoides demidoffii medius*, taken from animals in the flesh, are as follows:

	Total Length	Head and Body	Tail Vertebræ	Hind Foot	Ear
11 ♂	297(264–349)	122(106–138)	176(156–211)	47(40–54)	25(22–28)
8 ♀	325(272–354)	138(113–161)	186(157–200)	50(45–53)	27(24–29)

The cranial measurements—average (minimum-maximum)—of nineteen adults of *Galagoides demidoffii medius* are as follows:

	Greatest Length	Condylobasal Length	Occipitonasal Length
11 ♂	36.3(33.0–39.0)	31.4(29.6–34.0)	35.7(33.8–37.7)
8 ♀	38.0(34.9–39.5)	34.0(29.8–38.6)	37.7(34.0–39.1)

	Zygomatic Breadth	Interorb. Breadth	Postorb. Constr.
11 ♂	22.1(20.8–23.5)	4.1(3.8–4.4)	14.6(13.0–15.7)
8 ♀	23.1(21.0–24.0)	4.3(3.6–5.0)	15.3(14.1–15.9)

	Mastoid Breadth	Breadth at m^3	Upper Toothrow	Upper Molars
11 ♂	19.0(17.8–20.4)	10.8(10.0–12.3)	11.7(11.0–12.4)	5.1(4.8–5.5)
8 ♀	19.8(18.3–20.6)	11.7(10.8–12.5)	12.5(10.8–13.5)	5.5(4.7–5.8)

Sexual Variation.—These measurements indicate no distinctive difference in size between males and females in a series of nineteen fully adult individuals. The permanent dentition is mature in all, and the basal sutures are closed in all but two of the males and three of the females. In these five skulls the braincase sutures are still entirely open, the fronto-parietal and occipital sutures remaining unclosed even after the basi-occipital suture has become obliterated by ankylosis. Even when the permanent teeth are fully developed the parietal bones become detached by slight maceration in cleaning the skull. The temporal ridges are weak and only slightly indicated even in old adults.

Individual Variation in Cranial Characters.—The cranial measurements demonstrate a considerable amount of individual variation in size, in relative proportion of parts, in length of the toothrow and the size of the teeth. In general it may be said that the variation in size in the present series covers the whole range in size variation shown in the published measurements of the hitherto recognized forms of the *demi-*

doffii group, except *thomasi* of Elliot, based on two Uganda specimens, which slightly exceed the maximum of the present series, the greatest skull-length in *thomasi* being recorded as 40–41 mm. as against a maximum of 39–39.5 in the present Congo series.

IMMATURE PELAGE.—Two specimens are in first pelage and a third is in transition to adult pelage. The youngest (No. 51369, ♂, Medje, March 24, 1914) has a total length of 142 mm.; tail length, 72; hind foot, 25; greatest skull length, 24. The cusps of the deciduous teeth are visible in the cleaned skull (probably not through the gum in life). The ventral area and inside of limbs are naked. The dorsal surface and tail are covered with fine soft hair, dark brown with blackish tips; upper surface of limbs nearly naked and dark brown; ears blackish. A broad hair-whorl at middle of shoulders, the hair immediately in front of which is directed forward. An older specimen (No. 50970, ♂, Medje, March 24, 1914) has the first pelage well developed, clothing the whole body and limbs (Pl. LXXXI, fig. 4). Total length, 175; tail, 96; hind foot, 32; greatest length of skull, 53. Milk teeth well above the gum. Postpectoral area and inside of limbs pale yellowish; throat, fore neck and chest grayish white, in contrast with the rest of the lower surface. Upper surface and tail dull brown, with conspicuously longer and darker hair-tips; interorbital space and outside of limbs dark grayish brown. The hair-whorl at shoulders less conspicuous than in the younger specimen, but nape-hairs distinctly directed forward. A third specimen (No. 50969, ♂, Medje, June 1, 1914) is much older, and has practically acquired the texture and coloration of the darker colored adults. Total length, 188; tail, 117; hind foot, 36; greatest length of skull, 53. Teeth about as in No. 50970. The pelage is everywhere full and soft, the coloration nearly as in the more rufous colored adults.

COLOR VARIATION IN ADULTS.—Adults present a considerable range of variation in color (wholly independent of sex), from dull grayish drab (darker along midline of back) on upperparts and a dark grayish black tail, to a dull rufous brown, frequently (not always) including the tail. The underparts are pale yellowish (about cream color) in the drab phase, a little more intense medially, to buff in the rufous-brown phase. The tail varies in this latter phase from a rufous tone uniform with the back to blackish. These variations are independent of locality and are connected by intermediates of every grade. Young adults tend to brighter tones than those shown by old adults.

Nearly all of the specimens were obtained within twenty to one hundred miles of the type locality of Thomas' *Hemigalago demidoffi*

medius, and more than half of the series from Medje, a locality from which two paratypes were recorded. There is hence little chance of error in referring all of the present series of specimens to *medius*. The two Stanleyville specimens are indistinguishable from the others as regards essential characters.

SUBORDER ANTHROPOIDEA

LASIOPYGIDÆ

Lasiopyginæ

GENERIC NOMENCLATURE OF AFRICAN BABOONS

Eleven names have been proposed for generic or subgeneric groups of African baboons, of which four were invalid by preoccupation when proposed (*Cynocephalus* Cuvier and Geoffroy, 1795; *Mormon* Wagner, 1839; *Hamadryas* Lesson 1840; *Maimon* Trouessart, 1904). Four are synonyms of earlier names (*Mandril* Voigt, 1831; *Chæropithecus* "Blainville" [=Gervais and Sénéchal], 1839; *Gelada* Gray, 1843; *Drill* Reichenbach, 1862). The three valid names are (1) *Papio* Erxleben, 1777,[1] (2) *Mandrillus* Ritgen, 1824, (3) *Theropithecus* I. Geoffroy, 1843.

Most of these names have been used, with varying restrictions and meanings by different authors, as subgenera of either *Papio*, *Cynocephalus*, or *Chæropithecus*. The *gelada* group is now currently recognized as a genus (*Theropithecus*), and all other baboons are referred to *Papio*,

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[1] *Papio* "Brisson" (Haak) and *Papio* Erxleben

Papio "Brisson" [=Haak], 1762, 'Regn. Anim.,' Quadrup., Stirps III, p. 136. Type, by monotypy, *Papio papio*, Le Babouin.

In this, the first reference is: "Linn. Syst. Nat. Ed. 6. g. 2. sp. 5." Other citations include: "Raj. Syn. Quadr. p. 158," and the three additional authors cited by Linnæus in the sixth and tenth editions of his 'Syst. Nat.' under *Simia sphinx* and also his diagnosis of *Simia sphinx*.

The citations include all monkeys with a short tail ("Eæ quæ caudam habent brevissimam"), in contrast, on the one hand, with the tailless species ("Simia" and "Simia cynocephala") and, on the other hand, those having a long tail ("Eæ quæ caudam habent longam, & rostrum breve. Cercopithecus"). His diagnosis indicates a short-tailed baboon, with "Habitat in Indiæ solitudinibus," which, as indicated by his citations, evidently includes Africa as well as tropical Asia. (The copy of Brisson—octavo edition, 1762—here used was formerly Boddaert's; it is annotated with additional references, including Linnæus' tenth edition of the 'Syst. Nat.' In Boddaert's handwriting under *Papio* is added: "Linn. Syst. Nat. ed. 10, g. 2, sp. 3. Sphinx").

From the above it would appear that Brisson's *Papio papio* is not only composite, but if restricted in accordance with modern usage should be synonymized with *Simia sphinx* Linnæus, now commonly accepted as the mandrill. If the genus *Papio* Brisson were transferred to the mandrill, it would preoccupy *Papio* Erxleben and produce great confusion in the nomenclature of the baboons. It seems best therefore to regard *Papio* Brisson as nomenclaturally non-existent, and to accept *Papio* Erxleben, with *Papio sphinx* Erxleben (not *Simia sphinx* Linnæus = *Cynocephalus papio* Desmarest) as genotype, as currently accepted. Furthermore, Brisson appears to have also described the mandrill under his "Stirps V" (p. 152, 1762 Ed.) as species " 3, *Cercopithecus Cynocephalus* naso violaceo. . . . Le Magot, ou Tartarin." This should preclude the use of *Papio* Brisson for the mandrill.

Erxleben cites under *Papio sphinx* all the references given by Brisson and many others, including the sixth, tenth, and twelfth editions of Linnæus' 'Syst. Nat.,' and the references to *Simia sphinx* of the tenth and twelfth editions.

All relate to the baboon, among them being "Le Papion ou Babouin proprement dit Buff. hist. nat. XIV, p. 133," and also "Grand Papion" and "Petit Papion," "Buff. hist. nat. XIV tab. 13, tab. 14 fig. bon." His species 2, *Papio maimon*, is the *Simia maimon* Linnæus, 1766. This is of course on the basis of Elliot's determination (1909, Ann. Mag. Nat. Hist., (8) IV, November, p. 417) of *Simia sphinx* Linnæus, approved later by Thomas (1911, Proc. Zool. Soc. London, p. 126), and of some earlier authors.

usually with four subgenera (Trouessart, 1897–1904, Elliot, 1913), for three of which invalid names are employed. The mandrills, however, are separable from *Papio* (*s.s.*) as a genus, and apparently the hamadryads or tartarins should also be recognized as a group of generic rank.

D. G. Elliot recognized in his 'Review of the Primates,' 1913 (1912), II, pp. 115–154, four subgenera of the genus *Papio*, placed in the following sequence: (1) *Chæropithecus*, with nine species; (2) *Papio*, with four species; (3) *Hamadryas*, with two species and an additional subspecies; (4) *Mormon*, with three species. He correctly gave *Papio sphinx* Erxleben (not Linnæus = *Cynocephalus papio* Desmarest) as the type of the genus *Papio*, but by a strange lapsus[1] placed this species in the subgenus *Chæropithecus*. He gave no genotype for any of his four subgenera, a practice followed throughout his great work on the Primates, as well as elsewhere, not recognizing this (as he informed me orally in 1914) as necessary, or that they should have the same validity as genera.

Chæropithecus "Blainville" (= Gervais and Sénéchal) was founded especially for "les Cynocéphales," and is thus equivalent to the earlier, preoccupied *Cynocephalus* Cuvier and Geoffroy (1795), a synonym of *Papio* (*s.s.*). Elliot, however, made *Simia cynocephalus* Linnæus the first species under his subgenus *Papio*, as did Trouessart (1904) before him. As the names adopted by Elliot for his other subgenera (*Hamadryas* and *Mormon*) are invalid by preoccupation, it thus happens that all of Elliot's designations for his subgenera of *Papio* are untenable. Trouessart ('Cat. Mamm.,' 1897 and 1904) had made about the same division of *Papio* into four subgenera.

Papio Erxleben

1777. *Papio* Erxleben, 'Syst. Reg. Anim.,' p. 15. Type, by subsequent designation (Palmer, 1904), *Papio sphinx* Erxleben (not Linnæus = *Cynocephalus papio* Desmarest 1820).

1795. *Cynocephalus* Cuvier and Geoffroy, 'Mag. Encyclop.,' III, p. 462. Type, by tautonomy, *Simia cynocephalus* Linnæus. Preoccupied by *Cynocephalus* Boddaert (1768) for a genus of insectivores, and by *Cynocephalus* Walbaum (1792) for a genus of fishes.

1839. *Chæropithecus* (subgenus of *Simia*) Gervais (*ex* Blainville, orally), 'Dict. Pittoresque Hist. Nat.,' VIII, p. 90, "Les Cynocéphales." Type, *Simia cynocephalus* Linnæus. Also Sénéchal, idem, p. 428, in the same sense. Apparently nowhere

[1][It evidently escaped Dr. Allen's notice that this error was corrected by Elliot in his introduction (1913, 'Rev. Primates,' I, (1912), pp. lv and lvi). Thus *Chæropithecus* (*loc. cit.*, II, p. 125) is replaced by *Papio* and *Papio* (*loc. cit.*, II, p. 137) is replaced by *Cynocephalus; Chæropithecus* being entirely eliminated as a subgenus. Elliot's subgenera thus have the following sequence: (1) *Papio*, (2) *Cynocephalus*, (3) *Hamadryas*, (4) *Mormon*, the number of species and subspecies remaining numerically the same as given by Dr. Allen above.—H. L.]

adopted by Blainville in any of his publications. As stated by Palmer (1904, 'Index Gen. Mamm.,' p. 186, footnote): "Blainville, Ostéog., I, Primates, 30, 31, 1839, merely refers to *Choiropithecus* as used by classical writers, without adopting the name." Gervais states (*loc. cit.*) that Blainville had employed for a long time "le mot latin *pithecus*" to indicate "toutes les espèces du genre *Simia* de Linné qui vivent dans l'Ancien-Monde, et il le fait entrer comme racine dans la composition de tous les noms de sous-genre que renferme cette partie de l'ordre des Primates. C'est ainsi que les Guenons s'appellent comme dans la méthode d'Erxleben *Cercopithecus;* les espèces à corps grêle, *Semnopithecus;* les Macaques, comprenant le Magot, *Cynopithecus;* les Cynocéphales, *Chæropithecus*, etc." Blainville in a note entitled 'Distribution géographique des quadrumanes' (1839, Echo du Monde Savant, V, January, pp. 19, 20) used (*loc. cit.*, p. 20) the following group names in the plural form: *Brachio-pitheci* for the "orang-outangs et gibbons"; *Cynopitheci* for the "macaques"; *Chæropitheci* for the "cynocéphales ou singes à narines terminales," including *Macacus gelada* Rüppell. *Chæropithecus* Blainville is thus a synonym of *Papio* Erxleben , as well as of *Cynocephalus* Cuvier and Geoffroy, invalid by preoccupation.

1862. *Choiropithecus* (subgenus of *Cynocephalus*) Reichenbach, 'Vollständ. Naturg. Affen,' p. 151. Type, by monotypy, *Simia porcaria* Boddaert. Emendation of *Chæropithecus* Gervais and Sénéchal.

1913. *Chæropithecus* (subgenus of *Papio*) Elliot, 'Rev. Primates,' II, (1912), p. 125. No type designated. Includes nine species, one of which (*Papio papio*) is the species he gives as the type of the genus *Papio*.

1913. *Papio* (subgenus of *Papio*) Elliot, 'Rev. Primates,' II, (1912), p. 137. No type designated. Includes four species, but not the genotype of *Papio!*

Specific and Subspecific Names Referable to *Papio*

1766. *Simia cynocephalus* Linnæus, 'Syst. Nat.,' I, p. 38. Diagnosis: "S. caudata imberbis flavescens, ore producto, cauda recta natibus calvis." Habitat in Africa. Simillima S. Inuo, sed caudata." The citations are: "Briss. quadr. 213. Jonst. quadr. t. 59. f. ultima. Alp. ægypt. t. 16." = *Cynocephalus babouin* Desmarest (1820), or the "Yellow Baboon" of later authors, as based on Brisson and Buffon. It is also the *Papio sphinx* of E. Geoffroy (1812), and the *Cynocephalus sphinx* of many other later authors.

1777. *Papio sphinx* Erxleben (not of Linnæus), 'Syst. Reg. Anim.,' p. 15. "Habitat in calidissimis Africæ Indiaque." = *Cynocephalus babouin* Desmarest (1820).

1787. *Simia porcaria* Boddaert, Naturforscher, XXII, pp. 17–22, Pl. 1, figs. 1, 2. "Habitat in Africa."

1792. *Papio variegata* Kerr, 'Anim. Kingd.,' p. 62, No. 18. = Yellow Baboon of Pennant, 'Hist. Quad.,' No. 80.

1800. *Simia sylvicola* Shaw, 'Gen. Zool.,' I, Mamm., p. 22. = "Wood Baboon. Pennant Quadr., p. 191, pl. 42." No locality.

1800. *Simia sublutea* Shaw, 'Gen. Zool.,' I, Mamm., p. 23. = "Yellow Baboon. Pennant Quadr. p. 191."

1804. *Simia sphingiola* Hermann, 'Obs. Zool.,' I, p. 2. = *Simia porcaria* Boddaert.

1812. *Papio comatus* E. Geoffroy, Ann. Mus. Hist. Nat. Paris, XIX, p 103. "Habite le cap de Bonne-Espérance." Cites "*Simia sphingiola* Schreber, fig. 6 *B.*" = *Simia porcaria* Boddaert.

1820. *Cynocephalus papio* DESMAREST, 'Mamm.,' I, p. 69. Based on the "Papion, Buff. tom. 14. pl. 13" and Le Papion, F. Cuvier and Geoffroy Saint-Hilaire, 1819, 'Hist. Nat. Mamm.,' I, livr. VI-VII, 2 color Pls. (♂ and ♀). "Patrie. La côte de Guinée."

1820. *Cynocephalus babouin* DESMAREST, 'Mamm.,' I, p. 68. = Le Babouin F. Cuvier and Geoffroy Saint-Hilaire, 1818, 'Hist. Nat. Mamm.,' I, livr. IV. Without locality.

1829. *Simia anubis* FISCHER, 'Synop. Mamm.,' p. 33. = "Le Cynocéphale Anubis," F. Cuvier and Geoffroy Saint-Hilaire, 1825, 'Hist. Nat. Mamm.,' III, livr. L, and color Pl. (animal), June. "Africa" = ?Meroë Island, Upper Nile (cf. Anderson, 1902, 'Zool. Egypt,' Mamm., pp. 34–53, Pl. IV (animal), Pl. VI (skull).

1839. *Cynocephalus ursinus* WAGNER, Schreber's 'Säugthiere,' Suppl. I, (1840), p. 162, Pl. VIII *B*; idem, 1855, V, p. 65. Specimen from Cape Colony, South Africa, described. Cites *Simia porcaria* Boddaert and *S. comatus* E. Geoffroy as synonyms. Also Schreber, Pl. VIII *B*, a copy of Boddaert's. = *Simia porcaria* Boddaert renamed.

1843. *Cynocephalus choras* OGILBY, Proc. Zool. Soc. London, p. 12 (in text). "The individual which I am now about to describe was brought from the Niger Expedition, and presented to the Society by Lieutenant Webb, R.N. It is a semiadult male."

1843. *Cynocephalus thoth* OGILBY, Proc. Zool. Soc. London, p. 11. Described from a living animal "in the Society's Gardens," from an unknown locality.

1848. *Cynocephalus olivaceus* I. GEOFFROY, Ann. Mus. Hist. Nat. Paris, p. 543; 1851, 'Cat. Méth. Coll. Mamm. Mus. Paris,' p. 34. Based on an immature male from Gulf of Benin, Guinea, living in the Paris Menagerie.

1853. *Papio rubescens* TEMMINCK, 'Esquiss. Zool.,' p. 39. Based on an immature specimen. "Patrie. Habite l'Afrique occidentale mais on ignore quelle partie de cette grande étendue des côtes."

1856. *Cynocephalus doguera* PUCHERAN, Rev. Mag. Zool., Paris, (2) VIII, p. 96; idem, 1857, (2) IX, pp. 250–252. Preliminary diagnosis of eight words (*loc. cit.*, 1856). A fuller description in 1857 (*loc. cit.*). Type, a male from Abyssinia, without definite locality. "Le Doguera habite, en troupes nombreuses, de mille à deux mille individus, les hautes montagnes du Sémen, séjournant, ainsi, à une élévation de 8 à 10,000 pieds au-dessus du niveau de la mer. . . Le Cynocéphale Doguera est, en Abyssinie, l'homologue du Chacma." Skull figured by Anderson, 1902, 'Zool. Egypt,' Mamm., Pl. VII (nat. size).

1892. *Cynocephalus langheldi* MATSCHIE, Sitzungsb. Ges. Naturf. Fr. Berlin, December, p. 233. Type a young female from eastern slope of the Unguru Mountains, German East Africa.

1893. *Papio thoth ibeanus* THOMAS, Ann. Mag. Nat. Hist., (6) XI, January, p. 47. Type, an adult male, skin and skull from Lamu, British East Africa.

1896. *Papio pruinosus* THOMAS, Proc. Zool. Soc. London, pp. 789–790, Pl. XXXVIII (animal). Type, an adolescent male from Lesumbwe, Monkey Bay, south end of Lake Nyasa. "Distinguished at the first glance from every other species [of baboon] by its hoary colour, white belly; and unannulated fur." Skull figured by Anderson, 1902, 'Zool. Egypt,' Mamm., Pl. XIV (nat. size).

1897. *Papio neumanni* MATSCHIE, Sitzungsb. Ges. Naturf. Fr. Berlin, p. 161. Type, skin and skull of a young male, from Donyo Ngai; also a skull of an old male from "Kilonito," Natron Lake, German East Africa. "Type" skull figured by Anderson, 1902, 'Zool. Egypt,' Mamm., Pl. VIII (nat. size).

1898. *Papio heuglini* MATSCHIE, Sitzungsb. Ges. Naturf. Fr. Berlin, July, pp. 80–81. An old male and a young female and another young specimen from "Bahr el Abiad, Bahr el Azrek und Atbara," Sudan. Type skull (Shilluk Island) figured by Anderson, 1902, 'Zool. Egypt,' Mamm., Pl. v (nat. size).

1900. *Papio yokoensis* MATSCHIE, Sitzungsb. Ges. Naturf. Fr. Berlin, p. 89. Type an adult male skin and skull from "Yoko am Sanaga, Hinterlande von Kamerun."

1902. *Papio lydekkeri* ROTHSCHILD, Novit. Zool., Tring, IX, p. 140. Briefly indicated. Type an adult female from "Upper Nile." = *Papio heuglini* Matschie (1898).

1902. *Papio anubis* subsp. *olivaceus* DE WINTON, in Anderson, 'Zool. Egypt,' Mamm., p. 53, part. Not *Cynocephalus olivaceus* I. Geoffroy = *Papio papio.*

1907. *Papio strepitus* ELLIOT, Ann. Mag. Nat. Hist., (7) XX, September, p. 194. Two specimens. Type an adult skin and skull from Fort Johnston, south end of Lake Nyasa. "The species bears no resemblance whatever to *P. pruinosus* Thomas, also procured at Fort Johnston, either in colour or in the character of the skull" (Elliot, *loc. cit.*, p. 195).

1907. *Papio furax* ELLIOT, Ann. Mag. Nat. Hist., (7) XX, December, p. 499. Two specimens. Type an adult male skin and skull from Baringo, northwest of Mt. Kenia, British East Africa. Allied to *P. doguera* of Abyssinia.

1909. *Papio tessellatum* ELLIOT, Ann. Mag. Nat. Hist., (8) IV, September, p. 247. Two specimens. Type an adult male skin and skull from Mulema, Ankole, Uganda.

1909. *Papio nigeriæ* ELLIOT, Ann. Mag. Nat. Hist., (8) IV, September, p. 247. Two specimens. Type an adult skin and skull from Ibi, northwestern Nigeria.

1911. *Papio porcarius griseipes* POCOCK, Proc. Zool. Soc. London, Abstr. No. 93, March 28, p. 17; idem, September, p. 558. Potchefstroom, Transvaal, South Africa.

1913. *Papio anubis lestes* HELLER, Smithsonian Misc. Coll., LXI, No. 19, November, p. 10. Three old males from Ulukenia Hills, Athi Plains, British East Africa.

1913. *Papio anubis vigilis* HELLER, Smithsonian Misc. Coll., LXI, No. 19, November, p. 11. Two old males. "Type from the Lakiundu River near its junction with the Northern Guaso Nyiro, British East Africa."

1915. *Papio silvestris* LORENZ, Anz. Ak. Wiss. Wien, Math.-Nat. Kl., LII, June, p. 173. Type a young male from Mawambi, Ituri Forest, Belgian Congo.

1916. *Papio werneri* WETTSTEIN, Anz. Ak. Wiss. Wien, Math.-Nat. Kl., LIII, p. 190. Gebel Talodi, near Talodi, Nuba Mts., southern Kordofan. Type, an adult female.

1917. *Papio graueri* LORENZ, Ann. Naturhist. Hofmus., Wien, XXXI, p. 236. Adult female from Rutshuru, south of Lake Albert Edward, Belgian Congo.

1918. *Choiropithecus rhodesiæ* HAAGNER, South Afr. Journ. Nat. Hist., I, May, p. 83. Central Rhodesia. Type, five year old specimen living in the National Zoölogical Gardens at Pretoria.

1919. *Papio kindæ* LÖNNBERG, Rev. Zool. Africaine, VII, October 1, p. 147. "Three adult females and several half-grown and young specimens from Kinda, district de la Lulua," Belgian Congo.

Mandrillus Ritgen

1824. *Mandrillus*[1] Ritgen, 'Nat. Eintheilung Säug.,' p. 33, and tabular insert = Les Mandrills = *Simia maimon* 1766 = *Simia sphinx* Linnæus 1758; *Simia mormon* Alströmer 1766 = *Simia maimon* Linnæus 1766. *Mandrillus* is here credited to Cuvier, who used only the French vernacular equivalent "Les Mandrills." The technical form *Mandrillus* is therefore Ritgen's.

1758. *Simia* Linnæus, 'Syst. Nat.,' 10th Ed., p. 25, part; also in part of many later authors.

Papio, part, of most recent authors.

1831. *Mandril* (subgenus of *Simia*) Voigt, Cuvier's 'Thierreich,' I, p. 88. Includes two species: (1) *S.*[*imia*] (*M.*)[*andril*] *mormon* Linnæus, (2) *S.* (*M.*)*leucophæa* F. Cuvier. Thomas,[2] 1911, Proc. Zool. Soc. London, p. 126 = *Mandrillus* Ritgen, 1824.

1839. *Mormon* (subgenus of *Cynocephalus*) Wagner, (1840), Schreber's 'Säugthiere,' Suppl., I, p. 164. Type, by tautonomy, *Simia mormon* Alströmer = *Simia sphinx* Linnæus, 1758. Preoccupied by *Mormon* Illiger, 1811, for a genus of birds.

1840. *Mormon* (subgenus of *Papio*) Lesson, 'Spec. Mamm.,' pp. 49, 111. For the mandrills = *Mormon* Wagner, 1839, but evidently independently proposed.

1843. "*Sphinx* Lesson" Gray, in synonymy but not adopted by Gray. (Cf. Palmer, 1904, 'Index Gen. Mamm.,' p. 641, where the case is correctly stated.)

1862. *Drill* (subgenus of *Mormon*) Reichenbach, 'Vollständ. Naturg. Affen,' p. 162. = *Mandrillus* Ritgen, 1824. Type, by monotypy, *Simia leucophæa* F. Cuvier.

1904. *Maimon* (subgenus of *Papio*) Trouessart, 'Cat. Mamm. Viv. Foss.,' Suppl., p. 21. Type, by tautonomy, *Simia maimon* Linnæus. New name to replace *Mormon* Lesson, 1840. Not *Maimon* Wagner, 1839, for a wholly different group.

1913. *Mormon* (subgenus of *Papio*) Elliot, 'Rev. Primates,' II, (1912), p. 149. Includes *Simia sphinx* Linnæus, *Simia leucophæa* F. Cuvier, and *Papio planirostris* Elliot.

Specific and Subspecific Names Referable to *Mandrillus*

1758. *Simia sphinx* Linnæus, 'Syst. Nat.,' I, p. 25. "Borneo" = West Africa. Based primarily on Gesner. (Cf. Elliot, 1909, Ann. Mag. Nat. Hist., (8) IV, November, p. 417; Thomas, 1911, Proc. Zool. Soc. London, p. 126.) F. Cuvier, however, in 1818, made the same determination, subsequently accepted by other systematists (Desmarest, 1820, Fischer, 1829, etc.). Cuvier stated: ". . . et le papio de Gesner ou le simia sphinx de Linneus, qui étoit un mandrill" (1818, Mém. Mus. Hist. Nat., Paris, IV, p. 424).

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[1] *Mandrill* Desmarest, 1820, 'Mamm.,' I, pp. 30, 70. Not a technical name.

Under the genus *Cynocephalus* Desmarest says (p. 30): "Ce genre se partage en deux sous-genres: 1°. les babouins proprement dits, et 2°. les mandrills." Again (p. 70): "II^e. sous-genre, Mandrill. Une queue très-courte et grêle, perpendiculaire à l'épine dorsale." The Mandrill group includes two species: (1) "*Cynocephalus mormon* = *Simia maimon* Linn. (jeune âge.)—*Simia mormon* Linn. (adulte)." (2) "*Cynocephalus leucophæus* = *Simia leucophæa* F. Cuv. Ann. du Mus. d'hist. nat. tom. 9, pl. 37.—*Drill*, ejusd. Mamm. lithogr. 1^re livr." Desmarest adds in a footnote: "M. Fréd. Cuvier remarque, avec raison, que le papion de Gesner, le babouin de Brisson et le *simia sphinx* de Linnæus ne diffèrent pas du mandrill." This identification of *Simia sphinx* Linnæus long precedes the same determination made by Elliot in 1909 (Ann. Mag. Nat. Hist., (8) IV, December, p. 417) and later endorsed by Thomas (1911, Proc. Zool. Soc. London, March, p. 126).

[2] Thomas (*loc. cit.*, footnote), on the authority of Palmer, gives *Mandril* as "the technical name for the Mandrill, if considered generically distinct from other Baboons, as it apparently should be." He appears to have overlooked the fact, also shown by Palmer ('Index Gen. Mamm.,' p. 398), that *Mandrillus* has seven years priority over *Mandril* for the same group.

1766. *Simia maimon* LINNÆUS, 'Syst. Nat.,' I, p. 35. "Zeylona" = West Africa. Based on an immature example of *Simia sphinx* Linnæus.

1766. *Simia mormon* ALSTRÖMER, 'Acta Naem.,' p. 144. (Not seen.) Referred by later authors to *Simia sphinx* LINNÆUS.

1792. *Simia suilla* KERR, 'Anim. Kingd.,' p. 59, No. 10. = Pig-tail Baboon of Pennant and Edwards. "It [Pennant's figure] seems a bad representation of the Mandril, or Simia maimon" (Kerr, *loc. cit.*, No. 10).

1792. *S.[imia] Papio cinerea* KERR, 'Anim. Kingd.,' p. 62, No. 19. Based on the Cinereous Baboon of Pennant (1781, 'Hist. Quad.,' p. 176, No. 80), an immature example in the Leverian Museum. Not satisfactorily identifiable, but strongly suggestive of the later described *Simia leucophæa* of F. Cuvier. (Cf. Allen, 1895, Bull. Amer. Mus. Nat. Hist., VII, p. 185; ELLIOT, 1913, 'Rev. Primates,' II, (1912), p. 154).

1807. *Simia leucophæa* F. CUVIER, Ann. Mus. Hist. Nat. Paris, IX, pp. 477–482, Pl. XXXVII. ". . . probablement des côtes d'Afrique." Based on a young female purchased by a dealer in Bordeaux.

1840. *Mormon drill* LESSON, 'Spec. Mamm.,' p. 114. New name for *Simia leucophæa* F. Cuvier.

1906. *Papio mundamensis* HILZHEIMER, Zool. Anz., XXX, April, p. 109. Mukonje Farm, Mundame, Cameroon = *Simia leucophæa* F. Cuvier, *apud* Elliot who has examined the type, which is not fully adult.

1909. *Papio planirostris* ELLIOT, Ann. Mag. Nat. Hist., (8) IV, September, p. 305. Fan, southern Cameroon. Based on a skull without skin.

1917. *Mandrillus tessmanni* MATSCHIE AND ZUKOWSKY, Sitzungsb. Ges. Naturf. Fr. Berlin, p. 470. Okak-land on the middle Benito, not far from Alen (Nkolentengan), Spanish Guinea. Type, adult male, skin and skull.

1917. *Mandrillus escherichi* MATSCHIE AND ZUKOWSKY, Sitzungsb. Ges. Naturf. Fr. Berlin, p. 478. Ekododo on the Temboni, near southern border of Spanish Guinea. Type, adult male, skull without mandible.

1917. *Mandrillus zenkeri* MATSCHIE AND ZUKOWSKY, Sitzungsb. Ges. Naturf. Fr. Berlin, p. 479. Probably between Bipindi on the Lokundje and Yaunde, Cameroon. Type, young male, skin and skull.

1917. *Mandrillus hagenbecki* MATSCHIE AND ZUKOWSKY, Sitzungsb. Ges. Naturf. Fr. Berlin, p. 488. Probably coast region near Lagos, West Africa. Type, young adult male, skin and skull.

1917. [*Mandrillus zenkeri*] var. *ebolowæ* MATSCHIE AND ZUKOWSKY, Sitzungsb. Ges. Naturf. Fr. Berlin, p. 493. Near Ebolowa, Cameroon. Type, skull.

COMOPITHECUS, new name

To replace *Hamadryas* Lesson, preoccupied by *Hamadryas* Hübner (1806) for a genus of insects. Genotype, *Simia hamadryas* Linnæus. In allusion to the heavy mantle of long hair in the males.

1840. *Hamadryas* LESSON, 'Spec. Mamm.,' p. 107. Type, by tautonomy, *Hamadryas chœropithecus* Lesson = *Simia hamadryas* Linnæus. Preoccupied.

SPECIFIC AND SUBSPECIFIC NAMES REFERABLE TO *Comopithecus*

1757. *Simia ægyptiaca* LINNÆUS in Hasselquist, 'Iter. Palæst.,' p. 189. = *Simia hamadryas* Linnæus, 1758.

1758. *Simia hamadryas* LINNÆUS, 'Syst. Nat.,' I, p. 27. Based wholly on "Alp. ægypt. 248." "Africa" = Egypt.

1758. *Simia cynamolgos* LINNÆUS, 'Syst. Nat.,' I, p. 28. Based on *Simia ægyptiaca* Linnæus in Hasselquist (1757). Upper Egypt. = *Simia hamadryas* Linnæus.

1792. *Cercopithecus hamadryas ursinus* KERR, 'Anim. Kingd.,' pp. 39, 63, No. 25. From Pennant, 1781, 'Hist. Quad.,' p. 179, No. 86.

1828. *Cynocephalus wagleri* AGASSIZ, Oken's Isis, XXI, p. 862, Pl. XI. Based on a female from an unknown locality. Compared with *Simia hamadryas* Linnæus.

1840. *Hamadryas chœropithecus* LESSON, 'Spec. Mamm.,' p. 109. "L'Abyssinie, l'Arabie et l'Égypte." New name for *Simia hamadryas* Linnæus.

1870. *Hamadryas ægyptiaca* GRAY, 'Cat. Monkeys, Lemurs, and Fruit-eating Bats,' p. 34. New name for *Simia hamadryas* Linnæus and *Simia ægyptiaca* "Hasselquist."

1899. *Papio arabicus* THOMAS, Proc. Zool. Soc. London, p. 929 (preliminary notice); idem, 1900, p. 96 (full description). Subaihi Country, "about 60 miles northwest of Aden," Arabia. Type a young female. Similar to *Simia hamadryas* Linnæus in coloration but considerably smaller.

1909. *Papio brockmani* ELLIOT, Ann. Mag. Nat. Hist., (8) IV, September, p. 248. Type an adult male from Dirre Dawa, Somaliland.

THEROPITHECUS I. Geoffroy

1843. *Theropithecus* I. GEOFFROY, Arch. Mus. Hist. Nat., Paris, II, (1841), p. 576; 1851, 'Cat. Méth. Mamm. Mus. Hist. Nat. Paris,' p. 32. "Genre établi par nous, *Mémoire sur les Singes*, 1843 (dans les *Archiv. du Mus.*), pour le *Gelada* des Abyssins." Type, by monotypy, *Macacus gelada* Rüppell.

1843. *Gelada* GRAY, 'List Spec. Mamm. in Brit. Mus.,' pp. xvii, 9. Type, by monotypy and by tautonomy, *Gelada rüppellii* Gray = *Macacus gelada* Rüppell. *Gelada* and *Theropithecus* are of nearly even date but the latter has been assumed by authors to have priority. (Cf. Palmer, 1904, 'Index Gen. Mamm.,' p. 673.)

SPECIFIC NAMES REFERABLE TO *Theropithecus*

1835. *Macacus gelada* RÜPPELL, 'Neue Wirbelth.,' Säug., p. 5, Pl. II. Mountains of Southern Abyssinia.

1857. *Theropithecus senex* PUCHERAN (*ex* Schimper MS.), Rev. Mag. Zool., (2) IX, p. 243. Type a mounted specimen (the skull inside the skin) in the Paris Museum, from the type locality of *Macacus gelada* Rüppell. (Cf. Elliot, 1913, 'Rev. Primates,' II, (1912), p. 156.)

1862. *Theropithecus nedjo* REICHENBACH, 'Vollständ. Naturg. Affen,' p. 204. (Not seen.) New name for *Theropithecus obscurus* Heuglin.

1863. *Theropithecus obscurus* HEUGLIN, Nov. Act. Ac. Leop. Carol. Nat. Cur., XXX, Abhandl. 2, pp. 10–14. Sources of the Takazza River, Galla Country, southern Abyssinia, altitude 6000–10,000 feet.

1870. *Gelada rüppellii* GRAY, 'Cat. Monkeys, Lemurs, and Fruit-eating Bats,' p. 33. New name for *Macacus gelada* Rüppell.

The *Papio cynocephalus* Group

Some twenty names have been given to supposed species or subspecies of the *Papio cynocephalus* group, all but three of which were rated by their respective authors as species. The three earliest names (*cynocephalus, anubis, thoth*) were based on menagerie specimens from unknown localities. Most of those published since 1850 (beginning with *doguera* Pucheran, 1856) have been based on field specimens, with at least approximate (mostly with definite) localities but they rest on scanty (frequently immature) material. The first series from any single locality that became available for study consisted of eight specimens of *Papio tessellatum* Elliot from Rutshuru, representing adults and young of both sexes, discussed in detail by Lönnberg in 1917 (Kungl. Sven. Vet. Ak. Handl., Stockholm, LVIII, No. 2, pp. 40–45, Pl. VII).

Elliot, in his 'Review of the Primates' (II, pp. 124–143) recognized twelve forms of this group, all of them as full species. Seven other forms have since been added. The type localities extend in East Africa from the Anglo-Egyptian Sudan and Abyssinia south to the southern end of Lake Nyasa and westward into eastern Belgian Congo, with one as far west as Nigeria and another in eastern Cameroon.

While the number of distinct specific forms enumerated above is at present beyond reasonable conjecture, it is certain that a considerable number will prove to be synonyms, and equally certain that many of them will ultimately stand as designations for regional forms. The series of fifteen specimens collected in a comparatively small area by the American Museum Congo Expedition demonstrates that baboons are no exception to the rule of a wide range of differentiation due to age, sex, and individual variation, especially in respect to details of skull and teeth, and indicate that certain cranial characters usually considered as of great diagnostic importance may have no distinctive value whatever.

The great difficulty in determining the present series of Congo baboons is the uncertain basis of the original *Simia cynocephalus* Linnæus. While practically all recent systematists concede that it must have been the large "yellow" baboon of East Africa, no one except Anderson (1902, 'Zool. Egypt,' Mamm.), seems to have made a serious attempt to establish for it a definite type region. Nor does it seem possible to do this except more or less arbitrarily. Hence there is no absolutely definable *Papio cynocephalus typicus* with a definite habitation, since the first knowledge of it was derived from specimens from unknown parts of Africa. E. Geoffroy in 1812 (Ann. Mus. Hist. Nat., Paris, XIX, p. 102) indicated for it: "Habite l'Afrique méditerranéenne." In 1829

J. B. Fischer ('Synop. Mamm.,' p. 33) gave "Hab. in Africa boreali," citing F. Cuvier as authority. Anderson (*loc. cit.*, p. 64), after a thorough discussion of the literature of the subject and a personal study of all the extant specimens of East African baboons in the British, the Berlin, the Paris and other museums of Europe, reached the conclusion that the type region of *cynocephalus* Linnæus was inland from Mombasa. This decision I think may well be accepted as final. He also concluded that *Cynocephalus babouin* Desmarest and *Cynocephalus thoth* Ogilby, after an examination of the specimens on which they were based, should be considered as unquestionably synonyms of it (*loc. cit.*, pp. 57–64).[1]

The "Cynocéphale Anubis" of F. Cuvier (*Simia anubis* Fischer) was also considered at length by Anderson (*loc. cit.*, pp. 34–53), who assumed on wholly conjectural grounds that the type probably came from the Upper Nile Valley (*loc. cit.*, p. 36). The type of *S. anubis* was a young animal in the Paris menagerie from an unknown part of Africa, and was not preserved. The description and figure are so equivocal that the species has been assigned both to West Africa and to East Africa by subsequent authors.[2] Under these conditions it is absolutely undeterminable, and Anderson did poor service to the nomenclature of the baboons by recognizing it as entitled to serious consideration. He even admitted that "Unfortunately after all these years the material at present available is not sufficient for the settlement of this question" (*loc. cit.*, p. 37), yet he accepted the name *anubis* for all the baboons of this group occurring from the Upper Nile eastward to the Red Sea, synonymizing with it *Papio doguera* (Pucheran) of Abyssinia and *Papio heuglini* Matschie from the Atbara River to the White Nile.[3] Anderson defines the range of *P. anubis* (*loc. cit.*, pp. 37, 38) as follows: "The southern range of baboons conforming to *P. anubis* is practically unknown, but they appear to spread from Abyssinia and the Nile Valley as far as the region of the great Lake Victoria Nyanza. They also extend through the river system of the Bhar-el-Ghazal to Dar Fertit, where Schweinfurth obtained specimens. From the Victoria Nyanza district this species possibly follows the greater part of the river-system of the Congo, while from Dar Fertit it extends to the Niger. Its form seems to be modified in given areas of

[1] Matschie in 1898 (Sitzungsb. Ges. Naturf. Fr. Berlin, p. 79) considered the baboon of the coast region of German East Africa to be in all probability the *Papio thoth* of Ogilby.

[2] Ogilby in 1838 ('The Menageries,' I, pp. 425–427) believed *Cynocephalus anubis* to be a "Nubian species." In 1843 (Proc. Zool. Soc. London, p. 9) he retracted this opinion and assigned it to West Africa.

[3] Anderson (*loc. cit.*, p. 40 and passim) has fixed the type locality of *Papio heuglini* Matschie as Shilluk Island, White Nile, and figured (*loc. cit.*, Pl. v) what he considers should be the type skull. Matschie had three specimens from two different localities all collected by Heuglin, an old male and a young female, "am Weissen Nil in der Nähe der Schilluk-Inseln," and a young male "im Sennaar," and did not designate a type, but gave the range of the species as the Bahr el Abiad, Bahr el Azrek and the Atbara River.

this vast region, but the differences manifested in the scanty material at present available will probably be somewhat bridged over when zoologists are placed in full possession of the different phases assumed by the individuals in diverse geographical areas at various periods of their existence." This forecast of the range of the group has in the twenty years since it was made been amply confirmed by acquisitions of material from the regions in question, but the status and the relationships of the various forms based on the later material is still a problem for the future. It is unfortunate, however, that Anderson should have selected for the group an absolutely untenable name, which has for the most part escaped acceptance by later authors.[1] The half-dozen forms described from specimens obtained within the area assigned to *anubis* since the publication of Anderson's work have for the most part been given the rank of species, while Elliot recognized *doguera, heuglini* and *neumanni* as full species.

There being very little material in the museums of this country bearing on the questions at issue in this connection no wholly satisfactory conclusions can be reached regarding the nomenclature and relationships of the baboons of the Congo area, but it seems admissible to consider the baboons of British and German East Africa as referable to the *Papio cynocephalus* group in contradistinction from the larger and darker forms of Abyssinia, the Upper Nile and Upper Congo regions. The forms from these districts are evidently closely related, probably conspecific, as are the members of the *Colobus abyssinicus* group occurring in these areas. Anderson's colored plate (*loc. cit.*, Pl. IV) of the type of *Papio doguera* and his plate of the skull of the same species (*loc. cit.*, Pl. VII) are strikingly like specimens from the Upper Congo and permit little doubt of their conspecific relationship. Consequently it seems reasonable to accept, provisionally at least, this name in a specific sense for the present series from the Upper Congo district, and as the earliest applicable specific name for the two well-marked regional forms this material represents.

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[1]In a bracketed paragraph at the end of Anderson's article on *Papio anubis* W. E. De Winton gives his views on the status and relationships of the forms of the *anubis* group. In his opinion *P. doguera* and *P. heuglini* are synonyms of *anubis*, and specimens from "the neighbourhood of Victoria Nyanza and Lake Rudolf [are referable] to a slightly modified form, *P. anubis* subsp. *neumanni;* while a large form with strongly developed teeth, ranging from Nigeria to Dar Fertit, may be known as *P. anubis* subsp. *olivaceus*." The last name is certainly untenable if based on the *Cynocephalus olivaceus* of I. Geoffroy, as the type locality is given by Geoffroy, as "De Guinée, golfe de Bénin," and was based on a young specimen that lived for a time in the Paris menagerie, and the status of the species was admitted by the author as quite uncertain. If *olivaceus* is used in a new sense it is of course preoccupied for a supposed form of *Papio* from the coast of Guinea. Elliot (1913, 'Rev. Primates,' II, (1912), p. 132) examined the type of Geoffroy's *Cynocephalus olivaceus* and says of it: "This animal is a female and not full grown. It has the reddish coloring so characteristic of *P. papio*, and nothing of an olivaceous hue to warrant the name given by Geoffroy."

Papio doguera tessellatus Elliot

Plate LXXXIII, Figure 1

Papio tessellatum [sic] Elliot, 1909, Ann. Mag. Nat. Hist., (8) IV, September, p. 247 ; 1913, 'Rev. Primates,' II, (1912), p. 127. Type, adult male, Mulema, Ankole, Uganda; another young specimen from Rogoro.

Papio tessellatus Lönnberg, 1917, Kungl. Sven. Vet. Ak. Handl., Stockholm, LVIII, No. 2, September 1, pp. 40–45, Pl. vii (skulls). Rutshuru, between Lake Albert Edward and Lake Kivu, eight specimens; 1919, Rev. Zool. Africaine, VII, p. 145. Rutshuru (1 specimen), Masisi (4), Mawambi (1), Makala (2), Avakubi (1), Belgian Congo.

Papio silvestris Lorenz, 1915, Anz. Ak. Wiss. Wien, Math.-Naturwiss. Kl., LII, June, p. 173. Type (and only specimen), Mawambi, Belgian Congo.

Papio graueri Lorenz, 1917, Ann. Naturhist. Hofmus., Wien, XXXI, p. 236. Based on adult female from Rutshuru.

Represented by seven specimens, collected as follows:

Akenge, 4 (adult ♂, adult ♀, and two immature ♂), September 14–October 29, 1913.

Niapu, 2 (adult ♂and ♀), November 20 and December 5, 1913.

Avakubi, 1 (subadult ♀), October 25, 1909.

The specimens are skins with skulls and field measurements. One is represented by a complete skeleton.

The external measurements of five specimens of *Papio doguera tessellatus*, taken from animals in the flesh, are as follows:

Cat. No.	Sex	Locality	Total Length	Head and Body	Tail Vertebræ	Hind Foot	Ear
52680	♂	Niapu	1320	780	540	230	67
51380	♂	Akenge	1335	750	585	234	64
52668	♀	"	1015	562	453	185	61[1]
52679	♀	Niapu	1050	635	415	185	65
52671	♀ juv.	Avakubi	1030	550	480	200	..

The cranial measurements of the same five specimens of *Papio doguera tessellatus* are as follows:

Cat. No.	Greatest Length	Condylobasal Length	Occipitonasal Length	Zygomatic Breadth
52680	237	189	192	140
51380	230	185	193	130
52668	178	140	150	106
52679	...	...	...	106
52671	167	130	139	100

[1]Last molars enclosed in the alveoli.

Cat. No.	Orbital Breadth	Interorb. Breadth	Postorb. Constr.	Mastoid Breadth
52680	103	13.7	62.0	104.5
51380	100	14.5	63.2	101.6
52668	75	7.5	58.5	84.5
52679	...	8.7	55.3	....
52671	...	9.1	61.3	79.0

Cat. No.	Upper Cheekteeth	Upper Molars	m^3	Basal Suture
52680	63.3	44.5	16.0	Closed
51380	58.3	40.7	14.8	Open
52668	53.3	38.7	13.4	Closed
52679	55.2	39.0	12.5	Closed
52671	....	....	....	Open. Last molars still enclosed in alveoli

As stated above, the series of baboons collected by the American Museum Congo Expedition represent two regional phases. Of the fifteen specimens obtained seven were collected in the rain forest region and eight in the adjoining bush-veldt country. The differences are mainly in coloration, and are obvious at a glance, the forest specimens being much darker and far more intensely colored. The individual variation in coloration, noteworthy in both, is parallel in character in the two series, and is compared below in detail under the veldt form.

IMMATURE PELAGE.—The first pelage is represented by a young male (No. 52669) from Akenge (Pl. LXXXIII, fig. 1) in which the posterior tooth of the milk dentition is still enclosed in the jaw. The pelage of the body, hind limbs and tail is soft and short, much thinner on the ventral surface than elsewhere, the skin here showing through the slight covering of hair. The color is seal-brown, the hairs minutely tipped with grayish shading to olivaceous. The average length of the coat on the back is about 14 mm. The top of the head is covered with much longer, more silky, lustrous black hair, ranging in length from about 22 to 25 mm. On the outside of the fore limbs, from the shoulders to the tips of the toes, the first coat has been largely replaced by the coarse, stiff hairs of the second coat, in character and color much like that of adults, being a coarse grizzle of black and pale yellow.

ADULT PELAGE.—The general effect of the coloration of an average adult male could scarcely be better represented than in the colored plate of Anderson's "*Papio anubis*" (1902, 'Zool. Egypt,' Mamm., Pl. IV), subtitled "*P. doguera*, Pucheran." The general tone is rather too dark, particularly as regards the hind feet, the fore limbs and flanks; in other

respects, as the depth and distribution of the color tones, it is a fair representation of the forest baboon of the Upper Congo. Anderson's description of the color characters (*loc. cit.*, p. 34) is equally applicable to the northeastern Belgian Congo form, even to details. The "checkered appearance" of the coat given by Elliot as a distinctive feature of his *Papio tessellatum* [sic] is strongly developed in several specimens of the present series, while his general description of the Mulema type of the species would need scarcely any qualification to make it apply to the Niapu and Akenge specimens, in which the checkered effect of black blotches on the ochraceous-buff ground color is strongly marked on the posterior half of the dorsal area, but less distinct on the shoulders and foreback, where the tips of the hairs in some of the specimens are frayed by wear.

The pelage is long and thick. The hairs individually of the upper-parts are purplish black for about the proximal half; the mid-portion is ochraceous-buff on the lower back and hind limbs, and light ochraceous-buff on the anterior dorsal area and fore-limbs, followed by an apical broad band of deep black. The top of the head is darkened by the lengthening of the black hair tips, giving in some instances the effect of a fairly well-defined black crown-patch. There is an indistinct whitish superciliary band, and the cheeks are grayish. The upper surface of the hands varies in different specimens from a strong grizzle of black to wholly black, including the wrist; feet usually only slightly grizzled with black but in some instances they are nearly as dark as the hands. The tail is pale ochraceous-buff grizzled with black, the individual hairs being banded like those of the body.

Individual Color Variation.—There is considerable variation in the coloration of different individuals, especially in the amount of black on the crown, hands and feet, and in the distinctness of the dark blotches on the body, the latter obviously depending to some extent on the condition of the pelage in respect to wear.

Individual Variation in Size and in Cranial Characters.—Individual variation in size is strongly marked, especially shown in the skull. The adult specimens of this series are all of about the same age, as indicated by the condition of the skull and teeth; in none are the teeth appreciably worn. As shown in the above table of measurements of skulls, No. 51380, an adult male from Akenge differs greatly from No. 52680, an adult male from Niapu. The latter is probably a few months older than the former, as indicated by the canines and the texture of the zygoma, the surface of the orbits, and of the external edges of the sagittal

and lambdoid crests, where the bone is less dense in the Akenge specimen than in the one from Niapu. In general dimensions the two skulls do not essentially differ, the Akenge skull being only slightly smaller in some of the axial measurements and slightly larger in some of the transverse measurements. The striking differences are the extreme narrowness of the preorbital portion of the Akenge skull and the correlated reduction of the dental armature and the exceptional robustness of these parts in the Niapu skull. While the rostrum is 8 mm. longer in the Niapu skull than in the other, the nasals are 4.5 mm. shorter. The following measurements indicate the principal differences in the proportions of the rostrum: length from the mesial point of the orbital crest to the anterior border of the premaxillaries in the two skulls, Akenge 139 mm., Niapu 147; middle of anterior edge of orbit to anterior border of intermaxillaries, Akenge 115.6, Niapu 118.3; breadth of rostrum at base of canines, A. 53.5, N. 58.7; breadth at base of outer incisors, A. 36.4, N. 42.0; greatest breadth at malar suture, A. 53.0, N. 55.5; depth at m^2, A. 46.0, N. 48.6. Palatal length (front border of premaxillaries to posterior border of palate), A. 115.3, N. 117.3; breadth of palate at p^2, A. 34.0, N. 32.8; breadth at m^3, A. 31.7, N. 29.8. Length of upper tooth-row (c-m^3 inclusive), A. 73.5, N. 80.2; cheek-teeth, A. 58.3, N. 63.3; upper molars, A. 40.7, N. 44.5; length of m^3, A. 14.8, N. 16.0. Canines, length from alveolar plane, A. 38.0, N. 43.4; antero-posterior breadth at alveolar plane, A. 17.2, N. 18.9; transverse breadth at same point, A. 10.0, N. 13.6.

The dominating difference between the two skulls is the exceptional development of the dental armature in the Niapu specimen and the unusual narrowness of the rostrum in the Akenge skull. The difference in the size of the teeth also renders the palate narrower in the Niapu skull, while the breadth of the rostrum is greater, a differentiation more striking when the skulls are placed side by side than the above statistics would seem to indicate.

Niapu and Akenge are both in the same environment and separated by less than fifty miles in a direct line. The two skulls above described are both extremes, but in opposite directions, and the differences are due beyond question to individual variation. A somewhat similar case occurs in two adult female skulls from Bafuka, as noted below.

Papio doguera heuglini Matschie

Plate LXXXII

Papio heuglini Matschie, 1898, Sitzungsb. Ges. Naturf. Fr. Berlin, July, p. 81. Based on an adult male and an immature female collected by Heuglin near the

Shilluk Islands, White Nile. No type designated. Later the male was designated as type by Anderson.

Papio anubis ANDERSON, 1902, 'Zool. Egypt,' Mamm., pp. 34–53, Pls. IV–VIII, part; Upper Nile specimens only.

Papio anubis subsp. *olivaceus* DE WINTON, 1902, Anderson's 'Zool. Egypt,' Mamm., p 53, part. Not *Cynocephalus olivaceus* I. Geoffroy = *Papio papio.*

? *Papio nigeriæ* ELLIOT, Ann. Mag. Nat. Hist., (8) IV, September, p. 247; 1913, 'Rev. Primates,' II, p. 125, Pls. VI and VII (skull). Type, an adult, Ibi, North Nigeria.

Papio nigeriæ LÖNNBERG, 1919, Rev. Zool. Africaine, VII, p. 146. An adult male and a young female, Bafuka, Uele, Belgian Congo.

Represented by 8 specimens (5 adult, 3 young) collected as follows:

Bafuka, 5 (adult ♂, 2 adult and 2 young ♀), March 19–April 1, 1913.

Aba, 1 (young ♂), July 17, 1911.

Faradje, 2 (old ♂), November 23–30, 1911.

The specimens are skins with skulls and field measurements. Two of them, adults, are represented by complete skeletons.

The external measurements of five adults of *Papio doguera heuglini*, taken from animals in the flesh, are as follows:

Cat. No.	Sex	Locality	Total Length	Head and Body	Tail Vertebræ	Hind Foot	Ear
52676	♂	Bafuka	1270	735	535	225	63
52677	♂	Faradje	1385	785	600	225	72
52678	♂	"	1270	750	520	230	74
52672	♀	Bafuka	1190	660	530	220	68
52674	♀	"	1040	590	450	190	60

The cranial measurements of the same five specimens of *Papio doguera heuglini* are as follows:

Cat. No.	Greatest Length	Condylobasal Length	Occipitonasal Length	Zygomatic Breadth
52676	207	163	162	123
52677	230	187	192	129
52678	233	182	190	139
52672	181	140	145	113
52674	162	120	136	105

Cat. No.	Orbital Breadth	Interorb. Breadth	Postorb. Constr.	Mastoid Breadth
52676	92	12.7	62.4	86.5
52677	100	12.8	62.7	101.4
52678	103	14.5	58.2	100.7
52672	83	10.5	61.3	88.5
52674	73	7.2	54.2	78.8

Cat. No.	Upper Cheekteeth	Upper Molars	m^3	Basal Suture
52676	62.0	44.4	16.1	Open
52677	59.3	41.0	13.9	"
52678	55.6	38.9	13.4	Closed
52672	49.6	36.1	12.6	"
52674	51.7	36.6	12.5	Open

IMMATURE PELAGE.—Two specimens from Bafuka, in which the deciduous dentition is fully developed, show no trace of the natal coat, the pelage being long and coarse, that of the back having a length of 40 to 45 mm., increasing on the nape to 50 to 60 mm. The basal third to one-half is dark grayish brown, followed by a narrower zone of pale yellow and long black tips, giving a general surface effect of pale yellow buff conspicuously grizzled with black. They differ from adults in having more yellow and less black in the coloration.

ADULT COLORATION.—The present series from the bush-veldt adjoining and to the north of the Rain Forest is similar in size and coloration to the series referred above (p. 317) to *P. d. tessellatus* except in being uniformly much paler, in this respect the two series differing strongly. The ground color of the posterior half of the upperparts, including the hind limbs, is about warm buff of Ridgway, of the rest of the upperparts pale warm buff, in contrast with the ochraceous buff and pale ochraceous buff of the *tessellatus* series. The upper surface of the hands varies, as in the latter, from a strong mixture of black to entirely black, the hind feet varying from a strong grizzle of black to nearly uniform grayish brown. The basal half of the pelage is dark drab-gray instead of purplish black, the yellowish middle zone pale buff instead of ochraceous buff, and the black tip is shorter. There is a tendency to the same black coronal patch, strongly developed in some and absent in others, and to a checkered effect in the color pattern.

SIZE OF THE TWO FORMS OF *Papio*.—The two forms differ only slightly in size, with indications, especially in external measurements, toward a slightly larger size for the veldt form. The present material is too scanty to be decisive, but points to an agreement in this respect with the subspecies of *Colobus* having the same distribution, the veldt form being distinctly larger than the forest form. The skulls (four adults of each series) show no greater variation in size or other characters than might be found in an equal number from a single locality.

INDIVIDUAL VARIATION IN SIZE AND IN CRANIAL CHARACTERS.—Two adult female skulls show an exceptional difference in size. Both are of practically the same age, and both were taken the same day at the

same locality from the same band. Hence the unusual difference in size, both external and cranial, must be regarded as due to individual differentiation in members of the same troop. As shown in the above table of measurements (p. 321), the smaller of the two (No. 52674) is 10 to 12 per cent less in the principal measurements of the skull than the larger one (No. 52672), while the dental measurements are practically the same. The larger skull agrees closely in size with a female skull of strictly comparable age from Akenge, and may be considered as representing normal size, and the smaller one as an exceptionally small or dwarfed individual. If, however, the two specimens had been taken at different times and fallen into the hands of different investigators they might each have been taken as the type of a new form, as most certainly would have been the case with the two male skulls of *tessellatus* described above from respectively Akenge and Niapu.

While the number of fully adult males and females is small, they exceed the number hitherto reported from any other area of similar extent within the range of the *Papio doguera* group. This series also affords the only available external measurements taken from animals in the flesh, all others having been based on skins or on mounted specimens and are consequently of little value.

The two Congo forms are apparently indistinguishable by either external or cranial dimensions. The published external measurements of the mounted type of *doguera* exceed all others, but are probably from an overstuffed specimen,[1] as the cranial measurements do not indicate so large an animal.

The four adult male skulls from the Upper Congo vary in the greatest length measurement from 230 to 237 mm., the average being 233. They are thus the largest baboon skulls thus far recorded. Anderson gives (see below, table on p. 324) the greatest length of two male skulls of *doguera* from Abyssinia as, respectively, 228 and 209 mm.; of two male skulls of *heuglini* from, respectively, the White Nile (Shilluk Islands) and the Gash River as 218 and 213 mm. His figures of these skulls (Pls. v–vii) show they were old adults, and thus strictly comparable in age with the Upper Congo specimens, although much smaller. Lönnberg gives the greatest length measurement of an adult male skull of *tessellatus* from Rutshuru as 216 mm. His plate indicates that the skull is not that

[1]Pucheran gave the measurements of the type of *doguera* as head and body 933 mm., tail to end of hair 568, making a total length of 1501. Anderson's, of the same specimen, are, respectively, 950 and 560, making a total length of 1510. Elliot gives the total length as 1678.4, and the length of the tail as 609.6. Anderson gives the measurements of the type (male) of *heuglini* as, head and body 875, tail 470, or a total length of 1345. Elliot gives for the type (male) of his *tessellatus* (from a skin), total length 1400 mm., tail to end of hair 500, hind foot 210, dimensions quite in agreement with those of specimens from the Upper Congo.

Cranial Measurements of *Papio doguera* Group

(Compiled from Elliot, Lönnberg, and Anderson)

Name	Locality	Sex	Greatest Length	Occipito-nasal Length	Basal Length (Hensel)	Zygomatic Breadth	Postorb. Constr.	Upper Cheek-teeth
nigeriæ[1]	Ibi, N. Nigeria	♂	220	181	153	133	60.9	53.9
tessellatus[1]	Mulema, Ankole	♂	...	170	158	131	60.9	58.3
tessellatus[2]	Rutshuru	♂	216	175	155	129	58.0	53.0
yokoensis[1]	Central Cameroon	♂	215	...	152	...	60.0	57.0
heuglini[1]	Bahr el Ghazal	♂	214	178	153	128	60.8	57.8
heuglini[3]	Shilluk I., White Nile	♂	218	...	162	127	....	....
heuglini[3]	Near Kassala, Gash River	♂	213	...	148	126	....	....
doguera[3]	Abyssinia	♂	228	...	165	128	....	....
doguera[3]	Abyssinia	♂	209	...	147	126	....	....

[1]Authority of Elliot, 1913, 'Rev. Primates,' II, (1912).
[2]Authority of Lönnberg, 1917, Kungl. Sven. Vet. Ak. Handl., Stockholm, LVIII, No. 2, p. 41.
[3]Authority of Anderson, 1902, 'Zool. Egypt,' Mamm., p. 40.

Cranial Measurements of *Papio anubis* Anderson = *P. doguera* (Pucheran)

(From 'Zool. Egypt,' Mamm., p. 40)

Anderson's No.	Locality	Sex	Greatest Length	Basal Length	Zygomatic Breadth	Upper Molars	Remarks
1	Abyssinia (Rüppell)	♂	228	165	128	40.0	"Rüppell, No. 4, labelled *C. anubis*"
4	Abyssinia (Schimper)	♂	209	147	126	38.5	Figured by Anderson, *loc. cit.*, Pl. VII, as *P. doguera* (Pucheran).
2	Shilluk Islands, White Nile	♂	218	162	127	38.7	"Type" of *Papio heuglini* Matschie. Figured by Anderson, *loc. cit.* Pl. V.
3	Gash River, near Kassala (=Upper Atbara R.)	♂	213	148	126	41.2	Figured by Anderson, *loc. cit.*, Pl. VI, as "*Papio anubis.*"
5	Gash River, near Kassala (=Upper Atbara R.)	♀	177	126	105	36.5	
6	Gash River, near Kassala (=Upper Atbara R.)	♀	174	122	99	38.9	
8	Abyssinia (Rüppell)	♀	170	118	103	36.0	"Rüppell, No. 5, labelled *C. anubis.*"
	Average	**4 ♂**	**217**	**156**	**127**	**39.6**	
	"	**3 ♀**	**174**	**122**	**102**	**37.1**	

Cranial Measurements of *Papio cynocephalus*

(From Anderson, 'Zool. Egypt,' Mamm., pp. 74, 75)

Anderson's No.	Page	Locality	Sex	Greatest Length	Basal Length	Zygomatic Breadth	Upper Molars	Remarks
1	74	Zomba, Nyasa	♂	204	140	118	34.0	"Adult."
3	74	Fort Johnston, Nyasa	♂	198	143	116	32.8	"
7	74	Langenberg, North Nyasa	♂	192	137	99	33.8	"
2	74	Lamu	♂	202	151	114	37.0	"Adult." "Type of *Papio thoth ibeanus* Thomas." Figured by Anderson, *loc. cit.*, Pl. XII.
3	75	Ukami	♂	201	140	113	....	"Adult." "One of the types of *P. langheldi* Matschie."
1	75	Moschi, Kilimanjaro	♂	212	158	114	37.8	"Adult."
2	75	Osi Tana	♂	210	158	118	36.8	"
4	75	Near Madschame, Kilimanjaro	♂	199	150	110	36.3	Age not indicated.
4	74	Mpapwe	♂	196	149	...	34.0	"Not fully adult."
5	74	Mpapwe	♂	196	149	109	37.7	"Not fully adult."
8	74	Mpapwe	♂	191	141	...	37.5	"Not fully adult."
6	74	Perondo, Uhehe	♂	192	140	109	35.0	"Not fully adult." Figured by Anderson, *loc. cit.*, Pl. XIII, as *P. langheldi* (Matschie).
9	74	Mombasa	♂	188	134	101	34.5	"Not fully adult." "Zool. Gardens, Lond."
10	74	Mombasa	♀	159	109	94	....	"Not fully adult." "Zool. Gardens, Lond."
5	75	Marpiensen, near Tanga	♀	152	104	91	32.5	Age not indicated.
Average			**7 ad. ♂**	**203**	**147**	**113**	**35.4**	
"			**2 ♀**	**155**	**107**	**93**		

of an old adult, and would have become larger with increase in age. The greatest length of the type skull (an old male) of *P. nigeriæ* is not given by Elliot, but as computed from his figures (¾ nat. size, Pls. VI, VII) is 220 mm. While this is less than the same measurement in the Upper Congo specimens, most of the other dimensions, as recorded by Elliot, agree closely with those of the Congo series.

SEXUAL VARIATION.—The sexual difference in size in baboons is well known to be strongly marked. In the present group the females are fully one-fourth smaller than the males, on the basis of linear dimensions.

In addition to the cranial measurements tabulated above (pp. 317, 318, 321, 322,) all available published measurements of skulls of the *Papio doguera* group (pp. 324–325) are added for convenient comparison. The cranial measurements given by Anderson for the forms of the *Papio cynocephalus* group are given too, showing their much smaller size (p. 326).

CERCOCEBUS E. Geoffroy

1812. *Cercocebus* E. GEOFFROY, Ann. Mus. Hist. Nat., Paris, XIX, p. 97. Eight species, of which three are African and five are Asiatic. Type, by subsequent designation (Elliot, 1913, 'Rev. Primates,' II, (1912), p. 254), *Cercocebus fuliginosus* E. Geoffroy.

1841. *Æthiops* (subgenus of *Cercopithecus*) MARTIN, 'Gen. Introd. Nat. Hist. Mamm. Anim.,' p. 508. Proposed for the "White-eyelid Monkey," without designation of the species. Type, by tautonomy, *Simia æthiops* auct., not Linnæus.

1870. *Semnocebus* (subgenus of *Cercocebus*) GRAY, 'Cat. Monkeys, Lemurs and Fruit-eating Bats,' p. 27. Type, by monotypy, *Presbytis albigena* Gray. Not *Semnocebus* Lesson, 1840.

1903. *Lophocebus* PALMER, Science, (new ser.) XVII, May 29, p. 873. To replace *Semnocebus* Gray, preoccupied.

1904. *Leptocebus* TROUESSART, 'Cat. Mamm.,' Suppl., p. 15. To replace *Semnocebus* Gray, preoccupied = *Lophocebus* Palmer dated one year earlier.

