
FOR·THE·INCREASE·
AND·DIFFVSION·OF·
KNOWLEDGE·AMONG·MEN·
PER ORBEM
SMITHSONIAN·
INSTITVTION·
WASHINGTON·1846·

SMITHSONIAN INSTITUTION
UNITED STATES NATIONAL MUSEUM
Bulletin 99

EAST AFRICAN MAMMALS IN THE UNITED STATES NATIONAL MUSEUM

PART III. PRIMATES, ARTIODACTYLA, PERISSODACTYLA, PROBOSCIDEA, AND HYRACOIDEA

BY

N. HOLLISTER
Superintendent, National Zoological Park, Washington

WASHINGTON
GOVERNMENT PRINTING OFFICE
1924

ADDITIONAL COPIES

OF THIS PUBLICATION MAY BE PROCURED FROM
THE SUPERINTENDENT OF DOCUMENTS
GOVERNMENT PRINTING OFFICE
WASHINGTON, D. C.

AT

40 CENTS PER COPY

TABLE OF CONTENTS.

LIST OF ILLUSTRATIONS.

TEXT FIGURE.

PLATES.

EAST AFRICAN MAMMALS IN THE UNITED STATES NATIONAL MUSEUM.

PART III. PRIMATES, ARTIODACTYLA, PERISSODACTYLA, PROBOSCIDEA, AND HYRACOIDEA.

By N. HOLLISTER,

Superintendent, National Zoological Park, Washington.

INTRODUCTION.

The first part of this bulletin, published August 16, 1918, dealt with the mammals of the orders Insectivora, Chiroptera, and Carnivora contained in the East African collections of the United States National Museum. The second part, published May 16, 1919, dealt with the orders Rodentia, Lagomorpha, and Tubulidentata. This third part, which completes the work, consists of reports on the specimens from East Africa belonging to the Orders Primates (lemurs and monkeys), Artiodactyla (swine, hippopotamuses, giraffes, buffaloes, antelopes, and their allies), Perissodactyla (zebras and rhinoceroses), Proboscidea (elephants), and Hyracoidea (hyraxes).

The plan of arrangement of the text is the same as in the earlier parts, and has been fully explained in the introduction to Part I. The geographical limits are also the same. All specimens of mammals from Eritrea, Somaliland, Sudan, Abyssinia, Lado Enclave, Uganda, British East Africa, and German East Africa, including Zanzibar, contained in the collection have been critically examined and listed. The territory included is shown in Figure 1.

Since the publication of the earlier parts, there have been conspicuous changes in the political aspect of Africa. As one of the results of the World War the names of countries, as well as their boundaries, have been altered. The principal changes that affect the region covered by this report are as follows: The greater part of British East Africa is now known as Kenya Colony; the strip of coast land, 10 miles wide, leased from the Sultan of Zanzibar, remains a Protectorate under the title of Kenya Protectorate. Most of the former German East Africa, now under British control, is known as Tanganyika Territory. A small section of the northwestern part, including Ruanda and Urundi, is transferred to Belgium; and 400

square miles at the mouth of the Rovuma River, bordering on Portuguese East Africa, are transferred to Portugal. It is reported that further concessions may be made to Italy and Abyssinia, and, with the development of the country, the names and boundary lines are almost certain to be altered further. For the sake of uniformity in the three parts of this bulletin, and to avoid confusion, the geographical boundaries and names used in the earlier parts are used, without change, in this final volume.

The great bulk of specimens included in this third part, as in the case of groups listed in the earlier sections, was collected by the Smithsonian African Expedition under the direction of the late Col. Theodore Roosevelt, 1909–10; and by the Paul J. Rainey African Expedition, 1911–12. Many additional specimens, particularly of Artiodactyla, have been received from miscellaneous sources, however, as noted in the summary below. Particularly important collections were made and presented by Dr. W. L. Abbott, John Jay White, and Elton Clark.

SUMMARY OF SPECIMENS LISTED IN PART 3.

The mammals of the orders Primates, Artiodactyla, Perissodactyla Proboscidea, and Hyracoidea, listed in these pages, were received by the Museum from expeditions and collectors as follows:

	Primates.	Artiodactyla.	Perissodactyla.	Proboscidea.	Hyracoidea.	Totals.
Smithsonian African Expedition under the direction of Col. Theodore Roosevelt:						
Col. Theodore Roosevelt	6	193	26	6		231
Kermit Roosevelt	6	138	19	1		164
Lieut. Col. Edgar A. Mearns, U. S. A.	35	92	15	4	32	178
Edmund Heller	16	56	8	3	1	84
J. Alden Loring	11	60	14		26	111
R. J. Cuninghame		7	1			8
Leslie J. Tarlton		6	1			7
H. H. Heatley		3				3
Sir Alfred Pease		2				2
Maj. C. J. Ross		2				2
A. B. Percival		1	1			2
S. Medlicott		2				2
George Grey		1				1
Paul J. Rainey African Expedition:						
Paul J. Rainey		237	34	1	24	296
Edmund Heller	138	77	4		52	271
Dr. M. E. Johnston		5				5
Dr. W. L. Abbott	16	45	4		9	74
John Jay White	4	33	2			39
H. C. Raven	29	8				37
Maj. W. P. Draper		20		1		21
Elton Clark		19				19
Col. H. G. C. Swayne		18				18
Dr. A. Donaldson Smith	2	6				8

	Primates.	Artiodactyla.	Perissodactyla.	Proboscidea.	Hyracoidea.	Totals.
George L. Harrison, jr		8				8
F. M. Stephenson		6	2			8
A. J. Klein	2	4				6
L. Folsom		4				4
W. N. McMillan	1	2				3
Emperor Menelik	2		1			3
James L. Clark		2	1			3
D. Pomeroy		3				3
H. Davidson		2	1			3
J. Prentice		1	2			3
A. B. Hepburn		1	2			3
Thomas P. Lindsay	1	1				2
Dr. W. S. Rainsford		2				2
Henry Tarlton		2				2
John T. McCutcheon		2				2
Hon. Hoffman Philip		2				2
Dr. S. A. Ellis		1	1			2
A. H. Witherill			2			2
J. H. Eagle			2			2
W. F. H. Rosenberg (received from)					2	2
Miss Annie M. Alexander	1					1
William Astor Chanler		1				1
Dr. Daniel Giraud Elliot		1				1
Ras Makonnen			1			1
F. W. W. Turner	1					1
G. H. Barker		1				1
Dr. Clarence Falmestock		1				1
S. C. Perie			1			1
Henry A. Ward (received from)	1					1
Edward Gerrard (received from)	1					1
Rowland Ward (received from)		1				1
Carl Hagenbeck (received from)		1				1
Bureau of Animal Industry			1			1
National Zoological Park				1		1
British Museum (received from)		1				1
Berlin Museum (received from)		1				1
	273	1,082	146	17	146	1,664

SUMMARY.

From Smithsonian African Expedition	795
From Paul J. Rainey Expedition	572
From miscellaneous sources	297
Total primates, artiodactyles, perissodactyles, proboscidians, and hyracoideans in the United States National Museum East African collections	1,664

There are included in the East African collections of these groups 17 type-specimens of Primates, 30 of Artiodactyla, 1 of Perissodactyla, and 2 of Hyracoidea. Of the 50 new forms 1 was described by Lord Rothschild, 1 by Dr. D. G. Elliot, 2 by Dr. F. W. True, 7 by N. Hollister, and 39 by Edmund Heller.

Of these 50 described forms 48 are recognized as valid species or subspecies in the present paper.

In the previous parts there were listed 6,696 specimens of mammals of the six orders dealt with. Including the present part, this makes a grand total of 8,360 specimens, of 526 species and subspecies belonging to the 11 orders of mammals in the East African collections, including 192 type-specimens. The sources for these specimens are as follows:

Grand total of East African mammal collections.

Smithsonian African Expedition	4,513
Paul J. Rainey Expedition	3,328
Miscellaneous collections	519
	8,360

LIST OF LOCALITIES.

Below is a list of all localities from which United States National Museum specimens of mammals are listed in this part, with index references to the accompanying map, reproduced from parts 1 and 2. Only a few of the localities are marked on the map itself, but, with the aid of larger maps, it will not be difficult to determine with fair accuracy any collecting station mentioned in the text.

Aberdare Mountains—A range of mountains about half way between Lake Naivasha and Mount Kenia. Summits said to be 11,000–12,000 feet. J 4.

Adis Ababa—Capital city of Abyssinia, situated near the geographical center of that country. Also written Addis Ababa and Addis Abeba. F 5.

Agate's, or Agate's Ranch—On the Southern Guaso Nyiro near the eastern edge of Loita Plains. J 4.

Ali Bereb, Asmara—Inland and southwest of Massaua, Eritrea. D 5.

Amala River—Flows southwest from Kabalolot Hill, Sotik. J 3–4.

Archer's Post—On the Northern Guaso Nyiro near the mouth of the Lakiundu River, north of Mount Kenia. I 5.

Aruscha Wa-cini, or Aruscha-wa-chini—South of Mount Kilimanjaro, in German East Africa, near the upper Pangani River. K 4.

Arussi—District in central Abyssinia, west of Ogaden and southeast of Adis Ababa, F–G 5–6.

Athi Plains—North and east of Nairobi. J 4.

Bahr-el-Ghazal District—In extreme southern Sudan, bordering French Congo, Belgian Congo, and Lado. G–H 1.

Bahr-el-Zeraf—Flows from the south into the Nile between Lake No and the Sobat. F 2.

Berbera—Seaport of British Somaliland, on the Gulf of Aden. E 7.

Berkate-Turkwell Junction—Where the Berkate River flows into the Turkwell River, northeast of Mount Elgon, in eastern Central Province, Uganda. I 3–4.

Blue Nile—Flows northwest from western Abyssinia and empties into the Nile at Khartoum. D–E 2–3.

Bondoni—On Kapiti Plains, British East Africa. J 4.

Budonga Forest—In Unyoro, western Uganda, east of Butiaba, Albert Nyanza. I 2.

Buhuka—Southeastern shore of Albert Nyanza, west and a little south of Hoima, Uganda. I 2.

Butiaba—On the northeast shore of Albert Nyanza in Unyoro, Uganda. I 2.

Changamwe—Station on the railroad 6 miles inland from Mombasa. Altitude, 180 feet. K 5.

Dagoreti—Just west of Nairobi, British East Africa. J 4.

Deep Dale—Between the Engare Narok River and Suswa Plain, southwestern British East Africa. J 4.

Dire Dawa—Northwest of Harrar, Abyssinia. F 6.

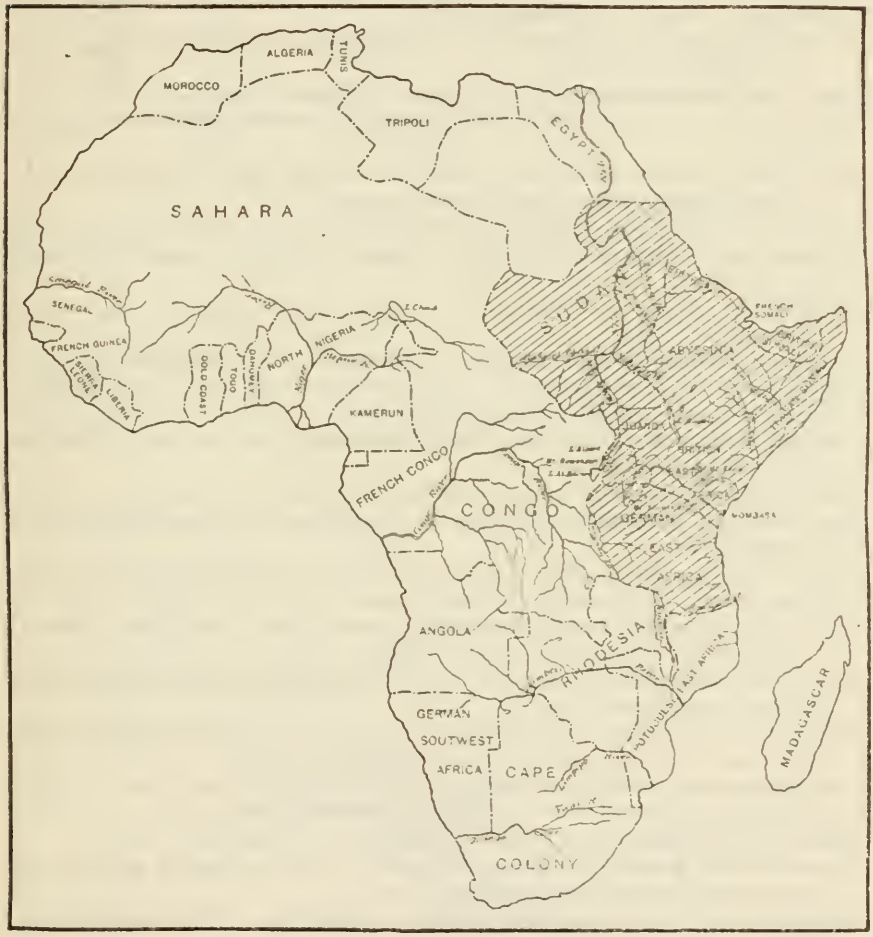


Fig. 1.—Map of Africa with shaded area showing the region covered by this report.

Donyio Burru Mountains—West of Lake Naivasha. J 4.

Donyo Gelsha—On the escarpment east of Lake Baringo, British East Africa. J 4.

El Dere—In extreme central southern Abyssinia, near the border of British East Africa; 3° 53′ N., 39° 57′ E. H 5–6.

Eldoma Ravine—Just north of the Equator and north from the railroad station of Londiana, British East Africa; the Eldoma River flows into the Molo, which empties into Lake Baringo. I–J 4.

ENGARE NAROK RIVER—A tributary of the Southern Guaso Nyiro. On the west side of the Mau Escarpment midway between the Uganda railroad and the border of German East Africa. Also written Engarro Naroke, or N'garri Narok. J 4.

ENGARE NDARE RIVER—A southern tributary of the Northern Guaso Nyiro, north of Mount Kenia. I 4.

ENJORO—On the Uganda Railway 12 miles west of Nakuru, between Naivasha and Port Florence. Altitude, 6,990 feet. Also written Njoro. I–J 4.

ESCARPMENT, KEDONG VALLEY—Between Nairobi and Naivasha, on the Uganda Railway. Station is 7,390 feet. J 4.

EVEREGO—North of Loita Plains and west of Southern Guaso Nyiro River in southwestern British East Africa. J 4.

FORT HALL—About midway between Nairobi and Mount Kenia. J 4.

GONDOKORO—On the east bank of the Bahr el Jebel in extreme northwestern Uganda. H 2.

GUAS NGISHU BOMA—At the eastern edge of the Guas Ngishu Plateau near the Elgeyo Escarpment and north of Ravine Station. I 4.

GUAS NGISHU PLATEAU—South and east of Mount Elgon, west of the Elgeyo Escarpment, and north of the Nandi Hills. Drained by the upper waters of the Nzoia River. I 3–4.

GUTA, or GUTA'S—On the northeast shore of Speke Gulf, Victoria Nyanza, German East Africa. J–K 3.

IKOMA—In northern German East Africa, east of Speke Gulf, Victoria Nyanza. J 3.

ISIOLA RIVER—A southern affluent of the Northern Guaso Nyiro north of Mount Kenia, and west from the Lakiundu River. I 4–5.

JAMBENI MOUNTAINS—Northeast of Mount Kenia about half way to the Northern Guaso Nyiro River. I 5.

JEBEL BAWATI—In eastern Nubia, inland from Port Sudan. B 3–4.

JUJA FARM—W. N. McMillan's place on the Athi Plains, about 23 miles northeast of Nairobi. J 4.

KABALOLOT HILL—In the Sotik, west of Loita Plains and near the border of German East Africa. Headwaters of the Amala River. J 3–4.

KABULA MULIRO—On the road about midway between Kampala and Hoima, Uganda, between Albert Nyanza and Victoria Nyanza. I 2.

KAHE—About 45 miles southeast of Mount Kilimanjaro, in German East Africa, east of the Pangani River. K 4–5.

KAIMOSI—On the Lukosa River just north of the Equator and north of Port Florence, the western terminus of the railway in Kavirondo. I 3.

KAKUMEGA—Just north of the Equator near Port Florence, the end of the railway in Kavirondo, Kisumu Province, northeast of Victoria Nyanza. I 3.

KAMITI FARM—Ranch owned by H. H. Heatley on the Athi Plains. J 4.

KAMPALA—Fort Kampala, or Mengo, just north of Entebbe, Uganda, and near the northwestern edge of Victoria Nyanza. I 2.

KAMPIYA BIBI—On the Guas Ngishu Plateau. Sometimes written Kampiya biba. I 3–4.

KAPITI, or KAPITI PLAINS—A station, also called Kapiti Station, on the railway 29 miles southeast of Nairobi and 288 miles from Mombasa. Altitude, 5,350 feet. J 4.

KARA WATER, or KARA RIVER—On the Marsabit Road north of Mount Lololokwi. I 5.

KASORONGAI RIVER—On the west side of Mount Kenia and north of Nyeri. J 4.

KATWE—Between Kabula Muliro and Kisingo, on the road between Kampala and Hoima, Uganda. Also written Kutwe. I 2.

KEDONG RIVER—West of Nairobi and east of the Rift Valley. As shown on maps, it crosses the railroad between Escarpment Station and Kijabe. J 4.

KEDONG VALLEY—The valley of the Kedong River. J 4.

MAP OF EASTERN EQUATORIAL AFRICA.

FOR EXPLANATION OF PLATE SEE PAGE 147

Nairobi—Capital of Ukamba Province, British East Africa, 327 miles from Mombasa and about 260 miles from Port Florence by rail. Altitude, 5,450 feet. J 4.

Naivasha—A station on the Uganda Railway near Lake Naivasha. Altitude, 6,230 feet. J 4.

Naivasha Station—See Naivasha and Lake Naivasha. J 4.

Nakuru, or Nakuro—Station and lake on the railroad in British East Africa, about 55 miles west of Naivasha. The altitude of the station is 5,950 feet. J 4.

Narosurra River—Flows from the Loita Plains into the Southern Guaso Nyiro. Also called Narossera. J 4.

Ndi—In the Taita Hills, between Taveta and the railroad. K 5.

Neuman's Boma—On the north bank of the Northern Guaso Nyiro River nearly opposite the mouth of the Isiola. Also called Neuman's Camp. Almost directly north from Mount Kenia, about 60 miles. I 4–5.

Ngare Ndare River—See Engare Ndare River. I 4.

Ngare Nyuki, or Nyuki River—One of the headwaters of the Northern Guaso Nyiro, northwest of Mount Kenia. Sometimes written Nyuku. I 4.

Ngong Hills—Just west from Nairobi. J 4.

Ngongo Bagas—In the Nairobi forest, just west of Nairobi, British East Africa. J 4.

Nimule—On the east bank of the Bahr el Jebel, about midway between Albert Nyanza and the Sudan border, in northwestern Uganda. H 2.

Njoro Osolali, or Njoro O Solali—In the Sotik, southwestern British East Africa. J 4.

Nkyanuna—A few miles northwest from Fort Kampala, Uganda, on the trail to Hoima. I 2.

Northern Guaso Nyiro—The region of the Northern Guaso Nyiro River, north of Mount Kenia. I 4–5.

Northern Guaso Nyiro River—Formed by numerous streams in the Aberdares, northern slopes of Mount Kenia, and Mathews Range; and flowing eastward at least to the Lorian Swamp. I 4–5.

Nubia—Northeastern Sudan. B 2–4.

Nyanza—A village on the eastern shore of Lake Tanganyika about 40 miles north of Kigoma, German East Africa. K 1–2.

Nyeri—On the southwestern side of Mount Kenia at 6,200 feet. J 4.

Nyuki River—See Ngare Nyuki. I 4.

Nzoia River—Drains the Guas Ngishu Plateau and empties into Victoria Nyanza a few miles north of the Equator. I 3.

Olarakeri—In the Sotik, southwestern British East Africa. J 4.

Omo River—About 35 miles north of Lake Rudolf, in southwestern Abyssinia. G–H 4.

Pagazi River—North end of Lake Natron, in British East Africa, near the border of German East Africa. J–K 4.

Palm Springs—Near Kabalolot Hill, Loita Plains, British East Africa, not far from the German East Africa boundary. J 3–4.

Potha—Kapiti Plains. J 4.

Punda Milia—About 12 miles southeast from Fort Hall, near Thika River. J 4–5.

Quoy, or Quoy Water—On the Marsabit Road northeast from Mount Lololokwi. I 5.

Rejaf—Southwest of Gondokoro, on the west bank of the Nile, Lado Enclave. H 2.

Rhino Camp—Colonel Roosevelt's base camp on the west bank of the Nile in extreme southern Lado Enclave at 2° 55′ north. H–I 2.

Rumathe River, or Rumathe Water—A small tributary of the Northern Guaso Nyiro. I 4–5.

Salt Marsh—Near the eastern edge of the Loita Plains, near Lime Springs, Sotik. J 4.

Lukosa River—South of the Nzoia River on Guas Ngishu Plateau, flowing into Victoria Nyanza; also called Lukos River and Yala River. I 3.

Machakos Road—A railway station between Kiu and Kapiti Plains stations; the road leading from the station to town of Machakos, north of the railway and southeast of Nairobi. J 4–5.

Maji-ya-chumvi—A station on the railroad 35 miles from Mombasa. Altitude, 570 feet. K 5.

Mariakani—A station on the railroad 26 miles from Mombasa. K 5.

Marodijeh—South of the Golis Range in British Somaliland. F 7.

Marsabit Road—The route to Mount Marsabit north of the Northern Guaso Nyiro. I 5.

Mau, or Mau Hills—The Mau Escarpment. In this connection the specimens labeled Mau came from a point about 15 miles north of Ravine Station. I 4.

Mau Forest—Forests of the Mau Escarpment in vicinity of Enjoro and Naivasha. J 4.

Mau Summit, Sotik Road—The summit of the Mau Escarpment; in this connection southwest of Naivasha. J 4.

Mazeras—Station on the railroad 16 miles from Mombasa. Altitude, 530 feet. K 5.

Mbalageti River—In northern German East Africa; rises at western edge of the Serengeti Plains and flows westward into Speke Gulf, Victoria Nyanza. J–K 3.

Merelle River, or Merelle Water—On the Marsabit Road about midway between the Northern Guaso Nyiro River and Mount Marsabit. Sometimes written Merele. I 5.

Meru, or Meru Boma—Just north of Mount Kenia. I–J 4–5.

Meru Road—Across the Laikipia Plateau to Meru, north of Kenia. I–J 4.

Mikindu, or Makindu—Between Mtoto Andei and Ulu, on the Uganda Railway. Altitude, 3,280 feet. J–K 4–5.

Mongalla—On the east side of the Bahr el Jebel in extreme southern Sudan, a few miles north of Gondokoro. G–H 2.

Mongalla Province—A province of extreme southeastern Sudan, bordering Uganda on the north. G–H 2–4.

Mount Elgon—Northeast of Victoria Nyanza, on boundary between Uganda and British East Africa. I 3.

Mount Gargues—In the Mathews Range, north of Mount Kenia and southeast of Lake Rudolf. Summit said to be 8,800 feet altitude. Also written Mount Uaragess. I 4–5.

Mount Kenia—A high peak in central British East Africa, almost directly on the Equator. Altitude given on recent maps from 17,200 feet to 18,620 feet. Timber line is about 13,000 feet. I–J 4–5.

Mount Kilimanjaro—A mountain on the border between British East Africa and German East Africa, about 175 miles from the coast. Altitude, 19,780 feet. K 4.

Mount Lololokwi—An isolated mountain east of the Mathews Range, about midway between Mount Kenia and Mount Marsabit, British East Africa. I 4–5.

Mount Mbololo—In the Taita Hills, about midway between Kilimanjaro and the coast. Summit, 4,400 feet. Sometimes written Mbululu, or Umbololo. K 5.

Mount Sagalla—In the southern Taita Hills, about midway in a line between Kilimanjaro and Mombasa. K 5.

Mount Uaragess—See Mount Gargues. I 4–5.

Mount Umengo—In the Taita Hills, west of Ndi, and between Taveta and the railway, British East Africa. K 5.

Mtoto Andei—A station on the railway 165 miles inland from the coast and about midway between Mombasa and Nairobi. Altitude, 2,500 feet. K 5.

Nabea, or Navea—In Budonga Forest, Unyoro, western Uganda. I 2.

NAIROBI—Capital of Ukamba Province, British East Africa, 327 miles from Mombasa and about 260 miles from Port Florence by rail. Altitude, 5,450 feet. J 4.

NAIVASHA—A station on the Uganda Railway near Lake Naivasha. Altitude, 6,230 feet. J 4.

NAIVASHA STATION—See Naivasha and Lake Naivasha. J 4.

NAKURU, or NAKURO—Station and lake on the railroad in British East Africa, about 55 miles west of Naivasha. The altitude of the station is 5,950 feet. J 4.

NAROSURRA RIVER—Flows from the Loita Plains into the Southern Guaso Nyiro. Also called Narossera. J 4.

NDI—In the Taita Hills, between Taveta and the railroad. K 5.

NEUMAN'S BOMA—On the north bank of the Northern Guaso Nyiro River nearly opposite the mouth of the Isiola. Also called Neuman's Camp. Almost directly north from Mount Kenia, about 60 miles. I 4–5.

NGARE NDARE RIVER—See Engare Ndare River. I 4.

NGARE NYUKI, or NYUKI RIVER—One of the headwaters of the Northern Guaso Nyiro, northwest of Mount Kenia. Sometimes written Nyuku. I 4.

NGONG HILLS—Just west from Nairobi. J 4.

NGONGO BAGAS—In the Nairobi forest, just west of Nairobi, British East Africa. J 4.

NIMULE—On the east bank of the Bahr el Jebel, about midway between Albert Nyanza and the Sudan border, in northwestern Uganda. H 2.

NJORO OSOLALI, or NJORO O SOLALI—In the Sotik, southwestern British East Africa. J 4.

NKYANUNA—A few miles northwest from Fort Kampala, Uganda, on the trail to Hoima. I 2.

NORTHERN GUASO NYIRO—The region of the Northern Guaso Nyiro River, north of Mount Kenia. I 4–5.