1914. *Cercolophocebus* (subgenus of *Cercocebus*) MATSCHIE, Sitzungsb. Ges. Naturf. Fr. Berlin, p. 341. Type, by original designation, *Cercocebus aterrimus* (Oudemans). Also employed (*loc. cit.*, p. 342) as a full genus.

SPECIFIC AND SUBSPECIFIC NAMES REFERABLE TO *Cercocebus*

1775. *Simia æthiops* (not Linnæus) SCHREBER, 'Säugthiere,' I, p. 105, Pl. XX. Based on "Le Mangabey" of Buffon.

1792. *S.[imia] Cercopithecus æthiops torquatus* KERR, 'Anim. Kingd.,' p. 67, No. 39. = Mangabey à collier blanc, Buffon, 1766, 'Hist. Nat.,' XIV, p. 256, Pl. XXXIII. First available name; for specimens from Sierra Leone and Liberia.

1797. *Simia atys* AUDEBERT, 'Hist. Nat. Singes et Makis,' Family IV, Sect. 2, p. 13, Pl. VIII. "Indes Orientales" = West Africa. Unidentifiable; based on an albino from an unknown locality. Still preserved in the Paris Museum. (Cf. Elliot, 1913, 'Rev. Primates,' II, (1912), p. 262.)

1812. *Cercocebus fuliginosus* E. GEOFFROY, Ann. Mus. Hist. Nat., Paris, XIX, p. 97. = Le Mangabey, Buffon, 1766, 'Hist. Nat.,' XIV, Pl. XXXII. Locality unknown. Wrongly identified by Buffon with *Simia æthiops* Linnæus, "Syst. nat. edit. x, p. 28."[1] = *S. Cercopithecus æthiops torquatus* Kerr.

1821. ———*æthiopicus* F. CUVIER, 'Hist. Nat. Mamm.,' II, livr. XXXV. = *S.[imia] Cercopithecus æthiops torquatus* Kerr. Cuvier attributes the name to E. Geoffroy but gives no reference. The context indicates that *æthiopicus* F. Cuvier is a miscitation of *Cercocebus æthiops* E. Geoffroy (1812, Ann. Mus. Hist. Nat., Paris, XIX, p. 97). F. Cuvier does not give any generic name with his *æthiopicus*.

1843. *Cercocebus collaris* GRAY, 'List. Mamm. Brit. Mus.,' p. 7; 1870, 'Cat. Lemurs, Monkeys, and Fruit-eating Bats,' p. 27. Primarily the "Mangabey à collier blanc" of Buffon (1766, 'Hist. Nat.,' XIV, p. 256, Pl. XXXIII). Hence = *S.[imia] Cercopithecus æthiops torquatus* Kerr.

1850. *Presbytis albigena* GRAY, Proc. Zool. Soc. London, p. 77, Pl. XVI (animal). Based on an immature menagerie specimen from an unknown locality.

1853. *Cercopithecus lunulatus* TEMMINCK, 'Esquiss. Zool.,' p. 37. "Patrie. Habite les fôrets qui bordent la rivière Boutry, côte de Guiné." No type designated. First mangabey described from a definite locality.

1879. *Cercocebus galeritus* PETERS, Monatsb. Ak. Wiss. Berlin, p. 830, Pls. 1*B* (animal) and III (skull). Mitole, mouth of Osi and Tana Rivers, British East Africa.

1886. *Cercocebus agilis* R. RIVIÈRE, Rev. Scient., (3) XII, p. 15. Brief mention of the type specimen from "Congo français." Name credited to A. Milne-Edwards, but apparently here first published.

1890. *Cercopithecus aterrimus* OUDEMANS, Zool. Garten, XXXI, p. 267. Stanley Falls, right bank of the Congo. Type a half grown specimen that died in the Hague Zoölogical Gardens.

1899. *Cercocebus congicus* SCLATER, Proc. Zool. Soc. London, pp. 827–828, fig. "Terra Congica," without definite locality. "Based on a single female specimen living in the Antwerp Gardens and believed to have come from the district of Stanley Falls on the Upper Congo" (Pocock).

1900. *Cercocebus chrysogaster* LYDEKKER, Novit. Zool., Tring, VII, p. 279, Pl. III (animal). "Upper Congo," exact locality unknown. Type an immature specimen in the London Zoölogical Gardens.

1900. *Cercocebus hagenbecki* LYDEKKER, Novit. Zool., Tring, VII, December, p. 594; 1901, VIII, Pl. I, fig. 1. "Congo River," without definite locality. Type a young male in the London Zoölogical Gardens.

1900. *Semnocebus albigena johnstoni* LYDEKKER, Novit. Zool., Tring, VII, pp. 595–596. Northern end of Lake Tanganyika. Exact locality unknown. Type a very young animal sent alive to the London Zoölogical Gardens.

1900. *Semnocebus albigena rothschildi* LYDEKKER, Novit. Zool., Tring, VII, pp. 595–596; 1901, VIII, Pl. I, fig. 2. Exact type locality unknown. Based on a very young specimen in the London Zoölogical Gardens.

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[1]Elliot (1913, 'Rev. Primates,' II, (1912), pp. 261–263), disregarding the rule "Once a synonym always a synonym," wrongly substituted the specific name *æthiops* (*Simia æthiops* Schreber, not of Linnæus) for *Cercocebus fuliginosus* E. Geoffroy, he affirming that because *Simia æthiops* Linnæus is a *Lasiopyga* (=*Cercopithecus*) and *Simia æthiops* Schreber is a *Cercocebus*, "there is no law known that forbids the same specific name to be given to two species of different genera," he overlooking the fact that Schreber's use of the name *Simia æthiops* was simply a misidentification of *Simia æthiops* Linnæus.

1906. *Cercocebus hamlyni* Pocock, Ann. Mag. Nat. Hist., (7) XVIII, September, p. 208, Pl. vii. "Upper Congo, exact area unknown." Described "from a living female specimen, still with milk dentition."

1906. *Cercocebus jamrachi* Pocock, Ann. Mag. Nat. Hist., (7) XVIII, December, p. 454, Pl. xi (animal). "Molinga (? Mlungu), Lake Mweru." Described from a young male living in the Zoölogical Society's Gardens, London. = *Semnocebus albigena johnstoni* Lydekker (cf. Schwarz, 1910, Ann. Mag. Nat. Hist., (8) V, p. 529).

1910. *Cercocebus albigena zenkeri* Schwarz, Sitzungsb. Ges. Naturf. Fr. Berlin, p. 456. Bipindi, on the Lokundje River, Cameroon. Type an adult male skin and skull.

1913. *Cercocebus* (*Leptocebus*) *albigena ituricus* Matschie, Rev. Zool. Africaine, II, February, p. 208. Type, a male, from between Beni and Irumu, Ituri Forest. Based on "12 Felle mit 11 Schädeln, von Herrn Major Powell-Cotton im Gebiete des oberen Ituri erlegt und jetzt im Museum zu Quex bei Birchington." (Measurements of 8 adult skulls, p. 212.)

1913. *Cercocebus albigena ugandæ* Matschie, Rev. Zool. Africaine, II, February, p. 210 (in text). Entebbe, Uganda. Type an adult male skin and skull. = *Semnocebus albigena johnstoni* Lydekker.

1913. *Cercocebus* (*Leptocebus*) *albigena weynsi* Matschie, Rev. Zool. Africaine, II, February, p. 211. Sanga, Mayombe District, Belgian Congo. Type a mounted specimen with skull in the skin. = *Presbytis albigena* Gray.

1914. *Cercocebus fumosus* Matschie, Sitzungsb. Ges. Naturf. Fr. Berlin, p. 341. Northwest of Beni, Semliki River, Belgian Congo. Based on an adult female skin and skull.

1914. *Cercolophocebus cœlognathus* Matschie, Sitzungsb. Ges. Naturf. Fr. Berlin, July, p. 342. Near Kindu, on the Lualaba River, Belgian Congo. Type an immature female, skin and skull.

1915. *Cercocebus oberlænderi* Lorenz, Anz. Ak. Wiss. Wien, Math.-Nat. Kl., LII, p. 172. Near Mawambi, Ituri Forest, Belgian Congo. Three specimens, all from the same troop. Type not designated. See also Lorenz, 1917, Ann. Naturhist. Hofmus., Wien, XXXI, p. 230, Pl. xv, figs. 5, 6 (skull). Claimed to be distinct from *C. fumosus* Matschie (1914), from Beni.

The small group of African monkeys commonly known as mangabeys have an interesting and in some respects rather a peculiar history, from the fact that the greater part of the twenty-five described forms have each had for their original basis a single immature example, kept for a time in confinement, and the original habitat either quite unknown or conjectural. In very few cases was the type specimen an adult animal, or from a definitely known locality. Besides this, a singularly large proportion of these type examples have turned out to be merely albinistic, as later revisers have been able to prove. Prior to the beginning of the present century even the best known of the forms were represented in collections by only a few specimens.

The mangabey group appears to have been first made known by Buffon and Daubenton in 1766 ('Hist. Nat.,' XIV, pp. 244–257, Pls. XXXII and XXXIII), who described and figured two individuals, a male and a female, wrongly supposed to have been obtained in Madagascar. One of them differed from the other in having a white collar and white on the cheeks and front of the lower jaw. The one without the white collar is figured on Plate XXXII as "Le Mangabey," the other on Plate XXXIII as "Mangabey à collier blanc." The difference in color shown by the two specimens the authors thought might be due to age and sex rather than to difference of species.

Buffon, in a footnote to the name Mangabey (*loc. cit.*, p. 244), added to his comment on the name a partial transcript of the description of Linnæus' *Simia æthiops*, from the tenth edition (1758) of the 'Systema Naturæ.' The inference is that Buffon considered *Simia æthiops* the same species as the mangabey. In any case this probably led to the identification of Buffon's mangabey with *Simia æthiops* Linnæus by Schreber nine years later (1775, 'Säugthiere,' I, p. 105, Pl. XX).[1]

Buffon's "Le Mangabey," the *Simia æthiops* of Schreber (not of Linnæus), appears to have been first specifically named by E. Geoffroy in 1812 (Ann. Mus. Hist. Nat., Paris, XIX, p. 97), whose *Cercocebus fuliginosus* rests entirely on Buffon and Daubenton's description and figure (Pl. XXXII) of the mangabey. If there was a type specimen of Geoffroy's *C. fuliginosus* the fact is not indicated in the description, nor has the existence of such a type been shown.[2] This being the case it would seem reasonable to regard *C. fuliginosus* E. Geoffroy as indeterminate having been based on a specimen from an unknown locality.

Kerr, in 1792 ('Anim. Kingd.,' p. 67, No. 39) named the "Mangabey à collier blanc" of Buffon *S[imia] Cercopithecus æthiops torquatus*, which is the earliest available specific name for any mangabey. Similar specimens from "West Africa" became later the basis of the names *æthiopicus* F. Cuvier (1821) and *Cercocebus collaris* Gray (1843). Previously a wholly white mangabey, also from an unknown locality, was

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[1]See the fuller discussion of *Simia æthiops* Linnæus below (pp. 333–335).

[2]Geoffroy's entire account of his *Cercocebus fuliginosus* is as follows:

"I. C. enfumé. *Cercocebus fuliginosus.*

"Pelage brun-enfumé: sans taches sur la tête et le cou: les paupières supérieures blanches.

"*Simia æthiops.* Lin. Gm.
Mangabey. Buff., 14, fig. 32.
Mangabey. Aud., fam. 4, sect. 2, fig. 9.
Simia æthiops. Schreb., fig. 20.

"Habite. . . non à Madagascar; ce qui sur un renseignement inexact a été cru par Buffon."

In other words, it is "Le Mangabey" of Buffon, without the mention of any actual specimen. It is therefore not surprising that Elliot (1913, 'Rev. Primates,' II, (1912), p. 262) should not have found the type in Paris. He says: "The type of E. Geoffroy's species is not to be found in the Paris Museum, the oldest [specimen] there being one which died in the Menagerie in 1821, nine years after the species was described, but no indication is given as to whether it was the type or not."

named *Simia atys* by Audebert (1797). As shown below, the mangabeys of the *albigena* and *aterrimus* groups are now known to be especially subject to albinism.

The first species of the mangabey group described from a wild specimen from a definitely known locality appears to have been *Cercopithecus lunulatus* Temminck (1853), collected by the explorer Pel on the Gold Coast.[1] As said by De Winton in 1902: "For some unknown reason *Simia æthiops* has been applied by most modern writers to a species of mangabey (*Cercocebus*) . . . The Mangabey referred to has no claim, therefore, to the name *æthiops*, and should be called *Cercocebus lunulatus*, Temm."[2] = *S. Cercopithecus æthiops torquatus* Kerr, the first available name and based upon Buffon's "Mangabey." Used for specimens from Sierra Leone and Liberia; *C. lunulatus* being from the Gold Coast.

Only three other forms of the twelve described between 1853 and 1910 were based on wild-killed specimens from definitely known localities: *galeritus* Peters (1879), *agilis* Rivière (1886), *zenkeri* Schwarz (1910). The others were based on young specimens (some of them with only the milk teeth) received alive at menageries from unknown localities, usually given as "Upper Congo." The five of the six added later (1913–1915) were founded on one or more adult specimens from known points. Most of these forms come within the scope of the present paper and are referred to in more or less detail below.

The mangabeys (*Cercocebus*) have recently been revised by two authors, Pocock in 1906[3] and Elliot in 1913.[4] Elliot's revision includes one form described after the publication of Pocock's paper. Pocock recognized twelve forms (ten species and two additional subspecies). Elliot reduced the same forms to nine species and two subspecies, two of Pocock's species described as new being placed in synonymy by Elliot, on the ground that both were based on albinistic menagerie specimens from unknown localities.

While there is close agreement between these two authors as to the number of forms entitled to recognition and their status, there are several important discrepancies in nomenclature, due to the determina-

[1] Elliot says (1913, 'Rev. Primates,' II, (1912), p. 263), "The type of *C. lunulatus* Temm. is not in the Leyden Museum, nor any specimen bearing that name." This is perhaps not strange, if we recall that Schlegel (1876, 'Les Singes,' Mus. Hist. Nat. Pays-Bas, VII, p. 96) synonymized *Cercopithecus lunulatus* Temminck with his *Cercocebus æthiops*, citing under the latter five specimens, all from Côte d'Or, four of them credited to "voyage de Pel." The same specimens are listed by Jentink in 1892 ('Cat. Syst. Mamm,' Mus. Hist. Nat. Leyden, XI, p. 25) in the same way—as *Cercocebus æthiops* Linnæus.

[2] 1902, in Anderson, "Zool. Egypt,' Mamm., p. 15.

[3] Pocock, R. I. 1906, 'On the Genus *Cercocebus*, with a Key to the known Species.' Ann. Mag. Nat. Hist., (7) XVIII, October, pp. 278–286.

[4] Elliot, D. G. 1913, 'Rev. Primates,' II, (1912), June, pp. 254–272, Pl. XXVIII (skull of *Cercocebus torquatus*), Pl. XXIX (skull of *Cercocebus aterrimus*), Pl. IX (front view of *C. torquatus* and *C. albigena*).

tion of the name *Simia æthiops* as used by Linnæus, Schreber, E. Geoffroy, and later authors, as shown in the following tabular comparison. Elliot recognized two subgenera, *Cercocebus* and *Lophocebus*, placing under the latter the *albigena-aterrimus* group. A tabular comparison of the results of these two revisions follows.

Species and Subspecies of *Cercocebus*

Pocock, October 1906 Genus *Cercocebus*	Elliot, June 1913 Subgenus *Cercocebus*
1. *C. fuliginosus* E. Geoffroy	1. *C. torquatus* (Kerr) Syn. *æthiops* E. Geoff., not Linnæus, not Schreber Syn. *æthiopicus* F. Cuvier Syn. *collaris* Gray
2. *C. lunulatus* (Temminck) Syn. *C. æthiops* Geoffroy, not Linnæus	2. *C. æthiops* (Schreber), not Linnæus Syn. *C. fuliginosus* E. Geoffroy
3. *C. æthiopicus* F. Cuvier Syn. *collaris* Gray	3. *C. lunulatus* (Temminck) Syn. *æthiops* I. Geoffroy
4. *C. chrysogaster* Lydekker	4. *C. chrysogaster* Lydekker
5. *C. hagenbecki* Lydekker	5. *C. hagenbecki* Lydekker
6. *C. agilis* Rivière	6. *C. agilis* Rivière
7. *C. galeritus* Peters	7. *C. galeritus* Peters Subgenus *Lophocebus*
8. *C. albigena* (Gray) Syn. *aterrimus* Oudemans	8. *C. albigena* (Gray)
8a. *C. albigena johnstoni* Lydekker	8a. *C. albigena johnstoni* Lydekker Syn. *jamrachi* Pocock, December 1906
8b. *C. albigena rothschildi* Lydekker	8b. *C. albigena zenkeri* Schwarz
9. *C. congicus* Sclater	9. *C. aterrimus* (Oudemans) Syn. *congicus* Sclater Syn. *albigena rothschildi* Lydekker Syn. *hamlyni* Pocock
10. *C. hamlyni* Pocock	

The mangabeys, like the guenons, vary considerably in external characters, as coloration, nature of the pelage, and especially the development or absence of hair tufts and crests on the head. Several subgenera based on such differences have been proposed and have met with acceptance by some authors and considered needless by others. Elliot employed two, *Cercocebus* and *Lophocebus*, and made a full genus (*Rhinostigma*) for the little known *Cercopithecus hamlyni* Pocock. No characters of generic or even subgeneric importance have been alleged for it, this genus even now being known only from three young specimens in captivity. It is certainly closely related to the *Lophocebus* group. Matschie's proposed

subgenus (or genus, as he employed it with both values) *Cercolophocebus* is superfluous.

Note on *Simia æthiops* Linnæus

Linnæus' *Simia æthiops* was exclusively based on Hasselquist, who states that the Ethiopian monkey was brought down to Egypt from Ethiopia in numbers by the negroes. Linnæus' original description of this monkey in Hasselquist's 'Iter Palæstinum' (1757, p. 190) is, in part, as follows:

> Color: Caput, Dorsum, Latera, Cauda & Crura supra ex cano & viridescente mixta. Facies nigrescens. Abdomen, gula & crura subtus candida. Crura anterius cana. Cauda subtus ferrugina. Linea candida tenuis, proxime super supercilia, transversaliter per frontem extensa.

In this description there is no mention of white eyelids, as there is in the later versions. The phrase "Palpebra superior nuda, alba" is added first in the tenth edition of the 'Systema Naturæ' (1758, p. 28, No. 14), repeated in the 'Museum Adolphi Friderici' (1764, II, p. 4), and in the twelfth edition of 'Systema Naturæ' (1766, p. 39, No. 19), where it appears as "Palpebræ superiores albæ." The original description is the most detailed and fullest; it is greatly abridged and otherwise altered in the tenth edition of the 'Syst. Nat.'; again expanded and modified in the 'Museum Adolphi Friderici,' and again abbreviated and altered in the twelfth edition of the 'Syst. Nat.,' where *æthiops* is given the status of a variety under *Simia cephus*, with "Habitat in Guinea" instead of "in Æthiopia." It is thus not the *Simia æthiops* of Hasselquist's 'Iter Palæstinum,' nor of the tenth edition of the 'Syst. Nat.,' which is obviously based exclusively on the description in Hasselquist. Furthermore, no mangabey is known from the region whence Hasselquist's Ethiopian monkey could have been brought. If the twelfth edition of Linnæus' 'Syst. Nat.' be taken as the final basis of *æthiops*, the species became so transformed as to be meaningless. If taken from the tenth edition, where its sole basis is Hasselquist, it is clearly the *Cercopithecus* (=*Lasiopyga*) of the Nile Valley, and by no possibility a mangabey.

De Winton, in Anderson's 'Zoology of Egypt' (1902, Mamm., p. 15) thus correctly and emphatically stated the case as follows:

> There can be no question as to the species indicated by Linnæus in his account of Hasselquist's journey to Egypt and Palestine, published after the death of that traveller. In the 10th edition of the 'Systema Naturæ' the same name (*S. æthiops*) is applied to this animal, which is unquestionably the green monkey [*Lasiopyga æthiops* Linnæus] of the Upper Nile Valley and Abyssinia. In the 12th edition of the 'Systema' Linnæus unfortunately only mentions this name in connection with a variety of another species from West Africa. . . .

For some unknown reason *Simia æthiops* has been applied by most modern writers to a species of Mangabey (*Cercocebus*). There is nothing in the original description applicable to any member of that genus, while every word agrees perfectly with the monkey under notice, which, as Hasselquist mentions, is so frequently seen in captivity in Egypt. It has been said, in excuse for this view, that Linnæus described the *eyelids* as white. This is an error for not only did the white band mentioned not affect the *eyelids*, but it was placed *above the eyebrows*. The description runs: "linea candida tenuis, proxime super supercilia, transvaliter per frontem extensa."[1] The Mangabey referred to has no claim, therefore, to the name *æthiops*, and should be called *Cercocebus lunulatus* Temm.[2]

The confusion of *Simia æthiops* with the mangabeys in technical nomenclature began with Schreber in 1775 ('Säugthiere,' I, p. 105, Pls. XX and XXI), who adopted the name from Linnæus but, misled probably by Buffon, confounded it with Buffon's Le Mangabey. Schreber's *Simia æthiops* was composite, his citations including Linnæus while his description and plates were based on Le Mangabey of Buffon (1766, 'Hist. Nat.,' XIV, pp. 244–257, Pls. XXXII and XXXIII). Schreber's plates are accredited copies of Buffon's. Erxleben, Gmelin, and many later authors continued the confusion, which still persists (e.g., Elliot, 1913), the name *æthiops* of Linnæus having incorrectly been replaced by *Cercopithecus griseoviridis* Desmarest (1820).

Buffon (*loc. cit.*, p. 244 and footnote) says of his Le Mangabey: "Nous avons eu deux individus (pl. XXXII & XXXIII) de cette espèce de Guenons ou Singes à longue queue; tous deux nous ont été donnés sous la dénomination de *Singes de Madagascar*. . . ." He says in a footnote to the name Le Mangabey: "*Mangabey*, nom précaire que nous donnons à cet animal en attendant qu'on sache son vrai nom; comme il se trouve à Madagascar, dans les terres voisines de Mangabey, cette dénomination en rappellera l'idée aux Voyageurs qui seront à portée de le voir & de s'informer du nom qu'il porte dans cette île qui est son pays natal." These statements are followed by an abridged transcript of Linnæus' description of *Simia æthiops* from his "Syst. nat. edit. X, page 28," which includes the phrase "palpebra superior, nuda, alba." As shown above, this misleading and erroneous characterization is not present in the original description given in Hasselquist. There can be no further doubt that the correct name for Hasselquist's Egyptian guenon is *Simia æthiops* Linnæus = *Lasiopyga æthiops* (Linnæus) with *griseoviridis* Desmarest as synonym; the first available name for Buffon's Mangabey is as

[1][This quotation is from the original description in Hasselquist, and does not occur in either edition of Linnæus' 'Syst. Nat.,' as is shown on a preceding page.]

[2]*C. lunulatus* is the species from the Gold Coast, whereas the first available name for the mangabey based upon *S. æthiops* Linnæus is *S. Cercopithecus æthiops torquatus* Kerr.

previously stated (p. 330) *S. Cercopithecus æthiops torquatus* Kerr = *Cercocebus torquatus* (Kerr).

A recent revision of the *Simia æthiops* group by Wettstein[1] is of interest in the present connection. Wettstein recognizes two very different groups of species of green monkeys (guenons; subgenus *Chlorocebus*) in northeast Africa, one northern, the other southern, each comprising a number of forms, to each of which he gives the rank of species (*loc. cit.*, p. 639). The northern is brownish yellow above and without an evident green tone; the southern group has the upperparts distinctly green or yellowish green. The range of the northern group is given as North Abyssinia, Eritrea and the Atbara region, and also the lower Blue Nile and the White Nile below Khartum. He says it comprises three forms, as yet undescribed. The southern group occupies the region between the White Nile and the Blue Nile, extending on the former to Goz Abu Guma, and on the latter north to Wad Medani, but does not reach Kordofan. This group he says also comprises three forms as yet undescribed.

Two females, one adult, the other immature obtained by him near Kadugli, southern Kordofan, form the basis of a new species, *Cercopithecus toldti* (*loc. cit.*, p. 645).

Three species are formally recognized, as follows:

"1. *Cercopithecus* (*Chlorocebus*) *cailliaudi* nov. spec."

Founded on two skins in the Berlin Museum (which, however, at the time he wrote were not, he says, available for description) and on the plate (but excluding the text) of F. Cuvier's "grivet." The type is a specimen collected on the lower Blue Nile by Werne. The species is said to be distinguished from *C. griseoviridis* Desmarest by the absence of a green tone in the color of the upperparts.

"2. *Cercopithecus* (*Chlorocebus*) *griseoviridis* Desm." [= *Lasiopyga æthiops* (Linnæus).]

Four specimens are referred to this species, all from Senaar (right bank of the Blue Nile).

"3. *Cercopithecus* (*Chlorocebus*) *toldti* nov. spec."

Based on two females (only one adult) taken by the expedition at Jebel Rihal near Kadugli, South Kordofan.

Wettstein devotes several pages to the literature and nomenclature of the *Lasiopyga æthiops* group, which are of much historical interest. He, of course, accepts the long current view that *Simia æthiops* Linnæus is a mangabey.

[1]Wettstein, Otto von. 1918, 'Bearbeitung der auf der Expedition gesammelten Vögel und Säugetiere.' Denkschr. Ak. Wiss. Wien, Math.-Nat. Kl., XCIV, (1917), pp. 555–693, Pls. I–IV, text figs. 1–13, and map. Mammals, pp. 638–689 (pp. 84–135 of the author's separata).

Cercocebus agilis Rivière

Plates LXXXIV, LXXXV

Cercocebus agilis (*ex* A. Milne-Edwards, Ms.) RIVIÈRE, 1886, Rev. Scient., (3) XII, p. 15. Congo français, without definite locality. Type an adult male, skin and skull (Pousargues). Description merely a brief mention; name credited to Milne-Edwards, from the type specimens in the Paris Museum.

Cercocebus agilis POUSARGUES, 1896, Ann. Sci. Nat., Paris, (8) III, pp. 229–235. Congo français; 5 specimens, including the type. A detailed description based on this material, and discussion of its relation to *C. galeritus*.

Cercocebus agilis POCOCK, 1906, Ann. Mag. Nat. Hist., (7) XVIII, October, p. 282.

Cercocebus agilis ELLIOT, 1913, 'Rev. Primates,' II, (1912), p. 264. Redescription of the type in the Paris Museum.

Cercocebus chrysogaster LYDEKKER, 1900, Novit. Zool., Tring, VII, August 20, p. 279, Pl. III. Based on an immature captive specimen in the Garden of the Zoölogical Society of London, "sent from the Upper Congo." Locality of capture unknown.

Cercocebus chrysogaster POCOCK, 1906, Ann. Mag. Nat. Hist., (7) XVIII, p. 280. Interesting comment on the type specimen in amplification of the original description.

Cercocebus chrysogaster ELLIOT, 1913, 'Rev. Primates,' II, (1912), p. 264. Redescription of the type, without comment.

Cercocebus hagenbecki LYDEKKER, 1900, Novit. Zool., Tring, VII, p. 594; idem, 1901, VIII, Pl. I, fig. 1. Based on a very young captive specimen in the Gardens of the Zoölogical Society of London, "from the Mobangi [Ubangi] River, 300 miles above the junction with the Congo."

Cercocebus hagenbecki POCOCK, 1906, Ann. Mag. Nat. Hist., (7) XVIII, p. 281. Redescribed from the type specimen, with comment.

Cercocebus hagenbecki ELLIOT, 1913, 'Rev. Primates,' II, (1912), p. 265. Redescription from two adult specimens in the British Museum, for which neither sex nor locality is given.

Cercocebus fumosus MATSCHIE, 1914, Sitzungsb. Ges. Naturf. Fr. Berlin, July, p. 341. "Im Urwalde nordwestlich von Beni am Semliki," Belgian Congo. Skin and skull of an adult female.

Cercocebus oberlænderi LORENZ, 1915, Anz. Ak. Wiss. Wien, Math.-Nat. Kl., LII, p. 172. Ituri Forest, near Mawambi. Three specimens, adult male and female and a young specimen.

Cercocebus oberlænderi LORENZ, 1917, Ann. Naturhist. Hofmus., Wien, XXXI, p. 230, Pl. XV, figs. 5, 6 (skull). Maintains its distinctness from *C. fumosus* Matschie, against Matschie's statement in a letter.

Cercocebus sp. (*agilis* group) LÖNNBERG, 1919, Rev. Zool. Africaine, VII, p. 143. Three native skins in a bad state and received from unknown locality in French Congo (région de la Sanga).

Represented by 36 specimens, collected as follows:

Faradje, 2 (♀ and embryo), November 23, 1911.

Akenge, 13, September 22–October 21, 1913.

Niapu, 19, November 9–December 10, 1913.

Panga, 1, September 21, 1914.

Penge, 1, April 21, 1914.

Twenty of the specimens are fully adult; in eight immature specimens the last molar is undeveloped or only partly up; in six younger immature specimens only the milk teeth are present in four, while in two the first permanent molar is partly up. Males and females are about equally represented. All but two of the series were measured in the flesh, and of two the complete skeleton is preserved.

The external measurements—average (minimum-maximum)—of twenty adults of *Cercocebus agilis*, taken from animals in the flesh, are as follows:

	Total Length	Head and Body	Tail Vertebræ	Hind Foot	Ear
10 ♂	1292(1235–1390)	543(515–580)	748(690–785)	177(162–193)	40(35–45)
10 ♀	1117(1035–1190)	473(440–520)	643(590–695)	152(143–159)	38(36–41)

The cranial measurements—average (minimum-maximum)—of nineteen adults of *Cercocebus agilis* are as follows:

	Greatest Length	Condylobasal Length	Occipitonasal Length
10 ♂	128.9(122.7–137.0)	98.8(92.5–106.3)	105.2(99.8–109.2)
9 ♀	112.1(100.7–117.6)	83.0(82.0– 86.2)	94.3(90.3– 99.3)

	Zygomatic Breadth	Orbital Breadth	Postorb. Constr.
10 ♂	76.6(81.2–88.5)	68.4(65.0–78.6)	47.8(45.0–49.7)
9 ♀	74.6(71.4–79.0)	58.4(57.0–60.2)	45.7(44.2–47.2)

	Mastoid Breadth	Length Nasals	Upper Toothrow	Upper Molars
10 ♂	68.0(64.3–71.5)	28.8(25.1–31.8)	41.7(40.4–43.6)	22.7(21.7–23.4)
9 ♀	60.7(57.0–64.5)	23.1(21.5–25.8)	37.4(36.5–38.4)	21.7(21.0–22.3)

Immature Pelage.—Young specimens with only the milk teeth developed differ very little in color from adults, but the pelage is softer, shorter and much thinner, with an evident appearance of immaturity. The distribution of the color areas is the same, but usually the tones are rather weaker. The youngest example of all is the only specimen without a skull. Judging from the external measurements, in comparison with those of others which have only the milk teeth, it appears probable that it had not acquired the full milk dentition. The pelage is short and thin, and the darker areas are less dark than in the older examples, except on the hind part of the head, while on the front and sides of the head the second coat has begun to replace the first. In the others next in age none of the natal coat is positively distinguishable.

Sexual Variation.—There is no recognizable sexual color difference in the present species. There is, however, the usual pronounced sexual difference in size and in the dentition and cranial characters characteristic of the mangabeys. In no instance do the external or the

cranial measurements of females overlap those of males. (See measurements above, p. 337.)

INDIVIDUAL COLOR VARIATION.—In the present large series of specimens (of which thirteen are from Akenge and nineteen from Niapu) the range of purely individual variation in coloration is exceptionally small, consisting in moderate variations in intensity of tone of the pelage as a whole, and of the annulations of the tips of the hairs.

The upperparts are darkish brown, strongly speckled with pale yellow, varying in different individuals from the same localities in the degree of darkness, toned with reddish, which also varies greatly in amount in different individuals strictly comparable as to sex, age and locality. The hairs individually are gray basally and barred apically with narrow bands of light yellowish varying in different specimens from light olive-buff to tawny olive, and also in breadth; usually much broader on the head, nape and shoulders than on the rest of the body and the limbs. In some specimens the head hairs are banded with very narrow and very pale rings, which sometimes do not greatly affect the general tone of coloration while in other comparable specimens the rings are so much broader and so deeply colored as to form the prevailing color.

The underparts and inside of the limbs vary from pale gray or grayish white, or nearly white, to pale yellowish and pale gold. The skin of the under surface of the body, which always shows through the thin pelage, varies from dull brownish gray to deep yellow, and strongly determines the color effect of the underparts.

An indistinct band of pale grayish white extends posteriorly from the base of the ears along the sides of the nape, varying in color from nearly white to pale gray, the hairs individually white or whitish at base passing into gray apically.

In some specimens there is an incipient band on the forehead, particularly in immature specimens, consisting of whitish, or mixed white and black, or wholly black hairs not usually present in old adults.

The amount of black on the upper surface of the tail is extremely variable. While usually blackish, sometimes nearly black medially, the apical eighth or more is much lighter, or grayish, and sometimes (dorsally) wholly black or blackish. The hands are black, the feet dark gray, with a slight mixture of black hairs on the toes. The hair whorl on the front of the head (Pl. LXXXV) is conspicuously present in the greater part of the series, whether adult or immature; it is quite lacking in a few, and only slightly indicated in a few others.

NOMENCLATURE AND DISTRIBUTION.—*Cercocebus agilis* was very briefly and informally indicated by É. Rivière in 1886, from an adult male sent from French Congo by M. de Brazza, no definite locality being indicated.[1] The type, however, was preserved in the Paris Museum, and formed part of the material on which Pousargues based his detailed description of the species in 1896, which included measurements of the type skull. He made a careful comparison of *C. agilis* with *C. galeritus*, on the basis of Peters' description of the latter, reaching the conclusion that *C. agilis* should be regarded as specifically distinct from *C. galeritus* of East Africa. Of the five specimens of *C. agilis* which Pousargues records, definite localities are given for only three of them, of which one was taken at the confluence of the rivers Congo and Ubangi, the other two at the "Poste des Ouaddas," about 400 miles north of the mouth of the Ubangi.

Later authors have added but little to our knowledge of the distribution of the original *C. agilis* as currently understood. Lönnberg (1919) has referred three badly preserved native skins from an unknown locality in French Congo and a young mounted specimen "from Nyangwe" (on the Lualaba River, about 300 miles south of Stanleyville) to the "*agilis* group."

Two supposed species (*chrysogaster* and *hagenbecki* Lydekker) have been based on immature menagerie specimens, from unknown localities, supposed to be somewhere in "Upper Congo"; another has been described from Mawambi (*oberlænderi* Lorenz), and a fourth (*fumosus* Matschie) from Beni, on the Semliki River. The first two have no grounds for serious consideration, and the other two present no alleged characters that are not shown by the present series of specimens from Akenge and Niapu. It is possible that a good series from the type locality of *fumosus* might warrant its recognition as a local race of *agilis;* others may yet remain to be defined, as there is evidence that the *agilis* group has an extended geographic range, as yet imperfectly known.

Pocock (1906) in his remarks on *C. agilis* calls attention to several discrepancies between Pousargues' description of the species and Trouessart's[2] based on the same specimen, adding: "The discrepancies between the two descriptions taken by two authors of repute from the same specimen are difficult to reconcile. They are also highly instructive as emphasizing the magnitude of the personal equation to be reckoned with in judging of species from published diagnoses." Elliot's descrip-

[1]Rivière attributes the name to Milne-Edwards, but Rivière here first gave it publication.
[2]1897. Le Naturaliste, p. 9.

tion, made years later from the same type specimen, differs also in important points from either Pousargues' or Trouessart's, notably in his statement, both "hands and feet black," and in other particulars, thus adding emphasis to Pocock's reference to the "personal equation" in descriptions by different authors of the same specimens, not to mention species. Besides this is the difference in color effect of the same specimen in different lights, as a morning and afternoon light in the same exposure.

Cercocebus chrysogaster and *C. hagenbecki* of Lydekker are both accepted by Pocock, apparently without reservation. He says however of *chrysogaster:* "The describer's statement that this species differs from all other species of *Cercocebus* as well as from all species of *Cercopithecus* in the bright orange coloration of the under surface was made in forgetfulness of the fact that Pousargues had already ascribed a similar coloration to the belly of *Cercocebus agilis. . .* " Under *C. agilis* Pocock says: "I have not seen any specimen which exactly fits the descriptions [of *agilis*], though the latter apply pretty closely to mangabeys we commonly receive from the Congo and call *C. hagenbecki.*" Yet owing to certain differences in the prevailing tone of the upperparts and of the annulations of the hairs he separates "the two forms specifically, although strongly suspecting they will ultimately prove to be at most merely local races (that is to say, subspecies) of one and the same species." Elliot, on the other hand, accepts both *chrysogaster* and *hagenbecki* as full species without reservation. Elliot's redescription of *hagenbecki* is from two adult specimens in the British Museum, which differ "from the young in color, in having the head and back more tawny, the yellow markings of the young having changed to tawny." He gives measurements of one of the adult skulls, but does not state where the adult specimens were obtained. His skull measurements indicate an unusually large male, which is exceeded however by one from Akenge in the present series. The type was a young specimen with the milk teeth only.

Cercocebus fumosus Matschie was based on an adult female skin and skull from the forest northwest of Beni. The characters given relate to the color of the annulations of the hairs on the head and upperparts stated to be not yellowish but putty-colored, the presence of a tuft of whitish hair behind the ears, etc., which are individualistic and not racial, being in no way indicative of a local form. Lorenz's *Cercocebus oberlænderi* (1915, *loc. cit.*, p. 172) described a few months later from three specimens (two adult and one very young) from the Ituri forest near Mawambi, likewise lacks distinctive features as a local form. In a

later fuller description by Lorenz (1917, *loc. cit.*, p. 230) he defends its distinctness from *C. fumosus* Matschie, against the latter's (in a letter to Lorenz) reference of it to *fumosus*.

Cercocebus albigena ituricus Matschie

Plates LXXXVI, LXXXVII

Cercocebus albigena subsp. *albigena* Pocock, 1906, Ann. Mag. Nat. Hist., (7) XVIII, October, p. 286 (part).

Cercocebus albigena johnstoni (not Lydekker) Schwarz, 1910, Ann. Mag. Nat. Hist., (8) V, p. 530, part, Sitzungsb. Ges. Naturf. Fr. Berlin, December, p. 456, part. "Upper Congo." Not "Uganda and Lake Mweru."

Cercocebus albigena [*albigena*] Elliot, 1913, 'Rev. Primates,' II, (1912), p. 266, part. "Congo Free State, West Africa."

Cercocebus (*Leptocebus*) *albigena ituricus* Matschie, 1913, Rev. Zool. Africaine, II, February, p. 208. Ituri Forest, between Beni and Irumu. Type an adult male, skin and skull. Also 11 other specimens from the Upper Ituri, collected by Powell-Cotton.

Cercocebus (*Lophocebus*) *albigena ituricus* Lönnberg, 1917, Kungl. Sven. Vet. Ak. Handl., Stockholm, LVIII, No. 2, p. 37, Pl. xii, figs. 1, 2 (skull). Five specimens from Beni, 2 from Rutshuru.

Cercocebus albigena ituricus Lorenz, 1917, Ann. Naturhist. Hofmus., Wien, XXXI, pp. 232–235. Four specimens from Moëra (near Beni), two from Ukaika, one from between Mawambi and Irumu.

Cercocebus albigena mawambicus (*ex* Matschie Mss.) Lorenz, 1917, idem, pp. 233–234. Mawambi. Not accepted by Lorenz.

Cercocebus albigena ituricus Lönnberg, 1919, Rev. Zool. Africaine, VII, p. 144. Seventeen specimens from localities between Semliki River in the Ituri district and Bafuka in the Uele District.

Represented by 51 specimens accompanied by 6 skeletons, collected as follows:

Bafuka, 3 (adult ♀), March 13, 25, 1913.

Poko, 1, August 1913.

Akenge, 21, September 27–October 29, 1913.

Niapu, 5 (4 adult, 1 young), November 20–28, 1913.

Medje, 2 (adult ♂ and ♀), April 5, 1910; July 20, 1914.

Gamangui, 8 (7 adult ♂, 1 adult ♀), January 31–February 13, 1910.

Ngayu, 1, December 18, 1909.

Avakubi, 5 (all adult, 4 ♂), October 25, 1908; December 18, 1913; February 12 and August 22, 1914.

Risimu, 3, September 8–11, 1909.

Ukaturaka, 2 (flat skins), April 1915.

The external measurements—average (minimum-maximum)—of twenty-nine adults of *Cercocebus albigena ituricus*, taken from animals in the flesh, are as follows:

	Total Length	Head and Body	Tail Vertebræ	Hind Foot	Ear
15 ♂	1462(1365–1510)	576(540–615)	886(820–940)	186(179–196)	39(36–42)
14 ♀	1313(1210–1425)	503(435–580)	810(740–895)	166(155–183)	38(35–40)

The cranial measurements—average (minimum-maximum)—of thirty-five adults of *Cercocebus albigena ituricus* are as follows:

	Greatest Length	Condylobasal Length	Occipitonasal Length
20 ♂	126.2(122.4-132.0)	97.8(90.2-104.8)	107.5(103.4-112.0)
15 ♀	116.6(109.6-125.3)	88.9(82.7- 95.5)	100.8(94.2-109.3)

	Zygomatic Breadth	Orbital Breadth	Postorb. Constr.
20 ♂	81.6(79.8-83.6)	62.8(59.8-66.4)	46.4(44.0-49.2)
15 ♀	75.3(71.5-77.7)	57.2(54.4-59.5)	44.7(43.0-47.6)

	Mastoid Breadth	Length Nasals	Upper Toothrow	Upper Molars
20 ♂	68.7(65.5-72.5)	27.1(25.2-31.6)	38.3(36.3-41.5)	20.7(19.0-22.3)
15 ♀	64.8(61.5-69.8)	24.6(21.2-28.4)	34.7(32.4-37.0)	20.2(18.6-21.0)

The series comprises twenty fully adult males and fifteen fully adult females; one other has all the permanent teeth, but the canines are not fully grown; five others have the last molars just breaking through the gum or partly up; the rest are still younger, ranging in age from a few weeks to probably a year or more.

This material thus affords an opportunity to trace the pelage changes from the natal coat to the fully adult condition; also individual variation in a large series of adults, of which fifteen are from a single locality (Akenge), all collected during a period of thirty-one days (September 29–October 29).

Immature Pelage.—The youngest of the series (No. 52602, ♂, Akenge; total length 645 mm., greatest length of skull 75) has not fully acquired the milk dentition, only the incisors having pierced the gum, the canines and molars being below the alveolar plane. The pelage is everywhere uniform black, short and silky. The upperparts of the body, the head, limbs and tail are thickly clothed; the nape, sides of the neck and underparts scantily covered, the skin everywhere showing through the hair. No. 52608 (Pl. LXXXVI, fig. 2), ♂, Akenge (total length 570, greatest length of skull 74) is slightly smaller but at the same stage of tooth development. The skin is not well preserved but evidently is similar to the one above described in coloration and character of pelage.

Two other specimens represent a slightly more advanced stage, the coat being much thicker and longer, the whole body better clothed. The

smaller of the two (No. 52610, ♀, Akenge; total length, 660; greatest length of skull, 77) has the milk teeth fully developed except the last molar, the crown of which is still below the alveolar border. The foreneck and chest are still thinly haired. The hairs of the nape and sides of the head have a seal-brown tone at base and black tips, forecasting the adult pattern of coloration. Otherwise the pelage differs from that of the younger stages only in the greater length and thickness of pelage and especially in the lengthening of the hairs of the forehead and superciliary region. The hairs of the occipital region are directed forward.

The other (No. 52605, ♂, Akenge; total length, 720; skull missing) is larger and older. It differs from No. 52610 only in a slight increase in the length and thickness of the pelage, and in the stronger brownish tone of the basal half of the hairs of the nape, sides of the head and neck, and its extension to the sides of the body.

A considerable gap in the series of immature specimens occurs between the example last described and the next in age, a young female from Risimu (No. 52583; total length, 1010 mm.; greatest length of skull, 93.5). In this individual the middle pair of milk incisors has been replaced by the permanent teeth, and the crown of the second permanent molar has reached the alveolar plane. The whiskers are thin and directed backward; the anterior are grayish passing into light brown posteriorly. Soft, fine brown hairs cover the sides of the crown from the front base of the ears posteriorly and merge with those of the nape. The long black hairs of the upper surface of the head are directed backward, and with the softer long brown hairs of the nuchal region form a high occipital crest, the longer hairs of which have a length of 50 to 60 mm. The entire nuchal region posteriorly to the interscapular area is heavily clothed with long, soft, brown hair, which extends laterally to the sides of the neck and thence posteriorly and laterally over the scapulars to the sides of the body and on the arms to the elbows. The foreneck, chest and sides of the ventral area are thinly clothed with dark brown hairs tipped with black, passing into black on the midventral area. Inside of thighs brownish black. The limbs elsewhere intense black, like the tail and back.

Four or five other specimens, mostly from Akenge and of about the same age, are similar in general coloration except that the brown of the nape and shoulders varies in extent in different individuals, especially along the sides of the body and on the ventral surface. These examples are adult as regards their pelage, in some of which it shows abrasion from wear.

With advancing age the cheeks gradually lose the thin covering of hair present in the young, in old age the whole face and interramal region being usually quite nude.

COLOR VARIATION IN ADULTS.—Adults vary but little in color tones, but considerably in the extent of the brownish areas. The underparts range from wholly black to wholly brown, the latter varying from dark brown to a much lighter shade. This variation is usually correlated with the extent and tone of the brown of the nape and shoulders. The head, back, limbs and tail are intense black. The nape from the posterior border of the crest to or somewhat beyond the shoulders, as well as the sides of the neck and shoulders, are brown (light seal-brown to pale sepia); this color extends often across the chest and along the sides of the body to a varying extent, and also to the upper arm, sometimes as far as the elbow. The inside of the thighs is usually intense black, but sometimes is toned quite strongly with brown. The hair along the back is black to the base, but toward the lateral border the proximal third or half is often strongly toned with brown, this feature varying in different individuals.

The crest hairs of the head vary in position and length in different specimens, sometimes being placed laterally and forming horn-like tufts, in others massed centrally on the occiput. The hairs of the brow-band are stiff, black, and directed backward; those of the posterior border of the crest are reversed (directed forward) and of greater length than the black hairs.

In adults the hair of the upperparts is directed obliquely backward from the midline of the back, and attains the great length of from 100 to 150 mm. or more. The lower soft brown hairs of the occipital crest have a length of 90 to 110, and the brown shoulder hairs often exceed this length.

VARIATION IN SIZE AND IN CRANIAL CHARACTERS.—The following comparisons are based on fully adults, as indicated by the measurements given above (p. 342), the specimens being nearly all from within a radius of less than fifty miles, nearly one-half of them from the same locality.

The males, in both external and cranial measurements, are about one-twelfth larger than the females. There are no obvious sexual differences in coloration or in the length of pelage.

Individual variation in cranial and dental characters is about the same in character and amount as in the *Colobus* monkeys and guenons, and does not here require special consideration, except to call attention to the variability of the last molar in both the upper and lower dentition.

NOMENCLATURE OF THE *Cercocebus albigena* GROUP.—The earliest described form of the crested mangabeys (subgenera *Lophocebus* and *Cercolophocebus* of some authors) was described by Gray in 1850 as *Presbytis albigena* (Proc. Zool. Soc. London, p. 77, Pl. XVI, animal) from an immature specimen, supposed to have come from "West Africa," that had lived in the Society's Menagerie. No other specimen is mentioned, nor is there any reference to its cranial characters, sex or age. Gray in 1870 ('Cat. Monkeys, Lemurs, and Fruit-eating Bats,' p. 27) refers to it a specimen collected by Du Chaillu in "the Gaboon," and makes *albigena* the type and only species of his *Semnocebus*, a subgenus of *Cercocebus* (the name being preoccupied was replaced by *Lophocebus* Palmer, 1903). Prior to 1910 *albigena* was often confused with *aterrimus*, as shown by Schwarz (*loc. cit.*, 1910), who did much toward clearing up the relationships of the two forms and their supposed subspecies. Since the publication of his paper on this subject a number of additional forms of the *albigena* group have been described, some of which are doubtless tenable as geographic forms. Several of these, on geographical grounds, require consideration in the present connection. In 1913 Matschie described from the upper Ituri and Lindi Rivers his *Cercocebus albigena ituricus*, his *Cercocebus albigena weynsi* from Sanga, Mayombe District, Lower Congo = *C. a. albigena* (Gray) and his *Cercocebus albigena ugandæ* = *C. a. johnstoni* Lydekker, from the Chagwe forest, Uganda. These three races, two of which become synonyms, appear, on geographical grounds and on their alleged characters, entitled to recognition as regional forms. Since 1913 other names have been given to supposed forms that do not appear to merit recognition, as indicated in the above table of bibliographical references. As *C. albigena ituricus* belongs to the region where the present material was collected, it has been here adopted.

It seems to be currently accepted that *C. albigena albigena* is the form of the Lower Congo; *C. albigena ituricus* is the form of the Upper Congo Rain Forest region; while *C. albigena johnstoni* is the form from the forests of Urundi east of Lake Tanganyika to those north of Lake Victoria; *Cercocebus albigena zenkeri* Schwarz from Bipindi represents the southern Cameroon form, with the brown areas light colored, or brownish gray.

As shown above there is a wide range in the extent and tone of the brown areas in individuals from the same locality. Similar variation is mentioned by Lorenz (*loc. cit.*, 1917) as occurring in his specimens from Mawambi, in his discussion of a proposed *C. albigena mawambicus* Matschie, which Lorenz declines to recognize.

The exact limits of the range of *ituricus* cannot be defined, but it appears to extend from Rutshuru and Beni (Lönnberg, Lorenz), north to Irumu and Bafuka, and west to beyond Akenge and Niapu.

Cercocebus aterrimus (Oudemans)

Plates LXXXVIII, LXXXIX, Figure 1

Cercopithecus aterrimus OUDEMANS, 1890, Zool. Garten, XXXI, p. 267. Stanley Falls, Belgian Congo.

Cercocebus aterrimus SCLATER, 1893, Proc. Zool. Soc. London, p. 256, footnote. *Cercopithecus aterrimus* referred to *Cercocebus*.

Cercopithecus aterrimus JENTINK, 1895, Proc. Zool. Soc. London, p. 339. Wrongly states that the type of *C. aterrimus*, a young specimen having the molars still undeveloped, "was really a young *Cercocebus albigena*."

Cercocebus congicus SCLATER, 1899, Proc. Zool. Soc. London, p. 827, fig. from photo of the living type, in the Antwerp Zoölogical Gardens. "Hab. Terra Congica." Pocock (*loc. cit.*, 1906, p. 286) says the type is "believed to have come from the district of Stanley Falls on the Upper Congo."

Semnocebus albigena rothschildi LYDEKKER, 1900, Novit. Zool., Tring, VII, p. 596; idem, 1901, VIII, Pl. I, fig. 2. Locality unknown. Based on a living specimen in the London Zoölogical Gardens. An albinistic individual of *C. aterrimus*, according to Schwarz and Elliot.

Cercocebus hamlyni POCOCK, 1906, Ann. Mag. Nat. Hist., (7) XVIII, September, pp. 208–210, Pl. VII (animal); idem, October, pp. 285–286. "Upper Congo, exact area unknown." Based on a young female with milk dentition living in the Society's Gardens. = Albinistic example of *C. aterrimus*.

Cercocebus aterrimus SCHWARZ, 1910, Ann. Mag. Nat. Hist., (8) V, pp. 527–530. Relationship to *albigena*, and critical comment on various supposed forms of *aterrimus* and *albigena*.

Cercocebus aterrimus ELLIOT, 1913, 'Rev. Primates,' II, (1912), p. 270, Pl. XXIX (skull). Redescribes the type specimen, which he states is "only about half grown," and comments on the proneness of this species to albinism.

Cercolophocebus cœlognathus MATSCHIE, 1914, Sitzungsb. Ges. Naturf. Fr. Berlin, July, p. 342. Kindu, Lualaba River, Belgian Congo. Type, and only specimen, a young female, skin and skull.

Cercocebus aterrimus LÖNNBERG, 1919, Rev. Zool. Africaine, VII, p. 143. Eleven specimens recorded from localities on the Lukenie River and one from the Aruwimi. "Several specimens chiefly from the district of Lake Leopold II in the Congo Museum indicate that this region is the chief habitat of the species."

Represented by two specimens from Stanleyville, collected respectively November 1914 and April 1915. Both are immature, although in respect to coloration and texture of the pelage they have the appearance of adults.

The younger (No. 52631, ♂, April 1915) was purchased alive from the natives. Mr. Lang believes it was brought from some point south of Stanleyville. The external measurements are: Total length, 780 mm.;

head and body, 300; tail vertebræ, 480; hind foot, 114; ear, 38. Only the milk dentition is present.

The principal dimensions of the skull are: Greatest length, 87.5 mm.; occipitonasal length, 81.6; condylobasal length, 58.8; zygomatic breadth, 51.4; mastoid breadth, 54.5; orbital breadth, 43.7.

Whiskers and sides of the neck pale sepia; inside of thighs brown, darker than the cheeks; hair of inside of upper arms and pectoral area toned basally with brown; rest of the pelage deep black, including the nuchal area.

The other specimen (No. 52630, ♂, November 1914; Pls. LXXXVIII, LXXXIX, fig. 1) is older and larger. Total length, 820 mm.; tail, 470; hind foot, 135; ear, 37. Cranial measurements as follows: Greatest length, 95.6; occipitonasal length, 85.3; condylobasal length, 66.0; zygomatic breadth, 59.5; mastoid breadth, 56.4; orbital breadth, 46.3. The milk teeth are all present but much worn, especially the canines and incisors, and the first permanent molar is fully developed. The entire skeleton was preserved as well as the skull and skin. The accompanying photographic illustrations of the external characters were taken from the specimen in the flesh, showing especially the high pointed crown-crest and the long hair on the cheeks, which so strikingly distinguish *aterrimus* from the *albigena* group. The whiskers and soft hair on the sides of the neck are dark brown, much darker and less reddish than in No. 52631; the inguinal region and inside of thighs are faintly toned with brown, but the inside of the upper arms are black; the rest of the pelage is intense black; the black midline of the nape is narrower than in No. 52631. The throat is scantily covered with short gray hairs. The soft, brown whiskers are very long and curve upward over the ears, the longest hairs having a length of 75 mm. The long brown hairs on the sides of the neck, directed upward and inward, nearly conceal the narrow nuchal band of black.

Cercocebus aterrimus is evidently closely related to some of the forms of the *albigena* group but it is here provisionally accepted as a full species. The general resemblance to *C. albigena ituricus* is striking, there being no difference in the color tones, but the brown areas of *ituricus* are much more extended than in *aterrimus*. The presence of the long upcurving whiskers of the latter are, however, in strong contrast with the bare cheeks in the *albigena* group; the peak-like crown tuft is also unlike, in position and form, the occipital (or parieto-occipital) crest in *ituricus*. *C. aterrimus*, so far as known, has a more southern distribution than *C. a. ituricus*. Most of the specimens, so far as the localities were known, recorded prior to 1919, have come from the Stanleyville district, but

Lönnberg's recent records (*loc. cit.*, 1919) carry its range southward to the Lukenie River, and if Matschie's *Cercolophocebus cœlognathus* be referable to *aterrimus*, as seems probable, it extends eastward in about the same latitude to Kindu, on the Lualaba River. Lönnberg records also a specimen from "Aruwimi," about fifty miles north of Stanleyville. Among the fifty-two specimens of *ituricus* obtained by the American Museum Congo Expedition none was collected south of Risimu, a little southwest of Avakubi, although many other kinds of monkey were obtained at stations between Avakubi and Stanleyville.

The records of *aterrimus* show its tendency to albinism, nearly half the specimens thus far recorded, and an especially large proportion of those that have reached menageries, being of this character. Such examples have been the sole basis of several supposed specific or subspecific forms (*congicus* Sclater, *rothschildi* Lydekker, *hamlyni* Pocock). Schwarz, in 1910, (*loc. cit.*, p. 528), stated that eight such specimens were known to him (only one of them with a definite locality), and several have since been recorded from the Antwerp Zoölogical Gardens. Neither of the two specimens recorded in the present paper shows any trace of albinism.

RHINOSTIGMA Elliot

Rhinostigma ELLIOT, 1913, 'Rev. Primates,' II, (1912), June, p. 273, Pl. XXX (skull), Pl. 10 (animal). Type, by monotypy, *Cercopithecus hamlyni* Pocock.

Rhinostigma hamlyni (Pocock)

Plates LXXXIX, Figure 2; XC

Cercopithecus hamlyni POCOCK, 1907, Ann. Mag. Nat. Hist., (7) XX, December, p. 521. "Ituri Forest." Based on an immature animal living in the Gardens of the London Zoölogical Society. It died in 1909 while still young, the permanent dentition being then not fully developed.

Cercopithecus hamlyni POCOCK, 1908, Proc. Zool. Soc. London, September, p. 160 (in text), Pl. 10, fig. 3 (animal, bad figure).

Rhinostigma hamlyni ELLIOT, 1913, 'Rev. Primates,' II, (1912), pp. 273–274, Pl. XXX (skull); Pl. 10 (animal; photograph from life). Made the type of a new genus *Rhinostigma*.

Represented by a young female, No. 52463. The external measurements are: Total length, 700 mm.; head and body, 280; tail vertebræ, 420; hind foot, 110; ear, 35. Greatest length of skull 75. This specimen was purchased alive from a native of Stanleyville but, according to information given to Lang by its former owner, it had been captured a considerable distance south of Stanleyville. The native had secured it from soldiers in Ponthierville who had been previously stationed much farther south, where future explorers may be able to complete its history.

Skin and skeleton, and also photographs from specimen in the flesh (Pls. LXXXIX, fig. 2, XC). The milk teeth are all present (middle upper incisors worn), and the first molar of the permanent set is fully developed.

This specimen closely agrees with the type of *Rhinostigma hamlyni*, as described by Elliot.

The white stripe from between the eyes down the nose to the lips is very conspicuous; on the head the dark gray and black hair is strongly vermiculated with yellowish, the yellow just above the eyes being more predominant; the chin black; throat gray, only slightly speckled with same color as on head. The long soft hair falling from the crown down over the ears and along the cheeks is a very peculiar feature. The color is practically the same down the back to the base of the tail, although it is considerably grayer than on the head; the hairs on the proximal five-sixths of the tail, especially near the root, are tipped with silvery gray, as also on the thighs; the tip of the tail darker. The limbs are black, including hands and feet; on the forearm and leg the yellowish vermiculation is slightly indicated; the flanks are grayish speckled with yellowish. The underparts from breast posteriorly are nearly black with slight yellowish ticking. Plate XC gives an idea of the shortness of the rostrum and the vermiculation of the long, smooth hair about the head.

The type locality of this species is unknown. The type, according to Pocock, "was said to have come from the Ituri Forest." Elliot recorded a second example examined by him in the Gardens of the Royal Zoölogical Society at Antwerp. It was smaller than the one in London, but resembled it closely in color and markings. The American Museum Congo Expedition collected several thousand mammals in the Ituri Forest region, from Stanleyville northward, including some four hundred primates, without either Lang or Chapin meeting with this species.

Rhinostigma hamlyni appears to me to be closely related to the *Lophocebus* section of *Cercocebus*. Elliot first recognized it as a mangabey and not a guenon, as supposed to be by Pocock, its first describer.

LASIOPYGA Illiger

1758. *Simia* LINNÆUS, 'Syst. Nat.,' 10th Ed., I, p. 25 (part, and in part of other early authors).

1762. *Cercopithecus* HAAK (*ex* Brisson), 'Regn. Anim.,' Haak Ed., pp. 133, 137–151, 246. Not available.

1772. *Cercopithecus* BRÜNNICH, 'Zoologiæ Fundamenta,' pp. 34, 40. To include all monkeys with "cauda elongata." Hence equal to *Cercopithecus* Brisson and to *Cercopitheci* Linnæus. The only diagnosis is that afforded in the "Generum Tabulæ Synopticæ." No author is cited for the genus and no species is mentioned.

1777. *Cercopithecus* ERXLEBEN, 'Syst. Regn. Anim.,' p. 22, part. Included 22 species, without designation of type. Type, by subsequent designation, le Callitriche of Buffon and F. Cuvier = *Cercopithecus callithrichus* I. Geoffroy (1851, 'Cat. Méth. Coll. Mamm. Mus. Paris,' pp. 18 and 23) = *Simia sabæa* Linnæus.

1811. *Lasiopyga* ILLIGER, 'Prod. Syst. Mamm. et Avium,' p. 68. Two species: (1) *Simia nemæus* Linnæus, (2) *Simia nictitans* Linnæus. In 1812 *S. nemæus* became the type of *Pygathrix* E. Geoffroy, by monotypy, leaving *S. nictitans* as the sole species and type of *Lasiopyga*, and later type by subsequent designation (Elliot, 1911).

1815. *Cebus* RAFINESQUE, 'Analyse de la Nature,' p. 53. Substitute name for *Cercopithecus* Erxleben. Not *Cebus* Erxleben, 1777.

1816. *Monichus* (subgenus of *Cercopithecus*) OKEN, 'Lehrb. Naturgesch.,' Th. III, Abth. 2, pp. xi, 1208. No type designated. Included three species: (1) *M.[onichus] C.[ercopithecus] mona* [Schreber], (2) *C.[ercopithecus] diana* [Linnæus], (3) *S.[imia] roloway* [Schreber]. Type, by present designation, *Simia mona* Schreber.

Monichus was evidently founded on *Simia mona* Schreber, the first species of the group. The question arises as to the status of the subsequent generic name *Monachus* Fleming (1822) for a genus of seals. The two names have a wholly different basis, Fleming having adopted an already existing specific name *monachus* (from *Phoca monachus* Hermann) as the name of a genus, while Oken coined the word *Monichus* from the specific name *mona* (*Simia mona* Schreber) with the same termination but with *i* instead of *a* for the connecting vowel. The seal is known in the vernacular as the Monk Seal, the monkey as the *Mona* ("la mone" of Buffon) from the name by which it is said to be known by some of the native tribes of the district whence the first specimens of it were received. The two generic names thus have an entirely different etymological basis, and both should be tenable.

1862. *Petaurista* (subgenus of *Cercopithecus*) REICHENBACH,[1] 'Vollständ. Naturgesch. Affen,' p. 105. Type, by tautonomy, *Simia petaurista* Schreber. Preoccupied by *Petaurista* Link (1795) for a genus of Rodents.

1862. *Callithrix* (subgenus of *Cercopithecus*) REICHENBACH, 'Vollständ. Naturgesch. Affen,' p. 105. Type, by tautonomy, *Cercopithecus callithrix* I. Geoffroy = *Simia sabæa* Linnæus. Not *Callithrix* Erxleben.

1862. *Diademia* (subgenus of *Cercopithecus*) REICHENBACH, 'Vollständ. Naturgesch. Affen,' p. 107. Type, by subsequent designation (Pocock, 1907), *Simia leucampyx* Fischer. Not preoccupied, as generally stated, by *Diadema* Schumacher (1817), a genus of Crustacea; a different name.

1862. *Mona* (subgenus of *Cercopithecus*) REICHENBACH, 'Vollständ. Naturgesch. Affen,' p. 109. Type, by tautonomy, *Simia mona* Schreber. = *Monichus* Oken, 1816.

1870. *Chlorocebus* GRAY, 'Cat. Monkeys, Lemurs and Fruit-eating Bats,' pp. 5, 24, part. Type, by subsequent designation (Pocock, 1907), *Simia sabæa* Linnæus.

1870. *Cynocebus* (subgenus of *Chlorocebus*) GRAY, 'Cat. Monkeys, Lemurs and Fruit-eating Bats,' p. 26. Type, by monotypy, *Simia cynosuros* Scopoli.

[1]Reichenbach's 'Vollständ. Naturgesch. Affen' is not at present available for consultation. The references here given are from citations by other authors, some of whom give the date of the work as 1862, others as 1863.

1878. *Diana* (subgenus of *Cercopithecus*) ("Lesson") TROUESSART, Rev. Mag. Zool., (3) VI, p. 124. Type, by tautonomy, *Simia diana* Linnæus. Preoccupied by *Diana* Risso (1826) for a genus of Fishes.
1897. *Rhinostictus* (subgenus of *Cercopithecus*) TROUESSART, 'Cat. Mamm.,' p. 17. To replace *Petaurista* Reichenbach, preoccupied.
1897. *Otopithecus* (subgenus of *Cercopithecus*) TROUESSART, 'Cat. Mamm.,' p. 22. Type, by subsequent designation (Pocock, 1907), *Cercopithecus pogonias* Bennett.
1904. *Pogonocebus* (subgenus of *Cercopithecus*) TROUESSART, 'Cat. Mamm.,' Suppl., p. 14. To replace *Diana* Trouessart (1897), preoccupied.
1913. *Allochrocebus* (subgenus of *Lasiopyga*) ELLIOT, 'Rev. Primates,' I, (1912), pp. xl, lix; II, pp. 296, 297. Type, by original designation, *Cercopithecus l'hoesti* Sclater.
1913. *Neocebus* (subgenus of *Lasiopyga*) ELLIOT, 'Rev Primates,' I, (1912), p. xl; II, pp. 296, 319. Type, by original designation, *Simia cephus* Linnæus.
1913. *Insignicebus* (subgenus of *Lasiopyga*) ELLIOT, 'Rev. Primates,' I, (1912), p. xl; II, pp. 296, 359. Type, by original designation, *Cercopithecus albogularis* (Sykes).
1913. *Melanocebus* (subgenus of *Lasiopyga*) ELLIOT, 'Rev. Primates,' I, (1912), p. lix; II, pp. 296, 306. No type designated. = *Diademia* Reichenbach (1862).

The nineteen generic and subgeneric names proposed for the group of monkeys currently known for a century as *Cercopithecus* (= *Lasiopyga*) are here listed in two categories, those nomenclaturally tenable and those nomenclaturally untenable. *Miopithecus* and *Erythrocebus* are dealt with separately below, since they have been given generic rank by Elliot in his 'Review of the Primates,' and were so more or less currently recognized by some other writers of the last decade.

Tenable Names

1811. *Lasiopyga* ILLIGER. Type, *Simia nictitans* Linnæus.
1816. *Monichus* OKEN. Type, *Simia mona* Schreber.
1862. *Diademia* REICHENBACH. Type, *Simia leucampyx* Fischer.
1870. *Cynocebus* GRAY. Type, *Simia cynosuros* Scopoli.
1897. *Rhinostictus* TROUESSART. To replace *Petaurista*, preoccupied.
1897. *Otopithecus* TROUESSART. Type, *Cercopithecus pogonias* Bennett.
1904. *Pogonocebus* TROUESSART. To replace *Diana*, preoccupied.
1913. *Allochrocebus* ELLIOT. Type, *Cercopithecus l'hoesti* Sclater.
1913. *Neocebus* ELLIOT. Type, *Simia cephus* Linnæus.
1913. *Insignicebus* ELLIOT. Type, *Cercopithecus albogularis* (Sykes).

Untenable Names

1758. *Simia* LINNÆUS, as formerly used for African guenons.
1762. *Cercopithecus*, as formerly used for African guenons.
1815. *Cebus* RAFINESQUE, substitute name for *Cercopithecus;* not *Cebus* Erxleben (1777).
1862. *Petaurista* REICHENBACH, not of Link (1795).

1862. *Callithrix* REICHENBACH. Not *Callithrix* Erxleben (1777). Type, *Simia sabæa* Linnæus, type of *Cercopithecus*.

1862. *Mona* REICHENBACH. Type, *Simia mona* Schreber. = *Monichus* Oken (1816).

1870. *Chlorocebus* GRAY. Type, *Simia sabæa* Linnæus = *Cercopithecus* Erxleben (1777).

1878. *Diana* TROUESSART, not of Risso (1826).

1913. *Melanocebus* ELLIOT, substitute name for *Diademia* Reichenbach.

The taxonomic value of the groups listed above as nomenclaturally available cannot be here discussed owing to lack of necessary material.

SPECIFIC AND SUBSPECIFIC NAMES REFERABLE TO *Lasiopyga*

1758. *Simia diana* LINNÆUS, 'Syst. Nat.,' Ed. 10, I, p. 26. "Habitat in Guinea." = Liberia (Jentink). Based primarily on a living individual in confinement.

1758. *Simia cephus* LINNÆUS, 'Syst. Nat.,' Ed. 10, I, p. 27. "Habitat in America" = Africa. Based on "*Cercopithecus barbatus alius guineensis* Marcgr. bras. 228."

1758. *Simia æthiops* LINNÆUS, 'Syst. Nat.,' Ed. 10, I, p. 28. "Habitat in Æthiopia." Based on Hasselquist, hence = Upper Egypt.—Considered by Elliot (1913, 'Rev. Primates,' II, (1912), p. 278) as "Undeterminable." He substituted for it *Cercopithecus griseoviridis* Desmarest (1820), which Anderson (1902, 'Zool. Egypt,' Mamm., p. 13) correctly placed in the synonymy of *æthiops* = *Lasiopyga æthiops*.

1766. *Simia sabæa* LINNÆUS, 'Syst. Nat.,' 12th Ed., I, p. 38. Composite, but mainly the Green Monkey of Edwards (1758, 'Gleanings Nat. Hist.,' I, Pl. CCXV), which he says was "brought from St. Jago, one of the Cape de Verde islands, lying off the Cape de Verde, on the western coast of Africa." As Linnæus cites Edwards the type locality may be given as Cape Verde Islands, to which it was doubtless introduced from Senegal. *Simia sabæa* Schreber (1775, 'Säugthiere,' I, p. 100, Pl. XVIII) is based on the same citations as *S. sabæa* Linnæus, and Schreber's plate is a copy of Edward's Pl. CCXV, and carries the legend "*Simia sabæa* Linn." Elliot (1913, 'Rev. Primates,' II, (1912), p. 334) rejected *S. sabæa* Linnæus as composite, and substituted for it *Cercopithecus callithrichus* I. Geoffroy, which was based on specimens from "Saint Yago, archipel du Cap-Vert." The primary basis of *Simia sabæa* Linnæus and of *Simia sabæa* Schreber are thus essentially the same.

1766. *Simia nictitans* LINNÆUS, 'Syst. Nat.,' 12th Ed., I, p. 40. Type locality "Guinea." Designated by Pocock (1907) as Benito River, Spanish Guinea.

1775. *Simia mona* SCHREBER, 'Säugthiere,' I, p. 97, Pl. XV (copied from Buffon). Based primarily on La Mone, Buffon (1766, 'Hist. Nat.,' XIV, p. 258, Pl. XXXVI). From specimens living in the Paris Menagerie.

1775. *Simia petaurista* SCHREBER, 'Säugthiere,' I, p. 103, Pl. XIX*B*. Name only on Pl. XIX*B*, a copy from Allamand. "Madagascar" = Guinea, West Africa.

1775. *Simia roloway* SCHREBER, 'Säugthiere,' I, pp. 109, 186, Pl. XXV. Name on page 186 and on Pl. XXV, "*Simia Roloway* Allam." Usually this name is attributed to Erxleben (1777, 'Syst. Regn. Anim.,' p. 42), who there quotes Schreber.

1786. *Simia cynosuros* SCOPOLI, 'Delic. Floræ et Faunæ Insubricæ,' pt. 1, p. 44, Pl. XIX. Based on a living specimen; locality of capture not stated.

1799. *Simia ascanius* AUDEBERT, 'Hist. Nat. Singes,' Fam. IV, p. 21, Pl. XIII. Locality unknown. Based on a living specimen in the Paris Menagerie.

1804. *Simia engytilthia* HERMANN, 'Obs. Zool.,' p. 1. Locality not stated. Compared with "*Simia roloway* Linn." and with *S. mona*. Unidentifiable; usually referred to the *Chlorocebus* group.

1820. *Cercopithecus griseoviridis* DESMAREST, 'Mamm.,' I, p. 61. Le Grivet of F. Cuvier. Locality unknown. Based on a living specimen in captivity.

1821. *Simia subviridis* F. CUVIER, Dict. Sci. Nat., XX, p. 27. No locality. New name for *Cercopithecus griseoviridis* Desmarest. = Le Grivet.

1821. [*Simia*] *pygerythra* F. CUVIER, 'Hist. Nat. Mamm.,' II, livr. XXIV, January. Based on a living specimen from an unknown locality in Africa.

1825. "*Cercopithecus pusillus* Delalande" DESMOULINS, Dict. Class. Hist. Nat., VII, p. 568. "Au-delà de Groote-Vis-River au Keiskama," Cafraria, South Africa. (Cf. I. Geoffroy, 1851, 'Cat. Méth. Coll. Mamm. Mus. Paris,' p. 21.)

1829. *Simia leucampyx* J. B. FISCHER, 'Synop. Mamm.,' p. 20. "La Diane femelle," F. Cuvier, 1824, 'Hist. Nat. Mamm.,' III, livr. xlii. "Guinea."

1831. *Semn. ? albogularis* SYKES, Proc. Zool. Soc. London, August 5, p. 106; *Cercopithecus albogularis*, idem, 1832, p. 18. Based on a living specimen in the Zoölogical Society's Gardens, obtained at Bombay and "believed to have been taken from Madagascar."

1833. *Cercopithecus pogonias* BENNETT, Proc. Zool. Soc. London, September 20, p. 67. Fernando Po, West Africa. Skin without skull.

1833. *Cercopithecus tephrops* BENNETT, Proc. Zool. Soc. London, November 18, p. 109. The Malbrouck of Buffon (not of F. Cuvier). Based on a living specimen in the Gardens of the Zoölogical Society.

1834. *Cercopithecus diadematus* I. GEOFFROY, Bélanger, 'Voy. Indes-Orient.,' Zool., p. 51. = *Simia leucampyx* J. B. Fischer.

1838. *Cercopithecus temminckii* OGILBY, 'Menageries,' I, p. 345. Based on a unique specimen in the Leyden Museum, "said to have been brought from the coast of Guinea."

1838. *Cercopithecus campbelli* WATERHOUSE, Proc. Zool. Soc. London, July, p. 61. Sierra Leone. Skin only.

1838. *Cercopithecus erythrotis* WATERHOUSE, Proc. Zool. Soc. London, July, p. 59. Fernando Po, West Africa. Skin only, lacking face and feet.

1838. *Cercopithecus martini* WATERHOUSE, Proc. Zool. Soc. London, July, p. 58; idem, 1841, p. 71. Fernando Po, West Africa. Two imperfect skins, lacking face, hands and feet.

1840. *Cercopithecus griseus* LESSON, 'Species Mamm.,' p. 81. New name for *C. griseoviridis* Desmarest.

1841. *Cercopithecus tantalus* OGILBY, Proc. Zool. Soc. London, September, p. 33. Locality unknown. Described from a living specimen in the Society's Menagerie.

1842. *Cercopithecus burnettii* GRAY, Ann. Mag. Nat. Hist., (1) X, December, p. 256. Fernando Po, West Africa. Skin, tail imperfect.

1842. *Cercopithecus labiatus* I. GEOFFROY, Compt. Rend. Ac. Sci., Paris, XV, December, p. 1038. "Le Cercopithèque aux lèvres blanches, *Cercopithecus labiatus*, voisin du Hocheur et du *C. Campbelli* de M. Waterhouse." No locality, no definite mention of any specimen.

1842. *Cercopithecus rufo-viridis* I. GEOFFROY, Compt. Rend. Ac. Sci., Paris, XV. December, p. 1038. "Le Cercopithèque roux-vert, *C. rufo-viridis*, voisin du *C, griseo-viridis* et du *C. sabæus*." No locality, no further description.

1843. *Cercopithecus lalandii* I. GEOFFROY, Arch. Mus. Hist. Nat., Paris, II, (1841), p. 561; 1851, 'Cat. Méth. Coll. Mamm. Mus. Paris,' p. 21. New name for "*C. pusillus* Delalande, Desmoulins, 1825." Based on three specimens from Cafraria, South Africa, collected by Delalande; 1842, Compt. Rend. Ac. Sci., Paris, XV, December, p. 1038 (nomen nudum).

1843. *Cercopithecus monoides* I. GEOFFROY, Arch. Mus. Hist. Nat., Paris, II (1841), p. 558, Pl. XXXI. Based on a living specimen in the Paris Menagerie, an adult female from "Africa," without definite locality (I. Geoffroy, 1851, 'Cat. Méth. Coll. Mamm. Mus. Paris,' p. 19); 1842, Compt. Rend. Ac. Sci., Paris, XV, December, p. 1038 (nomen nudum).

1844. *Cercopithecus samango* SUNDEVALL, Öfvers. Kungl. Vet. Ak. Förhandl., Stockholm, I, p. 160. (Not seen, citation from authors.) Port Natal, South Africa. Based on specimens obtained by Wahlberg (cf. Schlegel, 1876, 'Simiæ,' Mus. Hist. Nat. Pays-Bas, p. 79).

1845. *Cercopithecus melanogenys* GRAY, Ann. Mag. Nat. Hist., (1) XVI, 1845, p. 212; 1849, Proc. Zool. Soc. London, p. 7, Pl. IX. West Africa. Based on "a half-grown specimen which died in a menagerie near London and was said to have come from West Africa."

1848. *Cercopithecus pluto* GRAY, Proc. Zool. Soc. London, p. 56, text fig. and Pl. III. Angola. Based on a living specimen in the Society's Menagerie.

1849. *Cercopithecus ludio* GRAY, Proc. Zool. Soc. London, p. 8, Pl. IX, fig. 2. West Africa. Described from a menagerie specimen.

1850. *Cercopithecus werneri* I. GEOFFROY, Compt. Rend. Ac. Sci., Paris, XXXI, p. 874. Near the "Callitriche des auteurs et du vrai *C. sabæus* [Linnæus]." Based on living animals in the Paris Menagerie. Africa, exact locality unknown.

1850. *Cercopithecus grayi* FRASER, 'Cat. Knowsley Coll.,' p. 8. (Not seen; from citations by other authors.) No type locality; assigned to South Cameroon and neighboring regions by recent authors.

1851. *Cercopithecus callithrichus* I. GEOFFROY, 'Cat. Méth. Coll. Mamm. Mus. Paris,' p. 23. According to Pocock (1907, Proc. Zool. Soc. London, p. 727) *C. callithrichus* I. Geoffroy is a synonym of *Simia sabæa* Linnæus, and also of *C. werneri* I. GEOFFROY. (See above p. 352.)

1852. *Cercopithecus erythrarchus* PETERS, 'Reise Mossambique,' Säug., p. 1, Pl. I. Not scarce on the plains of Inhambane; less common near Quellimane. Mossambique. Type an immature male. = *C. albogularis* (Sykes).

1852. *Cercopithecus flavidus* PETERS, 'Reise Mossambique,' Säug., p. 3, Pl. I*B*. From Quitangonha, mainland north of Mossambique. Type and only specimen an immature male. (Cf. Matschie, 1893, Sitzungsb. Ges. Naturf. Fr. Berlin, p. 213). = *C. rufoviridis* I. Geoffroy.

1855. *Cercopithecus palatinus* WAGNER, Schreber's 'Säugthiere,' Suppl., V, p. 47. = *C. roloway* I. Geoffroy.

1856. *Cercopithecus erxlebenii* DAHLBOM ET PUCHERAN, Rev. Mag. Zool., (2) VIII, p. 96, idem, 1857, (2) IX, p. 196. Based on a young female that died in the Paris Menagerie, believed to have come from "Afrique occidentale."

1860. *Cercopithecus nigripes* Du Chaillu, Proc. Boston Soc. Nat. Hist., VII, p. 360 "Banks of the Ofoubour River." Male and female described.

1862. *Cercopithecus histrio* Reichenbach, 'Vollständ. Naturgesch. Affen,' p. 106, fig. 260. (Not seen.) Locality unknown. A synonym of *C. ascanius* (Audebert).

1866. *Cercopithecus erythrogaster* Gray, Proc. Zool. Soc. London, p. 169, Pl. xvi. West Africa. Described from a young female living in the Society's Menagerie.

1870. *Chlorocebus engythithea* Gray, 'Cat. Monkeys, Lemurs, and Fruit-eating Bats,' p. 26. "Abyssinia; Sennaar."

1870. *Cercopithecus diana* var. *ignita* Gray, 'Cat. Monkeys, Lemurs and Fruit-eating Bats,' p. 22. "West Africa." No definite type locality nor specimen mentioned. Sclater (1893, Proc. Zool. Soc. London, p. 255) records a specimen "brought from the Congo by Capt. Moore-Harper in 1886."

1876. *Cercopithecus neglectus* Schlegel, 'Simiæ,' Mus. Hist. Nat. Pays-Bas, p. 70. "White Nile." New name for *C. leucocampyx* Gray (1870; not *Simia leucampyx* J. B. Fischer, 1829).

1886. *Cercopithecus brazzæ* (*ex* A. Milne-Edwards Ms.) Rivière, Rev. Scient., (3) XII, p. 15. Brief mention of a specimen in the Paris Museum from French Congo. Name attributed to Milne-Edwards.

1886. *Cercopithecus picturatus* Santos, Jorn. Sci. Math. Phys. Nat. Ac. Lisboa, XI, p. 98. West Africa. Described from a living adult male in the Zoological Garden of Lisbon.

1886. *Cercopithecus signatus* Jentink, Notes Leyden Mus., VIII, p. 55. Believed to be "from West Africa, perhaps from Banana." Menagerie specimen.

1886. *Cercopithecus büttikoferi* Jentink, Notes Leyden Mus., VIII, p. 56. "Liberia." A series of eight specimens.

1887. *Cercopithecus boutourlinii* Giglioli, Zool. Anz., X, p. 510. Kaffa, southern Abyssinia. Adult female, skin and skeleton.

1888. *Cercopithecus stampflii* Jentink, Notes Leyden Mus., X, p. 10. "Pessy-country," Liberia. Adult male skin and skeleton.

1891. *Cercopithecus wolfi* Meyer, Notes Leyden Mus., XIII, p. 63. "Central West Africa," exact locality not known.

1892. *Cercopithecus stairsi* Sclater, Proc. Zool. Soc. London, p. 580, Pl. xl. Chindi, Lower Zambesi River. One specimen, sex not indicated.

1892. *Cercopithecus schmidti* Matschie, Zool. Anz., XV, p. 161. Mengo, Uganda. Adult male and subadult female. (See below, p. 410.)

1893. *Cercopithecus stuhlmanni* Matschie, Sitzungsb. Ges. Naturf. Fr. Berlin, p. 225. Forest north of Kinjawanga, between Lake Albert Edward and Lake Albert. Type and only specimen an old male, skin and skull.

1893. *Cercopithecus fantiensis* Matschie, Sitzungsb. Ges. Naturf. Fr. Berlin, pp. 64, 98. Rio Boutry, Gold Coast, West Africa. Based on one specimen.

1893. *Cercopithecus opisthostictus* Sclater, Proc. Zool. Soc. London, p. 725. Lake Mweru, British Central Africa. "Two flat skins, which appear to have been used as dresses."

1893. *Cercopithecus moloneyi* Sclater, Proc. Zool. Soc. London, p. 252, Pl. xvii. Karonga, north end of Lake Nyasa.

1896. *Cercopithecus albotorquatus* Pousargues, Bull. Mus. Hist. Nat., Paris, II, p. 55. Type locality unknown.

1898. *Cercopithecus l'hoesti* SCLATER, Proc. Zool. Soc. London, p. 586, Pl. XLVIII. "Congoland." "Chepo or Tschepo in Congoland" (Pocock, 1907). A living specimen, received from the Zoölogical Society of Antwerp.

1898. *Cercopithecus preussi* MATSCHIE, Sitzungsb. Ges. Naturf. Berlin, p. 76. Victoria, Cameroon, West Africa. "Dr. Preuss coll. 4 specimina."

1900. *Cercopithecus centralis* NEUMANN, Zool. Jahrb., Syst., XIII, p. 533. Bukoba, west shore of Victoria Nyanza. One specimen.

1900. *Cercopithecus omensis* THOMAS, Proc. Zool. Soc. London, November 20, p. 801. Mursu, Omo River, about 40 miles north of Lake Rudolf. Adult female, skin and skull.

1902. *Cercopithecus otoleucus* SCLATER, Proc. Zool. Soc. London, I, p. 237, Pl. XXV. Latuka Mountains, northern Uganda, "about 100 miles east of the Upper Nile." One specimen.

1902. *Cercopithecus hilgerti* NEUMANN, Sitzungsb. Ges. Naturf. Fr. Berlin, p. 50. Gobele River, Galla Land, Northeast Africa. Type an adult male. Also female and young male.

1902. *Cercopithecus ellenbecki* NEUMANN, Sitzungsb. Ges. Naturf. Fr. Berlin, p. 50. Suksuk River, Northeast Africa. Several examples.

1902. *Cercopithecus djamdjamensis* NEUMANN, Sitzungsb. Ges. Naturf. Fr. Berlin, p. 51. Abera (Djamdjam), Northeast Africa. Adult female.

1902. *Cercopithecus matschiei* NEUMANN, Sitzungsb. Ges. Naturf. Fr. Berlin, p. 51. Malo on the Omo River. Other specimens from the same region.

1902. *Cercopithecus kolbi* NEUMANN, Proc. Zool. Soc. London, II, p. 144. Kedong Escarpment, British East Africa. Type an adult male. Also two adult males from the east side of Mount Kenia at 8000 to 9000 feet and in Roromo; and two adult females from Nairobi forest.

1902. *Cercopithecus francescæ* THOMAS, Ann. Mag. Nat. Hist., (7) X, p. 243. Near Mount Waller, west of Lake Nyasa. Type an imperfect skin, without skull or feet.

1904. *Cercopithecus sclateri* POCOCK, Proc. Zool. Soc. London, Abstr. No. 5, March 22, p. 18; idem, I, p. 433, fig. 87. Benin, Nigeria. Based on the skin of a young male that died in the Zoölogical Gardens.

1905. *Cercopithecus crossi* FORBES, Nature, LXXII, October 26, p. 630. Cameroon, West Africa. Type a subadult male. = *C. preussi* Matschie.

1905. *Cercopithecus kandti* MATSCHIE, Sitzungsb. Ges. Naturf. Fr. Berlin, December, p. 264. Volcano country north of Lake Kivu. Three native skins without skulls.

1905. *Cercopithecus thomasi* MATSCHIE, Sitzungsb. Ges. Naturf. Fr. Berlin, December, p. 262. Near Lake Kivu, Belgian Congo. Type a young female, skin and skeleton.

1905. *Cercopithecus neumanni* MATSCHIE, Sitzungsb. Ges. Naturf. Fr. Berlin, December, p. 266. Kwa Kitoto, Kavirondo, British East Africa. Based on two adult females and an immature specimen.

1907. *Cercopithecus denti* THOMAS, Proc. Zool. Soc. London, Abstr., January 22, p. 1; idem, June 12, p. 2, Pl. I. Ituri forest, between Mawambi and Avakubi, alt. 3000 feet. Type an adult male, skin and skull.

1907. *Cercopithecus leucampyx nigrigenis* POCOCK, Proc. Zool. Soc. London, October 8, p. 692, Pl. XXXIX, fig. 1. West Africa, exact locality unknown. Type (unique) a female skin without skull.

1907. *Cercopithecus neglectus brazziformis* Pocock, Proc. Zool. Soc. London, October 8, p. 687. Locality unknown, supposed to be French Congo. Type (unique) a skin only, sex not indicated. A menagerie specimen.

1907. *Cercopithecus leucampyx doggetti* Pocock, Proc. Zool. Soc. London, October 8, p. 691. "S. W. Ankole, between Lakes Victoria and Albert Edward." Type (unique) a young female, skin and skull (Elliot).

1907. *Cercopithecus leucampyx carruthersi* Pocock, Proc. Zool. Soc. London, October 8, p. 691. "Ruwenzori, east side, 10,000 ft." Type (unique) a skin of a female without skull.

1907. *Cercopithecus nictitans laglaizei* Pocock, Proc. Zool. Soc. London, October 8, p. 698. Gaboon. Type (unique) skin and skull, formerly mounted (1913, Elliot, 'Rev. Primates,' II, (1912), p. 317).

1907. *Cercopithecus albogularis beirensis* Pocock, Proc. Zool. Soc. London, October 8, p. 701. "Beira." Two adult males.

1907. *Cercopithecus albogularis rufilatus* Pocock, Proc. Zool. Soc. London, October 8, p. 702. Rufiji River, south of Zanzibar. Two specimens, type not designated.

1907. *Cercopithecus kolbi hindei* Pocock, Proc. Zool. Soc. London, October 8, p. 703, Pl. xxxix, fig. 3. "Tutha, in the Kenia district, 8000 ft. alt." Type a young adult male, skin and skull (Elliot).

1907. *Cercopithecus stairsi mossambicus* Pocock, Proc. Zool. Soc. London, October 8, p. 705. "Mozambique." A single male specimen.

1907. *Cercopithecus rufotinctus* Pocock, Proc. Zool. Soc. London, October 8, p. 706. "British East Africa (?Mombasa)." Type a half-grown skin of a female (Elliot).

1907. *Cercopithecus cephus cephodes* Pocock, Proc. Zool. Soc. London, October 8, p. 724. "Gaboon." Type "a subadult male."

1907. *Cercopithecus tantalus budgetti* Pocock, Proc. Zool. Soc. London, October 8, p. 733. "Uganda: Bathyaba, on the east shore of Lake Albert." Sex of the unique type not indicated.

1907. [*Cercopithecus pygerythrus*] *whytei* Pocock, Proc. Zool. Soc. London, October 8, p. 738. Mount Chiradgula, Nyasaland. Based on a single specimen.

1907. [*Cercopithecus pygerythrus*] *johnstoni* Pocock, Proc. Zool. Soc. London, October 8, p. 738. "Moshi: south side of Kilima Njaro, 5000 ft. alt." Based on two specimens from the type locality.

1907. *Cercopithecus nigroviridis* Pocock, Proc. Zool. Soc. London, October 8, p. 739, Pl. xlii, fig. 5; idem, 1908, Pl. x, fig. 1. Upper Congo, exact locality unknown. Type, the skin of a female that had lived for a year and a half in the London Zoölogical Gardens.[1]

1908. *Cercopithecus ezræ* Pocock, Proc. Zool. Soc. London, Abstr. No. 54, March 3, p. 10; idem, September, p. 158, Pl. x, fig. 2. Locality unknown; presumably Upper Congo. Type an immature example living in the London Zoölogical Gardens.

1908. *Cercopithecus albogularis kibonotensis* Lönnberg, 'Wiss. Ergebn. Swed. Zool. Exped. Kilimandjaro-Mweru,' I, No. 2 (1910), Mamm., p. 3. Kibonoto, Kilimandjaro. Based on a series of specimens of adults and young of both sexes.

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[1][This species has been made the type of a new genus (see below, pp. 418–422).—H. L.]

1909. *Cercopithecus ascanius whitesidei* THOMAS, Ann. Mag. Nat. Hist., (8) IV, December, p. 542. Nsoli, Ikau, Upper Lulanga River, Central Belgian Congo. Type, an adult male, skin and skull.

1909. *Cercopithecus insolitus* ELLIOT, Ann. Mag. Nat. Hist., (8) IV, September, p. 258. "Northern Nigeria," without definite locality. Type, and only specimen, "a young animal," skin and skull.

1909. *Cercopithecus tantalus griseistictus* ELLIOT, Ann. Mag. Nat. Hist., (8) IV, September, p. 259. "Bambara, Welle River," Belgian Congo. Based on an adult male, skin and skull.

1909. *Cercopithecus rubellus* ELLIOT, Ann. Mag. Nat. Hist., (8) IV, September, p. 260. Fort Hall, British East Africa. A number of specimens in the British Museum, sex and age not stated.

1909. *Cercopithecus pogonias pallidus* ELLIOT, Ann. Mag. Nat. Hist., (8) IV, September, p. 261. "Gaboon." No definite type locality. Type, a female; no other specimen cited. Name later corrected to *C. grayi pallidus* (1910, Ann. Mag. Nat. Hist., (8) V, p. 83).

1909. *Cercopithecus sticticeps* ELLIOT, Ann. Mag. Nat. Hist., (8) IV, September, p. 263. "N'dongo-leti, on the Upper Ubangui River," Belgian Congo. Based on "a single specimen obtained by the Alexander-Gosling Expedition." No skull.

1909. *Cercopithecus silaceus* ELLIOT, Ann. Mag. Nat. Hist., (8) IV, September, p. 263. "East bank of the Loangwa River, Angoniland," British Central Africa. Three specimens are mentioned, from widely separated localities.

1909. *Cercopithecus insignis* ELLIOT, Ann. Mag. Nat. Hist., (8) IV, September, p. 274. "Congo Forest," without definite locality. Described from a living specimen in the Zoölogical Gardens of Antwerp.

1909. *Cercopithecus princeps* ELLIOT, Ann. Mag. Nat. Hist., (8) IV, September, p. 304. "Mpanga Forest," south of Lake Albert. Type, a skin and skull, age and sex not given, and no other specimen mentioned.

1909. *Cercopithecus tantalus alexandri* POCOCK, Proc. Zool. Soc. London, October, p. 545. Lake Chad. Type a skin without skull.

1910. *Cercopithecus leucampyx aurora* THOMAS AND WROUGHTON, Trans. Zool. Soc. London, XIX, pt. 5, March, p. 485. South end of Lake Kivu. Type an adult male skin (at least no skull is mentioned).

1910. *Cercopithecus inobservatus* ELLIOT, Ann. Mag. Nat. Hist., (8) V, January, p. 81. "West Africa (exact locality unknown)." "Adult male," skin and skull.

1910. *Cercopithecus centralis luteus* ELLIOT, Smithsonian Misc. Coll., LVI, June 11, No. 7, p. 1. Wambugu, southwest of Mount Kenia, British East Africa. Based on two young adult females.

1910. *Cercopithecus kolbi nubilus* DOLLMAN, Ann. Mag. Nat. Hist., (8) V, February, p. 202. Nairobi Forest, British East Africa. Type, an adult female, skin and skull.

1910. *Cercopithecus preussi insularis* THOMAS, Ann. Mag. Nat. Hist., (8) V, February, p. 191. North Bantabiri, Fernando Po, West Africa. Type, an immature female.

1911. *Cercopithecus petronellæ* BÜTTIKOFER, Notes Leyden Mus., XXXIV, December 1, p. 1. Upper Congo? A semiadult female, "said to be imported from the Upper Congo."

1912. *Cercopithecus (Chlorocebus) cynosurus weynsi* DUBOIS AND MATSCHIE, Rev. Zool. Africaine, I, March 31, p. 435. Banana, mouth of Congo. Type, an adult male, skin mounted; also a paratype from Kakongo, skin and skull.

1912. *Cercopithecus (Chlorocebus) cynosurus itimbiriensis* DUBOIS AND MATSCHIE, Rev. Zool. Africaine, I, March 31, p. 437. Itimbiri, northwestern Belgian Congo. Type (and only specimen), a young female.

1912. *Cercopithecus (Chlorocebus) cynosurus tholloni* MATSCHIE, Rev. Zool. Africaine, I, March 31, p. 438 (in text). Near Brazzaville, Congo River. Type and only specimen a skin.

1912. *Cercopithecus (Chlorocebus) æthiops lukonzolwæ* MATSCHIE, Rev. Zool. Africaine, I, March 31, p. 438, fig. 2. Lukonzolwa, Lake Moëro, southeastern Belgian Congo. Type a young male skin.

1912. *Cercopithecus (Otopithecus) denti liebrechtsi* DUBOIS AND MATSCHIE, Rev. Zool. Africaine, I, March 31, p. 439, fig. 3. Stanley Falls, Belgian Congo. Type (and only specimen) an adult male skin and skull.

1912. *Cercopithecus (Otopithecus) elegans* DUBOIS AND MATSCHIE, Rev. Zool. Africaine, I, March 31, p. 440, fig. 4. Probably from Lomami River, Belgian Congo. Type an adult male skin and skull; a paratype (young female) from Aruwimi.

1912. *Lasiopyga pygerythra callida* HOLLISTER, Smithsonian Misc. Coll., LIX, No. 3, March 2, p. 1. South side of Lake Naivasha, British East Africa. Type, an adult male, skin and skull, also four topotypes.

1913. *Cercopithecus (Rhinostictus) schmidti mpangæ* MATSCHIE, Ann. Soc. Zool. Malacol. Belgique XLVII, (1912), August, p. 67. Mpanga Forest, Uganda. Type, a male, skin and skull. Also several paratypes.

1913. *Cercopithecus (Rhinostictus) ascanius omissus* MATSCHIE, Ann. Soc. Zool. Malacol. Belgique, LXVII, (1912), August, p. 68. Manyema?, Belgian Congo. Type and only specimen, an immature female.

1913. *Cercopithecus (Rhinostictus) ascanius cirrhorhinus* MATSCHIE, Ann. Soc. Zool. Malacol. Belgique, XLVII, (1912), August, p. 70. "Aus der Provinz Stanley Falls." Type, an adult male, skin and skull. Also five topotypes.

1913. *Cercopithecus (Rhinostictus) schmidti sassæ* MATSCHIE, Ann. Soc. Zool. Malacol. Belgique, XLVII, (1912), August, p. 72. Sassa (=Isasa River), southeast[1] of Lake Albert Edward. Type, and only specimen, an adult female, skin and skull.

1913. *Cercopithecus (Rhinostictus) schmidti enkamer* MATSCHIE, Ann. Soc. Zool. Malacol. Belgique, XLVII, (1912), August, p. 73. Chima Kilima, north of Mawambi, Belgian Congo. Type, an adult male, skin and skull. Also three paratypes.

1913. *Cercopithecus (Rhinostictus) ascanius kassaicus* MATSCHIE, Ann. Soc. Zool. Malacol. Belgique, XLVII, (1912), August, p. 74. Pogge Falls, Kasai River, Belgian Congo. Type, a young adult female, skin and skull. Also young male topotype.

1913. *Cercopithecus (Rhinostictus) ascanius pelorhinus* MATSCHIE, Ann. Soc. Zool. Malacol. Belgique, XLVII, (1912), August, p. 76. "At Yambuya received," Belgian Congo. Type, and only specimen, an adult female, skin without skull.

1913. *Cercopithecus (Mona) leucampyx schubotzi* MATSCHIE, Ann. Soc. Zool. et Malacol. Belgique, XLVII, (1912), August, p. 78. Mawambi, Belgian Congo.

[1]Matschie said "west of Lake Albert Edward." (Cf. Powell-Cotton's itinerary, 1907, Geogr Journ., London, XXX, map opposite p. 468.).—H. L.]

Type, an adult male, skin and skull. Also two topotypes and six paratypes from localities in the Ituri Forest, mostly from near Mawambi.

1913. *Lasiopyga leucampax mauæ* HELLER, Smithsonian Misc. Coll., LXI, No. 17, October 21, p. 7. Summit of Mau Escarpment, between Londiani and Sirgoit, British East Africa. Type (unique), an adult male, skin and skull.

1913. *Lasiopyga albogularis maritima* HELLER, Smithsonian Misc. Coll., LXI, No. 17, October 21, p. 8. Mazeras, British East Africa. Type, an adult female, skin and skull; also two other females from the type locality.

1913. *Lasiopyga albogularis kima* HELLER, Smithsonian Misc. Coll., LXI, No. 17, October 21, p. 9. Mount Mbololo, Taita District, British East Africa. Type, an adult male, skin and skull; and nine other specimens, in part topotypes.

1913. *Lasiopyga ascanius kaimosæ* HELLER, Smithsonian Misc. Coll., LXI, No. 17, October 21, p. 10. Near Kaimosi, Upper Lukosa River, British East Africa. Type, an adult male, skin and skull; also a large series of topo-paratypes.

1913. *Lasiopyga pygerythra tumbili* HELLER, Smithsonian Misc. Coll., LXI, No. 17, October 21, p. 10. Ndi, Taita District, British East Africa. Type, an adult male, skin and skull; and 12 other specimens, mostly topotypes.

1913. *Lasiopyga pygerythra arenaria* HELLER, Smithsonian Misc. Coll., LXI, No. 17, October 21, p. 11. Merille waterholes, Marsabit Road, British East Africa. Type, an adult male, skin and skull; also 16 paratypes from the type region.

1913. *Lasiopyga leucampyx sibatoi* LORENZ, Anz. Ak. Wiss. Wien, Math.-Nat. Kl., L, No. 26, December 11, p. 439. Mountain forest northwest of Lake Tanganyika (2000 m.). Type, an old male, skin and skull.

1914. *Lasyopyga schmidti montana* LORENZ, Anz. Ak. Wiss. Wien, Math.-Nat. Kl., LI, No. 17, July 2, p. 357. Territory of the Wabembe, northwest of Lake Tanganyika. Based on six skins from the type locality. No type designated.

1914. *Lasyopyga schmidti ituriensis* LORENZ, Anz. Ak. Wiss. Wien, Math.-Nat. Kl., LI, No. 17, July 2, p. 357. Ituri Forest near Beni and Mawambi. Based on four skins from these localities. No type designated. Referred by Lorenz in 1917 to *C. schmidti enkamer* Matschie.

1914. *Lasyopyga tantalus beniana* LORENZ, Anz. Ak. Wiss. Wien, Math.-Nat. Kl., LI, No. 17, July 2, p. 358. Beni, Belgian Congo. Based on two skins. No type designated.

1914. *Lasyopyga tantalus graueri* LORENZ, Anz. Ak. Wiss. Wien, Math.-Nat. Kl., LI, No. 17, July 2, p. 358. Baraka, northwest shore of Lake Tanganyika. Based on a female skin and skull.

1915. *Cercopithecus pulcher* LORENZ, Anz. Ak. Wiss. Wien, Math.-Nat. Kl., LII, No. 14, p. 171. Cameroon, without definite locality. Based on two skins without skull, sex not determinable.

1915. *Cercopithecus thomasi rutschuricus* LORENZ, Anz. Ak. Wiss. Wien, Math.-Nat. Kl., LII, No. 14, p. 172. Eastern slope of Mount Rutshuru, altitude 1600 m. Based on skin and skull of an old male. Later (1917) referred by Lorenz to *Cercopithecus thomasi* Matschie.

1916. *Cercopithecus (Chlorocebus) toldti* WETTSTEIN, Anz. Ak. Wiss. Wien, Math.-Nat. Kl., LIII, p. 189; 1918, Denkschr. Ak. Wiss. Wien, Math.-Nat. Kl., XCIV, (1917), p. 645. Gebel Rihal near Kadugli, South Kordofan. Type, an adult female; also a cotype, a young female.

1917. *Cercopithecus schmidti rutschuricus* LORENZ, Ann. Naturhist. Hofmus., Wien, XXXI, p. 228, Pl. xv, fig. 2 (skull). Mountain border of Rutschuru Plain. Type, a male, skin and skull. Not *Cercopithecus thomasi rutschuricus* Lorenz, 1915.

1918. *Cercopithecus (Chlorocebus) cailliaudi* WETTSTEIN, Denkschr. Ak. Wiss. Wien, Math.-Nat. Kl., XCIV, (1917), p. 643. Based on "einige Affenfelle im Berliner Museum und auf die Abbildung (nicht Text) des 'Grivet' in Geoff.-Fr. Cuvier 'Histoire Naturelle des Mammifères 1824'." Type, a female in the Berlin Museum, collected by Werne on the [Lower?] Blue Nile; other specimens referred to it are from North Abyssinia, Eritrea, Atbara basin, Salomona, Tacazze-Biagela, Mograt Island, near Abu Hamed and from Nile Valley to Jebel Ambukol. (Cf. *loc. cit.*, pp. 638–641.)

1919. *Cercopithecus ascanius katangæ* LÖNNBERG, Rev. Zool. Africaine, VII, October, p. 122. Kinda, southern Belgian Congo. Based on 11 specimens from Kinda, without designation of type.

1919. *Cercopithecus ascanius orientalis* LÖNNBERG, Rev. Zool. Africaine, VII, October, p. 125 (in text). Campi Simba, Zuwani River, British East Africa. Type, a female, incomplete skin without skull.

1919. *Cercopithecus brazzæ uelensis* LÖNNBERG, Rev. Zool. Africaine, VII, October, p. 130 (in text). Poko, Uele district, Belgian Congo. Based on three specimens.

1919. *Cercopithecus leucampyx maesi* LÖNNBERG, Rev. Zool. Africaine, VII, October, p. 133 (in text). Kutu, Lake Leopold II district, Belgian Congo. Based on a single young specimen with the permanent dentition not fully developed.

1919. *Cercopithecus leucampyx elgonis* LÖNNBERG, Rev. Zool. Africaine, VII, October, p. 133. Mt. Elgon, British East Africa. Based on three adult specimens, without designation of a type.

1919. *Cercopithecus pyrogaster* LÖNNBERG, Rev. Zool. Africaine, VII, October, p. 137. Atene, Kwango River, Belgian Congo. Type, and only specimen, a young adult female.

1919. *Cercopithecus pygerythrus katangensis* LÖNNBERG, Rev. Zool. Africaine, VII, October, p. 141. Funda Biabo, southern Belgian Congo. Type, an old male, skin and skull. Another specimen from Kinda.

1920. *Lasiopyga pygerythra contigua* HOLLISTER, Smithsonian Misc. Coll., LXXII, No. 2, January 22, p. 2. Changamwe, six miles inland from Mombasa, British East Africa. Type, adult male, skin and skull; and two other specimens from the type locality.

MIOPITHECUS I. Geoffroy

1842. *Miopithecus* I. GEOFFROY, Compt. Rend. Ac. Sci. Paris, XV, pp. 720, 1037. Type, by original designation, "Le Talapoin de Buffon" = *Simia talapoin* Schreber ('Säugthiere,' Pl. xvii).

SPECIFIC AND SUBSPECIFIC NAMES REFERABLE TO *Miopithecus*

1775. *Simia talapoin* SCHREBER, 'Säugthiere,' I, p. 101, Pl. xvii (copied from Buffon). Locality unknown. Based primarily on Le Talapoin, Buffon (1766, 'Hist. Nat.,' XIV, p. 287, Pl. xl).

1829. *Simia melarhina* G. CUVIER, 'Règn. Anim.,' Ed. 2, I, p. 92. Cites F. Cuvier, Pl. xviii, Le Talapoin.

1842. *Miopithecus capillatus* I. GEOFFROY, Compt. Rend. Ac. Sci. Paris, XV, p. 720, footnote. ". . . une espèce nouvelle, le Miopithèque chevelu (*M. capillatus*), très-voisin du Talapoin, mais un peu plus grand et à pelage d'un roux légèrement verdâtre." No locality, no further description.

1907. *Cercopithecus talapoin ansorgei* POCOCK, Proc. Zool. Soc. London, October 8, p. 742. Cambaca (=Canhoca), Angola. Two specimens, type a male from Canhoca, and a female paratype from Casualalla, North Angola (Elliot).

1919. *Miopithecus talapoin pilettei* LÖNNBERG, Rev. Zool. Africaine, VII, October, p. 119. Kabawaki, Ruwenzori, altitude 2500 m. Type, a male, skin without skull.

ERYTHROCEBUS Trouessart

1897. *Erythrocebus* (subgenus of *Cercopithecus*) TROUESSART, 'Cat. Mamm. Viv. Foss.,' I, p. 19. Type, by subsequent designation (Pocock 1907), *Simia patas* Schreber.

1870. *Chlorocebus* GRAY, 'Cat. Monkeys, Lemurs, and Fruit-eating Bats,' pp. 5, 24, part.

SPECIFIC AND SUBSPECIFIC NAMES REFERABLE TO *Erythrocebus*

1775. *Simia patas* SCHREBER, 'Säugthiere,' I, p. 98, Pl. XVI (copied from Buffon). Based on Le Patas, Buffon (1766, 'Hist. Nat.,' XIV, p. 208, Pls. XXV, XXVI. Senegal, without definite locality.

1788. *Simia rubra* GMELIN, Linnæus, 'Syst. Nat.,' I, p. 34. New name for *Simia mona* and *Simia patas* Schreber.

1792. *Simia (Cercopithecus) ruber nigrofasciatus* KERR, 'Anim. Kingd.,' p. 71, No. 48. "Senegal." A "variety" of *Simia ruber* Gmelin = *Simia patas* Schreber.

1792. *Simia (Cercopithecus) ruber albofasciatus* KERR, 'Anim. Kingd.,' p. 71, No. 49. "Senegal." A "variety" of *Simia ruber* Gmelin = *Simia patas* Schreber.

1801. *Simia rufa* SCHREBER, 'Säugthiere,' Suppl., Pl. XVI*B* (no text).

1829. *Cercopithecus pyrronotus* HEMPRICH AND EHRENBERG, Verhandl. Ges. Naturf. Fr. Berlin, I, p. 407. Kordofan.

1862. *Cercopithecus poliophæus*[1] REICHENBACH, 'Vollständ. Naturgesch. Affen,' p. 122, fig. 309. First description of Heuglin's *C. poliophæus*. (Not seen; citations and comment from other authors. Fazogli, Blue Nile, on border of Western Abyssinia.

1862. *Cercopithecus circumcinctus* REICHENBACH, 'Vollständ. Naturgesch. Affen,' p. 123, Pl. XXXI, fig. 310. (Not seen.) Locality unknown. Type, a menagerie specimen.

1905. *Erythrocebus kerstingi* MATSCHIE, Sitzungsb. Ges. Naturf. Fr. Berlin, December, p. 274. Sokode, Togoland, West Africa. Type, a female.

1905. *Erythrocebus zechi* MATSCHIE, Sitzungsb. Ges. Naturf. Fr. Berlin, December, p. 274. Kete Kradji, western Togoland. Type, a living specimen in the Berlin Zoölogical Gardens.

1905. *Erythrocebus langheldi* MATSCHIE, Sitzungsb. Ges. Naturf. Fr. Berlin, December, p. 276. Garua, upper Benue River, Cameroon. Type, an immature female.

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[1]Heuglin (1861, Petermann's Mitteilungen, VII, p. 13) mentions an animal of the *C. patas* group discovered by him on the White Nile and in Fazogli, under this name, but without description.

1905. *Erythrocebus baumstarki* MATSCHIE, Sitzungsb. Ges. Naturf. Fr. Berlin, December, p. 273. Ikomo, east of the southeast end of Victoria Nyanza. Type, a subadult female.

1906. *Cercopithecus patas sannio* THOMAS, Ann. Mag. Nat. Hist., (7) XVII, February, p. 173. Yo, Lake Chad. Type, an adult male.

1909. *Erythrocebus albigenus* ELLIOT, Ann. Mag. Nat. Hist., (8) IV, p. 265. Egyptian Sudan, exact locality not known. Type, an adult male, skin and skull.

1909. *Erythrocebus formosus* ELLIOT, Ann. Mag. Nat. Hist., (8) IV, September, p. 264. Uganda, particular locality not given. Type, and only specimen, a male skin without skull.

1910. *Erythrocebus whitei* HOLLISTER, Smithsonian Misc. Coll., LVI, No. 2, March 31, p. 11, Pl. II (skull). Nzoia River, Guas Ngishu Plateau, British East Africa. Type, an adult male, skin and skull.

1912. *Cercopithecus* (*Erythrocebus*) *patas albosignatus* MATSCHIE, Rev. Zool. Africaine, I, March, p. 433, fig. 1 (head). Mbomu River, Uele Basin, Belgian Congo. Type, an adult female.

1912. *Cercopithecus* (*Erythrocebus*) *patas poliomystax* MATSCHIE, Rev. Zool. Africaine, I, March, p. 434. Upper Congo, locality unknown. Type, an adult male, skin and skull.

The foregoing list of 174[1] species and subspecies of *Lasiopyga*, *Miopithecus* and *Erythrocebus* described prior to and including 1920 may be divided into six sections, four of which represent quarter centuries.

Periods	Number of Forms
1758–1799	15
1800–1824	5
1825–1850	26
1851–1874	12
1875–1899	17
1900–1920	99

Of these 174 forms about one-fourth had been relegated to synonymy by 1912 (by Pocock in 1907 and by Elliot in 1912, both authors being in practical agreement respecting them). A few described since 1912 have already shared the same disposal, as will doubtless still others when the group is again comprehensively revised.

The above statistical table shows that the number of forms described during the first two decades of the present century greatly exceeds the number described during the preceding century and a half (99 and 75, respectively). This increase is in marked correlation with the increase of material representing this group in the museums of Europe and America

[1]This number is approximate, and will doubtless be increased when all the literature published in 1917–1919 has become available for examination.

since 1905. It may be further noted that nearly two-thirds of the forms described during the last twenty years, or 61 of the 99, have been given trinomial names, indicating geographic forms or subspecies. It is however evident from a study of the literature of this later period, in connection with the large series of specimens of these monkeys from single localities in the Upper Congo region now available for comparison, that many of the names recently proposed for species and subspecies will prove to be superfluous.

During the century from 1758–1857 forty-nine specific and two subspecific names were proposed for African guenons. The first ten (proposed 1758–1775) are still current, as are sixteen others proposed prior to 1857, or twenty-six out of fifty-one. The other twenty-five have passed into synonymy, many of which were intentionally proposed as substitute names, most of them before the B. A. (or Strickland) Code of Nomenclature was promulgated, or when authors felt at liberty to propose names in place of earlier names that failed to satisfy their sense of appropriateness. Others, and these are not few, were given through lack of knowledge of the subject. Most of the names given prior to the eighteenth century were based on the descriptions and illustrations of pre-Linnean or other nonbinomial authors, and nearly all were described originally from living specimens observed in menageries or from preserved specimens derived from such sources. During the first half of the nineteenth century, besides the still available menagerie sources, many species were based on imperfect native-made skins, without skulls, often without feet or the facial portion, and with imperfect tails.

From the geographical point of view the conditions were equally unfortunate. Three-fourths of the species were from unknown or indefinitely known localities, as "Africa," "West Africa," or "West Africa?" Some were even attributed to Madagascar, South America, and East Indies. Prior to 1858 actual localities were given for very few species, as follows: St. Jago, Cape Verde Islands, one; Fernando Po, three; Port Natal, one; Sierra Leone, one; Mozambique, two; Cafraria, 2. With these exceptions there were no type localities for the species described, and their approximate geographic sources have been determined by the later reception of specimens similar to the types from more or less definitely known localities. For the most part no definite type district has been formally assigned to the first described forms, even in cases where subspecies have been assigned to the groups denoted by eighteenth and early nineteenth century names.[1] The practice of basing a species

[1]The guenons are of course not exceptional in this respect, but it has become more or less the custom with many recent revisers to arbitrarily designate a type locality for the first described form of a group of subspecies with which they find it necessary to deal in a comprehensive way.

or a subspecies on a single specimen from an unknown locality still continues, about a dozen such forms having been described since the year 1900. A very large part of the species thus far described prove to have been originally founded on single specimens, and often on immature examples. The number of cases when the describer refers to more than one example as having been examined at the time the original description was prepared are relatively few; reference to a series of topotypical specimens is rare, but less so during the last ten or fifteen years than previously.

Respecting the geographical distribution of the 174 described (or renamed) forms, about 50 were from unknown or conjecturally known localities. Most of these were probably from West Africa, a number from the Upper Congo drainage, a few from East Africa. About thirty were assigned to more or less definitely known localities in West Africa, about forty to definite localities in Central Africa (mainly the drainage basin of the Congo), and about fifty to definite localities in East Africa. Thus about 120 of the forms have satisfactorily known type localities.

Some fifty species and subspecies of guenons have been described from the Belgian Congo and the adjoining border of Uganda, all but five of them during the period 1905–1919. Eight have no type localities, but are recorded as from "Congoland," "Upper Congo," "Congo Forest" or "Ituri Forest." Lönnberg, in an important paper on the monkeys of the Belgian Congo published in 1919,[1] deals with about 175 specimens of guenons in the Congo Museum at Tervueren, of which he records twenty-eight forms (seven as new). Most of the specimens are listed with their respective localities and the name of the collector. Fifteen of the twenty-eight forms are given the status of subspecies, and allotted to seven species; nine additional binomial forms are recognized. Valuable information is given respecting their relationships and individual variation. The numerous localities mentioned cover a wide extent of country, but usually there are few specimens of any form from any single locality, the highest being usually four to six (in one case nine, from Tshopo), in contrast with frequent series of ten to fifteen or more of the same species from single localities, and from fifteen to forty or more from a small district, as in the present Upper Congo collection.

[1]Lönnberg, Einar. 1919, 'Contributions to the Knowledge about the Monkeys of Belgian Congo.' Rev. Zool. Africaine, VII, pp. 107–154 (*Cercopithecus*, pp. 121–143).

Recent Revisions of African Guenons

The guenons[1] were revised by Pocock[2] in 1907 and by Elliot in 1913[3] (the manuscript of the latter was transmitted to the printer in June, 1912). In the interval of practically four years between the publication of Pocock's revision and the date to which Elliot brings the subject (only one species described in 1912 is included) twenty-one new forms were described. Deducting these from the number included by Elliot, the following comparison may be made of the two revisions for the period 1758 to 1907. Pocock included all the guenons in the genus *Cercopithecus*, but recognized thirteen groups, indicated by the name of the leading species of each, as "Diana Group," "Neglectus Group," etc. Elliot substituted *Lasiopyga* for *Cercopithecus* and formally recognized three genera and eight subgenera for the forms referred to *Cercopithecus* by Pocock. In the main the subdivisions made by the two authors are equivalent groups, although in three instances two of Pocock's "groups" are combined as one by Elliot. But the order of sequence is radically different, as shown by the following comparison:

Pocock's Groups	Elliot's Subgenera and Genera
1. *Diana* group 2. *Neglectus* group 4 species+1 subspecies	8. *Pogonocebus* (subg.) Trouessart 4 species
3. *Leucampyx* group 4. *Nictitans* group 5 species+7 subspecies	3. *Melanocebus* Elliot (new subg.) (=*Diademia* Reichenbach) 11 species+1 subspecies
5. *Albogularis* group 8 species+5 subspecies	7. *Insignicebus* Elliot (new subg.) 11 species+5 subspecies
6. *Mona* group 7 species+1 subspecies	6. *Mona* (subg.) Reichenbach (untenable) (=*Monichus* Oken) 7 species+1 subspecies
7. *L'hoesti* group 1 species+1 subspecies	1. *Allochrocebus* Elliot (new subg.) 1 species
8. *Erythrogaster* group 9. *Petaurista* group 4 species+2 subspecies	2. *Rhinostictus* (subg.) Trouessart 7 species

[1]Including members of the genera *Lasiopyga*, *Miopithecus* and *Erythrocebus*.

[2]Pocock, R. I. 1907, 'A Monographic Revision of the Monkeys of the Genus *Cercopithecus*.' Proc. Zool. Soc. London, pp. 677–746, Pls. xxxix–xlii and text figs. 179–193.

[3]Elliot, Daniel Giraud. 1913, 'A Review of the Primates,' (1912), II, pp. 275–382, Pls. 3–8 (colored), Pls. xxxi–xxxix (skulls), Pl. 11 (2 figs. from life), Pls. 1–4 (heads); III, pp. 1–18, Pls. 1–2 (skulls), Pl. 1 (fig. from life).

Pocock's Groups	Elliot's Subgenera and Genera
10. *Cephus* group 3 species+1 subspecies	4. *Neocebus* Elliot (new subg.) 4 species
11. *Æthiops* group 8 species+7 subspecies	5. *Chlorocebus* (subg.) Gray 12 species+3 subspecies
12. *Talapoin* group 1 species+1 subspecies	9. *Miopithecus* (gen.) I. Geoffroy 2 species
13. *Patas* group 1 species+1 subspecies[1]	10. *Erythrocebus* (gen.) Trouessart 9 species

Pocock states respecting the status of his "groups": "The application of subgeneric names to these sections is at present, I think, premature, because they rest almost wholly upon color-characters; and if the system be adopted with consistency, it will be necessary to introduce additional names to emphasize the isolation of certain other species, such as *C. neglectus*, *C. l'hoesti*, and possibly *C. nigroviridis*." Elliot, in partial agreement with these suggestions, proposed the new subgenus *Allochrocebus* for the *L. l'hoesti* group, *Melanocebus*[2] for the *L. leucampyx* and *L. nictitans* groups, *Neocebus* for the *L. cephus* group, *Insignicebus* for the *L. albogularis* group. He also combined the *L. diana* and *L. neglecta* groups under *Pogonocebus* Trouessart, the *L. erythrogaster* and *L. petaurista* groups under *Rhinostictus* Trouessart. The *L. mona* group was recognized under the name *Mona* Reichenbach (=*Monichus* Oken), and the *L. æthiops* group under the name *Chlorocebus* Gray. He gave the *C. talapoin* group recognition as a genus under the name *Miopithecus* I. Geoffroy, and the *C. patas* group generic status as *Erythrocebus* Trouessart.

There are naturally many differences in respect to the status and nomenclature of the forms recognized respectively by the two authors for the same period of time (1758–1907), as shown in the table of species and subspecies below. The marginal numbers prefixed to the names indicate the order of sequence. These show at a glance the difference in the order of arrangement in the two revisions. Synonyms are also included to elucidate the rulings of both authors.

The number of forms recognized as valid by Pocock is 69 (42 species and 27 additional subspecies); the number of forms recognized as valid by Elliot is 78 (68 species and 10 additional subspecies). The total

[1]Seven others referred to *Erythrocebus* by Matschie are listed but held in abeyance.
[2]No genotype is indicated for *Melanocebus* but it becomes in effect a synonym of *Diademia* Reichenbach.

number recognized by Elliot (from 1758 to 1912) is 98 (81 species and 17 subspecies), including 21 published after 1907 (indicated by an asterisk prefixed to the marginal number). Twelve of these were described by Elliot, two by Hollister, three by Thomas, and Thomas and Wroughton, and one each by Pocock, Büttikofer, Dollman, and Lönnberg. The number of names assigned as synonyms is 39 by Pocock and 40 by Elliot, but the names thus allocated are not always the same.

Pocock states (*loc. cit.*, p. 680), that the material he had at his disposal was "the skins in the collection of the [Zoölogical] Society and the examples living in the Gardens during the past four years, most of which were deposited for scientific work of this kind by the Hon. Walter Rothschild." He also had "the freest possible access at all times" to the collection in the British Museum. He also says, "I regret that lack of proper material has prevented me making use of skull-characters." Elliot (*loc. cit.*, II, p. 290) comments on this inadequate material which "though considerable in number of specimens, gave the Author no personal knowledge of many species in Continental Museums not represented in the British Museum, and thus placed him at a disadvantage. Cranial characters, which are of supreme importance in the discrimination of species were not considered at all, for the reason as he states, that 'lack of proper material has prevented me from making use of skull-characters,' and so at the outset he was deprived of one of the most important methods of determining species."

Pocock further says: "One great systematic difficulty that I have had to face, and in many cases to leave unsatisfactorily settled, is the decision as to the status, whether specific or subspecific, that should be given to certain forms. This is an extremely difficult point, and one about which probably no two authors will agree. I suspect that most of my present day colleagues will think that I have been too lavish with subspecies, and will consider that the higher rank should have been assigned to them in most cases. Personally, I doubt if in all instances I have gone quite far enough in reducing species to subspecific level."

Elliot comments (*loc. cit.*, p. 292): "Mr. Pocock's method of employing subspecific names is somewhat perplexing, for it is generally understood by Naturalists that a subspecies can only be properly established when there are intergrades between it and a closely related species, Now nearly all the recognized subspecies in this [Pocock's] paper . . . . have no intermediates, and consequently should not be classed as subspecies." Possibly Pocock's view here criticised by Elliot is too liberal, but certainly that of his critic is too narrow and not in accord with the

generally accepted view that general conditions, geographical and environmental, as illustrated and well known in hundreds of parallel cases, are entitled to weight in considering the status of closely related forms in cases where actual intergrades are absent but all other indications point to subspecific rather than specific relationship. While Elliot had the advantage of a wider scope of material there is no evidence that he had opportunity to examine a large series of specimens of any one form, much less a large series of any form from a single locality, or was able to bring together for direct comparison examples seen in one museum with those in other museums.

Pocock mentions the *Erythrocebus* group (typified by *C. patas*), as standing out from the others and which "might perhaps with advantage be given full generic status," the living animals being markedly different not only in color but in form. In fact *Erythrocebus* has been accorded full generic rank not only by Elliot but by several other recent authors. It is so treated in the list of the genera, species and subspecies given above in the present paper, and in the detailed consideration of the material of the guenon group collected by the American Museum Congo Expedition, to which material the resources available at the present writing are unfortunately almost wholly restricted.

Species and Subspecies of *Lasiopyga* (=*Cercopithecus*)

Cercopithecus Pocock, 1907	*Lasiopyga* Elliot, (1912) 1913
1. *Diana* Group	8. Subgenus *Pogonocebus*
1. *C. diana* (Linnæus)	64. *L. diana* (Linnæus)
Syn. *diana* var. *ignita* Gray	Syn. *diana* var. *ignita* Gray
2. *C. roloway* (Schreber)	65. *L. roloway* (Erxleben)
Syn. *palatinus* Wagner	Syn. *palatinus* Wagner
2. *Neglectus* Group	
3. *C. neglectus* Schlegel	62. *L. neglecta* (Schlegel)
3*a*. *C. neglectus neglectus*	
Syn. *leucocampyx* Gray (not *leucampyx* Fischer)	
" *brazzæ* M.-Edwards.	
3*b*. *C. neglectus brazziformis* Pocock	63. *L. brazzæ* (M.-Edwards)
*3bis. *C. ezræ* Pocock[1]	Syn. *brazziformis* Pocock
	" *ezræ* Pocock
3. *Leucampyx* Group	3. Subgenus *Melanocebus* Elliot [=*Diademia* Reichenbach]
4. *C. leucampyx* Fischer	9. *L. leucampyx* (Fischer)
4*a*. *C. leucampyx leucampyx*	Syn. *diana* F. Cuvier
Syn. *diana* F. Cuvier	" *diadematus* I. Geoffroy

[1]The asterisk before a number indicates that the species so indicated was described after the publication of Pocock's Monograph.

Species and Subspecies of *Lasiopyga* (=*Cercopithecus*) (*Continued*)

Cercopithecus Pocock, 1907	*Lasiopyga* Elliot, (1912) 1913
Syn. *diadematus* I. Geoffroy	
4*b*. *C. leucampyx stuhlmanni* Matschie	15. *L. stuhlmanni* (Matschie)
Syn. *otoleucus* Sclater	Syn. *otoleucus* Sclater
	16. *L. neumanni* (Matschie)
4*c*. *C. leucampyx carruthersi* Pocock	19. *L. carruthersi* (Pocock)
4*d*. *C. leucampyx doggetti* Pocock	17. *L. doggetti* (Pocock)
	*18. *L. princeps* (Elliot)
	Syn. *stuhlmanni* Pocock, not Matschie
4*e*. *C. leucampyx nigrigenis* Pocock	11. *L. nigrigenis* (Pocock)
Syn. *leucampyx* Sclater (not Fischer)	
4*f*. *C. leucampyx pluto* Gray	10. *L. pluto* (Gray)
4*g*. *C. leucampyx boutourlinii* Giglioli	12. *L. boutourlinii* (Giglioli)
Syn. *omensis* Thomas	Syn. *albogularis* Giglioli (not Sykes)
	" *omensis* Thomas
5. *C. opisthostictus* Sclater	13. *L. opisthosticta* (Sclater)
6. *C. kandti* Matschie	57. *L. kandti* (Matschie)[1]
	*14. *L. aurora* (Thomas and Wroughton)
4. *Nictitans* Group	
7. *C. nictitans* (Linnæus)	20. *L. nictitans* (Linnæus)
7*a*. *C. nictitans nictitans*	
7*b*. *C. nictitans laglaizei* Pocock	20*a*. *L. nictitans laglaizei* (Pocock)
8. *C. martini* Waterhouse	22. *L. martini* (Waterhouse)
Syn. *ludio* Gray	Syn. *ludio* Gray
" *stampflii* Jentink	" *temmincki* I. Geoffroy
" ? *temmincki* I. Geoffroy	" *melanogenys* Schlegel
	" *stampflii* Jentink
	*21. *L. sticticeps* (Elliot)
5. *Albogularis* Group	7. Subgenus *Insignicebus*
9. *C. albogularis* (Sykes)	52. *L. albogularis* (Sykes)
9*a*. *C. albogularis albogularis*	Syn. *monoides* I. Geoffroy
Syn. *erythrarchus* Peters	" *erythrarchus* Peters
9*b*. *C. albogularis beirensis* Pocock	52*a*. *L. albogularis beirensis* (Pocock)
9*c*. C. *albogularis rufilatus* Pocock	52*c*. *L. albogularis rufilata* (Pocock)
Syn. *?monoides* I. Geoffroy	*52*d*. *L. albogularis kibonotensis* (Lönnberg)
9*d*. *C. albogularis albotorquatus* Pousargues	50. *L. albotorquata* (Pousargues)
10. *C. kolbi* Neumann	51. *L. kolbi* (Neumann)
10*a*. *C. kolbi hindei* Pocock	*51*a*. *L. kolbi nubila* (Dollman)
	51*b*. *L. kolbi hindei* (Pocock)

[1] *L. kandti* is placed by Elliot in his subgenus *Insignicebus*.

Species and Subspecies of *Lasiopyga* (=*Cercopithecus*) (*Continued*)

Cercopithecus Pocock, 1907	*Lasiopyga* Elliot, (1912) 1913
11. *C. moloneyi* Sclater	53. *L. moloneyi* (Sclater)
12. *C. stairsi* Sclater	
12*a*. *C. stairsi stairsi*	59. *L. stairsi* (Sclater)
12*b*. *C. stairsi mossambicus* Pocock	59*a*. *L. stairsi mossambica* (Pocock)
	*58. *L. insignis* (Elliot)
13. *C. rufotinctus* Pocock	60. *L. rufotincta* (Pocock)
14. *C. francescæ* Thomas	54. *L. francescæ* (Thomas)
15. *C. preussi* Matschie	55. *L. preussi* (Matschie)
Syn. *crossi* Forbes	Syn. *crossi* Forbes
	*55*a*. *L. preussi insularis* (Thomas)
16. *C. labiatus* I. Geoffroy	61. *L. labiata* (I. Geoffroy)
Syn. *samango* Sundevall	Syn. *samango* Sundevall
6. *Mona* Group	6. Subgenus *Mona* [=*Monichus*]
17. *C. mona* (Schreber)	42. *L. mona* (Schreber)
18. *C. campbelli* Waterhouse	45. *L. campbelli* (Waterhouse)
19. *C. burnetti* Gray	46. *L. burnetti* (Gray)
20. *C. denti* Thomas	43. *L. denti* (Thomas)
21. *C. wolfi* Meyer	44. *L. wolfi* (Meyer)
22. *C. grayi* Fraser	48. *L. grayi* (Fraser)
22*a*. *C. grayi grayi*	Syn. *erxlebeni* Dahlb. and Pucher.
Syn. *erxlebeni* Dahlb. and Pucher.	*48*a*. *L. grayi pallida* (Elliot)
22*b*. *C. grayi nigripes* Du Chaillu	
23. *C. pogonias* Bennett	47. *L. pogonias* (Bennett)
	47*a*. *L. pogonias nigripes* (Du Chaillu)
	*49. *L. petronellæ* (Büttikofer)
7. *L'hœsti* Group	1. Subgenus *Allochrocebus* Elliot
24. *C. l'hœsti* Sclater	1. *L. l'hœsti* (Sclater)
24*a*. *C. l'hœsti l'hœsti*	*2. *L. insolita* (Elliot)
24*b*. *C. l'hœsti thomasi* Matschie	56. *L. thomasi* (Matschie)[1]
8. *Erythrogaster* Group	2. Subgenus *Rhinostictus*
25. *C. erythrogaster* Gray	4bis. *L. erythrogaster* (Gray)
9. *Petaurista* Group	3. *L. petaurista* (Schreber)
26. *C. petaurista* (Schreber)	
26*a*. *C. petaurista petaurista*	
Syn. *fantiensis* Matschie	4. *L. fantiensis* (Matschie)
26*b*. *C. petaurista buttikoferi* Jentink	5. *L. buttikoferi* (Jentink)
27. *C. ascanius* (Audebert)	6. *L. ascanius* (Audebert)
27*a*. *C. ascanius ascanius*	Syn. *melanogenys* Gray
Syn. *melanogenys* Gray	" *histrio* Reichenbach
" *histrio* Reichenbach	" *picturatus* Santos
" *picturatus* Santos	*6*a*. *L. ascanius whitesidei* (Thomas)
27*b*. *C. ascanius schmidti* Matschie	

[1] *L. thomasi* is placed by Elliot in his subgenus *Insignicebus*.