NORTHERN GUASO NYIRO RIVER—Formed by numerous streams in the Aberdares, northern slopes of Mount Kenia, and Mathews Range; and flowing eastward at least to the Lorian Swamp. I 4–5.

NUBIA—Northeastern Sudan. B 2–4.

NYANZA—A village on the eastern shore of Lake Tanganyika about 40 miles north of Kigoma, German East Africa. K 1–2.

NYERI—On the southwestern side of Mount Kenia at 6,200 feet. J 4.

NYUKI RIVER—See Ngare Nyuki. I 4.

NZOIA RIVER—Drains the Guas Ngishu Plateau and empties into Victoria Nyanza a few miles north of the Equator. I 3.

OLARAKERI—In the Sotik, southwestern British East Africa. J 4.

OMO RIVER—About 35 miles north of Lake Rudolf, in southwestern Abyssinia. G–H 4.

PAGAZI RIVER—North end of Lake Natron, in British East Africa, near the border of German East Africa. J–K 4.

PALM SPRINGS—Near Kabalolot Hill, Loita Plains, British East Africa, not far from the German East Africa boundary. J 3–4.

POTHA—Kapiti Plains. J 4.

PUNDA MILIA—About 12 miles southeast from Fort Hall, near Thika River. J 4–5.

QUOY, or QUOY WATER—On the Marsabit Road northeast from Mount Lololokwi. I 5.

REJAF—Southwest of Gondokoro, on the west bank of the Nile, Lado Enclave. H 2.

RHINO CAMP—Colonel Roosevelt's base camp on the west bank of the Nile in extreme southern Lado Enclave at 2° 55′ north. H–I 2.

RUMATHE RIVER, or RUMATHE WATER—A small tributary of the Northern Guaso Nyiro. I 4–5.

SALT MARSH—Near the eastern edge of the Loita Plains, near Lime Springs, Sotik. J 4.

Serengeti Plains—In north central German East Africa south of Loita Plains and west of Lake Natron. The western edge is about 75 miles east of Speke Gulf, Victoria Nyanza. J–K 3–4.

Shimba Hills—Southwest from Mombasa, British East Africa. K 5.

Sigaa—West of Southern Guaso Nyiro River in southwestern British East Africa. J 3–4.

Sir Alfred Pease's Farm—See Kitanga. J 4.

Sirgoit—Near the Elgeyo Escarpment, eastern edge of Guas Ngishu Plateau. I 4.

Sironera River—Flows from the western edge of the Serengeti Plains northward into the Mumussi River southeast of Ikoma, German East Africa. J–K 3.

Sotik—District in southwestern British East Africa between the Mau Escarpment and Kavirondo Bay. J 3–4.

Southern Guaso Nyiro—Region of the Southern Guaso Nyiro River, southwestern British East Africa. J 4.

Southern Guaso Nyiro River—Southwestern British East Africa and northern German East Africa on the west side of the Rift Valley. J 4.

Suswa Plain—South of Lake Naivasha and west of Kikuyu. J 4.

Tana River—Heads in the Aberdares and southern side of Kenia and flows into the Indian Ocean something over 100 miles north of Mombasa. J 5.

Taveta—In British East Africa near the German East African border southeast of Mount Kilimanjaro. K 4–5.

Telek River—North of Loita Plains in southwestern British East Africa. J 3–4.

Thika River—One of the affluents of the Tana River south of Mount Kenia. J 5.

Ulu, or Ulu Station—Station on the Uganda Railway, 276 miles from Mombasa and about 50 miles southeast of Nairobi. Altitude, 5,250 feet. J–K 4–5.

Ulukenia Hills—On the Athi Plains east of Nairobi; also written Ulucania or Lukenia. J 4.

Voi—Station on the railway 103 miles northwest from Mombasa. Altitude, 1,830 feet. K 5.

Wambugu—Between Fort Hall and Mount Kenia at 5,300 feet altitude. J 4–5.

Wami Hill—On the Kapiti Plains, British East Africa. J 4.

Webi Dawa—Flows east into the Juba River on the boundary between Abyssinia and British East Africa. H 6.

Wembere Plains—In north central German East Africa south of the Serengeti Plains. K 3–4.

West Kenia Plains—Plains just west of Mount Kenia. I–J 4–5.

Yala River—See Lukosa River. I 3.

Zanzibar—Town on Zanzibar Island. L 5.

The plates illustrate the skulls of all type specimens of mammals of the orders included in this part which are in the Museum. The type specimen of *Oryx annectens* is a skin only. Of the 49 type skulls 45 are here figured for the first time.

Order PRIMATES.

Family LORISIDÆ.

Genus PERODICTICUS Bennett.

1831. *Perodicticus* Bennett, Proc. Zool. Soc. London, 1831, p. 109. (*P. potto.*)

A single form of the West African potto inhabits the Congo Forest Zone in the immediate vicinity of Victoria Nyanza, where specimens were collected by the Rainey Expedition in January and February, 1912.

PERODICTICUS IBEANUS Thomas.

1910. *Perodicticus ibeanus* Thomas, Abstr. Proc. Zool. Soc. London, No. 81, p. 17. March 22. (Kakumega Forest, near Mount Elgon, British East Africa type in British Museum.)

Specimens.—Six from the following localities:

British East Africa: Kaimosi, 5 (Heller); Lukosa River, 1 (Heller).

Five specimens out of the above series are fully adult, and four of these are males. The single female skin is decidedly grayish, lacking entirely the rich, dark, ferruginous color of the males. The difference is really very striking but does not, perhaps, signify a genuine sexual variation. The female, collected at Kaimosi February 4, was nursing a small young one 142 millimeters in length. The young animal is clothed in a whitish woolly coat washed with a faint cinnamon tinge on the dorsal surface; the underfur, especially of the neck, is gray. Stomach contents of the males, as recorded by the collector, consisted of white grubs and one large caterpillar for one specimen and seven small snails and some gelatine-like matter for another. The entire skinned body of one adult male is preserved in alcohol.

For measurements of specimens see page 14.

Family GALAGIDÆ.

Genus GALAGO Geoffroy.

1796. *Galago* Geoffroy, Mag. Encycl., 1796, vol. 1, p. 49. (*G. senegalensis.*)

1811. *Macropus* Fischer, Mém. Soc. Moscou, vol. 1, p. 12. (*G. senegalensis;* not *Macropus* Shaw and Nodder, 1790.)

1811. *Otolicnus* Illiger, Prodr. Syst. Mamm. et Avium, p. 74. (*G. senegalensis.*)

1854. *Chirosciurus* Gervais, Hist. Nat. Mamm., vol. 1, p. 159. (*G. senegalensis.*)

1859. *Otolemur* Coquerel, Rev. et Mag. Zool., ser. 2, vol. 11, p. 458. November. (*G. agisymbanus*=*G. garnettii.*[1]) [Valid as a subgenus.]

1863. *Otogale* Gray, Proc. Zool. Soc. London, p. 139. (*G. garnettii.*)

[1] See Thomas, Ann. and Mag. Nat. Hist., ser. 8, vol. 20, p. 48. July, 1917.

Much better series of specimens of these bush babies must be available for study before the ranges and characters of the forms can be worked out satisfactorily. This is especially true of the larger species, *lasiotis* and *kikuyuensis*, members of the subgenus *Otolemur*, in which the variation in the color of the tail and the relative length of tail and body have been used to distinguish forms which often exhibit great individual variation in these respects. There is no specimen in our collection which might be assumed to represent *Galago hindei* Elliot,[1] described from Kitui, British East Africa.

The smaller forms, members of the subgenus *Galago*, including *braccatus* and its allies and the coast species *cocos*, are much more sharply marked; and there is very little individual variation among skins from a single locality. The forms of these smaller bush babies appear to be very local in distribution.

For measurements of specimens see page 14.

GALAGO KIKUYUENSIS Lönnberg.

1912. *Galago (Otolemur) kikuyuensis* Lönnberg, Ann. and Mag. Nat. Hist., ser. 8, vol. 9, p. 64. January. (Escarpment Station, British East Africa; type in R. Nat. Hist. Mus., Stockholm.)

Specimens.—Two, as follows:

British East Africa: Ngongo Bagas (Klein).

These two specimens are dark and richly colored. Both have very dark brownish black tail tips.

GALAGO LASIOTIS LASIOTIS Peters.

1877. *Galago lasiotis* Peters, Mon.-ber K. Preuss. Akad. Wiss. Berlin, 1876, p. 912. (Mombasa, British East Africa; type in Berlin Museum.)

1910. *Galago (Otolemur) lasiotis* Roosevelt, African Game Trails, Amer. ed., p. 474; London ed., p. 486.[2]

Specimens.—Seven, from localities as follows:

British East Africa: Changamwe, 1 (Mearns); Maji-ya-chumvi, 1 (Heller); Mazeras, 2 (Heller); Mount Mbololo, 1 (Heller); Ndi, 2 (Heller).

There is great variation in the color of the tip of the tail in this form. One female from Mount Mbololo has the end of the tail for 30 millimeters almost clear white; one male from Ndi has a broad terminal area of blackish without any indication of white hairs; and other skins are intermediate between these extreme types of coloration. There is also much variation in the amount of rufous on the arms and legs.

At Ndi, Mount Mbololo, and Maji-ya-chumvi, Heller noted in his journal that these lemurs were very noisy, and many were heard

[1] Ann. and Mag. Nat. Hist., ser. 7, vol. 20, p. 186. September, 1907.

[2] All references to Roosevelt's African Game Trails are from the original American and London editions. There is a later popular edition, without title-page date, in which the pagination is entirely different.

calling in the bush every night. He describes the call as a sharp and crow-like *ka'-ka-ka,* with terrific emphasis on the first syllable. At Ndi one came into the trees near his camp and woke him by its loud crying. In one place he compares the notes to those of the tree hyrax but as less loud and varied. The specimens were secured by "shining" the animals with a lamp at night, when it was comparatively easy to shoot them.

Heller examined the type of this species in Berlin and made the following manuscript notes, which are on file in the National Museum:

The type of *Galago lasiotis* Peters is a young specimen in alcohol; No. 5107 Berlin Mus.; labeled Mombasa; Hildebrandt coll. Size and appearance of the smaller lemur, but it is the young of the larger species, as the skull, which has been removed, is very immature, with molars just erupting. Tail with terminal three-fourths whitish, body drab, feet brown; ears very hairy. Exact locality uncertain, probably came from mainland near Mombasa.

GALAGO LASIOTIS PANGANIENSIS (Matschie).

1892. *Galago crassicaudatus* True, Proc. U. S. Nat. Mus., vol. 15, p. 450. (Not of Geoffroy.)

1905. *Otolemur panganiensis* Matschie, Sitz.-ber. Ges. nat. Freunde Berlin, p. 278. (Aruscha, German East Africa; type in Berlin Museum.)

Specimens.—Three from the following localities:

British East Africa: Taveta, 2 (Abbott).

German East Africa: Aruscha Wa-cini, 1 (Abbott).

As noted by Dr. F. W. True in his report on the Abbott Kilimanjaro collection,[1] there is great variation in color among these specimens, although they apparently do not represent more than one named form. One of the males from Taveta is of a general grayish buff coloration and has a buffy white tail tip; the other is heavily washed with rufous, especially on the limbs and tail, and has a dark brown tail tip. The specimen from Aruscha Wa-cini, a female, is in general appearance very much like the gray male from Taveta but has a dark brown tail tip like the reddish skin from that place and the hands and feet are considerably darker in color. The form is not very well distinguished from *Galago lasiotis lasiotis,* in so far as our material shows, and better series would be needed to diagnose properly the two subspecies. The degree of nakedness of the ears is in a great measure dependent on condition of pelage and varies from skin to skin.

Following are Heller's manuscript notes on the type of this form taken at the Berlin Museum:

Otolemur panganiensis Matchie. Type No. 3402; Aruscha; von der Decken. Skin mounted, dirty or somewhat faded; color brownish yellow, tip of tail blackish. Skull with floor of brain case torn away but one condyle still left. Length of skull, 60.5; zygomatic width, 45.0; upper tooth row, 27.2; postorbital constriction, 20.2; length of mandible, 48.0; palatal width at m^2, 14.8; length of nasals, 20.2.

[1] Proc. U. S. Nat. Mus., vol. 15, p. 450. 1892.

Measurements of adult specimens of Perodicticus and Galago.

Form and locality.	No.	Sex.	Head and body.	Tail vertebræ.	Hind foot.	Skull: Condylo-basal length.	Zygo-matic breadth.	Mastoid breadth.	Inter-orbital breadth.	Length of man-dible.	Upper tooth row, canine to m^3, inclusive.	Remarks.
Perodicticus ibeanus.												
B. E. A.:												
Lukosa River	184232	Male	360	60	78	62.8	45.4	36.4	9.1	40.6	20.0	Basal suture open.
Kaimosi	184227	...do	350	60	70	63.1	48.5	38.5	10.5	42.8	21.5	Basal and nasal sutures closed.
Do	184228	...do	350	62	68	61.7	46.4	38.8	8.8	41.1	20.9	Do.
Do	184231	...do	345	65	70	61.2	45.8	37.0	9.4	40.4	20.3	Do.
Do	184230	Female	340	60	72	60.6	44.9	38.4	9.2	41.5	20.4	Do.
Galago kikuyuensis.												
B. E. A.:												
Ngongo Bagas	184196	Male							8.2	39.4	24.3	Basal suture open.
Do	184197	...do				56.6	39.8	28.5	7.4	38.8	23.8	Do.
Galago lasiotis lasiotis.												
B. E. A.:												
Mazeras	184202	Male	270	360	88	58.3	43.3	32.0	8.5	41.3	23.8	Basal suture closed.
Maji-ya-chumvi	184201	...do	275	340	82	58.5		31.5	9.0	40.8	24.0	Do.
Ndi	184200	...do	305	355	90	61.5	45.4	32.9	8.6	43.6	24.8	Do.
Mount Mbololo	184199	Female	270	325	90	58.8	42.6	31.2	8.0	40.6	23.6	Do.
Galago lasiotis panganiensis.												
B. E. A.: Taveta	35091	Male							9.1	42.8		
G. F. A.: Arusha Wa-cini	35093	Female				61.3	44.2	31.2	8.9	43.1	24.3	Basal suture closed.

Galago albipes.											
B. E. A.:											
Lukosa River	184209	Male	180	255	72	41.0	31.7	24.8	5.9	27.5	15.6	Basal suture closed.
Do	184207	Female	165	248	67	37.5	29.9	24.0	4.9	25.0	14.6	Basal suture open.
Do	184208	...do	175	235	68	39.5	30.0	23.8	5.7	26.3	15.5	Basal suture closed.
Galago sotikæ.											
B. E. A.: Telek River	[1] 184205	Male	200	295	76	43.6	32.8	26.3	5.4	28.2	16.8	Basal suture closed.
Do	184204	Female	190	275	75	42.9	31.7	25.6	5.0	29.2	17.3	Do.
Do	184206	...do	195	280	72	42.7	32.4	25.5	.....	29.4	16.6	Do.
Galago braccatus.											
B. E. A.:											
Ndi	184212	Male	163	235	64	39.2	31.8	24.8	5.9	27.5	16.4	Basal suture closed.
Do	184213	...do	170	.....	66	39.3	31.8	24.2	4.9	26.3	16.0	Do.
Do	184211	Female	160	250	64	37.0	29.8	23.2	5.1	25.4	15.3	Do.
Maji-ya chumvi	184214	Male	170	250	64	38.4	30.2	23.3	4.5	26.2	15.3	Basal suture open.
Do	184216	...do	162	250	68	38.3	28.8	23.1	4.8	25.3	15.3	Do.
Do	184217	...do	160	268	68	37.4	29.3	23.4	5.0	25.2	15.1	Do.
Do	184215	Female	170	250	64	39.4	.....	24.0	5.0	25.8	14.9	Basal suture closed.
Galago cocos.											
B. E. A.:											
Mazeras	[1] 181810	Male	150	203	55	36.7	27.0	21.4	4.7	24.7	14.6	Basal suture closed.
Do	184218	...do	155	220	60	38.1	27.8	22.3	5.1	.....	14.7	Do.
Do	184222	...do	165	200	.....	.....	28.1	22.2	5.0	26.2	15.2	
Do	184223	...do	155	230	60	39.3	.....	23.3	5.1	26.0	15.2	Do.
Do	184224	...do	150	222	58	38.0	25.5	22.0	4.9	24.0	14.4	Basal suture open.
Do	184219	Female	160	215	55	.....	28.0	21.8	4.3	25.5	14.5	
Do	184220	...do	145	205	57	36.5	26.0	21.6	4.6	23.8	14.5	Do.
Do	184221	...do	150	205	53	37.8	26.9	21.2	5.0	24.7	15.0	Do.
Do	184225	...do	160	225	56	38.2	27.0	23.0	5.0	25.0	15 2	Basal suture closed.

[1] Type.

GALAGO ALBIPES Dollman.

1909. *Galago braccatus albipes* Dollman, Ann. and Mag. Nat. Hist., ser. 8, vol. 4, p. 549. December. (Kirui, Mount Elgon, British East Africa, 6,000 feet; type in British Museum.)

Specimens.—Three, as follows:

British East Africa: Lukosa River, 3 (Heller).

A female from Lukosa River, collected on February 10, contained a single large embryo. In all three of these specimens the toes are whitish, sharply marked from the cinnamon buff color of the legs and feet.

For measurements of species of bush babies of the subgenus *Galago* see page 15.

GALAGO SOTIKÆ Hollister.

Plate 2.

1920. *Galago sotikæ* Hollister, Smithsonian Misc. Coll., vol. 72, No. 2, p. 1. January 22. (Telek River, Sotik, British East Africa; type in U. S. National Museum.)

Specimens.—Three, as follows:

British East Africa: Telek River, Sotik, 3 (Heller).

This form is related closely to *Galago albipes* and to *G. braccatus* but is larger than either, with longer tail, larger hind foot, and paler colored limbs. It is not unlikely that the three forms will eventually be found to intergrade, but there is no evidence of blending of characters in the specimens now at hand, and until specimens of the smaller species of *Galago* are obtained from intermediate territory all three must be considered full species.

GALAGO BRACCATUS Elliot.

1907. *Galago braccatus* Elliot, Ann. and Mag. Nat. Hist., ser. 7, vol. 20, p. 187. September. (Tsavo River,[1] near Mount Kilimanjaro, British East Africa; type in British Museum.)

Specimens.—Eight, from the following localities:

British East Africa: Maji-ya-chumvi, 4 (Heller); Ndi, 4 (Heller).

Single embryos were found in females from Ndi, November 1, and from Maji-ya-chumvi, December 13. There is very little variation in color in this series; all the skins have bright cinnamon buff limbs with paler, creamy buff, toes. The type locality for this form was given in the original description as Mount Kilimanjaro, but the type-specimen in the British Museum is labeled Tsavo River and was doubtless collected at some point along the river well away from the mountain.

[1] Dollman, Revue Zool. Africaine, vol. 4, p. 88. July, 1914.

In Heller's journal of the Rainey expedition are the following notes on this species at Ndi, October 30, 1911:

Weather cloudy so that the moon was obscured. Shined with the head light the whole way through the bush. Shined five or six small lemurs, four of which I shot. Their eyes shone brilliant fire-red and are the most brilliant of all animal eyes. I did not hear any of them call.

At Maji-ya-chumvi the animals were found in the dry acacia bush country; here also no call was heard.

GALAGO COCOS Heller.

Plate 2.

1912. *Galago moholi cocos* Heller, Smithsonian Misc. Coll., vol. 60, No. 12, p. 1. November 4. (Mazeras, British East Africa; type in U. S. National Museum.)

1913. *Galago cocos* Elliot, Rev. Primates, vol. 3, p. 257. June 15.

Specimens.—Ten, as follows:

British East Africa: Mazeras, 10 (Heller).

This distinct lemur is not intimately related to *Galago braccatus*, which occurs less than 15 miles inland from Mazeras at Maji-ya-chumvi. It is probably more closely related to *Galago gallarum* Thomas [1] from the Boran Galla country. The skins are very uniformly colored, the limbs scarcely brighter than the back. An immature specimen, with the last molar not yet in place, has the tail almost blackish, very much darker than in any of the adults. Single embryos were found in females collected at Mazeras December 21 and 22.

Family LASIOPYGIDÆ.

Genus PAPIO Erxleben.

1777. *Papio* Erxleben, Syst. Regni Anim., Mamm., p. 15. (*P. sphinx* Erxleben=*P. papio*.)

Five closely related forms of baboons are represented in these collections. No evidence of direct intergradation is to be found and it seems better to treat them all as species until the group is properly monographed and their relationships with earlier named forms are better understood.

For measurements of specimens see page 20.

PAPIO FURAX Elliot.

1907. *Papio furax* Elliot, Ann. and Mag. Nat. Hist., ser. 7, vol. 20, p. 498. December. (Lake Baringo, British East Africa; type in British Museum.)

1910. *Papio ibeanus* Roosevelt, African Game Trails, Amer. ed., pp. 474 and 480; London ed., pp. 486 and 492. (Part; specimens from Naivasha; not of Thomas.)

[1] Ann. and Mag. Nat. Hist., ser. 7, vol. 8, p. 27. July, 1901.

Specimens.—Eleven, from localities as follows:

British East Africa: Lake Naivasha, 4, including one odd skull (K. Roosevelt, Loring); Merelle River, Marsabit Road, 4 (Heller); Mount Lololokwi, 3 (Heller).

There is remarkable uniformity in all characters between specimens from Lake Naivasha and the region north of the Northern Guaso Nyiro. From the other East African forms, *P. furax* is readily distinguished by the shortness of the rostral portion of the skull.

In his notes on the baboons at Lake Naivasha, Colonel Roosevelt has written:

> The baboons were numerous around this camp, living both among the rocks and in the tree tops. They are hideous creatures. They ravage the crops and tear open new-born lambs to get at the milk inside them; and where the natives are timid and unable to harm them, they become wantonly savage and aggressive and attack and even kill women and children.[1]

In Heller's manuscript journal of the Rainey Expedition are the following notes made at Merelle Water, July 23, 1911:

> We sat down to watch the baboons come to the water holes. A troup of about 20, consisting of about 5 large males and many females and young, came down. The half-grown ones were the most daring and solitary ones came to the water first. Afterwards the old males and females came. A little one got into one of our traps and the baboons all ran about chattering. An old male made desperate attempts to drag the young one out of the trap and remained behind until driven away. One of our dogs chased him and he turned about and drove him away. It is apparent that the old males give the troup as much protection as they can.

PAPIO VIGILIS Heller.

Plates 3, 4.

1913. *Papio anubis vigilis* Heller, Smithsonian Misc. Coll., vol. 61, No. 19, p. 11. November 8. (Lakiundu River, near its junction with the Northern Guaso Nyiro, British East Africa; type in U. S. National Museum.)

Specimens.—Two, from the following localities:

British East Africa: Archer's Post, Northern Guaso Nyiro, 1 (Heller); Lakiundu River, 1 (Heller).

Baboons from the southern side of the Northern Guaso Nyiro, at the two localities listed, have much longer skulls than *furax*. The rostrum is especially elongated. In this character the species agrees with *P. lestes* from south of Mount Kenia and *P. neumanni* from German East Africa; and is remarkably different from *P. furax*, which occurs at localities north of the river. Flesh measurements of the type-specimen, a very old male, are: Head and body, 700 millimeters; tail vertebræ, 540; hind foot, 190; ear, 50.

[1] African Game Trails, Amer. ed., pp. 218–219. 1910.

PAPIO LESTES Heller.

Plates 4, 5.

1910. *Papio ibeanus* Roosevelt, African Game Trails, Amer. ed., pp. 474 and 480; London ed., pp. 486 and 492. (Part; not of Thomas.)

1913. *Papio anubis lestes* Heller, Smithsonian Misc. Coll., vol. 61, No. 19, p. 10. November 8. (Ulukenia Hills, Athi Plains, British East Africa; type in U. S. National Museum.)

Specimens.—Four, from localities as follows:

British East Africa: Nairobi, 1 (McMillan); Ulukenia Hills, 3, including one odd skull (Loring).

This large baboon agrees with *P. vigilis*, as opposed to *P. furax*, in the form of the skull, but differs from *vigilis* in having much more black on the hands and wrists. The specimen from Nairobi, which was received at the National Zoological Park, in Washington, December 19, 1909, and lived in the gardens until June 20, 1912, is very different from skins of wild-killed animals. All of the buff and yellowish colors of the wild baboon have changed to a rich reddish brown during the two and one-half years of captivity in Washington, and if the history of the specimen was not known its identity with *Papio lestes* would never be mistrusted. Flesh measurements of the type specimen, as recorded by Loring, are: Head and body, 723 millimeters; tail vertebræ, 439; hind foot, 215. The type is a fully grown male.

PAPIO NEUMANNI Matschie.

1897. *Papio neumanni* Matschie, Sitz-ber. Ges. nat. Freunde Berlin, 1897, p. 161. (Dönyo Ngai, Masailand, German East Africa; type in Berlin Museum.)

Specimen.—One odd skull from—

German East Africa: Ikoma (Lindsay).

This species is said by Elliot [1] to be "quite a small baboon," but as the type is an immature specimen with the last molar not yet in place, the adult animal must be considerably larger than indicated by the dimensions he records. Heller examined the type-specimen in Berlin, and as his measurements of it differ considerably from those given by Elliot they may be presented here:

Papio neumanni Matschie. Type ♂, 11551. Dönyo Ngai; O. Neumann. Skin stuffed, but not mounted. Color chiefly tawny, the blackish not dominant as in specimens from the highlands of British East Africa. Skull immature, last molar not yet in place and sutures all open; canines still only half out. Condylo-incisive length, 138; greatest length, 173; zygomatic width, 98; rostral width, 34; braincase width, 80; upper tooth row to canine, 62; width of palate at second molar, 28; second molar, 11.2×13.3; condylo-incisive length of mandible, 128.

It is evident that the skull figured and measured by Anderson [2] as the type-specimen of this species was not the actual type. The

[1] Review of the Primates, vol. 2, p. 141. June 15, 1913.

[2] Zoology of Egypt: Mammalia, pp. 46–47, pl. 8. 1902.

Cranial and dental measurements of East African baboons.