Species and Subspecies of *Lasiopyga* (=*Cercopithecus*) (*Continued*)

Cercopithecus Pocock, 1907	*Lasiopyga* Elliot, (1912) 1913
28. *C. signatus* Jentink	7. *L. signata* (Jentink)
Syn. *martini* Sclater, not Waterhouse	Syn. *martini* Sclater (not Waterhouse
	" *nictitans* Schlegel (part)
	8. *L. schmidti* (Matschie)
10. *Cephus* Group	4. *Neocebus* Elliot
29. *C. cephus* (Linnæus)	23. *L. cephus* (Linnæus)
29*a*. *C. cephus cephus*	24. *L. cephodes* (Pocock)
29*b*. *C. cephus cephodes* Pocock	*25. *L. inobservata* (Elliot)
30. *C. erythrotis* Waterhouse	27. *L. erythrotis* (Waterhouse)
31. *C. sclateri* Pocock	26. *L. sclateri* (Pocock)
11. *Æthiops* Group	5. Subgenus *Chlorocebus*
32. *C. sabæus* (Linnæus)	31. *L. callithrichus* (I. Geoffroy)
Syn. *werneri* I. Geoffroy	Syn. *sabæus* Pousargues (not Linnæus)
" *callithrichus* I. Geoffroy	32. *L. werneri* (I. Geoffroy)
33. *C. æthiops* (Linnæus)	33. *L. griseoviridis* (Desmarest)
33*a*. *C. æthiops æthiops*	
Syn. *griseoviridis* Desmarest	Syn. *sabæus* E. Geoffroy (not Linnæus)
" *subviridis* F. Cuvier	" *griseus* Lesson
" *griseus* F. Cuvier	
" *sabæus* I. Geoffroy (not Linnæus)	" *engythithea* Gray
33*b*. *C. æthiops ellenbecki* Neumann	" *æthiops* Anderson (not Linnæus)
33*c*. *C. æthiops hilgerti* Neumann	28bis. *L. hilgerti* (Neumann)
	Syn. *ellenbecki* Neumann
34. *C. matschiei* Neumann	28. *L. matschiei* (Neumann)
35. *C. djamdjamensis* Neumann	29. *L. djamdjamensis* (Neumann)
36. *C. tantalus* Ogilby	30. *L. tantalus* (Ogilby)
36*a*. *C. tantalus tantalus*	30*a*. *L. tantalus budgetti* (Pocock)
Syn. ? *chrysurus* Blyth	*30*b*. *L. tantalus griseisticta* (Elliot)
" ? *sabæus* Reichenbach	*30*c*. *L. tantalus alexandri* (Pocock)
" ? *callithrichus* Forbes	
" ? *sabæus* Pousargues	
36*b*. *C. tantalus budgetti* Pocock	
37. *C. cynosurus* (Scopoli)	34. *L. cynosura* (Scopoli)
Syn. *tephrops* Bennett	Syn. *tephrop* Bennett
38. *C. pygerythrus* F. Cuvier	35. *L. pygerythra* (F. Cuvier)
38*a*. *C. pygerythrus pygerythrus*	Syn. *pusillus* Desmoulins
Syn. *erythropyga* G. Cuvier	" *erythropyga* G. Cuvier
" *pusillus* Desmoulins	" *lalandii* I. Geoffroy
" *lalandii* I. Geoffroy	

Species and Subspecies of *Lasiopyga* (=*Cercopithecus*) (*Continued*)

Cercopithecus Pocock, 1907	*Lasiopyga* Elliot, (1912) 1913
38*b*. *C. pygerythrus rufoviridis* I. Geoffroy	36. *L. rufoviridis* (I. Geoffroy)
Syn. *flavidus* Peters	Syn. *flavidus* Peters
38*c*. *C. pygerythrus whytei* Pocock	*37. *L. rubella* (Elliot)
38*d*. *C. pygerythrus johnstoni* Pocock	*38. *L. callida* Hollister
38*e*. *C. pygerythrus centralis* Neumann	39. *L. centralis* (Neumann)
	39*a*. *L. centralis whytei* (Pocock)
	39*b*. *L. centralis johnstoni* (Pocock)
	*39*c*. *L. centralis lutea* (Elliot)
	*40. *L. silacea* (Elliot)
39. *C. nigroviridis* Pocock	41. *L. nigroviridis* (Pocock)
12. *Talapoin* Group	9. Genus *Miopithecus*
40. *C. talapoin* (Schreber)	79. *M. talapoin* (Schreber)
40*a*. *C. talapoin talapoin*	Syn. *capillatus* I. Geoffroy
Syn. *melarhina* G. Cuvier	" *melarhinus* "Schinz"
40*b*. *C. talapoin ansorgei* Pocock	80. *M. ansorgei* (Pocock)
13. *Patas* Group	10. Genus *Erythrocebus*
41. *C. patas* (Schreber)	66. *E. patas* (Schreber)
41*a*. *C. patas patas*	Syn. *ruber* Gmelin
Syn. *ruber* (Gmelin)	" *ruber nigrofasciatus* Kerr
	" *ruber albofasciatus* Kerr
41*b*. *C. patas pyrronotus* Hemp. and Ehren.	67. *E. pyrronotus* (Hemp. and Ehren.)
	*68. *E. formosus* Elliot
Other forms recognized by Matschie (except *sannio* Thomas) as species of *Erythrocebus* and listed by Pocock at the close of the paper as follows:	69. *E. poliophæus* (Reichenbach)
	*70. *E. whitei* Hollister
	71. *E. kerstingi* (Matschie)
	72. *E. zechi* Matschie
	73. *E. langheldi* Matschie
	*74. *E. albigenus* Elliot
rufa Schreber	75. *E. sannio* (Thomas)
circumcinctus Reichenbach	76. *E. circumcinctus* (Reichenbach)
sannio Thomas	77. *E. baumstarki* Matschie
zechi Matschie	
kerstingi Matschie	
langheldi Matschie	
poliophæus Reichenbach	
baumstarki Matschie	

Status of the Generic Name *Cercopithecus*

Linnæus (1748) in the sixth edition of his 'Systema Naturæ' placed all the primates in his genus *Simia* without division into named groups. Of his sixteen species ten were indicated as species with tails.

Brisson (1756, 'Regn. Anim.,' Tabula, p. 188) was the first author to divide the genus *Simia* into named groups, his divisions are as follows:

SIMIÆ sunt vel
Ecaudatæ;
Rostro brevi.....*Simia*.....Stirps I.
Rostro productiore.....*Simia Cynocephala*.....Stirps II.
Caudatæ;
Caudâ brevissima.....*Papio*.....Stirps III.
Caudâ longâ;
Rostro brevi.....*Cercopithecus*.....Stirps IV.
Rostro productiore....*Cercopithecus Cynocephalus*....Stirps V.

Under Stirps IV, *Cercopithecus*, he placed twenty-nine species, of which nine were new and the remaining twenty were based on preceding authors. Thus *Cercopithecus* included all the long-tailed monkeys of the world then known, by far the greater part of which were from tropical America, but the few African and Asiatic species previously described were also included. The sixth edition of Linnæus 'Syst. Nat.' is uniformly cited in the references. As Brisson's work was published prior to 1758, his generic and subgeneric names are invalid.

Linnæus (1758) in the tenth edition of his 'Syst. Nat.' divided the genus *Simia* into three sections: (1) Cauda nulla: *Simia veterum;* (2) Cauda abbreviata: *Papiones;* (3) Cauda elongata: *Cercopitheci.* The latter included all the long-tailed monkeys, those of the Old World as well as of America, the former comprising macaques as well as guenons. The names of these divisions, however, are in plural form and hence not available as generic (or subgeneric) designations.

A second abridged edition of Brisson's 'Regn. Anim.' was brought out in 1762 by the Dutch publisher Theodore Haak, but, as he states in his introduction, it was his own publication ("hac mea editione") and simply a reprint of the Latin portion of the bilingual original (French and Latin in parallel columns), without change except for small additions of new matter, indicated by insertion between brackets. The original Latin text is otherwise unchanged. It is therefore a republication of the Latin text of the original quarto edition of 1756,[1] and does not give validity to Brisson's genera.[2] The avowed additions by the publisher alone would have validity, but none of these occur in the part devoted to the primates.

[1]The publisher states that he was induced to issue it in this form in order that it might be more easily carried about and thus serve better the convenience of students interested in the study of this subject.

[2]See 1910, 'International Code of Zoölogical Nomenclature,' Opinion 5, July.

Its relation to the present discussion of the generic name *Cercopithecus* comes through the publication of Gronow's 'Zoophylacium' in 1763,[1]

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[1]Gronow's Genera and Species of Mammals in his 'Zoophylacium' (1763, fasc. 1, pp. 1–9), are as follows:

I. *Myrmecophaga* Gronow (ex Brisson = *Myrmecophaga* Linnæus).
1. = *M. didactylus* Linnæus (by citation of Linnæus, 1758, 'Syst. Nat.,' Ed. 10, gen. 8, sp. 1).
2. = *M. tridactylus* Linnæus (*loc. cit.*, gen. 8, sp. 2). Type of *Myrmecophaga* Linnæus by restriction.

II. *Pholidotus* Gronow (ex Brisson = *Manis* Linnæus).
3. = *Manis pentadactyla* Linnæus (*loc. cit.*, gen. 9, sp. 1). Monotypic type of *Manis* Linnæus.

III. *Tardigradus* Gronow (ex Brisson = *Bradypus* Linnæus; not *Tardigradus* Boddaert, 1784 = *Loris* E. Geoffroy, 1796).
4. = *Bradypus tridactylus* Linnæus (*loc. cit.*, gen. 7, sp. 1). Type of *Bradypus* Linnæus by restriction.

IV. *Cataphractus* Gronow (ex Brisson = *Dasypus* Linnæus).
5. = *Dasypus novemcinctus* Linnæus (*loc. cit.*, gen. 17, sp. 6). Tautonomic type of *Dasypus* Linnæus.

V. *Elephas* Gronow (ex Brisson = *Elephas* Linnæus).
6. = *Elephas maximus* Linnæus (*loc. cit.*, gen. 5, sp. 1). Monotypic type of *Elephas* Linnæus.

VI. *Capra* Gronow (ex Linnæus, *loc. cit.*, gen. 31). Tautonomic type, *C. hircus* Linnæus.
7. = *Capra angorensis* Brisson (1756, 'Regn. Anim.,' p. 64).
8. = *Capra gazella* Linnæus (*loc. cit.*, gen. 31, sp. 7). Type of *Oryx* Blainville, 1816.

VII. *Cervus* Gronow (ex Brisson = *Cervus* Linnæus).
9. = *Cervus bezoarticus* Linnæus (*loc. cit.*, gen. 30, sp. 6). The type of *Cervus* Linnæus is fortunately *Cervus elephas* Linnæus by tautonomy. *C. bezoarticus* is the type of *Blastocerus* Wagner, 1844.

VIII. *Sus* Gronow (ex Brisson = *Sus* Linnæus).
10. = *Sus tajacu* Linnæus (*loc. cit.*, gen. 16, sp. 3). Tautonomic type of *Tayassu* Fischer 1814.
11. = *Sus scrofa* Linnæus (*loc. cit.*, gen. 16, sp. 1). Tautonomic type of *Sus*.
12. = *Sus babyrussa* Linnæus (*loc. cit.*, gen. 16, sp. 4). Tautonomic type of *Babiroussus* Gray, 1821.

IX. *Rhinoceros* Gronow (ex Brisson = *Rhinoceros* Linnæus).
13. = *Rhinoceros unicornis* Linnæus (*loc. cit.*, gen. 22, sp. 1). Tautonomic type of *Rhinoceros* Linnæus.

X. *Cuniculus* Gronow (ex Brisson = *Mus* (part) Linnæus).
14. = *C. Aguti* Brisson (*loc. cit.*, gen. 23, sp. 2). Based primarily on Marcgrave. Tautonomic type of *Agouti* Lacépède, 1799.
15. = *C. Paca* Brisson (*loc. cit.*, gen. 23, sp. 4). Based primarily on Marcgrave.
16. = *Mus porcellus* Linnæus (*loc. cit.*, gen. 26, sp. 1).

XI. *Sciurus* Gronow (ex Brisson = *Sciurus* Linnæus).
17. = *Sciurus vulgaris* Linnæus (*loc. cit.*, gen. 27, sp. 1). Tautonomic type of *Sciurus* Linnæus.

XII. *Mus* Gronow (ex Brisson = *Mus* Linnæus).
18. = *Mus rattus* Linnæus (*loc. cit.*, gen. 26, sp. 9).
19. = *Mus musculus* Linnæus (*loc. cit.*, gen. 26, sp. 10). Tautonomic type of *Mus* Linnæus.

XIII. *Cercopithecus* Gronow (ex Brisson, *loc. cit.*, gen. 29, stirp. 4).
20. = *Simia midas* Linnæus (*loc. cit.*, gen. 2, sp. 15). Based on the "little black Monkey of Edwards, Aves, p. 196, Pl. 196." Type, by practical monotypy, of *Cercopithecus* Gronow, if tenable from Gronow.
21. = *Simia faunus* Linnæus (*loc. cit.*, gen. 2, sp. 6) and *Simia morta* Linnæus (*loc. cit.*, gen. 2, sp. 18), neither of which is identifiable.

XIV. *Lemur* Gronow (ex Linnæus, *loc. cit.*, gen. 3).
22. = *Lemur macaco* Erxleben (1777, 'Syst. Regn. Anim.,' gen. 7, sp. 3). Not a Linnean species. Gronow's citations for the species are, (1) *Prosimia fuscus* Brisson, gen. 31, sp. 1; and (2) *Simia sciurus* Petiver, "Gazoph., tab. 17, fig. 5." The latter is the sole basis of Brisson's *Prosimia fuscus*. Linnæus' only citation for *L. catta* is Edwards, Aves, p. 199, Pl. 199.

XV. *Vespertilio* Gronow (ex Brisson *loc. cit.*, gen. 32 = *Vespertilio* Linnæus).
23. = *Vespertilio auritus* Linnæus (*loc. cit.*, gen. 4, sp. 6).
24. = *Vespertilio murinus* Linnæus (*loc. cit.*, gen. 4, sp. 7). Tautonomic type of *Vespertilio* Linnæus.
25. = *Vespertilio pictus* Erxleben (*loc. cit.*, gen. 16, sp. 8). The only citation is "Seba, Thes. vol. I, p. 91, n. 2, 3. tab. 56, fig. 2, 3."
26. = *Vespertilio perspicillatus* Linnæus (*loc. cit.*, gen. 4, sp. 3).
27. = *Vespertilio spasma* Linnæus (*loc. cit.*, gen. 4, sp. 4). The only citation is "Seba. Thes. vol. I, p. 90, n. 1. tab. 56. fig. 1."

XVI. *Phoca* Gronow (ex Brisson = *Phoca* Linnæus).
28. = *Phoca vitulina* Linnæus (*loc. cit.*, gen. 10, sp. 4). Tautonomic type of *Phoca* Linnæus.

XVII. *Canis* Gronow (ex Brisson = *Canis* Linnæus).
29. = *Canis familiaris* Linnæus (*loc. cit.*, gen. 11, sp. 1). Tautonomic type of *Canis* Linnæus).
30. = *Canis mexicanus* Erxleben (*loc. cit.*, gen. 45, sp. 3).

and the contention of Elliot that Brisson's section *Cercopithecus* was validated by Gronow's restriction of it to practically a single species. Elliot assumed that the republication of the Latin text of Brisson's work in 1762 validated Brisson's genera of mammals, overlooking the fact that it was not by Brisson himself as usually taken for granted, but by a publisher named Theodore Haak of Amsterdam in order, as explained above, to make Brisson's work more accessible to students. There is no evidence that Gronow knew of, or made any use of, the 1762 reprint, but contra indication that he did not. The reprint is dated 1762, the first part of the 'Zoophylacium,' containing the mammals, is dated 1763, a folio of 140 pages, of which the mammals occupy only the first nine. Part two of the 'Zoophylacium' (pp. i–iv+141–236) is dated 1764. It is therefore almost certain that the reprint of Brisson was not available at the time the first pages of the 'Zoophylacium,' containing the mammals, were printed. Unfortunately Gronow's citations of Brisson are not by page references but by the genus and species, as "gen. 4, sp. 1" etc., so that these give no clue to whether the citations refer to the original or the reprint. Gronow's title-page explains the scope and purpose of his work: "Zoophylacii Gronoviani Fasciculus primus exhibens Animalia Quadrupeda, Amphibia atque Pisces, quae in Museo suo adservat, rite examinavit, systematice disposuit, descripsit, atque iconibus illustravit." The Animalia Quadrupeda number thirty-five species, distributed under twenty genera, with an additional genus of mammals (*Balæna*) in the order Plagiuri of his Pisces. Only two of the species are monkeys. The classification and sequence of arrangement are strictly Brissonian. Eighteen of the twenty genera of Gronow's mammals are attributed to Brisson, the other two to Linnæus, namely, *Lemur* (=*Prosimia* Brisson) and *Capra* (=*Hircus* Brisson). In reality fourteen of the genera are Linnean and only six Brissonian.

The only two species of monkeys recorded are placed in *Cercopithecus* literally as follows:

"CERCOPITHECUS. Brisson. Quadr. gen. 29, stirp. 4."

XVIII. *Lutra* Gronow (ex Brisson, *loc. cit.*, gen. 40).
31. =*Mustela lutra* Linnæus (*loc. cit.*, gen. 14, sp. 2). Tautonomic type of *Lutra* Haak (ex Brisson), 1762.

XIX. *Talpa* Gronow (ex Brisson=*Talpa* Linnæus).
32. =*Talpa europæa* Linnæus (*loc. cit.*, gen. 19, sp. 1). Tautonomic type of *Talpa* Linnæus.

XX. *Philander* Gronow (ex Brisson).
33. =*Didelphis philander* Linnæus (*loc. cit.*, gen. 21, sp. 2). Tautonomic type of the genus *Philander* Haak (ex Brisson), 1762.
34. =? No citations. Probably not identifiable.
35. =*Didelphis brevicaudata* Erxleben (*loc. cit.*, gen. 8, sp. 4). Type of *Peramys* Lesson, 1842. Citations: Brisson, gen. 42, sp. 9; Seba, Thes. I, p. 50, tab. 31, fig. 6. Brisson is based on Seba.

XXI. *Balaena* Gronow (ex Brisson and Linnæus).
139. =*Balaena mysticetus* Linnæus (*loc. cit.*, gen. 37, sp. 1). Tautonomic type of *Balaena* Linnæus.

"20. *Cercopithecus* imberbis, caudatus, niger; labio superiore fisso; auriculis quadratis nudis; pedibus croceis."

". . . Linn. Syst. Nat. Ed. 10, gen. 2, n. 15." [=*Simia midas* Linnæus.] The little black Monkey, Edw. Av. p. 196, tab. 196. Brisson is not quoted, it not being a Brissonian species.

A fuller description follows, making seven lines in double column, followed by "Habitat in America Meridionali."

"21. *Cercopithecus* caudatus, imberbis, ore fusco: cauda nuda subsquamosa."

The first citation is "Brisson. Regn. Animal. n. 13," followed by citations of Seba, Petiver, Klein, and "Linn. Syst. Nat. Ed. 9, gen. 2, n. 6," and "Linn. Syst. Nat. Ed. 10, gen. 2, n. 18." The first is *Simia faunus* Linnæus, the second, *S. morta* Linnæus, neither identifiable. This is followed by a description of twelve lines in double column, and "Inhabitat Ameiica Meridionalem."

As the above two species of monkey are the only species enumerated by Gronow, it was natural that he should place them in accordance with Brisson's system and nomenclature, which Gronow in all cases so scrupulously followed. If he had also had some African guenons or some macaques in his Museum there is no reason to believe that he would have placed them in any group other than Brisson's *Cercopithecus*. It is obvious therefore that Gronow did not under any reasonable construction determine the genotype of the invalid Brissonian "genus" *Cercopithecus*.

Elliot[1] stated: "For nearly a century and a half the genus *Cercopithecus* has been employed by all mammalogists for the group of African Monkeys known by the popular name of Guenon, and Erxleben, 1777, is usually given as the author of the generic term. On investigating the literature of this name, it would seem we must go farther back into the past than Erxleben . . . to learn that *Cercopithecus* when first employed as a genus had an American monkey for its type, and that no Guenon was included in it." He then refers to Brisson's Stirps IV, and to Gronow's 'Zoophylacium,' where he says, "on page 5 of the *Quadrupeda* he employs Brisson's subgenus *Cercopithecus* as a genus, citing it as 'Stirps IV' of Brisson's work, naming as his first species, the 'little black monkey' of Edwards' 'Natural History,' and giving the number of the colored plate 196. This is a very recognizable figure of the *Simia midas* Linnæus. Therefore, reluctant as we may be to accept the change, the Tamarins, or at least certain species of them, will have to be hereafter

[1]1911, Bull. Amer. Mus. Nat. Hist., XXX, December 21, pp. 341–342.

included in the genus *Cercopithecus*, which term was borne for so long a period by the Guenons. . . The generic term next in order to substitute for *Cercopithecus*, is *Lasiopyga* Illiger . . . 1811 . . . with *Simia nictitans* Linnæus as its type, and in this genus the Guenons must henceforth be included."

Elliot accordingly used Gronow's *Cercopithecus* in his 'Rev. Primates' (1913, I, pp. 190–193) for *Simia midas* Linnæus and two other allied species, and *Lasiopyga* (*loc. cit.*, II, pp. 275–382) for the guenons. In a footnote (*loc. cit.*, I, p. 190) he makes further comment, to the effect that although Gronow was not a binomialist the 'International Commission on Zoölogical Nomenclature' has ruled (Opinion 20, 1910) that his generic names, when conforming to the provisions of the Code, are available in nomenclature. This decision had special reference to Gronow's new genera of fishes, of which twenty-six were accepted as valid and six others were considered as synonyms of Linnean genera of 1758. These were all accompanied with adequate diagnoses, as were also his numerous new genera of amphibians, reptiles and invertebrates, and the genotypes were in many cases automatically determinable by either tautonomy or monotypy. *Cercopithecus* was adopted from Brisson; no diagnosis of it was given, and only one of the two species referred to it is identifiable. *Cercopithecus* might thus be construed as valid and date from Gronow. In view of his general procedure in the part of his work relating to mammals it is evident that this would be merely the result of coincidence, his only identifiable species happening to be South American instead of African, and thus transferred *Cercopithecus* from the guenons to a species of tamarin. Of Gronow's twenty-one genera of mammals, twelve had only a single species each, and eight of these were Linnean. On the basis that *Cercopithecus* was validated by its having a single identifiable species referred to it, his inclusion of only one species in each of the eight Linnean genera would render the single species referred to each its genotype by monotypy. It fortunately happens that the genotype of each of the fourteen Linnean genera adopted by Gronow (most of them indirectly through citation of Brisson) is determinable by tautonomy, thus eliminating Gronow as the determinator of their genotypes, as might not have been the case, at least in some instances,[1] if Gronow had chanced to have other species in place of those he recorded. The bearing of these facts indicates the wholly fortuitous opportunity afforded later revisers of nomenclature to transfer *Cercopithecus* from its

[1] In the case of *Cervus*, Gronow's single species is *Cervus bezoarticus* Linnæus, the type of *Blastocerus* Wagner, 1844.

century and a half of service as the generic designation of nearly a hundred or more species and subspecies of guenons to a very small group of South American monkeys, that had been known equally as long by some other generic name than *Cercopithecus*. This change also results in the substitution of a new family name in place of the long familiar name Cercopithecidæ. Hence if there was ever need to invoke the plenary power of the International Zoölogical Nomenclature Commission to prevent a change in names when such a change "would clearly result in greater confusion than uniformity," the case of *Cercopithecus* is a preëminent instance.

Cercopithecus of Erxleben (1777, 'Syst. Reg. Anim.,' p. 22) embraced only Old World monkeys, of which ten of the twenty-two originally included species were guenons, while two other genera were provided for the New World monkeys, all clearly defined by diagnoses giving distinctive characters. Stirps IV (*Cercopithecus*) of Brisson, 1756, and section three of Linnæus' *Simia* (Cauda elongata: *Cercopitheci*, 1758) were separated by Erxleben as three natural groups designated as genera (*Cercopithecus, Callithrix, Cebus*). They each comprised several groups to which later taxonomers assigned generic value, but in the later subdivision of Erxleben's three genera the names of all were conserved for a part of their original content until 1911, when the name of the major group (*Cercopithecus*) was given an entirely different significance, both geographically and taxonomically, from its original import on a clearly fortuitous technicality, involving a change in the generic designation of more than a hundred currently recognized forms (species and subspecies) without any compensating gain for this wholesale confusion in nomenclature. This transposition of *Cercopithecus* has naturally aroused opposition on the part of a number of European mammalogists, resulting in an appeal to the International Commission on Zoölogical Nomenclature to suspend, in this case, the Rule of Priority which renders the transposition of *Cercopithecus* from a large African group of monkeys to a small American group seemingly mandatory. Since no decision of the case, however, has yet been announced by the Commission and as Elliot in his great work on primates has introduced the correct use of these generic names, and all necessary changes connected therewith, I prefer to follow him, using *Lasiopyga* Illiger as the only available generic name for the African guenons.

LASIOPYGA Illiger

Lasiopyga brazzæ[1] uelensis (Lönnberg)

Plates XCI, XCII

Lasiopyga neglecta ELLIOT, 1913, 'Rev. Primates,' II, (1912), p. 376, part; only the immature specimen "from the Welle River, procured by the Alexander and Gosling Expedition."

Cercopithecus neglectus (not of Schlegel) THOMAS, 1915, Ann. Mag. Nat. Hist., (8) XVI, December, p. 466. Poko, 1 specimen (No. 1168, Christy Coll.), which later (1919) became virtually the type of *Cercopithecus brazzæ uelensis* Lönnberg.

Cercopithecus brazzæ uelensis Lönnberg, 1919, Rev. Zool. Africaine, VII, p. 130 (postscript, in text). Type, the Christy specimen from Poko, Belgian Congo; other specimens mentioned from Bafuka and Zobia. The type is here first designated, Lönnberg omitting to do so.

Represented by 40 specimens accompanied by 2 skeletons, collected as follows:

Bafuka, 6 (5 adult ♂, 1 adult ♀), March 12–April 1, 1913.

Faradje, 2, March 9 and 24, 1911.

Niangara, 12 (5 immature), November 25–December 10, 1910; April 6–June 10, 1913.

Poko, 1 (adult ♂), August 23, 1913.

Niapu, 8 (mostly adult ♂), November 25–December 10, April 6–June 10, 1913.

Avakubi, 4 (all adult), January 4–February 24, 1914.

Banalia, 1 (adult ♂), September 21, 1914.

Ukaturaka, 6 (flat native-made skins, without skulls), May–June, 1909.

The external measurements—average (minimum-maximum)—of twenty-one adults of *Lasiopyga brazzæ uelensis*, taken from animals in the flesh, are as follows:

	Total Length	Head and Body	Tail Vertebræ	Hind Foot	Ear
13 ♂	1235(1135–1395)	540(465–590)	702(630–850)	157(146–172)	39(33–43)
8 ♀	1029(950–1070)	435(400–470)	587(545–630)	134(123–145)	38(35–42)

[1]Some of the more important references to *Lasiopyga brazzæ* are the following:

Cercopithecus brazzæ Rivière, 1886, Rev. Sci., (3) XII, 3 Juillet, p. 15. Brief mention of the type specimen in the Paris Museum, from French Congo, without definite locality. Name attributed to A. Milne-Edwards, doubtless a manuscript name on a Museum label.

Cercopithecus brazzæ Sclater, 1893, Proc. Zool. Soc. London, p. 255, text fig. (head); idem, p. 443, Pl. XXXIII (animal, poorly colored). Described fully on p. 443, from two specimens; from "French Congo-land," without definite locality. The stuffed head described and figured on p. 255 was received from A. Milne-Edwards, as was one of the later described and figured skins. In the colored figure the femoral white band is omitted and the coloring in other respects is inaccurate.

Cercopithecus brazzæ Pousargues, 1896, Ann. Sci. Nat. Zool., Paris, (8) III, pp. 216–222. Congo français: 3 adult males, without definite locality, collected by de Brazza; a semi-adult female from Poste des Ouaddas, Haut Oubangui, Lat. N. 5°, Long. E. 16° 47′ 30″. A detailed description based on this material. Calls attention to errors in Sclater's short description and in his colored plate.

Cercopithecus neglectus subsp. *brazziformis* Pocock, 1907, Proc. Zool. Soc. London, p. 687. Based on an immature menagerie specimen from an unknown locality.=*C. brazzæ* Rivière.

Cercopithecus neglectus subsp. *neglectus* Pocock, 1907, idem, p. 687, part. To replace "*C. brazzæ* Milne-Edwards"; includes *C. neglectus* Schlegel.

Lasiopyga brazzæ Elliot, 1913, 'Rev. Primates,' II, (1912), pp. 378–380, Pl. VIII (animal, reproduced from Sclater).

The cranial measurements—average (minimum-maximum)—of twenty-one adults of *Lasiopyga brazzæ uelensis* are as follows:

	Greatest Length	Condylobasal Length	Occipitonasal Length
13 ♂	112.6(104.5–119.0)	91.7(84.2–97.0)	94.4(87.7–98.0)
8 ♀	100.1(95.7–102.8)	74.9(72.0–80.5)	86.8(75.5–90.3)

	Zygomatic Breadth	Orbital Breadth	Postorb. Constr.	Mastoid Breadth
13 ♂	74.2(67.5-78.5)	61.6(53.6-65.4)	44.3(42.1-46.0)	62.5(58.0-66.3)
8 ♀	65.5(61.0-68.9)	54.3(50.7-57.4)	41.7(37.6-44.0)	57.7(54.2-60.0)

	Length Nasals	Upper Toothrow	Upper Molars
13 ♂	22.6(20.5-25.5)	37.5(35.2-39.7)	19.2(18.1-20.2)
8 ♀	19.5(17.0-22.8)	31.9(30.5-34.0)	17.9(17.0-19.4)

IMMATURE PELAGE.—Immature stages of pelage are represented by seven specimens, all but two from Niangara and all collected in April and June. The youngest (No. 51025, ♂) was taken June 10, and is in the first pelage (Pl. XCI, fig. 2). (Total length, 520 mm.; greatest length of skull, 68; milk dentition only, the last milk molar not fully up.) Brow-band golden yellow, the hairs black at base, the black showing plainly on the front margin of the band. Upper arm, outside of hind limbs and the tail pale yellow, the latter darker at extreme base above and also apically. A pale thinly haired area on the nape. Rest of the upperparts, including the head, yellowish superficially, the hairs individually whitish at extreme base, broadly zoned subapically with dusky, with conspicuous yellowish tips. Cheeks and outside of fore limbs like the back, the latter passing into black on the wrists. Outer border of fore limbs pale yellow, inner surface yellowish white with a silvery sheen; inside of hind limbs similar except that at the thighs it is darkened with a gray suffusion. Underparts thinly haired and yellowish, the hairs of the pectoral area slightly darkened with blackish tips.

The next in age (No. 52437, ♂) is much older and shows no trace of the natal coat. (Total length, 625 mm.; greatest length of skull, 74; milk dentition fully developed but incisors not worn.) The brow-band is not strongly differentiated from the adjoining pelage, except medially, where the hairs are rigid, dull reddish, with lighter tips. Hair and entire dorsal area grizzled as in adults, but the light annulations are much darker, giving a quite different general effect. Tail at base dark chestnut, passing into yellowish brown and darkening apically to blackish. Rump on each side at base of tail chestnut. Fore limbs externally yellowish gray, darker on the shoulder and wrist; internally pale yellowish. Hind limbs similar internally but the hair on the thighs long, soft and blackish on the posterior border. Throat and foreneck whitish, the hair long and soft; rest of ventral surface similar but the tips of the hairs brownish.

Three other specimens represent the same stage as the last; they are all quite similar in general coloration but differ in details, as in the color of the tail and in the amount of chestnut on the back and head. No. 52430 has the front and sides of the head, sides of the nape and the lower back strongly suffused with chestnut, and the light annulations of the entire upperparts have a distinctly rufous tone, increasing in intensity from the nape posteriorly, the whole sacral area as well as the base of the tail being dark chestnut. The tail is less yellow and more grizzled with black, becoming quite black for the apical 50 mm.

A more advanced stage is represented by No. 52427, which has the first permanent molar fully developed in addition to the complete milk dentition. The brow-band is not well defined and is much varied with black; the hairs on the front of the head are broadly tipped with pale tawny; crown and occipital region like the rest of the dorsal surface, the light annulations being light tawny to the base of the tail which is dusky strongly varied with chestnut; remainder of the tail grizzled pale tawny and blackish to near the tip, which is black. Outside of fore limbs a little darker than the back, the black spot on the hand extending to the wrist. Outside of hind limbs grizzled pale tawny and blackish. Inside of all the limbs yellowish white. Throat and foreneck whitish; chest and rest of underparts whitish, the hairs being light basally, the tips dusky. The white bar across the upperpart of the thighs in adults is foreshadowed by an indistinct bar of pale yellow.

No. 52438, a much older specimen, is of special interest. (Total length, 865 mm.; greatest length of skull, 81.7; the milk dentition has all been replaced by the permanent teeth except the canines, and the first two permanent molars are fully developed.) The general color of the upperparts is as in adults except that the light annulations are darker, or slightly more tawny, and the underparts, from the chest posteriorly are less heavily washed with black. Outside of fore limbs blackish from shoulder to base of toes; hind limbs much darker than in the younger specimens but much less dark than in adults. The brow-band is deep rufous, the hairs without the light tips seen in adults, and the broad band of black behind the rufous brow-band, present in adults, is absent, but the area it occupies in adults (extending to the ears) is covered by hairs that are blackish at base and tipped with a narrow bar of rufous. The basal fifth of the tail and the adjoining area at the base is dark chestnut varied with blackish. The white thigh band is represented by buffy yellow. In other words, this specimen strikingly resembles the description and colored figure of the type of *Lasiopyga ezræ* (Pocock), based on a young animal, from an unknown locality.

A young male, probably in the last stage of immature pelage, as the second permanent molar has barely reached the alveolar plane, is peculiar through its exceedingly dark coloration. It has all the distinctive markings of adult age but the black annulations of the pelage are so broad and the light ones so narrow that black prevails over the entire body, suggesting a melanistic condition. The pelage, however, is finer and softer than in old adults, except on the cheeks, crown, nape and base of the tail where a shorter and coarser new pelage is coming in. This specimen therefore may well be considered as representing a late stage of immature pelage.

SEXUAL VARIATION.—The females are about one-fourth smaller than the males. In the present series none of the largest females equal the smallest males, the measurements of the two sexes not overlapping, as is usually the case in other forms of *Lasiopyga* in the present collection.

The only constant sexual variation in color is in the perineal area, which is white in the males and brownish red in the females.

INDIVIDUAL VARIATION.—The wide range of individual variation in size is as marked in the present species as in other forms described in the present paper, as is sufficiently shown by the statement of measurements given above. In male skulls with the basal suture closed the greatest length of the skull ranges from 109 to 119 mm.; in females, from 98 to 102.

Individual color variation in adults is not striking, being much less in amount than in most of the other forms of guenons represented in the present Congo collection. The light annulations of the pelage of the upperparts vary sufficiently—from nearly pure white to a pale tone of buff—to change noticeably the general effect from nearly pure gray to buffy gray, shown in specimens from each locality in about equal degree, in females as well as males. The black of the ventral area varies in breadth and in intensity, and in the length and tone of the buffy hair-tips. The inside of the thighs varies from clear white to pale yellowish white, or pale gold. The white bar across the outside of the thigh varies in breadth and in the purity of the white. In most adults there is a narrow band of tawny extending from the front of the shoulder to the proximal part of the upper arm. It is sometimes a conspicuous marking, but not infrequently is entirely absent. When present it varies in color from pale yellowish to deep tawny. The brow-band is exceedingly variable in both breadth and color, being much broader and heavier in some than others, and varying from light ochraceous rufous to chestnut; the light tips of the hairs also vary much in length and in color, from

yellowish white to white. The black band behind the brow-band, running to the ears, varies much in width, being twice as broad in some specimens as in others. The narrow line of black at the front base of the brow-band may be strongly developed or practically absent.

Six imperfect flat skins, lacking the feet and most of the front of the head, obtained at Ukaturaka from the natives, require a special word. They differ in no respect from the large series collected 300 to 400 miles further east at Niapu and Niangara except that the light annulations are more buffy and thus give to most of them a darker and more olivaceous general effect. Possibly better specimens and a larger series might show that they represent a slight local differentiation from typical *uelensis*.

NOMENCLATURE.—Lönnberg in his important paper on the monkeys of the Belgian Congo, published in 1919,[1] recorded fourteen specimens of *L. brazzæ*, of which eight were "from various places in the district of Lake Leopold II," another "from Kasai, and a mounted one from Stanleyville." (The locality of the last is open to question.) Also one from Bafuka, one from Zobia, and one from Poko, the last three from the Uele drainage. In a postscript (*loc. cit.*, p. 130) he named the Uele race *C. brazzæ uelensis* (=*L. brazzæ uelensis*), after receiving a specimen from Poko, which may be here designated as the type of *uelensis*, the author omitting to specify a type. The present large series from the Uele district appears to support the alleged characters of *uelensis*.

The present series also contains an immature specimen which agrees so well with the description and colored figure of Pocock's *Lasiopyga ezræ* (1908, Proc. Zool. Soc. London, p. 158, Pl. x, fig. 2) that it could well have served as the type (see above, p. 382). The type was a young individual in the London Zoölogical Gardens, received from an unknown locality, "probably Upper Congo." Elliot showed keen insight when he referred this supposed species to *L. brazzæ*, as probably representing the young of that species. Elliot says of the type of *ezræ* of which he examined the skin: "The specimen is so young, and its pelage so affected by captivity (the hair on the loins having all been worn away by the rope or chain which held it, and the tail having lost all its hair, except a little at the root), that it makes a most unsatisfactory type for a distinct form, and it is to be regretted that such specimens should ever be selected to be the unique representative of a new species. At present it can only be surmised what the full grown animal would look like, but probably it might be recognizable from *L. brazzæ* by having the head from the red

[1] 1919, "Contributions to the Knowledge about the Monkeys of Belgian Congo." Rev. Zool. Africaine, VII, pp. 107–154. *Cercopithecus brazzæ*, pp. 129–130.

frontal band colored like the back. This is, however, only a surmise, as it is more probable that it will prove to be the young of *L. brazzæ*, as I have supposed is really the fact." Elliot indicates this in his synonymy of *brazzæ*.

The series of immature specimens described above shows that individuals of essentially the same age and from the same locality differ widely in coloration. Doubtless a similar series of immature examples of typical *L. brazzæ* would differ in a similar way, rendering it impossible to determine with certainty whether a young specimen from an unknown locality should be referred to *brazzæ* or to *uelensis*. For this reason it seems better to accept Elliot's previous decision and to consider *ezræ* as a synonym of *Lasiopyga brazzæ brazzæ*. In any case such a specimen is subspecifically undeterminable and it becomes necessary to adopt the later name *uelensis* for the Upper Congo form of *brazzæ*.

Another name, *Cercopithecus neglectus* Schlegel (1876) (=*L. neglecta*), requires consideration in the present connection, it having been applied by some authors to the species currently known as *L. brazzæ*. The history of the name *L. neglecta* is as follows. In 1870 J. E. Gray, in his 'Catalogue of Monkeys, Lemurs, and Fruit-eating Bats in the British Museum' (p. 22), referred a specimen of monkey from the "White Nile" to *Simia leucocampyx* "F. Cuvier." (He may have intended to indicate by it a new species.) Gray gave the following description: "Fur grey brown, minutely grey-grizzled; underside of body black; crown, outside of limbs, and all but base of tail black; front edge of thighs and band across haunches whitish." There was no intimation that the skin was not complete, but Elliot states it had the "Head and feet lacking." In 1876, without having seen the specimen, Schlegel (Mus. Hist. Nat. Pays-Bas, Monographie 40, Primates, p. 69) quotes Gray's description, pointing out how it differs from *leucampyx* Fischer and, judging it to represent a new species, proposed for it the name *Cercopithecus neglectus;* and it was accepted by subsequent authors as a well-founded species. No other specimens agreeing with the type are yet known.

Sclater, some years later, in his list of the species of the genus *Cercopithecus* (1893, Proc. Zool. Soc. London, p. 253) referred to *L. neglecta* as "a very distinct species, founded by Schlegel on a single flat skin in the British Museum from the White Nile, which was wrongly referred to by Gray to *C. leucampyx*." There is, however, no evidence that Schlegel ever saw the actual specimen, as he founded it, as he distinctly states, entirely on Gray's description.

Sclater, later in the same volume (idem, p. 443), in redescribing and refiguring *L. brazzæ* (*loc. cit.*, Pl. XXXIII) thus refers again to *L. neglecta:*

"There can be no doubt that *C. brazzæ* is a close ally of *C. neglectus*, and it is even possible that the two species may be the same." He notes, however, some differences, and refers to the absence of "the front part of the face-skin," which he says "having been cut away, it is impossible to say whether it ever possessed the erect red frontal band of *C. brazzæ*, but there are some indications of the band left on the skin. In other respects the two skins [of *brazzæ* and *neglecta*] are much alike, and had they been from the same locality I should have been inclined to refer them to the same species."

Pocock, fourteen years later, in his 'Monographic Revision of the Monkeys of the Genus *Cercopithecus*' (1907, Proc. Zool Soc. London, pp. 686–688), adopted the name *neglecta* in place of *brazzæ* and gave the range of *neglecta* as "Region of the White Nile and Lake Rudolf to the Congo and Cameroons." He adds: "The examples of this species that I have seen appear to be referable to two distinct kinds, which are regarded [by him] as subspecies," and are diagnosed as "subsp. *brazziformis*" and "subsp. *neglectus*." The former (*brazziformis*) is founded on a single immature specimen from an unknown locality, that had been purchased by the London Zoölogical Society from the Zoölogical Gardens at Antwerp, and recorded by Sclater in 1896 (Proc. Zool. Soc. London, p. 780) as from the French Congo. Pocock, however, believed that "it may have come from Belgian rather than from French territory in W. Africa." "Of what may be regarded as the typical form," he says, "the British Museum possesses the imperfect skin obtained by Petherick on the White Nile and referred by Gray with some insight to *C. leucampyx;* a specimen shot by Donaldson Smith on the Omo River, north of Lake Rudolph; a third from the Charada forest in Kaffa, 6000 ft., procured by Mr. W. N. Macmillan. From these I cannot distinguish subspecifically a series sent home by Mr. G. L. Bates from the Ja River, Cameroons, and taken near the bank of the river at an altitude of 2000 ft." The results of Pocock's revision are: (1) the substitution of the name *neglecta* (1876) for *brazzæ* (1886) and the extension of the range of the supposed *neglecta* from the White Nile east to Abyssinia and west to Cameroon; (2) the redescription of *brazzæ* as *brazziformis*, from an immature specimen from an unknown locality, but probably from the type region of *brazzæ*.

Elliot, in his 'Rev. Primates,' (1913, II, p. 377) described the original type of *neglecta*, adding: "In coloration this type is as different from what is ordinarily considered to be *L. neglecta* as can be conceived. It has none of the gray color about it, and the general tint is more brown than any shade of gray. . . There are examples of so-called *L. neglecta*

in the British Museum from the Omo River, the Charada forest and Kaffa, north of Lake Rudolf in the east, to the French Congo, and the Ja River in Cameroon, but none of them agree in color with the type, although they do with each other. Unless a gray *Lasiopyga* is obtained on the White Nile, to prove that the type of *L. neglecta* represents a stage of pelage unknown in so-called *neglecta* from other parts of Africa, it would seem that the only proper way will be, in the future, to restrict the name *neglecta* to this White Nile form, and the name for the gray animal would be *L. brazzæ*, conferred by A. Milne-Edwards upon the gray monkey from the Upper Congo, for it is impossible to recognize that form from a correct description of the type of *L. neglecta*." It is of interest to note that Elliot begins his description of the type of *neglecta* by saying: "Head and feet lacking. A black front band at end of the flat skin, presumably hind portion of head; . . . " He describes the thighs as "seal brown on outer edge, remaining portion speckled buff and tawny ochraceous, with a bright buff band crossing at base of tail . . . " This and some other features suggest an immature stage of the *brazzæ* group.[1]

As shown by the foregoing history of *Lasiopyga neglecta*, this name has not sufficient basis for its satisfactory recognition, and it should be consigned to the list of undeterminable species. In the first place it was based on a brief and inadequate description (not on a type specimen) of a mutilated flat skin supposed to have been "obtained on the White Nile." As it was a native-made skin of the usual type used in traffic by the natives of Africa, it may have been "obtained" by the collector from a point far distant from the place where the animal lived. At all events no other specimen like it has come to the notice of mammalogists, either from the White Nile or elsewhere. The region of the White Nile has been too often traversed by exploring naturalists and collectors since 1870 to render it probable that a monkey of this character should have escaped recognition if really occurring there. In case the original specimen of *neglecta* should prove to belong to some later described species (*e. g.*, *L. brazzæ*) it would not conduce to the stability of nomenclature nor to

[1]In this connection Elliot described a young specimen of *Lasiopyga* in the British Museum, "presumably from the Welle River, procured by the Alexander and Gosling Expedition, which differs in color from all others. . . " From his very detailed description it is easy, in comparison with the American Museum series of immature specimens from the same general region, to recognize it as a late stage of immaturity of *L. brazzæ uelensis*. But what is most interesting and worthy of attention is the paragraph following this description, which runs as follows (*loc. cit.*, p. 378): "It is desirable to obtain adults from this district when the proper specific standing of the animal could be accurately ascertained, but there have been already too many names given to half grown captive specimens, a practice more fruitful in creating confusion than producing valid species, therefore I merely desire to draw attention to this example."

I have stated elsewhere in this paper that nearly half of the proposed species of *Lasiopyga* have been based on immature menagerie specimens, to the great detriment of our present knowledge of this group.

the advancement of science to displace a later well founded and familiar name by the long indeterminate name *neglecta*, which has from its first inception merited discard.

Lasiopyga l'hœsti l'hœsti (Sclater)

Plates XCIII; XCIV, Figure 1

Cercopithecus l'hœsti SCLATER, 1898, Proc. Zool. Soc. London, p. 586, Pl. XLVIII. "Congoland," without definite locality. Based on a living specimen in the Society's Zoölogical Gardens, received from the Zoölogical Gardens at Antwerp.

Cercopithecus l'hœsti MATSCHIE, 1905, Sitzungsb. Ges. Naturf. Fr. Berlin, pp. 262–264 (in text). Specimen from "bei Tschopo im Gebiet des Uelle" (=Tshopo River near Stanleyville), collected by Weyns, in the Tervueren Museum.

Cercopithecus l'hœsti subsp. *l'hœsti* POCOCK, 1907, Proc. Zool. Soc. London, p. 714, Pl. XLI, fig. 2 (head). Based on the type, from an unknown locality. Cites "*Loc.* Chepo or Tschepo in Congoland," on the basis of the specimen mentioned by Matschie (*loc. cit.*, 1905).

Lasiopyga [*Allochrocebus*] *l'hœsti* ELLIOT, 1913, 'Rev. Primates,' II, (1912), p. 297, Pl. III (from Sclater), Pl. I, fig. 1 (head, from Pocock). Based on the type in the British Museum.

Cercopithecus hœsti [sic] LORENZ, 1917, Ann. Naturhist. Hofmus., Wien, XXXI, p. 218. Two young females from Mawambi.

Cercopithecus l'hœsti LÖNNBERG, 1919, Rev. Zool. Africaine, VII, p. 128. Three specimens: Mawambi (Christy, 1); Tshopo north of Stanleyville (Weyns, 1), the specimen previously recorded by Matschie (*loc. cit.*, 1905), "Congo" (1), ("from the Zoölogical Garden of Antwerp").

Represented by twelve specimens accompanied by one skeleton, collected as follows:

Gamangui, 10 (2 ♂—1 adult, 1 young—, and 8 ♀), January 27–February 12, 1910.

Babeyru, 1 (old ♂), July 14, 1914.

Stanleyville, 1 (immature ♀), April 1915.

The external measurements—average (minimum-maximum)—of seven adults of *Lasiopyga l'hœsti l'hœsti*, taken from animals in the flesh, are as follows:

	Total Length	Head and Body	Tail Vertebræ	Hind Foot	Ear
2 ♂	(1275–1300)	(575–545)	(700–755)	(172–172)	(–42)
5 ♀	1004(985–1040)	482(460–515)	522(480–550)	135(130–140)	–

The cranial measurements—average (minimum-maximum)—of the same seven adults of *Lasiopyga l'hœsti l'hœsti* are as follows:

	Greatest Length	Condylobasal Length	Occipitonasal Length	Zygomatic Breadth
2 ♂	(106.4-107.0)	(89.5-91.2)	(98.1-99.7)	(74.5-77.8)
5 ♀	96.8(94.0- 98.9)	71.4(68.6-74.5)	82.9(80.2-84.4)	62.9(61.4-65.6)

	Orbital Breadth	Postorb. Constr.	Mastoid Breadth
2 ♂	(60.2-63.0)	(45.1-44.8)	(62.5-64.2)
5 ♀	58.2(52.2-63.7)	42.4(40.9-43.0)	56.3(55.2-57.3)
	Length Nasals	Upper Toothrow	Upper Molars
2 ♂	(21.9-27.5)	(35.8-36.8)	(19.1-19.4)
5 ♀	15.8(13.2-18.8)	32.1(31.5-33.0)	18.4(17.5-19.0)

SEXUAL VARIATION.—The two old males are both much larger than the largest of the females, which has a total length of 1040 mm., while the total length of the two old males is respectively 1275 and 1300 mm. There is, however, no sexual difference in coloration.

A very young specimen (No. 52459, ♂, Gamangui, February 10, 1910; total length 695, greatest length of skull 80) is only slightly distinguishable in pattern and coloration from fully adult specimens. Three other specimens, all of the same age and size as the above, have nearly acquired the adult color pattern but have an appearance of immaturity in the texture and length of the pelage and the absence of slight development of the gray band on the flanks.

The fully adult specimens are very uniform in all features of coloration, individual variation being unusually limited.

Eleven of the twelve specimens of the present series are from practically the same locality, Babeyru being only a day's journey from Gamangui, where ten of them were obtained; the other is from Stanleyville, about 200 miles southwest of Gamangui. So far as I am aware, only six specimens of this species have been previously recorded, of which two (including the type) are without definite locality; of the other four, three (two of them young females) were from Mawambi, about 120 miles southeast of Gamangui, the other from "Tshopo River near Stanleyville," which is the first definite record occurring in the literature.

The only described form with which *Lasiopyga l'hœsti* need be compared is *L. thomasi* (Matschie), based originally on a young female and four imperfect native-made skins from the east shore of Lake Kivu. Lorenz, in 1915, recorded a specimen from the "östliche Randberge der Rutschuru-Ebene" as the type of his *Cercopithecus thomasi rutschuricus*,[1] later (1917) referred by him to *L. thomasi*. Lönnberg (*loc. cit.*, 1919) records two additional specimens, one being from the type locality and the other from Masisi, a short distance northwest of Lake Kivu. The differences claimed as distinguishing *thomasi* from *l'hœsti* are rather slight, indicating at best merely a southwestern local form of the latter. Pocock

[1]1915, Anz. Ak. Wiss. Wien, Math. Nat. Kl., No. 14, June, p. 172.

(1907) regarded this as its proper status, on the basis of the original description. Elliot (1913) took exception to this ruling and not only recognized *thomasi* as a distinct species but referred it to a different subgenus, on the basis of his examination of the type specimen ('Rev. Primates,' II, (1912), p. 371). Lönnberg (1919) expressed surprise at this, stating that from his examination of two specimens from the type region of *thomasi* with specimens of *l'hœsti*, that it is impossible for him to understand "why Elliot has regarded *l'hœsti* and *Thomasi* not only as separate species, but even placed these 'species' in separate subgenera!" He expresses himself as uncertain whether or not they should be kept apart as even geographical races.

Lasiopyga kandti (Matschie)

Cercopithecus kandti MATSCHIE, 1905, Sitzungsb. Ges. Naturf. Fr. Berlin, p. 264. Volcano region north of Lake Kivu. Three imperfect native-made skins without skulls.

Cercopithecus kandti POCOCK, 1907, Proc. Zool. Soc. London, p. 695. "Two flat native-prepared skins" from "near Lake Kivu (*Powell-Cotton*)."

Lasiopyga kandti ELLIOT, 1913, 'Rev. Primates,' II, (1912), p. 371. Based on the type specimens in the Berlin Museum.

Cercopithecus kandti LÖNNBERG, 1917, Kungl. Sven. Vet. Ak. Handl., Stockholm, LVIII, No. 2, p. 36. Kisenji, German East Africa. Two specimens, a male and a female.

Cercopithecus kandti LÖNNBERG, 1919, Rev. Zool. Africaine, VII, p. 135. Five native-made skins from the region of Lake Kivu. *C. insignis* Elliot is referred to *kandti*.

Cercopithecus insignis ELLIOT, 1909, Ann. Mag. Nat. Hist., (8) IV, September, p. 274. "Congo Forest, Central Africa." Described from a living specimen in the Antwerp Zoölogical Gardens.

Lasiopyga insignis ELLIOT, 1913, 'Rev. Primates,' II, (1912), p. 372.

Represented by two mutilated native-made skins, without skulls, and lacking hands and feet and the facial region to above the eyes, from Kisenje, about four miles east of Goma, northeastern bank of Lake Kivu, They are evidently skins of adults, and the pelage is in excellent condition. The first complete specimens, one adult male and one female with skulls, were described by Lönnberg (*loc. cit.*, 1917).

Cercopithecus insignis Elliot was described from a living specimen in the Antwerp Zoölogical Gardens, of which Elliot says: "It was very active and constantly in motion, making a careful description difficult." Lönnberg (*loc. cit.*, p. 135) says: "After its death this specimen [type of *insignis*] has been delivered to the Congo Museum, where it has been registered as No. 3429. This is very fortunate, because thanks to this it is open to any zoologist to verify that *insignis* is nothing but a specimen

of *kandti*." Instead of having "the lower back dark orange unspeckled," as described by Elliot, Lönnberg states, "The type specimen of '*insignis*' is, however, just as much speckled as adult specimens of *C. kandti* generally are. As regards the shades of colour exhibited there is no difference between '*insignis*' and *kandti*, nor in pattern, but *kandti* displays a certain amount of individual variation even at the same locality."

Elliot's description appropriately characterizes the exceptionally well furnished fur, as long, loose and fluffy. *L. kandti* evidently inhabits the colder climatic belt in the mountain forests northeast of Lake Kivu and in some respects resembles *L. kolbi* from the forests of Mount Kenya and the Kedong Escarpment of Kenya Colony.

Lasiopyga leucampyx stuhlmanni (Matschie)

Plates XCIV, Figure 2; XCV

Cercopithecus stuhlmanni MATSCHIE, 1893, Sitzungsb. Ges. Naturf. Fr. Berlin, November, pp. 225–227. Forest north of Kinjawanga, west of the Ituri River, between Lakes Albert Edward and Albert, in the country of the Wakondjo (about 0° 25′ N., 29° 35′ E. = neighborhood of Semliki River south of Beni), Belgian Congo. Adult male skin and skull.

Cercopithecus otoleucus SCLATER, 1902, Proc. Zool. Soc. London, p. 237, Pl. XXV. Latuka Mountains, North Uganda. Based on a living specimen in the London Zoölogical Society's Gardens. Referred to *C. stuhlmanni* by both Pocock and Elliot.

Cercopithecus leucampyx subsp. *carruthersi* POCOCK, 1907, Proc. Zool. Soc. London, October 8, p. 691. "Ruwenzori, east side, 10,000 ft. (D. Carruthers)." Based on a skin without skull.

Cercopithecus princeps ELLIOT, 1909, Ann. Mag. Nat. Hist., (8) IV, September, p. 304. Mpanga Forest, west and south of Lake Albert. Type, a skin with skull. Sex not stated but evidently an adult male.

Cercopithecus (Mona) leucampyx schubotzi MATSCHIE, 1913, Ann. Soc. Zool. Malacol. Belgique, XLVII, (1912), August, p. 78. Mawambi, Belgian Congo. Type an adult male, skin and skull. Also two topotypes and six other paratypes, the latter from nearby localities in the Ituri Forest.

? *Lasiopyga leucampyx sibatoi* LORENZ, 1913, Anz. Ak. Wiss. Wien, Math.-Nat. Kl., L, No. 26, December, p. 439, Mountain forest northwest of Lake Tanganyika (2000 m.); *Cercopithecus l. sibatoi*, 1917, Ann. Naturhist. Hofmus., Wien, XXXI, p. 226, Pl. XIV, fig. 6 (skull), Bamboo forest behind the escarpments on the northwest shore of Lake Tanganyika (2300 m.). Type, an adult male, skin and skull.

Cercopithecus leucampyx schubotzi LÖNNBERG, 1917, Kungl. Sven. Vet. Ak. Handl., Stockholm, LVIII, No. 2, September 1, p. 36. Five specimens, 2 from Rutshuru (adult male and semi-adult female), 3 from Beni (1 adult male and 2 quite young).

Cercopithecus leucampyx schubotzi LORENZ, 1917, Ann. Naturhist. Hofmus., Wien, XXXI, p. 224. Three specimens, Moëra and Ukaika, Ituri Forest.

Cercopithecus leucampyx princeps LORENZ, 1917, idem, p. 225. A young male from Rutshuru.

Cercopithecus leucampyx carruthersi LÖNNBERG, 1919, Rev. Zool. Africaine, VII, pp. 130–132. Thirteen specimens, from eight localities, scattered from the Ituri Forest to Rutshuru, including (among others) Mawambi, Kilo, Beni, Masisi, and Rutshuru. *C. princeps* Elliot and *C. l. schubotzi* Matschie are referred to *C. l. carruthersi* Pocock. Extended comment on the color variations shown by this series.

Represented by 68 specimens accompanied by 6 skeletons, collected as follows:

Akenge, 25 (13 ♂, 12 ♀), September 13–October 29, 1913.

Niapu, 11 (6 ♂, 5 ♀, all adult), November 16–December 18, 1913; January 29, 1914.

Medje, 8 (7 ♂, 1 ♀), March 26–September 21, 1910.

Gamangui, 19 (12 ♂, 7 ♀, nearly all adult), January 28–February 19, 1910.

Avakubi, 4 (2 ♂, 2 ♀, all adult), August 1914.

Risimu, 1 (adult ♂), September 7, 1909.

Fifty are fully adult; the others range in age from young a few days old to those with the permanent dentition complete except the last molar. All but four have measurements taken from the animal before skinning. Twenty-five were collected at Akenge, nineteen at Gamangui, the others at points near these two localities.

The external measurements—average (minimum-maximum)—of forty-two adults of *Lasiopyga leucampyx stuhlmanni*, taken from animals in the flesh, are as follows:

	Total Length	Head and Body	Tail Vertebræ	Hind Foot	Ear
24 ♂	1489(1325–1620)	532(410–625)	961(820–1090)	165(145–183)	45(42–48)
18 ♀	1286(1130–1540)	464(315–520)	822(687–1020)	142(133–154)	41(35–45)

The cranial measurements—average (minimum-maximum)—of forty-six adults of *Lasiopyga leucampyx stuhlmanni* are as follows:

	Greatest Length	Condylobasal Length	Occipitonasal Length	Zygomatic Breadth
28 ♂	109.7(101.2-117.5)	88.8(77.0-97.5)	92.2(87.3-97.5)	72.5(65.5-78.6)
18 ♀	97.8(93.3-103.2)	76.3(70.5-80.1)	83.3(79.8-88.6)	65.9(61.4-68.5)

	Orbital Breadth	Postorb. Constr.	Mastoid Breadth
28 ♂	59.1(53.0-64.3)	43.5(41.0-46.0)	60.7(53.5-65.5)
18 ♀	53.2(49.8-54.8)	41.2(39.5-44.0)	55.3(52.2-58.2)

	Length Nasals	Upper Toothrow	Upper Molars
28 ♂	20.7(17.2-23.7)	35.0(32.0-37.7)	18.4(16.4-19.9)
18 ♀	17.9(15.5-21.6)	31.1(29.7-32.5)	17.8(16.2-18.3)

IMMATURE PELAGE.—The youngest of the series (No. 52400, ♀, Medje, August 29, 1910; total length, 573 mm.; greatest length of skull, 66.2), is entirely in the first coat. The pelage is exceedingly soft and fine, deep black on the entire upperparts (including the forehead, which shows barely a trace of the frontal band), the entire limbs and tail. The underparts are nearly naked except on the foreneck and thorax, which are thinly covered with very soft, fine fur, blackish on the foreneck, dingy grayish brown on the thorax. The milk incisors and first molar are fully up, the tips of the canines are just breaking through. A second specimen (No. 52397, ♂, Medje, July 26, 1910; total length, 580; skull missing) is of the same age and entirely similar in the color and texture of the pelage.

More advanced stages are represented by two specimens from Akenge, both of the same sex and age and closely alike in pelage, taken respectively September 27 and 28. While in general they are larger than the two above described there is only slight difference in the development of the teeth. The smaller one (No. 51029 has a total length of 548 mm. and a skull length of 66.7, as against 610 and 69.5 in the other, No. 51030). The following changes in pelage have been acquired: a broad brow-band and gray cheeks as in adults; a thickening and lengthening of the pelage, the new hairs being minutely white-tipped. These two specimens differ in the younger one (No. 51029) being more scantily haired, and in retaining more of the soft black coat on the body and limbs, which are grayish black in the other.

Another specimen from Akenge (No. 52360, ♀, October 9, 1913; total length, 585; greatest length of skull, 55) is very similar to the two last described except that the tail is conspicuously gray instead of black, owing to its abundance of white-tipped hairs.

An older specimen (No. 51028, ♂, Akenge, September 15, 1913; total length, 690; greatest length of skull 72.3) is similar to the last three above described except that the black hair of the crown is longer and coarser, and the gray hair of the brow-band and whiskers is longer and better developed, and there is a broad blackish band across the breast.

In the next stage, represented by four specimens in which the milk dentition is fully developed, the adult texture and coloration of the pelage is well developed, but shows indications of immaturity. They range in total length from 845 mm. in females to 950 mm. in males, with the greatest length of skull ranging from 68 in females to 77 in males.

Four still older specimens, which have the first permanent molar well developed in addition to the milk teeth, are similar to adults in

coloration. They range in total length from 850 to 950 (all males) and from 81 to 85 in greatest length of skull. Such specimens are practically adult in coloration but far below adults in size.

LOCAL VARIATION.—The series of specimens from different localities, as Akenge, Gamangui, Niapu, of which there is a large number from each, present no differential characters, the same slight individual differences recurring at each.

SEXUAL VARIATION.—There is no obvious sexual variation in coloration, but, as usual in guenons, the males greatly exceed the females in size (for measurements see above, p. 392). The largest females however exceed in size the smallest males.

INDIVIDUAL COLOR VARIATION.—Individual variation in color is not striking. In certain lights the gray of the upperparts has an olive-gray tone, less noticeable in some specimens than in others. The most marked variation in color is seen in the intensity and posterior extension of the black area of the head and nape. Three specimens from Akenge, all males of the same age (as indicated by cranial characters) and all taken within a few days of each other in October, may be cited as illustrating the range of color variation. No. 52359 has the whole top of the head and nape thickly sprinkled with light-tipped hairs, very few of the hairs being entirely black, with the result that these parts are darkened but by no means black. In No. 52362 the entire top of the head, the nape, interscapular region and shoulders are deep glossy black, the black of the shoulders extending uninterruptedly to the fore limbs none of the hairs being light-tipped. In No. 52352 the top of the head and the occipital area are black enclosing a small coronal spot on which the hairs are minutely light-tipped. The nape is also black but the hairs on the shoulders are mostly light-tipped, but the general effect is much darker than in No. 52359, less dark than in average specimens. Other specimens are intermediate between these two. In the greater part of the series the whole upper surface of the head, the nape, and the shoulders to the arms are uninterruptedly black. Others have the interscapular region more or less gray, gradually merging into the gray of the back. The dark pectoral band is usually correlated in development with the amount of black on the head, nape and shoulders. In some specimens it is broad and deep black; in others narrower and much lightened by the light tips of the hairs. In a few it is scarcely indicated. The ventral area varies from much lighter than the back to about the general tone of the upperparts.

The hair fringing the upper border of the ears varies greatly in amount being sometimes scanty and sometimes abundant, and in color from pale yellowish white to deep reddish ochre.

About one specimen in ten has reddish hair on the anal area, varying in amount in different specimens from a few hairs only to a conspicuous patch of brownish red.

The light annulations on the hairs of the brow-band vary from clear white to pale buff ringed with black. The light annulations of the cheek hairs also vary from nearly white to pale buff, and also in the relative breadth of the light and dark bars, so that the general effect is much darker in some specimens than in others; in some immature individuals the prevailing tone is decidedly blackish.

INDIVIDUAL VARIATION IN SIZE.—Individual variation in cranial characters, as in general size and in the proportions of breadth to length in different parts of the skull, is not strongly marked. In the summary of cranial and external measurements given above (p. 392), only specimens with mature dentition have been admitted, except two or three males in which the canines are not fully grown, although the last molars (m^3) are fully developed.

In three old male skulls in which the basal suture is wholly obliterated the greatest length of the skull varies from 108 to 117.5 mm., average 114, percentage of variation (based on the average) 8.4; in eight skulls in which the basal suture is closed but not obliterated the greatest length varies from 105 to 115, average 111, percentage 0.9; in twelve skulls with the basal suture open the range of greatest length is from 104 (canines not fully grown) to 112, average 110, percentage 0.7. In the same skulls the zygomatic breadth ranges from 74.5 to 75.5 in the three oldest, from 71 to 78 in the eight with the basal suture closed, and from 65.5 to 75 in the twelve with the basal suture open.

Individual variation in adult female skulls is similar to that of the males. Three skulls with the basal suture obliterated range in greatest length from 97.7 to 103, averaging 100 mm.; seven skulls in which the basal suture is closed range from 94 to 100, averaging 97.4; six skulls with the basal suture open range from 93 to 103, averaging 97. In the same skulls the zygomatic breadth ranges from 64.5 to 65.7, averaging 65; the seven with the basal suture closed range from 62 to 67, averaging 64.7; the six with the basal suture open range from 61.4 to 66.0, averaging 64.2. The two largest female skulls have the greatest length measurement respectively 103 mm., but in one the basal suture is obliterated, in the other open. The zygomatic breadth is respectively 65.2 and 63.7.

The variation in external measurements of adults is about 15 to 25 per cent of the average, in series of nine to twelve individuals of the same ages as shown by the following synopsis based on flesh measurements of 24 adult males and 18 adult females. The series is divided into three sections, on the basis of age as indicated by the condition of the basal suture: (1) basal suture open, (2) basal suture closed, (3) basal suture obliterated.

TOTAL LENGTH.—Twelve males with the basal suture open vary from 1350 mm. to 1620, average 1484, percentage of variation 18.2; ten males with basal suture closed, 1325 to 1600, average 1498, percentage 18.3; two males with the basal suture obliterated, 1370 to 1580, average 1475, percentage 14.2.

Six females with basal suture open, 1130 to 1335, average 1245, percentage of variation 16.5; nine females with basal suture closed, 1130 to 1540, average 1309, percentage 31.3; three females with basal suture obliterated, 1250 to 1350, average 1292, percentage 7.5.

HEAD AND BODY.—Twelve males with basal suture open, 470 to 580, average 528, percentage of variation 20.1. Ten males with basal suture closed, 505 to 625, average 546, percentage 22. Two males with basal suture obliterated, 520 to 565, average 562, percentage 8.1.

Six females with basal suture open, 448 to 490, average 470, variation 8.9. Nine females with basal suture closed, 394 to 620, average 488, percentage 46. Three females with basal suture obliterated, 460 to 485, average 468, percentage 5.4.

TAIL VERTEBRÆ.—Twelve males with basal suture open, 850 to 1090, average 948, percentage of variation 25. Ten males with basal suture closed, 820 to 1050, average 957, percentage 24. Two males with basal suture obliterated, 850 to 975, average 913, percentage 13.6.

Six females with basal suture open, 687 to 858, average 771, percentage 22. Nine females with basal suture closed, 715 to 920, average 824, percentage 25.5. Three females with basal suture obliterated, 790 to 865, average 823, percentage 9.0.

HIND FOOT.—Twelve males with basal suture open, 150 to 183, average 166, percentage of variation 20. Ten males with basal suture closed, 157 to 174, average 163, percentage 10.5. Two males with basal suture obliterated, 145 to 158, average 153, percentage 7.0.

Six females with basal suture open, 135 to 150, average 141, percentage 10. Nine females with basal suture closed, 133 to 154, average 143, percentage 14. Three females with basal suture obliterated, 135 to 147, average 142, percentage 8.

GENERAL COMMENT.—The above statistics not only show the amount of individual variation in series of specimens of approximately the same age, but tend to show variation with age where the age sections comprise a considerable series of individuals (as from nine to twelve). They show that size is not greatly affected by age, young adults being often among the largest of a series, and undersized examples may be very old.

For greater convenience in comparison the above details are here tabulated

Summary of External Measurements of *Lasiopyga leucampyx stuhlmanni*

Basal Suture Open

	Total Length	Head and Body	Tail Vertebræ	Hind Foot
12 ♂	1484(1350–1620)	528(470–580)	948(850–1090)	166(150–183)
6 ♀	1245(1130–1335)	470(448–490)	771(687– 858)	141(135–150)

Basal Suture Closed

	Total Length	Head and Body	Tail Vertebræ	Hind Foot
10 ♂	1498(1325–1600)	546(505–625)	957(820–1050)	163(157–174)
9 ♀	1309(1130–1540)	488(394–620)	824(715– 920)	143(133–154)

Basal Suture Obliterated

	Total Length	Head and Body	Tail Vertebræ	Hind Foot
2 ♂	1475(1370–1580)	562(520–565)	913(850–975)	153(145–158)
3 ♀	1292(1250–1350)	468(460–485)	823(790–865)	142(135–147)

NOMENCLATURE.—The *Lasiopyga leucampyx* group has a wide geographical range, extending from Angola to Southern Uganda and Lake Rudolf, and is represented by a considerable number of currently recognized regional forms. The present large series of specimens from Northeastern Belgian Congo shows that some of the forms are subject to a considerable amount of purely individual variation, as set forth above, which renders it almost certain that some of the numerous described forms rest on a very unsatisfactory basis. It is thus a question what racial name should be assigned to the present series, for the following reasons:

(1) The described forms have usually been based either on single specimens or on otherwise wholly inadequate material, which has not as yet been materially increased; (2) from the geographical point of view, no specimens have been recorded (so far as present available literature indicates) from the immediate area represented by the present collection. The oldest name involved is *L. stuhlmanni* (Matschie) (1893), based on specimens from the Upper Ituri forest region. To this form specimens from the vicinity of Mawambi, and thence south from various intervening localities to Beni and Rutshuru have been referred by Lönnberg

(*loc. cit.*, 1919) and others, and numerous closely allied forms have been assumed to occur in northern Uganda and southward in British East Africa, some of which are undoubtedly entitled to recognition as races. Yet the alleged differences consist in slight variations in the color of different areas, as the brow-band, the ears, the tone of the upper and under surfaces of the body, the presence or absence of a black breast band, the color of the outside of the thighs in relation to the back, and whether or not red hairs are present at the base of the tail. Most of these differences are represented in the present series of specimens as features of individual variation, perhaps more strongly developed in outside districts so as to become of racial significance. In some of the described forms the general tone of the upperparts appears to be more decidedly olive, or even reddish than in the Congo series.

The seventeen described forms apparently referable to the *leucampyx* group comprise the following. It is of interest in the present connection to give a brief résumé of their history and present status.

1829. *Simia leucampyx* FISCHER. Originally based on F. Cuvier's "La Diane femelle," a menagerie specimen from an unknown locality. Elliot gives a description of an adult skin in the Paris Museum, which "died in the Menagerie in 1899." He gives the type locality of *leucampyx* as "Guinea," without stating proof. Schlegel (1876) referred specimens to it from "Angola et du Congo," and makes *C. pluto* Gray a synonym of *leucampyx*, a decision since commonly accepted by authors, but rejected by Pocock who recognized *pluto* as a subspecies of *leucampyx*, and by Elliot who recognized *pluto* as a distinct Angolan species.

1848. *Cercopithecus pluto* GRAY. Based on a specimen formerly living in the Zoölogical Society's Gardens, London. Type locality, "Angola."

1887. *Cercopithecus boutourlinii* GIGLIOLI. Based on a specimen from Kaffa, South Abyssinia. Other specimens have been since received from Kaffa, Shoa, and other localities in Abyssinia.

1893. *Cercopithecus stuhlmanni* MATSCHIE. Type a skin and skull, from the forest north of Kinjawanga (N. Lat. 0° 25′, E. Long. 29° 35′). Later the author referred to it other specimens from the eastern Ituri Forest.

1900. *Cercopithecus omensis* THOMAS. Based on an immature female from the Omo River, north of Lake Rudolf. Referred by Pocock to *C. boutourlinii*.

1902. *Cercopithecus otoleucus* SCLATER. Type a menagerie specimen from Latuka Mountains, North Uganda, still living in 1907 in the Zoölogical Society's Gardens, London, according to Pocock, who identifies it, as does also Elliot, with *C. stuhlmanni*.

1905. *Cercopithecus neumanni* MATSCHIE. Based on two adult females and an immature specimen from Kwa Kitolo, North Kavirondo. In general characters "almost exactly" like *C. stuhlmanni*, according to Elliot, but upperparts rather more buffy.

1907. *Cercopithecus leucampyx carruthersi* POCOCK. Based on a single specimen from Mt. Ruwenzori, east slope, altitude 10,000 feet. No white in the brow-band, shoulders less black, underparts darker and less speckled with gray than in *stuhlmanni*, now synonymized with *L. l. stuhlmanni*.

1907. *Cercopithecus leucampyx doggetti* POCOCK. Based on a single female from southwestern Ankole, between Lakes Victoria and Albert Edward. Middle of back gray toned with greenish and passing into reddish brown posteriorly.

1907. *Cercopithecus leucampyx nigrigenis* POCOCK. "The type and only known representative of this subspecies is a single female specimen, ticketed 'W. Africa.'" Distinguished especially by the lateral extension of the black area on the head to the sides of the neck and cheeks.

1909. *Cercopithecus princeps* ELLIOT. Based on a single specimen from the "Mpanga Forest," southwest of Lake Albert. The description agrees perfectly with the greater part of the specimens obtained by the American Museum Congo Expedition from the Akenge-Niapu district of the Upper Congo region.

1910. *Cercopithecus leucampyx aurora* THOMAS. Based on an imperfect skin without skull from the south end of Lake Kivu. Apparently of the *leucampyx* group, and allied to the *stuhlmanni* type.

1913. *Cercopithecus leucampyx schubotzi* MATSCHIE. Type an adult male, skin and skull, from Mawambi. Also several cotypes from Mawambi and neighboring localities. The characters alleged to distinguish this form from *stuhlmanni* and *carruthersi* are merely individualistic.

1913. *Lasiopyga leucampyx sibatoi* LORENZ. Based on an adult female from the Bambu forest at the northwest end of Lake Tanganyika. To be compared with *C. l. aurora* Thomas from the south end of Lake Kivu. Upperparts mixed yellowish brown and black.

1913. *Lasiopyga leucampax* [sic] *mauæ* HELLER. Type and only specimen an adult male "from the summit of the Mau Escarpment between Londiani and Sirgoit, British East Africa." Upperparts grayish olive instead of mouse-gray as in *neumanni* from Kavirondo.

1919. *Cercopithecus leucampyx maesi* LÖNNBERG. Provisional name for "a young specimen . . . of the *leucampyx*-series from Kutu (district of lake Leopold II)."

1919. *Cercopithecus leucampyx elgonis* LÖNNBERG. Based on three adult specimens from Elgon (British East Africa?). Compared with specimens of *C. l. carruthersi* from Rutshuru, from which *elgonis* appears to differ only in minor points.

The alleged characters of *L. l. carruthersi* (Pocock) and *L. princeps* (Elliot) are covered by the present series of specimens, the description of *L. princeps* representing an average individual from the Akenge-Niapu district. *L. l. schubotzi* (Matschie) is based on specimens from near the type locality of *L. l. stuhlmanni*. *L. l. carruthersi* has been recorded by Lönnberg from various localities in the eastern Ituri Forest and southward, including the type localities of *schubotzi* Matschie and *sibatoi* Lorenz. Lorenz has recognized in his series of six specimens from the Rutshuru district three forms of the *leucampyx* group, *schubotzi, princeps* and *doggetti*. In view of the foregoing facts the name *Lasiopyga leucampyx stuhlmanni* is provisionally adopted for the specimens here under consideration.

Lasiopyga denti (Thomas)

Plates XCVI; XCVII, Figure 1

Cercopithecus denti THOMAS, 1907, Proc. Zool. Soc. London, Abstr. No. 38, January 15, p. 1; idem, January 15, p. 2, Pl. 1. Ituri River, between Mawambi and Avakubi, Belgian Congo. Adult male, skin and skull.

Cercopithecus denti POCOCK, 1907, Proc. Zool. Soc. London, p. 711. Redescription of the type.

Cercopithecus (Otopithecus) denti MATSCHIE, 1913, Ann. Soc. Zool. Malacol. Belgique, XLVII, (1912), p. 64. Seven specimens, Belgian Congo: Mundema (1), Kulu Kulu (1), Makala (3), Kiapanda (1), Mawambi (1); Powell-Cotton collection.

Cercopithecus (Otopithecus) denti liebrechtsi DUBOIS AND MATSCHIE, 1912, Rev. Zool. Africaine, I, p. 439, fig. 3. Based on an adult male from Stanley Falls. Considered by Lönnberg (*loc. cit.*, p. 139) "only as an individual aberration of *C. denti.*"

Lasiopyga denti ELLIOT, 1913, 'Rev. Primates,' II, (1912), p. 351, Pl. XXXVI (skull). Redescription of the type and figs. of the type skull.

Cercopithecus denti LORENZ, 1917, Ann. Naturhist. Hofmus., Wien, XXXI, p. 220. Four specimens, Belgian Congo: Moëra (2), Ukaika (2).

Cercopithecus denti LÖNNBERG, 1919, Rev. Zool. Africaine, VII, p. 138. Four specimens, Belgian Congo: Baraka (1), Fundi (2), Mawambi (1).

Represented by 47 specimens, collected as follows:

Poko, 1, August 1913.

Rungu, 1, June 10, 1913.

Akenge, 9, September 5–October 17, 1913.

Niapu, 9, November 13–January 12, 1914.

Medje, 5. August 3, 18, October 9, 1910; June 25, 1914.

Gamangui, 14, January 28–February 20, 1910.

Avakubi 3 September 1, 1913; August 1914.

Batama, 4. September 16–18, 1909.

Risimu, 1, August 30, 1910.

All but eight are adult. Forty are skins with skulls; four are skins with complete skeletons; two skulls without skins.

The external measurements—average (minimum-maximum)—of thirteen adult females of *Lasiopyga denti*, taken from animals in the flesh, are as follows:

	Total Length	Head and Body	Tail Vertebræ	Hind Foot	Ear
13 ♀	1078(990–1185)	402(330–460)	676(530–770)	127(120–135)	34(32–37)

The cranial measurements—average (minimum-maximum)—of thirty-five adults of *Lasiopyga denti* are as follows:

	Greatest Length	Condylobasal Length	Occipitonasal Length	Zygomatic Breadth
22 ♂	100.2(90.7-109.2)	78.2(69.4-83.0)	84.0(78.5-90.7)	68.3(59.0-71.5)
13 ♀	89.2(84.0- 94.8)	67.2(63.8-73.0)	78.6(74.2-82.7)	60.1(54.0-63.7)

	Orbital Breadth	Postorb. Constr.	Mastoid Breadth
22 ♂	56.2(50.5-64.0)	43.0(40.6-45.4)	58.5(54.2-62.5)
13 ♀	50.6(48.4-52.5)	42.1(40.8-44.4)	53.2(50.9-55.2)
	Length Nasals	Upper Toothrow	Upper Molars
22 ♂	14.4(12.0-16.4)	30.4(28.5-36.4)	16.3(14.8-20.8)
13 ♀	13.3(11.4-14.8)	26.9(26.0-28.4)	15.3(14.5-16.5)

IMMATURE PELAGE.—Two specimens are in the first or natal coat. The pattern of coloration is the same as that of adults, and the color tones are in general so similar to those of adults that there is no mistaking their relationship. The texture of the pelage is of course very different, that of the young specimens being very short and soft, and very thin on the underparts and inside of the limbs. The youngest (No. 52513, ♂, Medje, August 3, 1910; total length, 515 mm.; greatest length of skull, 63.5; only the middle pair of upper incisors and the first milk molar above the alveoli) has a well-developed frontal band of stiff hairs, mixed buffy gray and black, formed by a narrow front border of black followed by a broad band of gray with the tips of the hairs black. Top of head wholly black superficially but the hairs gray at base; nape grayish black; rest of the dorsal area mixed black and pale rufous, the hairs pale gray at base, with a subapical band of rufous and black tips. Underparts and inside of limbs nearly bare except on lower abdomen, the skin golden, with a slight covering of soft white hairs, most developed posteriorly. Entire outside of fore limbs blackish and thinly haired; hind limbs well clothed with long hair, grayish basally and superficially finely grizzled with pale rufous and blackish. Tail pattern as in adults but less strongly colored, the lower surface white faintly toned with yellow on the proximal half.

The other specimen (No. 51026, ♀, Akenge, September 5, 1913; total length, 583 mm.; greatest length of skull, 63.5; milk dentition complete but last molar not fully up) is several weeks older. It is everywhere much more heavily clothed than No. 52513, and in a general way closely resembles adults in both the tones and the pattern of coloration. On the top and sides of the head the first pelage has been replaced by coarse hair of the same texture and color as in adults, but much shorter. The rest of the upperparts are mixed rufous and black, the pelage short and thick. The underparts are still very thinly haired, the hairs soft and white. Outside of the fore limbs is thickly clothed, the fore arms and hands intense black; hind limbs and tail nearly as in adults.

The next stages represented are half-grown young; they differ little from the fully adult except in having a general aspect of immaturity.

The youngest of these is No. 52504, ♂, Gamangui, January 31, 1910 (total length, 690 mm.; greatest length of skull, 82.5; permanent middle incisors and first permanent molars nearly fully developed). The conspicuous white ear tufts of adults are present, and in this particular specimen the rufous speckling prevails over the black. Five others have acquired all the permanent teeth except the last molar, which is nearly up in three and just breaking through the gum in the others. They so closely resemble adults in character of pelage and in coloration as to call for no special comment.

SEXUAL VARIATION.—There is no appreciable difference in color due to sex. The usual sexual variation in size obtains, the males averaging much larger than the females, but some of the largest females exceed the dimensions of the smallest males.

INDIVIDUAL VARIATION.—The usual amount of individual variation in size is present, as shown in the summary of measurements given above (pp. 400–401). As is usual, variation in size is not to any great extent due to age, after maturity is reached, as the following summary of cranial variation in adult males clearly shows. No specimen is included that has not acquired mature dentition, those otherwise mature as regards the teeth, but in which the canines are not fully grown, being excluded from consideration.

The twenty-two males of which cranial measurements are given above consist of ten skulls with the basal suture open, ten in which it is closed, and two in which it is obliterated. The minimum greatest length of the series with the basal suture open is 90.7 mm., the maximum, 109, the average, 99.7. The ten with the basal suture closed have the minimum greatest length of the skull 97.3, the maximum 102, the average 100. The greatest length of skull in the two in which the basal suture is obliterated is respectively 104.4 and 109.2. The zygomatic breadth shows similar conditions, as follows: Basal suture open, minimum 59, maximum 70.8, average 65.6; basal suture closed, minimum 64.6, maximum 70.8, average 68.4; basal suture obliterated, respectively 70 and 71.5.

The series of thirteen fully adult females present parallel conditions.

Individual variation in coloration is much more restricted than is usual in species of guenons. The frontal band varies in width, and from nearly clear white to pale buff, in individuals from the same locality. There is often a mixture of wholly black hairs with the white ones, which are also black-tipped. There is sometimes a narrow line of black at the anterior base of the white frontal band. The cheeks vary from the usual yellowish general tone to occasional examples in which the general tone is

dark gray with only a few of the hairs subapically ringed with narrow bands of pale buff.

The light hair tips of the top of the head and the prescapular area vary in color from whitish to buff, and from about an equal area with the black basal tone to a decided predominance of the light tips. The dorsal area varies in tone from strong rufous to blackish. The ventral surface varies from pure white to yellowish white, and exceptionally to pale yellow-orange. The black at the tip of the tail extends from one-fifth to one-third of the total length, with corresponding variation in the median dorsal black band, which varies also from dusky gray to nearly black.

NOMENCLATURE AND DISTRIBUTION.—*Lasiopyga denti* was described by Thomas in 1907, and was based on a single specimen from between Mawambi and Avakubi on the Ituri River. It is represented in the present series by specimens from Batama (near Stanleyville) north to Poko and Rungu, and from various intermediate localities. Lönnberg has recorded a specimen from Baraka, west of the north end of Lake Tanganyika.

Thus far only one subspecies of *L. denti* appears to have been proposed. This is *Cercopithecus* (*Otopithecus*) *denti liebrechtsi* Dubois and Matschie (1912) (=*L. denti liebrechtsi*). It was based on a single specimen from "Stanley Falls" (Stanleyville), or from within the known range of *denti* as represented in the present collection. The description indicates no feature not present in the majority of the present series, some of which are from near the assigned type locality of *liebrechtsi*. Lönnberg (*loc. cit.*, 1919) considers it "only as an individual aberration of *C. denti*." It seems, however, not entitled even to this faint compliment.

A closely allied form has been described by Dubois and Matschie (1912, *loc. cit.*, p. 440) as *Cercopithecus* (*Otopithecus*) *elegans* (=*L. elegans*), the type a specimen in the Tervueren Museum, "wahrscheinlich vom Lomani." Another, immature specimen from the Aruwimi, in the same museum, is a paratype. The description shows it to be closely allied to *L. denti;* the characters claimed for it indicate that it may be only a subspecies of *denti*. Lönnberg (*loc. cit.*, 1919, p. 139), who has examined the two original specimens, gives them as both from Aruwimi, and says it is "easy to recognize on the white cheeks, and on the black dominating more completely in the temporal region, but especially on its gray hind legs." The amount of black on the temporal region is variable in *L. denti*, but the other assigned characters should have value. Lönnberg considers it as substituting "*C. denti* on the western side of the great Lualaba" River, doubtless on account of the alleged type being "apparently" from the Lomani River, although Lönnberg himself gives the type (No. 346) as from the Aruwimi!

Lasiopyga wolfi (Meyer)

Cercopithecus wolfi MEYER, 1891, Notes Leyden Mus., XIII, p. 63. "Central West Africa." Exact locality unknown; described from a living specimen in the Dresden Zoölogical Garden.

Cercopithecus wolfi MEYER, 1894, Proc. Zool. Soc. London, p. 83, Pl. VII (colored).

Cercopithecus wolfi POCOCK, 1907, Proc. Zool. Soc. London, p. 711. Records a specimen from Brazzaville, received at the London Zoölogical Gardens.

Lasiopyga wolfi ELLIOT, 1913, 'Rev. Primates,' II, (1912), p. 351. Records a specimen from Batempas, Sankuru River.

Cercopithecus wolfi LÖNNBERG, 1919, Rev. Zool. Africaine, VII, p. 136. Nineteen specimens recorded from seven localities in the Lake Leopold II district, and one from Stanleyville with comment on their variations.

Represented by one specimen (No. 52573), an adult male, skin and skull, with field measurements, collected at Mosembe, southwest of Nouvelle Anvers and about 250 miles from the Lake Leopold II district, July 22, 1909. Collectors' measurements: Total length, 1015 mm.; head and body, 283; tail vertebræ, 732; hind foot, 142. Skull, greatest length, 93.6; occipito-nasal length, 82.4; condylobasal length, 73.0; zygomatic breadth, 64.2; length of upper toothrow, 28.2; length of upper molars, 14.8. The permanent dentition is fully developed, but the basal suture is not closed. The pelage is in fine condition.

This species generally has been placed close to *L. denti*. The white brow-band, extending laterally to the ears, and considered by Pocock as one of the most distinctive characteristics, is rather indistinct in the present specimen. The ear-tufts are tinged with ochre; the whiskers appear blackish, heavily grizzled with pale yellow, the base of the hair being light gray. There is a whitish area of silky hair behind the ears joining the white of the throat and underside; the chin is beset with a few bristly black hairs. Upperparts black grizzled on crown with light yellow markings, the speckling gradually turning to brown on the back, where the intensity of the brown increases to form a median darker dorsal area. The yellow-orange on flanks is diffused with the much lighter under side which from chin downward is uniform except for a median orange marking on abdomen joining with the dark brown anal region. Forelimbs black externally, with orange streak from elbow up to lateral orange line; there is only an ochraceous touch on the inside of the wrist. Hind limbs reddish brown on outside, heavily speckled posteriorly with black, especially towards black feet. Tail near base above less speckled than back, turning into dirty blackish gray, the terminal third being black; proximal two-thirds of underside of tail appears gray, base of hairs being much lighter than tips.

This species was based on a living specimen from an unknown locality in "Central West Africa." Pocock states that another specimen was obtained by Hamlyn in Brazzaville, whither it was brought by natives. Elliot records a specimen from Batempas, Sankuru River, Kasai. The species has become definitely known through Dr. Maes' collecting a large series in the Lake Leopold II region. Lönnberg also lists one specimen from Stanley Falls.

Lasiopyga ascanius cirrhorhinus (Matschie)

Plates XCVII, Figure 2; XCVIII

Cercopithecus ascanias (?) SCLATER, 1887, Proc. Zool. Soc. London, p. 502. A living specimen in the Society's Gardens "said to have been brought from Manyuema, on the western shore of Lake Tanganyika." (Not *ascanius* Audebert, 1799.)

Cercopithecus schmidti MATSCHIE, 1892, Zool. Anz., XV, p. 161, part. Manyema.

Cercopithecus schmidti SCLATER, 1893, *loc. cit.*, p. 245, part, Pl. XVI (animal, colored, from a living specimen in the Society's Gardens, 1883–1886, from Manyema). See above, Sclater, 1887.

Cercopithecus schmidti FORBES, 1894, 'Handb. Primates,' II, p. 50, part. From Sclater and Matschie.

Cercopithecus ascanius subsp. *schmidti* POCOCK, 1907, Proc. Zool. Soc. London, p. 720, part. Manyema; Bumba, Upper Congo.

? *Cercopithecus* (*Rhinostictus*) *ascanius omissus* MATSCHIE, 1913, Ann. Soc. Zool. Malacol. Belgique, XLVII, (1912), pp. 68–70. ?Manyema, Belgian Congo. Type and only specimen, an immature female.

Cercopithecus (*Rhinostictus*) *ascanius cirrhorhinus* MATSCHIE, 1913, Ann. Soc. Zool. Malacol. Belgique, XLVII, (1912), p. 70. Province of Stanley Falls. Six specimens.

Cercopithecus (*Rhinostictus*) *schmidti sassæ* MATSCHIE, 1913, idem, p. 72. Sassa, southeast of Lake Albert Edward. One specimen, adult female, skin and skull.

Cercopithecus (*Rhinostictus*) *schmidti enkamer* MATSCHIE, 1913, idem, p. 73. Type, adult male, skin and skull, from a few miles north of Mawambi; three paratypes from neighboring localities (Pemba, and between Mawambi and Beni, Ituri Forest).

Lasiopyga schmidti ELLIOT, 1913, 'Rev. Primates,' II, (1912), p. 306, Pl. V (colored, from Sclater, 1893), part.

Lasyopyga [sic] *schmidti montana* LORENZ, 1914, Anz. Ak. Wiss. Wien, Math.-Nat. Kl., LI, No. 17, July, p. 356. Wabembe, northwest of Lake Tanganyika. Type, an adult male, skin and skull. Also four topotypes.

Lasyopyga schmidti ituriensis LORENZ, 1914, idem, p. 357. Ituri Forest, near Beni and Mawambi. Four skins mentioned. No type designated. Referred by Lorenz himself in 1917 to *enkamer* Matschie.

Cercopithecus schmidti THOMAS, 1915, Ann. Mag. Nat. Hist., (8) XVI, December, p. 466. Medje, 2 specimens; Poko ("20 or 30 miles north-west of Medje"), 6 specimens. No comment.

Cercopithecus schmidti enkamer LÖNNBERG, 1917, Kungl. Sven. Vet. Ak. Handl., Stockholm, LVIII, No. 2, September, pp. 32–35, Pl. VIII (skulls). Rutshuru, 9 specimens; Masisi, 2 specimens; Beni, 1 specimen. Detailed discussion. *Lasyopyga*

schmidti montana, *L. s. ituriensis* Lorenz, and *C. schmidti sassæ* Matschie are all referred to *Cercopithecus schmidti enkamer* Matschie.

Cercopithecus schmidti enkamer LORENZ, 1917, Ann. Naturhist. Hofmus., Wien, XXXI, p. 227, Pl. xv, fig. 1 (2 views of skull). Here he refers his *C. schmidti ituriensis* to *enkamer*.

Cercopithecus schmidti rutschuricus LORENZ, 1917, idem, p. 228, Pl. xv, fig. 2 (2 views of skull). Type and only specimen, an adult male, skin and skull, from the eastern base of Rutshuru.

Cercopithecus schmidti LÖNNBERG, 1919, Rev. Zool. Africaine, VII, p. 126. Four specimens, 1 each from Zobia, Buta, Bafuka and Uele.

Cercopithecus schmidti enkamer LÖNNBERG, 1919, idem, pp. 126–127, part. Specimens: Ituri 1, Kilo 2, Lesse 2, Beni 4, Kasindi 1, Lenda 1, Mawambi 1, Masisi 3, Penghe 1, Rutshuru 1, Barika 1, Alimasi 1, Kalumendo 1, Mambaka 1, Pili-pili 1, between Stanleyville and Bafwaboli 1, Kinzi 1.

Represented by 39 specimens accompanied by 2 skeletons (25 males, 14 females, nearly all adult), collected as follows:

Faradje, 1 (♂ adult), March 15, 1911.

Rungu, 1 (adult ♀), June 10, 1913.

Akenge, 14 (9 adult ♂, 2 adult ♀, 3 young ♀), September 13–October 19, 1913.

Niapu, 2 (adult ♂), November 22, December 13, 1913.

Medje, 4 (2 ♂, 2 ♀), March, August, and September, 1910.

Gamangui, 2 (adult ♂), January 29, February 13, 1910.

Bafwabaka, 1 (adult ♂), January 9, 1910.

Avakubi, 2 (adult ♂), October 12, 1909.

Bafwasende, 1 (adult ♀), September 25, 1909.

Kamunionge, 2 (adult ♂ and ♀), September 21, 1909.

Lubilo, 3 (2 ♂, 1 ♀, all adult), September 20, 1909.

Munye Katoto, 1 (adult ♂), September 10, 1909.

Bafwaboli, 4 (1 adult ♂, 3 ♀), September 11, 1909.

Stanleyville, 1 (adult ♂), August 27, 1909.

The external measurements—average (minimum-maximum)—of thirty-three adults of *Lasiopyga ascanius cirrhorhinus*, taken from animals in the flesh, are as follows:

	Total Length	Head and Body	Tail Vertebræ	Hind Foot	Ear
23 ♂	1270(1160-1390)	476(430-630)	795(695-930)	141(130-150)	38(34-43)
10 ♀	1090(1020-1160)	410(380-460)	680(630-755)	125(118-135)	35(32-37)

The cranial measurements—average (minimum-maximum)—of thirty adults of *Lasiopyga ascanius cirrhorhinus* are as follows:

	Greatest Length	Condylobasal Length	Occipitonasal Length	Zygomatic Breadth
23 ♂	96.1(90.0-101.0)	72.6(70.6-81.6)	83.9(78.3-88.3)	62.3(60.4-70.7)
7 ♀	87.1(82.8- 90.8)	66.5(62.1-68.8)	78.2(74.0-88.8)	57.7(53.9-63.3)

	Orbital Breadth	Postorb. Constr.	Mastoid Breadth
23 ♂	55.1(49.6-59.3)	41.5(39.0-44.7)	56.0(52.2-60.0)
7 ♀	50.0(46.8-52.8)	41.1(39.8-42.4)	52.5(49.4-54.9)
	Length Nasals	Upper Toothrow	Upper Molars
23 ♂	15.2(13.0-17.4)	29.7(27.5-35.0)	16.5(14.9-17.2)
7 ♀	13.5(10.2-15.6)	26.5(21.2-29.5)	14.7(10.4-16.9)

INDIVIDUAL COLOR VARIATION.—Most of the present series of nearly forty specimens were collected in a small area extending from Akenge south to Bafwaboli (about one hundred and fifty miles) and from Akenge east to Avakubi (about half that distance). Fourteen were from Akenge, nearly all of which were collected during a period of ten days in October, 1913. Two-thirds of the others were taken at localities between Avakubi and Stanleyville, September 10 to 25, 1909. These latter and the Akenge specimens were obtained within an area about one hundred miles square in the months of September and October, and are thus comparable as to season and habitat.

The variability of specimens of the *L. ascanius* (*"schmidti"*) group of guenons from the same locality was noted by Lönnberg in 1917 on the basis of twelve specimens from the Rutshuru district, and in 1919 on the basis of twenty-five specimens mostly from the Ituri Forest. Respecting the Rutshuru series he says[1]: "The colour of the specimens of this collection is on the whole essentially alike, although presenting variation." He mentions as among these variations the color of the crown, limbs, tail and ears. The color of the hair on the inside of the ears is said to be white or whitish in some and in others pale reddish ochre, in still others intermediate between these shades. He refers to the color of the tail as "very variable in specimens from Rutshuru." Finally he adds: "It appears therefore difficult to base a subspecies on the characteristic mentioned [the color of the tail] when the variation in colour is so common." As a result of these conditions he is led to consider *L. schmidti montana* and *L. schmidti ituriensis* of Lorenz and *L. schmidti sassæ* (Matschie) as not sufficiently different from *L. schmidti enkamer* (Matschie) to be recognized. Later he found[2] that "Specimens from the Ituri forest and Rutshuru are similar, although in both there is a certain amount of variation." He notes especially that the development of black in the lower cheek-stripe varies much in different specimens.

The large series from Akenge in the present collection, nearly all obtained during a short interval in October, afford a satisfactory basis

[1]1917, Kungl. Sven. Vet. Ak. Handl., Stockholm, LVIII, No. 2, pp. 32-33.
[2]1919, Rev. Zool. Africaine, VII, p. 127.

for the study of individual variation in color. In comparison with the wide range shown by other species of mammals from the same region, especially among some of the carnivores and in the *Colobus* monkeys, the variation in these guenons is small, yet it has evidently been misused as a basis for the recognition of a number of questionable subspecies, which will receive attention later in the present discussion.

The extremes in the general coloration of the upperparts do not differ strikingly, the main feature being the difference in the width and tone of the ochraceous annulations of the individual hairs, which results in a slightly lighter or a darker general effect in different individuals. The white underparts vary inappreciably, except that in some a grayish tipping to the hairs is discernible on close inspection which is not usually present but is sometimes conspicuous on the abdominal area. The head markings and the tail, however, are subject to wide variation.

The top of the head is usually much lighter than the rest of the upperparts, it often forming a contrasting crown-patch, due to the light color of the annulations and the extreme shortness of the black tips of the hairs. It is sharply defined on the front and sides by the black brow-band, which often spreads medially behind the crown-patch from the ears to form a poorly defined blackish area on the occiput and nape. In some specimens black is the prevailing tone of the whole nape region, while in others it is not more prominent as a feature of the coloration than is the black-tipping of the dorsal pelage in general.

The nose-spot varies somewhat in size and outline in different specimens, and in color from clear white to pale yellowish or brownish white. Lang informs me that the yellowish or brownish tints of the short-haired nose-spot are evidently the result of subsequent alteration. All specimens Lang and Chapin saw in the field had white nose-spots. Yet slight differences in color and shape of this nose-spot have been used by describers as an important diagnostic character. The black median area behind it is even more variable, being usually broad basally and extended as a narrow band to meet the black brow-band; in others it is much smaller, and the upward extension is reduced to a mere line or even practically obsolete.

The upper lateral band from the eye to the ear is usually broad and heavy, the hairs long, bristly and intensely black. They also usually meet in front as a conspicuous frontal band, but are often greatly narrowed medially and sometimes reduced to obsolescence.

The lower lateral black band is even more irregular in its extent, being in some specimens more than twice as wide as in others. In some it

extends forward as far as the eyes as a narrow line of short black hairs, in others it practically ends at a point below the anterior base of the ears. It is formed in part by the black tips of the cheek-hairs or whiskers.

The whiskers consist of long coarse hairs directed backward, usually dull white but often more or less toned with pale yellow and varied with grayish. Those of the lower border are broadly tipped with black, thus forming the upper edge of the lower cheek-band. The length and fulness of the whiskers varies much in different individuals, and also in the amount of black tipping. In some specimens nearly all the hairs are blackish at the extreme tip, contributing a general grayish tone to the cheeks.

The chin has a thin covering of short, blackish, bristly hairs, usually inconspicuous and frequently absent.

The inside of the ears is thinly clothed with whitish hairs, varying from clear white to dingy grayish white, rarely dull reddish (in two or three specimens only).

The most variable feature is the coloration of the tail, with respect especially to the extent of the proximal gray area of the under surface, the length of the blackish tip, and the tone of the red portion. The gray proximal area varies about 100 per cent in its extent, ranging from 100 to 200 mm., or from about one-eighth to one-fourth of the total length of the tail. A parallel variation exists in respect to the extent of intrusion of the color of the back upon the basal portion of the upper surface of the tail. The blackish tip varies greatly in length, being in some restricted to about 30 to 50 mm., in others extending to 150 mm. or more. The amount of black toning the red of the median dorsal band varies greatly in different specimens; in some it is brilliant red, in others the blackish tone prevails.

Although these color variations are in no way exceptional or even unusual, describers of supposed local forms from single specimens or other inadequate material have often based their new forms on differentiations of just this character.

Sexual Variation.—There is no recognizable sexual variation in coloration in the present large series. There is however a marked sexual difference in size, the males being about one-sixth larger than the females.

Age Variation.—The youngest specimens in the present series are three from Akenge in which only the milk teeth are present, and two others from Bafwaboli in one of which the first permanent molar is just up; in the other the first two permanent molars are fully developed, the third nearly up, and the middle pair of milk incisors and the milk pre-

molars have been replaced by their permanent successors. Even in the youngest the first pelage has been replaced and the coloration and texture of the pelage is like that of the adults, except in one in which it is finer and softer, due perhaps to the retention of a mixture of the first coat.

INDIVIDUAL VARIATION IN CRANIAL CHARACTERS.—The variation in cranial characters is not especially noteworthy, and follows the usual normal lines. In the largest male the basal suture is still open. Two of the three very old specimens are below average size, the other slightly above. The degree of ossification varies greatly in specimens of corresponding age, so that while some are slender and delicate in all parts of the skull others are heavy and strong. In general, of course, ossification is heaviest in senile specimens, and the teeth, especially the incisors and canines are greatly worn, the incisors appearing as formless stumps. The development of the temporal ridges also varies greatly in males apparently of about the same age, being weak in some skulls and heavy in others.

The greatest length of the skull in 23 males varies from 90 to 101 mm. or nearly 12 per cent of the average. The variation is about the same in the occipitonasal length, and ranges in other measurements from 13 to 28 per cent. Similar ratios obtain in the seven females. As usual the transverse and axial measurements are often discrepant, the longest skulls not having as great a zygomatic breadth as do the shorter skulls; nor is the heaviest dentition always found in the largest skulls.

The following abnormalities may be mentioned. In an adult male skull (No. 52542) m^3 on the left side is peg-like and less than half the normal size. An adult female (No. 52550) lacks m^3 on both sides, and there is no evidence that it was ever present. In the lower jaw the last molar is present on both sides and of normal size and form.

NOMENCLATURE AND DISTRIBUTION.—*Lasiopyga schmidti* (Matschie) (1892) was originally composite, having been based on specimens from several different localities, as follows: "Hab. Manyema, westlich vom Nordende des Tanganjika-Sees (Schmidt); Wald zwischen Mengo und Mjongo in Uganda (Stuhlmann); Wald nahe der Murchison-Bay am Victoria Njansa, Uganda (Stuhlmann)." As the species was named for Dr. Schmidt, Manyema has been given as the type locality by some

authors; others choose Mengo, Uganda.[1] Not until twenty years later was *L. schmidti* clearly defined and its type locality definitely indicated when its author divided the original composite *schmidti* into subspecies.[2] In this later paper it is stated that the original diagnosis was based on "Ein ♂ ad. und ein ♀ ad., A. 5564 und 5569 des Berliner Zoologischen Museums hat Stuhlmann bei Mengo in Uganda in der Nähe der Murchison-Bay erlegt." The two specimens were fully described in the original paper, and those from the other localities were referred to the same species. In the latter paper (1913) the original Manyema specimen (a young animal, taken living to the Berlin Zoölogical Garden by Dr. Rochus Schmidt) became the type of the new subspecies *Cercopithecus (Rhinostictus) ascanius omissus* Matschie. We are further told that this young animal was purchased at Mpapua from a caravan on its way from Manyema eastward by Schmidt while on his journey to meet Emin Pascha and Stanley. Hence the specimen is without definite locality, and belongs to the *ascanius* group, in which *schmidti* should also be included (Cf. Pocock, *loc. cit.*, 1907).

In the same paper Matschie described a third subspecies from the Mpanga forest, at the eastern base of Mount Ruwenzori (near Fort Portal) as *Cercopithecus schmidti mpangæ*, based on specimens collected by Dr. Grauer. Also a fourth as *C. schmidti sassæ*, based on a single specimen collected by Major Powell-Cotton at Sassa, southeast of Lake Albert Edward, and a fifth as *C. schmidti enkamer*, the type being from Chima Kilima, north of Mawambi, with three paratypes from between Beni and Irumu, all collected by Powell-Cotton. Lorenz added (1914 and 1917) from the same general region three other subspecies of *schmidti*,

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[1]The distribution of *schmidti* as given by authors is of interest. Sclater (*loc. cit.*, 1893) says: "*Hab.* Int. Eastern Africa; Manyuema, west of Tanganyika (Schmidt); Uganda (Stuhlmann)." He mentions that "a skin of this species has been lately received at the British Museum from Berlin." He also states that the specimen figured in Plate XVI (1893, Proc. Zool. Soc. London) was [made from an individual which lived three years in the Society's Gardens, and was "presented by the Rev. W. C. Willoughby in December 1883, [and] was originally obtained in Manyuema."

Forbes (*loc. cit.*, 1894) says: "This species was obtained by the Rev. W. C. Willoughby, in 1883, at Uniamwezi, in Eastern Equatorial Africa, and was said to have been brought thither from the Manyuema country, on the western shore of Lake Tanganyika. . . It has also been obtained in Uganda, further to the north."

Pocock (*loc. cit.*, 1907) made *C. schmidti* a subspecies of *C. ascanius*, and devotes the greater part of his account of it to a comparison of it with *ascanius*. He adds: "In the British Museum there are specimens of this local race from the following localities:—Uganda (*F. J. Jackson*, 99.8. 4.1 ; *Capt. H. J. Nadorhr*, 98. 10. 10.1); Port Alice (*H. H. Johnston*, 1. 8. 9. 16); Manyema (*Beche Coll.*, 93. 1. 1. 1); Bumba, Upper Congo (*Capt. Weyns*, 1.5.4.1)."

Elliot (*loc. cit.*, 1913, from his investigations made prior to 1912) gives a poor copy of Sclater's colored plate and an unsatisfactory description. He says, "*Type locality.* Manyema. Type in Berlin Museum. *Geogr. Distr.* Uganda, Port Alice, Manyema, Bumba, Upper Congo."

Thomas (*loc. cit.*, 1915), records two specimens from Medje and six from Poko, Belgian Congo (Christy Coll.) as "*Cercopithecus schmidti*, Matsch.," without comment.

Lönnberg (*loc. cit.*, 1919) recorded three specimens in the Tervueren Museum, collected by Hutereau in the Uele region, one each from Zobia, Buta ("30 kil. north of Niangara") and Bafuka, and incidentally states that "the type specimens" of *schmidti* were obtained in Uganda at Mengo;" adding that "the Uganda fauna extends westwards to the forests round Uele river to the north of the great forest of Ituri. . . ."

[2]*Cf.* 1913, Matschie, Ann. Soc. Zool. Malacol. Belgique, XLVII, (1912), pp 65–68.

as follows: "*Lasyopyga schmidti montana*," from Wabembe, northwest of Lake Tanganyika; "*Lasyopyga schmidti ituriensis*," the type from Ukaika, and three paratypes from Beni, referred later by Lorenz himself to *L. schmidti enkamer* (Matschie); and *Cercopithecus schmidti rutschuricus* (1917), based on a single specimen from the mountain forests of the eastern escarpments of the Rutshuru Plain; the name *rutschuricus* for a form of *Cercopithecus* (=*Lasiopyga*) is preoccupied by an earlier *Cercopithecus thomasi rutschuricus* by the same author (1915). As shown by Lönnberg (*loc. cit.*, 1917 and 1919), four of these subspecies are founded on insufficient characters, and are all referred by him to Matschie's subspecies *enkamer*, which Lönnberg recognizes as ranging from the Manyema-Wabembe district north to the Ituri Forest region, and thence west to Stanleyville. Lönnberg and Thomas have referred Uele specimens to the Uganda form *L. ascanius schmidti*. On ecological grounds this might seem justified, but Lang informs me that these monkeys are relatively scarce beyond the Rain Forest and wherever they occur they live under environmental conditions much the same as those in their real habitat in the Rain Forest, practically never invading the Savannah proper.

Noteworthy is the fact that Lönnberg (*loc. cit.*, 1919, p. 126) has included in *enkamer* a specimen from "Equateur," which is clearly within the range of *L. a. whitesidei* (Thomas), and also a specimen taken between Bafwaboli and Stanleyville, which falls within the range of *L. a. cirrhorhinus*. In the latter instance I follow Lönnberg as I can see no difference between specimens from Avakubi and Akenge and six taken at Bafwaboli, Bafwasende (on the Lindi) and Stanleyville.

It is evident that there is no valid diagnostic subspecific character to distinguish *enkamer* from *cirrhorhinus* and I consider them as synonyms. *Cirrhorhinus*, however, has several pages priority over *enkamer* and I am compelled to accept *Lasiopyga ascanius cirrhorhinus* as the name for the present series, its range extending from a considerable distance west of the Lower Lomami to Beni and Rutshuru, and including also the Ituri and eastern Uele districts.

Matschie (*loc. cit.*, 1913) in describing *cirrhorhinus* designated as type, an adult male, No. 347 of the Museum at Tervueren, said to come "Aus der Provinz Stanley Falls." In connection with the five co-types the only two other locality references occurring in his original description are: No. 246, "Rivière des Topokès," which refers to the Topoke people living on the left bank of the Lower Lomami; and No. 248, "La Lindi," meaning the Lindi River, which reaches from near Stanleyville to farther

south than Makala. It is interesting that Lönnberg (*loc. cit.*, 1919), in his paper on the Primates of the Tervueren Museum, six years later, cites nine specimens, among them the same type and two co-types of Matschie, Nos. 246, 248 and 347. For all of these specimens Lönnberg gives the single locality of "Tshoppo." There is undoubtedly some difficulty in ascertaining the exact origin of these specimens in the Tervueren Museum, but it is certain that Major Weyns, long stationed at Stanleyville, has collected at least some of them near Stanleyville, and probably Lönnberg meant to assign them to the forests along the Tshoppo River, where Lang and Chapin have also taken one specimen. Under these circumstances I believe "Tshoppo River, near Stanleyville" was the locality where the type specimen was obtained.

The specimen recorded from Faradje in the northeastern Uele is of special interest. It was really collected in one of the large forest galleries halfway between Faradje and Aba. Since "Faradje" lies in the midst of the Savannah, some 210 miles northeast of Akenge, one might have expected that this specimen would be at least subspecifically different from those taken in the Rain Forest. Compared with some specimens of our large series it differs by a slightly darker median dorsal area. But there are others in the Rain Forest series which it matches perfectly and still others which have even more intense brownish coloration on the back than the Faradje specimen. By selecting on the other hand the specimen most different among the forest series and supposing that this were the only specimen that happened to be at hand for comparison, one would have an apparently good reason for designating the Faradje specimen as a new subspecies. Too often have single specimens served as sole criterion for such a deplorable procedure.

Lasiopyga ascanius pelorhinus (Matschie)

Cercopithecus (*Rhinostictus*) *ascanius pelorhinus* MATSCHIE, 1913, Ann. Soc. Zool. Malacol. Belgique, XLVII, (1912), p. 76. Yambuya, Belgian Congo. Type, and only specimen, an adult female, skin without skull.

Represented by five imperfect native-prepared skins from Ukaturaka, an island in the Middle Congo (Lat. 2° N., Long. 20° 30′ E.). These skins lack the face, hands, feet, and skull. The ears are present in two, and the fore limbs to the hands in one. They are otherwise in good condition, with the tail complete.

The character of the nose-spot cannot of course be determined, but in other respects these specimens closely agree with Matschie's description of *pelorhinus*. His *C. a. kassaicus*, described on an earlier page of the same paper (*loc. cit.*, p. 74), is from the Pogge Falls on the Kasai, and

based on two immature specimens; the type, a subadult female, was received alive at the Berlin Zoölogical Garden. The chief differences claimed as distinguishing the two forms are the diagnostically doubtful color of the nose-spot which is said to be maize-yellow in *kassaica* and lemon-yellow in *pelorhinus*, and the greater whiteness of the basal portion of the tail in the latter. The present series of specimens agrees better with *pelorhinus* in the greater amount of white at the base of the underside of the tail, while the type locality of this form is not far from Ukaturaka (about 300 miles to the eastward), the type locality of *kassaica* being about twice this distance directly south.

The present specimens have a black brow-band as in *ascanius* (said by Lönnberg[1] to be practicaly absent in *kassaica*). The color tones of the tail and the extent of the white on its proximal portion are strikingly variable. One has a line of vivid red separating the white of the underside from the dark dorsal median band, mentioned by Lönnberg (*loc. cit.*, p. 123) as present in his *katangæ*.

A striking feature of these specimens is the exact agreement in coloration of every part, except the ears and tail, with specimens of *L. ascanius cirrhorhinus* from the Akenge-Medje-Avakubi-Stanleyville region, even to the tones of color of the whole dorsal area and head.

Lasiopyga cephus (Linnæus)

Plate XCIX

Simia cephus Linnæus, 1758, 'Syst. Nat.,' Ed. 10, I, p. 27. "America" = Guinea. Based on Marcgrave.

Cercopithecus cephus Lönnberg, 1919, Rev. Zool. Africaine, VII, p. 127. Lower Congo: Luali, Mayumbe (Bequaert).

Represented by one specimen, ♂, No. 52569, skin and skull, collected near Zambi, 30 miles from the mouth of the Congo, April 1915. No flesh measurements. Not fully adult, m^3 not through the gum. Skull, occipito-nasal length, 96 mm.; condylobasal length, 73.5; zygomatic breadth, 62.3; orbital breadth, 51.2; postorbital constriction, 42.7; mastoid breadth, 56.7.

The extent of the white nose-markings is well shown in the photographic field study (Pl. XCIX); what appears in the photograph to be a brow-band is merely due to the fact that the bluish slate-gray of the skin on the naked part of the face photographs white. The yellowish whiskers, bordered by black above and below, and the peculiar pale yellowish-tipped ear-tufts are the striking features. The crown is

[1] 1919, Rev. Zool. Africaine, VII, p. 122.

considerably darker than the back, the hairs being gray basally, becoming strongly speckled with black, yellow, and brownish-red, the latter considerably more pronounced on back and invading somewhat the flanks. The chin has a few stiff black hairs; throat and lower neck pale gray turning to light olive-gray brown from breast to abdomen. Tail above near root colored like back passing into a stripe of auburn to the red tip that is slightly speckled with black; proximal third of underside gray, the longer hairs speckled with black, passing into pale red which gains in intensity towards the tip. Hands black; forearms slightly speckled like back, innerside dark gray; thighs outside speckled like back, but paler, passing into slightly grizzled feet.

This species is evidently restricted to the lower Congo on the right bank, extending up through the Gaboon to Spanish Guinea (Benito). Lönnberg also records native-made skins from "région de la Sangha."

Lasiopyga pygerythra griseisticta (Elliot)

Plate LXXXIII, Figure 2; C

Cercopithecus tantalus griseistictus Elliot, 1909, Ann. Mag. Nat. Hist., (8) IV, September, p. 259. "Bambara, Welle River, Monbuttu Country, Central Africa." Type and only specimen, an adult male, skin and skull, procured by Mr. Boyd Alexander.

Lasiopyga tantalus griseisticta Elliot, 1913, 'Rev. Primates,' II, (1912), p. 331. Same as the above, with additions and change of generic name.

Represented by fifteen specimens accompanied by one skeleton, collected as follows:

Yakuluku, 3 (2 adult ♂, 1 ♀), September 28 and November 5, 1911.

Aba, 2 (♂, only 1 adult), December 12, 1911.

Faradje, 8 (only 3 fully adult), February 5–September 12, 1911.

Vankerckhovenville, 2 (adult ♂ and ♀), April 16–17, 1912.

The external measurements—average (minimum-maximum)—of seven adults of *Lasiopyga pygerythra griseisticta*, taken from animals in the flesh, are as follows:

	Total Length	Head and Body	Tail Vertebræ	Hind Foot	Ear
4 ♂	1111(1015–1230)	473(440–495)	598(575–615)	145(140–152)	41(40–42)
3 ♀	987(940–1040)	415(385–440)	571(555–600)	129(125–135)	40

Elliot gives the external measurements of the type, a male from Bambara, as based on the skin in the British Museum, as follows:

	Total Length	Head and Body	Tail Vertebræ	Hind Foot
♂	1290	570	720	135

The cranial measurements—average (minimum-maximum)—of five adults of *Lasiopyga pygerythra griseisticta* are as follows:

	Greatest Length	Condylobasal Length	Occipitonasal Length
2 ♂	(98.3–111.5)	(77.0–91.8)	(86.8–93.6)
3 ♀	97.9(94.4–100.8)	73.6(73.1–74.2)	83.1(79.4–86.5)

	Zygomatic Breadth	Orbital Breadth	Postorb. Constr.
2 ♂	(65.3–70.0)	(64.3–65.3)	(43.3–44.9)
3 ♀	63.6(61.8–65.3)	56.1(51.6–64.2)	42.6(41.0–45.1)

	Mastoid Breadth	Length Nasals	Upper Toothrow	Upper Molars
2 ♂	(56.7–61.9)	(15.6–18.7)	(33.5–36.2)	(19.5–19.8)
3 ♀	52.6(50.0–55.2)	15.8(14.0–17.3)	31.8(31.6–32.2)	18.6(18.4–19.0)

The cranial measurements of the type, as given by Elliot, are as follows:

	Greatest Length	Occipitonasal Length	Zygomatic Breadth	Postorb. Constr.	Length Nasals
♂	113.2	95.5	77.5	44.7	21.2[1]

SEXUAL VARIATION.—There is no recognizable sexual difference in coloration in the present series, but there is a marked sexual difference in size, the only old male being one-sixth larger in external measurements than females of corresponding age, and one-tenth larger in cranial measurements.

IMMATURE PELAGE.—The first pelage is represented by four specimens, forming a series differing in age. The youngest is fœtal (No. 51014, ♀, Faradje, September 12, 1911; total length, 330 mm.), and the teeth have not cut the gums. The pelage is very short and entirely black, but it covers only the head and mid-dorsal area to the sacral region, the rest of the body, limbs and tail being practically nude. The pelage is most heavily developed on the head, where it is thick but short.

The next in age (No. 52470, ♂, Faradje, March 14, 1911; total length, 455; greatest length of skull, 65) is well clothed in the soft natal coat, the basal two-thirds yellowish white, the apical third black, through which the light basal portion can be seen when the pelage is disarranged. In this specimen the cheek-teeth are covered by the gums, but the tips of the incisors have broken through.

The third specimen (No. 52474, ♂, Faradje, February 5, 1911; total length, 550; greatest length of skull, 68) is slightly older, with fully developed milk dentition. The second coat is coming in on the head, on the front edge of the shoulders and on the fore limbs, but not on the body, hind limbs or tail. The white frontal band is clearly indicated, and the

[1]Probably total length, not length at middle, as in the other specimens included in the measurements.

hairs of the front half of the head are broadly banded subapically with ochraceous, forming an ochraceous band behind the frontal zone of white.

The fourth specimen (No. 52466, ♂, Aba, December 12, 1911; total length, 555; greatest length of skull, 74) is older and shows a slight advance in pelage change, especially on the head, where there is a well defined, rather broad ochraceous band behind the narrow frontal line, a transition feature not shown in adults or even older subadults.

A young male (No. 52477, Yakuluku, September 26, 1911; total length, 980; greatest length of skull, 96; m^3 not yet developed) is the richest colored of the whole series, due probably to a fresh, unfaded coat, the pelage in older specimens collected at the same time and place being much paler.

Individual Variation in Coloration.—In general effect the coloration of the upperparts is a grizzle of pale yellowish gray sprinkled slightly with black, especially on the head and median dorsal area, the limbs and tail distinctly grayer than the body, and the tail more strongly mixed with black. The underparts and inside of the limbs are white faintly toned with yellow. In none is the color of the upperparts appreciably toned with green. However, there is a very slight olivaceous tint all over the back. The white frontal band is always strongly developed, but varies in width in different individuals, being twice broader in some than in others. The tuft of lengthened white hair on either side of the base of the tail is usually a conspicuous feature, but is occasionally greatly reduced. It joins the white of the proximal third or more of the underside of the tail. The anal tufts of red hair vary greatly in both color and quantity, independently of sex. In one of two males they are almost obsolete and pale brownish red; in the other they form a broad conspicuous patch of coarse, bright red hair. Other specimens are variously intermediate between these extremes. In one of the females this area is greatly extended, bright red for the most part, but with the longer hairs of the mid-portion chestnut-red passing into blackish apically. In another it is greatly reduced in extent and in intensity of color.

Nomenclature.—The type of *Lasiopyga tantalus* (Ogilby) (1841, Proc. Zool. Soc. London, p. 33) was from an unknown locality. On the basis of specimens essentially agreeing with it from Nigeria this region has been accepted by subsequent authors as the type region of the species (cf. Pocock, 1907, Proc. Zool. Soc. London, pp. 731–733, text fig. 189). Three subspecies belonging to this group were described prior to 1914. Two of these are undoubtedly closely related to those

represented in the northeastern Belgian Congo: (1) *C. tantalus budgetti* Pocock (*loc. cit.*, p. 733) based on a single specimen (skin and skeleton) from "Bathyaba" = Butiaba, on the east shore of Lake Albert; (2) *C. tantalus alexandri* Pocock (1909, Proc. Zool. Soc. London, Abstr. No. 71, May 11, p. 25; idem, December, p. 545) based on a specimen from Lake Chad, brought alive to the London Zoölogical Society's Gardens; (3) *C. tantalus griseistictus* Elliot (*loc. cit.*) from about 200 miles east of Bambara (on the Uele River, between Amadi and Surunga, at about 3° 35′ N., 27° 20′ E.), the type locality of this subspecies. The relationships of these three forms cannot now be definitely determined. The earliest name is *budgetti; alexandri* has six months priority over *griseisticta.* Two others were added by Lorenz[1] in 1914, as *Lasyopyga tantalus beniana* and *L. t. graueri*, the former based on two specimens (an adult male and a young male) from Beni, the other on an adult female from Baraka, west of the north end of Lake Tanganyika. The descriptions of these forms indicate their close similarity to the series from the Uele here referred to *griseisticta.* Probably they are synonyms of *L. pygerythra centralis*, for Lönnberg (*loc. cit.*, 1919) lists specimens from Beni and as far west as Ponthierville as *L. pygerythra centralis.*

From the above it is apparent that heretofore specimens recorded from the Savannah north of the West African Rain Forest, from eastern Uele, were considered to be subspecifically related to the West African species *L. tantalus.* Specimens from the Savannah south and east of the West African Rain Forest have been generally subspecifically referred to the South African *L. pygerythra* as *L. p. centralis* and *L. p. katangensis.* Uganda and East African representatives have also been subspecifically included in *L. pygerythra.* On comparing East African specimens with the material from the Uele I see no reason why the Uele specimens should not be treated as a subspecies of *pygerythra*, and therefore have chosen the name *L. pygerythra griseisticta.*

Allenopithecus[2] Lang

[*Allenopithecus* LANG, 1923, Amer. Mus. Novitates, No. 87, September 12, pp. 1–5, Figs. 1–3 (skull and dentition).

The chief characters of *Allenopithecus*, compared with *Lasiopyga*, are given as: baboon-like habitus due to much shorter, heavier body; more muscular shorter limbs, and short tail, although the short rostrum

[1]Anz. Ak. Wiss. Math. Nat. Kl. Wien, LI, No. 17, July 2, pp. 357–358. Redescribed in 1917 (Ann. Naturhist. Hofmus., Wien, XXXI, pp. 221–223) as *Cercopithecus tantalus benianus* and *C. t. graueri.*

[2]The first primate collected by the Congo Expedition of the American Museum was "*Lasiopyga*" *nigroviridis* (Pocock). In preparing his general report on the primates of the Congo collection the late Dr. J. A. Allen accidentally overlooked this specimen, which has since been described.—H. L.

accounts for a distinctly thickset roundish head. The molars more hypsodont, much broader basally, the outer and inner cusps more drawn together towards their apex, so as to form a very narrow longitudinal valley; the lower molars m_1, m_2 and m_3 having an external cusplet at the base of the groove between the anterior and posterior cusps.—H. L.]

Allenopithecus nigroviridis (Pocock)

Text Figures 1–3

[*Cercopithecus nigroviridis* POCOCK, 1907, Proc. Zool. Soc. London, October 8, p. 739, Pl. XLII, fig. 5 (head in profile); idem, 1908, p. 160 (in text), Pl. x, fig. 1 (animal; colored). Based on "the skin of a female specimen that lived in the Society's Gardens from November 29th, 1892 to May 15th, 1894," brought from "Upper Congo."

Lasiopyga (*Chlorocebus*) *nigriviridis* ELLIOT, 1913, 'Rev. Primates,' II, (1912), p. 348. Redescription of the type.

Represented by a single adult male, skin and skull, collected July 16, 1909 (Amer. Mus. No. 52467). Shot in a low tree near Bolobo, at an island in the Congo River. Several other individuals, barking loudly, escaped by leaping to the ground.

The field measurements are: Total length, 960 mm.; head and body, 460; tail vertebræ, 500; hind foot, 135. The principal cranial measurements are: Greatest length of skull, 111 mm.; occipitonasal length, 95.0; condylobasal length, 85.4; zygomatic breadth, 71.5; orbital breadth, 57.7; postorbital constriction, 39.5; mastoid breadth, 56.0; length of nasals, 24.0; upper toothrow (c-m^3), 35.0; length of upper molar series, 27.6; pm^3, width 5; m^1, width 6.8; m^2, width 7.8, length 6.7; m^3, width 7; lower toothrow (c-m_3), 38.5; length of lower molar series, 31.9; m_1, width 4.8; m_2, width 5.9; m_3, width 5.9. The basal suture is not fully closed, but there is a thin, low sagittal crest, although the teeth are only slightly worn. The facial portion of the skull is strongly sloping.

The type of *nigroviridis* was supposed to come from an unknown locality in the "Upper Congo." Another living specimen which Hamlyn stated "was brought with other Monkeys to Brazzaville from further inland" was received later in London. The present specimen from near Bolobo, about 150 miles north of Brazzaville, gives the first definite locality for the species.

The excellent description by Pocock[1] agrees so well with the color of the present specimen as to leave no doubt as to its correct specific reference. Slight alterations are necessary to make it fit perfectly, since

[1]His later colored figure of the species (*loc. cit.*, 1908, Pl. x, fig. 1), however, could hardly be more misleading, since green is not the prevailing color, as indicated by this figure.—H. L.

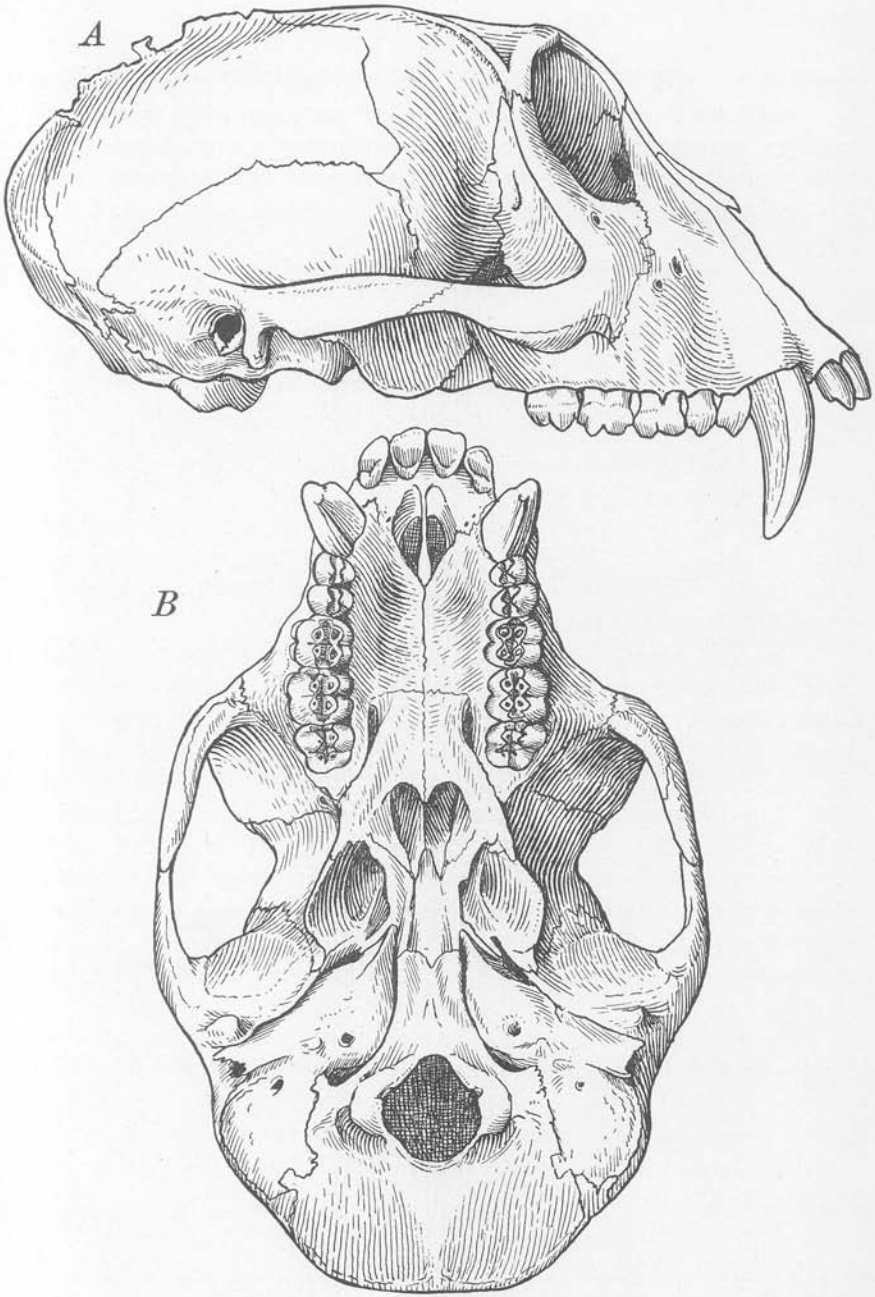

Fig. 1. *Allenopithecus nigroviridis* (Pocock). Skull of adult male (No. 52467).
A, right lateral view; *B*, palatal view. Natural size.

Pocock had only a young specimen "with remarkably soft silky hair," whereas the present specimen is a fully adult male with fairly coarse pelage, softer and thinner only on the underparts.

Skin of face dark grayish brown, as are also the ears; chin whitish pink, beset with grayish stiff hairs. Hairs on upper lip and adjacent to face black. The black brow-band is hardly indicated in the middle but

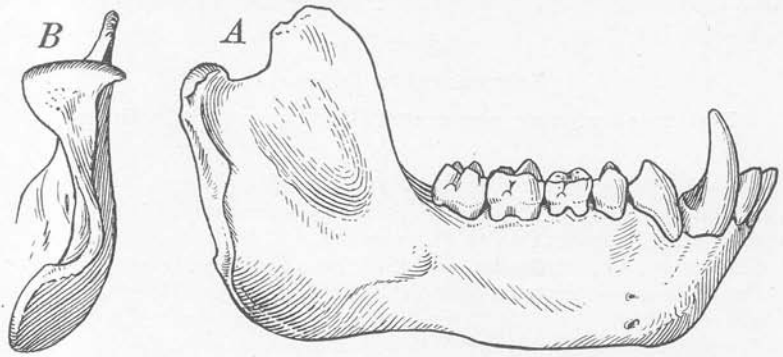

Fig. 2. *Allenopithecus nigroviridis* (Pocock). Mandible of adult male (No. 52467).

A, right lateral view; *B*, posterior view of right ascending ramus, showing wide mandibular condyle, inward curve caused by inception of muscle, and inflected angular process. Natural size.

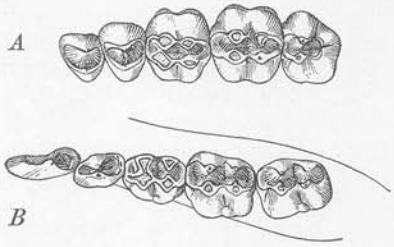

Fig. 3. *Allenopithecus nigroviridis* (Pocock). Dentition of adult male (No. 52467), crown view.

A, left upper molar series; *B*, left lower molar series. $\times\frac{3}{2}$.

from the eyes to ears increases in width. The ears are only slightly beset with soft hairs. The basally light gray whiskers are tipped with black and speckled with yellow in such fashion as to produce a golden subapical band near their edges. Crown, nape, shoulders, center of back and dorsal side of tail much darker than flanks; all hairs being at base dark gray, otherwise black and ringed with two golden-yellow bands narrower than the black space between them or than the black tip. Forelimbs towards hands gradually more short-haired, externally of

much the same speckled appearance as back but paler; hands grizzled; thighs externally more golden than back, passing gradually to the speckled grayish feet. Slightly darker shade across breast. Throat light gray; underparts gray, speckled with black and yellow; portion near flanks bright rusty red; scrotum whitish blue; a tuft of hair at perineal region dark rusty brown. Tail with hair much shorter than on body, darker dorsally, pale yellowish speckled below; extreme tip black.—H. L.]

ERYTHROCEBUS Trouessart

Erythrocebus patas[1] pyrronotus (Hemprich and Ehrenberg)

Plate CI

Cercopithecus pyrronotus HEMPRICH AND EHRENBERG, 1829, Verhandl. Ges. Naturf. Fr. Berlin, I, p. 407, Kordofan; *Cercopithecus pyrrhonotus*, idem, 1832, 'Symb. Physicæ,' Mamm., Decas I, Pl. x and text.

Cercopithecus pyrrhonotus SCLATER, 1893, Proc. Zool. Soc. London, p. 250.

Cercopithecus pyrrhonotus ANDERSON, 1902, 'Zool. Egypt,' Mamm., pp. 22–27. Redescription of the type in the Berlin Museum; historical comment.

Cercopithecus pyrrhonotus DE WINTON, 1902, in Anderson's 'Zool. Egypt,' Mamm., p. 25. "Some examples attributed to the Nile region have black noses."

Cercopithecus pyrronotus MATSCHIE, 1905, Sitzungsb. Ges. Naturf. Fr. Berlin, p. 269. Critical comment.

Cercopithecus patas subsp. *pyrrhonotus* POCOCK, 1907, Proc. Zool. Soc. London, p. 744. "I also suspect that the nose of the white-nosed eastern form of this species, for which the oldest name appears to be *pyrrhonotus*, is black in the young."

Cercopithecus (*Erythrocebus*) *patas albosignatus* MATSCHIE, 1912, Rev. Zool. Africaine, I, March, p. 433. "Mbomu-Fluss im Uelle-Becken." Type and only specimen an adult female.

Cercopithecus (*Erythrocebus*) *patas poliomystax* MATSCHIE, 1912, idem, p. 434. "Oberer-Kongo. Genauer Fundort nicht zu ermitteln." Type and only specimen an adult male.

Erythrocebus pyrrhonotus ELLIOT, 1913, 'Rev. Primates,' III, (1912), p. 9.

Erythrocebus pyrrhonotus G. M. ALLEN, 1914, Bull. Mus. Comp. Zool., LVIII, July, p. 354. Seen near Gozar, on the Blue Nile.

Erythrocebus phyrrhonotus WETTSTEIN, 1917, Denks. Ak. Wiss. Wien, Math.-Nat. Kl., XCIV, p. 646. J. Debri, S.-Kordofan (about 30 miles north of Kadugli), skin and skull of a young female.

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[1]The basis of *Simia patas* and its synonyms is as follows:

Le Patas Buffon and Daubenton, 1766, 'Hist. Nat.,' XIV, pp. 208–223, Pls. XXV and XXVI (animal), XXVII and XXVIII (anatomy). "Sénégal," by inference. ("Nom de cette espèce . . dans son pays natal au Sénégal.") Two specimens are figured and described as, respectively, *Patas à bandeau noir* (Pl. XXV) and *Patas à bandeau blanc* (Pl. XXVI) but they are said to differ only in the color of the supraorbital band, which is black in the former and white in the latter.

Simia patas Schreber, 1775, 'Säugthiere,' I, p. 98, Pl. XVI. No technical name in the text but the plate is legended "*Simia patas* Buff." Description based on Buffon and Daubenton, plate a copy of theirs, as above, colored.

Simia rubra Gmelin, 1788, 'Syst. Nat.,' I, p. 34. "*Simia patas* Buffon" of Schreber, renamed *Cercopithecus ruber* of later authors. Also *Simia rubra* Schreber, Pl. XVI B, 1804, without text.

Simia Cercopithecus ruber nigro-fasciatus Kerr, 1792, 'Anim. Kingd.,' p. 71, No. 48. = *Patas à bandeau noir* Buffon.