Locality.	No.	Sex.	Greatest length skull.	Condylo-basal length.	Zygomatic breadth.	Length of nasals.	Upper molar-premolar row.	Second upper molar.	Lower tooth row, including canine.	Remarks.
Papio furax.										
B. E. A.:										
Merelle River	182096	Male	191	154	113	72.3	53.3	13.4×11.9	78.3	Basal suture closed.
Do	182207	...do	197	153	122	67.8	51.3	12.8×11.9	70.5	Basal suture nearly closed.
Do	182208	...do	193	152	119	70.5	54.3	14.2×12.6	80.8	Basal suture closed.
Lake Naivasha	162899	...do	196	155	126	69.7	50.9	13.0×12.4	76.8	Do.
Mount Lololokwi	182148	Female	154	119	91	51.1	43.1	10.7× 9.8	56.6	Do.
Papio vigilis.										
B. E. A.:										
Archer's Post	182025	Male	212	171	125	69.7	62.8	12.8×11.7	79.5	Basal suture nearly closed; has four upper molars.
Lakiundu River	[1] 182033	...do	211	170	125	81.2	53.0	13.4×12.1	99.5	Basal suture closed; teeth much worn; has 4 lower molars.
Papio lestes.										
B. E. A.:										
Ulukenia Hills	164518	Male	198	152	113	67.9	52.7	13.6×11.8	75.1	Basal suture closed.
Do	[1] 164633	...do	200	156	114	75.8	55.4	14.5×12.8	77.9	Basal suture nearly closed.
Papio neumanni.										
G. E. A.: Ikoma	216605	Male	213	166	126	87.2	52.8	13.3×13.0	78.2	Basal suture nearly closed.
Papio tessellatus.										
Uganda: Budonga Forest	236976	...do	223	180	130	81.3	55.5	13.7×13.3	85.2	Basal suture closed.

[1] Type.

specimen from Ikoma which I have here listed as *Papio neumanni* differs greatly from skulls of *Papio furax* in its larger size and longer rostrum, equaling in these features the skulls of *Papio vigilis* from the Northern Guaso Nyiro. Without more material from northern German East Africa it will be impossible to determine it with accuracy, but as it was collected only a comparatively short distance northwest from the type locality of *neumanni*, and as no other baboons, except *furax* and *neumanni*, are recorded from this general region, it seems safe to assume that this specimen is the skull of the adult male of the latter. Mr. Lindsay's notes on the specimen say that it was shot in the river bottom at Ikoma, May 30, 1914.

PAPIO TESSELLATUS Elliot.

1909. *Papio tessellatum* Elliot, Ann. and Mag. Nat. Hist., ser. 8, vol. 4, p. 247. September. (Mulema, Ankole, Uganda; type in British Museum.)

Specimens.—Four, as follows:

Uganda: Budonga Forest, 4 (Raven).

This series includes one fully adult male, which exceeds in measurements the type-specimen described by Elliot. The collector's field book gives the weight of this large male as 76 pounds, and its measurements as follows: Head and body, 780; tail vertebræ, 550; hind foot, 235.

Genus THEROPITHECUS Geoffroy.

1843. *Theropithecus* Geoffroy, Archiv. Mus. Hist. Nat. Paris, vol. 2, 1841, p. 576. (*T. gelada.*)

1843. *Gelada* Gray, List. Spec. Mamm. British Mus., p. 9. (*T. gelada.*)

The gelada is represented in the National Museum collections only by specimens received from the National Zoological Park.

THEROPITHECUS OBSCURUS Heuglin.

1863. *Theropithecus obscurus* Heuglin, Nov. Act. Acad. Caes. Leop.-Car., vol. 30, Abhandl. No. 2, p. 10. (Sources of the Takassie River, eastern Abyssinia; types in Leyden Mus.)

Specimens.—Two, as follows:

Abyssinia: No definite locality, 2 (Menelik).

Both of these specimens were presented alive to President Roosevelt by Emperor Menelik of Abyssinia and were deposited in the National Zoological Park on November 24, 1904. They were then not much more than one-half grown. The male died on December 27, 1904, and the female on January 12, 1906. The complete skeleton of the male is preserved, as well as the skin.

Genus CERCOCEBUS Geoffroy.

1812. *Cercocebus* Geoffroy, Ann. Mus. Hist. Nat., Paris, vol. 19, p. 97. (*C. fuliginosus.*)

1870. *Semnocebus* Gray, Cat. Monk., Lemurs, and Fruit-eat. Bats Brit. Mus., p. 27. (*C. albigena.* Not *Semnocebus* Lesson, 1840.)

1903. *Lophocebus* Palmer, Science, new ser., vol. 17, p. 873. May 29. (*C. albigena.*)

1914. *Cercolophocebus* Matschie, Sitz.-ber. Ges. nat. Freunde Berlin, p. 341. July. (*C. aterrimus.*)

The mangabeys are chiefly confined to western and central Africa, but two species occur in the region covered by this report. One of these was collected by the Smithsonian African Expedition in Uganda.

CERCOCEBUS ALBIGENA UGANDÆ Matschie.

1913. *Cercocebus albigena ugandae* Matschie, Rev. Zool. Africaine, vol. 2, fasc. 2, p. 210. February. (Near Entebbe, Uganda; type in Berlin Museum.)

Specimens.—Four, from—

Uganda: Kampala (Mearns).

This series of the Uganda mangabey includes one adult male, two adult females, and a very young male. The young male lacks the brown mane and collar of the adults and is entirely black. The skin of the adult male has been mounted. The three adults measure as follows, the external dimensions from the field catalogue records of Doctor Mearns:

	164579, male.	164578, female.	164680, female.
Head and body	610	510	515
Tail vertebræ	780	720	680
Hind foot	160	146	135
Entire ear	36×25	33×24	33×24
Head	142	120	123
Caudal pencil	90	80	85
Edge of upper lip to eye	56	46	46
Skull:			
Greatest length	116	108	103
Condylobasal length	93	83	81
Zygomatic breadth	73.8	66.6	68.4
Mastoid breadth	63.2	60.3	58.5
Breadth of rostrum over canine	34.3	28.5	28.0
Length of mandible	85.4	71.6	73.6
Entire upper tooth row	51.7	47.2	46.4
Upper molar—premolar series	31.3	28.7	28.5
Entire mandibular tooth row	48.9	45.2	44.8

Doctor Mearns records the iris in all three adult specimens as yellow-brown.

Another species of *Cercocebus*, described by Peters,[1] from the coast region of British East Africa, is not represented in our collections.

[1] *Cercocebus galeritus* Peters, Mon-ber. K. Akad. Wiss., 1879, p. 830.

Mr. Heller examined the type of this monkey in Berlin and made the following notes, which are on file in the National Museum:

Cercocebus galeritus Peters. Type, 5546 ♂ Berlin Mus. Mitole, Tana River, British East Africa. Fischer coll. Skin mounted; faded slightly, but in good condition. Skull perfect; old, molars much worn. Color grayish olive; top of head blackish. Skull: condylo-incisive length, 100; greatest length, 127; zygomatic breadth, 84; interorbital breadth, 9.2; postorbital breadth, 46.5; upper tooth row, including canine, 40; width palate at second molar, 22; length of mandible, 90. Fairly closely allied to *agilis* of central Congo; not close to the *albigena* group of Uganda.

Genus ERYTHROCEBUS Trouessart.

1897. *Erythrocebus* TROUESSART, Cat. Mamm., p. 19. (*E. patas.*)

Several species of the hussar monkey have been recognized from the region covered by this report. The earliest described form is *Erythrocebus pyrrhonotus* (Hemprich and Ehrenberg),[1] from Dar-Fur.[2] The next is *E. poliophæus* (Reichenbach),[3] from Fazogli, on the Blue Nile near the border of Abyssinia. Almost hopeless confusion for future workers in the Nile monkeys of this group has been brought about by the description by Elliot of two additional species, both based on zoological park specimens of uncertain history and probably of abnormal coloration. These are *Erythrocebus albigenus*,[4] the type a specimen formerly living in the Giza Zoological Gardens, and supposed to have come from Egyptian Sudan; and *E. formosus*,[5] based on the skin of a specimen that died in the Zoological Gardens in London, and labeled "Uganda." The types of both of these alleged species are in the British Museum, but not until good series of wild-killed specimens from all parts of Sudan are available for study will it be possible, by comparison with these types and with due allowance for their changed colors, to deal satisfactorily with the names. Mr. Heller examined all the available material in the larger museums of Europe and came to the conclusion that *formosus* and *albigenus* are synonyms of *poliophæus*. Forms from British East Africa and German East Africa, with definite type-localities, have been described as noted below.

---

[1] Symb. Phys., pl. 10. 1838.
[2] See Anderson, Zool. Egypt, Mamm., p. 26. 1902.
[3] Die vollständ. Naturg. Affen, p. 122. 1863.
[4] Ann. and Mag. Nat. Hist., ser. 8, vol. 4, p. 265. September, 1909.
[5] Ann. and Mag. Nat. Hist., ser. 8, vol. 4, p. 264. September, 1909.

ERYTHROCEBUS WHITEI Hollister.

Plate 6.

1910. *Erythrocebus whitei* Hollister, Smiths. Misc. Coll., vol. 56, No. 2, p. 11, pl. 2. March 31. (Nzoia River, Guas Ngishu Plateau, British East Africa; type in U. S. National Museum.)

1910. *Erythrocebus formosus* Roosevelt, African Game Trails, Amer. ed., p. 474; London ed., p. 486. (Specimen from Nimule; not of Elliot.)

1913. *Erythrocebus whitei* Elliot, Rev. Primates, vol. 3, p. 11. June 15.

Specimens.—Four, as follows:

Uganda: Sixty miles north of Nimule, 1 (T. Roosevelt).

British East Africa: Guas Ngishu Plateau, 3 (White).

One of the specimens from British East Africa, the type, was killed near the Nzoia River; one was collected 13 miles east of Mount Elgon; and one 12 miles east of Sirgoit Rock, all on the Guas Ngishu Plateau. The type is the oldest male and is the richest and darkest colored of the three, with the most black and gray on the shoulders and the brightest rump. A female is next oldest and approaches the type closely in the bright coloration of the rump but has much less blackish-gray on the shoulders. The other male, adult but somewhat younger, has less glossy bay on the rump and back and less well-marked shoulders.

Mr. John Jay White, who, in 1908, collected the type of this species and on a later expedition in 1910 secured the other specimens, tells me that several small groups of the monkeys were seen on the Guas Ngishu Plateau. As usually noted, they were in parties of three or four to a dozen animals, traveling on the ground in open country, and were very hard to approach. The type-specimen was stalked and shot from a low tree.

Some form of the hussar monkey inhabits the country southeast of Nairobi, British East Africa. Heller, in his journal of the Rainey Expedition, mentions seeing a group of five, within 100 yards of the train, between Kui and Ulu, March 23, 1911. Dr. Einar Lönnberg also records the animal near Ulu Station, writing as follows:[1]

> Although I have not myself seen any red monkeys during my expedition to Brit. E. Africa, I think it worth mentioning that I heard stated by Dr. Walsh that he had shot a red monkey which according to the description must have been a member of the *patas*-group. This happened not far from Ulu station of the Uganda railroad in April, 1911. Dr. W. observed it running at a long distance and shot at it believing it to be a cheetah, and he confessed to be very astonished to see this strange-looking animal when he had killed it. The occurrence of a monkey of this group as far southeast as Ulu appears rather interesting, but as I have not seen the specimen I cannot tell whether it belongs to any of the species mentioned above.

Sportsmen and naturalists visiting the vicinity of Ulu should make every effort to obtain specimens of the hussar monkey from that locality and send them to some museum for determination. The

[1] Kungl. Sv. Vet. Akad. Handl., vol. 48, No. 5, p. 38, 1912.

forms of this monkey are apparently rather local, and specimens are difficult to secure. Until very recently almost all of the specimens in museums were animals which had died in zoological gardens, with the exact locality of capture unknown. A species of this group was described by Matschie from Ikoma, German East Africa, as *Erythrocebus baumstarki*.[1] While in Berlin, Heller made the following notes on the type-specimen:

Erythrocebus baumstarki Matschie. Type, ♀, A5575, Berlin Mus. Ikoma, German East Africa. Skull immature, last molar just up, all molars unworn, sutures all open. Skin stuffed; color pale, middle dorsal streak sorrel, sides ochraceous, underparts of belly and legs whitish. Hair on face slipped and color can not be made out.

The specimen listed above from Uganda in no way agrees with the description of Elliot's *Erythrocebus formosus* and is here provisionally placed under *E. whitei*. As already mentioned, the type of *formosus*, said to come from "Uganda," is a zoological park animal and its color is doubtless abnormal. Mr. Heller considers *formosus* a synonym of *poliophæus*. The intensity of color and the degree of dark shoulder markings in hussar monkeys are largely matters of age, and there is known to be considerable variation in the extent of the dark facial stripes. The specimen shot by Colonel Roosevelt below Nimule has a darker face than typical specimens of *Erythrocebus whitei* from the Guas Ngishu Plateau, the skin surrounding the mouth being especially blackish; but it has a white-haired nose-spot. It also has the black border of the crown-patch less distinct, almost wanting, and the arms more marked with iron gray, the color extending slightly below the elbow. These differences are in reality very slight and the Nimule specimen may, considering the known variations in monkeys, well be of the same form as the Guas Ngishu animal.

The skulls of the four hussar monkeys listed above measure as follows:

	Guas Ngishu Plateau.			Nimule.
	155340, male, type.	173010, male.	173009, female.	164684, male.
Greatest length	149	130	147	145
Condylobasal length	120	104	118	114
Zygomatic breadth	99	83	84	91
Length of nasals (median)	22.5	21.3	27.2	24.8
Mastoid breadth	72.7	65.5	69.8	72.8
Rostral breadth, over canines	38.8	35.9	38.8	37.1
Palatal length	63.2	50.2	62.2	58.3
Length of mandible	108	93.7	106	103
Maxillary tooth row, exclusive of canine	32	30.7	32	31.8
Mandibular tooth row, including canine	50.3	45.1	49.3	49.6

[1] Sitz.-ber. Ges. nat. Freunde Berlin, 1905, p. 273.

Genus LASIOPYGA Illiger.

1772. *Cercopithecus* Brünnich, Zool. Fund., p. 34. (*L. mona.* Not *Cercopithecus* Gronovius, 1763.)
1811. *Lasiopyga* Illiger, Prodr. Syst. Mamm. et Avium, p. 68. (*L. nictitans.*)
1815. *Cebus* Rafinesque, Anal. Nat., p. 53. (*L. nictitans.* Not *Cebus* Erxleben, 1777.)
1870. *Chlorocebus* Gray, Cat. Monk., Lemurs and Fruit-eat. Bats Brit. Mus., p. 5. (*L. pygerythra.*)
1897. *Rhinostictus* Trouessart, Cat. Mamm., vol. 1, p. 17. (*L. petaurista.*)
1913. *Melanocebus* Elliot, Rev. Primates, vol. 2, p. 296. June 15. (*L. leucampyx.*)
1913. *Insignicebus* Elliot, Rev. Primates, vol. 2, p. 296. June 15. (*L. albogularis.*)

Four distinct groups of guenons are included in the East African collections. These are the *ascanius* group (subgenus *Rhinostictus*); the *leucampyx* group (subgenus *Lasiopyga*); the *pygerythra* group (subgenus *Chlorocebus*); and the *albogularis* group (subgenus *Insignicebus*).

For measurements of specimens of *Lasiopyga*, see tables on pages 33–35.

LASIOPYGA ASCANIUS SCHMIDTI (Matschie).

1892. *Cercopithecus schmidti* Matschie, Zool. Anz., 1892, p. 161. May 2. (Forest between Mengo and Mjongo, Uganda; type in Berlin Museum.)
1910. *Cercopithecus ascanius schmidti* Roosevelt, African Game Trails, Amer. ed., pp. 474 and 481; London ed., pp. 486 and 492.

Specimens.—Four, from the following localities:

Uganda: Budonga Forest, 2 (Raven); Kikandwa, 1 (Heller); Nabea, 1 (Raven).

The specimen from Kikandwa (virtually a topotype) is an adult male, and differs from specimens of *Lasiopyga ascanius kaimosæ* Heller in its shorter coat and darker gray underfur; it also has much smaller teeth. Its external measurements were: Head and body, 470; tail vertebræ, 780; hind foot, 140; ear, 21. Specimens from the Budonga Forest are inseparable.

Heller examined the type and other specimens of this form in Berlin and as the specimen measured by Elliot [1] as the type is evidently not considered such by Matschie, Heller's notes as given below are of especial interest.

Cercopithecus schmidti Matschie. Type, ♂, A5564. Between Mengo and Mjongo, Uganda (Coll. Stuhlmann). Skin mounted; in good condition. Skull perfect, old, cheek-teeth much worn. Matschie says this specimen is the type. Skull: greatest length, 100; condylo-incisive length, 78; basilar length, 65.5; zygomatic width, 65; post-orbital width, 41; upper cheek teeth and canine, 28; width of palate at m^3, 20, width of braincase, 55.5; width at orbits, 52.2; length of mandible, 65.5.

The *Lasiopyga schmidti* (Matschie) of Elliot has been much subdivided since the publication of the "Review of the Primates." The

[1] Review Primates, vol. 2, p. 306. June 15, 1913.

following forms have been described: *Cercopithecus schmidti mpangæ* Matschie, 1913,[1] from Mpanga Forest, Uganda; *Cercopithecus ascanius omissus* Matschie, 1913,[2] the type of which was bought alive from a caravan which came from Manyema, west of the north end of Lake Tanganyika, Belgian Congo; *C. a. cirrhorhinus* Matschie, 1913,[3] probably from the lower Lomami, Province of Stanley Falls, Belgian Congo; *Cercopithecus schmidti sassæ* Matschie, 1913,[4] from Sassa, west of Albert Edward Nyansa, Belgian Congo; *C. s. enkamer* Matschie, 1913,[5] from Chima Kilima, north of Mawambi, Upper Ituru, Belgian Congo; *Cercopithecus ascanius kassaicus* Matschie, 1913,[6] from Pogge Falls on the Kassai, Congo; *C. a. pelorhinus* Matschie, 1913,[7] from Yambuya, Belgian Congo; *Lasyopyga* [sic] *schmidti montana* Lorenz von Liburnau, 1914,[8] from Wabembe, northwestern Lake Tanganyika, Congo; and *L. s. ituriensis* Lorenz von Liburnau, 1914,[9] from the Ituri Forest, Belgian Congo.

LASIOPYGA ASCANIUS KAIMOSÆ Heller.

Plate 7.

1913. *Lasiopyga ascanius kaimosæ* Heller, Smithsonian Misc. Coll., vol. 61, No. 17, p. 10. October 21. (Upper Lukosa River, near the mission station of Kaimosi, British East Africa; type in U. S. National Museum.)

1919. *Cercopithecus ascanius orientalis* Lönnberg, Revue Zool. Africaine, vol. 7, p. 125. (Kampi Simba, upper Nzoia River, British East Africa; type in Congo Museum, Tervueren, Belgium.)

Specimens.—Nineteen, from localities as follows:

British East Africa: Kaimosi, 11 (Heller); Kakumega, 1 (Heller); Lukosa River, 7, including one fetus in alcohol (Heller).

This excellent series contains skins and skulls of five adult males, five adult females, and young of all ages from small nursing animals to those in which the last molar is just erupting. The smallest suckling, with head and body measuring 150 millimeters, was collected on February 4 and is chiefly a dingy blackish above, especially on the head and center of back, with a few yellowish-buffy hairs throughout the pelage of the body and tail; the underparts are thinly haired with grayish white and the tail is tipped with black; there are no markings on the crown. A slightly older suckling female collected the same day, with head and body measuring 180 millimeters, has a distinct yellowish brow band, yellowish cheeks, sharply marked white nose spot, and glossy black hands and feet; the tail is beginning

[1] Ann. Soc. Roy. Zool. Malac. Belgique, vol. 47 (1912), p. 67. December, 1913.
[2] Ann. Soc. Roy. Zool. Malac. Belgique, vol. 47 (1912), p. 68. December, 1913.
[3] Ann. Soc. Roy. Zool. Malac. Belgique, vol. 47 (1912), p. 68. December, 1913.
[4] Ann. Soc. Roy. Zool. Malac. Belgique, vol. 47 (1912), p. 72. December, 1913.
[5] Ann. Soc. Roy. Zool. Malac. Belgique, vol. 47 (1912), p. 72. December, 1913.
[6] Ann. Soc. Roy. Zool. Malac. Belgique, vol. 47 (1912), p. 74. December, 1913.
[7] Ann. Soc. Roy. Zool. Malac. Belgique, vol. 47 (1912), p. 76. December, 1913.
[8] Sitz.-ber. K. Akad. Wiss., Wien, 1914, No. 17, p. 357. June, 1914.
[9] Sitz.-ber. K. Akad. Wiss., Wien, 1914, No. 17, p. 357. June, 1914.

to show considerable ochraceous. Older specimens, but with the molar teeth not yet in place, are colored essentially like the adults.

The Rainey Expedition collected a large series of specimens from Kaimosi, the head of the Lukosa River on the lower slopes of the Nandi Escarpment and the Kakumega forest. This material is now in the National Museum. It represents the eastern limits of the *ascanius* group of *Lasiopyga* in Africa which has not previously been reported so far east as British East Africa. They were found abundant in the dense forests where they lived in proximity to colobus and the large gray forest monkeys, *Lasiopyga leucampax neumanni*. When alarmed they uttered a peculiar, low, chirping, bird-like note very unlike the barking calls of other African monkeys.[1]

The type-specimen of Lönnberg's *Cercopithecus ascanius orientalis* is virtually a topotype of *Lasiopyga ascanius kaimosæ*. The locality, Kampi Simba, is only a short distance from the upper Lukosa River, where Heller obtained his type series, and as the collector of Lönnberg's specimen stated that although the specimen was prepared at Kampi Simba it was doubtless obtained in some of the forests at some little distance from that place, it is likely that it came from the exact region of Heller's specimens, the only locality in British East Africa where the species is known certainly to occur. Doctor Lönnberg overlooked Heller's name in describing his new form.

LASIOPYGA LEUCAMPYX CARRUTHERSI (Pocock).

1907. [*Cercopithecus leucampyx*] subsp. *carruthersi* Pocock, Proc. Zool. Soc. London, p. 689. (Ruwenzori, east side, 10,000 feet, Uganda; type in British Museum.)

1909. *Cercopithecus princeps* Elliot, Ann. and Mag. Nat. Hist., ser. 8, vol. 4, p. 304. September. (Mpanga Forest, Uganda; type in British Museum.)

Specimens.—Sixteen, as follows:

Uganda: Budonga Forest, 16, including one odd skull (Raven).

LASIOPYGA LEUCAMPYX NEUMANNI (Matschie).

1905. *Cercopithecus neumanni* Matschie, Sitz.-ber. Ges. nat. Freunde Berlin, 1905, p. 266. (Kwa Kitoto, North Kavirondo, British East Africa; type in Berlin Museum.)

Specimens.—Nine, as follows:

British East Africa: Kakumega, 3 (Heller); Lukosa River, 6 (Heller).

No specimens of this group of guenons were collected by the Smithsonian African Expedition, but the Rainey Expedition secured this fine series in the Kakumega Forest.

[1] Heller, Smithsonian Misc. Coll., vol. 61, No. 17, p. 10. Oct. 21, 1913.

LASIOPYGA LEUCAMPYX MAUÆ Heller.

Plate 8.

1913. *Lasiopyga leucampax* [sic] *mauæ* Heller, Smithsonian Misc. Coll., vol. 61, No. 17, p. 7. October 21. (Summit of Mau Escarpment, between Londiani and Sirgoit, British East Africa; type in U. S. National Museum.)

Specimen.—One, the type, from—

British East Africa: Wagon road, Londiani to Sirgoit, 1 (White).

The type-specimen of this form was collected by Mr. John Jay White, November 1, 1910. It resembles very closely specimens of *Lasiopyga leucampyx neumanni*, but has more buff, less gray, in the coloration of the upper parts; larger skull, with well-developed sagittal crest; and larger teeth. This form is the easternmost representative of the *leucampyx* group.

Doctor Lönnberg has recently described a subspecies from Mount Elgon, as *Cercopithecus leucampyx elgonis*,[1] that would seem to be more closely related to *Lasiopyga leucampyx mauæ* than to *L. l. neumanni*.

LASIOPYGA PYGERYTHRA JOHNSTONI (Pocock).

1892. *Cercopithecus sabæus* True, Proc. U. S. Nat. Mus., vol. 15, p. 449. October 26. (Not of Linnæus.)

1907. [*Cercopithecus pygerythrus*] subsp. *johnstoni* Pocock, Proc. Zool. Soc. London, 1907, p. 738. (Moshi, south side of Mount Kilimanjaro, at 5,000 feet altitude, German East Africa; type in British Museum.)

Specimen.—One, from—

British East Africa: Taveta (Abbott).

This specimen is immature.

LASIOPYGA PYGERYTHRA TUMBILI Heller.

Plate 9.

1913. *Lasiopyga pygerythra tumbili* Heller, Smithsonian Misc. Coll., vol. 61, No. 17, p. 10. October 21. (Ndi, Taita District, British East Africa; type in U. S. National Museum.)

Specimens.—Ten, from the following localities:

British East Africa: Mtoto Andei, 2 (Heller); Ndi, 6 (Heller); Voi, 2 (Heller).

This pale form of the *pygerythra* group has a very sharply bicolored tail, with the median stripe above blackish and well defined, and the underside clear yellowish buff. In its typical form it is apparently confined to the Taita Hills region, as the specimens from near the coast at Changamwe, which were included with it by the original describer, are clearly of another subspecies. The two specimens from Mtoto Andei are both females and one of them is immature. They

[1] Revue Zool. Africaine, vol. 7, p. 133. 1919.

are externally very similar to comparable specimens of *tumbili* from Ndi and Voi, but the adult female is much smaller. Without more material from the region about Mtoto Andei, the exact allocation of these specimens is impossible. The adult female may be an undersized example, or, as the forms of *pygerythra* appear to be very local, may represent another race.

At Ndi Heller found this monkey living in the acacia trees on the steep sides of Mount Mbololo, from which they descended daily to the small stream near the village to drink. At Voi they were found in fig trees near the banks of the Voi River. He says: "This monkey is called by the Swahili 'tumbili' and the name has been adopted by many of the inland tribes and the resident Europeans for the monkeys of the *pygerythra* group." [1]

LASIOPYGA PYGERYTHRA CONTIGUA Hollister.

Plate 10.

1913. *Lasiopyga pygerythra tumbili* Heller, Smithsonian Misc. Coll., vol. 61, No. 17, p. 10. October 21. (Part; specimens from Changamwe; not *L. p. tumbili* Heller from Ndi.)

1920. *Lasiopyga pygerythra contigua* Hollister, Smithsonian Misc. Coll., vol. 72, No. 2, p. 2. January 22. (Changamwe, British East Africa; type in U. S. National Museum.)

Specimens.—Three, as follows:

British East Africa: Changamwe, 3 (Mearns).

This subspecies from the coast region near Mombasa is closely related to *Lasiopyga pygerythra tumbili* of the Taita Hills, but is larger, with smaller molariform teeth, and has a much less sharply bicolored tail. The underside of the tail is gray, not tawny yellowish, as in *tumbili*, and the dark gray longitudinal stripe above is consequently much less well marked.

The external measurements of the type, an old male, as recorded by Mearns are: Head and body, 570; tail vertebræ, 720; hind foot, 150; ear, 30; head, 122. "Scrotum pale blue." Of a younger male Mearns says: "Iris light brown."

[1] Smithsonian Misc. Coll., vol. 61, No. 17, p. 11. Oct. 21, 1913.

LASIOPYGA PYGERYTHRA CALLIDA Hollister.

Plate 11.

1910. *Cercopithecus pygerythrus johnstoni* Roosevelt, African Game Trails, Amer. ed., pp. 474 and 481;[1] London ed., pp. 486 and 492.[1] (Part; not of Pocock.)

1912. *Lasiopyga pygerythra callida* Hollister, Smithsonian Misc. Coll., vol. 59, No. 3, p. 1. March 2. (South side of Lake Naivasha, British East Africa; type in U. S. National Museum.)

1913. *Lasiopyga callida* Elliot, Rev. Primates, vol. 2, p. 343. June 15.

Specimens.—Fifteen, from localities as follows:

British East Africa: Amala River, 5 (Heller); Kabalolot Hill, 1 (Heller); Lake Naivasha, 7, including one large fetus in alcohol (Heller, Mearns); Telek River, Sotik, 2 (Heller).

This well-marked form, as shown by material collected by the Rainey Expedition, ranges southward through the Sotik at least to the border of German East Africa. The type, an adult male, collected by Mearns, measured: Head and body, 525; tail vertebræ, 610; hind foot, 140; ear from crown, 27. It weighed exactly 10 pounds. Doctor Mearns shot it from a group of seven, 60 feet high in a thorn tree. An adult female, collected by Heller at Lake Naivasha, measured: Head and body, 420; tail vertebræ, 515; hind foot, 120; ear, 30. It contained one large embryo. The stomach contents of this specimen were identified as fruit of the yellow thorn tree.

LASIOPYGA PYGERYTHRA RUBELLA (Elliot).

Plate 12.

1909. *Cercopithecus rubellus* Elliot, Ann. and Mag. Nat. Hist., ser. 8, vol. 4, p. 260. September. (Fort Hall, British East Africa; type in British Museum.)

1910. *Cercopithecus centralis luteus* Elliot, Smithsonian Misc. Coll., vol. 56, No. 7, p. 1. June 11. (Wambugu, British East Africa; type in U. S. National Museum.)

1913. *Lasiopyga rubella* Elliot, Rev. Primates, vol. 2, p. 342. June 15.

1913. *Lasiopyga centralis lutea* Elliot, Rev. Primates, vol. 2, p. 346. June 15.

Specimens.—Two, as follows:

British East Africa: Wambugu, 2 (Loring).

One of these specimens is the type of Elliot's *Cercopithecus centralis luteus*, which is unquestionably synonymous with his earlier *C. rubellus*.[2] The paratype is a young male, not a female, as stated by Elliot. The subspecies is best distinguished externally by the ochraceous coloration of the underside of the tail, which is most pronounced near the black tip.

[1] "*johnsoni.*"

[2] See Lönnberg, Arkiv för Zoologi, vol. 10, No. 12, pp. 1–4. 1916.

LASIOPYGA PYGERYTHRA ARENARIA Heller.

Plate 13.

1910. *Cercopithecus pygerythrus johnstoni* Roosevelt, African Game Trails, Amer. ed., pp. 474 and 481;[1] London ed., pp. 486 and 492.[1] (Part; not of Pocock.)

1913. *Lasiopyga pygerythra arenaria* Heller, Smithsonian Misc. Coll., vol. 61, No. 17, p. 11. October 21. (Merelle water holes, Marsabit Road, British East Africa; type in U. S. National Museum.)

Specimens.—Eighteen, from the following localities:

British East Africa: Engare Ndare River, 12 (Heller); Isiola River, 1 (Heller); Marsabit Road, 1 (Heller); Merelle River, Marsabit Road, 1 (Heller); Mount Gargues, 2 (Heller); Northern Guaso Nyiro River, 1 (K. Roosevelt).

This subspecies, which seems to be confined to the region north of Mount Kenia, is very much like *Lasiopyga p. callida* in general appearance but differs in having the black of the feet in old males less extensive and more mixed with the grayish buff of the limbs, which sometimes extends in a narrow, median line down to the base of the toes. The tail is much lighter colored than that of *L. p. rubella* from the southern side of Mount Kenia.

The Rainey Expedition found this monkey abundant along the Northern Guaso Nyiro and throughout the desert to the northward wherever water was available. It was commonly seen in small troupes in the large, flat-topped acacias and came daily to the water holes to drink.

LASIOPYGA ALBOGULARIS KIBONOTENSIS (Lönnberg).

1892. *Cercopithecus albogularis* True, Proc. U. S. Nat. Mus., vol. 15, p. 448. October 26. (Not of Sykes.)

1908. *Cercopithecus albogularis kibonotensis* Lönnberg, Sjöstedt's Kilimandjaro-Meru Exped., Mamm., p. 3. (Kibonoto, German East Africa.)

Specimens.—Three, as follows:

British East Africa: Taveta, 3 (Abbott).

Elliot has used the spelling "*albigularis*" for all the races of this monkey and quotes the word in that form from Sykes. As a matter of fact, Sykes uses the word *albogularis* consistently in both his first [2] and second [3] papers on this monkey, and the change is therefore inadmissible on grounds that a typographical error has been made.

[1] "*johnsoni.*"

[2] Proc. Comm. Sci. and Corr. Zool. Soc. London, 1831, p. 106.

[3] Idem, 1832, p. 18.

Measurements of skulls of adult monkeys of the genus Lasiopyga.

Form and locality.	No.	Sex.	Greatest length.	Condylo-basal length.	Zygo-matic breadth.	Post-orbital constric-tion.	Mastoid breadth.	Length of man-dible.	Upper molar-premolar row.	Lower molar-premolar row.	Remarks.
Lasiopyga ascanius schmidti.											
Uganda: Kikandwa	164582	Male	96.9	74.7	63.4	40.5	53.7	62.9	21.4	26.3	Basal suture closed.
Lasiopyga ascanius kaimosæ.											
B. E. A.:											
Lukosa River	182359	Male	100.2	78.5	66.1	42.8	69.1	66.3	25.0	28.6	Basal suture closed.
Do	182364	...do	92.1	70.3	61.5	43.0	53.7	59.8	23.3	27.5	Basal suture open.
Do	182368	...do	98.9	76.7	67.1	41.9	59.9	65.9	23.2	29.2	Basal suture obliterated.
Do	[1]182371	...do	101.0	79.3	68.3	41.7	56.7	69.4	23.9	27.9	Basal suture closed.
Do	182372	Female	86.7	63.7	56.7	38.7	52.3	54.9	23.8	27.7	Basal suture open.
Kaimosi	182349	Male	85.4	64.3	57.3	41.4	52.2	55.8	22.6	26.9	Do.
Do	182354	Female	86.8	65.0	59.8	41.2	55.6	57.1	23.1	27.5	Do.
Do	182355	...do	91.6	66.9	59.8	38.3	53.6	56.7	23.6	27.3	Basal suture closed.
Do	182357	...do	89.7	69.3	61.0	43.2	53.9	60.3	22.4	25.4	Basal suture obliterated; teeth much worn.
Lasiopyga leucampyx neumanni.											
B. E. A.: Kakumega	182386	Male	109.0	87.1	70.8	43.7	57.0	78.3	27.2	34.2	Basal suture open.
B. E. A.: Lukosa River	182361	...do	112.5	90.4	72.0	43.7	60.3	76.3	27.3	33.5	Basal suture closed.
Do	182378	...do	114.0	93.1	78.3	45.8	63.7	81.8	27.1	33.3	Basal suture open.
Do	182370	Female	97.8	78.3	64.4	39.9	54.1	69.3	24.7	30.7	Basal suture closed.
Lasiopyga leucampyx mauæ.											
B. E. A.: Mau Escarpment	[1]173002	Male	121.5	99.2	76.8	40.7	62.4	88.1	27.5	35.1	Basal suture closed.
Lasiopyga pygerythra tumbili.											
B. E. A.:											
Ndi	[1]182229	Male	104.0	81.2	70.0	43.9	60.0	70.3	26.4	32.5	Basal suture closed.
Do	182230	...do	102.3	79.3	68.4	43.7	57.8	69.8	25.8	31.8	Do.
Do	182232	Female	91.3	68.4	59.2	41.8	53.7	61.3	23.5	27.8	Do.
Do	182233	...do	90.3	69.4	59.3	41.0	53.3	61.1	23.8	28.7	Basal suture obliterated.

[1] Type.

Measurements of skulls of adult monkeys of the genus Lasiopyga—Continued.

Form and locality.	No.	Sex.	Greatest length.	Condylo-basal length.	Zygo-matic breadth.	Post-orbital constric-tion.	Mastoid breadth.	Length of man-dible.	Upper molar-premolar row.	Lower molar-premolar row.	Remarks.
Lasiopyga pygerythra tumbili—Con.											
B. E. A.:											
Voi	182222	Female	88.3	67.7	57.8	41.2	50.0	.....	23.3	.....	Basal suture closed.
Mtoto Andel	181827	do	86.5	62.8	55.6	41.8	49.2	57.3	21.6	27.5	Do.
Lasiopyga pygerythra contigua.											
B. E. A.: Changamwe	[1] 163327	Male	110.0	88.5	72.6	46.8	59.8	77.0	24.8	33.0	Basal suture closed.
Lasiopyga pygerythra callida.											
B. E. A.:											
Lake Naivasha	[1] 162843	Male	110.5	84.0	66.0	42.3	53.0	74.3	25.4	31.7	Basal suture obliterated.
Do	162896	do	102.4	82.8	65.2	43.4	53.7	70.8	26.5	31.0	Do.
Do	162894	Female	88.3	68.3	57.4	40.3	49.5	57.8	21.3	21.7	Basal suture closed.
Do	162895	do	88.2	66.0	56.7	40.8	51.4	58.4	22.8	26.9	Basal suture open.
Telek River	181957	Male	102.4	80.8	68.2	42.7	56.6	70.0	25.7	31.2	Basal suture closed.
Do	181958	Female	93.1	72.8	60.2	42.4	50.9	63.9	23.3	28.7	Do.
Amala River	181967	do	93.1	69.3	62.8	43.4	55.1	61.8	25.0	29.2	Do.
Lasiopyga pygerythra rubella.											
B. E. A.: Wambugu	[2] 163086	Female	89.7	67.7	60.5	43.3	55.1	59.8	23.9	29.7	Basal suture open.
Lasiopyga pygerythra arenaria.											
B. E. A.:											
Mount Gargues	182140	Male	104.5	80.3	68.9	42.5	59.4	70.1	24.8	29.4	Basal suture obliterated.
Do	182142	do	102.3	79.6	67.5	41.7	57.2	71.2	23.8	29.9	Do.
Merelle River	[1] 182201	do	99.4	76.3	70.2	42.7	56.4	70.5	24.5	30.0	Basal suture closed.
Marsabit Road	182200	Female	91.4	70.2	59.2	40.8	49.3	63.1	22.5	27.2	Do.
Northern Guaso Nyiro	164831	Male	96.6	74.8	68.4	41.6	54.7	66.2	25.6	.....	Do.
Engare Ndare River	182161	do	92.8	72.5	67.9	42.1	53.8	64.8	23.5	29.8	Do.
Do	182162	do	109.0	85.3	68.0	.....	55.0	71.3	24.4	30.9	Do.
Do	182167	do	98.9	75.8	63.9	41.9	55.2	68.2	.....	26.6	Basal suture obliterated.

Do	182165	Female	88.7	68.2	57.7	40.0	.....	61.8	22.7	26.8	Basal suture closed.
Do	182164	...do	86.3	65.3	57.4	41.7	47.8	60.3	23.4	27.3	Basal suture open.
Lasiopyga albogularis kibonotensis.											
B. E. A.: Taveta	34681	Male	103.4	83.7	67.7	41.5	57.6	72.2	24.8	30.1	Basal suture closed.
Lasiopyga albogularis kima.											
B. E. A.:											
Mount Mbololo	182241	Male	104.5	82.0	68.7	45.4	57.4	73.3	25.2	32.0	Basal suture open.
Do	[1] 182242	...do	113.5	93.8	76.2	44.2	57.9	83.8	27.7	35.5	Basal suture closed.
Do	182248	...do	109.4	87.9	76.6	44.0	56.5	78.3	27.0	32.9	Do.
Do	182243	Female	97.8	74.3	66.3	42.5	55.0	67.2	23.5	27.7	Do.
Do	182249	...do	95.7	72.6	63.0	41.0	53.1	63.3	24.4	27.8	Do.
Mount Umengo	182250	Male	108.0	87.3	76.7	44.1	58.3	78.7	26.2	32.2	Do.
Do	182254	Female	93.3	74.8	63.7	40.3	52.7	67.0	24.8	29.0	Basal suture open.
Lasiopyga albogularis maritima.											
B. E. A.: Mazeras	[1] 182272	Female	95.6	72.6	62.2	42.1	54.5	64.4	25.1	28.1	Basal suture closed.
Lasiopyga kolbi.											
B. E. A.:											
Naivasha	162844	Female	102.4	80.3	73.1	41.0	56.7	72.4	26.8	30.4	Basal suture open.
Kijabe	164526	...do	95.8	76.8	61.3	42.5	52.2	67.2	25.5	29.2	Do.
Aberdare Mountains	182185	Male	115.4	90.9	79.4	41.0	62.7	81.3	28.4	34.2	Do.
Do	182186	Female	97.7	73.4	66.1	41.6	55.4	65.6	25.1	28.7	Do.
Nyeri	164832	...do	97.6	75.3	65.2	41.7	54.0	.....	25.5	.....	Basal suture closed.

[1] Type.

[2] Type of *Cercopithecus centralis luteus* Elliot.

LASIOPYGA ALBOGULARIS KIMA Heller.

Plate 14.

1913. *Lasiopyga albogularis kima* HELLER, Smithsonian Misc. Coll., vol. 61, No. 17, p. 9. October 21. (Mount Mbololo, Taita District, British East Africa; type in U. S. National Museum.)

Specimens.—Ten, from localities as follows:

BRITISH EAST AFRICA: Mount Mbololo, 7 (Heller); Mount Umengo, 3 (Heller).

Heller says that the monkeys of this race are confined to the forests of the extreme summits of the Taita Hills, where their cover is at present rapidly disappearing before the ax and fire of the agricultural Wataita, who are constantly enlarging their fields at the expense of the forest. "The Wataita are fond of the flesh of the *kima*, and owing to their persecution it is extremely shy and difficult to stalk. The name kima is used universally by the Swahili for this monkey, and it is also employed by the Wataita, who occasionally corrupt it to gima." [1]

LASIOPYGA ALBOGULARIS MARITIMA Heller.

Plate 15.

1913. *Lasiopyga albogularis maritima* HELLER, Smithsonian Misc. Coll., vol. 61, No. 17, p. 8. October 21. (Mazeras, British East Africa; type in U. S. National Museum.)

Specimens.—Three, as follows:

BRITISH EAST AFRICA: Mazeras, 3 (Heller).

This is a much lighter colored, less reddish, subspecies than *Lasiopyga albogularis kima* of the Taita Hills or *L. a. kibonotensis* of Kilimanjaro.

LASIOPYGA KOLBI (Neumann).

1902. *Cercopithecus kolbi* NEUMANN, Proc. Zool. Soc. London, 1902, vol. 2, p. 144. (Kedong Escarpment, British East Africa; type in British Museum.)

1907. [*Cercopithecus kolbi*] Subsp. *hindei* POCOCK, Proc. Zool. Soc. London, p. 703. (Tutha, Kenia District, British East Africa; type in British Museum.)

1910. *Cercopithecus kolbi* ROOSEVELT, African Game Trails, Amer. ed., pp. 474 and 481; London ed., pp. 486 and 492.

1910. *Cercopithecus kolbi hindei* ROOSEVELT, African Game Trails, Amer. ed. p. 474; London ed., p. 486.

1910. [*Cercopithecus kolbi*] subspecies *hindei* ROOSEVELT, African Game Trails, Amer. ed., p. 481; London ed., p. 492.

1913. *Lasiopyga albogularis kolbi* HELLER, Smithsonian Misc. Coll., vol. 61, No. 17, p. 9. October 21.

Specimens.—Nine, from localities as follows:

BRITISH EAST AFRICA: Aberdare Mountains, 2 (Heller); Kijabe, 1 (Loring); Mount Kenia, west slope at 7,000 feet, 2 (Heller); Mount

[1] Heller, Smithsonian Misc. Coll., vol. 61, No. 17, p. 9. October 21, 1913.

Kenia, at 9,000 feet, 2 (Mearns); Naivasha, near, on Fort Hall trail, at 8,500 feet, 1 (Mearns); Nyeri, 1 (Heller).

Doctor Mearns records the iris as "light brown."

The type locality of this form is erroneously given in Elliot's Review of the Primates as "Kedong Escarpment, east side of Mount Kenia;" the Kedong Escarpment is southeast of Lake Naivasha. Elliot also writes that the type is in the Berlin Museum whereas it is really in the British Museum. The *Cercopithecus kolbi hindei* of Pocock from the Kenia region is unquestionably a synonym of *kolbi*. Dollman's *Cercopithecus kolbi nubilus*[1] from the Nairobi Forest is probably identical also,[2] but I have seen no specimens from the exact type locality. Elliot's misconception regarding the type locality of *kolbi* has made him hopelessly at sea regarding the distribution of the forms he recognizes. This monkey is much more closely related to *Lasiopyga albogularis* than one would think from Elliot's treatment of the various forms, and will doubtless eventually be considered only a geographic race of that earlier named species.

Family COLOBIDÆ.

Genus COLOBUS Illiger.

1811. *Colobus* Illiger. Prodr. Syst. Mamm. et Avium, p. 69. (*C. polycomus.*)
1821. *Colobolus* Gray, London Med. Repos., vol. 15, p. 298. (pro *Colobus.*)
1870. *Guereza* Gray, Cat. Monk., Lemurs, and Fruit-eat. Bats Brit. Mus., p. 5. (*C. guereza* Rüppell=*C. abyssinicus* Oken.)
1887. *Tropicolobus* Rochebrune, Faune Sénégambie, suppl., fasc. 1, p. 96. (*C. rufomitratus.*)

The collection contains representatives of two distinct groups, or subgenera, of guerezas. Of the black and white group, typical *Colobus*, there are nine forms which apparently belong to three separate species. Of the subgenus *Tropicolobus*, as defined by Elliot, only a single specimen of a single form is included in our East African collections.

For measurements of specimens see pages 41–43.

COLOBUS KIRKII Gray.

1868. *Colobus kirkii* Gray, Proc. Zool. Soc. London, p. 180; pl. 15.[3] (Zanzibar Island; type in British Museum.)

Specimen.—One, from—

[Zanzibar]: 1 (received from E. Gerrard).

This specimen was purchased from Edward Gerrard in 1889. For a number of years it was on exhibition, but in May, 1916, because of the rarity of the species, it was dismounted and made into a study

[1] Ann. and Mag. Nat. Hist., ser. 8, vol. 5, p. 202. 1910.
[2] See Lönnberg, Kungl. Svenska Vet.-Akad. Handl., vol. 48, No. 5, pp. 34–37. 1912.
[3] *Colobus kirki* on plate.

skin; the skull was at the same time removed and cleaned. The specimen is apparently a female. No exact data accompany the specimen.

COLOBUS ABYSSINICUS ABYSSINICUS (Oken).

1816. *L [emur] abyssinicus* OKEN, Lehrb. Nat., 3ter Theil, 2te Abth., p. 1182. (Abyssinia.)

1892. *Colobus guereza* TRUE, Proc. U. S. Nat. Mus., vol. 15, p. 448. October 26.

Specimen.—One, from—

[ABYSSINIA]: "Northeastern Africa" (received from H. A. Ward).

The skin of this specimen has been mounted and is on exhibition in the mammal hall. The skull is in the study series in the Division of Mammals. The specimen was purchased in 1884 from H. A. Ward, Rochester, New York, and is without definite data.

COLOBUS ABYSSINICUS POLIURUS Thomas.

1900. *Colobus abyssinicus poliurus* THOMAS, Proc. Zool. Soc. London, p. 801. (Omo River, north of Lake Rudolf, Abyssinia; type in British Museum.)

Specimens.—Two skins, paratypes, from—

ABYSSINIA: Omo River, north of Lake Rudolf, 2 (Smith).

These specimens, part of the original series brought home by Dr. A. Donaldson Smith and received by the Museum from the Academy of Sciences of Philadelphia, are native skins without skulls.

COLOBUS CAUDATUS CAUDATUS Thomas.

1885. *Colobus guereza caudatus* THOMAS, Proc. Zool. Soc. London, p. 219, pl. 12. (Useri, northeastern flank of Mount Kilimanjaro, British East Africa; type in British Museum.)

1892. *Colobus caudatus* TRUE, Proc. U. S. Nat. Mus., vol. 15, p. 447. October 26.

1913. *Colobus abyssinicus caudatus* HELLER, Smithsonian Misc. Coll., vol. 61, No. 17, p. 6. October 21.

Specimens.—Nine, from—

GERMAN EAST AFRICA: Kahe, 9, including four odd skulls (Abbott).

The five skins of this form are mounted in an exhibition group; the nine skulls are in the Division of Mammals.

The subspecies of *Colobus caudatus* are all easily distinguished from the forms of *Colobus abyssinicus* and *C. occidentalis* by the luxuriant, bushy tail. They are closely related, and the typical subspecies from Kilimanjaro and *C. c. kikuyuensis* especially, are much alike. Adult male skulls of *C. caudatus caudatus* develop a sharply marked sagittal crest, such as is not found in any of the skulls of much older individuals in our large series of *kikuyuensis* from Kijabe and Mount Kenia. The skull figured by Elliot, Review of the Primates (vol. 3, pl. 19), as *Colobus caudatus*, was, I have been informed by Dr. J. A. Allen, collected at Kijabe and is therefore referable to *Colobus c. kikuyuensis*.

COLOBUS CAUDATUS KIKUYUENSIS Lönnberg.

1910. *Colobus abyssinicus caudatus* Roosevelt. African Game Trails, Amer. ed., pp. 474 and 481; London ed., pp. 486 and 492. (Not of Thomas.)

1912. *Colobus abyssinicus kikuyuensis* Lönnberg, Ann. and Mag. Nat. Hist., ser. 8, vol. 9, p. 63. January. (Escarpment Station, British East Africa; type in R. Nat. Hist. Mus., Stockholm); Kungl. Sv. Akad. Handl., vol. 48, No. 5, p. 31.

1913. *Colobus (Guereza) caudatus thika* Matschie, Ann. Soc. Roy. Zool. Malac. Belgique, vol. 47 (1912), p. 56. December. (West side of Mount Kenia, British East Africa; type in Berlin Museum.)

1913. *Colobus (Guereza) caudatus laticeps* Matschie, Ann. Soc. Roy. Zool. Malac. Belgique, vol. 47 (1912), p. 57. December. (West side of Mount Kenia, British East Africa; type in collection of Major Powell-Cotton, Quex Park, Birchington, England.)

Specimens.—Forty-two, from localities as follows:

British East Africa: Kijabe, 13, including one odd skull and one fetus in alcohol (Heller, K. Roosevelt, Loring, Alexander); Mount Kenia, west slope, 28, including nine odd skulls and one large fetus in alcohol (Mearns, Heller); "Nairobi," 1 (Turner).

The specimens from the western slope of Mount Kenia were collected at altitudes ranging from 6,000 to 10,000 feet. I can find no constant external or cranial characters by which to separate the specimens from Mount Kenia from those collected near the railroad at Kijabe. This subspecies is closely related to typical *caudatus* from Kilimanjaro and does not seem to differ appreciably in color from that form. The skulls of old males of *C. c. kikuyuensis* apparently never develop a distinct sagittal crest as commonly found in comparatively young adult male skulls of true *caudatus*.

Heller records a female at Kijabe containing a large embryo on June 4. Mearns found a female on Mount Kenia with one fetus on October 13. "Iris hazel; naked face and callosities dark gray; feet black" (E. A. Mearns, on label of specimen from Mount Kenia).

An interesting series of specimens of the young of *Colobus caudatus kikuyuensis* is in the collection. The youngest of these, with head and body in the skin measuring 270 millimeters, is almost entirely white. The hair is everywhere wavy or slightly curly. The face, arms, sides of neck, and feet are mixed with blackish and there are a few gray hairs in the terminal half of the tail. This specimen was collected on August 10 and is in its first year. The next oldest juvenile, taken on Mount Kenia October 5, shows distinctly the color pattern of the adult animal. The hair is short and wavy excepting along the sides of the back, where the white hairs of the mantle are beginning to lengthen. The tail is entirely whitish except for a slight grayish wash at base; the limbs, head, forward part of the back, and the underparts are largely blackish. This specimen measures almost exactly the same in length as the white specimen

taken in August and is probably only about two or three months older. It was clinging to its mother when collected. A slightly larger young one, taken August 27, has the color almost exactly as in adult specimens but has shorter hair throughout. As is well known, the growth of young monkeys is very slow, and this specimen is probably about a year older than the two smallest animals mentioned above. A young specimen, taken on October 14, with head and body measuring 370 millimeters, is, except for the less luxuriant tail plume, almost exactly like old animals. It is probably in its third year, although the first molar has not yet erupted. Doctor Lönnberg has written that the young of *Colobus caudatus kikuyuensis* differs from the young of *C. c. caudatus* of Kilimanjaro in color,[1] but it appears that this is not the case. Young monkeys grow so slowly, as compared with most mammals, that very slight difference in size indicates a considerable difference in age, and it is apparent that Doctor Lönnberg has compared, from the two localities, young specimens in a very different stage of pelage development.