Simia Cercopithecus ruber albo-fasciatus Kerr, 1792, idem, No. 49. = *Patas à bandeau blanc* Buffon.

Represented by five specimens, all immature but one, which is accompanied by the skeleton, collected as follows:

Faradje, 4 (an adult ♂ and 3 immature), March 8–May 3, 1911.

Niangara, 1 (young ♀), May 4, 1913.

IMMATURE PELAGE.—The youngest specimen is a male from Faradje (No. 52575, March 9, 1911) in first pelage (total length 495 mm., greatest length of skull 69.3), with the last milk molar still enclosed in the gum. The pelage of the upperparts is thick and soft, of the underparts thin and silky, not wholly concealing the skin. The nose is black with a cream-buff spot on each side. A narrow frontal band of rigid black hairs, behind which is a broader one of ochraceous buff, paler on the posterior border; cheeks faintly yellowish grizzled with black; head washed with tawny, the individual hairs dark slate-gray (slightly lighter at extreme base) annulated subapically with tawny and slightly tipped with black; nape and shoulders similar superficially but the basal half of the fur is creamy white passing into light gray; the rest of the upperparts similar but the tawny tips of the hairs are longer. The tail proximally is deep cinnamon-buff, becoming gradually paler apically. Ventral area and inside of limbs whitish to the base of the hairs; outside of limbs tawny; hands and feet blackish.

A more advanced stage is represented by two specimens in which the first coat has been replaced by the coarser pelage of a later stage. The younger of the two (No. 52577, ♂, Faradje, May 3, 1909; total length, 650 mm.; greatest length of skull, 90; only the fully developed milk dentition) has the general coloration of adults, the markings being the same except on the nose, shoulders and limbs. The nose is black. The whiskers are softer and less grizzled with black, those at the base of the ears curved upward. The ears are strongly tufted with white hairs, the longest of which have a length of 25 to 30 mm. The top of the head is dark red, with many of the hairs minutely tipped with black, especially those of the occipital area where the black tips have a length of 3 to 5 mm. The pelage of the upperparts is pale reddish, the red extending to the base of the hairs, but with faintly lighter tips mixed with a sprinkling of black tips, the latter long and conspicuous over the scapular area. Outside of the limbs slightly paler than the body, not white as in the mature pelage, and the hands and feet slightly darkened with blackish. The underparts are faintly grayish white slightly toned with reddish on the breast and lower abdomen.

No. 52574 (♀, Faradje, March 8, 1911; total length, 600 mm.; greatest length of skull, 99 mm.; milk dentition fully developed) is

slightly older, although smaller and taken two months earlier in the season. The cheeks are strongly mixed with black (black prevailing anteriorly), and the soft buffy hairs at the base of the ears have disappeared and the tips of the ears are much more thinly tufted. The general coloration is nearly as in the young male last described but the front border of the shoulders is strongly toned with gray, which extends to the base of the hairs, and the red color of the back is stronger, with less soft underfur. In fact the general texture of the pelage indicates an older stage of development. The nose is still black.

A somewhat older specimen from Niangara (No. 52578, ♀, May 4, 1913; total length 780 mm., greatest length of skull 93.6; first permanent molar fully up in addition to the milk teeth) is similar to the two examples just described, but the color tones are slightly brighter and the interscapular region is much grayer. The inside of the limbs is much clearer white, while the red tone of the outside of the limbs is more restricted and paler and the gray of the shoulders extends along the outer edge of the forelimbs nearly to the feet. The nose is still black.

ADULT PELAGE.—The adult stage is represented by a single male from Faradje (No. 52576, April 4, 1911; Pl. CI). The nose is conspicuously clear white, in contrast with the intense black nose of the four young already described. The coarse long gray hair of the shoulders is gray to the base of the pelage and extends over the upper arms to the elbow, the whole forearm being white to the end of the toes; a faint creamy suffusion on the anterior aspect contrasts slightly with the clear white of the posterior. The longest of the gray hairs on the shoulders have a length of 90 to 100 mm. The entire top of the head is dark red, darkest on the posterior part where many of the hairs are minutely tipped with black; laterally the black hair tips are longer and form a thin black line joining the broad black facial band. The long cheek-hairs (whiskers) curve upward at the posterior base of the ears. The center of the back is deep brick-red, the hairs being vermiculated with yellow and tipped with black; the sides are lighter. The proximal half of the tail is deep brownish red, much darker than the thighs and lower back. The red on the thighs extends only to a line continuous with the lower border of the callosities.

The external measurements of this specimen are: Total length, 1195 mm.; head and body, 575; tail vertebræ, 620; hind foot, 165; ear, 49. For cranial measurements see p. 431.

RELATIONSHIPS AND NOMENCLATURE.—The *Erythrocebus* group of guenons is a homogenous group, sharply defined from all others by colora-

tion. As a rule the forms are poorly represented in museums, although living specimens in menageries are not unusual. It is from this source that most of the museum specimens have been derived; and the types of the greater part of the described forms have been of this character, usually without definitely known localities.

The distribution of the group extends across Africa south of the Sahara from Senegal to western Abyssinia, thence south to Cameroon, northern Belgian Congo, Uganda, and the western part of British East Africa to Masailand, thus ranging from about 15° N. to 4° S. None have been recorded from Belgian Congo south of the Uele River.

Twelve species were recognized by Elliot, all described prior to 1912, and two forms have been added since that date. Besides these twelve names, several synonyms are commonly referred to *patas* and *pyrronotus*. In recent years several authors have recognized *Erythrocebus* as a genus, others have given it the status of a subgenus. Probably Pocock's estimate of its value is a fair one. He says:[1] "One group [of the guenons], however, stands out from the rest and might perhaps with advantage be given full generic status. This is the group name *Erythrocebus*, typified by *patas*. The living animals differ markedly from other species, not only in colour, but in form. They are slender Monkeys standing high on the legs, the fore legs being particularly long as compared with those of other species, which are heavily built and low on the fore legs. . . . I suspect that *C. patas* is more terrestrial and less arboreal than the other members of the genus *Cercopithecus*."

The number of species referred to *Erythrocebus* by different authors during the last twenty years has greatly varied. Trouessart, in 1904 ('Cat. Mamm.,' Suppl., fasc. 1, p. 13), recognized two. Matschie, in 1905 (*loc. cit.*), admitted five previously described and added four new ones, making nine in all. Pocock, in 1907 (*loc. cit.*), recognized only one, with an additional subspecies (*Erythrocebus patas patas* and *E. patas pyrronotus*). He states that his material was too scanty for him "to contribute anything to our knowledge of the geographical races of the species." He appended, however, a list of references to the described "local forms." Elliot, in 1912 (date of publication June 1913), recognized twelve forms, all as full species. They include those given by Matschie and two others described by himself in 1909. Two others were added by Matschie in 1912.

[1] 1907, Proc. Zool. Soc. London, p. 679.

These fourteen forms, with their type localities and the character of the material on which they were originally founded, are:

1775. *Simia patas* SCHREBER (ex Buffon and Daubenton). (*Loc. cit.*, p. 98.) Founded on two menagerie specimens, without definite locality but inferentially from Senegal. Buffon's account of these two specimens became later (*supra*, p. 422, footnote) the basis of two specific and two subspecific designations.

1829. *Cercopithecus pyrronotus* HEMPRICH AND EHRENBERG. (*Loc. cit.*, p. 407.) Type, a male brought alive from Kordofan to Berlin, where the prepared specimen is preserved in the Zoölogical Museum. (Cf. Matschie, 1905, Sitzungsb. Ges. Naturf. Fr. Berlin, p. 269.) Redescribed by Anderson in his 'Zool. Egypt' (1902, Mamm., p. 22), and by Elliot (1913, 'Rev. Primates,' III, (1912), p. 9).

1861. *Cercopithecus poliophæus* HEUGLIN (nomen nudum). Petermann's Mitteilungen, VII, p. 13. Described and figured by Reichenbach in 1862. Type a male, brought alive by Heuglin to Vienna, where it lived for four years, and preserved as a specimen in the Vienna Museum. Said to have come originally from Fazogli, on the Blue Nile, near the Abyssinian boundary. Type redescribed by Fitzinger in 1866 (cf. Matschie, *loc. cit.*, 1905, pp. 270–271) and by Elliot (*loc. cit.*, p. 11).

1863. *Cercopithecus circumcinctus* REICHENBACH, 'Vollständ. Naturg. Affen,' p. 123, Pl. XXI, fig. 310. Based on a living animal, from an unknown locality. Face black encircled with white. (Cf. Matschie, *loc. cit.*, 1905, p. 271, and Elliot, *loc. cit.*, III, p. 17.)

1905. *Erythrocebus baumstarki* MATSCHIE, Sitzungsb. Ges. Naturf. Fr. Berlin, No. 10, p. 273. Based on a nearly full-grown female, a skin and skull, from Ikoma, east of the south end of Victoria Nyansa. Immature, the last molar not fully up. The region about the eyes is said to have been injured but that it could be seen that there was no black frontal band.

1905. *Erythrocebus zechi* MATSCHIE, idem, p. 274. Based on three young individuals from the environs of Kete Kradji, western Togo, sent alive to the Berlin Zoölogical Gardens. Black nosed. Top of head dragon-blood red; back cinnamon-red. No really distinctive features are given.

1905. *Erythrocebus kerstingi* MATSCHIE, idem, p. 274. Five specimens. Type an adult female from Sokode, Togo; four immature specimens from "Fasaú im Mono-Quellgebiet." Black nosed. Back orange-red finely sprinkled with light gray.

In addition to these two Togoland species, other specimens are referred to a third species recognized as "*Simia rufa* Schreber." Two young specimens, from Tapong, one of them "ganz jungen und einen nicht ganz ausgewachsenen." Thus it is shown that "innerhalb der Grenzen von Togo drei sehr verschiedene Husarenaffen leben."

1905. *Erythrocebus langheldi* MATSCHIE, idem, p. 276. Based on two living specimens, both young, in the Berlin Zoölogical Gardens, from Garua, Upper Benue, Cameroon. The alleged characters for the recognition of this species are without value. The younger of the two is made the type, which, says Elliot, "is so young I have not deemed it worth while to give the dimensions of the skull." The other (older) specimen has no skull.

1906. *Cercopithecus patas sannio* THOMAS, Ann. Mag. Nat. Hist., (7) XVII, February, p. 173. Type, an adult male, skin and skull, from Yo, Lake Chad. Nose black, shoulders grayish black, not yellow as in typical *patas*.

1909. *Erythrocebus formosus* ELLIOT, Ann. Mag. Nat. Hist., (8) IV, p. 264. Based on an adult skin, without skull, from Uganda; exact locality not known. Nearly related to *C. baumstarki* Matschie (1905) from Masai Land.

1909. *Erythrocebus albigenus* [sic] ELLIOT, idem, p. 265. Based on an adult male, skin and skull, from "Egyptian Soudan, exact locality not known."

1910. *Erythrocebus whitei* HOLLISTER, Smithsonian Misc. Coll., LVI, No. 2, March 31, p. 11, Pl. II (skull). Type, an adult male, skin and skull (also an adult male paratype), Nzoia River, Guas Ngishu Plateau, British East Africa.

1912. *Cercopithecus* (*Erythrocebus*) *patas albosignatus* MATSCHIE, Rev. Zool. Africaine, I, Mars, p. 433. Based on an adult female skin (no skull mentioned), from Bomu River, Belgian Congo. Black nosed. No really diagnostic characters given.

1912. *Cercopithecus* (*Erythrocebus*) *patas poliomystax* MATSCHIE, idem, p. 434. Based on an adult male skin and skull from the Upper Congo, exact locality unknown. Black nosed.

Eight of the fourteen forms listed above were based on single specimens, the types of three of them from unknown localities. Six were based on immature specimens that died in menageries. In the case of the original *patas*, a considerable number of specimens have been received from time to time at the Paris Zoölogical Gardens that were known to have come from Senegal (cf. I. Geoffroy, 1851, 'Cat. Meth. Coll. Mamm. Mus. Paris,' p. 24). Eight of the forms appear to have been based on wild-killed specimens, some of them immature, and all on single specimens except two, where the original material consisted of two specimens in one case and six in the other. The literature of the group, however, appears to furnish very few records of wild-killed material for any of the forms. The amount of such material in museums is probably small, as Elliot in his 'Review of the Primates' rarely refers to any other specimens than the types, and probably little has since been added. Hence little has been recorded in reference to individual variation in this group of guenons. My own material is restricted to the small series (five specimens) collected by the American Museum Congo Expedition as listed above; seven topotypes of *Erythrocebus whitei* Hollister; a single specimen referable to the original *patas*, an adult male from the Central Park Menagerie of New York City; and a wild-killed adult male from Uganda (without definite locality) representing *Erythrocebus formosus* Elliot.

The color pattern is essentially the same in all, but the tones and relative extent of corresponding color areas are subject to wide variation, even in specimens from the same locality. The single specimen of *C.*

patas, evidently typical although from an unknown locality, has the softest pelage and the most intense color tones of all, and the red color of the upperparts extends on the hind limbs to the knees. The single specimen from Uganda is brighter and more intensely colored than either the Upper Congo specimens or the series from the Nzoia River, British East Africa, topotypes of *E. whitei* Hollister.

E. whitei is represented by three adults (two males and a female) and four young, the latter varying in age from about one-fourth to one-half grown. The two adult males are perfectly comparable in age and were collected at the same locality, respectively on October 31 and December 30. They thus illustrate the kind and amount of individual color variation that may be expected to occur in guenons of the *patas* group. In texture of pelage and in coloration the general effect is closely similar; in details of coloration there are marked differences. In No. 34713 (which for brevity may be designated as A), collected October 31, the fronto-superciliary band is broad, uniformly and equally composed of mixed rigid black and white hairs to a point about one-third the distance between the eye and ear, and thence posteriorly consists of shorter soft black hairs without intermixture of white. In the other (No. 34714, designated for convenience B), collected December 30, the frontal band is black with a very few partly white hairs, black greatly prevailing and the white hairs are annulated with black instead of being wholly white. The cheek hairs are similar in both—white with the tips of the upper series broadly black-tipped.

In A the forehead immediately behind the frontal band is of the same tone of red as the crown; in B it is distinctly paler (about cinnamon-buff). In A the pale temporal tuft in front of the ear is very pale, many shades paler than the forehead; in B it is about the same tone as the forehead. In A the nape region is much paler than in B; yet in A the general tone of the under-pelage of the upperparts is much brighter reddish orange than in B. In A the long hair of the shoulder is scarcely different in color from the interscapular region and flanks; in B the shoulder hairs are conspicuously gray, the apical half of the hairs being broadly banded with black and narrowly subapically with white, and consequently are strikingly different from the rest of the upperparts. As a further result the upper arm is externally gray like the shoulder and unlike the rest of the upperparts, while in A it is, like the shoulder, without gray and not different from the rest of the upperparts. In A the belly is white, the tips of the hairs faintly toned with light red; in B the hairs of the belly are deep orange-red to the base. In A the tail at the

extreme base (for about 50 mm.) is like the adjoining part of the back, but from this point posteriorly, on the upper surface, rapidly passes from pale cinnamon-buff to pale cream-buff, thence apically to pale yellowish white; under-surface of tail wholly white. In B the upper-surface of the tail for about the proximal fourth or third is dark brownish red, much darker than the back, fading gradually apically to about cinnamon-buff at the tip; under surface of the tail about cream-buff to the tip.

The differences between these two specimens, of the same age, sex, and locality, are greater than those indicated in the comparative descriptions of most of the forms given the status of full species by Elliot and by their original describers. While this shows the inadequacy of our knowledge of most of the hitherto described forms it does not follow that some of these forms (perhaps most of them) may not prove, when fully known, to be recognizable local races. But it is hardly probable that the three forms recognized by Matschie from Togoland will all prove tenable, or that there are two good forms in the Uele drainage of the Upper Congo, or that the form from that region is really sufficiently different from *pyrronotus* of the Upper Nile region to require a special name. Indeed, the adult male in the present collection from Faradje, Uele district, is not very appreciably different from specimen B of *E. whitei* described above; it differs from it much less, in fact, than the specimen A differs from specimen B, both from the same locality, and both from practically the type locality of *E. whitei*. For this reason I have deemed it preferable to refer provisionally the Faradje series to *pyrronotus* rather than to take for them one of Matschie's names based on Bomu and "Upper Congo" specimens.

So far as cranial measurements are available, they fail to show racial differences in size, as shown in the table of measurements on p. 431. The single middle-aged male from Faradje shows no tangible differences from *E. whitei*, the individual variation in three comparable examples of *whitei* covering the size differences of not only the Faradje specimen but also the types of *E. p. sannio* and *E. p. poliomystax*.

Different parts of the range of the *patas* group (genus *Erythrocebus* of some authors) present widely different ecological conditions, and it is a practical certainty that regional forms exist, but just how and to what extent they differ is at present unknown. The principal differences alleged are slight variations in color, mainly the intensity of color, and whether the nose patch is white or black. The texture of pelage, whether soft and rather short or long and coarse, obviously varies with the environment, and likewise the intensity of the tones of coloration, the

forms of the semi-desert and sparsely wooded districts differing from those of more heavily wooded and moister districts. As in other similar groups, local differences in size are not apparent, so far as can be judged from measurements at present available. The significance of the color of the nose patch, whether black or white, has practically been solved. Adults of the West African forms, probably as far east as the Shari River, have the nose black, while adults of the more eastern districts, including those of the Upper Congo region, have the nose white. Yet young individuals of the white-nosed form have the nose black. In the present material of five specimens from the Uele district the only adult has the nose white, while all of the four young, collected at the same time and place as the adult, have the nose black; this includes one nearly full grown (the permanent teeth fully developed except the last molar). In a series of four young of *whitei*, of similar age to the Faradje series, the nose is white in the older ones and changing from black to white in the younger ones, while in six known adults of *whitei* the nose is white. Pocock, long ago (1907, Proc. Zool. Soc. London, p. 744), was led to suspect, from his observations of living examples in the London Zoölogical Gardens, that the white-nosed forms had black noses when young.

In young specimens the outside of the limbs are only a little paler than the body, the lower legs and fore arms not acquiring the white color of these parts in the adult until half-grown or until after the anterior permanent molar has reached full development; yet the type specimen of some of the described forms had not passed beyond this stage.

Among the leading characters set forth by describers as diagnostic is the brow-band, whether all black or white and black mixed, and, if the latter, whether of uniform character throughout or broken on the median line by a space all black.[1] Or again whether it reaches to the ear or ends some distance in front of it; also whether the branch extending to the sides of the crown is indistinct or strongly developed. The hairs of the crown and occiput and of the back may be minutely or strongly black-tipped in specimens from the same locality, yet such variations have been taken as racial distinctions. Also the shoulder and upper arm may be gray, or even blackish in general effect, or not different from the general color of the upperparts, as in the two examples of *whitei* above described.

[1]The three primary divisions in Elliot's "Key to the Species" of *Erythrocebus* are: "A. Brow band black; B. Brow band white; C. No brow band." Ten species are placed in section A, one each in sections B and C (*circumcinctus* in B, *baumstarki* in C). The illustration of Reichenbach's *Erythrocebus circumcinctus* was based on an immature specimen living in confinement, from an unknown locality, some thirty years previous to its publication, and is indeterminable. It is represented as having a white brow band. *Erythrocebus baumstarki* Matschie was based on the skin of a wild-killed female, not fully grown, from Ikoma, Masailand. The region over the eyes, says the description, "ist leider bei dem vorliegenden Fell faul"; yet the author says he was able to recognize that there could have been "keine schwarze Stirnbinde" in front of the ochre-colored forehead. Elliot describes the same specimen as having "no black on forehead or on side of head." It thus seems necessary to have this exceptional character confirmed by other specimens from the type locality.

Cranial Measurements of Forms of the *Erythrocebus patas* Group

Cat. No.	Form	Sex	Locality	Greatest Length	Condylo-basal Length	Occipito-nasal Length	Zygomatic Breadth
52576	*pyrronotus*	♂	Faradje	141.0	107.2	117.4	88.3
	sannio[1]	♂	Lake Chad	143.0	98.2	127.5	88.5
	albigenus[2]	♂	Egyptian Sudan	135.0		114.0	80.0
	whitei[3]	♂	Guas Ngishu	149.0	120.0		99.0
34713	*whitei*	♂	Guas Ngishu	143.8	115.0	113.5	86.3
34714	*whitei*	♂	Guas Ngishu	147.3	117.8	118.8	89.3
	poliomystax[4]	♂	Upper Congo	150.0			93.0

Cat. No.	Form	Sex	Orbital Breadth	Postorb. Constr.	Mastoid Breadth	Length Nasals	Upper Toothrow	Upper Molars	Basal Suture
52576	*pyrronotus*	♂	73.9	49.3	65.6	27.0	44.3	21.0	Closed
	sannio[1]	♂		47.3		24.8			
	albigenus[2]	♂		47.3		25.2			
	whitei[3]	♂				22.5			
34713	*whitei*	♂	73.3	48.3	70.0	22.7	43.1	21.0	Closed
34714	*whitei*	♂	74.2	49.4	72.5	25.0	43.4	20.0	Obliterated
	poliomystax[4]	♂		53.0	73.0	27.5			

Colobinæ

Colobus Illiger

1811. *Colobus* Illiger, 'Prodr. Syst. Mamm. et Avium,' p. 69. Type, by subsequent designation, "*Simia polycomos* Schreber" = *Cebus polykomos* Zimmermann.[5]

1821. *Colobolus* Gray, London Med. Repos., XV, April, p. 298. Type, by monotypy, *Simia polycomos* Schreber = *Cebus polykomos* Zimmermann.

1870. *Guereza* Gray, 'Cat. Monkeys, Lemurs and Fruit-eating Bats,' pp. 5 and 19. Type, by monotypy and tautonomy, *Guereza rüppelli* Gray = *Colobus guereza* Rüppell.

[1] *Erythrocebus patas sannio* (Thomas). Measurements from Thomas.
[2] *Erythrocebus albigenus* [sic] Elliot. Measurements from Elliot.
[3] *Erythrocebus whitei* Hollister. Measurements from Hollister.
[4] *Erythrocebus patas poliomystax* (Matschie). Measurements from Matschie.
[5] "Ce genre [*Colobus*], crée en 1811 par Illiger, est aujourd'hui généralement adopté. Le type est la *Guenon à camail* de Buffon (suppl. VII, p. 65), présentement *Colobus polycomos*. Cette espèce étant encore imparfaitement connue, nous citerons aussi comme type le *C. guereza*, Rüpp., qui est voisin du précédent [but it was not described till twenty-four years after the genus *Colobus* was founded]." I. Geoffroy, 1851, 'Cat. Méth. Coll. Mamm. Mus. Paris,' p. 17.

1887. *Procolobus* ROCHEBRUNE, 'Faune de la Sénégambie,' Suppl. aux Vertébrés, fasc. 1, pp. 95, 97. Type, by monotypy, *Colobus verus* Van Beneden.

1887. *Tropicolobus* ROCHEBRUNE, idem, pp. 96, 102. Type, by monotypy, *Colobus rufomitratus* Peters.

1887. *Piliocolobus* ROCHEBRUNE, idem, pp. 96, 105. Type, by subsequent designation (Allen, 1920),[1] *Simia (Cercopithecus) badius* Kerr.

1887. *Stachycolobus* ROCHEBRUNE, idem, pp. 96, 114. Type, by monotypy, *Colobus satanas* Waterhouse.

1887. *Pterycolobus* ROCHEBRUNE, idem, pp. 96, 125. Type, by monotypy, *Colobus vellerosus* I. Geoffroy.

1895. *Lophocolobus* POUSARGUES, Bull. Mus. Hist. Nat., Paris, I, No. 3, April 28, p. 98. Subgenus of *Colobus*. Type, by monotypy and original designation, *Colobus verus* Van Beneden. = *Procolobus* Rochebrune, 1887.

The geographic range of the genus *Colobus* is restricted to intertropical Africa, in the north from Senegambia to Abyssinia and the south from Angola to Nyasaland, throughout the greater part of which vast area forms of this group are represented. They have been recognized as constituting two groups, on the basis of coloration, commonly known as "red Colobi" and "black Colobi." Some of the "red" group, as now known, have very little red in the coloration, the prevailing color of the upper parts being some shade of dark brown. The various forms of the "black" group vary greatly in respect to development of long hair on the head, shoulders, and sides of the body, and the presence or absence of a heavy terminal tail tuft.

Rochebrune[2] in his monograph of the *Colobus* group recognized it as a family Colobidæ (Cercopithecidæ of recent authors), consisting of seven genera, five of which he proposed as new. Some of his generic groups have been recognized as subgenera by later authors, although they are based on rather slight characters. As recognized by Elliot,[3] Rochebrune's *Stachycolobus* is, however, synonymous with *Colobus* (*s.s.*), as are also Gray's *Colobolus* and *Guereza*, while *Lophocolobus* Pousargues (1895) is a strict synonym of *Procolobus* Rochebrune, both having the same genotype, as admitted later by Pousargues himself.[4]

The first described species referable to the genus *Colobus* are the "Full-bottom Monkey" and the "Bay Monkey" of Pennant, based on a specimen of each in the Leverian Museum, brought from Sierra Leone. The former was described and figured by Pennant in 1781 ('Hist. Quadr.,' I, p. 197, No. 110, Pl. XXIV), and a description was given of the latter (*loc. cit.*, p. 198, No. 111). The Full-bottom Monkey received its

[1] Journ. Mammalogy, February, p. 97.
[2] 1887, 'Faune de la Sénégambie,' Suppl. aux Vertébrés, fasc. 1.
[3] 1913, 'Rev. Primates,' III.
[4] Cf. 1896, Ann. Sci. Nat. Zool., Paris, (8) III, p. 162, footnote.

first systematic name from Zimmermann, who designated it *Cebus polykomos* in 1780 ('Geogr. Gesch.,' II, p. 202), his description being based on manuscript notes sent to him by Pennant. Zimmermann's account of the species thus preceded Pennant's by one year. Other technical names were given to it by later authors, all based on Pennant's description and figure, in the following sequence: *Simia (Cercopithecus) regalis* Kerr (1792, 'Anim. Kingd.,' p. 74, No. 61); *Simia tetradactyla* Link (1795, 'Beitr. Naturgesch.,' p. 62); *Simia comosa* Shaw (1800, 'Gen. Zool.,' I, pt. 1, p. 59); *Ateles comatus* E. Geoffroy (1806, Ann. Mus. Hist. Nat., Paris, VII, p. 273). Also apparently the same form was redescribed as *Colobus ursinus* Ogilby (1835, Proc. Zool. Soc. London, p. 98; and idem, 1838, p. 61), also from Sierra Leone specimens.

The second species, Pennant's "Bay Monkey," was first technically named by Kerr, in 1792 (*loc. cit.*, p. 74, No. 62), *Simia (Cercopithecus) badius*. It was renamed *Simia ferruginea* by Shaw in 1800 (*loc. cit.*, p. 59) and *Colobus ferruginosus* by E. Geoffroy in 1812 (Ann. Mus. Hist. Nat. Paris, XIX, p. 92). Probably Ogilby's *Colobus rufoniger* (1839, 'Cat. Mamm. Zool. Soc. London,' p. 270), from Sierra Leone, is also identical. Other forms from adjoining parts of Africa are likely to represent only local forms of the *badius* group.

These two Pennantian species were the only ones enumerated by Illiger in 1811 in founding the genus *Colobus*, who cited them as *Simia polycomos* Schreber and *Simia ferruginea* Shaw, on others having been described prior to that date. It is of interest to note that one of them is a representative of the "black" group of the genus, the other of the "red" group. The next species described (*Colobus temminkii* Kuhl, 1820) was from an unknown locality and, while it has never been satisfactorily identified, is evidently a member of the red group.

The first species technically named from West Africa (from Senegambia across Upper Guinea, including the Gaboon, but excluding Lower Congo) dates, as stated, from the year 1780 (*Cebus polykomos* Zimmermann, from "Sierra Leone"). During the following years of the nineteenth century technical names were given to twenty-three other species, of which several have been assigned to synonymy by most recent writers. The last form described from this region is *Piliocolobus preussi* Matschie (1900) from North Cameroon.

The first species technically named from Western Equatorial Africa (the Congo Basin and the Upper Nile drainage south of about latitude 5° N.) dates from the year 1860 (*Colobus angolensis* P. L. Sclater, from northern Angola). The first from eastern Belgian Congo was described

in 1899 (*Colobus foai* Pousargues). Four others were described during the period ending 1901, and twenty-eight more forms during the years 1913 and 1914. In all, there have been forty-two forms (species and subspecies) thus far recorded from Western Equatorial Africa.

The first species technically named from Eastern Africa (Abyssinia through East Africa to Nyasaland) dates from the year 1816 (*Lemur abyssinicus* Oken, from "Abyssinia"). Sixteen other forms from the same region have since been characterized, making seventeen in all, of which six were published during 1912–1913. Of the fifty-nine forms described from East Africa and Western Equatorial Africa together, thirty-five were described since the beginning of 1912, of which number twenty-six were described in 1913 and 1914 by a single author, Paul Matschie of the Berlin Museum.

About eighty-five names have been given to supposed species and subspecies of *Colobus*, this number including ten substitute names needlessly added by early authors, and about the same number of later date now commonly treated as synonyms, thus leaving about sixty practically unchallenged. The status and relationships of the greater part of the species described to date can be satisfactorily determined only by comparative study of large series of specimens from many different localities, in view of the now known wide range of variation due to sex, age, and individualism.

Elliot's 'Review of the Primates' went to press early in 1912, and included none of the forms published after January of that year. In his review of the genus *Colobus* he recognized only thirty forms as valid, and gave to each the status of a full species. His synonymies contain twelve additional names, which are for the most part substitute names given by early authors for personal reasons. Hence the number described since 1912 exceeds the number entitled to serious consideration published prior to that date. It seems highly probable, however, that many of these alleged forms will fail of confirmation when large series of topotypical specimens become available for comparative study. As indicated in a later part of this paper (pp. 456–460) a reaction appears to have already set in as the result of the study of large series of specimens from single localities.

The subjoined schedules of the described forms of *Colobus* are arranged to show, in chronological order, (1) the forms from West Africa, (2) Western Equatorial Africa, and (3) East Africa, with, as far as practicable, a statement of the amount and character of material on which each was originally based, and the type locality or type region as indicated in the original description.

Specific and Subspecific Names Referable to *Colobus* Described from 1780–1919

West Africa

From Senegambia across Upper Guinea, including the Gaboon, but excluding the Lower Congo

1780. *Cebus polykomos* ZIMMERMANN, 'Geogr. Gesch.,' II, p. 202. = "Full-bottom Monkey," Pennant ('Hist. Quadr.,' 1781, p. 197; *ex lit.*). "Sierra Leone," from a specimen in the Leverian Museum.

1783. *Cercopith[ecus] polykomos* ZIMMERMANN, 'Geogr. Gesch.,' III, p. 170. "Der vierfingrige afrikanische Affe, *Cercopith. Polykomos*" = *Cebus polykomos* Zimmermann, idem, 1780, II, p. 202.

"*Simia polycomos* Zimmerm." Schreber's 'Säugthiere,' legend to Plate x *D*.

Plates x *B*, x *C*, x *D*, of Schreber's 'Säugthiere' were issued, according to Sherborn (1891, Proc. Zool. Soc. London, p. 590) with Theil V, Heft. 56, 57, the date of publication for which he gives as probably 1800. Plate x *D* is cited by Shaw in his 'General Zoology,' Volume I, Part 1, p. 59, dated 1800. Hence the date of issue of this plate must have been prior to the year 1800. Wagner (1840, Schreber's 'Säugthiere,' Suppl., I, p. 108) cites Schreber's Plate x *D*, under his *Semnopithecus polycomos*, as follows: "*Simia polycomos*. Schreb. tab. 10. *D* (fig. Penn.)." The plate is a poor copy of Pennant's "Full-bottom Monkey."

It is evident from the above citations of Zimmermann (at 1780 and 1783) that the authority for the current specific name "*polycomos*" is Zimmermann (with the original spelling *polykomos*)[1] and not Schreber, and that Schreber's Plate x *B* could not have been issued prior to 1780 (not in 1775, as usually quoted).

Rochebrune[2] in his highly controversial monograph places the Full-bottom Monkey of Pennant, and all the technical names based on it, in his 'Formes douteuses ou problématiques' (*loc. cit.*, pp. 144–162), substituting in its place *Colobus ursinus* of Ogilby. As he states, and as every author who has considered the subject has doubtless recognized, Pennant's description and figure are obviously faulty, inasmuch as they represent the hair of the body short and the long white hair of the front and sides of the head so lengthened as to extend over the top of the head and nape to the shoulders, "like a full-bottomed perriwig." In other respects it agrees well with the later described *Colobus ursinus*, the species that most closely approaches it in general coloration. The Full-bottom Monkey was based on a specimen in the Museum of Sir Ashton Lever "brought over [from Sierra Leone] by Mr. Smeathman" with a specimen of his Bay Monkey, described on the following page[3] but not figured. There is thus a definite geographic origin and history for the types of both of Pennant's species, although the types themselves were lost in the dispersal of the Leverian collection. It is to be noted that Sierra Leone, the type region of *polykomos* (Full-bottom Monkey) is in the central part of the area of the known distribution of *ursinus*,[4] which was finally also established on a Sierra Leone specimen.[5] Notwithstanding the faults of

[1] Allen, J. A. 1920, Journ. Mammalogy, I, p. 96.
[2] 1887, 'Faune de la Sénégambie,' Suppl. aux Vertébrés, Mamm., fasc. 1, pp. 1–190, Pls. I–XXXIII.
[3] 1781, Pennant, 'Hist. Quadr.,' I, p. 197.
[4] Cf. Pousargues, 1896, 'Étude sur les Mammifères du Congo Français,' Ann. Sci. Nat., Zool., (8), III, pp. 170, 171, map and table of distribution of the forms of *Colobus*.
[5] Cf. Ogilby, 1838, Proc. Zool. Soc. London, p. 61.

Pennant's description and figure, which may have been based on a specimen altered from its natural condition by some native decorator, it seems clear that they must have had as their origin a native skin of the animal later known as *Colobus ursinus* Ogilby, a name antedated by half a century by *Colobus polykomos* (Zimmermann).

1792. *Simia (Cercopithecus) regalis* KERR, 'Anim. Kingd.,' p. 74, No. 61. Based on Pennant's Full-bottom Monkey, from Sierra Leone. = *Simia comosa* Shaw = *Cebus polykomos* Zimmermann.

1792. *Simia (Cercopithecus) badius* KERR, 'Anim. Kingd.,' p. 74, No. 62. = Bay Monkey of Pennant = *Simia ferruginea* Shaw (1800).

1795. *Simia tetradactyla* LINK, 'Beitr. Naturgesch.,' p. 62. Based on Buffon's La Guenon à Camail = Full-bottom Monkey of Pennant. (Citation from Rochebrune.)

1800. *Simia comosa* SHAW, 'Gen. Zool.,' I, pt. 1, p. 59. Based on the "Full-bottom Monkey" of Pennant (1781, 'Hist. Quadr.,' I, p. 197, No. 110, Pl. XXIV). "Inhabits Sierra Leone. This species is figured in Schreber's plates under the name of *Simia Polycomos*, but the figure is not very accurate" (Shaw, *loc. cit.*).

1800. *Simia ferruginea* SHAW, 'Gen. Zool.,' I, pt. 1, p. 59. Based on the "Bay Monkey" of Pennant (1781, 'Hist. Quadr.,' p. 198), from "Sierra Leone." Same as *Simia badius* Kerr.

1806. *Ateles comatus* E. GEOFFROY, Ann. Mus. Hist. Nat., Paris, VII, p. 273. Based on Le Camail of Buffon = Full-bottom Monkey of Pennant.

1812. *Colobus ferruginosus* E. GEOFFROY, Ann. Mus. Hist. Nat., Paris, XIX, p. 92. New name for *Simia ferruginea* Shaw.

1820. *Colobus temminkii* KUHL, 'Beitr. Zool.,' p. 7. Skin only. "Patria?" Elliot (1913, 'Rev. Primates,' III, (1912), p. 121) has suggested Senegambia. He has also given a full description of the type in the Leyden Museum (*loc. cit.*, p. 130).

1834. *Semnopithecus vellerosus* I. GEOFFROY, in Bélanger's 'Voyag. Indes-Orient.,' Mamm., p. 37. A mutilated skin without hands. "Patrie inconnue." By later authors assigned as the Gold Coast.[1]

1835. *Semnopithecus bicolor* WESMAEL, Bull. Acad. Sci. et Belles-Lettres Bruxelles, II, p. 237. "Le *S. bicolor* paraît originaire des côtes d'Afrique." = *Colobus vellerosus* (I. Geoffroy).

1835. *Colobus fuliginosus* OGILBY, Proc. Zool. Soc. London, p. 97. An adult (type) and another, immature specimen from Gambia, received from Mr. Rendall.[2]

1835. *Colobus ursinus* OGILBY, Proc. Zool. Soc. London, p. 98; idem, 1838, p. 61. Two imperfect skins without head or hands. "Algoa Bay." Later redescribed from a complete skin from Sierra Leone.

1837. *Colobus leucomeros* OGILBY, Proc. Zool. Soc. London, p. 69. Skin only. "Africa."

1838. *Colobus rufofuliginus* OGILBY, 'Nat. Hist. Monkeys, Opossums, Lemurs,' Menageries, I, p. 270. Substitute name for the same author's *C. fuliginosus* of earlier date (Ogilby, 1835).

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[1] "Type de l'espèce [*Colobus vellerosus*]. Peau mutilée, faisant partie des collections rapportées du Brésil par M. Delalande en 1816. Elle venait, d'après les renseignements recueillis par lui, de la côte occidentale d'Afrique." (I. Geoffroy, 1851, 'Cat. Méth. Coll. Mamm. Mus. Hist. Nat. Paris, p. 17.)

[2] Elliot (1913, 'Rev. Primates,' III, (1912), p. 134) says: "Type not now in British Museum." In 1851, according to I. Geoffroy (*loc. cit.*, p. 17), the cotype was in the Paris Museum, it having been presented by the Natural History Museum of Lyon.

1838. *Colobus rufoniger* OGILBY, 'Nat. Hist. Monkeys, Opossums, Lemurs,' Menageries, I, p. 273. Type, a flat skin, imperfect, lacking hands and feet, from Sierra Leone.

1838. *Colobus verus* VAN BENEDEN, Bull. Acad. Sci. et Belles-Lettres Bruxelles, V, p. 347, Pl. opp. p. 344 (animal). Skin and skull. "Afrique." Range, as assigned by later authors, Liberia to Ashanti.

1838. *Colobus pennantii* WATERHOUSE, Proc. Zool. Soc. London, p. 57. Two imperfect skins. "Island of Fernando Po."

1838. *Colobus satanas* WATERHOUSE, Proc. Zool. Soc. London, p. 58. Three imperfect skins, without hands or feet. "Island of Fernando Po."

1840. *Semnopithecus (Colobus) olivaceus* WAGNER, Schreber's 'Säugthiere,' Suppl., I, p. 309. Substitute name for *Colobus verus* Van Beneden.

1857. *Semnopithecus anthracinus* LE CONTE, Proc. Ac. Nat. Sci. Philadelphia, IX, p. 10. A skin from the Gaboon, from Du Chaillu's Collection. = *Colobus satanas* Waterhouse.

1866. *Colobus cristatus* GRAY, Ann. Mag. Nat. Hist., (3) XVII, p. 77; 1868, Proc. Zool. Soc. London, p. 182, Pl. XV (animal to the rear). "West Africa." Later admitted by Gray (1870, 'Cat. Monkeys, Lemurs and Fruit-eating Bats,' p. 128) to be the same as *Colobus verus* Van Beneden.

1887. *Piliocolobus bouvieri* ROCHEBRUNE, 'Faune de la Sénégambie,' Suppl. aux Vertébrés, fasc. 1, p. 108, Pl. IV (animal). "Gambia." Figure from a photograph taken by M. Thollon, "attaché à la mission Brazza." "Plusiers exemplaires, du même type, proviennent de l'expédition Brazza." Positively referred by Pousargues (1896, Ann. Sci. Nat., Zool., (8) I, p. 263; and idem, 1896, (8) III, pp. 157, 160) to *Colobus pennantii*.

1900. *Piliocolobus preussi* MATSCHIE, Sitzungsb. Ges. Naturf. Fr. Berlin, p. 183. Skin only, from "Barombi am Elefanten-See in Nord-Kamerun."

Western Equatorial Africa

Congo Basin and Upper Nile Drainages south of about 5° N.

1860. *Colobus angolensis* P. L. SCLATER, Proc. Zool. Soc. London, p. 245. Skin, without skull, feet or face. Near Bembe, North Angola.

1886. *Colobus tholloni* RIVIÈRE,[1] Rev. Scient., (3) XII, p. 15. Female[2] skin with skull. Lower Congo. No definite locality indicated. Rochebrune (1887, 'Faune de la Sénégambie,' Suppl. aux Vertébrés, fasc. 1, p. 110) gives several localities of its occurrence, from the junction of the Kasai River with the Congo to the mouth of the latter (cf. *infra*, p. 443).

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[1] *Colobus tholloni* is universally ascribed to A. Milne-Edwards. The first reference to this name that I have been able to find is in an article by E. Rivière entitled: "Exposition de la mission Brazza au Muséum," published in Revue Scientifique, Série 3e, 23e année, 2e semestre, No. 1, 3 Juillet 1886, pp. 13–23, where (p. 15) Rivière mentions "les colobes," of which he says four species are known at the Mission, "l'une d'elles est absolument nouvelle." He states that two of them "sont de couleur rousse," one of them being known as "*Colobus ferrugineus* ou *Pennanti* (Ogilby); le second est d'espèce nouvelle: il a été désigné par M. Milne Edwards sous le nom de *Colobus Tholloni;* il resemble au précédent par ses teintes générales, mais il est facile de l'en distinguer à cause du développement que prennent les poils de la région postérieure du corps, qui audessous de la queue, forment une sorte de panache." This is doubtless the first published description of the species and the first publication of the name *Colobus tholloni*, which Milne-Edwards had probably employed as a manuscript name for specimens in the Paris Museum. Therefore, according to present usage, the authority for the name *Colobus tholloni* is Rivière (*Colobus tholloni* Rivière, ex Milne-Edwards Ms.).

[2] Pousargues (1899, Bull. Mus. Hist. Nat., Paris, V, p. 279, footnote) says the two known specimens are females, the type being indicated as a male in error.

1887. *Guereza occidentalis* ROCHEBRUNE, 'Faune de la Sénégambie,' Suppl. aux Vertébrés, fasc. 1, p. 140, Pl. XIII (animal). Noki, near mouth of Congo.

1899. *Colobus foai* POUSARGUES, Bull. Mus. Hist. Nat., Paris, V, p. 278. An imperfect skin, without hands, feet, or skull. Ouroua country, west of Lake Tanganyika, Belgian Congo. [1]

1899. *Colobus matschiei* NEUMANN, Sitzungsb. Ges. Naturf. Fr. Berlin, January, p. 15. Skin with skull. Kavirondo, Ugowe Bay, Lake Victoria.

1901. *Colobus ruwenzorii* THOMAS, Proc. Zool. Soc. London, II, May 7, p. 85. Skin only. Buamba Country, northwest slope of Mt. Ruwenzori, Belgian Congo.

1905. *Colobus palliatus cottoni* LYDEKKER, Ann. Mag. Nat. Hist., (7) XVI, October, p. 432. Skin with skull. Zokwa, between Mahagi and Irumu, headwaters of the Ituri River, west of Lake Albert Edward, Belgian Congo. Not "Qugo," a misprint for Zokwa (cf. Matschie, 1913, Rev. Zool. Africaine, II, p. 204).

1906. *Colobus nigrimanus* TROUESSART, Bull. Mus. Hist. Nat., Paris, XII, p. 444. Liranga, left bank of the Congo, Equatorial French Congo.

1906. *Colobus oustaleti* TROUESSART, Bull. Mus. Hist. Nat., Paris, XII, p. 443. Skin with skull. Youmba country, Oubangui, Belgian Congo.

1907. *Colobus tephrosceles* ELLIOT, Ann. Mag. Nat. Hist., (7) XX, September, p. 195. Three specimens, one adult (type) and two immature. Ruahara River, Toro (east side of Mt. Ruwenzori, altitude 4000 feet), Uganda.

1908. *Colobus angolensis sandbergi* LÖNNBERG, Arkiv för Zool., IV, No. 15, April 28, p. 1, text-fig. 1. Skin only, hands and face missing. Near Lufizi River, tributary of Zambezi River, Portuguese Angola.

1909. *Colobus graueri* DOLLMAN, Ann. Mag. Nat. Hist., (8) IV, November, p. 474. Adult male, skin with skull (type), and an immature male. Wabembeland, 80 kilometers west of the north end of Lake Tanganyika, Belgian Congo.

1909. *Colobus ellioti* DOLLMAN, Ann. Mag. Nat. Hist., (8) IV, November, p. 475. Skin only. Ninety kilometers west of the south end of Lake Albert Edward, Belgian Congo. (Probably near Oso River.)

1913. *Colobus (Guereza) matschiei uellensis* MATSCHIE, Ann. Soc. Zool. Malacol. Belgique, XLVII, (1912), August, p. 47. Skin and skull. "Uelle," Belgian Congo.

1913. *Colobus (Guereza) matschiei iturícus* MATSCHIE, Ann. Soc. Zool. Malacol. Belgique, XLVII, (1912), August, p. 48. Type, adult male skin with skull. "Ituri." Also half a dozen other skins, mostly from Irumu and Mawambi, Ituri Forest, Belgian Congo.

1913. *Colobus (Colobus) palliatus weynsi* MATSCHIE, Rev. Zool. Africaine, II, February, p. 207. "Unterer Congo." According to Lönnberg, District of Lake Leopold II (*loc. cit.*, 1919, VII, p. 116).

1913. *Colobus (Guereza) matschiei dianæ* MATSCHIE, Ann. Soc. Zool. Malacol. Belgique, XLVII, (1912), August, p. 49. Type, adult male, skin with skull from Kissenge; and eleven other specimens from Kissenge and Sassa River, east side of Lake Albert Edward.

1913. *Colobus (Colobus) palliatus mawambicus* MATSCHIE, Rev. Zool. Africaine, II, February, p. 205. Type, a young male, mounted, skull separate, No. 766, Ter-

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[1] Matschie (1900, Sitzungsb. Ges. Naturf. Fr. Berlin, p. 189) gives: "Urua, zwischen dem Tanganyika und den oberen Congo-Zuflüssen."

vueren Museum, Powell-Cotton Coll. Also three other specimens. Type locality, "Bei Nord Pemba, zwischen Irumu und Mawambi am oberen Ituri."

1913. *Colobus (Guereza) matschiei dodingæ* MATSCHIE, Ann. Soc. Zool. Malacol. Belgique, XLVII, (1912), August, p. 52. Type, adult male, with six other specimens from Dodinga Mts. (33° 42′ E. L., 4° 10′ N. L.), altitude 5650 feet; three others from southwest of Tarangole, northeast of Dufile.

1913. *Colobus (Guereza) matschiei brachychaites* MATSCHIE, Ann. Soc. Zool. Malacol. Belgique, XLVII, (1912), August, p. 53. Five specimens from between Kaya and Dufile, Lado Enclave. Altitude 2000 feet.

1913. *Colobus (Piliocolobus) lovizettii* MATSCHIE, Rev. Zool. Africaine, II, February, p. 207. Two mounted skins with skulls. Type, semi-adult female, the other an adult female. Kutu, Lake Leopold II, Belgian Congo.

1913. *Colobus (Piliocolobus) powelli* MATSCHIE, Ann. Soc. Zool. Malacol. Belgique, XLVII, (1912), August, p. 61. Type, adult male, and six other specimens, skins with skulls. Zokwa, between Mahagi and Irumu, west of Lake Albert, Belgian Congo.

1913. *Colobus abyssinicus terrestris* HELLER, Smithsonian Misc. Coll., LXI, No. 17, October 21, p. 7. Type, and only specimen, an adult female. Rhino Camp, Lado Enclave.

1914. *Colobus langheldi* MATSCHIE, Sitzungsb. Ges. Naturf. Fr. Berlin, July, p. 337. Type, male, skin only. Native skin from Manyema country, west of Lake Tanganyika, Belgian Congo. (Skin bought from a caravan stopping at Ujiji.)

1914. *Colobus adolfi-friederici* MATSCHIE, Sitzungsb. Ges. Naturf. Fr. Berlin, July, p. 337. Type, adult male, skin with skull. Rugege forest, east of Lake Kivu.

1914. *Colobus benamakimæ* MATSCHIE, Sitzungsb. Ges. Naturf. Fr. Berlin, July, p. 337. Type, adult male, skin only. Bena Makima, Sankuru River, Belgian Congo.

1914. *Piliocolobus kabambarei* MATSCHIE, Sitzungsb. Ges. Naturf. Fr. Berlin, July, p. 338. Type, adult female, skin with skull. Near Kabambare, between Baraka and Kasongo on the Lualaba River, northwest of Lake Tanganyika, Belgian Congo.

1914. *Piliocolobus lulindicus* MATSCHIE, Sitzungsb. Ges. Naturf. Fr. Berlin, July, p. 338. Type, adult female, skin and skull. Lulindi River, near Kasongo, Belgian Congo.

1914. *Piliocolobus anzeliusi* MATSCHIE, Sitzungsb. Ges. Naturf. Fr. Berlin, July, p. 339. Type, adult male, skin with skull. Upper Ituri River, Belgian Congo.

1914. *Piliocolobus ellioti melanochir* MATSCHIE, Sitzungsb. Ges. Naturf. Fr. Berlin, July, p. 339. Type, male, skin with skull. Between Beni and Irumu, upper Irumu River, Belgian Congo.

1914. *Tropicolobus gudoviusi* MATSCHIE, Sitzungsb. Ges. Naturf. Fr. Berlin, July, p. 340. Type, adult male, skin only. Between Ussuwi and Ihangiro, west of Lake Victoria, German East Africa.

1914. *Colobus (Guereza) escherichi* MATSCHIE, Sitzungsb. Ges. Naturf. Fr. Berlin, July, p. 342. Adult male, skin with skull, from Gombe, on the Sanga River between Ikelemba and Knick, French Congo.

1914. *Colobus (Tropicolobus) umbrinus* MATSCHIE, Sitzungsb. Ges. Naturf. Fr. Berlin, July, p. 343. Two adult male skins with skulls, from Bungi, on the Sanga River between Wesso and Ikelemba, French Congo.

1914. *Colobus (Tropicolobus) schubotzi* MATSCHIE, Sitzungsb. Ges. Naturf. Fr. Berlin, July, p. 345 (in text). Skin only. Near Koloka, between the Likati and Bima Rivers, Belgian Congo.

1914. *Colobus (Piliocolobus) likualæ* MATSCHIE, Sitzungsb. Ges. Naturf. Fr. Berlin, July, p. 346. Adult female (type) and immature female, skins with skulls, from Sanga River, opposite the mouth of the Likuala River, French Congo.

1914. *Colobus mawambicus nahani* MATSCHIE, Sitzungsb. Ges. Naturf. Fr. Berlin, July, p. 335. Type, adult female, Panga, Aruwimi River, Belgian Congo.

1914. *Colobus maniemæ* MATSCHIE, Sitzungsb. Ges. Naturf. Fr. Berlin, July, p. 336. Type, adult male, skin with skull. Between Kibombo and Pienimulamba, Luala River, Belgian Congo.

1914. *Colobus occidentalis ituricus* LORENZ, Anz. Ak. Wiss. Wien, Math.-Nat. Kl., LI, November, p. 508. No type designated. Based on nine specimens, four males, four females, and one young male, collected by Grauer, at the eastern edge of the forest near Mawambi, Belgian Congo.

1914. *Colobus [Tropicolobus] multicolor* LORENZ, Anz. Ak. Wiss. Wien, Math.-Nat. Kl., LI, July, p. 385. "Ein einzelnes Exemplar, bei Mawambi am Ituri erbeutet." Referred to the subgenus *Tropicolobus*.

1914. *Colobus [Tropicolobus] variabilis* LORENZ, Anz. Ak. Wiss. Wien, Math.-Nat. Kl., LI, July, p. 383. No type designated. Based on a series of over 30 specimens from the "Gebiete des Ituri-Urwaldes," collected by Grauer. Referred to the subgenus *Tropicolobus*.

1914. *Colobus occidentalis rutschuricus* LORENZ, Anz. Ak. Wiss. Wien, Math.-Nat. Kl., LI, November, p. 508. Based on a female from "Sassaflusse, am nordöstlichen Rande der Rutschuruebene (südöstlich vom Albert-Edwardsee)."

1919. *Colobus (Piliocolobus) brunneus* LÖNNBERG, Rev. Zool. Africaine, VII, October, p. 112. Four specimens from three localities; type from Sili, Upper Uele, Belgian Congo.

East Africa

Abyssinia through East Africa to Nyasaland

1816. *L[emur] abyssinicus* OKEN, 'Lehrb. Naturgesch.,' Th. III, Abth. 2, p. 1182. Abyssinia.

1835. *Colobus guereza* RÜPPELL, 'Neue Wirbelth.,' Säug., p. 1, Pl. I (animal). South and west Abyssinia ("Provinzen Godjam and Kulla").

1868. *Colobus kirki* GRAY, Proc. Zool. Soc. London, p. 180, Pl. XV (animal). One specimen, subadult. Zanzibar.

1868. *Colobus palliatus* PETERS, Monatsb. Ak. Wiss. Berlin, p. 637; idem, 1879, p. 830, Pl. IV (animal). Two subadult males. East coast of Africa near Zanzibar.

1870. *Guereza rüppellii* GRAY, 'Cat. Monkeys, Lemurs, and Fruit-eating Bats,' p. 19. *Colobus guereza* Rüppell renamed.

1879. *Colobus rufomitratus* PETERS, Monatsb. Ak. Wiss. Berlin, p. 829, Pls. IA, II (animal and skull). Muniuni, Tana River, British East Africa.

1885. *Colobus guereza caudatus* THOMAS, Proc. Zool. Soc. London, p. 219, Pl. XII (animal). One specimen, Useri, northeast flank of Mt. Kilimanjaro at 3000 feet, German East Africa.

1900. *Colobus abyssinicus poliurus* THOMAS, Proc. Zool. Soc. London, November, p. 800; idem, 1902, II, p. 308. Several specimens, besides some native skins. Omo River, north of Lake Rudolf, Abyssinia.

1900. *Piliocolobus gordonorum* MATSCHIE, Sitzungsb. Ges. Naturf. Fr. Berlin, p. 186. A mutilated skin, without head, feet, tail, or skull. Udschungwe Mts., Uhehe, German East Africa.

1902. *Colobus gallarum* NEUMANN, Sitzungsb. Ges. Naturf. Fr. Berlin, March, p. 49. Mountains near source of Webbi Shebeli, near Harar, Abyssinia.

1902. *Colobus sharpei* THOMAS, Proc. Zool. Soc. London, I, February 18, p. 118. Type, old female skin with skull. Fort Hill, Nyasa-Tanganyika Plateau, northern Nyasaland.

1912. *Colobus abyssinicus kikuyuensis* LÖNNBERG, Ann. Mag. Nat. Hist., (8) IX, January, p. 63. Escarpment Station, British East Africa.

1913. *Colobus (Guereza) poliurus managaschæ* MATSCHIE, Ann. Soc. Zool. Malacol. Belgique, XLVII, (1912), August, p. 54. Three skins with skulls. Managascha forest, west of Addis Abbeba, Abyssinia.

1913. *Colobus (Guereza) caudatus thikæ* MATSCHIE, Ann. Soc. Zool. Malacol. Belgique, XLVII, (1912), August, p. 56. Five adult skins with skulls. West slope of Mt. Kenia, at an altitude of about 7500 feet. British East Africa.

1913. *Colobus (Guereza) caudatus laticeps* MATSCHIE, Ann. Soc. Zool. Malacol. Belgique, XLVII, (1912), August, p. 57. Skin with skull. West slope of Mt. Kenia, altitude 7400 feet. (Taken at same time and place as one of the paratypes of *Colobus caudatus thikæ*.)

1913. *Colobus abyssinicus roosevelti* HELLER, Smithsonian Misc. Coll., LXI, No. 17, October 21, p. 5. Type, adult male, skin with skull, and three other specimens. Mau forest, near Enjoro, British East Africa.

1913. *Colobus abyssinicus percivali* HELLER, Smithsonian Misc. Coll., LXI, No. 17, October 21, p. 6. Type, adult male, skin with skull, and another adult male. Mount Uaragess, British East Africa.

Colobus tholloni Rivière[1]

Colobus tholloni RIVIÈRE (*ex* A. Milne-Edwards Ms.), 1886, Rev. Scient., (3) XII, July, p. 15. Two females, adult and semiadult, skins with skulls. Left bank of Congo, opposite Brazzaville.

Piliocolobus tholloni ROCHEBRUNE, 1887, 'Faune de la Sénégambie,' Suppl. aux Vertébrés, Mamm., fasc. 1, p. 110, Pl. v (animal).

Colobus tholloni POUSARGUES, 1896, Ann. Sci. Nat., Zool., (8) III, pp. 150–156, 167; 1899, Bull. Mus. Hist. Nat., Paris, V, p. 279. Type stated to have been a semiadult female, not a male as had been previously stated.

Represented by four specimens collected as follows:

Lukolela, 2 (♀ adult, ♀ juvenile, skins with skulls), December 17, 1909.

Bolobo, 2 (♀ adult—skull only, ♂ juvenile—skin with skull), July 16, 1909.

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[1]Cf. footnote p. 437.

These specimens agree closely with the descriptions given in detail by Rochebrune and by Pousargues (*loc. cit.*). The adult female from Bolobo is represented by only the skull, the collectors being unable to obtain the skin, but measurements were secured from the animal in the flesh. The young male from the same locality, of which skin and skull were both obtained, is very young (with the complete milk dentition only), but agrees in coloration with the adult from Lukolela, leaving no doubt as to its determination. One of the two females from Lukolela is an old adult with greatly worn teeth, ankylosed cranial sutures and a strongly developed sagittal crest; the other is much younger, the permanent canine being only partly up, and the last molar of the permanent series just breaking through the alveolus. Both specimens are represented by skin and skull. The distribution of the color areas is the same in both, but in the older specimen the tones are more intense than in the subadult.

ADULT PELAGE.—In the old female from Lukolela the upperparts are deep dark red, darkening to black suffused with reddish on head and neck, and extending thence posteriorly to the middorsal region as a broad blackish diffused band, leaving the lower back, sides of body, outside of limbs and basal half of tail deep red; a frontal band of long, intensely black, bristly hairs is continued on either side of the head, covering the lower part of the ears and forming conspicuous superciliary bands; apical two-thirds of upper surface of hands and feet are darkened to brownish black, toned with purplish; the tail gradually darkening apically to a purplish black tip. Ventral surface and inside of thighs are so thinly haired that in places the skin is nearly naked; the hairs that remain are yellowish or grayish white. In the immature specimens these parts are covered with a short silky fur, which is nearly white on the throat, thoracic region, and inside of upper arms and thighs.

The tufts of long, purplish-red hairs at each side of the base of the tail are thinly developed, in comparison with the heavy, curved, drooping tufts shown in Rochebrune's plate; these tufts are heavier in the younger specimens than in the old adult, reaching a length of about 110 mm.; in the latter they are not especially noticeable and have an abraded appearance, although the longest hairs attain a length of 75 to 80 mm.[1]

Collectors' measurements of the adult female from Lukolela: Total length, 1270 mm.; head and body, 580; tail vertebræ, 690; hind foot, 170; ear, 35. Adult female from Bolobo: Total length, 1012; head and body, 600; tail vertebræ, 412; hind foot, 150.

[1]These tufts are found in other members of the red *Colobus* group, as mentioned later (p. 452) under *Colobus powelli powelli*.

The cranial measurements of the two adult skulls, both females, are as follows: Greatest length, Bolobo 103.0, Lukolela 105.5; condylobasal length, B. 82.3, L. 87.0; occipitonasal length, B. 82.3, L. 86.4; zygomatic breadth, B. 71.5, L. 74.2; interorbital breadth, B. 10.0, L. 10.0; postorbital constr., B. 39.2, L. 41.0; breadth braincase, B. 54.5, L. 56.7; mastoid breadth, B. 54.0, L. 60.5; upper toothrow (c-m^3), B. 37.0, L. 38.5; upper molars, B. 21.0, L. 21.6; condition of teeth, B. not worn, L. greatly worn.

DISTRIBUTION.—No definite type locality nor type is indicated for the species in the original description. Elliot gives the type locality simply as "Congo." Rochebrune gives "Région du Congo, d'où les exemplaires du Muséum ont été rapportés par M. Thollon, voyageur attaché à la mission Brazza." The localities specified are "Nokki, Kissango, Makoko, Loango." Pousargues (*loc. cit.*, 1896, p. 150) has recorded a specimen (adult female) from "Rive gauche du Congo, près Brazzaville, 1890," received from M. Thollon. Bolobo and Lukolela, where the present specimens were taken, are respectively about 160 and 260 miles north of Brazzaville on the left bank of the Congo, and only 60 and 160 miles from Makoko.

Colobus langi, new species

Plates CII, CIII

Type, No. 52290, old ♂. Cotypes, No. 52291, adult ♀, and No. 52292, subadult ♂. All collected at Risimu, between Stanleyville and Bafwaboli, Belgian Congo, September 8, 1909; Herbert Lang and James P. Chapin. American Museum Congo Expedition. Orig. No. of type, 19.

A small sized *Colobus* of the *C. ellioti* group, with head conspicuously crested.

Type: A narrow black frontal band passing backward over the eyes, the tips of the long hairs reaching beyond base of ears. Top of head, cheeks, nape, shoulders, and fore limbs (including hands) dark maroon; rest of upperparts, and hind limbs (including feet) dark sepia washed with black; tail from near base to tip black; foreneck and pectoral area reddish fawn; rest of underparts slate gray, lighter on inside of thighs and inguinal areas. The transition in color, both above and below, from maroon on the anterior half to dark sepia on the posterior half is abrupt and extends to the roots of the hairs.

In the subadult male and in the adult female the coloration and the color areas are as in the old male (type), except that the tones are less intense. In the skull of the type (Pls. CII,CIII) the teeth are greatly worn, all the cranial sutures are ankylosed, and the sagittal crest is well developed. The subadult male has the permanent dentition fully developed except that the canines are not fully grown. The female is a middle-aged adult.

The collectors' measurements of the three specimens are as follows:

Cat. No.	Sex and Age	Total Length	Head and Body	Tail Vertebræ	Hind Foot
[1]52290	♂ old adult	1165	500	665	170
52292	♂ juvenile	1080	470	610	165
52291	♀ adult	1135	485	650	170

The cranial measurements of the same three specimens are as follows:

	Greatest Length	Condylobasal Length	Occipitonasal Length	Zygomatic Breadth	Interorb. Breadth
♂	105.8	80.5	88.2	81.0	10.3
♂ juv.	93.2	72.7	78.6	65.8	7.4
♀	95.6	75.5	83.0	70.8	9.3

	Postorb. Constr.	Breadth Braincase	Mastoid Breadth	Upper Toothrow	Upper Molars
♂	40.0	63.3	63.4	35.5	20.0
♂ juv.	36.4	51.2	52.2	34.0	19.2
♀	40.0	52.0	55.6	32.0	19.0

Colobus langi is readily distinguished from all other members of the *Tropicolobus* group (of Elliot's 'Rev. Primates') thus far described by its small size and the unique fore-and-aft distribution of the color areas and especially the abrupt transition from the deep reddish (maroon) of the anterior half of the body and fore limbs to the dark sepia of the posterior half and hind limbs.

Colobus ellioti Dollman

Colobus ellioti DOLLMAN, 1909, Ann. Mag. Nat. Hist., (8) IV, November, pp. 475–476. Type, adult male, skin only, collected by R. Grauer, 90 kilometres west of the south end of Lake Albert Edward.

Represented by one specimen, skin with skull, adult female (No. 52286), Avakubi, June 23, 1914.

There is no doubt whatever that this specimen is referable to *Colobus ellioti* Dollman, the type locality of which is about 150 miles south of Avakubi. In coloration it so closely agrees with Dollman's very careful description of the type that the present Avakubi specimen might have served as the basis of the description. Another specimen taken the same day at the same locality, also an adult female, is entirely different from it in coloration and represents an average specimen of the *Colobus* of the Akenge-Niapu district, of which there are thirty-nine adult specimens. The *ellioti* specimen is the only one with red cheeks, red throat and red

[1]Type.

chest in the American Museum's Akenge-Niapu-Faradje series of eighty-five specimens.

There are unfortunately no field measurements of this specimen. Measurements from the skin are as follows: Total length, 1285 mm.; head and body, 700; tail, about 585; or a little less than the measurements of the male type, also from a skin. The skull measures: Greatest length, 102.0; condylobasal length, 85.1; occipitonasal length, 83.5; zygomatic breadth, 74.7; orbital breadth, 61.5; interorbital breadth, 10.2; postorbital constriction, 40.5; breadth of braincase, 57.5; mastoid breadth, 60.2; upper toothrow (c-m^3), 35.7; upper molars, 20.7.

Colobus powelli powelli Matschie

Plates CIV; CV, Figure 1; CXII–CXXI

Colobus (*Piliocolobus*) *powelli* Matschie, 1913, Ann. Soc. Zool. Malacol. Belgique, XLVII, (1912), pp. 61–64. (Date of publication of fascicule 2, in which Matschie's paper appeared, as given on the wrapper, "Août 1913.") Type, adult male, skin with skull. "Am 13. Juni 1905 bei Zokwa in einer Höhe von 5350 F. auf der Strasse zwischen Mahagi und Irumu, westlich vom Albert-See im Gebiete der Zuflüsse des oberen Ituri von Herrn Major Powell-Cotton erlegt." Also six other specimens collected at the same date and place.

Represented by 43 specimens accompanied by 3 skeletons collected as follows:

Abawe, 2 (adult ♂, adult ♀), September 23, 1913.

Akenge, 27 (all adult but 2, sexes about equally represented), September 26–October 30, 1913.

Niapu, 8 (5 ♂, 3 ♀, all but one adult), November 20–December 2, 1913.

Medje, 1 (adult ♂, skull only), July 20, 1914.

Gamangui, 3 (3 ♂, 2 adult, 1 juvenile), February 14–16, 1910.

Bafwabaka, 1 (adult ♂), July 27, 1914.

Avakubi, 1 (adult ♀), August 1914.

The external measurements—average (minimum-maximum)—of twenty-nine adults of *Colobus powelli powelli*, taken from animals in the flesh, are as follows:

	Total Length	Head and Body	Tail Vertebræ	Hind Foot	Ear
17 ♂	1262(1140–1351)	540(455–590)	726(650–800)	186(170–198)	39(35–42)
12 ♀	1235(1150–1340)	524(480–565)	713(645–790)	182(170–202)	37(35–40)

The cranial measurements—average (minimum-maximum)—of twenty-three adults of *Colobus powelli powelli* are as follows:

	Greatest Length	Condylobasal Length	Occipitonasal Length	Zygomatic Breadth
13 ♂	113.2(105.1–128.0)	91.5(86.2–97.9)	93.4(87.7–107.6)	85.6(77.4–96.7)
10 ♀	103.0(95.5–109.7)	81.3(77.3–89.7)	85.7(79.5– 91.3)	75.7(71.7–78.6)

	Orbital Breadth	Interorb. Breadth	Postorb. Constr.	Braincase Breadth
13 ♂	67.6(63.3–77.4)	9.8(9.1–10.7)	42.9(39.7–49.7)	60.4(54.5–69.4)
10 ♀	62.0(56.7–67.2)	9.8(8.4–10.7)	41.1(39.7–43.0)	58.0(55.6–60.4)
	Mastoid Breadth	Upper Toothrow (c–m^3)	Upper Molars	
13 ♂	65.5(60.0–69.8)	40.3(38.0–44.0)	21.5(19.6–25.0)	
10 ♀	61.1(59.2–64.1)	35.9(34.2–38.0)	21.0(20.1–21.9)	

These forty-three specimens were all collected in a small area extending from Avakubi north to Akenge, a distance of about 100 miles, and from Niapu east to Bafwabaka, a distance of about 70 miles, in a region of uniform environment. They present an extremely wide range of color variation, mainly individual but due in part to sex and age. Only three or four of them are in first pelage. They are all referable to a single subspecific group.