COLOBUS CAUDATUS PERCIVALI Heller.

Plate 16.

1913. *Colobus abyssinicus percivali* Heller, Smithsonian Misc. Coll., vol. 61, No. 17, p. 6. October 21. (Mount Gargues, British East Africa; type in U. S. National Museum.)

Specimens.—Two, as follows:

British East Africa: Mount Gargues, north slope at 6,000 feet altitude, 2 (Heller).

This subspecies is, according to Heller, confined to the forested summit of Mount Gargues, where it is rather rare. But one group of 15 or 20 animals was seen during his stay of a week on the northern peak. On Mount Gargues, August 29, 1911, Heller made the following entry in his journal of the Rainey Expedition:

> The colobus monkeys could be heard calling in the early morning, while it was still dark, and again about sunrise. They make a hoarse, growling bark which is often heard in the morning and during the night. None have been seen since I shot two out of a herd of fifteen or more on our way up the mountain, but they have been heard nearly every night.

COLOBUS OCCIDENTALIS OCCIDENTALIS (Rochebrune).

1887. *Guereza occidentalis* Rochebrune, Faune Sénégambie, Suppl., p. 140. (Noki, "haut Congo" [?Angola]).

Specimens.—Three, as follows:

Uganda: Budonga Forest, 3 (Raven).

These specimens are much like *Colobus occidentalis matschiei* of Kavirondo but are smaller, with longer tails and smaller skulls.

[1] Kungl. Sv. Vet. Akad. Handl., vol. 48, No. 5, p. 33. 1912.

Measurements of adult monkeys of the genus Colobus.

Locality.	No.	Sex.	Head and body.	Tail vertebræ.	Hind foot.	Ear.	Skull.						Condition of basisphenoid suture.
							Greatest length.	Condylo-basal length.	Post-orbital breadth.	Zygo-matic breadth.	Length of upper molar-premolar row.	Length of lower molar-premolar row.	
Colobus kirkii.													
[Zanzibar]	38746	[Female]					90.7	74.4	38.3		24.8	30.6	Closed.
Colobus abyssinicus.													
[N. E. Africa]	21729	Male					116.0	94.4	44.4	79.8	33.2	40.2	Closed.
Colobus caudatus caudatus.													
G. E. A.:													
Kahe	34679	Male					120.3	101.3	41.2	78.5	33.7	41.0	Open.
Do	34680	...do					123.0	105.6	43.6	84.5	34.6	41.4	Do.
Do	34676	Female					111.0	93.3	42.9	73.3	34.3	39.8	Do.
Do	34677	...do					102.4	87.4	43.3	71.3	32.4	38.6	Do.
Do	34678	...do					104.0	86.5	41.7	70.4	31.8	37.3	Do.
Colobus caudatus kikuyuensis.													
B. E. A.:													
Kijabe	148579	Male					119.5	101.2	46.0	83.4	32.3	40.9	Obliterated.
Do	164584	...do	620	620	190	36	116.5	99.4	45.6	85.6	32.4	40.7	Do.
Do	181828	...do	730	610	183		121.0	104.2	46.0	81.6	34.1	42.8	Closed.
Do	181829	...do					113.4	96.8	44.3	80.3	30.3	39.3	Obliterated.
Do	181832	...do	650	630	182		118.5	102.6	45.6	84.0	32.1	40.2	Do.
Do	164522	Female	500	530	164	34	102.3	85.5	44.7	68.0	31.4	38.0	Closed.
Do	164524	...do	500	530	165	30	95.2	80.5	43.8	68.5	30.3	37.6	Open.
Do	181830	...do					104.5	87.5	44.3	73.5	31.2	38.0	Obliterated.

51202—24——4

Measurements of adult monkeys of the genus Colobus—Continued.

Locality.	No.	Sex.	Head and body.	Tail vertebræ.	Hind foot.	Ear.	Skull.						Condition of basisphenoid suture.
							Greatest length.	Condylo-basal length.	Post-orbital breadth.	Zygo-matic breadth.	Length of upper molar-premolar row.	Length of lower molar-premolar row.	
Colobus caudatus kikuyuensis—Con.													
B. E. A.:													
Mount Kenia	163123	Male	600	575	175	35	110.0	96.5	43.8	80.5	33.8	41.5	Closed.
Do	163271	...do	620	610	190	35	118.5	103.0	44.3	86.8	34.1	42.5	Do.
Do	163274	...do	685	640	190	32	121.0	102.4	45.6	82.4	36.5	41.8	Obliterated.
Do	163278	...do	640	595	180	28	111.5	98.1	45.1	79.7	32.2	40.4	Open.
Do	163279	...do	635	570	175	26	113.0	97.3	45.1	80.7	33.7	41.8	Do.
Do	164603	...do	630	590	185	40	117.0	99.6	43.9	88.8	32.8	41.2	Closed.
Do	164631	...do	580	600	183	35	122.0	107.5	43.7	83.9	35.1	45.4	Obliterated.
Do	163122	Female	720	570	172	33	107.0	89.7	42.7	77.9	30.3	38.0	Do.
Do	163125	...do	562	537	168	30	107.4	91.5	43.2	76.7	33.6	40.5	Do.
Do	163267	...do					102.0	87.4	40.0	69.9	31.4	37.0	Closed.
Do	163269	...do					105.0	88.4	42.1	75.3	33.4	40.3	Obliterated.
Do	163272	...do					104.5	88.0	43.0	73.8	33.2	40.6	Closed.
Do	163276	...do	610	625	185	29	109.0	93.6	43.3	74.9	34.9	40.7	Do.
Do	163282	...do					104.4	89.2	44.0	76.5	31.1	38.1	Do.
Do	164749	...do	560	580	170	37	109.5	90.8	43.1	73.7	32.3	39.3	Obliterated.
Colobus caudatus percivali.													
B. E. A.:													
Mount Gargues[1]	182138	Male	645	645	190	38	122.2	101.5	45.0	88.8	34.9	42.9	Closed.
Do	182139	...do	610		180	38	116.2	99.6	46.1	84.3	34.5	43.1	Do.

Colobus occidentalis occidentalis.												
Uganda:												
Budonga Forest	236983	Male	585	865	192	.....	111.5	94.5	46.8	79.5	31.6	37.5	Closed.
Do	236981	Female	560	760	175	.....	105.0	87.2	46.4	74.4	27.2	32.7	Do.
Do	236982	...do	570	730	175	.....	104.5	86.2	41.0	70.9	28.3	35.4	Do.
Colobus occidentalis terrestris.												
Lado: Rhino Camp[1]	164756	Female	540	775	158	30	102.0	87.4	42.6	72.1	30.1	36.4	Obliterated
Colobus occidentalis matschici.												
B. E. A.:												
Kisumu	182362	Male	600	720	185	42	121.7	102.8	44.4	86.0	31.9	40.7	Closed.
Do	182363	...do	590	.....	185	37	112.0	94.4	46.3	82.1	30.7	36.6	Do.
Do	182365	...do	600	760	193	38	124.5	102.7	47.5	90.5	31.0	40.4	Open.
Do	182366	...do	620	720	182	35	126.5	109.6	46.6	91.7	33.0	41.8	Obliterated.
Do	182375	Female	550	655	170	36	108.0	90.2	46.1	77.9	29.6	36.5	Do.
Colobus occidentalis roosevelti.												
B. E. A.:												
Enjoro[1]	163261	Male	.....	.....	.....	.....	119.0	98.6	45.0	86.1	33.5	40.7	Closed.
Do	182362	...do	.....	.....	.....	.....	123.5	106.4	43.4	86.3	33.8	41.8	Do.
Do	163264	Female	.....	.....	.....	.....	108.5	91.7	42.8	72.0	30.3	36.8	Obliterated.
Do	163265	...do	.....	.....	.....	.....	104.0	84.9	43.6	74.8	31.3	36.9	Closed.

[1] Type.

Authors are quite generally agreed that the *occidentalis*-like colobus monkeys from the lake region of Central Africa, are scarcely distinguishable from the typical form of the Congo Valley,[1] although several subspecies have been described from extreme eastern Congo. Only a single skin, without skull, of *occidentalis* from the Congo Valley is in the National Museum collection, and I am therefore unable to make satisfactory comparisons.

Descriptions of new forms of *Colobus* are often of little use in identifying specimens, as they frequently have been based on unreliable characters, especially on such a variable feature as the tuft of the tail. Names to be considered in connection with the Budonga Forest form, if it is not true *occidentalis*, are *Colobus* (*Guereza*) *matschiei uellensis* Matschie,[2] described from Uelle, Belgian Congo; *Colobus* (*Guereza*) *matschiei ituricus* Matschie,[3] from Ituri, Belgian Congo; *Colobus* (*Guereza*) *matschiei dianæ* Matschie,[4] from Kissenge, on the northeast shore of Lake Albert Edward; *Colobus* (*Guereza*) *matschiei dodingæ* Matschie,[5] from southwestern Dodinga Mountains, Uganda; and *Colobus occidentalis rutschuricus* Lorenz,[6] from Sassa River, on the northeastern edge of the Rutschuru Plains, southeast of Lake Albert Edward.

COLOBUS OCCIDENTALIS TERRESTRIS Heller.

Plate 17.

1910. *Colobus palliatus cottoni* Roosevelt, African Game Trails, Amer. ed., p. 474; London ed., p. 486. (Not *Colobus cottoni* Lydekker.)

1913. *Colobus abyssinicus terrestris* Heller, Smithsonian Misc. Coll., vol. 61, No. 17, p. 7. October 21. (Rhino Camp, Lado Enclave; type in U. S. Nat. Mus.)

1913. *Colobus* (*Guereza*) *matschiei brachychaites* Matschie, Ann. Soc. Roy. Zool. Malac. Belgique, vol. 47 (1912), p. 53. December. (Modi, between Kaya and Dufile, Lado Enclave; type in collection of Maj. Powell-Cotton, Quex Park, Birchington, England.)

Specimen.—One, from—

Lado: Rhino Camp (K. Roosevelt).

Small troupes of this race were seen by Kermit Roosevelt near the banks of the Nile, but were not observed by other members of the expedition. They were found in small scattered acacia trees which they deserted when hard pressed and ran across country to the nearest grove in the manner of baboons. The Colobus monkeys of the highlands of East Africa have quite different habits and live in dense forests where they move about through the trees by leaping from one branch to another and

[1] Elliot, Rev. Primates, vol. 3, pp. 144–145, 1913; Lönnberg, Kungl. Svenska Vet.-Akad. Hand., vol. 58, No. 2, pp. 27–28, 1917; Lönnberg, Revue Zool. Africaine, vol. 7, pp. 117–118, 1919.

[2] Ann. Soc. Roy. Zool. Malac. Belgique, vol. 47 (1912), p. 47. December, 1913.

[3] Ann. Soc. Roy. Zool. Malac. Belgique, vol. 47 (1912), p. 48. December, 1913.

[4] Ann. Soc. Roy. Zool. Malac. Belgique, vol. 47 (1912), p. 49. December, 1913.

[5] Ann. Soc. Roy. Zool. Malac. Belgique, vol. 47 (1912), p. 52. December, 1913.

[6] Anz. K. Akad. Wiss. Wien, vol. 51, p. 508. 1914.

descend to the ground rarely to escape an enemy. They are not known to inhabit acacia trees.[1]

COLOBUS OCCIDENTALIS MATSCHIEI Neumann.

1899. *Colobus matschiei* NEUMANN, Sitz.-ber. Ges. nat. Freunde Berlin, p. 15. January. (Kwa Kitoto, Ugowe Bay, Victoria Nyanza, Kavirondo, British East Africa; type in Berlin Museum.)

1913. *Colobus abyssinicus matschiei* HELLER, Smithsonian Misc. Coll., vol. 61, No. 17, p. 5. October 21.

Specimens.—Seven, including two flat skins, from—

BRITISH EAST AFRICA: Lukosa River, Kisumu, 7 (Heller).

COLOBUS OCCIDENTALIS ROOSEVELTI Heller.

Plate 18.

1910. *Colobus abyssinicus matschiei* ROOSEVELT, African Game Trails, Amer. ed., p. 474; London ed., p. 486. (Not of Neumann.)

1913. *Colobus abyssinicus roosevelti* HELLER, Smithsonian Misc. Coll., vol. 61, No. 17, p. 5. October 21. (Mau Forest, near Enjoro, British East Africa; type in U. S. National Museum.)

Specimens.—Five, as follows:

BRITISH EAST AFRICA: Enjoro, 5 (T. Roosevelt).

This form is very closely related to *Colobus occidentalis matschiei* of Kavirondo. In color there is very little difference between the two subspecies, but the light markings of all the specimens of *matschiei* are yellowish-white, with a distinct greenish cast, while the white markings of *roosevelti* are buffy-white, more mixed with gray. These differences are especially marked on the light areas on the head and throat. As noted by Heller, the skulls of old males of *roosevelti* develop a sharp sagittal crest, while those of *matschiei* do not.

[1] Heller, Smithsonian Misc. Coll., vol. 61, No. 17, p. 7. October 21, 1913.

Family PONGIDÆ.

Genus PAN Oken.

1812. *Troglodytes* Geoffroy, Ann. Mus. Hist. Nat., vol. 19, p. 87. (*T. niger=P. satyrus.* Not of Vieillot, 1806.)

1816. *Pan* Oken, Lehrb. Nat., 3ter Theil, 2te Abth., pp. xi, 1230. (*P. africanus=P. satyrus.*)

1820. *Mimetes* Leach, Ann. Philos., vol. 16, p. 104. August. (*Simia troglodytes=P. satyrus.* Not of Hübner, 1816.)

1821. *Mimeles* Gray, Lond. Med. Repos., vol. 15, p. 279. (pro *Mimetes.*)

1828. *Theranthropus* Brookes, Cat. Anat. & Zool. Mus. Joshua Brookes, p. 28. (*Nomen nudum.*)

1838. *Anthropopithecus* Blainville, Ann. Franç., Paris, vol. 2, p. 360. (*A. troglodytes=P. satyrus.*)

1842. *Hylanthropus* Gloger, Handb. Nat., vol. 1, pp. xxvii, 34. (*H. troglodytes=P. satyrus.*)

1863. *Pseudanthropos* Reichenbach, Vollständ. Nat. Affen, p. 191. (pro *Troglodytes* Geoffroy.)

1866. *Engeco* Haeckel, Gen. Morph. Organism, vol. 2, p. cl. (*E. troglodytes=P. satyrus.*)

1866. *Pongo* Haeckel, Gen. Morph. Organism., vol. 2, p. cl. (pro *Troglodytes* Geoffroy.)

1884. *Antropopithecus* Ameghino, Filogenia, p. xxxviii. (pro *Anthropopithecus.*)

1895. *Anthropithecus* Haeckel, Syst. Phyl. Wirbelth., vol. 3, p. 600. (pro *Anthropopithecus.*)

The chimpanzee occurs in isolated forests, along the western border of the region covered by this report, from southern Sudan to German East Africa.

PAN SCHUBOTZI (Matschie).

1914. *Anthropopithecus schubotzi* Matschie, Sitz.-ber. Ges. nat. Freunde Berlin, p. 335. July. (Upper Ituri, between Kilo and Irumu, 2 days' march northwest of southern extremity of Albert Nyanza, Belgian Congo; type in Berlin Museum.)

Specimens.—Three, as follows:

Uganda: Budonga Forest, 3 (Raven).

This lot includes an adult female, skin and skull; a young female, skin and skull; and a young male preserved in alcohol. The adult female from Nabea, Budonga Forest, weighed 69 pounds and measured: Head and body, 780 mm.; hind foot, 210 mm.

No less than 14 forms of the chimpanzee have now been described from central Africa from extreme southern Sudan to Lake Tanganyika. The nearest type locality to the Budonga Forest is that of *Pan schubotzi* (Matschie). This species was described from the skull only of an adult male, and from the available material it is impossible to state if the Budonga Forest animal is the same or represents still another undescribed form.

Order ARTIODACTYLA.

Family SUIDÆ.

Genus KOIROPOTAMUS Gray.

1843. *Koiropotamus* GRAY, List Spec. Mamm. Brit. Mus., p. xxvii. (*Sus africanus* Schreber, not Gmelin=*Sus koïropotamus* Desmoulins.)

1843. *Choiropotamus* GRAY, List Spec. Mamm. Brit. Mus., p. 185. (*pro Koiropotamus.*)

1854. *Potamochœrus* GRAY, Proc. Zool. Soc. London, 1852, p. 130. (New name for *Koiropotamus* Gray and *Choiropotamus* Gray, supposed to be preoccupied by "*Chaeropotamus* Cuvier.")

1863. *Nyctochoerus* HEUGLIN, Nov. Act. Acad. Caes. Leop.-Carol., vol. 30, Nachtrag zweiten Abhandl., p. 7. (*K. hassama.*)

1921. *Koiropotamus* HOLLISTER, Proc. Biol. Soc. Washington, vol. 34, p. 77. March 31.

1921. *Choiropotamus* THOMAS, Proc. Biol. Soc. Washington, vol. 34, p. 135 June 30.

The generic name *Koiropotamus* Gray, 1843, for the African bush pigs or river hogs is usually cited as a *nomen nudum*, but it is without question a valid name. Although it is written "*Choiropotamus*" in one place in the body of the text, it appears in the "Systematic List" and in the index of Gray's work only as *Koiropotamus* and was evidently taken direct from the specific name *koïropotamus* of Desmoulins. Furthermore, at the time Gray proposed the substitute name *Potamochœrus* he cited in synonymy only the name *Koiropotamus* from his 1843 work and cites *Choiropotamus* Gray only from the Annals and Magazine of Natural History for October, 1852. It is maintained therefore that *Choiropotamus* Gray, 1843, is a *lapsus* for *Koiropotamus*, which latter is not invalidated by the earlier *Chaeropotamus* Desmarest, 1822, and is the proper name for the African bush pigs.

In reply to my preliminary note calling attention to the necessity for this change, Mr. Thomas, while agreeing that *Koiropotamus* is valid nomenclaturally, maintains that *Choiropotamus* should be used pending an official ruling on the relative priority of names used in introduction and body of the same work. He believes that Gray at this time, finding the classically incorrect *Koiropotamus* in existence, deliberately corrected it by the alteration of K into Ch. If this was done, the correction was made in the page proof, after the index and systematic list were set up. The systematic and alphabetical indices and the main body of this book are of equal date. It matters little which was actually printed first if they were distributed at the same time, and the International Code does not provide for page precedence in names appearing at the same time in the same work, except as a guide to later selection by the first reviser. Such cases would seem

to be covered by Article 28, and no further official ruling is necessary—"If the names are of the same date, that selected by the first reviser shall stand."

In this particular case I am not yet ready to believe, however, that *Choiropotamus* Gray, 1843, should be accepted in any other light than as a lapsus for *Koiropotamus* in the same work. The absolute proof that Gray derived his generic name from one of the names of the type-species of the genus, *Sus koïropotamus* Desmoulins, 1831, may be wanting; but that he did that very thing, as was common practice, is reasonable to assume.[1] No error of transcription, *lapsus calami*, nor typographical error can then be admitted in the case; and the name is not subject to emendation.

KOIROPOTAMUS KOIROPOTAMUS DÆMONIS (Major).

1892. *Potamochœrus africanus* True, Proc. U. S. Nat. Mus., vol. 15, p. 479. October 26. (Not of Schreber.)

1897. *Potamochœrus chœropotamus dæmonis* Major, Proc. Zool. Soc. London, 1897, p. 367. (Mount Kilimanjaro, East Africa; type in British Museum.)

1910. *Potamochœrus chœropotamus dæmonis* Roosevelt, African Game Trails, Amer. ed., p. 475; London ed., p. 486. (Part.)

1914. *Potamochœrus koiropotamus dæmonis* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 1, p. 273. (Part.)

Specimens.—Two, from localities as follows:

British East Africa: Voi, 1 skull (Percival).

German East Africa: Mount Kilimanjaro, 1 skin (Abbott).

The skull from Voi was presented by Mr. A. B. Percival to Doctor Mearns at the time of the Smithsonian African Expedition.

Although apparently a common animal in much of the country covered by our expeditions, the bush pig is rarely collected. It is said to be seldom seen because of its nocturnal habits and retiring disposition. The material at hand is inadequate for me to judge with any degree of certainty the validity of the named races, and the various specimens are placed with the forms with which they should belong for geographical reasons alone. The specimen collected by Doctor Abbott on Kilimanjaro, a topotype of *K. k. dæmonis*, is the skin only of a female; the body is reddish with an admixture of black and the head and dorsal mane are whitish. The skull from Voi, evidently also a female, adult but with m^3 not worn, measures: Occipitonasal length, 338; parietal width, 39; greatest width lambdoid crest, 76; zygomatic width, 158; width postorbital processes, 104; interorbital width, 74; width of palate at m^2, 30; upper tooth row, 113; length of m^3, 32.

[1] In his paper proposing the new name *Potamochœrus* as a substitute for *Koiropotamus* and *Choiropotamus* Gray cites in his synonymy from his 1843 work only *Koiropotamus* and cites *Choiropotamus* from his paper in the Annals and Magazine for 1852. At the same time he cites in his specific synonymy "*Sus koiropotamus* Des Moul. Dict. Class. H. N. Atlas, t. 7♀."

KOIROPOTAMUS KOIROPOTAMUS KENIÆ (Lönnberg).

1910. *Potamochœrus chœropotamus dæmonis* ROOSEVELT, African Game Trails, Amer. ed., p. 475; London ed., p. 486. (Part.)

1912. *Potamochœrus chœropotamus keniæ* LÖNNBERG, Ann. and Mag. Nat. Hist., ser. 8, vol. 9, p. 66. January. (Forests near Nairobi, British East Africa; type in R. Nat. Hist. Mus., Stockholm.)

1914. *Potamochœrus koiropotamus dæmonis* ROOSEVELT AND HELLER, Life-Hist. African Game Anim., vol. 1, p. 273. (Part.)

Specimens.—Two, from localities as follows:

BRITISH EAST AFRICA: Mau, 1 skull (Mearns); Ngong Hills, near Nairobi, 1, skin, skull, and leg bones (Heller).

The skin of the adult male from Ngong Hills is largely black, with only faint indications of reddish coloration and with considerable admixture of whitish over the entire body. The skull, which has m^3 much worn, measures as follows: Occipitonasal length, 350; parietal width, 30; greatest width lambdoid crest, 76; zygomatic width, 170; width postorbital processes, 103; interorbital width, 73; width of palate at m^2, 26.5; upper tooth row, 124; length of m^3, 34.

KOIROPOTAMUS HASSAMA (Heuglin).

1863. *Nyctochoerus hassama* HEUGLIN, Nov. Act. Acad. Caes. Leop.-Carol., vol. 30, Nachtrag zweiten Abhandl., p. 7. (Hawash Valley, Abyssinia; type in Senckenberg Museum, Frankfort-on-the-Main.)

1914. *Potamochœrus koiropotamus hassama* ROOSEVELT AND HELLER, Life-Hist. African Game Anim., vol. 1, p. 275.

Specimen.—One, from—

BRITISH EAST AFRICA: Mount Lololokwi, 1 (Heller).

An interesting account of the collecting of this bush pig is given in Heller's account of his trip to Mount Lololokwi.[1] In another account [2] he writes as follows:

> Only a single specimen of this pig has been available for examination. This one is an old boar collected by the Rainey expedition on Lololokui, a table-topped mountain situated north of the Northern Guaso Nyiro River. The skull of this specimen shows the short character of the bony process above the canine well, and is in general shape quite identical to the figures of Heuglin's specimen. The flesh measurements of this specimen were: head and body, 47 inches; tail, 16 inches; hind foot, 9¼ inches; ear, 7 inches. Greatest skull length, 12⅞ inches. These measurements, compared to those of an adult boar of the East African race, show less body size, greater length of tail and ears, and shorter feet. The specimen here described was one of a herd of fifteen met with on the broad summit of Mount Lololokui, at an altitude of six thousand feet. The herd came nightly to the springs to drink and were occasionally seen in the daytime, the mountain being quite without human inhabitants. The stomach of this specimen contained the remains of the white, bulb-like roots of the *Sansevieria* plants which grew abundantly in patches on the slopes of the mountain and resembled closely in habit the smaller yuccas or Spanish daggers of Arizona or California.

The skin of this adult male is black, mixed with brown from withers to the lower back, with white head and a prominent white

[1] Mount Lololokwi the Unknown, Harper's Mag., vol. 140, pp. 155-156. January, 1920.

[2] Roosevelt and Heller. Life-Histories of African Game Animals, vol. 1, pp. 275-276. 1914.

dorsal stripe. The females and immature animals in the herd seen by Heller were said to be quite reddish on the sides, strikingly different in coloration from the old males.

Genus HYLOCHŒRUS Thomas.

1904. *Hylochoerus* THOMAS, Nature, vol. 70, p. 577. October 13. (*H. meinertzhageni.*)

Two specimens of the forest hog were secured by the Smithsonian African Expedition in 1909.

HYLOCHŒRUS MEINERTZHAGENI Thomas.

1904. *Hylochoerus meinertzhageni* THOMAS, Nature, vol. 70, p. 577. October 13. (Nandi Forest, 7,000 feet altitude, British East Africa; type in British Museum.)

1910. *Hylochœrus meinertzhageni* ROOSEVELT, African Game Trails, Amer. ed., p. 475; London ed., p. 486.

1914. *Hylochœrus minertzhageni* [sic] ROOSEVELT AND HELLER, Life-Hist. African Game Anim., vol. 1, p. 278.

Specimens.—Two, from localities as follows:

BRITISH EAST AFRICA: Mau Forest near Enjoro, 1 (Roosevelt); Mau Forest near Lake Naivasha, 1 (Heller).

The Enjoro specimen was presented to Colonel Roosevelt by Lord Delamere, and the Naivasha specimen was purchased by Heller from a farmer, while the Smithsonian African Expedition was in the region of their capture. Both have skins and skulls and the Naivasha specimen is accompanied by the complete skeleton. The skull of the Enjoro specimen, an adult male, measures as follows: Greatest length, 382; condylobasal length, 382; zygomatic breadth, 225; interorbital breadth, 95; width across postorbital processes, 124; width of lambdoidal crest, 124; palatal length, 275; length of upper tooth row, 102; length of m^3, 40.

A forest hog (*Hylochœrus schulzi*) from the mountains west of Kilimanjaro, in German East Africa ("Winterhochlande, dem Mutjekgebirge und dem Meru"), has recently been described by Zukowsky.[1]

Genus PHACOCHŒRUS Cuvier.

1817. *Phaco chœrus* CUVIER, Règne Anim., vol. 1, p. 236. (*P. æthiopicus.*)

1817. *Eureodon* FISCHER, Mém. Soc. Imp. Nat. Moscou, vol. 5, p. 373. (*P. æthiopicus.*)

1841. *Dinochoerus* GLOGER, Handb. Naturgesch., vol. 1, p. 131. (*P. æthiopicus.*)

1915. *Eureodon* LYON, Proc. Biol. Soc. Washington, vol. 28, p. 141. June 29.

1915. *Phacochœrus* THOMAS, Proc. Biol. Soc. Washington, vol. 28, p. 181. November 29.

The common East African wart-hog has a wide distribution from Abyssinia southward into German East Africa, and is commonly

[1] Archiv für Nat., 87 Jahrg., Abt. A, 1 Heft, p 181. July, 1921.

collected by sportsmen and travelers. The other two forms represented in the collection are comparatively rare in museums.

PHACOCHŒRUS AFRICANUS ÆLIANI (Cretzschmar).

1826. *Phascochaeres aeliani* Cretzschmar, Atlas zu Reise im nördl. Afrika von Eduard Rüppell, vol. 1, p. 61. (Abyssinia, eastern slope; type in Senckenberg Mus., Frankfort-on-the-Main.)

1892. *Phacochœrus ælianii* True, Proc. U. S. Nat. Mus., vol. 15, p. 479. October 26. (Specimens from Taveta.)

1908. *Phacochœrus massaicus* Lönnberg, Sjöstedt's Kilimandjaro-Meru Exped., Mamm., p. 54. ("Kilimandjaro-Meru" district, German East Africa; type in Roy. Nat. Hist. Mus., Stockholm.)

1910. *Phacochœrus æthiopicus massaicus* Roosevelt, African Game Trails, Amer. ed., p. 475; London ed., p. 486.

1914. *Phacochœrus africanus æliani* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 1, p. 284.

Specimens.—Fifty-six from the following localities:

British East Africa: Agate's Ranch, Loita Plains, 4 (T. Roosevelt, K. Roosevelt, Heller); Amala River, Sotik, 2 (Heller); Guas Ngishu Boma, Guas Ngishu Plateau, 4 (Heller); Juja Farm, 1 (K. Roosevelt); Kabalolot Hill, Sotik, 7, including 2 odd skulls (Heller); Kamiti Farm, Athi Plains, 4 (T. Roosevelt, K. Roosevelt); Kampiya bibi, Guas Ngishu Plateau, 1 (T. Roosevelt); Kapiti Plains, 1 (T. Roosevelt); Kedong River, 5, including 4 odd skulls (Heller, Rainey); Laikipia Plateau, 1 (K. Roosevelt); Lake Hannington, 1 (K. Roosevelt); Lime Springs, Sotik, 2 (Heller, Cuninghame); Loita Plains, 1 (Heller); Mau Summit, Sotik Road, 2 (Rainey); Nairobi, 1 (McMillan); Nzoia River, Guas Ngishu Plateau, 2 (K. Roosevelt, Stephenson); Olarakeri, Sotik, 1 (T. Roosevelt); Sotik, 1 (Draper); Southern Guaso Nyiro, 2 odd skulls (Mearns, Tarlton); Suswa Plain, 1 (Rainey); Taveta, 3, including 2 odd skulls (Abbott); Telek River, Loita Plains, 8 (Heller); Thika River, 1 skull (Mearns).

After careful study of the common East African wart-hog skulls enumerated above I quite agree with Heller that it is apparently impossible satisfactorily to separate the animal into races over all this region. There is much genuine individual variation in the skulls, and the characters so far pointed out by which a form from southern British East Africa might be distinguished are far from satisfactory.

From the accompanying table of measurements of 24 male wart-hog skulls (p. 53) it will be seen that the relative proportions used by Doctor Lönnberg as the principal characters in separating *massaicus* from *æliani* prove to be too inconstant and unreliable in this case for systematic purposes. The skull of true *æliani* from Zulla, Abyssinia, measured by Lönnberg at the British Museum,[1] had a total

[1] Proc. Zool. Soc. London, 1908, p. 937.

length of 388 millimeters; postorbital length, 60; and a postorbital breadth, flat area, of 24.5. The percentages to total length of skull were as follows: Postorbital length, 15.4; postorbital breadth, flat area, 6.3; interorbital breadth, 31.7. His comparative relative proportions for typical *massaicus* are: Postorbital length, 14.0; postorbital breadth, flat area, 14.5; and interorbital breadth, 38.8 per cent of total length. In a study of our series of 24 large males from British East Africa we find the following facts: The skulls most closely approaching typical *æliani* in the various proportions come from widely scattered localities, from the Guas Ngishu Plateau, Sotik, and Kilimanjaro regions. The skulls in the series most closely approaching the recorded proportions of *massaicus* come from the same three areas. Skulls with the postorbital length 15 per cent or more of occipitonasal length (*æliani*) are as follows: Nzoia River, Guas Ngishu Plateau, 15.9; Southern Guaso Nyiro, 15.1; Amala River, Sotik, 15.0. Skulls with postorbital length less than 14 per cent of occipitonasal length ("*massaicus*") are from Nzoia River, 13.1; Kedong River, 13.1, 13.0, 11.9; Olarakeri, Loita Plains, Kabalolot Hill, and other localities in the Sotik, 13.5, 13.6, 13.4, 13.2, 11.9, 12.3, 13.1, 11.4, 12.4, and 11.9; Taveta, 13.9. Skulls with postorbital breadth, flat area, less than 9 per cent of occipitonasal length (*æliani* skull, 6.3) come from Olarakeri, 7.5; Lime Springs, 8.1; Telek River, 8.6, all Sotik; and Taveta, 7.3. The Taveta skull, practically a topotype of *massaicus*, is the nearest approach among the 24 skulls to typical *æliani* in this character, and all of the four skulls with least relative postorbital breadth come from extreme southern localities. In the entire series there is no specimen with the postorbital breadth, flat area, more than 14 per cent of total length of skull (said to be a typical condition in *massaicus*). True *æliani* is said to have interorbital breadth, measured from center of rim of orbits, 31.7 per cent of total length of skull, while in *massaicus* it is 38.8 per cent In our series we find 12 male skulls from Guas Ngishu Plateau, Mau Summit and Kedong Valley, the Sotik, and from Taveta, Kilimanjaro, with the interorbital breadth less than 31.7 per cent.of occipitonasal length; and only two skulls, from Kedong Valley and Telek River, in which it is more than 34 per cent.

In his notes on the wart-hog killed at Kapiti Plains Colonel Roosevelt has written:[1]

> Wart-hogs are common throughout the country over which we hunted. They are hideous beasts, with strange protuberances on their cheeks; and when alarmed they trot or gallop away, holding the tail perfectly erect with the tassel bent forward. Usually they are seen in family parties, but a big boar will often be alone. They often root up the ground, but the stomachs of those we shot were commonly filled with nothing but grass. If the weather is cloudy or wet they may be out all day

[1] African Game Trails, Amer. ed., pp. 87, 88. 1910.

Measurements of male wart-hogs from British East Africa.

Locality.	No.	Head and body.	Tail vertebræ.	Hind foot.	Ear.	Skull: Greatest length.[1]	Condylobasal length.	Greatest breadth.	Interorbital breadth.[2]	Postpalatal length, median.	Postorbital breadth.	Postorbital breadth, flat area.	Length of crown of last upper molar.	Percent of total length skull of —			Remarks.
														Postorbital length.	Postorbital breadth, flat area.	Interorbital breadth.	
Nzoia River	163341	.....	350	285	135	397	323	201	105	63	79	43	.....	15.9	10.8	26.4	m^3 not in place.
Do	199090	.....	.....	.....	.....	390	320	228	125	51	84	42	48	13.1	10.8	32.1	m^3 moderately worn.
Man Smumit	181842	1,440	415	275	142	404	330	224	112	58	88	44	43	14.4	10.9	27.7	Do.
Kedong River	162971	.....	.....	.....	.....	382	305	201	129	50	78	40	.....	13.1	10.5	33.8	m^3 not in place.
Do	162972	.....	.....	.....	.....	384	316	216	126	50	96	36	50	13.0	9.4	32.8	m^3 considerably worn.
Do	162973	.....	.....	.....	.....	430	348	225	132	60	83	44	56	14.0	10.2	30.7	Do.
Do	162974	.....	.....	.....	.....	395	317	232	135	47	90	46	40	11.9	11.6	34.2	Do.
Kamiti Farm	161941	1,300	360	300	145	367	311	195	117	54	66	34	.....	14.7	9.3	31.9	m^3 not in place.
Olarakerl	162967	1,340	380	280	130	400	311	225	131	54	75	30	50	13.5	7.5	32.8	m^3 much worn.
Southern Guaso Nyiro.	162970	.....	.....	.....	.....	411	332	223	121	62	80	49	60	15.1	11.9	29.4	Do.
Loita Plains	182000	.....	.....	.....	.....	368	311	190	112	50	80	40	.....	13.6	10.9	30.4	m^3 not entirely in place.
Agate's Ranch	162965	1,200	350	265	120	374	313	195	118	50	69	34	.....	13.4	9.1	31.6	Do.
Do	162969	1,450	435	275	130	393	318	215	129	52	82	44	43	13.2	11.2	32.8	m^3 slightly worn.
Lime Springs	162966	1,380	410	270	130	395	330	208	125	47	82	32	50	11.9	8.1	31.6	m^3 moderately worn.
Telek River	181982	1,270	350	265	115	391	325	220	132	48	88	41	49	12.3	10.5	33.7	Do.
Do	181985	.....	.....	.....	.....	406	328	229	143	53	89	50	53	13.1	12.3	35.2	Do.
Do	181989	.....	.....	.....	.....	405	331	221	126	46	79	35	44	11.4	8.6	31.1	Do.
Amala River	181963	1,420	480	280	135	411	338	221	128	51	81	43	.....	12.4	10.5	31.1	m^3 moderately worn; broken.
Do	181969	.....	.....	.....	.....	401	334	201	136	60	81	51	.....	15.0	12.5	33.9	m^3 not in place.
Kabalolot Hill	181886	1,350	420	270	136	416	330	226	127	59	85	42	42	14.2	10.1	30.5	m^3 slightly worn.
Do	181887	1,350	440	275	122	394	329	213	123	47	77	42	.....	11.9	10.7	31.2	m^3 not in place.
Do	181936	1,370	380	280	122	404	338	217	125	57	.....	50	43	14.1	12.4	30.9	m^3 little worn.
Do	184800	.....	.....	.....	.....	382	312	203	130	55	84	39	61	14.4	10.2	34.0	m^3 moderately worn.
Tavela	34715	.....	.....	.....	.....	425	340	228	132	59	80	31	53	13.9	7.3	31.1	Do.

[1] Occipitonasal length, median line.

[2] From center of rim of orbits.

long, but in hot, dry weather we generally found them abroad only in the morning and evening. A pig is always a comical animal; even more so than is the case with a bear, which always impresses one with a sense of grotesque humor—and this notwithstanding the fact that both boar and bear may be very formidable creatures. A wart-hog standing alert at gaze, head and tail up, legs straddled out, and ears cocked forward, is rather a figure of fun; and not the less so when with characteristic suddenness he bounces round with a grunt and scuttles madly off to safety. Wart-hogs are beasts of the bare plain or open forest, and though they will often lie up in patches of brush they do not care for thick timber.

For measurements of specimens of *Phacochœrus africanus æliani* see page 53.

PHACOCHŒRUS AFRICANUS BUFO Heller.

Plate 19.

1914. *Phacochœrus africanus bufo* Heller, Smithsonian Misc. Coll., vol. 61, No. 22, p. 2. January 26. (Rhino Camp, Lado Enclave: type in U. S. National Museum.)

1914. *Phacochœrus africanus bufo* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 1, p. 286.

Specimen.—One, the type, from—

Lado: Rhino Camp (Heller).

The type specimen was collected on the shores of a small pond near Chief Sururu's village in the vicinity of Rhino Camp. It had been killed by a lion the night previous to the arrival of Colonel Roosevelt's hunting party, and the head was the only portion which remained uneaten. Wart-hogs were rare in the Lado Enclave, less than a score being seen by the members of the Smithsonian African expedition during a month's sojourn in the upper Nile district. (Heller, Smithsonian Misc. Coll., vol. 61 No. 22, p. 3, 1914.)

The type skull is that of an immature female, in which the last molar is just erupting.

PHACOCHŒRUS DELAMEREI Lönnberg.

1909. *Phacochœrus delamerei* Lönnberg, Proc. Zool. Soc. London, 1908, pt. 4, p. 940. April. (Country north of Northern Guaso Nyiro, British East Africa;[1] cotypes in British Museum.)

1914 *Phacochœrus delamerei* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 1, p. 287.

Specimens.—Two, as follows:

British East Africa: Merelle Water, Marsabit Road, 2 (Heller).

This is evidently a considerably smaller species than *Phacochœrus africanus æliani*.

[1] See Lönnberg, Kungl. Sv. Vet. Akad. Handl., vol. 48, No. 5, p. 140. 1912.

Family HIPPOPOTAMIDÆ.

Genus HIPPOPOTAMUS Linnæus.

1758. *Hippopotamus* Linnæus, Syst. Nat., ed. 10, vol. 1, p. 74. (*H. amphibius.*)
1815. *Hippotamus* Rafinesque, Anal. Nat., p. 56. (pro *Hippopotamus.*)
1836. *Tetraprotodon* Falconer and Cautley, Asiatic Research, Calcutta, vol. 19, p. 51. (*H. amphibius.*)

An excellent series of specimens of the East African hippopotamus was brought home by the Smithsonian African Expedition, and skulls of the Nile subspecies were collected by the Rainey Expedition at Victoria Nyanza.

For measurements of specimens see page 56.

HIPPOPOTAMUS AMPHIBIUS AMPHIBIUS Linnæus.

1758. *Hippopotamus amphibius* Linnæus, Syst. Nat., ed. 10, vol. 1, p. 74. (River Nile.)
1914. *Hippopotamus amphibius amphibius* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 1, p. 297.

Specimens.—Four, as follows:

British East Africa: Kisumu, Kavirondo Gulf, 4 skulls (Heller).

HIPPOPOTAMUS AMPHIBIUS KIBOKO Heller.

Plates 20, 21.

1910. *Hippopotamus amphibius* Roosevelt, African Game Trails, Amer. ed., p. 474; London ed., p. 486. (Not of Linnæus.)
1914. *Hippopotamus amphibius kiboko* Heller, Smithsonian Misc. Coll., vol. 61, No. 22, p. 1. January 26. (Lake Naivasha, British East Africa; type in U. S. National Museum.)
1914. *Hippopotamus amphibius kiboko* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 1, p. 298.

Specimens.—Nine, as follows:

British East Africa: Juja Farm, 1 skin and skull (T. Roosevelt); Lake Naivasha, 8 skulls, 4 with skins and 4 with skeletons (T. Roosevelt, K. Roosevelt, Mearns, Heller).

Colonel Roosevelt has recorded the weight of the female hippopotamus from the Rewero River, Juja Farm, as nearly 2,800 pounds, which, he says, is a "good size for one dwelling in a small river, where they never approach the dimensions of those making their homes in a great lake like the Victoria Nyanza." A big lake bull would weigh, he believed, between three and four tons. He writes further:[1]

In wild regions hippos rest on sandy bars, and even come ashore to feed, by day; but wherever there are inhabitants they land to feed only at night. Those in the Rewero continually entered McMillan's garden. Where they are numerous they sometimes attack small boats and kill the people in them; and where they are so

[1] African Game Trails, p. 123. 1910.

Measurements of specimens of Hippopotamus from British East Africa.

Form and locality.	No.	Sex.	Head and body.	Tail.	Hind foot.	Ear.	Skull: Condylobasal length.	Zygomatic breadth.	Rostral constriction.	Least breadth nasals.	Breadth of nasals at tip.	Width of orbit.	Height of orbit.	Length of crown of m^2.	Width of crown of m^2.	Remarks.
H. a. amphibius.																
Kisumu	182397	Male						388	116			63	66	47	46	m^3 moderately worn.
Do	182395	Female						370	107			58	67	58	50	m^3 slightly worn.
Do	182396	...do						382	107	38		54	66	52	51	m^3 considerably worn.
Do	182398	...do						375	105	27		62	70	58	49	m^3 not in place.
H. a. kiboko.																
Lake Naivasha	[1]162979	Male	3,710	510	550	95	720	442	138	48	65	60	80	55	46	m^3 slightly worn.
Do	162976	Female	3,000	435	465	75	560	347	115	42	47	60	67			m^3 not in place.
Do	162977	...do	3,150	405	450	78	600	370	110	40	59	59	68	55	53	m^3 much worn.
Do	162978	...do				90		390	131	48	65	50	67	57	50	m^3 moderately worn.
Do	162980	...do	3,410	380	585	77	650	390	137	47	54	61	75	52	45	m^3 almost unworn.
Do	162981	...do	3,340	380	540	75	600	385	114	40	56	57	65	57	46	m^3 unworn.
Do	162982	...do					690	415	113	40		62	75	54	55	m^3 moderately worn.
Do	162983	...do						380	117	49		61	75			m^3 not in place.
Juja Farm	161942	...do	2,900	380	450	80	600	361	117	40	44	51	71	52	48	m^3 erupting.

[1] Type.

plentiful they do great damage to the plantations of the natives, so much so that they then have to be taken off the list of preserved game and their destruction encouraged. Their enormous jaws sweep in quantities of plants, or lush grass, or corn, or vegetables, at a mouthful, while their appetites are as gigantic as their bodies. In spite of their short legs, they go at a good gait on shore, but the water is their real home, and they always seek it when alarmed. They dive and float wonderfully, rising to the surface or sinking to the bottom at will, and they gallop at full speed along the bottoms of lakes or rivers, with their bodies wholly submerged; but as is natural enough, in view of their big bodies and short legs, they are not fast swimmers for any length of time. They make curious and unmistakable trails along the banks of any stream in which they dwell; their short legs are wide apart, and so when they tread out a path they leave a ridge of high soil down the center. Where they have lived a long time, the rutted paths are worn deep into the soil, but always carry this distinguishing middle ridge.

The hippopotamuses doubtless trample over and thus ruin far more of the natives' garden truck than they eat. Although the animal has a stomach capacity of 5 or 6 bushels, its food is comparatively slowly taken, is gathered largely by the lips, and is well masticated before being swallowed.

Family GIRAFFIDÆ.

Genus GIRAFFA Brisson.

1762. *Giraffa* Brisson, Regn. Anim., p. 12. (*G. camelopardalis.*)
1784. *Camelopardalis* Schreber, Säugthiere, pl. 255. (*G. camelopardalis.*)
1816. *Orasius* Oken, Lehrb. Nat., 3ter Theil, 2te Abth., p. 744. (*G. camelopardalis.*)
1848. *Trachelotherium* Gistel, Naturg. Thierr., p. 81. (*G. camelopardalis.*)

No authentic specimens of the true *Giraffa camelopardalis* [1] from northern Sudan, or of the allied *Giraffa camelopardalis antiquorum* [2] from Kordofan, are contained in the National Museum collection. Other forms of the giraffe described from the territory covered by this report and not included in the collection are *Giraffa camelopardalis cottoni* Lydekker [3] from Koten Plain, south of Toposa, northern Uganda, and *Giraffa hagenbecki* Knottnerus-Meyer [4] from Gallaland, southern Abyssinia. The former has been regarded by authors as indistinguishable from *Giraffa camelopardalis rothschildi*, and *hagenbecki*, based on an immature example living in Hagenbeck's zoological collection, is probably synonymous with *Giraffa camelopardalis reticulata*.

For measurements of specimens see page 59.

[1] *Cervus camelopardalis* Linnæus, Syst. Nat., ed. 10, vol. 1, p. 66. 1758.
[2] *Camelopardalis antiquorum* Jardine, Nat. Library, vol. 21, p. 187, pl. 21. 1838.
[3] Proc. Zool. Soc. London, 1904, p. 207. June.
[4] Zool. Anz., vol. 35, p. 800. June 21, 1910.

GIRAFFA CAMELOPARDALIS RETICULATA de Winton.

1899. *Giraffa camelopardalis reticulata* DE WINTON, Ann. and Mag. Nat. Hist., ser. 7, vol. 4, p. 212. September. (Loroghi Mountains, British East Africa; type in British Museum.)

1910. *Giraffa reticulata* ROOSEVELT, African Game Trails, Amer. ed., p. 475; London ed., p. 487.

1911. *G[iraffa] reticulata nigrescens* LYDEKKER, Nature, vol. 87, p. 484. October 12. (British East Africa, probably the district north of Mount Kenia; type in British Museum.)

1914. *Giraffa camelopardalis reticulata* ROOSEVELT AND HELLER, Life-Hist. African Game Anim., vol. 1, p. 304.

Specimens.—Five, from localities as follows:

BRITISH EAST AFRICA: Koya Water, Marsabit Road, 2 skulls (Rainey, Heller); Lakiundu River, 1 skull (Heller); Northern Guaso Nyiro River, 2, with skulls, skins, leg and foot bones (T. Roosevelt).

The largest male collected by Roosevelt on the northern Guaso Nyiro has been mounted for the exhibition series.

GIRAFFA CAMELOPARDALIS ROTHSCHILDI Lydekker.

1903. *G[iraffa] camelopardalis rothschildi* LYDEKKER, Anim. Life and the World of Nature, vol. 2, p. 122. October. (Guas Ngishu Plateau, British East Africa; type in British Museum.)

1910. *Giraffa camelopardalis rothschildi* HOLLISTER, Smithsonian Misc. Coll., vol. 56, No. 2, p. 1. March 31.

1910. *Giraffa camelopardalis rothschildi* ROOSEVELT, African Game Trails, Amer. ed., p. 476; London ed., p. 487.

1914. *Giraffa camelopardalis rothschildi* ROOSEVELT AND HELLER, Life-Hist. African Game Anim., vol. 1, p. 314.

Specimens.—Four, from localities as follows:

BRITISH EAST AFRICA: Guas Ngishu Plateau, 2, including one complete specimen and one skull only (White, Barker); Kampiya bibi, Guas Ngishu Plateau, 1, skin and skeleton (K. Roosevelt); Lake Baringo, 1 skull and mounted skin (received from Rowland Ward).

Mr. John Jay White, who collected one of the largest male specimens in this series, found giraffes in good numbers on the Guas Ngishu Plateau in 1908. Herds numbering up to a dozen or fifteen animals were frequently seen, and one herd of about 75 was noted. This largest herd divided, however, about 25 animals going in one direction and the remainder in another.[1]

[1] Hollister, Smithsonian Misc. Coll., vol. 56, No. 2, p. 2. March 31, 1910.

Measurements of adult specimens of Giraffa from British East Africa.

Locality.	No.	Sex.	Head and body.	Tail vertebræ.	Hind foot.	Ear.	Height.	Skull: Condylo-basal length.	Greatest breadth over orbits.	Length anterior nares.	Height of front horn over orbit.	Length of mandible from angle.	Mandibular diastema.	Upper molar-premolar row.	Condition of molar teeth.
Giraffa c. reticulata.															
Koya Water	182124	Male						585	268	154	188				Much worn.
Do	182125	...do							272		217			140	Do.
Lakiundu River	182192	...do						570	283	154	208			140	Considerably worn.
Northern Guaso Nyiro	163113	...do	3,790	890	1,020	212	4,645	595	263	156	185	485	188	147	Moderately worn.
Do	163324	Female	3,610	800	1,020	217	4,442	602	240	165	132	518	200	158	Much worn.
Giraffa c. rothschildi.															
Lake Baringo	121010	Male						655	316	177	256	555	220	151	Considerably worn.
Guas Ngishu Plateau	155438	...do						650	337	191	282	535	200	156	Do.
Do	163312	...do	3,886	863	1,244	220	5,226	640	298	173	254	505	185	155	Moderately worn.
Do	200151	...do						662	312	187	287	548	205	157	Do.
Giraffa c. tippelskirchi.															
Kilima Kui	162016	Male	3,690	990	1,320	242	4,900	645	278	172	168	550	215	162	Moderately worn.
Machakos Road	162018	...do	4,065	965	1,345	235	5,235	650	290	168	200	520	198	161	Do.
Lime Springs	162988	Female	3,550	900	1,115	230	4,450	588	265	155		495	190	140	Considerably worn.

GIRAFFA CAMELOPARDALIS TIPPELSKIRCHI Matschie.

1898. *Giraffa tippelskirchi* Matschie, Sitz.-ber. Ges. nat. Freunde Berlin, p. 78. (Lake Eyasi, Rift Valley, German East Africa; type in Berlin Mus.)
1898. *Giraffa schillingsi* Matschie, Sitz.-ber. Ges. nat. Freunde Berlin, p. 79. (Taveta, British East Africa; type in Schillings collection.)
1910. *Giraffa camelopardalis tippelskirchi* Roosevelt, African Game Trails, Amer. ed., p. 476; London ed., p. 487.
1914. *Giraffa camelopardalis tippelskirchi* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 1, p. 316.

Specimens.—Six, from localities as follows:

British East Africa: Kilima Kui, Kapiti Plains, 2, with skins, skulls, leg and foot bones (T. Roosevelt); Machakos Road, 1, with skull and skin of head, legs, and tail (K. Roosevelt); Lime Springs, Sotik, 3, with skins, skulls, leg and foot bones (T. Roosevelt).