The American Museum Congo collection of the *powelli* type (as here recognized) comprises altogether 85 comparable specimens of skins and skulls, of which about 75 are adult, the others immature. Two environmental areas are represented, the heavy rain forest, and the forest galleries of the bush-veldt or "savannah" region. The first includes 43 specimens, of which 29 are from Akenge and vicinity, 8 from Niapu, and 6 from Gamangui and neighboring points; the second includes 42 specimens of which 40 are from Faradje and 2 from Bafuka. Although the range of individual variation is enormous, these specimens when laid out by localities for direct comparison as geographic series, clearly demonstrate the presence of two forms, those from the forest galleries of the veldt country being much paler and duller colored than those from the heavy rain forest; the colors, while varying more or less with each individual, are of a much duller tone and far less intense and lustrous in the Faradje series than in the Akenge-Niapu series. The five specimens from the Gamangui-Bafwabaka district are the richest and most intensely colored of all, leading to the conjecture that the animals from the Aruwimi drainage may prove racially separable from those of the upper Rubi and upper Poko districts. In the present uncertainty respecting the names they should receive, (i.e., whether any of those already proposed would be applicable), it seems preferable to refer, at least tentatively, all of the rain forest specimens to a single form (*powelli s.s.*). For the more northern form Lönnberg's *Colobus brunneus* seems applicable, though not in as comprehensive a sense as is implied by the original description (see below, p. 453). The distribution of the light and dark color areas is the same in both forms, and the individual variation in color tones is of the

same irregular character. The fact that the two series were taken at nearly the same time of year (the Niapu and Faradje series mainly in the month of November and the Akenge series in October) is evidence that the difference is not seasonal.

The external and cranial measurements (pp. 445–446) are based exclusively on fully adult specimens, in which the permanent dentition is fully developed. Respecting the presence or absence of a sagittal crest in males it is of interest to note that the development of this crest begins earlier in some individuals than in others, some of the younger males in which the teeth are very little worn having the sagittal crest as strongly developed as other males which have all the marks of old age. Neither is size, in either sex, always correlated with age, the largest in either external or cranial measurements being by no means the oldest of the series taken at the same locality.

Sexual Variation.—Males average about ten per cent. larger than females, on the basis of the greatest length and the zygomatic breadth of skull. The largest females of a series (usually old adults) rarely equal the smallest males (usually young adults). In addition to the difference in general size is the much greater sexual difference in the development of the canines, which in old males are several times larger than in females of corresponding age.

There is also considerable sexual difference in coloration, the males being as a rule more richly colored than the females, but there are many exceptions, coloration alone being an unsafe indicator of sex, but by aid of certain pelage distinctions, combined with the age of the individual, a pretty safe decision can usually be made. There is much less difference between young males and females than when both are middle-aged or old. Females often have the ear-tufts less developed than males, and also the bunches of long hair at the front border of the shoulder and proximal part of the upper arm, which are usually much heavier in old males than in old females or than in young males.

Individual Variation in Size.—As shown by the measurements (pp. 445–446) the range of size variation is noteworthy, especially in the skull. The largest and smallest females are both specimens with unworn teeth, representing the youngest of the series of ten specimens. A nearly parallel condition occurs in the males, among which the largest specimens are sometimes much younger (with unworn teeth) than others that are much older (teeth greatly worn).

There are marked discrepancies in cranial measurements in both sexes, but in an exaggerated degree in the males, between the axial and

the transverse dimensions, notably between the orbital and zygomatic breadth in relation to the length of the skull, which sometimes give astonishingly high ratios of variation, much higher in males than in females. In adult males with unworn teeth the variation in the ratio of the zygomatic breadth to the greatest length of the skull runs to 20% or more, and in the ratio of orbital breadth to the greatest length also to 20%. In adult females of the same age class it is only about one-half as great as in males, or about 10%.

INDIVIDUAL VARIATION IN COLORATION.—The variation in color tones in individuals of the same sex and age from the same locality, collected at the same season (usually the same week in the case of the present series) is simply astounding. The variations are not merely in the general tone of the pelage as a whole, but of the same parts in different individuals. Detailed descriptions of some fifteen specimens were at first prepared for the purpose of showing the range of color variation in the large Akenge series (with which the variations in the smaller Niapu series consistently agree), but for this résumé it seems better to take the different areas of the animal separately, as (1) the head, (2) dorsal area, (3) sides of the body, (4) underparts, (5) fore limbs (including hands), (6) hind limbs (including feet), and (7) tail.

1. Head.—A conspicuous feature is the frontal band of rather coarse, lustrous black hair, continued as an "eyebrow band" nearly to or beyond the anterior base of the ears. This varies in width in different individuals and in the length of the hairs, which may not reach to the anterior base of the ears or may extend to beyond their posterior base. Behind the frontal band the whole top of the head and occiput may be of a uniform tone of reddish brown, varying in different individuals from reddish black or dark Indian chestnut[1] to light dull brick red, without black-tipped hairs, or with a few such hairs, or with the prevailing color black to the base of the pelage. The long coarse black hair at the antero-internal base of the ears forms usually a long, thick, conspicuous tuft, considerably exceeding the height of the ears. These tufts vary greatly in length and fulness in different individuals, being sometimes much reduced. Immediately behind the ears is a tuft of long, fine hair, mostly whitish or cream white at base with blackish tips. The sides of the head (or "cheeks") are usually black on the upper third, gradually becoming more whitish on the middle and lower thirds, grizzled with black tips, for the most part gray or silvery gray in general effect. *In no instance in*

[1]The color terms here employed are those of Oberthür and Dauthenay's 'Rèpertoire de Couleurs, 1905.

the present large series are the sides of the head red, or in any degree toned with reddish, as specimens from the eastern border of the Ituri Forest are said to be. Chin and interramal space nearly bare, with whitish or blackish, or mixed whitish and blackish, short scattered hairs.

2. Dorsal Area.—The nape and shoulders are frequently heavily washed with blackish, varying to maroon and chocolate, restricted to the apical fourth or third of the pelage, the basal portion reddish, varying in tone and intensity in different individuals from dark Indian red to dark mineral brown, the basal portion often showing through the surface. The superficial tones of the shoulders grade into the lighter tones of the back and rump, these parts being generally much less dark at the surface than the shoulders and nape. It is impossible to indicate all the variations, as rarely are two specimens alike in either the basal or superficial tones of the pelage. The pelage of the back differs from that of the nape and shoulders in lacking the deep reddish tones at the base; the surface color extending nearly to the roots of the hairs, becoming gradually less intense, changing to smoke gray or even sepia.

In middle-aged and older examples the dorsal pelage, in both sexes, is vermiculated subapically with narrow pale yellowish and black bands, most strongly on the lower back and rump. This feature varies greatly in different individuals of comparable ages.

3. Sides of Body.—Usually the basal tones of the nape and shoulders are the prevailing color of the sides of the body, which is exceedingly variable in different individuals; the general effect is rendered more vivid through the absence of blackish hair-tips. The usual tone varies from pale chamois to reddish salmon.

4. Underparts.—The underparts are less variable than the upperparts, being usually of some shade of pale yellowish, ranging from creamy white to dark cream yellow, with a silky luster. The chief variations are to a lighter tone on the throat and lower abdomen and to gray on the foreneck and chest. In some old males the gray extends over the greater part of the ventral surface from the foreneck to beyond the thoracic area, and ranges in tone in different individuals from light ashy gray to deep mouse-gray. In young males and in the majority of females these gray areas are either absent or feebly developed.

5. Forelimbs.—A long thick pelage like that of the shoulder continues over the basal third or half of the outer surface of the upper arm and, with very little change in color, frequently to the elbow; thence it gradually becomes more restricted in area and intensity to the wrists. The color varies in different individuals with the color of the upperparts.

In most middle-aged and old examples of both sexes, but especially in males, the front edge of the upper arm and shoulder is strongly varied with long grayish-white hair-tips, which are usually absent or only incipiently developed in full-grown young males and in the younger adult females. In some specimens the hair tips are not lighter than the adjoining coloration and the fringe of coarse hair is consequently much less conspicuous. The inside of the fore limbs is well clothed with whitish-tipped hairs of nearly the same color as the lighter portions of the underparts. The hands are usually deep black as far proximally as the pollex, sometimes nearly to the wrist. The extent of the blackish area and its intensity varies widely in different individuals and is always more extended proximally than on the feet.

6. Hind Limbs.—The hind limbs externally, including the thighs, are usually colored like the lower back, and are thus much paler than the fore limbs. The color is often widely different in different individuals of the same sex and age. The inside of the hind limbs is usually grayish white, rather lighter than the general tone of the underparts, with, in many specimens, the inside of the thighs ashy or smoky gray. In highly colored specimens the feet are intense black like the hands, the black extending nearly to the proximal end of the metatarsals. In dull-colored individuals the feet are blackish-brown varied strongly with gray proximally and on the outside.

7. Tail.—The tail may be described in general terms as black or blackish brown above, varied on the sides with light-tipped hairs; median lower surface often much lighter than the upper or sides. The variations in the color of the tail are not closely correlated with those of the limbs and body. In many individuals the proximal three or four inches agree in color with the adjoining part of the back. In others the entire tail is deep black from base to tip. In many others the apical half or two-thirds is black, the rest dull brownish black, or the sides and below lightened with grayish or reddish tipped hairs. In exceptional instances the tail is dull reddish brown throughout; the apical or basal portion only, or both, may be reddish and the mid-portion blackish.

Immature Pelages.—The Akenge series includes two specimens taken when only a few weeks old, and others from Niapu and Faradje illustrate older stages up to and including young adults that have acquired all the permanent teeth but still retain features of immaturity in pelage.

In the youngest specimen (No. 52258, ♂, Akenge) none of the teeth had broken through the gum. Greatest length of skull, 57.3 mm.; condylobasal length, 36.2; occipitonasal length, 55.3; length of brain-

case, 56.2; breadth of braincase, 44.2. (There are no field measurements.) Sides and whole upper surface of head black, the hairs of the front and sides minutely tipped with white; a broad median dorsal area from occiput to behind shoulders black, the hairs of the nape almost imperceptibly tipped with white; rest of the upperparts, from shoulders to proximal fifth of tail gray, the pelage blackish at base with long white tips; underparts thinly clothed with short, soft, creamy white hairs; inside of limbs like underside of body; outside of limbs grizzled dark brown and white, the hairs dark basally with long white tips; tail above like outside of limbs; tail below like inside of limbs and ventral area.

In the next (No. 52274, ♀, Akenge), a few days older, the lower incisors are half up and the two middle upper incisors have pierced the gums. Greatest length of skull, 62.0; condylobasal length, 37.6; occipitonasal, 59.7; length of braincase, 41.1; breadth of braincese, 46.7. Field measurements: Total length, 440; head and body, 200; tail vertebræ, 240; hind foot, 73. In this specimen the pelage is much longer on the upperparts but the underparts are nearly naked. The color pattern is the same as in the preceding (No. 52258) but the tones are much different. What is the blackish area in the other (head, nape and median foreback) is reddish brown in this specimen and extends medially to the sacral region; pelage of sides and rump dark brown basally, frosted with minute white tips, longer on lower back and thighs. Limbs and tail nearly as in No. 52258 but hair much longer.

A third specimen (No. 52328, ♀, Faradje) is still older, the milk incisors and the first tooth of the premolar series being nearly full-grown. Greatest length of skull, 65.2; condylobasal, 44.4; occipitonasal, 54.3; length of braincase, 61.0; breadth of braincase, 49.8. Field measurements: Total length, 505; head and body, 219; tail vertebræ, 286; hind foot, 89. Similar in color pattern to No. 52374, but pelage longer and color tones paler, the head, nape and foreback nearer hair brown, the basal portion of the pelage near cinnamon drab; base of hairs on outside of fore limbs and upper surface of tail also much lighter; outside of hind limbs pale yellowish white, darkening at base to about smoke-gray.

The next specimen in the series (No. 52309, ♀, Faradje) is much older, but lacks skull and field measurements. It still retains some of the first pelage, but the greater part has been renewed. It differs only slightly in the general character of the pelage from Nos. 52314 and 52318, next to be described, but the coloration of the dark parts is decidedly darker.

No. 52314, ♂, Faradje, is in second pelage, which is long and soft. Greatest length of skull, 76.0; condylobasal length, 53.4; occipitonasal

length, 71.9; length of braincase, 64.2; breadth of braincase, 53.4. (No field measurements.) Mature milk dentition; crown of first permanent molar in both jaws above alveoli. A narrow black eyebrow band. Top of head, nape and shoulders dark raw umber (tone 4), much paler on lower back and upper surface of proximal two-thirds of tail; outside of fore limbs snuff-brown; outside of hind limbs of same general color but much lighter; underparts, inside of fore and hind limbs and underside of tail pale yellowish white or light putty color with a smoke-gray tinge on foreneck and chest.

No. 52318, Faradje. (No field measurements, and sex not indicated.) Head (except crown), nape and foreback light raw umber (tone 2; crown, tone 1); outside of fore and hind limbs (including hands and feet) dark putty color, but hind limbs a lighter tone than fore limbs; tail above and on sides light snuff-brown (tone 1); underparts, inside of limbs and underside of tail light chamois (tone 1).

No. 52344, ♀, Niapu. About half grown. (Skull lost.) Field measurements: Total length, 765; head and body, 293; tail vertebræ, 472; hind foot, 113. General coloration as in No. 52318, but tones rather stronger on upperparts and paler on underparts. Crown dark raw umber (tone 4); outside of fore limbs dark gray, hands grizzled with black; outside of hind limbs medium putty color, feet light gray slightly varied with blackish; proximal third of tail above dark reddish brown, rest of tail light fawn, slightly toned with blackish hair tips; lower side of tail lighter, but many shades darker than inside of limbs or underparts. Tuft of long hairs at each side of base of tail light fawn (tone 2).

The long hairs originating at the front base of the callosities as a pointed drooping tuft are well developed in even quite young specimens, and are at their highest development in older specimens just after the seasonal renewal of the pelage. In adults they are usually inconspicuous, but an examination of the pelage in front of the callosities shows that their apparent absence is due to wear, only the basal part remaining as a thick tuft of short, rather stiff hairs with abraded ends, slightly overlapping the upper edge of the callosities. In many young adults in fresh coat these tufts are as well developed as Rochebrune depicted for *Colobus tholloni* (cf. 1887, 'Faune de la Sénégambie,' Suppl. aux Vertébrés, fasc. 1, p. 110, Pl. v).

In young adults the pelage of the upperparts usually lacks the vermiculated tips commonly present in adults, in which it is often a conspicuous feature. The hands and feet are colored like the fore arms and lower legs until after the adult conditions of pelage have been fully acquired,

when the blackening of the upper surface of hands and feet begins gradually to appear, differing in extent and in intensity in different individuals, independently of sex.

Colobus powelli brunneus Lönnberg

Plates CV, Figure 2; CVI; CXXII–CXXXI

Colobus (*Piliocolobus*) *brunneus* LÖNNBERG, 1919, Rev. Zool. Africaine, VII, pp. 112–115; part, type only. Type locality, "Sili in the 'district du Haut-Uele.'" Type specimen, a skin with skull (sex not indicated, but its size indicates a male). The two specimens from Buta (in the same general region to the southwest of Sili), identified with it by the author, should doubtless be referred to it. The specimen from Mokoko[1] (between Penge and Irumu) should be referred to the subspecies *powelli*, as indicated by the locality and its brighter color tones.

?*Colobus* (*Tropicolobus*) *schubotzi* MATSCHIE, 1914, Sitzungsb. Ges. Naturf. Fr. Berlin, July, p. 345 (in text). Type locality, "Koloka zwischen dem zum Rubi-Itimbiri fliessenden Likati." Skin only. A brief preliminary notice, to be followed later by a fuller description, as yet apparently not published.

Represented by 42 specimens, accompanied by 3 skeletons, collected as follows:

Bafuka, 2 (adult ♂, skin and complete skeleton, and an additional ♂ skull), March 11, 1913.

Faradje, 40 (all adult but 5, nearly all skins with skulls, 17 with field measurements), June 23, July 16, 22, 23, November 23–December 3, 1911; December 2, 3, 1913.

The external measurements—average (minimum-maximum)—of fifteen adults of *Colobus powelli brunneus*, taken from animals in the flesh, are as follows:

	Total Length	Head and Body	Tail Vertebræ	Hind Foot	Ear
10 ♂	1295(1215–1335)	582(525–610)	714(633–785)	191(180–200)	40(38–42)
5 ♀	1268(1225–1315)	559(510–585)	709(650–750)	189(183–203)	39(35–42)

The cranial measurements—average (minimum-maximum)—of twenty-nine adults of *Colobus powelli brunneus* are as follows:

	Greatest Length	Condylobasal Length	Occipitonasal Length	Zygomatic Breadth
17 ♂	118.7(112.2–130.7)	97.0(92.3–107.7)	96.3(91.6–103.5)	91.1(86.8–97.4)
12 ♀	104.1(97.8–109.7)	85.7(81.7– 88.4)	86.2(80.1– 92.1)	76.3(70.3–81.0)

	Orbital Breadth	Interorb. Breadth	Postorb. Breadth	Braincase Breadth
17 ♂	71.7(65.5–77.7)	10.9(8.6–12.5)	41.1(38.0–45.2)	60.7(57.8–66.0)
12 ♀	63.1(60.4–66.1)	9.5(8.8–11.3)	41.0(39.2–43.7)	57.9(52.3–62.1)

[1][The collector, Dr. J. Bequaert, informs me that the locality is Mokoko. In the original description spelled by error "Muhako."—H. L.]

	Mastoid Breadth	Upper Toothrow	Upper Molars	Sagittal Crest
17 ♂	69.9(63.5–76.4)	41.2(38.0–45.5)	21.3(19.7–23.4)	5.4(2.5–8.4)
12 ♀	61.4(52.0–67.3)	36.7(34.2–39.1)	20.6(19.2–22.2)	

The Faradje-Bafuka series, from the forest galleries of the veldt district, represents a form of *powelli* strongly differentiated from that of the Rain Forest, and characterized by markedly paler coloration, as noted above under *C. powelli* (p. 445). Two average specimens from Faradje may be described as follows:

Male (No. 52306).—Head with a narrow black frontal band extending posteriorly about two-thirds the distance to the front base of ears; tufts of long hair in front of ears blackish, conspicuously annulated subapically with light mineral brown, in part also with the same tone on basal half; the whorl of softer hair behind ears pale yellowish white, lighter at tips and darker (nearly chamois) at base; sides of head grizzled dull blackish brown passing below into pale creamy white; crown and occiput madder brown. Nape and shoulders dark chocolate in general effect, the hairs individually smoke gray at base shading to pinkish drab, the apical fourth darkening to blackish brown minutely tipped with pale chocolate; foreback like shoulders but less heavily toned with dark brown; lower back and rump dark fawn in general tone, strongly vermiculated with pale snuff brown. Upper arm proximally similar to back but much paler, the long hair in front of shoulders with long pale yellowish white tips; lower arm pale yellowish gray superficially, the hairs slate gray for the basal two-thirds; hands dark brownish black nearly to wrist. Hind limbs much paler than fore limbs (about putty color); feet much paler than hands, the dusky portion not extending proximally beyond base of hallux. Tail above and laterally grizzled with dusky, underside like the hind limbs. Chin and throat nearly naked, with short scattered silvery white hairs. Foreneck, chest and whole abdominal area yellowish white darkened slightly on chest and more yellowish toward lateral edges; inside of both fore and hind limbs more whitish and less yellowish than the ventral area; laterally at base of tail and anal region a deeper tone prevailing (about pale yellowish buff).

Male (No. 52311).—Like the male above described, but all the color tones decidedly paler, particularly on the head and upperparts; below and on inside of limbs the yellowish tone is everywhere much stronger, including especially the long hairs of the lateral line. The pelage of the underparts is also everywhere thicker and longer except on the inside of thighs and inguinal regions which are nearly naked; chin and throat well clothed.

From the above average specimens the variations are, in extreme examples, toward a more dusky tone superficially on the upperparts on the one hand and to a more reddish tone on the other, varying to yellowish buff or even deep cinnamon. The prevailing color of the upper surface of the tail varies from blackish brown to a distinctly reddish tone, especially on the apical third; in only one specimen is the tail mainly black—blackish with a reddish tone on the basal third, thence wholly black to the tip.

Subadult specimens are usually paler than adults; they also lack the pale vermiculation of the dorsal area present in adults of both sexes.

The skin from Bafuka (No. 52287), an old male, may be regarded as practically a topotype of *brunneus*, the type locality, Sili, being about 60 miles southwest from Bafuka. This specimen agrees perfectly with the description of the type of *brunneus*. It is however a little darker than average males from Faradje, but is almost indistinguishable from some of the darker examples. Probably a large series of specimens from Bafuka would average very nearly like the large Faradje series.

The Faradje series parallels the *powelli* series from the Rain Forest in the range of individual variation in coloration, size, and cranial characters, and duplicates it in nearly all respects except in the color tones, which contrast strongly, the most richly colored specimens from Faradje scarcely equalling the dullest and palest of those from Akenge and Niapu. It seems therefore quite unnecessary to go into the details of individual variation in the Faradje series, which would be a repetition of what has already been given above under *powelli*, with a slightly different terminology for color tones.

As Lönnberg (*loc. cit.*) has suggested, his *brunneus* may be the same as *schubotzi* of Matschie (*loc. cit.*), the latter merely indicated very briefly from a single skin collected near the mouth of the Likati River, southwest of the type locality of *brunneus* in practically the same environment. Although the name *schubotzi* has four years priority over *brunneus*, it rests entirely upon the locality given for it, as the few words of description have no significance. So far as any characters are at present available, the name should be treated as indeterminate until it has been established on the basis of adequate topotypic material.

Colobus powelli brunneus differs from *C. p. powelli* not only in coloration (as already indicated) but averages slightly larger in both external and cranial measurements, especially in the latter. In 17 adult male skulls of *brunneus* of the Faradje series the average greatest length, condylo-basal length and zygomatic breadth exceeds that of 13 adult male skulls of *powelli* from Akenge by 5.5 mm. in each of these measurements, with all the other cranial measurements correspondingly larger. Besides this a sagittal crest is present in all male skulls of the Faradje series, varying in height from 2.5 to 8.4 mm., averaging 5.4 mm. A sagittal crest is present in only 8 males of the Akenge series, it being wholly absent in the other 5. It ranges in height from 2.3 to 7.2 mm., averaging 4.1. The condition of skulls and teeth, however, indicates greater average age in the Faradje series than in the Akenge. This factor

would account in a measure for the stronger development of the sagittal crest, and possibly to some extent for the larger average size. In the Faradje series about half of the skulls have the teeth greatly worn and the other half slightly worn. In the Akenge series only one-third have the teeth greatly worn, the other two-thirds showing little or no wear. As, however, skulls with greatly worn teeth are usually not the largest in either series, and as the largest skulls in both have practically unworn teeth, the element of age should not be given too much importance as the determining factor in the averages of size in these two series.

The females of *brunneus* and *powelli*, on the basis of 12 skulls of the former from Faradje and 10 of the latter from Akenge, differ almost inappreciably in size, with a slightly greater average for *brunneus*. In this case the skulls of the two series are strictly comparable as to age. Again it is found that the largest skulls of the series are among the youngest, and that the smallest are usually the oldest.

The measurements given above for these two forms (see p. 445 for *powelli* and p. 453 for *brunneus*) are worthy of careful study from the viewpoint of purely individual variation. There is a wide range of difference in the size of different specimens of the same sex from the same locality, and a great irregularity in variation of the same parts of the skull in skulls approximately alike in general size. This is interesting from the viewpoint of the bearing of such divergencies on their availability as diagnostic characters in the case of forms based on single specimens (Pls. CXII–CXXXI).

Nomenclature of *Colobus powelli* Group

At least ten described forms of *Colobus* must be carefully considered in determining the proper technical names of the red *Colobi* in the American Museum collection from the Upper Congo. The first name involved, in the order of priority, is *Colobus tephrosceles* Elliot (1907),[1] based on three specimens "procured by Sir H. H. Johnston on the Ruahara River, district of Toro, on the east side of Mount Ruwenzori at an altitude of 4000 feet." The description agrees satisfactorily with specimens in the present collection from Akenge and Niapu, *including the sides of the head*, described as "blackish gray" (not *red* as in *C. ellioti*). As noted below, five other forms were described in 1913 and 1914 from the adjoining eastern border of the Ituri Forest, some of them from quite near the

[1]1907, Ann. Mag. Nat. Hist., (7) XX, September, p. 195. Type, a skin without skull, from Toro, Uganda. In this description the measurements of the skull were, by a "misunderstanding," taken from "the skull of another species." (Cf. Elliot, 1913, 'Rev. Primates,' III, (1912), p. 125, footnote.) *Colobus tephrosceles* Elliot, *loc. cit.*, pp. 124–125, Pl. xv (skull). Correct measurements of a male topotype skull supplied.

western base of Mount Ruwenzori, with apparently no serious physical barrier (only the Semliki River) between the type region of *C. tephrosceles* and the type localities of the other five, and with no essential difference in the supposed diagnostic characters of these proposed species.

The next in order of date is *Colobus ellioti* Dollman,[1] based on a skin, without skull, from a locality 90 kilometers west of the south end of Lake Albert Edward. The typical phase of *C. ellioti* is, however, quite different from *C. tephrosceles*, and also from the five supposed forms of red *Colobi* from the Upper Ituri district, all of which live in a region of distinctly different environment. *C. ellioti*, on the other hand, seems closely related to the *C. foai-tholloni* group. It ranges north nearly or quite to the Lower Ituri, the only specimen in the present collection being from Avakubi. As stated above (p. 444) this specimen is so nearly identical in coloration with the description of the type that no differences are appreciable between it and the type. No other specimen suggesting near relationship to *ellioti* was obtained among the series of more than forty specimens collected at Avakubi and thence northward to Akenge, nor in the equally large series from Faradje. Matschie[2] has recorded a series of thirty-three specimens collected by Powell-Cotton on the road between Avakubi and Mawambi and thence eastward toward Beni as "*Colobus* (*Piliocolobus*) *ellioti*," which would seem to indicate that it is a common species for some distance eastward from Avakubi. In his remarks on the variability of the series as regards their general coloration he makes no reference to red color on the sides of the head, and on the following page describes his "*Colobus* (*Piliocolobus*) *powelli*" from specimens collected between Mahagi and Irumu, some distance to the northeastward, as having the cheeks gray and the back orange-ocher, in contradistinction from the *ellioti-foai-tholloni* group.

Lorenz in 1914[3] reported on a series of more than thirty specimens collected in the Ituri Forest by Grauer. This series he made the basis of a new species, *Colobus variabilis*, without designating a type specimen. He considered it a member of the subgenus *Tropicolobus*, on account of its red coloration and the erect hair-tufts behind the ears. He says the series shows great variation in coloration and yet is so fully blended that all must be regarded as belonging to a single species. In describing the color variations he divides the series into four groups, *a*, *b*, *c*, *d*. His detailed account indicates its near resemblance to *Colobus ellioti*. He

[1] 1909, Ann. Mag. Nat. Hist., (8) IV, November, pp. 475–476. Redescribed from the same specimen, with a colored figure, by Elliot in 1913 ('Rev. Primates,' III, (1912), pp. 126–127, Pl. v, animal).
[2] 1913, Ann. Soc. Zool. et Malacol. de Belgique, XLVII, (1912), August, pp. 58–61.
[3] 1914, 'Einige neue Stummelaffen von Innerafrika aus der Sammlung R. Grauer's.' Anz. Ak. Wiss. Math. Nat. Kl. Wien, LI, July, pp. 383–386.

also described a second species, *Colobus multicolor*, represented by a single specimen from Mawambi, which he says also belongs to the subgenus *Tropicolobus*, but differs from the *variabilis* series through its strikingly varied coloring, particularly by the presence of a sprinkling of whitish on the nape, foreback and shoulders,—in all probability an individual differentiation, not to be seriously considered.

In a later paper Lorenz,[1] after receiving still more material from the same general region, reached the conclusion that not only his *Colobus variabilis* but also other forms described from the Upper Ituri district should be referred to *C. ellioti* as synonyms, having been based on phases of individual variation. Among these are *Piliocolobus ellioti melanochir* and *Piliocolobus anzeliusi* of Matschie (1914).

Lönnberg in a paper on the monkeys of the Upper Congo published two years later[2] also gave a list of twenty-eight specimens from nearly the same district (most of them collected by Christy) which he refers to "*Colobus* (*Piliocolobus*) *ellioti*." He says, referring to Lorenz, that "he [Lorenz] regards not only *melanochir*, but also *anzeliusi* Matschie and *variabilis* Lorenz as synonyms of *ellioti*. I agree fully with him in this respect, but I think that still more names could be added to this list, among others *multicolor* Lorenz" (*loc. cit.*, p. 110).

Lönnberg, two years earlier,[3] had described a series of six specimens of a red *Colobus* from the vicinity of Beni and Rutshuru River, near the western border of the Ituri Forest, which he referred also to *Colobus ellioti*, with extended comment (*loc. cit.*, p. 31) on the great variability of this small series from a single locality, and the bearing of this variability in relation to other alleged forms. He sums up his descriptions of these specimens by saying "that no two specimens are fully alike," and adds: "The extremely great variability of these red *Colobi*, as set forth in Lorenz's papers as well as in this one, and the fact that *Colobus ellioti* was described on insufficient material, has caused the confusion, which now, as it may be hoped, is removed. On the other hand, however, this great variation is of deep interest, and it ought to be considered in connection with several other striking proofs of variation which are elucidated in this paper."

In the absence of comparable material for direct comparison it seems probable that all of the forms referred to above, except the first (*Colobus*

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[1] 1917, 'Beitrag zur Kenntnis der Affen und Halbaffen von Zentralafrika.' Ann. Naturhist. Hofmus. Wien, XXXI, pp. 169–241, Pls. VII–XV, text figs. 1–5.

[2] 1919, 'Contributions to the knowledge about the Monkeys of Belgian Congo.' Rev. Zool. Africaine, VII, pp. 107–154. *Colobus ellioti*, pp. 108–110.

[3] 1917, 'Mammals collected in Central Africa by Captain E. Arrhenius.' Kungl. Sven. Vetensk. Handl., Stockholm, LVIII, No. 2, September, pp. 1–110, Pls. I–XII, text figs. 1–11.

tephrosceles) should be assigned to *ellioti*, as has already been done by Lönnberg and Lorenz; either as synonyms or as local forms, especially those based on specimens from the eastern border of the Ituri district, which seem to differ somewhat from the type form of *ellioti* from the upper Lindi River. As said above only a single specimen in the present collection, from Avakubi, is referable to this group. Another name must consequently be sought for the large series of specimens from collecting stations north of Avakubi. The earliest name for any form of this group, which ranges from the Uganda forests westward to the Uele drainage, is apparently, as already mentioned, *Colobus tephrosceles* Elliot (1907), from the eastern base of Mount Ruwenzori. This name, in the absence of specimens for examination, seems, from geographical considerations, not entirely satisfactory. *Colobus powelli* Matschie (1913), based on specimens from Zokwa, between Mahagi and Irumu, is the next name in order of date, and for this reason has been provisionally accepted for the present series from the Avakubi-Niapu-Akenge district, about three degrees west of Zokwa in the Rain Forest. Absence of material from the Ituri district for direct comparison with that from Niapu and Akenge renders this an unsatisfactory decision, but the alternative to its acceptance is to give a new name, which seems extremely undesirable until the status of the numerous supposed forms involved has been definitively established. It is quite possible that *Colobus tephrosceles* will be found to extend far westward from its type locality, and that the forms recognized above as *Colobus powelli powelli* and *C. p. brunneus* will prove to be geographically related forms of *C. tephrosceles*.

Twenty forms of the red *Colobus* group have been described from the Belgian Congo. Fourteen of them were based on single specimens, nearly half of them on the skin alone, in two instances on only a mutilated skin. One (*C. powelli*) was based on a series of seven skins with skulls; in several other cases two or three specimens were available but the cotypes were immature, the permanent dentition being incomplete. Hence it follows that the descriptions were in most instances merely based on single specimens in a group now known to be extraordinarily subject to individual variation, and not on descriptions of species or of even geographical forms. The type localities of seven of these supposed species are within an area about 120 miles square in the Ituri Forest district; four others are in the upper drainage of the Lualaba River, and four more from the district of Lake Leopold II. These forms (most of them described as species) are admitted by their describers to be closely affiliated to the *Colobus-foai-ellioti-tholloni* group. It is quite probable that some

of them may represent local races, while many doubtless will eventually be relegated to synonymy. Their real value can be determined only by comparison of topotypical series of each form. When most of them were described little was known of sexual differentiation in these groups, or of differences due to immaturity, and almost nothing of the range of individual color variations, now found to be exceptionally great wherever series of specimens from the same locality have been available for comparison.

Colobus abyssinicus ituricus Matschie

Plates CVII; CVIII; CIX, Figure 2; CXXXII-CXLI

Colobus (*Guereza*) *matschiei ituricus* MATSCHIE, 1913, Ann. Soc. Zool. Malacol. Belgique, XLVII, (1912), August, p. 48. "Ituri." Type, an adult male, skin with skull, without definite locality, collected by Anzélius. Also six cotypes, Powell-Cotton collection, from near Mawambi, mostly from between Mawambi and Irumu, Ituri forest, Belgian Congo.

?*Colobus* (*Guereza*) *matschiei uellensis* MATSCHIE, 1913, *loc. cit.*, p. 47. Type (and only specimen mentioned), an adult female (skin mounted, skull separate), from "Uelle," without definite locality. Polidori collection, Musée du Congo belge.

Colobus occidentalis ituricus LORENZ (not *C. matschiei ituricus* Matschie), 1914, Anz. Ak.Wiss. Wien, Math.-Nat. Kl., LI, November, p. 508. Eastern border of Ituri forest near Mawambi. Nine specimens, Grauer collection. No type indicated.

Colobus occidentalis LÖNNBERG, 1919, Rev. Zool. Africaine, VII, October, pp. 117–118. Twenty-two specimens listed, with their respective localities and collectors, from the Ituri forest and Uele district, followed by comment, which includes the following: "In spite of the fact the [=that?] several names have been given to Guerezas from various parts of the Congo forest, I venture to include all these specimens under the above name."

Represented by 49 specimens accompanied by 5 skeletons, collected as follows:

Bafuka, 1 (subadult ♀), March 10, 1913.

Yakuluku, 2 (2 ♀, 1 adult, 1 young), September 30, 1911.

Faradje, 38 (26 adults, the sexes about equally represented; skins with skulls, 5 with skeletons; also 4 embryos in spirits, and 8 in various stages of immaturity; all but 1 with field measurements), February 5, 14–18, 28, March 9, 14, April 27, September 12, December 4–10, 1911; October 26–31, 1912.

Vankerckhovenville, 1 (young ♀), April 18, 1912.

Avakubi, 7 (6 adult ♂ and 1 young ♀; 1 with skeleton; all with field measurements), September 1, 10, November 3, 25, December 21, 1913; February 23, 1914.

The external measurements—average (minimum-maximum)—of twenty-nine adults of *Colobus abyssinicus ituricus*, taken from animals in the flesh, are as follows:

	Total Length	Head and Body	Tail Vertebræ	Hind Foot	Ear
16 ♂	1405(1270–1550)	593(535–690)	811(670–885)	191(175–207)	44(37–50)
13 ♀	1325(1235–1410)	554(485–640)	773(715–825)	179(165–190)	40(35–43)

The cranial measurements—average (minimum-maximum)—of thirty adults of *Colobus abyssinicus ituricus* are as follows:

	Greatest Length	Condylobasal Length	Occipitonasal Length
17 ♂	116.0(104.4–126.3)	99.8(87.0–110.3)	92.6(84.6–96.5)
13 ♀	107.2(104.0–114.4)	92.3(84.9– 97.3)	87.3(82.4–94.6)

	Zygomatic Breadth	Orbital Breadth	Interorb. Breadth	Postorb. Constr.
17 ♂	81.2(70.4–88.5)	68.0(59.4–73.4)	10.6(8.3–12.8)	44.8(42.3–47.8)
13 ♀	76.7(71.2–83.5)	65.4(61.2–69.7)	10.7(9.7–11.7)	44.2(42.3–46.5)

	Braincase Breadth	Mastoid Breadth	Upper Toothrow	Upper Molars
17 ♂	60.6(55.5–66.7)	67.1(59.6–77.3)	41.0(37.2–47.5)	21.3(20.0–22.6)
13 ♀	57.8(55.3–61.5)	62.6(58.4–69.2)	37.7(34.5–39.5)	20.5(19.2–21.4)

Age Variation.—The above cranial measurements are based only on specimens that have acquired fully developed permanent dentition, including canines as well as cheek-teeth. While there is a wide range of variation in external as well as in cranial measurements, only a small part of the difference in size is attributable to age, since some of the smallest members of the series are shown by the teeth and skull to be well advanced in age, while some of the largest have the teeth practically unworn, and the skull indicates comparative youthfulness.

Sexual Variation.—Females average considerably smaller than males, yet some females exceed some males in size, even where both are strictly comparable in respect to age. The canines in females are of the same relative length and size as in males, thus differing from those of females in the *Colobus powelli* group, in which the canines are relatively much shorter and less massive than in males.

A sagittal crest appears to be rarely developed, even in males, in the present species. The parietal ridges are much less developed in females, and even in old age have a lower position on the skull. In old males the parietal ridges move up to near the median line, forming posteriorly a broad flat ridge without a distinct median crest, in one specimen narrowing to a breadth of slightly less than 3 mm., with a height above the plane of the braincase of about 1 mm., and a length of about 11

mm. (Pls. CXXXII, fig. 1; CXXXIV, fig. 1; CXXXIX, fig. 1). In two other old male skulls the parietal ridges are joined for about 5 to 7 mm. into a narrow flat plate with an indistinct median crest posteriorly. In these specimens the lambdoidal crest is strongly developed and all the cranial sutures are obliterated.

In seven male skulls with the basal suture closed the average greatest length of the skulls is 119.9 mm., the extremes being 115.6 and 126.3. In ten skulls with the basal suture still open the average greatest length of the skull is 113.3, the extremes being 104.4 and 121.8. The zygomatic breadth in the same seven skulls with closed basal suture is 84.7, the extremes being 79.2 and 88.5. In the ten skulls with the basal suture open the zygomatic breadth averages 77.7 mm., the extremes being 70.4 and 83.6 mm. In the series of seven older skulls the greatest length is 120 mm. or more in three of them; in the series of ten younger skulls only three slightly exceed 120 mm. The average difference of the two series is about 6 mm. in greatest length and about 7 mm. in zygomatic breadth, probably due in part to the difference in age of the two series. The individual range in the older series is 11 mm. for greatest length and 9 mm. for zygomatic breadth. The individual range in the younger series is 17 mm. for greatest length and 13 mm. for zygomatic breadth.

The thirteen adult female skulls of the present series, all from a single locality, are of special interest for comparison with the statistics of size given above for the males. In eight of them the basal suture is fully obliterated, and in the other five it remains open. The average greatest length of the skull is slightly greater in the younger series, being in the older series 106 mm., in the younger series 109, or 3 mm. greater; the average zygomatic breadth is the same in both, 77 mm. Age has in the females little influence upon size, in striking contrast with what has been shown above to be the case with males.

The range of individual variation in the greatest length in the older series of eight is 7 mm. and in the younger series of five, 10 mm. The variation in zygomatic breadth is 10 mm. for the older series and 12.3 for the younger, or, respectively, 9.5 and 11 per cent of the average. In other words, the skull in females reaches its maximum size with the complete development of the permanent dentition, while in males the skull does not attain the maximum till a much later period. The skull in the female increases in weight and strength after it has reached its full linear dimensions by denser ossification, and develops also strong parietal ridges, greatly resembling those of males.

Individual Variation in Cranial Characters.—A feature of individual variation in both males and females, not only in the present

species but of very general occurrence, is the relative convexity and stoutness of the zygomatic arch in specimens otherwise quite similar and of strictly comparable age. In some of the skulls in the present series of *Colobus* monkeys the zygomatic arch is only slightly expanded and weak in structure, in others greatly and evenly arched outward and heavily ossified. Attention is called to this striking feature of individual variation for the reason that it is often seized upon as of weighty significance as a diagnostic character in distinguishing local forms, and sometimes species, especially when describers are dealing with limited material. Its value as a distinctive character should be confirmed by reference to more than a single specimen. This feature is often greatly influenced by the age of the individual, as the malar arch often changes much with age, being usually, or at least frequently, weaker and flatter in young adults than in old adults.

Other exceedingly variable features, not indicated by the above cranial measurements, are the size and form of the external nares and the size and shape of the nasal bones. They are so obviously of no diagnostic value that it has not been deemed worth while to include them in the series of cranial measurements. Yet it seems proper to recall that describers often regard them as important distinctive features for the discrimination of closely allied forms. Like other features of size and form, attentive study of large series of specimens from a single locality is convincing of their unavailability as diagnostic characters.

INDIVIDUAL VARIATION IN SIZE.—The external measurements from specimens in the flesh (p. 460) hardly require special comment; they are sufficient to call attention to the range of variation in size and relative proportions.

INDIVIDUAL VARIATION IN COLORATION.—The present series of 50 specimens of the white-mantled *Colobus* was taken in two small areas, the greater part at Faradje, a few at Avakubi. Although these two collecting stations differ somewhat in environmental conditions, which often give rise to local forms in other groups, there seem to be no recognizable features of differentiation, either in color, in markings or in size. There is, however, considerable individual variation in certain features of coloration.

The color pattern consists of sharply contrasting areas of black and white. The variations affect merely the relative extent of these areas. The white areas are as follows: (1) A narrow white frontal band, which merges posteriorly with the white of the sides of the face below the ears, and is continuous with the white of the throat and foreneck; (2) a mantle

of very long white hair on the lower back, which extends posteriorly to the base of the tail and joins the broad band of short white hair enclosing the callosities laterally and below, and also extending forward along the sides of the body to the shoulders.

Variations from the average condition occur in the breadth of the frontal band, in which the extremes vary from 30 to 50 per cent of the mean. Also in a few individuals the narrow line of white above the base of the ears is either absent or represented by a few short, inconspicuous white hairs. The lateral band of long white hairs is separated from the white of the sides of the neck by about 25 to 50 mm. of solid black; this space is reduced in a few instances to about 15 mm. Occasionally there are a few (in some instances many) scattered long, coarse white hairs in front of the shoulders on either side of the median line. There are similar scattered white hairs on the thighs, varying in abundance in different specimens and often entirely absent. The length of the long hair forming the mantle varies greatly in different individuals. The perineal patch of thick, short, white hair enclosing the callosities varies greatly in extent (from 25 to 60 mm. on the median line below them), and is relatively much smaller in females than in males. The relative length of the white terminal portion of the tail, and of the tuft beyond the vertebræ, is exceedingly variable. The white apical part is usually separated from the black proximal portion by a narrow space of gray, varying in length from less than 25 mm. to more than 75. At the point of junction, the white and black sometimes meet evenly entirely around the tail; usually the white or grayish white extends further proximally on the lower side of the tail than on the upper, varying in different individuals from 25 to 75 mm. or more. The white portion of the tail varies in length relatively to the black part, due partly to the condition of the pelage. In specimens with a thin, short brush the tips of the hairs show unmistakable abrasion. The white portion of the tail (to the end of the hair) varies in length from about one-fourth to about one-third of the entire length of the tail. The tuft at the end varies also from one-third to one-fourth of the length of the white portion. The white of the tail is usually not pure white, like the white of the mantle and sides of the body, but more or less brownish white, evidently due mainly to adventitious staining. The stain is greater in individuals with worn pelage than in those with a fresher coat. In many instances the brownish white stain is limited to the apical half or two-thirds of the hairs, the basal part being usually white, especially in specimens in unworn pelage. Also it is to be noted that the forest (Avakubi) specimens have the tail whiter (less stained) than the speci-

mens from the forest galleries of the Savannah region (Faradje). There are no other appreciable differences between the specimens of the two localities.

IMMATURE PELAGE.—Seven of the Faradje series are very young specimens, of which four are in the first, or natal, coat; the other three have fully assumed adult coloration. The youngest (No. 52242, ♂ juvenile, December 10, 1911) measured in the flesh: Total length, 580 mm.; head and body, 225; tail vertebræ, 355; hind foot, 94; ear, 31. Greatest length of skull, 66.7; occipitonasal length, 63.0; condylobasal length, 40.5; zygomatic breadth, 39.0; breadth of braincase, 51.2; mastoid breadth, 40.0. The two middle upper incisors are fully developed but the canines and cheek-teeth are just breaking through the gums. The pelage is short, soft, conspicuously wavy, and wholly white, including limbs and tail. It is thick on the entire upperparts, with a length of about 15 to 17 mm. on the middle of the back; the underparts are scantily covered, the pale yellow skin showing through. On the proximal two-thirds of the tail the hairs are short but increase greatly in length on the apical third, with a terminal tuft extending 25 mm. beyond the vertebræ. The skin on the body is everywhere pale yellow, except for grayish on the outside of the limbs and for a short distance on the upper side of the tail at the beginning of the proximal third.

A slightly older specimen (No. 52239, ♂ juvenile, December 4, 1911) still retains the natal pelage on the body and limbs, but the feet and hands, a small spot on the crown and the apical third of the tail are mixed blackish brown and white, black greatly prevailing on the hands, feet and apical third of the tail. The pelage is soft, wavy, and creamy white on the body and proximal two-thirds of the limbs and tail, and of the same texture as the somewhat younger specimen described above; the dark hairs on the distal portion of the limbs and tail are coarser and more bristly, belonging evidently to the incoming second pelage. This specimen measured in the flesh as follows: Total length, 590 mm.; head and body, 236; hind foot, 87; ear, 34. Greatest length of skull, 74.4; occipitonasal length, 71.0; condylobasal length, 51.4; zygomatic breadth, 41.0; breadth of braincase, 57.3; mastoid breadth, 46.4. In this specimen the milk dentition is fully developed.

In the next stage (represented by No. 52224, ♀ juvenile, February 15, 1911), the natal coat has been entirely replaced by a pelage of mature texture and coloration, except that the white of the lower back is grayish white, owing to a strong mixture of hairs that are more or less blackish on the median third, the base and tip only being white. The white

hair is much longer on the lower back and sides than on the adjoining black areas. The hair of the body, limbs and tail is as intensely black as in adults. This specimen, approximately about two and a half months old, measured in the flesh as follows: Total length, 620 mm.; head and body, 232; tail vertebræ, 388; hind foot, 100; ear, 30. Skull, greatest length, 76.4; occipitonasal, 66.4; condylobasal, 50.8; zygomatic breadth, 43.8; breadth of braincase, 51.5; mastoid breadth, 44.4. The full milk dentition is present but the last cheek-tooth is barely through the gum.

An older specimen (No. 52247, ♀ juvenile, October 27, 1912), probably about ten months old, is in perfect adult pelage, as regards texture, coloration, pattern of markings and proportional length of the long white hair of the mantle to the general pelage. The white at the tip of the tail is relatively much shorter than in adults, having a vertebral length of about 75 mm. and a total length to the end of the hairs of about 125 mm. This specimen has the complete deciduous dentition, and the first molar of the permanent set can be seen through an opening in the capsule. The flesh measurements are recorded as: Total length, 1060 mm.; head and body, 450; tail vertebræ, 610; hind foot, 140; ear, 41. Skull, greatest length, 72.3; condylobasal length, 51.3; zygomatic breadth, 47.2; mastoid breadth, 51.5. It hence appears that the mature characteristics of the pelage are attained long before any of the permanent teeth have pierced the gum, the milk teeth remaining functionally unimpaired. Other specimens of about the same age fully support this conclusion.

Another young female, taken at the same place and date, is smaller in external measurements but the skull is larger and more mature, as indicated by the contour of the frontal region and the presence of an almost fully developed first molar in addition to the full set of milk teeth. As in other examples of about the same age, the white tail-tip is relatively much shorter than in adults and not so white, the hairs being blackish or brownish for the greater part of their length and clear white for a short distance at the base.

Unfortunately there are no specimens representing the transition from the natal to the second pelage. The transition stages are, however, probably similar to those of *C. angolensis cottoni* described below (pp. 468–469).

Colobus angolensis cottoni Lydekker

Plates CIX, Figure 1; CX, CXI, CXLII-CLI; CLXVI, Figure 1

Colobus palliatus cottoni LYDEKKER, 1905, Ann. Mag. Nat. Hist., (7) XVI, October, p. 432. "Qugo" (lege Zokwa[1]), between Mahagi and Irumu, upper Ituri River, Belgian Congo. Type, a skin with skull, collected by Powell-Cotton.

[1] "Qugo" is a misprint for Zokwa (cf. Matschie, 1913, Rev. Zool. Africaine, II, February, p. 204).

Colobus (Colobus) palliatus cottoni MATSCHIE, 1913, Rev. Zool. Africaine, II, February 15, pp. 203–205. Comment on Lydekker's original specimens and on others collected by Powell-Cotton near the type locality.

Colobus cottoni THOMAS, 1915, Ann. Mag. Nat. Hist., (8) XVI, December, p. 466. Poko, 1 (young).

Colobus (Colobus) palliatus mawambicus MATSCHIE, 1913, Rev. Zool. Africaine, II, February 15, p. 205. Near "Nord Pemba, zwischen Irumu und Mawambi am oberen Ituri," Belgian Congo. Type, a young male, mounted in Tervueren Museum, skull separate. Also three cotypes, one an adult male topotype. Three of the specimens collected by Powell-Cotton, the other by Nahan, from Panga, on the Aruwimi.

Colobus mawambicus nahani MATSCHIE, 1914, Sitzungsb. Ges. Naturf. Fr. Berlin, p. 335. Panga, Aruwimi River, Belgian Congo. Type, adult female, previously a cotype of *Colobus palliatus mawambicus*.

Colobus palliatus mawambicus LÖNNBERG, 1919; Rev. Zool. Africaine, VII, October 1, p. 115. Comment on five specimens from Mawambi (Christy and Grauer collections).

Represented by 66 specimens accompanied by 4 skeletons, collected as follows:

Poko, 4 (2 ♂, 2 ♀—1 immature; only 1 with field measurements), August 1913.

Akenge, 23 (13 ♂, 10 ♀, of which 19 are adult; skins with skulls, with 3 complete skeletons; all but 3 with field measurements), September 29–October 28, 1913.

Niapu, 23 (11 ♂, 12 ♀, all skins and skulls, with field measurements; all but 4 adult), November 9–December 1, 1913.

Medje, 1 (young ♂), April 14, 1910.

Gamangui, 9 (5♂, 4 ♀, all but 1 adult; skins and skulls, including 1 skeleton; all with field measurements), January 31, February 1–20, 1910.

Avakubi, 3 (all adult ♂, skins and skulls, all with field measurements), April 14, 15, 1914.

Ukaturaka, 1 (skin only; no measurements), May 1909.

Also 2 flat skins without field data.

The external measurements—average (minimum-maximum)—of thirty-six adults of *Colobus angolensis cottoni*, taken from animals in the flesh, are as follows:

	Total Length	Head and Body	Tail Vertebræ	Hind Foot	Ear
21 ♂	1405(1310–1470)	581(490–640)	824(720–890)	192(180–205)	44(39–46)
15 ♀	1361(1230–1470)	561(505–610)	800(645–880)	186(171–200)	41(37–45)

The cranial measurements—average (minimum-maximum)—of forty-two adults of *Colobus angolensis cottoni* are as follows:

	Greatest Length	Condylobasal Length	Occipitonasal Length
25 ♂	114.0(105.3–122.8)	96.8(90.0–107.0)	92.6(87.2–99.3)
17 ♀	107.5(102.9–113.8)	88.8(78.5– 94.9)	88.5(84.1–94.3)

	Zygomatic Breadth	Orbital Breadth	Interorb. Breadth	Postorb. Constr.
25 ♂	84.4(80.0–92.6)	71.2(67.0–81.2)	11.7(9.6–14.2)	42.3(40.3–47.0)
17 ♀	77.4(69.6–82.8)	65.5(59.3–72.0)	10.3(8.8–12.0)	43.9(41.5–46.4)

	Braincase Breadth	Mastoid Breadth	Upper Toothrow	Upper Molars
25 ♂	60.1(56.6–66.7)	69.3(63.5–74.5)	39.4(37.0–42.3)	20.8(19.0–22.5)
17 ♀	59.2(57.3–62.5)	63.5(59.3–69.0)	36.4(33.8–38.3)	20.0(18.2–21.2)

IMMATURE PELAGE.—The first, or natal pelage is represented by a single specimen (Pl. CXI, fig. 2) from Niapu (No. 52178, ♀ juvenile, November 12, 1913) taken with its mother (No. 52177). The entire pelage is white, soft and wavy, and in color and texture is indistinguishable from that of the young *Colobus abyssinicus ituricus* of corresponding age. The underparts are naked. The skin of the body and limbs (except hands and feet) is pale yellow and gives a creamy tone to the pelage. The flesh measurements are as follows: Total length, 490 mm.; head and body, 205; tail vertebræ, 285; hind foot, 79; ear, 31. Skull, greatest length, 64.3; occipitonasal length, 60.8; condylobasal length, 47.2; zygomatic breadth, 41.0; breadth of braincase, 48.5; mastoid breadth, 42.5. The milk dentition is just breaking through the gums.

Other specimens illustrate various stages in which the natal pelage has been replaced in large part by the incoming second coat. In No. 52172, ♀ juvenile (Gamangui, February 12, 1910) the natal pelage remains on the chin and throat, and on the top of the head, nape and shoulders; the rest of the upperparts is strongly darkened by the incoming blackish second coat. The underparts, from the pectoral region posteriorly, and the inside of the limbs, are well clothed with fine black hair. The outside of the limbs, including hands and feet, is thickly covered with short intensely black hair. The sides of the head are covered with long hair of the second coat, mostly white but mixed with dusky-tipped hairs. The tail is darkened by a mixture of blackish on the proximal third, but is pale yellow on the median dorsal line toward the tip. The flesh measurements of this specimen are: Total length, 650 mm.; head and body, 255; tail vertebræ, 395; hind foot, 100. The skull is disarticulated and not conveniently measurable. The milk dentition is not complete, the last cheek-tooth being still enclosed in the alveolus. Another specimen (No. 52175, ♂ juvenile, Medje, April 14, 1910) is approximately of the

same age and size as the specimen above described, and closely agrees with it in coloration and character of the pelage.

Two other specimens (No. 52159, ♀ juvenile, Akenge, October 18, 1913, and No. 52195, ♂ juvenile, Niapu, November 30, 1913), are of nearly the same size as those last described but illustrate a more advanced stage of pelage change, the first coat having been replaced by the second everywhere except on the dorsal region, where remnants of the white silky first pelage are diffused over a broad median zone extending from the crown to the base of the tail, the natal pelage prevailing from the hinder part of the head to behind the shoulders, while more posteriorly it merely imparts a grayish tone to the prevailing black of the second coat. In a slightly older specimen the only trace of the first coat is seen in a slight mixture of soft grayish hairs on the nape and shoulders.

Several specimens, only a little older than those last described, have fully acquired the adult pelage. Of these No. 52193, ♂ juvenile, Niapu, November 30, 1913, may be taken as indicating the age at which the fully mature stage of pelage is attained. In this specimen the milk dentition is fully matured, and the crown of the first molar of the permanent set can be seen through an opening in the alveolus, but only the outer anterior cusp has reached the alveolar plane. The pelage is mature in both texture and coloration, except that the apical fourth of the tail is black at the surface nearly to the tip, and white only at the base, the white showing through for the apical 50 mm.[1] The long white hair on the shoulders, sides of the neck and cheeks is fully developed, relatively to the length of the black of the rest of the pelage of body and limbs. The flesh measurements are: Total length, 750 mm.; head and body, 280; tail vertebræ, 470; hind foot, 115; ear, 36. Skull, greatest length, 76.7; occipitonasal length, 70.4; condylobasal length, 53.6; zygomatic breadth, 52.5. The adult pelage is thus acquired before the first tooth of the permanent set has become functional.

Color Variation in Adults.—The chief color variations in adults are in respect to the development of the white areas on the head, sides of the neck, and on the shoulders. As a rule there is no white band on the forehead, as in the *abyssinicus* group. In one specimen (No. 52202, ♀ adult, Poko), however, there is a narrow frontal band of short white hairs. In several others the white on the sides of the head extends forward to the anterior border of the eyes, but usually ends at the posterior border.

The long white hair forming a narrow band on the sides of the neck usually joins the white patch on the shoulders. The amount of long white

[1]This is an individual feature, as other specimens at this stage differ little from adults in the relative amount of white and black on the tail.

hair in this band varies from what appears superficially to be a series of detached tufts to a continuous stripe. On parting the hair it is usually found to be continuous at the base.

The shoulder patch also varies greatly in the amount of elongated white hair composing it, and is thus much more conspicuous in some individuals than in others, in which it may be greatly reduced.

The color of the tail is an exceedingly variable feature. It is deep black proximally and white apically, with an intermediate portion of black grizzled in various degrees with glistening white hairs. The basal portion of the tail is deep black, but the extent of the wholly black base varies from about one-sixth to one-half of the total length. Usually about one-fourth to one-third is wholly deep black, followed by a grizzled black and white portion of greatly varying extent, the amount of white gradually increasing apically to the white distal portion without a sharp boundary line between any of the three sections. In some cases the terminal white portion is very short (about one-sixth of the total length of the tail), in others nearly or quite one-half of the tail is white, or nearer white than gray. A tabulation of the coloration of the tail for a large series of specimens shows that this feature is unrelated to sex or to locality, although it has been usually stressed as an important diagnostic feature by some describers.

The apical white portion of the tail is not clear white, as in some of the forms of the *abyssinicus* group, but brownish white, of varying tone in different specimens, and is due probably, to some extent, to adventitious staining. The tail is never furnished with a terminal tuft of lengthened hairs, but it is often thicker at the tip than at some distance behind it; but in this respect there is much individual difference, the apical hairs being in many specimens not appreciably lengthened.

CRANIAL VARIATIONS.—The twenty-five male skulls of *Colobus angolensis cottoni*, of which a summary of measurements is given above (pp. 467–468) are all fully adult (either middle-aged or old) except four which have the basal suture open but the dentition fully developed. In only a few are the cheek-teeth much worn, but in the older specimens the incisors and canines are greatly worn. As so frequently happens, some of the smallest are among the oldest. It is hence proper to disregard age in adults as seriously affecting variation in size. The greatest length of the skull and the least length in this series are respectively 122.8 and 105.3 mm.; the zygomatic breadth of the same two skulls is respectively 92.6 and 82.4. Both are very old skulls with closed sutures and greatly worn teeth. The two extremes in skulls with open basal

sutures and unworn teeth have the greatest length of the skull respectively 117.0 and 106.8 mm., and the zygomatic breadth respectively 82.4 and 80.0.

The seventeen female skulls of which a summary of measurements is tabulated above are also fully adult, the basal suture in only two of them being open, and all but four have the teeth more or less worn, particularly the incisors and canines. The largest skull of the fifteen with closed sutures and worn teeth measures 113.8 mm. in greatest length and 79.9 in zygomatic breadth. The smallest of the same thirteen skulls (also the smallest of the entire series) has a greatest length of 102.9 and a zygomatic breadth of 78.8 mm. The two with open basal sutures and unworn teeth measure respectively, greatest length 109.0 and 106.5 mm.; zygomatic breadth, respectively 69.6 and 75.5 mm.

There is as usual a large disproportionate variation between axial and transverse measurements in skulls of the same sex and age from the same locality. Two males with a greatest skull length respectively of 118.7 and 109.3 mm. have the breadth at the postorbital constriction respectively of 40.3 and 45.6; two other males with a skull length respectively of 119.0 and 111.4 have a zygomatic breadth respectively of 84.0 and 88.0 mm. Comparison of the interorbital and orbital breadth with the greatest length gives similar results. Female skulls are similarly variable.

Further comment on the cranial measurements seems unnecessary, as the variations parallel those of *C. abyssinicus ituricus* mentioned at length on an earlier page (pp. 461–463). The same is true of the external measurements given above. See also especially the comparative summary of both external and cranial measurements of four of the forms (*C. p. powelli*, *C. p. brunneus*, *C. abyssinicus ituricus*, and *C. angolensis cottoni*) represented in the present Congo collection of mammals (pp. 475–476).

While *Colobus angolensis cottoni* and *C. abyssinicus ituricus* differ radically in color pattern and in other pelage characters they cannot be positively distinguished by either external or cranial measurements although there is a slight average difference in size. While *cottoni* has the orbital region lower, the braincase broader and flatter, the occipital plane more nearly vertical, and the zygoma weaker and less convex than *ituricus*, single skulls uncorrelated with skins cannot be always satisfactorily discriminated as belonging to one of the forms rather than to the other, individual variation greatly exceeding the average slight

differences. Both forms differ from the *powelli* group, and apparently from all of the red forms of *Colobus*, by the absence of a thin, high sagittal crest which forms a striking feature in old males of the red *Colobi*.

NOMENCLATURE OF *Colobus abyssinicus* AND *C. angolensis* GROUPS

Four early names are fundamentally involved in the nomenclature of the black-and-white forms of *Colobus* of Central Africa. These are, in the order of publication, (1) *Lemur abyssinicus* Oken (1816); (2) *Colobus angolensis* Sclater (1860); (3) *Colobus palliatus* Peters (1868); (4) *Guereza occidentalis* Rochebrune (1887).

The type region of *abyssinicus* is of course Abyssinia, but recent describers have extended the range of the group to Uganda and southward to Lakes Albert-Edward and Kivu, and westward to the Uele country. I have accepted (p. 460) *abyssinicus* as the specific designation applicable to the large series of white-mantled *Colobus* collected by the American Museum Congo Expedition at Avakubi and Faradje, with *ituricus* as the subspecific name (*Colobus abyssinicus ituricus* Matschie), notwithstanding that *Colobus matschiei uellensis* has a page precedence in the same paper. *C. m. uellensis* was based on a single specimen without definite locality, and the alleged characters are not diagnostic. In other words, *uellensis* is not satisfactorily identifiable. *C. m. ituricus* was based on a series of seven specimens from the Ituri forest near Mawambi, and is identifiably described, although the specimen designated as type is given merely as from "Ituri."

Colobus angolensis was based on an imperfect skin, without feet or face, from northern Angola. It was later recognized as occurring along the Congo (left bank) as far as the Kasai River and eastward into the region drained by its tributaries.

Colobus palliatus was based on specimens from the Zanzibar coast of East Africa (Pangani River). Its close relationship to *angolensis* was early recognized, and led to much discussion respecting their specific unity.[1] Sclater (1880, Proc. Zool. Soc. London, p. 68) believed they were specifically the same, and several later authors shared this view, which Pousargues believed to be erroneous, but his evidence, based on insufficient material, is far from convincing. In 1913 Matschie[2] made the nomenclatural error of referring *Colobus angolensis* to *C. palliatus*, the name *angolensis* having eight years priority over *palliatus*. The range of the *C. palliatus* (=*angolensis*) group has been recognized by various

[1] See especially Pousargues, 1896, Ann. Sci. Nat., Zool., (8) I, pp. 267–276, and the authors he cites.
[2] 1913, Rev. Zool. Africaine, II, February, p. 206.

authors as extending across East Africa to Angola, including the Ituri forest, the Nyasa-Tanganyika Plateau, and the region of Lake Leopold II.

Colobus occidentalis (type locality, Noki, near the mouth of the Congo) has of late been recognized by some authors as a full species, to include the white-mantled forms of northeastern Belgian Congo. *C. occidentalis* (=*C. abyssinicus occidentalis*) is a member of the *abyssinicus* group, to which those of the Lower Congo also belong. *Colobus matschiei* Neumann (1899), based on specimens from Kavirondo, was treated as a synonym of *C. occidentalis* by Elliot (1913), after he had compared the type of *matschiei* with examples of *occidentalis*. In the same year (1913) Matschie considered *C. matschiei* entitled to rank as a species, and described five new forms of it as subspecies, two of them from the Rain Forest of the Belgian Congo.

The earliest name applicable to the present large series of the black-backed form of *Colobus* is *Colobus palliatus cottoni* Lydekker (1905), the type locality of which is about two hundred miles east of the district (Avakubi, Gamangui, Niapu, and Akenge) where the American Museum Congo Expedition specimens were collected. The specific name *palliatus* is, however, antedated by *angolensis*, so that the designation here adopted (p. 466) is *Colobus angolensis cottoni*.

The known forms of the *Colobus abyssinicus* and *C. angolensis* groups, so far as known to me, are in the order of date and with their type localities, as follows:

Colobus abyssinicus Group[1]

1816. *L[emur] abyssinicus* Oken. (=*Colobus abyssinicus abyssinicus*). Abyssinia.
1835. *Colobus guereza* Rüppell. (=*C. a. guereza*). South and West Abyssinia (Provinces of Godjam and Kulla).
1885. *Colobus guereza caudatus* Thomas. (=*C. a. caudatus*). Mount Kilimanjaro.
1887. *Guereza occidentalis* Rochebrune. (=*C. a. occidentalis*). Noki, Lower Congo (near mouth).
1899. *Colobus matschiei* Neumann. (=*C. a. matschiei*). Kavirondo, Lake Victoria.
1900. *Colobus abyssinicus poliurus* Thomas. Omo River, north of Lake Rudolf.
1902. *Colobus gallarum* Neumann. (=*C. a. gallarum*). Mountains near source of Webbi Shebeli, Abyssinia.
1912. *Colobus abyssinicus kikuyuensis* Lönnberg. Escarpment Station, British East Africa.
1913. *Colobus poliurus managaschæ* Matschie. (=*C. a. managaschæ*). Managascha forest, west of Addis Abbeba, Abyssinia.

[1]Full citations for the names here given may be found in the general list of the described forms of *Colobus* given above (pp. 435–441).

1913. *Colobus caudatus thikæ* MATSCHIE. (=*C. a. kikuyuensis*). West slope of Mount Kenia.
1913. *Colobus caudatus laticeps* MATSCHIE. (=*C. a. kikuyuensis*). West slope of Mount Kenia.
1913. *Colobus matschiei uellensis* MATSCHIE. (=*C. a. ituricus*). "Uelle," Belgian Congo. (Not satisfactorily identifiable.)
1913. *Colobus matschiei ituricus* MATSCHIE. (=*C. a. ituricus*). "Ituri," Belgian Congo.
1913. *Colobus matschiei dianæ* MATSCHIE. (=*C. a. dianæ*). "Kissenge." Northeast and east side of Lake Albert-Edward.
1913. *Colobus matschiei dodingæ* MATSCHIE. (=*C. a. dodingæ*). Southwest of Dodinga Mountains, Uganda.
1913. *Colobus matschiei brachychaites* MATSCHIE. (=*C. a. brachychaites*). Near Modi, between Kaya and Dufile, Lado Enclave.
1913. *Colobus abyssinicus roosevelti* HELLER. Mau forest, British East Africa. (Referable to typical *C. matschiei*).
1913. *Colobus abyssinicus percivali* HELLER. Mount Uaragess, Matthews Range, north of Mount Kenia.
1913. *Colobus abyssinicus terrestris* HELLER. Rhino Camp, Lado Enclave. (Not separable from *C. a. brachychaites*.)
1914. *Colobus occidentalis ituricus* LORENZ. Near Mawambi, Ituri Forest, Belgian Congo. (Same as *Colobus matschiei ituricus* Matschie of earlier date, though described as a new subspecies.)
1914. *Colobus (Guereza) escherichi* MATSCHIE. (=*C. a. escherichi*). Gombe, Sanga River, French Congo.
1914. *Colobus occidentalis rutschuricus* LORENZ. (=*C. a. rutschuricus*). Sassa River, southeast of Lake Albert-Edward.

Colobus angolensis Group

1860. *Colobus angolensis angolensis* SCLATER. Near Bembe, North Angola.
1868. *Colobus palliatus* PETERS. (=*C. a. palliatus*). Pangani River, Zanzibar coast of East Africa.
1901. *Colobus ruwenzorii* THOMAS. (=*C. a. ruwenzorii*). Northwest flank of Mount Ruwenzori.
1902. *Colobus sharpei* THOMAS. (=*C. a. sharpei*). Fort Hill Nyasa-Tanganyika Plateau.
1905. *Colobus palliatus cottoni* LYDEKKER. (=*C. a. cottoni*). Zokwa, between Mahagi and Irumu, Upper Ituri, Belgian Congo.
1908. *Colobus angolensis sandbergi* LÖNNBERG. Near Lufizi River, Upper Zambezi drainage, Portuguese Angola.
1913. *Colobus palliatus mawambicus* MATSCHIE. Pemba, between Irumu and Mawambi, Belgian Congo. Referable to *Colobus angolensis cottoni*.
1913. *Colobus palliatus weynsi* MATSCHIE. (=*C. a. weynsi*). "Unterer Congo." Lake Leopold II region.
1914. *Colobus mawambicus nahani* MATSCHIE. Panga, Aruwimi River, Belgian Congo. Referable to *Colobus angolensis cottoni*.
1914. *Colobus maniemæ* MATSCHIE. (=*C. a. maniemæ*). Near Kibombo, Lualaba River, Belgian Congo.

1914. *Colobus adolfi-friederici* MATSCHIE. (=*C. a. adolfi-friederici*). Rugege forest, east of Lake Kivu.

1914. *Colobus langheldi* MATSCHIE. (=*C. a. langheldi*). Manyema country, west of Lake Tanganyika, Belgian Congo.

1914. *Colobus benamakimæ* MATSCHIE. (=*C. a. benamakimæ*). Sankuru River, Belgian Congo.

The two West African forms of black-and-white *Colobus* are *Colobus satanas* Waterhouse (1838), Fernando Po; and *Colobus vellerosus* (I. Geoffroy) (1834), Gold Coast to Senegambia.

The forms of the *Colobus abyssinicus* group listed above number twenty-two; those of the *Colobus angolensis* group, thirteen. It is probable that most of these thirty-five forms will prove to be recognizable geographic forms, and quite certain that a number of them will be later assigned to synonymy. According to the rules of priority *Colobus matschiei brachychaites* Matschie (=*C. abyssinicus brachychaites*) takes the place of *Colobus abyssinicus terrestris* Heller, both from nearby localities in Lado Enclave. The volume containing Matschie's paper here in question is dated on the cover of the completed volume as issued "Décembre 1913," but the title cover of fascicule 2, in which Matschie's paper appeared, shows clearly that it was issued "Août 1913." Heller's paper is dated "October 21, 1913." This indicates nearly two months' priority for Matschie's paper over Heller's.

Colobus abyssinicus roosevelti Heller should also be referred to *Colobus abyssinicus matschiei* Neumann, as Matschie has recognized specimens from Mau Forest (type locality of *roosevelti*) as referable to typical *matschiei*.

Comparative Summary of External Measurements—Average (Minimum-Maximum)—of Forms of *Colobus* from Northeastern Belgian Congo

Colobus powelli powelli

	Total Length	Head and Body	Tail Vertebræ	Hind Foot	Ear
17 ♂	1262(1140–1351)	540(455–590)	726(650–800)	186(170–198)	39(35–42)
12 ♀	1235(1150–1340)	524(480–565)	713(645–790)	182(170–202)	37(35–40)

Colobus powelli brunneus

	Total Length	Head and Body	Tail Vertebræ	Hind Foot	Ear
10 ♂	1295(1215–1335)	582(525–610)	714(633–785)	191(180–200)	40(38–42)
5 ♀	1268(1225–1315)	559(510–585)	709(650–750)	189(183–203)	39(35–42)

Colobus abyssinicus ituricus

	Total Length	Head and Body	Tail Vertebræ	Hind Foot	Ear
16 ♂	1405(1270–1550)	593(535–690)	811(670–885)	191(175–207)	44(37–50)
13 ♀	1325(1235–1410)	554(485–640)	773(715–825)	179(165–190)	40(35–43)

Colobus angolensis cottoni

	Total Length	Head and Body	Tail Vertebræ	Hind Foot	Ear
21 ♂	1405(1310–1470)	581(490–640)	824(720–890)	192(180–205)	44(39–46)
15 ♀	1361(1230–1470)	561(505–610)	800(645–880)	186(171–200)	41(37–45)

Comparative Summary of Cranial Measurements—Average (Minimum-Maximum)—of Forms of *Colobus* from Northeastern Belgian Congo

Colobus powelli powelli

	Greatest Length	Condylobasal Length	Occipitonasal Length	Zygomatic Breadth
13 ♂	113.2(105.1–128.0)	91.5(86.2–97.9)	93.4(87.7–107.6)	85.6(77.4–96.7)
10 ♀	103.0(95.5–109.7)	81.3(77.3–89.7)	85.7(79.5– 91.3)	75.7(71.7–78.6)

	Orbital Breadth	Mastoid Breadth	Upper Toothrow	Upper Molars
13 ♂	67.6(63.3–77.4)	65.5(60.0–69.8)	40.3(38.0–44.0)	21.5(19.6–25.0)
10 ♀	62.0(56.7–67.2)	61.1(59.2–64.1)	35.9(34.2–38.0)	21.0(20.1–21.9)

Colobus powelli brunneus

	Greatest Length	Condylobasal Length	Occipitonasal Length	Zygomatic Breadth
17 ♂	118.7(112.2–130.7)	97.0(92.3–107.7)	96.3(91.6–103.5)	91.1(86.8–97.4)
12 ♀	104.1(97.8–109.7)	85.7(81.7– 88.4)	86.2(80.1– 92.1)	76.3(70.3–81.0)

	Orbital Breadth	Mastoid Breadth	Upper Toothrow	Upper Molars
17 ♂	71.7(65.5–77.7)	69.9(63.5–76.4)	41.2(38.0–45.5)	21.3(19.7–23.4)
12 ♀	63.1(60.4–66.1)	61.4(52.0–67.3)	36.7(34.2–39.1)	20.6(19.2–22.2)

Colobus abyssinicus iturícus

	Greatest Length	Condylobasal Length	Occipitonasal Length	Zygomatic Breadth
17 ♂	116.0(104.4–126.3)	99.8(87.0–110.3)	92.6(84.6–96.5)	81.2(70.4–88.5)
13 ♀	107.2(104.0–114.4)	92.3(84.9– 97.3)	87.3(82.4–94.6)	76.7(71.2–83.5)

	Orbital Breadth	Mastoid Breadth	Upper Toothrow	Upper Molars
17 ♂	68.0(59.4–73.4)	67.1(59.6–77.3)	41.0(37.2–47.5)	21.3(20.0–22.6)
13 ♀	65.4(61.2–69.7)	62.6(58.4–69.2)	37.7(34.5–39.5)	20.5(19.2–21.4)

Colobus angolensis cottoni

	Greatest Length	Condylobasal Length	Occipitonasal Length	Zygomatic Breadth
25 ♂	114.0(105.3–122.8)	96.8(90.0–107.0)	92.6(87.2–99.3)	84.4(80.0–92.6)
17 ♀	107.5(102.9–113.8)	88.8(78.5– 94.9)	88.5(84.1–94.3)	77.4(69.6–82.8)

	Orbital Breadth	Mastoid Breadth	Upper Toothrow	Upper Molars
25 ♂	71.2(67.0–81.2)	69.3(63.5–74.5)	39.4(37.0–42.3)	20.8(19.0–22.5)
17 ♀	65.5(59.3–72.0)	63.5(59.3–69.0)	36.4(33.8–38.3)	20.0(18.2–21.2)

PONGIDÆ

Ponginæ

Pan Oken

Simia, part, of various authors; not *Simia* (*s.s.*) Linnæus, 1758, type *Simia sylvanus* Linnæus.

1812. *Troglodytes* E. GEOFFROY, Ann. Mus. Hist. Nat., Paris, XIX, p. 87. Type, *Troglodytes niger* E. Geoffroy = *Simia troglodytes* Gmelin = *Simia satyrus* Linnæus, 1758 (not of 1766). Preoccupied by *Troglodytes* Vieillot, 1806, for a genus of birds.

1816. *Pan* OKEN, 'Lehrb. Naturges.,' Th. III, Abth. 2, pp. xi, 1230. Type, *Pan africanus* Oken = *Troglodytes niger* E. Geoffroy = *Simia troglodytes* Gmelin = *Simia satyrus* Linnæus, 1758.

1820. *Mimetes* LEACH, Thomson's Ann. Philos., XVI, August, p. 104. Type, by original designation, *Simia troglodytes* Gmelin = *Simia satyrus* Linnæus, 1758.

1828. *Theranthropus* BROOKES, 'Cat. Anat. and Zool. Museum of Joshua Brookes,' London, p. 28. Type, by monotypy, *Troglodytes niger* E. Geoffroy = *Simia troglodytes* Gmelin = *Simia satyrus* Linnæus, 1758.

1838. *Anthropopithecus* BLAINVILLE, Ann. Franç. et Étrang. Anat. et Physiol., II, p. 360. Type, *Anthropopithecus troglodytes* (Gmelin) = *Simia satyrus* Linnæus, 1758.

1841. *Hylanthropus* GLOGER, 'Hand. u. Hilfsbuch Naturges.,' I, pp. xxvii, 34. Type, *Hylanthropus troglodytes* (Gmelin) = *Simia satyrus* Linnæus, 1758.

1856. *Satyrus* MAYER, Arch. Naturgesch., I, p. 281, part; for Gorillas, Chimpanzees and Ourangs, collectively.

1860. *Pseudanthropos* REICHENBACH, "Fortsetzung Vollständ. Naturgesch."; 1862, 'Vollständ. Naturges. Affen,' p. 191. To replace *Troglodytes* E. Geoffroy, preoccupied.

1866. *Pongo* HÆCKEL, 'Gen. Morphol. Organismen,' II, p. cl, footnote. To replace *Troglodytes* E. Geoffroy, preoccupied. Not *Pongo* Oken, 1816.

1866. *Engeco* HÆCKEL, 'Gen. Morphol. Organismen,' II, p. cl, footnote. Type, *Engeco troglodytes* (Gmelin) = *Simia satyrus* Linnæus, 1758.

1895. *Anthropithecus* Hæckel, 'Syst. Phyl. Wirbelth.,' III, p. 600. (= *Anthropopithecus* Blainville).

1905. Fsihego (subgenus of *Pan*) De Pauw, 'Notes sur la Solidification et le Montage des grands Mammifères,' Saint Nichols (Belgium), p. 13, Pl. 1 (mounted animal and skeleton). Type, *Fsihego ituriensis* Matsche. *Simia Anthropopithecus*) *ituricus* Matschie, however, was not published until 1912.

A dozen different generic designations have been employed for the chimpanzees, most of them proposed distinctively for this group and based on the same genotype. The only available name, under the 'International Code of Zoological Nomenclature,' is *Pan* Oken (1816), brought to light by Palmer[1] in 1904. *Troglodytes* E. Geoffroy (1812) and *Mimetes* Leach (1820) proved to be preoccupied and various other names were given to replace them. For many years *Anthropopithecus* Blainville (1838) was the current name for the group. *Pan* may be said to have now come into general use by a large number of systematists, it being

[1] 1904, 'Index Generum Mammalium,' p. 109.

adopted without reservation by Elliot in 1913[1] as the correct generic name of the group.

Matschie[2] however rejected *Pan* in 1904 on the ground that Oken's nomenclature in his 'Lehrb. Naturgesch.' is not consistently binominal, and adopted *Simia* Linnæus (1758) as the correct name for the chimpanzee, which is the "first species" of the genus. It has since been shown to belong, under the principle of tautonomy, to the Barbary ape.[3] Rothschild, following Matschie, also adopted *Simia* for the chimpanzees, stating: "I, therefore, who, in opposition to Professor Matschie, consider Oken's names applicable, would have had to accept *Pan* as the generic name of the Chimpanzee, as do many American writers, but for the fact that a still older name exists,"[4] accepting *Simia* under the "first species" rule, as did Matschie.

In this connection reference may be made to a singular lapsus by both Matschie and Rothschild in compiling the generic synonymy of the orangs, the date of *Satyrus* Lesson being given by them as 1799 instead of 1840, erroneously making the date of *Satyrus* Lesson the same (1799) as that of *Pongo* Lacépède; but Rothschild correctly adopts, "as the least confusing name," *Pongo* Lacépède for the orang-outans.

The number of forms (species and subspecies) of chimpanzees cannot now be even approximately determined, nor can the ranges of any of them be defined except provisionally and in general terms, nor their synonymy positively allocated. About thirty-five species names have been proposed for chimpanzees, a few of them as substitutes for other names of earlier date. Of the twenty-eight proposed for supposed new forms, eighteen were published during the years 1912, 1913, 1914, all but one by a single author.

In 1904 Matschie reviewed the group of chimpanzees, under the generic designation *Simia*, recognizing seven species, all previously described.[5] In the following year the chimpanzees were again revised by Rothschild, also under the generic name *Simia*, in a general paper on the anthropoid apes. He recognized twelve forms (5 species, 7 subspecies),

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[1]1913, 'Rev. Primates,' III, (1912), pp. 227–254.

[2]1904, 'Bemerkungen über die Schimpansen,' Sitzungsb. Ges. Naturf. Fr. Berlin, pp. 55–69. Discussion of the generic name of the group, pp. 55–58.

[3]Cf. Thomas, 1911, Proc. Zool. Soc. London, p. 125; Elliot, 1913, 'Rev. Primates,' II, pp. 172–173.

[4]1904, Proc. Zool. Soc. London, II, (April 1905), p. 419.

[5]Matschie, Paul. 1904, 'Bemerkungen über die Schimpansen,' Sitzungsb. Ges. Naturf. Fr. Berlin, pp. 55–69.

Species recognized: (1) *Simia satyrus* Linnæus, (2) *Simia calvus* (Du Chaillu), (3) *Simia vellerosus* (Gray), (4) *Simia schweinfurthii* (Giglioli), (5) *Simia fuscus* (A. B. Meyer), (6) *Simia leucoprymnus* (Lesson), (7) *Simia chimpanse* (Mayer).

Cf. also: Matschie, Paul. 1900, 'Einige Bemerkungen über die in Berlin aufbewahrten Exemplare von Anthropopithecus,' Sitzungsb. Ges. Naturf. Fr. Berlin, pp. 77–85.

one of the subspecies being described as new.[1] He differed widely from Matschie, whose paper he reviewed at length, not only in the number of forms he recognized but in the allocation of names given by previous authors.

The next formal revision of the chimpanzees was made by Elliot in his great work on the Primates published in 1913.[2] Eleven forms are recognized, of which ten are full species and one is a subspecies, all under the generic name *Pan* Oken, now for the first time adopted in a revision of the chimpanzee group. No new forms were proposed, but four specimens from the Cameroon were recorded at the end of his review as not satisfactorily referable to any of the forms he formally recognized. All of them later became types of new species by another author.[3] Four forms reduced to synonyms by Matschie are given recognition. The differences between Elliot's and Rothschild's list are radical as regards the allocation of forms, their relationships, and nomenclature, and Rothschild's new subspecies is referred to *Pan fuliginosus* as a synonym.

The type localities and ranges of all but two of the forms of chimpanzees described prior to 1912 are West African, being included within the area (chiefly the coastal portion) extending from French Congo to Gambia; the other two are from the extreme eastern border of Belgian Congo. Since this date four have been added from Cameroon and eleven from the Upper Congo drainage. As a matter of interest the forms described to date, so far as known to me, are listed below, with their type localities stated as definitely as practicable, and the nature of the material on which they were originally founded.

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[1]Rothschild, Walter. 1905, 'Notes on Anthropoid Apes,' Proc. Zool. Soc. London, (1904), II, April, pp. 413–440, Pl. XXIV, text figs. 99–117. Chimpanzees, pp. 420–431, Pl. XXIV (colored; *Simia vellerosus* (Gray), very old male), and text figs. 105–115.

Species and subspecies recognized: (1) *Simia vellerosus* (Gray), (1*a*) *Simia vellerosus fuliginosus* (Schaufuss), (2) *Simia satyrus* (Linn.), (2*a*) *Simia satyrus marungensis* (Noack), (2*b*) *Simia satyrus schweinfurthi* (Giglioli), (3) *Simia koolookamba* (Du Chaillu), (4) *Simia aubryi* (Gratiolet & Alix), (5) *Simia pygmæus* Schreber, (5*a*) *Simia pygmæus fuscus* (Mayer), (5*b*) *Simia pygmæus leucoprymnus* (Lesson), (5*c*) *Simia pygmæus chimpanse* Matschie, (5*d*) *Simia pygmæus raripilosus* subsp. nov.

[2]Elliot, Daniel Giraud, 1913, 'A Review of the Primates,' I–III. Although printed in 1912, the actual date of issue was June 1913. The chimpanzees occupy pp. 227–254, Pls. XXXIV–XXXIX, and 7–8, of Vol. III.

Species and subspecies recognized: (1) *Pan calvus* (Du Chaillu), (2) *Pan fuliginosus* (Schaufuss), (3) *Pan satyrus* (Linnæus), (4) *Pan kooloo-kamba* (Du Chaillu), (5) *Pan leucoprymnus* (Lesson), (6) *Pan chimpanse* (Mayer), (7) *Pan schweinfurthi* (Giglioli), (8) *Pan schweinfurthi marungensis* (Noack), (9) *Pan aubryi* (Gratiolet et Alix), (10) *Pan vellerosus* (Gray), (11) *Pan fuscus* (Meyer).

[3]Matschie, Paul. 1914, 'Neue Affen aus Mittelafrika,' Sitzungsb. Ges. Naturf. Fr. Berlin, pp. 323–342.

Descriptions of three new species of *Gorilla*, ten new species of *Anthropopithecus* (=*Pan*), ten new forms of the *Colobus* group, two (including a new genus *Cercolophocebus*) of the *Cercocebus* group. It also includes critical comment on Elliot's treatment of the gorillas and chimpanzees in his 'Review of the Primates,' including a list of errors in the spelling of locality names.

Specific and Subspecific Names Referable to *Pan*

West Africa

1758. *Simia satyrus* LINNÆUS, 'Syst. Nat.,' 10th Ed., p. 25. Based on Tulp's figure and description of a black ape from West Africa.

1788. *Simia troglodytes* GMELIN, LINNÆUS, 'Syst. Nat.,' I, p. 26. *Simia satyrus* Linnæus, 1758, renamed.

1812. *Troglodytes niger* E. GEOFFROY, Ann. Mus. Hist. Nat., Paris, XIX, p. 87. *Simia satyrus* Linnæus, 1758, renamed.

1831. *Troglodytes leucoprymnus* LESSON, 'Illustr. Zool.,' Pl. XXXII. Male, skin and skull of an individual long kept in confinement, originally "pris sur la côte de Guinée."

1855. *Troglodytes tschego* DUVERNOY, Arch. Mus. Hist. Nat., Paris, VIII, pp. 8–248 (passim), Pls. I–XVI (Pl. I is legended "*Troglodytes tschego* Duv.," but usually the species is mentioned as "Tschego" or "Troglodyte Tschégo." No diagnosis nor type locality; only comparative mention in a paper on the anatomy of anthropoid apes. Usually synonymized with *Pan satyrus* (Linnæus) by later authors.

1856. *Satyrus chimpanse* MAYER, Arch. Naturgesch., I, p. 282. No type locality; no known type. A new specific name for the Chimpanzee group collectively.

1860. *Troglodytes calvus* DU CHAILLU, Proc. Boston Soc. Nat. Hist., VII, August 20, p. 296. Based on a single female from the interior of Gaboon, south of Cape Lopez. Other specimens mentioned. Type in British Museum; skull figured by Elliot (1913, 'Rev. Primates,' III, (1912), Pls. XXXIV, XXXV).

1860. *Troglodytes kooloo-kamba* DU CHAILLU, Proc. Boston Soc. Nat. Hist., VII, November 23, p. 358. One specimen; sex and age not stated. Ashankola Mts., upper Ovenga River, French Congo. Type in British Museum; skull figured by Elliot (1913, 'Rev. Primates,' III, (1912), Pls. XXXVI, XXXVII), p. 242.

1862. *Troglodytes vellerosus* GRAY, Proc. Zool. Soc. London, p. 181. Provisional name in the text, based on a skin without skull from North Cameroon.

1866. *Troglodytes aubryi* GRATIOLET ET ALIX, Nouv. Arch. Mus. Hist. Nat. Paris, II, p. 258. Young female. "Afrique équatoriale."

1870. *Pseudanthropus fuliginosus* SCHAUFUSS, 'Nunquam Otiosus, Zool. Mittheil.,' p. 345. Skin and skull, immature. French Congo. Exact type locality in doubt.

1895. *Anthropopithecus fuscus* MEYER, Abhandl. Ber. Zool. Anthrop. Mus. Dresden, V, No. 14, p. 7, footnote. Based on a young female in the Dresden Zoological Gardens; type not known to exist. Type locality unknown, but supposed to be the Gold Coast.

1904. *Simia schimpanse* MATSCHIE, Sitzungsb. Ges. Naturf. Fr. Berlin, p. 68 (in text). To replace *Satyrus chimpanse* Mayer (1856), in case the latter should prove untenable.

1905. *Simia pygmæus raripilosus* ROTHSCHILD, Proc. Zool. Soc. London, (1904), II, April, pp. 422, 430, text-fig. 111 (p. 428; head). French Congo, but type locality not definitely indicated. Type in Tring Museum.

1914. *A[nthropopithecus] ellioti* MATSCHIE, Sitzungsb. Ges. Naturf. Fr. Berlin, p. 327 (in text). Adult male skin, from near Bascho, North Cameroon.

1914. *Anthropopithecus oertzeni* MATSCHIE, Sitzungsb. Ges. Naturf. Fr. Berlin, p. 327. Adult male skin, from near Bascho, North Cameroon.

1914. *Anthropopithecus reuteri* MATSCHIE, Sitzungsb. Ges. Naturf. Fr. Berlin, p. 328. Adult male skin and skeleton from near the mouth of the Dume River, South Cameroon.

1914. *Anthropopithecus ochroleucus* MATSCHIE, Sitzungsb. Ges. Naturf. Fr. Berlin, p. 329. Adult male skin and skeleton. North of Sangmelima, upper Lobo River, South Cameroon.

1919. *Anthropopithecus schneideri* MATSCHIE, Zeitschr. Ethnol., LI, p. 75, figs. 4–5. Type, an adult male, from Fernan Vaz district, French Congo, exact locality not known.

1919. *Anthropopithecus papio* MATSCHIE, Zeitschr. Ethnol., LI, p. 80, fig. 7. Type, a male, from Barombi, Elephant Lake, Cameroon.

Upper Congo Drainage and Borderlands

1872. *Troglodytes schweinfurthii* GIGLIOLI, Ann. Mus. Civ. Stor. Nat. Genova, III, p. 114 footnote, 135. Two young skulls. Upper Uele drainage, Niam-niam country, northeastern Belgian Congo.

1887. *Troglodytes niger* var. *marungensis* NOACK, Zool. Jahrb., September, II, p. 291, Pl. x. An immature imperfect skull, without skin, the skull lacking the facial portion. Manda, Marungu, west of Lake Tanganyika, Belgian Congo.

1905. *Fsihego ituricus* De Pauw (cf. addendum, p. 497).

1912. *Simia* (*Anthropopithecus*) *nahani* MATSCHIE, Rev. Zool. Africaine, II, September, p. 118. Type, an adult male, skin and skull; also two immature females. All from Banalia, Aruwimi River, Belgian Congo.

1912. *Simia* (*Anthropithecus*) *cottoni* MATSCHIE, Rev. Zool. Africaine, II, September, p. 124. Type, an immature male; also two other specimens, all with partly developed permanent dentition. All three from Sassa (Ishasha) River, southeast of Lake Albert Edward, western border of Uganda.

1912. *Simia* (*Anthropopithecus*) *ituricus* MATSCHIE, Rev. Zool. Africaine, II, September, p. 121. Adult male, skin and skull. Makala-Avakubi Road, Belgian Congo.

1913. *Simia* (*Anthropopithecus*) *adolfi-friederici* MATSCHIE, Ann. Soc. Zool. Malacol. Belgique, XLVII, (1912), August, p. 46. Adult male, skin and skeleton. Bugoie forest, northeast of Lake Kivu, western border of German East Africa.

1913. *Simia* (*Anthropopithecus*) *kooloo-kamba yambuyæ* MATSCHIE, Ann. Soc. Zool. Malacol. Belgique, XLVII, (1912), August, p. 46. Skin of an adult without skull. Yambuya, lower Aruwimi River, Belgian Congo.

1914. *Anthropopithecus purschei* MATSCHIE, Sitzungsb. Ges. Naturf. Fr. Berlin, p. 332. Adult male, skin and skeleton. Tschingogo Forest, between Lake Kivu and Lake Luhondo, western border of German East Africa.

1914. *Anthropopithecus pfeifferi* MATSCHIE, Sitzungsb. Ges. Naturf. Fr. Berlin, July, p. 333. Adult female, skin and skeleton. Three days march east of Russissi on the border of Urundi near sources of Akanjaru, western border of German East Africa.

1914. *Anthropopithecus graueri* MATSCHIE, Sitzungsb. Ges. Naturf. Fr. Berlin, July, p. 333. Adult female, skin and skeleton. Eighty kilometers northwest of Boko, west shore of Lake Tanganyika, Belgian Congo.

1914. *Anthropopithecus castanomale* MATSCHIE, Sitzungsb. Ges. Naturf. Fr. Berlin, July, p. 334. Young male, skin and skeleton. Northeast shore of Lake Tanganyika, border of Urundi, German East Africa.

1914. *Anthropopithecus calvescens* MATSCHIE, Sitzungsb. Ges. Naturf. Fr. Berlin, July, p. 334. Adult male, skin and skull. On road from Baraka to Kasongo, between Niembo and Kabambare, on the Luama River, west of Lake Tanganyika, Belgian Congo.

1914. *Anthropopithecus schubotzi* MATSCHIE, Sitzungsb. Ges. Naturf. Fr. Berlin, July, p. 335. Adult male skull. Between Kilo and Irumu, upper Ituri River, west of Lake Albert Edward, Belgian Congo.

1914. *Anthropopithecus steindachneri* LORENZ, Anz. Ak. Wiss. Wien, Math.-Nat. Kl., LI, No. 27, December, pp. 550–551. "Ituri-Urwald . . . bei dem Dorfe Moëra," north of Beni, Belgian Congo. Type (and only specimen), a skin and skeleton of an old male.

Little is known of the types or original material on which the species of the earlier authors were based, as few of the types of those described prior to 1860 appear to have been preserved. The species themselves have been interpreted by later authors on other material. In several instances the original type was a skin without skull, or a skull without skin, and in many instances were immature specimens. Nearly all of the numerous forms recently described were based on single specimens, and in the few cases where paratypes were available, they were so immature as to have no diagnostic value. Hence the descriptions of supposed new forms are descriptions of individuals merely, not of "species," or even racial forms. This regrettable disregard for possible variation in this as in other groups of mammals tends to disconnect taxonomy from natural history. I do not hesitate to place in synonymy most of the chimpanzees described by Matschie in later years from the interior of Africa. The diagnostic characters cited are amply covered by the present series. I have my doubts only as to racial forms occurring in the higher mountain forests and the extreme eastern edge of their distribution.

Elliot's review of the chimpanzees is based on his personal examination of the types, so far as they are known to be extant, and such other material as existed at that time in the principal museums of Europe. It was of course impracticable for him to bring all this material together for direct comparison, and he had to depend upon his notes and his exceptionally good memory in reaching final decisions; but he spared neither time nor expense to render his examinations thorough and trustworthy. They cannot be taken, however, as infallible, but his attitude was conservative, and from the purely nomenclatural side his work is commendable. The fine series collected by Arrhenius in the Rutshuru region and so carefully described by Lönnberg and the thirty specimens collected by Lang and Chapin in the Ituri-Uele region are most important contributions furnishing further proof of the great plasticity of the skull and facial characters, which latter are now for the first time available through

Lang's fine series of portraits taken in the field from specimens in the flesh. This series helps confirm my own conclusions as to the great variation existing in the Pongidæ and adds many convincing details. Elliot's remarks upon the group as a whole, however, are so much to the point that it seems desirable to here reproduce them at considerable length.

It cannot be said that at the present time, a list of the species and races of Chimpanzees ean be satisfactorily given. We really know so little about them; the color of the young, the changes that take place from youth to age, the hues of the face, hands, and feet, whether these are permanent from youth to the adult state, what, if any, are the distinctions in color between the sexes (in some species we know there is no difference, but in others we are not so sure); what are the limits of the dispersion of those we gaily describe as distinct—do two or more species or races, call them what you will, dwell together in amity retaining their distinctive characteristics within limited areas; all these problems and more arise to greet us, and for the most of them we have no answer.

The material gathered in most Museums is so small and unsatisfactory, that it is of no avail in deciding the facts we all seek. The best, and so far as I have found, the only considerable collection of these animals extant to-day, is in the Berlin Museum, where about eighty skins and perhap as many skulls have been brought together from different parts of Africa. But when we study these, we constantly meet with difficulties that not only perplex us, but prevent any satisfactory decision from being reached. It is easy enough to solve a difficulty by describing some troublesome specimens as new, and leaving the proof for some one else to discover, but that does not solve legitimate doubts, nor help overmuch to teach us the truth we desire to know.

In seeking for characters upon which specific differences may be founded we naturally first examine the crania, and at once we are confronted with a fact that prevails among all the great Apes, that individual variations exist to such an extent, that no one character can be depended upon, for no two skulls are alike, and they differ from each other in a manner equally great as is observed among human skulls. I have already commented upon this fact when discussing the specific values of the Gorilla and the Ourang-utan, where in the latter I was compelled to decline to recognize more than one species after most careful investigation of a very large series of crania; and to recognize only with great doubt certain forms of Gorilla as possible species, not on any cranial character, but simply on the color of the fur which eventually may prove, as our knowledge of these animals increases, to be merely phases of pelage attributable solely to age. Certainly neither among Gorillas nor Ourang-utans can any specific difference be safely based upon cranial characters, and in this respect the Chimpanzees are no exception. At present, therefore, we rely mainly for our specific characters of these animals upon the texture, length and color of the hair; the presence or absence of beard; color of the face; sometimes of the hands and feet; seldom on the teeth, (for characters among these are rarely found), the extent in which the face is prognathous, and the presence or absence of a part in the hair on the head, or the existence of baldness, and its extent behind the ears. No doubt some of these are valid specific characters, and it is equally certain that there are several species of Chimpanzees, but it may also be regarded as a fact, that some of the characters above cited as specific are not valid, and that, with the material at present

available no one can decide how many of the specimens described have an undoubted specific standing. That problem will be solved by our successors; at present we are groping in the dark so far as the number of existing species of the great Anthropoids are concerned.—1913, 'Review of the Primates,' III, pp. 227–229.

. . . Thus far the material in the Berlin Museum, which is, without exception, the most extensive to be found anywhere, instead of assisting us to solve the problem of how many species exist, only makes it more difficult than ever, for the skulls present such endless variations, and the skins, by the diverse coloring of the fur, and the different hues and disposal of tints on the face, hands and feet, exhibited at times in examples from the same locality, that it is practically impossible to decide how many species really do exist, or if too many have not already been recognized. Herr Matschie has given much thought and study to this material, but was not by any means satisfied, at the time I examined these specimens with him, that the correct number of species had been demonstrated. Also which examples represent races, and which species, has by no means been ascertained.—Idem, p. 232.

. . . If our determinations are correct, we have the singular fact that nearly all the recognized forms of Chimpanzees, like the Gorillas, are crowded together on a small portion of West Africa, leaving us to wonder how so many distinct forms, if they are such, could exist in so restricted a territory and preserve their specific characters intact.—Idem, p. 233.

The sixteen forms (fourteen described since Elliot wrote the above), from the Upper Congo and adjoining regions might well suggest a similar inquiry respecting Central Africa.

Since Elliot wrote on the chimpanzees, considerable series have been brought together from single localities that throw much light upon the subject of purely individual variation among adult chimpanzees, and the changes due to age. Lönnberg in his report on the mammals collected by Arrhenius[1] in the region of Lake Albert Edward and Lake Kivu, published in 1917, has given a detailed account of a series of ten chimpanzees collected on the Rutshuru River, of which seven are adult and three immature, all taken in practically the same forest. The variations in external, cranial, and dental characters are described at length, he reaching the conclusion that "In spite of all differences it appears impossible for the present but to regard all as individual variations of one and the same race. This is of very high interest as very seldom wild animals from one and the same place vary in such a remarkable degree" (*loc. cit.*, p. 23). Further reference to this valuable paper will be made later in the present article.

As particularly pertinent to the general subject of "species" and individual variation, I transcribe the opening paragraph of a paper by

[1]Lönnberg, Einar. 1917, 'Mammals collected in Central Africa by Captain E. Arrhenius,' Kungl. Sven. Vet. Ak. Handl., Stockholm, LVIII, No. 2, September 1, pp. 1–110, Pls. I–XII, 11 text figs. Chimpanzees (*Anthropopithecus* cf. *cottoni* Matschie), pp. 18–27, Pls. V–VI.

H. V. Wilson of the University of North Carolina entitled 'In regard to Species and Sponges,'[1] just to hand at this writing:

In the language of systematic zoology, species are particularly "difficult to distinguish" in certain genera, in many genera of sponges, for instance. Where this is so, it is in large part due to the fact that many specimens from various regions have been reported on. In such cases we begin to be face to face with the facts (of variation) as they are, not as they are assumed to be, when the species description rests on one or two specimens or on specimens from one locality.

Pan schweinfurthii (Giglioli)

Plates CLII-CLXV; CLXVI, Figure 2; CLXVII

Troglodytes schweinfurthii GIGLIOLI, 1872, Ann. Mus. Civ. Stor. Nat. Genova, III, p. 135. Niam-niam country, northeastern Belgian Congo.

Troglodytes niger var. *marungensis* NOACK, 1887, Zool. Jahrb., II, p. 291, Pl. x. An immature imperfect skull, without skin, the skull lacking the facial portion. Manda, Marungu, west of Lake Tanganyika, Belgian Congo.

Fsihego ituriensis De Pauw, 1905 (cf. addendum, p. 497).

Simia (Anthropopithecus) nahani MATSCHIE, 1912, Rev. Zool. Africaine, II, p. 118. Type, an adult male, skin and skull; also two immature females. All from Banalia, Aruwimi River, Belgian Congo.

Simia (Anthropithecus) cottoni MATSCHIE, 1912, Rev. Zool. Africaine, II, p. 124. Type and two other specimens. Sassa (Ishasha) River, southeast of Lake Albert Edward, western border of Uganda.

Anthropopithecus cf. *cottoni* LÖNNBERG, 1917, Kungl. Sven. Vet. Ak. Handl., Stockholm, LVIII, No. 2, p. 18. Ten specimens from Rutshuru.

Simia (Anthropopithecus) ituricus MATSCHIE, 1912, Rev. Zool. Africaine, II, p. 121. Adult male from Makala-Avakubi Road, Belgian Congo.

Simia (Anthropopithecus) kooloo-kamba yambuyæ MATSCHIE, 1913, Ann. Soc. Zool. Malacol. Belgique, XLII, (1912), August, p. 46. Adult from Yambuya, Lower Aruwimi River, Belgian Congo.

Anthropopithecus calvescens MATSCHIE, 1914, Sitzungsb. Ges. Naturf. Fr. Berlin, p. 334. Adult male taken on the road from Baraka to Kasongo, between Niembo and Kabambare on the Luama River, west of Lake Tanganyika, Belgian Congo.

Anthropopithecus schubotzi MATSCHIE, 1914, Sitzungsb. Ges. Naturf. Fr. Berlin, p. 335. Adult male from between Kilo and Irumu, upper Ituri River, west of Lake Albert Edward, Belgian Congo.

Anthropopithecus steindachneri LORENZ, 1914, Anz. Ak. Wiss. Wien, Math.-Nat. Kl., LI, pp. 550–551. "Ituri-Urwald . . . bei dem Dorfe Moëra," north of Beni, Belgian Congo. Type an old male.

Represented by thirty specimens, essentially from two localities as regards environment—one section on the northeastern border of the Rain Forest (Aba, 3 specimens; Faradje, 9 specimens); the other, within the Rain Forest, and comprising seven collecting stations: Avakubi, Gamangui, Pawa and Ngayu (1 specimen from each), Niapu (4 specimens), Medje (6 specimens), Akenge (4 specimens). Aba and

[1] 1919, The Scientific Monthly, IX, No. 4, October, pp. 349–357.

Faradje are about 40 miles apart, and about 300 miles northeast of Akenge and Niapu, the most western of the Rain Forest stations. The seven stations in the Rain Forest are all within an area of about 70 miles square.

Twenty-four are skins with skulls and 6 are skulls only. In addition 23 skeletons were secured, ranging from young with milk dentition to old adults. The localities and dates of collecting are:

Aba, 3 (1 old ♂, 1 young ♂, 1 subadult ♀), December 25, 1911.

Faradje, 9 (nearly all adult), April 1, 3, 1911–November 12, 1912.

Akenge, 4 (3 adults, 1 juvenile), September 15, 29, October 4, 1913.

Pawa, 1 (young), July 28, 1914.

Medje, 6 (all adult), February 23, April 2, July 15, 1910; April 27, 29, June 16, 1914.

Niapu, 4 (2 adult, 2 immature), November 12, 14, December 19, 1913; January 20, 1914.

Gamangui, 1 (young ♀), February 15, 1910.

Ngayu, 1 (old ♂), December 24, 1909.

Avakubi, 1 (old ♂), March 10, 1914.

The external measurements—average (minimum-maximum)—of eleven adults of *Pan schweinfurthii*, taken from animals in the flesh, are as follows:

	Total Length	Hind Foot	Ear
7 ♂	834(770–925)	249(237–270)	77(66–95)
4 ♀	783(700–850)	227(220–235)	64(60–67)

The cranial measurements—average (minimum-maximum)—of fourteen adults of *Pan schweinfurthii* are as follows:

	Greatest Length	Condylobasal Length	Occipitonasal Length	Zygomatic Breadth
10 ♂	198(190–220)	156(145–170)	146(139–154)	133(124–139)
4 ♀	190(176–192)	151(139–155)	142(133–148)	126(107–130)

	Mastoid Breadth	Braincase Breadth	Orbital Breadth	Interorb. Breadth
10 ♂	124(117–133)	103(98–118)	108(101–115)	20.4(17.4–24.0)
4 ♀	121(103–124)	100(96–102)	103(91–105)	20.6(13.0–22.4)

	Postorb. Breadth	Breadth at Base Canines	Breadth outside m^3–m^3
10 ♂	70.4(67.8–74.1)	60.6(54.0–67.7)	56.8(52.0–61.3)
4 ♀	70.2(66.5–71.7)	58.1(50.8–63.0)	60.3(47.5–67.0)

	Upper Toothrow c–m^3	Upper Molars
10 ♂	58.9(54.7–62.8)	45.1(42.2–48.5)
4 ♀	55.6(52.6–58.0)	44.0(39.8–47.0)

Lönnberg[1] gives the cranial measurements—average (minimum-maximum)—of seven adult chimpanzees from Rutshuru, eastern Belgian Congo, as follows:

	Greatest Length	Condylobasal Length	Occipitonasal Length
2 ♂	191.7(186.0–197.5)	147.8(145.0–150.5)	146.4(141.8–151.0)
5 ♀	183.2(177.0–189.0)	141.8(137.5–144.6)	139.0(134.8–143.5)
	Zygomatic Breadth	Braincase Breadth	Orbital Breadth
2 ♂	127.3(123.5–131.0)	100.0(100.0–100.0)	100.1(98.5–103.7)
5 ♀	118.6(113.0–123.2)	96.2(92.4–100.0)	96.4(90.2–101.0)
	Interorb. Breadth	Breadth at Base Canines	Breadth at m^3
2 ♂	19.3(18.8– 19.8)	62.0(58.4– 65.5)	54.2 (53.6– 54.7)
5 ♀	14.2(11.6– 18.3)	51.6(50.0– 54.0)	54.4 (51.3– 58.0)
	Upper Molar Series	Upper True Molars	
2 ♂	44.7(43.1– 46.3)	30.6(29.5– 31.7)	
5 ♀	42.4(39.0– 44.8)	29.1(26.3– 30.5)	

Age and Individual Variation in Chimpanzees

As noted on a preceding page (p. 484), Lönnberg[2] gave in 1917 his results of a detailed study of a series of ten chimpanzees (skins with skulls) from a single collecting station near Rutshuru, on the Rutshuru River, "about half way between Lake Albert Edward and Lake Kivu," on the boundary between Belgian Congo and German East Africa. These specimens were provisionally referred to *Anthropopithecus cottoni* Matschie, originally described from immature specimens collected on the Sassa River, southeast of Lake Albert Edward, a locality "not geographically very distant from Rutshuru." This series of chimpanzees was the first large series of these apes from a single locality available to any investigator for comparative study. It included three males (one adult, one old adult, one young with the milk dentition and first molar) and seven females (five adult and two young with milk dentition). Each specimen is described in detail in respect to both external and cranial characters, and their individual differentiations are carefully noted. It is thus the first important contribution to a correct understanding of individual variation in chimpanzees. As supplementing Lönnberg, I am able to contribute further information to this hitherto little understood subject, based on thirty specimens collected by Lang and Chapin of the American Museum Congo Expedition from December 1909 to July 1914, of which nine are from a single locality (Faradje, at the extreme

[1] 1917, Kungl. Sven. Vet. Ak. Handl., Stockholm, LVIII, No. 2, September, p. 22.
[2] 1917, Kungl. Sven. Vet. Ak. Handl., Stockholm, LVIII, No. 2, September 1, pp. 18–27, Pls. v–vi.

northeast border of the Rain Forest district), and eighteen from neighboring collecting stations in a nearly uniform environment, hence essentially from a single locality, in the Upper Congo Rain Forest, since all of them were obtained within about a 50 mile radius from the central point of the area. I shall give first a summary of Lönnberg's results and conclusions, following this with a statement of my results and conclusions based on the Congo series.

YOUNG.—Lönnberg states that the three "young ones have a completely black pelage, but the chin is greyish white and there is a white patch above and surrounding the anal opening. The colour of the naked face is reddish brown, the colour of the dry skin somewhat resembling the palest shade of 'brownish drab,' or in other places a light shade of 'burnt amber.' The ears have also a similar tint. It is of course difficult to say whether this corresponds to the colour of the living animal, or not, but evidently it has had a light brownish face, perhaps with a russet tinge."

COLOR OF NAKED PARTS.—"The old animals have the naked parts much darker, so that at the first look they appear to be quite black in the face. One of the specimens, No. 224, is really quite black all over the face and on the ears." Others are described as having "the face quite black," but with the cheeks lighter or "reddish black" or (in different specimens) "russet brown," or a pale shade of "brownish drab," or (in the oldest male) "only the centre of the face being black, and the cheeks and the crown brown, mottled with black."

BALDNESS.—"In the young animals only the face is naked, already the fore-head a little above the eyes being sparingly beset with black hairs. All the adult animals display baldness in various degrees," the bare area varying in extent and in outline in different specimens. "The baldness increases evidently with age," as shown by the oldest male and the oldest female.

PELAGE.—A detailed account is given of the length of the hair on different parts of the body and at different ages, and of the "side whiskers" and postauricular tufts. "With increasing age the fur of some parts appears to become scantier than in the young animals not only on the head, but also on the throat. This is especially conspicuous on the old male in which also the hind neck is almost bare, only with scattered hairs."

COLOR OF PELAGE.—"The colour is also gradually changed with age, the adult being not quite [as] black as the young." But it is shown to vary irregularly, as one adult female is practically "black all over," while another female, evidently younger, "has the head decidedly brown-

ish," and "the back is overlaid with a brownish tint produced by brown tips to some hairs; the hind legs are similar, though with less brownish. . . . The beard on the throat is paler and somewhat more grayish brown, the scattered hairs on the chin are whitish grey."

The color of the different males is also described in detail, showing much variation in different individuals, concluding as follows: "The description thus given proves that the fur and its colour is rather variable in these Chimpanzees. Partly this variation is explained by the difference in age, the old ones gradually becoming more bald-headed and more pale brownish grey on the lower back and the hind legs. The almost complete blackness of the rather old female No. 224, and the shortness of the fur of the male No. 163 appear, however, without accordance with other facts and indicate a strange variability which is also displayed by the skulls, as will be set forth below."

General Size.—The males are slightly larger than the females both in external and cranial measurements. The total length of two males is given as 910 and 930 mm.; of three females, respectively, 830, 840, 890 mm., measured from the skins. They are hence not satisfactorily comparable with measurements taken from specimens in the flesh.

Cranial Measurements.—Lönnberg's table of cranial measurements is summarized above (p. 487). The average greatest length of the two adult male skulls is 192 mm.; of five females, 183 mm., the extremes of the latter being 177 and 189 mm. (For other measurements see table, *loc. cit.*). Lönnberg states that his measurements "show a very considerable variation, chiefly with regard to the orbits, interorbital space, and the teeth." He comments at length on these divergences in the different specimens, especially with reference to the dorsal outline of the superciliary ridge, which varies from an even line to one having a deep concavity above the interorbital space, a variation common to both sexes. He states that in one of the females "the mesial concavity amounts to nearly 4 mm., which does not sound much, but nevertheless gives a quite strikingly different aspect of these skulls, effected by the simultaneous raising of the eyebrow ridges with a mesial concavity between them and the increased height of the orbits. . . It is also of interest to note that the skulls with raised eyebrow ridges (No. 178, 224, and 160) at the same time have a considerably narrower interorbital septum than the others."

Teeth.—Considerable space is also given to the striking variations seen in the size and shape of the molar teeth and in the number of their tubercles. He summarizes these variations with reference to their sig-

nificance as follows: "There is thus no certain correlation between small molars on one hand, and a doubly arched superciliary ridge and a narrow interorbital septum on the other hand. Nor do the characters mentioned stand in correlation to the colour of the fur, as one of the small-toothed, No. 224, is the blackest, and the other, No. 178, is the greyest among the females. . . Thus, although the differences in certain cases, for instance with regard to the breadth of the interorbital space, and the size of the molars, certainly are great enough to appear to be of distinguishing value between different races the lack of correspondence, as set forth above, upsets every attempt of separating these specimens in two racial groups, as for instance a large-toothed and a small-toothed. In spite of all differences it appears impossible for the present but to regard all as individual variations of one and the same race."

He dwells especially upon the discordant variation in the size and form of m^3 in comparison with the other molars. He finds that m^3 not only varies greatly in size and shape relatively to the other teeth, but that the number and size of its cusps "are also variable characteristics, but seemingly independent of others. . . Normally there ought to be four cusps, two outer and two inner, but their development is variable. Especially the posterior inner cusp is often reduced in size, or even lacking. This is so irregular that the same animal may have four cusps on one, but only three on the other side, and this may happen in large-toothed as well as in small-toothed specimens."

He further demonstrates that "the size of p^1 is variable as well." Moreover that "the lower jaw is also extremely variable in shape"; and that the size of the foramen magnum varies greatly in both size and shape. He also notes several instances of supernumerary molars, and the very wide range in the capacity of the brain cavity.

Brain-Size.—A table is given showing the capacity of brain-cavity in two adult males, five adult females, and a young female with milk dentition. "From this table," he says, "can be seen that with regard to the capacity of the brain-cavity these Chimpanzees can be arranged in two groups, one with smaller, and one with larger brain. One of these groups comprises three females and a male, the other two females and a male. The difference in volume of the brain-cavity is with regard to the females more than 50 ccm., and with regard to the males about 44 ccm., thus in both cases quite considerable [in other words, 10.9 per cent in the two males and 14.5 per cent in the five females]. The question presents itself then again, is this difference due to racial distinction, or not? For the elucidation of this it is necessary to investigate, if there exists any correla-

tion between this difference in brain-capacity and the variation of other characteristics which has been discussed above. Such an investigation is facilitated by the table of measurements above. From this we learn that two of the small-brained females (No. 178 and 224) have small teeth, but this is not at all the case with the third (No. 161). The first two of these small-brained females have raised eyebrow ridges and thus comparatively high orbits, the third again (No. 161, Pl. v, fig. 3) has the superciliary arch very little raised and therefore comparatively low orbits. On the other hand especially one of the large-brained females (No. 160, Pl. v, fig. 4) has raised eyebrow-ridges and very large orbits."

BREADTH AND SHAPE OF PALATE.—Lönnberg also says: "The breadth and shape of the palate is also very different in the different specimens. Two of the small-brained ones (No. 178 and 224) have a comparatively broad and flat palate with a width inside m^2 of about 36.5 mm., but the third (No. 161) has the narrowest and most vaulted palate of all with a width inside m^2 of 28 mm. On the other hand the corresponding measurement of one of the large-brained females (No. 181) is 34.5 mm., but in the other (No. 160) it is 37.5 mm. The old large-brained and large-toothed male has the palatal breadth inside of m^2 34 mm.; in the comparatively small-toothed and small-brained male the same dimension is almost similar or 34.5 mm. In such a case it is evidently impossible to use this character for dividing the present material of Chimpanzees in two racial groups. The longest palate measuring 73.7 mm. is found in one of the small-brained (No. 161), but also the shortest palate, 69.5 mm., belongs to a small-brained specimen (No. 224)."

"This complete irregularity of the variable characteristics makes it plainly difficult to attribute any racial value to the differences in the size of the brain-cavity as expressed above. This does not exclude that in other cases a difference with regard to the capacity of the brain-cavity may be of racial value as Selenka has proved to be the case with the Orangs."[1]

[1]This last statement regarding Selenka's work on the Orangs is so amazing, in view of Elliot's careful exposition of its fallacies (1913, 'Rev. Primates,' III, (1912), pp. 183–187, 190–191, 193–194, Pls. XXIV–XXVIII), that it challenges comment. Elliot's historical account of the nature and character of the material used by Selenka, and Selenka's own statement of the hypothesis forming the basis of his discrimination of some fifteen races of orangs from a limited district of Borneo, and the immense amount of purely individual variation known to characterize the skulls of these animals, including the capacity of the braincase, is sufficient evidence of the worthlessness of Selenka's racial forms of Borneo orangs.

A much earlier paper than Elliot's 'Rev. Primates,' by Frederic A. Lucas (1883, 'The Species of Orangs,' Proc. Boston Soc. Nat. Hist., XXI, pp. 228–233), based on the large collection of orangs made by Wm. T. Hornaday in Borneo, should not be overlooked in any investigation of the orangs, since it is based on a series of 30 specimens from definitely known localities, with measurements and field notes by the collector. Variations in reference to sex, age and individual variation are described in detail. As Lucas took up the study of this material with the opinion that it represented "two good species," his final conclusion is of interest: " . . . the name *Simia satyrus* must stand for all Bornean Orangs and probably for those of Sumatra also, although it would be strange if some slight variation did not exist in specimens from the latter Island." This conclusion is in agreement with Elliot's, reached many years later and apparently without knowledge of the existence of Lucas' paper, as he does not mention it. Furthermore Lucas found that "the animals with cheek protuberances are *invariably* old males," and hence this feature is not "dimorphic" as some recent authors have assumed.

In former years I had opportunity to examine two large series of orangs from definite localities in Borneo, with the result that I became deeply impressed with the range of variation due to sex, age, and individualism, especially the latter, in these animals.

The foregoing résumé of Lönnberg's studies of the Rutshuru collection of chimpanzees indicates the care and detail with which he has conducted his researches, the record of which occupies about ten quarto pages and two plates of his memoir on the Arrhenius collection of mammals from the eastern border of Belgian Congo. It is given large space here not only on account of its intrinsic importance, and for its direct bearing on other chimpanzee material from a district a few hundred miles northwest of Rutshuru, now to be considered, but because they are the results of an independent investigator who has not heretofore been particularly identified with this line of work. He speaks indeed of his discoveries in respect to individual variation as being "of very high interest as very seldom wild mammals from one and the same place vary in such a remarkable degree" (*loc. cit.*, p. 23). On the other hand, it is a subject to which I have devoted the greater part of a life-time, and such developments bring to me no surprise. For why should not chimpanzees show variations, or physical individuality, as well as other large mammals when an adequate amount of material from a single locality has been assembled for study?

The thirty specimens of chimpanzees (twenty-four skins with skulls, six skulls without skins, and twenty-three skeletons), material brought together with so much industry and care by the collectors, Lang and Chapin, from a limited district in the Upper Uele and Ituri River drainage, more than confirm the results of the study of Lönnberg's series, as would be expected from the larger number of specimens available for comparative study. For the most part they show parallel variations to those from Rutshuru, but include some new features, due in part perhaps to the greater age of some of the adults. The two collections together cover, in a general way, a region which includes the type localities of a considerable number of species, including a half-score recently described by Matschie (see list, p. 485).

External Characters of Chimpanzees

IMMATURE.—Ten specimens are young, ranging in age from one apparently only a few days old to those that have acquired m^1, or both m^1 and m^2, and of which one-half are from the Faradje district and the other half from the Medje-Niapu district. The color of the pelage in all is deep black with the perineal area white. They are thus practically indistinguishable in coloration of pelage, which varies, however, in length with the age of the individual. The coloration of the naked parts varies only slightly, the face being much lighter colored than in adults. In the

dry skins the color of the face is pale brown, with usually a slight russet tone, varying slightly in different specimens, and more pronounced on the cheeks than elsewhere. Probably in life the variation individually would be more marked, in some the face approaching pinkish drab or pinkish pale brown. The hands and feet appear to agree very nearly in color with the face.

In the youngest specimen, in which the incisors and canines are only beginning to break through the gums, the whole underside of the body and inside of the limbs is nearly naked and pale yellowish brown like the face. The whole head is heavily clothed with black rather soft hair about 25 mm. long; the rest of the upperparts are thinly haired, the skin showing through; the hair is much shorter and thinner than on the head.

At a later stage (milk dentition, m^1 not fully mature) the body is well clothed, the pelage deep black, the long hair on back 45 to 50 mm. Several specimens.

At a still later stage (m^1 fully developed and m^2 nearly so), similar to the last mentioned above, except that the pelage is longer and a little heavier, the hair on the back about 60 mm. long. Several specimens. Two others somewhat older (m^3 partly up) are similar except that the pelage is slightly less intense black. In the youngest specimens the forehead is thinly haired, with scattering hairs nearly to the eyebrows. In older ones the forehead becomes nearly bare. The chin is thinly haired like the forehead; in some instances the chin hairs are whitish, giving a grayish tone.

ADULT.—About the time m^3 appears, but before it is fully developed, the general tone of the pelage becomes duller or brownish black. A little later still (m^3 mature but unworn) many of the hairs on the lower back are tipped with pale brown or whitish. With the advance of age this condition becomes greatly emphasized, the pelage becomes, as a rule, thinner and shorter and coarser and harsher. A female from Faradje (No. 51376; Pls. CLVIII, fig. 2; CLIX), with mature but unworn dentition, has the lower back and hind limbs dull brownish black with a strong rufescent tone, due to a heavy mixture of pale brownish-tipped hairs. In this specimen the entire chin has a profusion of whitish hairs, not present in another Faradje adult. An old male from the same locality, (No. 51377, the teeth greatly worn) is similar in coloration to the female just described, the lower back and hind limbs being brownish black due to pale reddish brown hair-tips, which are also diffused to a much less extent over the fore-back.

An old male from Medje (No. 51209, teeth greatly worn) has the pelage everywhere rather thin and short, the lower back grizzled with gray and black, the thighs and anterior back varied with scattered yellowish gray hairs. Hair of back 35 mm. in length, long hair on the shoulder, 70 to 75 mm. long.

Two adult males from Akenge show differences as follows: No. 51381 (with greatly worn teeth) has the whole top of the head yellowish gray somewhat grizzled with black; shoulders and anterior back darker; lower back yellowish white with scattered black-tipped hairs; hind limbs similar but with a larger proportion of black-tipped or wholly black hairs. In No. 51278 (Pls. CLVII; CLVIII, fig. 1) m^3 is fully developed but not worn, the pelage is thin and short, dull brownish black in general effect on the dorsal area, owing to a grizzle of reddish brown hair-tips, the rufescent tone stronger on the lower back and hind limbs, less developed on the fore limbs. These two males from the same locality differ strikingly, doubtless in part owing to difference in age. An adult female (dentition slightly worn) from the same locality is similar in all respects to No. 51278, but is slightly less rufescent.

An old male (No. 51394) from Avakubi has the top of the head in front of the ears nearly naked; the lower back is yellowish gray in general effect, with a sprinkling of black-tipped hairs; hind limbs darker, the dark basal portion of the hairs showing through the lighter tips. Hair on back about 35 to 40 mm. long.

An old male from Ngayu (No. 51393) has the pelage thin and short, dull black in general tone, the lower back and both fore and hind limbs grizzled with pale rufescent hair-tips.

An old male from Medje (No. 51202) has also a thin pelage, deep black, the hairs of the lower back and hind limbs with a slight grayish tipping, giving a much lighter or yellowish gray effect. An old male from Niapu (No. 51382; Pls. CLIII; CLIV, fig. 1) with greatly worn teeth and thin pelage is dull black with no appreciable mixture of light-tipped hairs except on the lower back, although very old.

From the foregoing it is evident that there is a wide range of color variation among adults, some of which is ascribable to age. Also the pelage is variable in respect to heaviness and length, the hairs varying in length on the middle of the back from 30 to 40 mm., and on the shoulders from 60 to 80 mm., with corresponding variations on the sides of the head and throat.

The color of the face is usually black, but is sometimes merely dark brown. The chin is usually thinly covered with whitish or grayish hairs, but in a considerable number the chin hairs are black or brownish black.

The forehead is usually thinly haired, but in two of the old males the head is nearly bald as far back as the front of the ears. In none is the hair distinctly parted by a bare median line or space. The hair on the top of the head shows slight differences in the manner of radiation from the mesial line. In the majority of specimens it is directed on the anterior third of the crown laterally at a nearly right angle to the mesial line; on the middle part the direction inclines obliquely backward, and on the posterior part of the crown the direction is mainly backward in a uniformly diminishing angle from the median line.

EARS.—The ears, as shown by the careful measurements taken in the flesh by Lang and Chapin, vary much in size in both young and old individuals. In young specimens with milk or incomplete permanent dentition the length of the ear varies from about 50 to 60 mm.; in comparable adults the length in four males varies from 66 to 95 mm., with an average of about 77 mm.; in three old females, from 60 to 67 mm. with the average at 64 mm. In the dry skin the ear of these same specimens measures considerably less, rarely more than from 50 to 65 mm. In some recent diagnoses of new forms of chimpanzees considerable stress has been laid upon the size of the ear, when the only basis for measurement must have been a single dry skin.

Cranial Characters of Chimpanzees

SIZE.—The above summary (p. 486) of cranial measurements shows that while males average larger than females there is an overlapping in size, some females being slightly larger than some males of exactly comparable age. The series of males is large enough to show that skulls of comparable age vary in greatest length from 190 mm. to 220 mm.—a range sufficiently large to cover the whole range of skull length in all the described forms, so far as recorded measurements are available. These include not only those given in Elliot's 'Rev. Primates' but also those of type specimens of various authors, and those of Matschie's several papers on chimpanzees.

The present series of skulls shows a wide range of variation in practically every feature, due in part to age but mainly to purely individual differentiation. They parallel in a general way those recorded by Lönnberg, but greatly extend in many instances the range of difference found by him in the much smaller Rutshuru series, as might be expected. These variations are shown in the dorsal outline of the superciliary ridges, the size of the orbits and the ratio of their transverse and vertical dimension; the size and form of the anterior narial opening—deep and narrow

in some, shallow and broad in others, and in the correlated length and width of the nasals; the shape and size of the foramen magnum; the breadth and vaulting of the palate; the length, width and relative convexity or depression of the basisphenoid region; the wide range in size of the teeth, taking the toothrow as a whole, and the great variation in the size of the posterior teeth in comparison with more anterior ones of the same toothrow, or the corresponding teeth in other skulls; also in the number of cusps on the posterior molars, as recorded in some detail by Lönnberg; variation in the transverse measurements of the skull as compared with its axial length, etc.; the amount of space separating the temporal ridges, and the presence or absence of a sagittal crest. The width of the facial portion of the skull greatly varies, as does also the facial angle. Many of these differences have been regarded as specific characters by various authors, especially by Matschie, in the description of supposed new forms based on a single specimen, as unfortunately many of the alleged forms have been founded.

Matschie states[1] that his *Simia* (*Anthropopithecus*) *nahani* "ist die einzige unter den beschriebenen [Formen], welche eine Schädel-Crista besitzt." Elliot's Plates XXXIV and XXXV of Volume III of the 'Rev. Primates' (not published when Matschie made this statement) show such a crest in the type skull of *Pan calvus* (Du Chaillu), and Plates XXXVIII and XXXIX show its presence in an old skull of *Pan vellerosus* (Gray). It is also present in two of the old male skulls of the present series.

It is perhaps almost needless to say that the presence or absence of a sagittal crest in chimpanzees, as in many groups of carnivores, and in other mammals in which this feature is found, is dependent upon age, it apparently occurring only in very old males. The temporal ridges in young chimpanzees are far apart and gradually approach each other as the animal advances in growth and in age till in very old males they meet on the median line and unite to form a more or less strongly developed median crest. The method of development of the sagittal crest, so common in certain mammals, should present no mystery, yet we find its presence or absence frequently regarded by mammalogists as a character of diagnostic value for subspecies, and sometimes for species, even by authors of considerable experience. Many authors without adequate resources, or blinded by prepossessions, make use of many features of individual differentiation that a comparative study of large series of specimens of the same form from a single locality would show were value-

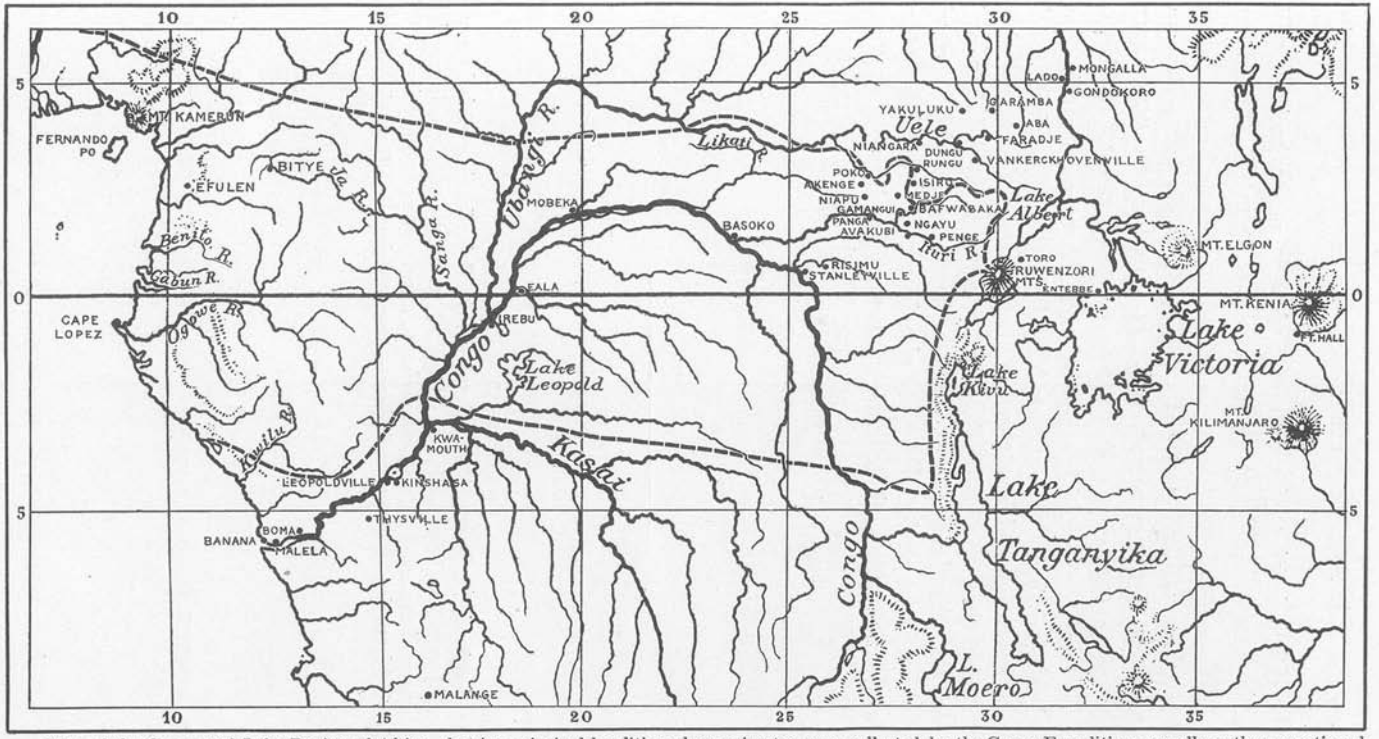
[1] 1912, Rev. Zool. Africaine, II, fasc. 1, September, p. 118.

less for the discrimination of even races. And in no group have such discriminations been carried to greater excess than in the chimpanzee group.

The variation in cranial features cannot be illustrated at present. Sixteen plates (Pls. CLII-CLXVII), however, show features seldom dealt with in other papers, due to Lang's work in the field. The portraits of ten chimpanzees, mostly front, side, and three-quarter views, furnish proof that the physiognomic features in these large Primates vary fully as much as one might have expected from the cranial differences. It becomes clear that even such a character as the shape of the ears, considered diagnostically of specific value, is equally variable. These photographs add much convincing proof that a relatively great plasticity is one of the dominant features in this group. A photograph of the hand and foot of an adult female (Pl. CLXVI, fig. 2) and another of the arboreal nest (Pl. CLXVII) are also presented.

ADDENDUM

Fsihego ituriensis DE PAUW, 1905, 'Notes sur la Solidification et le Montage des grands Mammifères,' Saint-Nicolas (Belgium), p. 13, Pl. 1. No description. Based on figures of mounted animal and skeleton, as appearing in a caption: "*Fsihego ituriensis* Matschie. Sous genre *Fsihego*.—Race spéciale de l'Ituri et du Congo central."



Map of the Congo and Lake Region of Africa, showing principal localities where primates were collected by the Congo Expedition, as well as others mentioned in the present paper. The limits of the West African rain forest are indicated by a broken line.

LIST OF LOCALITIES AT WHICH PRIMATES WERE COLLECTED BY THE CONGO EXPEDITION BUT NOT INDICATED ON THE ACCOMPANYING MAP (p. 498).

Abawe.—2° 30′ N., 26° 50′ E.
Babeyru.—1° 55′ N., 27° 40′ E.
Bafuka.—4° 20′ N., 27° 50′ E.
Bafwaboli.—0° 40′ N., 26° 10′ E.
Banalia.—1° 30′ N., 25° 40′ E.
Batama.—1° N., 26° 40′ E.
Bolobo.—2° 15′ S., 16° 15′ E.
Kamunionge.—1° N., 27° 5′ E.
Kisenje.—1° 35′ S., 29° 15′ E.
Lubilo.—1° N., 27° 10′ E.
Lukolela.—1° 10′ S., 17° 10′ E.
Mosembe.—1° 15′ N., 18° 35′ E.
Munye Katoto.—0° 35′ N., 26° 5′ E.
Pawa.—2° 25′ N., 27° 50′ E.
Ukaturaka.—2° N., 20° 30′ E.
Zambi.—6° S., 12° 50′ E.

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New names of genera, subgenera, species, and subspecies are printed in **heavy-faced type,** also the main reference in a series of references; synonyms are printed in *italics.*