Of all the beasts in an African landscape none is more striking than the giraffe. Usually it is found in small parties or in herds of fifteen or twenty or more individuals. Although it will drink regularly if occasion offers, it is able to get along without water for months at a time, and frequents by choice the dry plains or else the stretches of open forest where the trees are scattered and ordinarily somewhat stunted. Like the rhinoceros—the ordinary or prehensile-lipped rhinoceros—the giraffe is a browsing and not a grazing animal. The leaves, buds, and twigs of the mimosas or thorn-trees form its customary food. Its extraordinary height enables it to bring into play to the best possible advantage its noteworthy powers of vision, and no animal is harder to approach unseen. Again and again I have made it out a mile off or rather have seen it a mile off when it was pointed out to me, and looking at it through my glasses, would see that it was gazing steadily at us. It is a striking-looking animal and handsome in its way, but its length of leg and neck and sloping back make it appear awkward even at rest. When alarmed it may go off at a long swinging pace or walk, but if really frightened it strikes into a peculiar gallop or canter. The tail is cocked and twisted, and the huge hind legs are thrown forward well to the outside of the forelegs. The movements seem deliberate and the giraffe does not appear to be going at a fast pace, but if it has any start a horse must gallop hard to overtake it. When it starts on this gait, the neck may be dropped forward at a sharp angle with the straight line of the deep chest, and the big head is thrust in advance. They are defenseless things and, though they may kick at a man who incautiously comes within reach, they are in no way dangerous.[1]

Family BOVIDÆ.

Genus SYNCERUS Hodgson.

1847. *Syncerus* Hodgson, Journ. Asiatic Soc. Bengal, new series, vol. 16, No. 7, p. 709. July. (*S. brachyceros.*)
1872. *Planiceros* Gray, Cat. Rum. Mamm. Brit. Mus., p. 10. (*S. planiceros.*)
1872. *Synceros* Gray, Cat. Rum. Mamm. Brit. Mus., p. 12. (*S. caffer.*)
1911. *Syncerus* Hollister, Proc. Biol. Soc. Washington, vol. 24, p. 192. June 23.

In addition to the names for African buffaloes enumerated below, including those placed in synonymy, the following have been proposed for forms from outlying districts within the region

[1] Roosevelt, African Game Trails, pp. 96, 97. 1910.

covered by this report, but from which no specimens are available for comparison: *Bos caffer matthewsi* Lydekker,[1] Ruanda, northeast of Lake Kivu, German East Africa; *Bubalus ruahaensis* Matschie,[2] Ruaha River, German East Africa; *Bubalus schillingsi* Schillings,[3] Pangani River, German East Africa; *Bubalus ussanguensis* Matschie,[4] Uzangu, a district west of Uhehe in the region of the Great Ruaha, German East Africa; *Bubalus rufuensis* Zukowsky,[5] Upper Pangani River, German East Africa; *Bubalus caffer bubuensis* Matschie,[6] eastern Turu, German East Africa; *Bubalus massaicus* Matschie,[7] Umbugwe, southward from Manyara Lake, German East Africa; *Bubalus wintgensi* Matschie,[8] Muhambwe, Uha, German East Africa; and *Bubalus urundicus* Matschie,[9] southeast Urundi, German East Africa.

For measurements of specimens see page 62.

SYNCERUS CAFFER RADCLIFFEI (Thomas).

1892. *Bubalis caffer* True, Proc. U. S. Nat. Mus., vol. 15, p. 478. October 26. (Not of Sparrman.)

1904. *B[ubalus] caffer radcliffei* Thomas, Abstr. Proc. Zool. Soc. London, No. 4, p. 13. March 8. (Burumba, Ankole, Uganda; type in British Museum.)

1906. *Bubalus neumanni* Matschie, Sitz.-ber. Ges. nat. Freunde Berlin, p. 169. July. (Chagwe, Uganda; Neumann collection.)

1906. *Bubalus wembaerensis* Matschie, in Schillings's Der Zauber des Elelescho, p. 95. (Tschaja Swamp, southern Wembere Steppe, German East Africa; type specimen "somewhere in Africa.")

1910. *Bos caffer radcliffei* Roosevelt, African Game Trails, Amer. ed., p. 475; London ed., p. 486.

1911. *Syncerus caffer radcliffei* Hollister, Proc. Biol. Soc. Washington, vol. 24, p. 192. June 23.

1912. *Bubalus caffer tanae* Matschie, Deutsche Jäger-Zeitung, vol. 59, No. 15, p. 210, fig. 86. (Region south of Mount Kenia draining into the Tana River, British East Africa; mounted head in possession of Baron Wulff von Plessen.)

1912. *Bubalus caffer athiensis* Matschie, Deutsche Jäger-Zeitung, vol. 59, No. 15, p. 210, fig. 85. (Galla Galla Mountains, British East Africa; mounted head belonging to Baron Böcklin von Böcklinsau.)

1914. *Syncerus caffer radcliffei* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 1, p. 415.

Specimens.—Seventeen, from localities as follows:

British East Africa: "British East Africa," 1 juvenile, skin and skull (Clark); Escarpment, Kedong Valley, 1 skull (Clark); Kamiti

[1] Abstr. Proc. Zool. Soc. London, No. 9, p. 10. June 14, 1904.

[2] Sitz.-ber. Ges. nat. Freunde Berlin, 1906, p. 170. July.

[3] Der Zauber des Elelescho, p. 95. Leipsic, 1906. (*Buffelus suahelicus* Matschie, appendix to second edition of Schillings's "Mit Blitzlicht und Büchse," p. 535; *nomen nudum*. 1905.)

[4] Das Weidwerk in Wort und Bild, vol. 19, p. 297. April 15, 1910.

[5] Zool. Beob., vol. 51, p. 265. September 1910.

[6] Deutsche Jäger-Zeitung, vol. 59, No. 8, p. 103 (71 of reprint). 1912.

[7] Beröff. Inst. Jagdkunde, Neudamm, vol. 2, pt. 4, p. 169, fig. 83. 1913.

[8] Beröff. Inst. Jagdkunde, Neudamm, vol. 2, pt. 4, p. 169, fig. 83. 1913.

[9] Beröff. Inst. Jagdkunde, Neudamm ,vol. 2, pt. 4, p. 169, fig. 83. 1913.

Measurements of adult specimens of African buffaloes.

Form and locality.	No.	Sex.	Head and body.	Tail vertebræ.	Hind foot.	Ear.	Skull: Condylobasal length.	Palatal length.	Zygomatic breadth.	Greatest breadth over orbits.	Mastoid breadth.	Length of maxillary tooth row.	Length of mandibular tooth row.	Greatest spread of horns.	Distance between tips of horns.	Condition of m^3.
Syncerus caffer radcliffei.																
B. E. A.:																
Taveta	34710	Male						278	220	237	264	136		882	610	Much worn.
Do	34711	...do					500	297	207	225	255	133		817	606	Moderately worn.
Do	34712	Female					454	279	214	219	235	134		712	335	Much worn.
Do	34713	...do					495	292	206	207	227	134		830	470	Moderately worn.
Kamiti Farm	161943	Male	2,360	880	640	248	502	290	231	243	279	144				Considerably worn.
Do	161944	...do	2,700	900	640	288	492	279	230	240	283	135	145			Moderately worn.
Do	161945	...do	2,500	890	600	300	497	286	239	248	300	142	148			Considerably worn.
Do	161946	Female	2,350	710	600	260	483	281	220	217	267	134	139			Moderately worn.
Escarpment	200296	Male							230	232	255	149				Unworn.
Mount Kenia	163313	...do							242	254	296					Much worn.
Neuman's Boma	163309	...do					505	279	232	242	262	141	151	1,020	661	Considerably worn.
Do	163310	...do					522	280	242	255	290	142	147	1,090	806	Do.
Do	163311	Female	2,250	612	434	255	487	282	215	218	255	138	144	692	414	Moderately worn.
Quoy Water	182116	Male	2,330	730	580	265	500	275	227	234	280	146	150	1,110	855	Much worn.
Syncerus caffer æquinoctialis.																
Lado: Rhino Camp	164768	Male	2,540	710	610	275	501	284	229	233	276	140	148	797	652	Considerably worn.

Farm, Athi Plains, 4, skins and skulls (T. Roosevelt); Mount Kenia at 10,000 feet, 1 skull (Mearns); Neuman's Boma, Northern Guaso Nyiro River, 4, skins and skulls (K. Roosevelt, T. Roosevelt); Quoy Water, Marsibit Road, 1 skull and head skin (Rainey); Taveta, 4 skulls with head skins (Abbott).

German East Africa: Wembere Plains, 1 skin and complete skeleton (Hagenbeck).

Three of the adult buffaloes from Kamiti Farm, Athi Plains, are mounted in the buffalo group among the Roosevelt specimens Included in the group is also the small calf from "British East Africa," which was purchased through James L. Clark to complete the series. The Wembere Plains specimen was received at the National Zoological Park from Carl Hagenbeck December 24, 1910 when about 2½ years old. It then weighed 700 pounds. This buffalo lived in the park until April 7, 1914. There are, unfortunately, no specimens of *Syncerus caffer radcliffei* from the type locality available for comparison, but the specimens in the collection enumerated above all agree well with the descriptions of that animal and authors are quite generally agreed that only one form of the buffalo can be admitted for this general region. Many of the names proposed by Matschie are based on individual differences in the form of the horns and can not seriously be considered until sufficient series of specimens from the various localities are available so that the real characters, if such exist, can be worked out. It would seem reasonable, on geographic grounds and from what we know of the forms of other ungulates, to believe that some of these names eventually will be applied to valid subspecies. I can not distinguish more than one form in the material listed above.

SYNCERUS CAFFER ÆQUINOCTIALIS (Blyth).

1866. *B[ubalus] caffer*, var. *æquinoctialis* Blyth, Proc. Zool. Soc. London, p. 372. ([White Nile,] "Equatorial Africa.")

1866. *Bubalus æquinoctialis* Blyth, Proc. Zool. Soc. London, p. 372.

1873. [*Bubalus pumilus*] b. Stirps *orientalis* Brooke, Proc. Zool. Soc. London, p. 483. (Abyssinia and Upper Nubia.)

1906. *Bubalus azrakensis* Matschie, Sitz.-ber Ges. nat. Freunde Berlin, p. 169. July. (Roseires, Blue Nile, Sudan; type in Berlin Museum.)

1910. *Bos æquinoctialis* Roosevelt, African Game Trails, Amer. ed., p. 475; London ed., p. 486.

1911. *Syncerus caffer aequinoctialis* Hollister, Proc. Biol. Soc. Washington, vol. 24, p. 192. June 23.

1911. *Bubalus solvayi* Matschie, Deutsche Jäger-Zeitung, vol. 57, No. 7, p. 104. (Mongalla, Sudan; mounted head in collection of R. von Goldschmidt-Rothschild.)

1913. *Bubalus pumilus orientalis* Lydekker, Cat. Ungulate Mamm. Brit. Mus., vol. 1, p. 58. (In synonymy.)

1914. *Syncerus caffer æquinoctialis* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 1, p. 418.

Specimens.—Six, as follows:

LADO: Rhino Camp, 1 skin and skull (T. Roosevelt).

"UPPER NILE:" 5 skulls (Pomeroy, Davidson, Prentice).

The Abyssinian buffaloes we encountered were in the Lado, on the western bank of the Nile. They were living in country much like that along the Northern Guaso Nyiro, and their habits were substantially those of their Northern Guaso Nyiro cousins. At one camp by a native village, we found a herd living in the dense reed beds, through which they had trampled a tangle of trails. The herd entirely realized that they were safe in their reed fastnesses, and only came into the open country at night to graze. Yet in the same neighborhood there were other buffaloes with entirely different habits. These lived among the dry, scattered thorn-trees, which, interspersed with a few other trees such as palms, covered the surrounding country, but nowhere formed thick cover. There were a few pools at which these buffaloes drank. They fed and rested alternately throughout the day and night. We found a bull grazing at midday. They rested, standing or lying down, among the nearly leafless thorn-trees, which gave scant shelter from the sun.—(Roosevelt and Heller, Life-Histories African Game Animals, vol. 1, p. 411.)

Genus OVIS Linnæus.

1758. *Ovis* LINNÆUS, Syst. Nat., ed. 10, vol. 1, p. 70. (*O. aries.*)

1762. *Aries* BRISSON, Regn. Anim., ed. 2, p. 12. (*O. aries.*)

1798. *Musmon* SCHRANK, Fauna Boica, vol. 1, p. 78. (pro *Ovis;* not of Pallas, 1776.)

1816. *Ammon* BLAINVILLE, Bull. Soc. Philom., p. 76. May. (pro *Ovis.*)

A single pair of horns of one of the African breeds of the domestic sheep was brought home with material collected by the Smithsonian African Expedition.

OVIS ARIES Linnæus.

1758. *Ovis aries* LINNÆUS, Syst. Nat., ed. 10, vol. 1, p. 70. (Sweden; the domestic sheep.)

Specimens.—Two, as follows:

SUDAN: Nubia, 1 (Berlin Mus.).

BRITISH EAST AFRICA: Lake Naivasha, 1 pair of horns of the "Masai sheep" (Mearns).

The sheep in the immediate vicinity of Nairobi are those of the Kikuyu. They are a very mixed breed, having been continually influenced by importations of sheep from other tribes. The Kikuyu bush-country is not a sheep-country in the sense that the plain country is, and no special type seems to have perpetuated itself there. In the Masai country near Nairobi, and in other parts, the sheep are a distinct type, being perhaps the best in the Protectorate. They are large, hairy, fat-tailed sheep, and the predominating colour is brown. The tail is short.—(Lydekker, The Sheep and its Cousins, p. 210. 1913. Letter from the Director of Agriculture at Nairobi.)

The specimen from Nubia was received from the Berlin Zoological Museum in 1867 and is entered as *Ovis recurvicauda.* It represents the *Ovis pachycerca recurvicauda* or the *Ovis pachycerca jubata* of Fitzinger.[1]

[1] Wiss.-pop. Naturg. Säugethiere, vol. 5, pp. 43–45. Wien, 1860.

Genus ALCELAPHUS Blainville.

1816. *Alcelaphus* Blainville, Bull. Soc. Philom. Paris, p. 75. May. (*A. buselaphus.*)
1820. *Bubalis* Goldfuss, Handb. Zool., vol. 2, p. 367. (*A. buselaphus.*)
1827. *Damalis* Smith, Griffith's Cuvier, vol. 4, p. 343. (*A. buselaphus.*)
1827. *Acronotus* Smith, Griffith's Cuvier, vol. 4, p. 346. (*A. buselaphus.*)
1837. *Bubalus* Ogilby, Proc. Zool. Soc. London, 1836, p. 139. June 27, 1837. (*A. buselaphus;* not *Bubalus* Smith, 1827.)
1914. *Bubalis* Lyon, Proc. Biol. Soc. Washington, vol. 27, p. 228. (*Bubalis*, as usually cited from Lichtenstein, 1814, not a valid name; dates from Goldfuss, 1820.)
1921. *Alcelaphus* Hollister, Proc. Biol Soc. Washington, vol. 34, p. 77. March 31.

Probably the most abundant game mammal in eastern Africa, the hartebeest is better represented in the National Museum collection than are most of the species of antelopes. One species, *Alcelaphus tora* Gray, of which several geographical races have been described from Sudan, Abyssinia, and Somaliland, is, however, entirely unrepresented. Another distinct species, *Alcelaphus lichtensteini* Peters, which occurs northward from Zambesi (the type locality) and Rhodesia into German East Africa, is represented only by specimens from south of the area included in the present report. This species has been made by Heller the type of a separate genus, *Sigmoceros*.[1]

For measurements of specimens see pages 71–73.

ALCELAPHUS COKII COKII Günther.

1884. *Alcelaphus cokii* Günther, Ann. and Mag. Nat. Hist., ser. 5, vol. 14, p. 426. December. (M'lali Plains, near Mpwapwa Mountains, Ussagara, German East Africa; type in British Museum.)
1892. *Alcelaphus cokii* True, Proc. U. S. Nat. Mus., vol. 15, p. 471. October 26.
1913. *Bubalis cokei schillingsi* Zukowsky, Archiv Naturg., Jahrg. 79, Abt. A, Heft 10, p. 99. (Lake Jipi, Upper Pangani Valley, German East Africa; type in Berlin Museum.)[2]
1914. *Bubalis cokei cokei* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 1, p. 391.
1916. *B[ubalis] deckeni* Matschie and Zukowsky, Sitz.-ber. Ges. nat. Freunde Berlin, pl. 8, fig. 2. (Taveta Plains, British East Africa; type in Schillings collection, Berlin Mus.)

Specimens.—Five, from localities as follows:

British East Africa: Taveta, 4, including 1 odd skull (Abbott).

German East Africa: Mount Kilimanjaro, 1 skull and head skin (Abbott).

One specimen from Taveta has been mounted and is now in the exhibition series.

---

[1] Smithsonian Misc. Coll., vol. 60, No. 8, p. 4. November 2, 1912.

[2] The type frontlet and horns, collected by von der Decken in 1862, are figured in Sclater and Thomas, Book of Antelopes, vol. 1, pp. 28, 29. 1894.

The following manuscript notes on the type specimen of *Alcelaphus cokii* Günther were made by Heller at the British Museum.

Type No. 84.12.15.1; skull immature, milk teeth just shed; lower jaw and nasal bones lost, condyles and basisphenoid region cut away. Head skin of type rufous brown, throat lighter yellowish (very red, sorrel or rufous on snout, lighter on chin and throat). Color exactly as in specimens from near coast of B. E. A. Greatest length of skull, frontal fork to tip of premaxillæ, 453; zygomatic breadth, 123; width of palate at m^3, 45; length, pm^1 to tip premaxillæ, 131; orbit to frontal fork, 130; interorbital width, 80; length of upper tooth row, 93. Length of horn, outside curve, 413; breadth at tips, 315; greatest breadth, 395; circumference at base, 235.

ALCELAPHUS COKII SABAKIENSIS (Zukowsky).

1910. *Bubalis cokei* Hollister, Smithsonian Misc. Coll., vol. 56, No. 2, p. 2. March 31. (Part; not of Günther.)

1910. *Bubalis cokei* Roosevelt, African Game Trails, Amer. ed., p. 475; London ed., p. 487. (Part; not of Günther.)

1910. *Bubalis cokei sabakiensis* Zukowsky, Wild und Hund, vol. 16, No. 13, p. 225. April 1. (*Nomen nudum.*)

1913. *Bubalis cokei sabakiensis* Zukowsky, Archiv Naturg., Jahrg. 79, Abt. A, Heft 10, p. 97. (Athi Plains, southward from Nairobi, British East Africa; coll. Dr. A. Berger.)

1914. *Bubalis cokei kongoni* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 1, p. 392. (Part.)

Specimens.—Thirty-nine, from localities as follows:

British East Africa: Juja Farm, Athi Plains, 4, including one skull and head skin, two odd skulls, and one mounted calf (Loring, T. Roosevelt, Cuninghame); Kamiti Farm, Athi Plains, 3, including two odd skulls (T. Roosevelt, Heller); Kapiti Plains, 10, including seven odd skulls (Loring, T. Roosevelt, Mearns); Kitanga, Athi Plains, 6, including one odd skull (T. Roosevelt, K. Roosevelt, Mearns); Nairobi, 1 skull (Mearns); Potha, Kapiti Plains, 4, including one odd skull (Loring, K. Roosevelt, Mearns); Ulukenia Hills, 10 skulls (Loring); Ulu Station, 1 (Rainey).

An adult male and female from Kapiti Plains; an adult female from Kitanga, Athi Plains; and a juvenile specimen from Juja Farm, Athi Plains, are mounted in the hartebeest group in the exhibition hall of African mammals.

An old male of this hartebeest shot by Colonel Roosevelt on the Athi Plains, May 1, weighed 299 pounds. A younger male in better condition weighed 340 pounds and a female 315 pounds.

Specimens of this subspecies average distinctly smaller than typical examples of the closely related *Alcelaphus cokii kongoni* from the Southern Guaso Nyiro, and the color of skins is slightly darker.

ALCELAPHUS COKII TANÆ (Zukowsky).

1910. *Bubalis cokei* Hollister, Smithsonian Misc. Coll., vol. 56, No. 2, p. 2. March 31. (Part, specimen from Thika River; not of Günther.)

1913. *Bubalis cokei tanae* Zukowsky, Archiv Naturg., Jahrg. 79, Abt. A, Heft 10, p. 97. (Upper Tana Valley, northward from Nairobi; type in Berlin Museum.)

1914. *Bubalis cokei kongoni* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 1, p. 392. (Part.)

Specimen.—One, as follows:

British East Africa: Punda Milia, near Thika River, 1 skull and head skin (Rainsford).

The peculiarities of this skull, compared with specimens of the *cokii* group from Athi Plains and other localities, were described in my report on the mammals collected in British East Africa by John Jay White, 1910, but the material then at hand seemed insufficient to prove the validity of a local race. The specimen without doubt represents the subspecies later described by Zukowsky from the upper Tana Valley.

ALCELAPHUS COKII KONGONI (Heller).

Plate 22.

1910. *Bubalis cokei* Hollister, Smithsonian Misc. Coll., vol. 56, No. 2, p 2. March 31. (Part; not of Günther.)

1910. *Bubalis cokei* Roosevelt, African Game Trails, Amer. ed., p. 475; London ed., p. 487. (Part; not of Günther.)

1912. *Bubalis cokei kongoni* Heller, Smithsonian Misc. Coll., vol. 60, No. 8, p. 5. November 2. (Loita Plains, Southern Guaso Nyiro River, British East Africa; type in U. S. Nat. Mus.)

1914. *Bubalis cokei kongoni* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 1, p. 392. (Part.)

Specimens.—Twenty-nine, from localities as follows:

British East Africa: Agate's, Southern Guaso Nyiro, 2 (Mearns, Rainey); Kabalolot Hill, 1 skull (Rainey); Lake Naivasha, 1 (Loring); Lime Springs, Sotik, 1 skull (Tarlton); Loita Plains, 4, including one odd skull (T. Roosevelt, Rainey); Palm Springs, Sotik, 2, including one odd skull (Rainey); Sigaa, 1 (Draper); Southern Guaso Nyiro River, 8, including four odd skulls (Mearns, Rainey, T. Roosevelt, Loring, Cuninghame); Suswa Plains, 3 (Rainey, Draper); Telek River, 6, including two odd skulls (Rainey).

One adult male specimen and a calf from Loita Plains are mounted in the exhibition group of hartebeests.

An adult male of this form from the Southern Guaso Nyiro (No. 182002, third molar considerably worn) measured in the flesh: Head and body, 1,800; tail vertebræ, 495; hind foot, 520; ear from notch, 190.

ALCELAPHUS COKII NAKURÆ (Heller).

Plate 23.

1910. *Bubalis cokei* Hollister, Smithsonian Misc. Coll., vol. 56, No. 2, p. 2. March 31. (Part; not of Günther.)

1910. *Bubalis neumanni* Roosevelt, African Game Trails, Amer. ed., p. 475; London ed., p. 487. (Not of Rothschild.)

1912. *Bubalis nakuræ* Heller, Smithsonian Misc. Coll., vol. 60, No. 8, p. 6. November 2. (Nakuru, British East Africa; type in U. S. Nat. Mus.)

1914. *Bubalis cokei nakuræ* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 1, p. 394.

Specimens.—Three, as follows:

British East Africa: Nakuru, 3 (K. Roosevelt).

This hartebeest inhabits the region between Lake Baringo and Lake Elmentaita and is separated by several hundred miles from the southern border of the range of the allied *Alcelaphus neumanni* (Rothschild), a member of the *cokii* group not represented in our collection. Other described forms of the *cokii* group of which we have no specimens are *Alcelaphus rothschildi* (Neumann),[1] from Adoshebai Valley, north of Lake Stefanie, southern Abyssinia; *Alcelaphus cokii wembærensis* (Zukowsky),[2] from Wembaere Plains, German East Africa; *Alcelaphus cokii schulzi* Zukowsky,[3] from western uplands of Olossirwa, about 10 km. from the northern edge of the Ngorongoro Basin, German East Africa; and *Alcelaphus cokii oscari* (Matschie and Zukowsky)[4] from Gurui Mountain, German East Africa.

ALCELAPHUS LELWEL LELWEL (Heuglin).

1877. *Acronotus lelwel* Heuglin, Reise Nordost-Afrika, vol. 2, p. 124, 1 fig. (West side of the Nile in Jur, Bahr-el-Ghazal, Sudan; type apparently lost; see Rothschild, Ann. and Mag. Nat. Hist., ser. 6, vol. 20, p. 377, October, 1897.)

1908. *Bubalis lelwel typica* Lydekker, Game Anim. Africa, p. 107.

1914. *Bubalis lelwel lelwel* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 1, p. 398; map, p. 401.

Specimens.—Five, from localities as follows:

Lado: Rejaf, 1 skull (K. Roosevelt); Rhino Camp, 4 (T. Roosevelt, K. Roosevelt).

---

[1] *Bubalis rothschildi* Neumann, Sitz.-ber. Ges. nat. Freunde Berlin, 1905, p. 94.

[2] *Bubalis cokei wembaercnsis* Zukowsky, Wild und Hund, vol. 16, p. 208. March 25, 1910 (*nomen nudum*); Archiv für Nat., Jahrg. 79, Abt. A, Heft 10, p. 98. 1913.

[3] Archiv für Nat., Jahrg. 80, Abt. A, Heft 9, p. 101. 1914.

[4] *Bubalis oscari* Matschie and Zukowsky, Sitz.-ber. Ges. nat. Freunde Berlin, 1916, pl. 6, figs. 3, 4. 1916.

ALCELAPHUS LELWEL ROOSEVELTI (Heller).

Plate 24.

1910. *Bubalis lelwel niedieckl* Roosevelt, African Game Trails, Amer. ed., p. 475; London ed., p. 487. (Not of Neumann.)

1912. *Bubalis lelwel roosevelti* Heller, Smithsonian Misc. Coll., vol. 60, No. 8, p. 7. November 2. (Nimule,[1] Uganda; type in U. S. National Museum.)

1914. *Bubalis lelwel roosevelti* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 1, p. 399.

Specimens.—Eight, from localities as follows:

Uganda: Gondokoro, 6, including four odd skulls (Heller); Nimule, 80 miles north of, 1 (K. Roosevelt); Nimule, vicinity of, 1, the type (T. Roosevelt).

ALCELAPHUS LELWEL INSIGNIS (Thomas).

1904. *Bubalis jacksoni insignis* Thomas, Abstr. Proc. Zool. Soc. London, No. 6, p. 22. April 26. (Maanja River, Uganda; type in British Museum.)

1910. *Bubalis jacksoni insignis* Roosevelt, African Game Trails, Amer. ed., p. 475; London ed., p. 487.

1914. *Bubalis lelwel insignis* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 1, p. 400.

Specimens.—Four, from the following localities:

Uganda: Katwe, 1 (T. Roosevelt); Kigoma, 1 (T. Roosevelt); Kisingo, 2 (K. Roosevelt).

The flesh measurements of these four specimens were as follows:

	Head and body.	Tail vertebræ.	Hind foot.	Ear from notch.
164570. Kigoma. Male, adult	.....	480	600	187
164567. Katwe. Male, immature	1,860	530	550	198
164568. Kisingo. Female, adult	1,900	460	548	190
164569. Kisingo. Female, adult	1,970	500	550	196

ALCELAPHUS LELWEL JACKSONI (Thomas).

1892. *Bubalis jacksoni* Thomas, Ann. and Mag. Nat. Hist., ser. 6, vol. 9, p. 386. May. (Country between Victoria Nyanza and Lake Naivasha, British East Africa; type in British Museum.)

1910. *Bubalis jacksoni* Hollister, Smithsonian Misc. Coll., vol. 56, No. 2, p. 2. March 31.

1910. *Bubalis jacksoni* Roosevelt, African Game Trails, Amer. ed., p. 475; London ed., p. 487.

1914. *Bubalis lelwel jacksoni* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 1, p. 402.

Specimens.—Twenty-two, from localities as follows:

British East Africa: Guas Ngishu Boma, 2, including one odd skull (K. Roosevelt); Guas Ngishu Plateau, 3 (Heller, White); Kampiya bibi, Guas Ngishu Plateau, 6 (T. Roosevelt, K. Roosevelt);

[1] Not Gondokoro, as stated in the original description.

Nzoia River, Guas Ngishu Plateau, 9, including five odd skulls (T. Roosevelt, K. Roosevelt); Sirgoit, 30 miles south, 2 (T. Roosevelt).

Writing of this form on the Guas Ngishu Plateau, Colonel Roosevelt says:[1]

> These hartebeests, which are named after their discoverer, Governor Jackson, are totally different from the hartebeests of the Athi and Sotik countries, and are larger and finer in every way. One bull I shot weighed, in pieces, four hundred and seventy pounds. No allowance was made for the spilt blood, and inasmuch as he had been hallalled, I think his live weight would have been nearly four hundred and ninety pounds. He was a big, full-grown bull, but not of extraordinary size; later I killed much bigger ones, unusually fine specimens, which must have weighed well over five hundred pounds. * * * They were the common game of the plains. At times of course they were difficult to approach; but again and again, usually when we were riding, we came upon not only individuals but herds, down wind and in plain view, which permitted us to approach to within a hundred yards before they definitely took flight. Their motions look ungainly until they get into their full speed stride. They utter no sound save the usual hartebeest sneeze.

Two adult males from a point 30 miles south of Sirgoit measured, respectively: Head and body, 1,820, 1,980; tail vertebræ, 590, 600; hind foot, 560, 590; ear from notch, 203, 207.

ALCELAPHUS LELWEL KENIÆ (Heller).

Plate 25.

1913. *Bubalis lelwel kenix* Heller, Smithsonian Misc. Coll., vol. 61, No. 17, p. 3. October 21. (20 miles northeast of Nyeri, near the Meru Road, North Kenia Plateau, British East Africa; type in U. S. National Museum.)

1914. *Bubalis lelwel kenix* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 1, p. 403.

Specimens.—Two, from localities as follows:

British East Africa: Meru Road, 30 miles northeast of Nyeri, 1 (Rainey); Nyuki River, 1 (Rainey).

Heller says that this subspecies of *Alcelaphus lelwel* is confined to the plateau region flanking Mount Kenia on the north and drained by the Northern Guaso Nyiro River. It ranges northward, he believes, to the southwestern slopes of the Loroghi Mountains. The type specimen, an adult male, measured in the flesh as follows: Head and body, 2,000; tail vertebræ, 570; hind foot, 540; ear from notch, 180.

---

[1] African Game Trails, p. 332. 1910.

Measurements of skulls of Alcelaphus.

Form and locality.	No.	Sex.	Condylobasal length.	Zygomatic breadth.	Greatest breadth across orbits.	Mastoid breadth.	Nasal.	Greatest combined breadth of nasals.	Rostral depth at m^3.	Maxillary tooth row.	Mandibular tooth row.	Condition of m^3.
Alcelaphus cokii cokii.												
B. E. A.:												
Taveta	34689	Male	369	120	135	113	204	36.8	92	99.7	.....	Moderately worn.
Do	34690	...do	389	124	137	116	221	32.7	98	96.0	98.2	Do.
Do	34692	Female	390	120	128	114	198	35.2	93	86.5	98.5	Considerably worn.
Alcelaphus cokii sabakiensis.												
B. E. A.:												
Kapiti Plains	161953	Male	368	123	134	117	189	36.7	97	91.4	100.7	Slightly worn.
Do	161962	...do	382	120	134	119	207	36.0	101	83.5	99.9	Considerably worn.
Do	161963	...do	370	116	126	113	200	32.8	96	92.8	91.8	Unworn.
Athi Plains	161949	...do	389	123	129	120	202	33.3	102	99.2	98.5	Moderately worn.
Do	161951	...do	390	121	136	122	208	35.7	100	87.2	96.8	Considerably worn.
Do	161967	...do	395	131	140	119	201	35.2	94	96.5	103.5	Moderately worn.
Do	161970	Female	375	117	128	115	176	27.7	96	89.0	95.8	Do.
Ulukenia Hills	163154	Male	392	126	136	119	197	35.1	89	84.0	.....	Much worn.
Do	163159	...do	361	122	134	116	197	34.3	96	89.9	95.8	Considerably worn.
Do	163163	...do	384	124	137	126	184	32.8	91	86.9	89.4	Do.
Ulu Station	182334	...do	386	121	132	120	188	34.2	98	87.3	93.4	Do.
Nairobi	163153	Female	390	122	133	121	223	36.5	96	86.2	93.2	Moderately worn.
Alcelaphus cokii tanæ.												
B. E. A.: Punda Milia	155430	Male	405	124	140	125	232	36.9	101	86.2	.....	Considerably worn.

Measurements of skulls of Alcelaphus—Continued.

Form and locality.	No.	Sex.	Condylobasal length.	Zygomatic breadth.	Greatest breadth across orbits.	Mastoid breadth.	Nasal.	Greatest combined breadth of nasals.	Rostral depth at m^3.	Maxillary tooth row.	Mandibular tooth row.	Condition of m^3.
Alcelaphus cokii kongoni.												
B. E. A.:												
Suswa Plains	181505	Male	400	125	134	119	208	34.0	99	99.2	.....	Moderately worn.
Do	181837	...do	392	124	132	116	202	33.8	95	96.8	.....	Do.
Lake Naivasha	163152	...do	393	129	140	122	204	34.0	94	98.1	.....	Do.
Southern Guaso Nyiro	182002	...do	401	132	135	125	203	40.7	97	93.7	102.3	Considerably worn.
Do	162997	Female	402	127	136	113	222	31.3	101	94.3	.....	Little worn.
Loita Plains	[1] 162992	Male	402	.....	.....	.....	205	37.1	95	90.2	88.8	Moderately worn.
Do	182413	...do	413	134	148	135	228	35.3	99	94.3	100.3	Considerably worn.
Do	182414	...do	403	125	139	123	226	35.3	94	98.6	105.0	Do.
Telek River	181974	...do	418	133	146	135	225	43.1	101	92.6	101.8	Much worn.
Do	181995	...do	397	127	135	121	215	35.4	101	93.9	99.6	Considerably worn.
Do	181997	...do	393	128	142	120	210	35.8	100	94.4	100.1	Do.
Do	181994	Female	397	128	134	117	214	33.9	94	90.8	92.3	Moderately worn.
Kabalolot Hill	181921	Male	403	126	140	126	206	37.3	91	91.5	102.4	Considerably worn.
Palm Springs	162991	...do	.....	119	134	121	175	35.1	94	91.6	101.8	Moderately worn.
Alcelaphus cokii nakuræ.												
B. E. A.:												
Nakuru	[1] 163130	Male	402	127	135	115	230	35.4	93	95.3	102.3	Slightly worn.
Do	163144	...do	409	127	135	123	197	37.3	101	88.3	102.5	Moderately worn.
Do	163145	Female	389	127	131	114	198	32.9	95	102.3	101.1	Little worn.
Alcelaphus lelwel lelwel.												
Lado:												
Rejaf	164791	Male	416	128	138	122	233	34.5	104	98.1	102.0	Moderately worn.
Rhino Camp	164703	...do	438	131	143	128	236	38.7	99	92.7	98.8	Considerably worn.
Do	164705	Female	397	126	133	116	224	31.5	99	100.0	105.0	Moderately worn.

Alcelaphus lelwel roosevelti.												
Uganda:												
Gondokoro	164807	Male	423	125	138	120	226	38.0	102	98.8	104.0	Moderately worn.
Do	164809	...do	448	131	131	127	243	36.4	103	99.7	.....	Do.
Do	164792	Female	415	130	135	113	210	37.3	102	102.5	.....	Much worn.
Do	164808	...do	419	128	134	118	223	36.4	101	95.6	.....	Do.
Nimule	164733	Male	403	124	131	117	235	39.7	99	96.3	102.3	Moderately worn.
Do	[1]164734	...do	427	126	130	120	234	31.8	102	104.0	111.0	Do.
Alcelaphus lewlel insignis.												
Uganda:												
Kigoma	164570	Male	435	138	139	127	241	38.7	119	83.3	83.0	Much worn.
Katwe	164567	...do	419	130	135	119	230	30.4	111	105.0	113.0	Unworn; not entirely erupted.
Kisingo	164568	Female	405	130	131	113	233	31.8	104	99.4	102.4	Moderately worn.
Do	164569	...do	415	132	135	118	210	34.8	102	89.1	91.8	Do.
Alcelaphus lelwel jacksoni.												
B. E. A.:												
Guas Ngishu Plateau	155431	Male	420	136	133	128	211	37.2	103	98.4	.....	Moderately worn.
Do	163134	...do	419	131	138	125	223	41.1	97	98.0	95.8	Considerably worn.
Do	163135	...do	418	132	128	125	233	36.5	101	98.2	.....	Moderately worn.
Do	163136	...do	435	133	132	131	235	35.8	113	102.1	108.0	Considerably worn.
Do	163141	...do	416	131	138	123	212	38.0	100	93.8	99.7	Moderately worn.
Do	163137	Female	395	121	133	113	207	.....	97	94.8	95.8	Considerably worn.
Do	163138	...do	407	122	130	112	210	36.8	100	95.1	100.8	Moderately worn.
Do	163149	...do	390	134	133	112	204	32.3	95	97.9	101.8	Do.
Guas Ngishu Boma	163143	Male	400	135	129	124	221	43.2	102	98.4	100.2	Do.
Sirgolt	163146	...do	417	132	137	128	231	35.8	113	98.8	104.0	Do.
Do	163147	...do	424	139	146	131	221	35.8	100	99.7	104.2	Do.
Alcelaphus lelwel keniæ.												
B. E. A.:												
Nyuki River	182215	Male	385	129	132	122	193	29.8	96	102.4	111.0	Not fully erupted.
Meru Road	[1]182009	...do	430	136	140	128	223	42.7	115	99.1	104.0	Moderately worn.

[1] Type.

One form of the *lelwel* group described from within the limits of this report is not represented in the museum collections. This is *Alcelaphus lelwel niediecki* (Neumann),[1] from Gelo, source of the Sobat, Abyssinia. Mr. Heller examined the type in the Berlin Museum and made the following notes:

Bubalis niediecki Neumann. Type, ♂ A 155,06; Gelo; skin perfect, raw; skull perfect. Color tawny rufous, underparts ochraceous; feet without black about hoofs head also without black except on extreme tip of chin. Skull adult, but teeth little worn. Condylo-premaxillary length, 405; zygomatic breadth, 130; nasals, 224×41; orbital length, 59, height, 48; upper tooth row, 97; greatest spread of horns, 250; spread at tips, 168. Horn points parallel at tip.

Genus DAMALISCUS Sclater and Thomas.

1894. *Damaliscus* Sclater and Thomas, Book of Antelopes, vol. 1, p. 51. August. (*D. pygargus.*)

The topi is well represented in the collection by specimens from the Sotik and from the Guas Ngishu Plateau. There are no specimens from near the type localities of three forms described in 1914 by Blaine:[2] *Damaliscus korrigum topi* from the coastal region of British East Africa between the Juba and Sabaki Rivers; *Damaliscus korrigum ugandæ* from southwestern Ankole, Uganda; and *Damaliscus korrigum eurus* from the plains of the upper Ruaha River, German East Africa. A closely related species, *Damaliscus tiang* (Heuglin), of Sudan, together with its described geographical races, is also unrepresented in the collection. It is possible that the tiang and the topi are only subspecifically distinct.

For measurements of specimens see page 75.

DAMALISCUS JIMELA (Matschie).

1892. *Damalis jimela* Matschie, Sitz.-ber. Ges. nat. Freunde Berlin, p. 135. (Rowana Plains, near Muansa, southeastern shore of Victoria Nyanza, German East Africa; type in Berlin Museum.)

1907. *Damaliscus corrigum selousi* Lydekker, Field, vol. 110, No. 2850, p. 250. August 10. (Near Londiani, Mau Escarpment, British East Africa; type in British Museum.)

1910. *Damaliscus corrigum jimela* Roosevelt, African Game Trails, Amer. ed., p. 475; London ed., p. 487.

1910. *Damaliscus phalius* Cabrera, Proc. Zool. Soc. London, p. 998. December. (Guas Ngishu Plateau, British East Africa; type in collection of Mr. Ricardo de la Huerta, a Spanish sportsman.)

1914. *Damaliscus korrigum jimela* [3] Roosevelt and Heller, Life-Hist. African Game Anim., vol. 1, p. 351. (Part.)

Specimens.—Fifty-two, from localities as follows:

British East Africa: Amala River, 1 skull (Rainey); Guas Ngishu Plateau, 5, including four odd skulls (Stephenson, White,

[1] *Bubalis niediecki* Neumann, Sitz.-ber. Ges. nat. Freunde Berlin, 1905, p. 95.

[2] Ann. and Mag. Nat. Hist., ser. 8, vol. 13, pp. 330–335. March, 1914.

[3] "*jemala*" on legend to map, p. 357.

Measurements of specimens of Damaliscus jimela.

Locality.	No.	Sex.	Head and body.	Tail vertebræ.	Hind foot.	Skull: Condylobasal length.	Occipitonasal length.	Palatal length.	Zygomatic breadth.	Greatest breadth over orbits.	Least interorbital breadth.	Greatest length of nasal.	Combined width of nasals.	Maxillary tooth row.	Condition of m^3.
G. E. A.: Ikoma	200856	Male				369	326	208	127	142	88	160	33	93.9	Moderately worn.
B. E. A:															
Kabalolot Hill	181907	...do	1,770	480	505	396	348	217	143	154	95	176	33	93.9	Much worn.
Do	181938	...do	1,670	540	425	387	336	216	133	151	98	162	38	88.5	Considerably worn.
Do	181931	Female	1,560	480	470	359	303	202	124	140	89	145	30	87.0	Moderately worn.
Palm Springs	181874	Male	1,740	470	510	400	352	223	132	153	103	182	36	86.8	Do.
Telek River	181913	...do				403	346	226	130	146	94	179	40	96.2	Do.
Southern Guaso Nyiro	162999	...do	1,706	490	550	383	334	216	130	147	101	172	37	93.9	Do.
Do	163002	...do		530	525	394	344	222	132	150	96	179	36	93.9	Do.
Do	163006	...do				363	312	202	122	142	91	153	34	92.5	Do.
Do	163007	...do				402	350	227	138	153	102	177	40	95.3	Do.
Do	163008	...do	1,700	475	490	376	328	208	127	148	94	176	34	92.9	Slightly worn.
Do	163001	Female	1,600	480	470	356	307	202	121	134	81	157	29	97.5	Unworn.
Do	163004	...do		500	495	367	316	209	126	140	88	164	33	93.5	Considerably worn.
Guas Ngishu Plateau	163172	Male				399	333	221	134	146	95	184	35	98.4	Do.
Do	173012	...do				395	334	214	136	148	102	167	31	96.7	Do.
Do	199074	...do				381	315	208	128	141	99	154	29	97.8	Slightly worn.
Do	199075	...do				390	334	217	136	142	104	175	35	99.8	Considerably worn.
Do	163168	Female				360	299	205	124	132	85	147	29	92.5	Moderately worn.
Do	163170	...do				365	301	205	122	132	86	147	30	89.9	Do.

K. Roosevelt); Kabalolot Hill, 11, including five odd skulls (Rainey); Loita Plains, 9, including three odd skulls (Rainey, Johnston, Loring, Folsom); Nzoia River, Guas Ngishu Plateau, 4, including one odd skull (T. Roosevelt, K. Roosevelt); Palm Springs, Loita Plains, 1 (Rainey); Sigaa, 1 (Draper); Southern Guaso Nyiro, 14, five with skeletons (T. Roosevelt, K. Roosevelt, Mearns, Loring); Telek River, 5, including two odd skulls (Rainey).

German East Africa: Southeast of Ikoma, 1 (E. Clark).

Specimens from the Guas Ngishu Plateau and the Sotik, British East Africa, and from northern German East Africa appear to be subspecifically indistinguishable. Specimens with whitish face markings occasionally are found anywhere within the range of the species.

Heller examined the type-specimen of *Damalis jimela* Matschie in the Berlin Museum. His manuscript notes state that Matschie considers No. 8698, a frontlet with horns, as the type. The original account of the coloration of the species, somewhat erroneous, was based on a painting by Böhm of a specimen from central German East Africa.

The weight of one female specimen from the Southern Guaso Nyiro is recorded in the field catalogue as 260 pounds.

Genus CONNOCHÆTES Lichtenstein.

1814. *Connochaetes* Lichtenstein, Mag. Ges. nat. Freunde Berlin, vol. 6, p. 152. (*C. gnou.*)
1816. *Cemas* Oken, Lehrb. Naturg., vol. 3, pt. 2, p. 727. (*C. gnou.*)
1821. *Catablepas* Gray, London Med. Repos., vol. 15, p. 307. April 1. (*C. gnou.*)
1850. *Gorgon* Gray, Knowsley Menag., p. 20. (*C. taurinus.*)
1872. *Butragus* Gray, Cat. Rum. Mamm. Brit. Mus., p. 43. (*C. taurinus.*)
1912. *Gorgon* Heller, Smithsonian Misc. Coll., vol. 60, No. 8, p. 3. November 2.
1913. *Connochaetus* Zukowsky, Archiv Nat., Jahrg. 79, Abt. A, Heft 12, p. 76. (pro *Connochætes.*)
1914. *Gorgon* Lyon, Proc. Biol. Soc. Washington, vol. 27, p. 229. December 29.
1915. *Connochætes* Thomas, Proc. Biol. Soc. Washington, vol. 28, p. 69. March 12.

Specimens from the type regions of the following-named races of the wildebeest are not contained in the National Museum collections: *Connochoetes* [sic] *hecki* Neumann,[1] described as inhabiting Kibaya, German East Africa, from Ugogo, Irangi, and Gurui north to Manjara Lake and Kilimanjaro; *Connochaetes johnstoni rufijianus* de Beaux,[2] based on a living animal in the possession of Carl Hagenbeck, supposed to have been captured in the Rufiji Valley, German East Africa; *Connochaetus albojubatus lorenzi* Zukowsky;[3] and *Conno-*

[1] Sitz.-ber. Ges. nat. Freunde Berlin, 1905, p. 96. Mareh, 1905.
[2] Zool. Anz., vol. 38, p. 579. October 16, 1911.
[3] Archiv Nat., Jahrg. 79, Abt. A, Heft 12, p. 81. 1913.

chaetus albojubatus schulzi Zukowsky,[1] the last two also based on living animals in the Hagenbeck animal park, and both from the Ngorongoro Basin, German East Africa.

CONNOCHÆTES ALBOJUBATUS ALBOJUBATUS Thomas.

1892. *Connochætes taurinus albojubatus* Thomas, Ann. and Mag. Nat. Hist., ser. 6, vol. 9, p. 388. May. (Athi Plains,[2] British East Africa; type in British Museum.)

1892. *Connochætes taurinus albojubatus* True, Proc. U. S. Nat. Mus., vol. 15, p. 470. October 26.

1910. *Connochætes taurinus albojubatus* Hollister, Smithsonian Misc. Coll., vol. 56, No. 2, p. 3. March 31.

1910. *Connochætes albojubatus* Roosevelt, African Game Trails, Amer. ed., p. 475; London ed., p. 487. (Part.)

1913. *Gorgon albojubatus* Heller, Smithsonian Misc. Coll., vol. 61, No. 17, p. 1. October 21.

1914. *Gorgon albojubatus albojubatus* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 1, p. 369.

Specimens.—Seven, from localities as follows:

British East Africa: Athi Plains, 1 (Rainsford); Kamiti Farm, 1 (K. Roosevelt); Kapiti Plains, 4, one with skeleton (T. Roosevelt, Cuninghame); Taveta, 1 (Abbott).

An adult male of this form, from Kamiti Farm, measured in the flesh as follows: Head and body, 1,950 millimeters; tail vertebræ, 600; hind foot, 560; ear, 220.

CONNOCHÆTES ALBOJUBATUS MEARNSI (Heller).

Plates 26, 27.

1910. *Connochætes albojubatus* Roosevelt, African Game Trails, Amer. ed., p. 475; London ed., p. 487. (Part.)

1913. *Gorgon albojubatus mearnsi* Heller, Smithsonian Misc. Coll., vol. 61, No. 17, p. 1. October 21. (Loita Plains, British East Africa; type in U. S. National Museum.)

1913. *Connochaetus albojubatus henrici* Zukowsky, Archiv. Naturg., Jahrg. 79, Abt. A., Heft 12, p. 83. (Seringeti Steppes, German East Africa; type in Nat. Hist. Mus., Geneva, Switzerland.)

1914. *Gorgon albojubatus mearnsi* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 1, p. 370.

Specimens.—Twenty-three, from localities as follows:

British East Africa: Agate's, 3, one with skeleton (Rainey, Mearns); Everego, 2 (Draper); Kabalolot Hill, 2 (Rainey); Loita Plains, 2 (Rainey, Mearns); Southern Guaso Nyiro, 10, including three with skeletons and three odd skulls (Mearns, T. Roosevelt, Loring).

---

[1] Archiv Nat., Jahrg. 79, Abt. A, Heft 12, p. 83. 1913.

[2] Erroneously stated as "Uganda" in original description; see Sclater and Thomas, Book of Antelopes, vol. 1, p. 106. 1894.

German East Africa: Ikoma, southeast of, 1 (E. Clark); Mbalageti River, head of, at western edge of Serengeti Plains, 1 skull (E. Clark); Seregeti Plains, 2 skulls (E. Clark).

The flesh measurements of an adult male from the Loita Plains were as follows: Head and body, 2,000 millimeters; tail vertebræ, 645; hind foot, 515; ear, 200.

Writing of this animal in the Southern Guaso Nyiro, Colonel Roosevelt has said:[1]

Wildebeest are the oddest in nature and conduct, and in many ways the most interesting, of all antelopes. There is in their temper something queer, fiery, eccentric, and their actions are abrupt and violent. A single bull will stand motionless with head raised to stare at an intruder until the latter is quarter of a mile off; then down goes his head, his tail is lashed up and around, and off he gallops, plunging, kicking, and shaking his head. He may go straight away, he may circle round, or even approach nearer to, the intruder; and then he halts again to stare motionless, and perhaps to utter his grunt of alarm and defiance. A herd when approached, after fixed staring will move off, perhaps at a canter. Soon the leaders make a half wheel, and lead their followers in a semicircle; suddenly a couple of old bulls leave the rest, and at a tearing gallop describe a semicircle in exactly the opposite direction, racing by their comrades as these canter the other way. With one accord the whole troop may then halt and stare again at the object they suspect; then off they all go at a headlong run, kicking and bucking, tearing at full speed in one direction, then suddenly wheeling in semicircles so abrupt as to be almost zigzags, the dust flying in clouds; and two bulls may suddenly drop to their knees and for a moment or two fight furiously in their own peculiar fashion.

Genus CEPHALOPHUS Smith.

1827. *Cephalophus* Hamilton Smith, Griffith's Cuvier's Anim. Kingd., vol. 5, p. 344. (*C. sylvicultrix.*)
1840. *Philantomba* Blyth, Cuvier's Anim. Kingd., p. 140. (*C. maxwelli.*)
1842. *Cephalophora* Gray, Ann. Nat. Hist., vol. 10, p. 266. December. (pro *Cephalophus.*)
1843. *Cephalophorus* Gray, List Spec. Mamm. British Mus., p. xxvi. (pro *Cephalophus.*)
1844. *Cephalolophus* Wagner, Schreber's Säugth., Suppl., vol. 4, p. 445. (pro *Cephalophus.*)
1846. *Cephalopus* Sundevall, Svenska Ak. Handl., 1844, p. 189. (pro *Cephalophus.*)
1852. *Guevei* Gray, Cat. Mamm. British Mus., Ungulata, p. 86. (*C. maxwelli.*)

Two groups of duikers, that may well be recognized as subgenera, are represented in the collection. The typical forest duikers (subgenus *Cephalophus*) include the reddish forms, *johnstoni*, *ignifer*, and *harveyi*, and the larger, darker colored *spadix*. The smaller blue duikers, *æquatorialis* and *musculoides*, belong in the subgenus *Philantomba*.

For measurement of specimens see page 81.

[1] African Game Trails, pp. 180–181. 1910.

CEPHALOPHUS SPADIX True.

Plate 28.

1890. *Cephalophus spadix* True, Proc. U. S. Nat. Mus., vol. 13, p. 227. September 16. (High altitude on Mount Kilimanjaro, German East Africa; type in U. S. National Museum.)

1892. *Cephalophus spadix* True, Proc. U. S. Nat. Mus., vol. 15, p. 473. October 26.

1892. *Cephalolophus spadix* Thomas, Proc. Zool. Soc. London, p. 418.

1895. *Cephalophus spadix* Sclater and Thomas, Book of Antel., vol. 1, p. 135.

1909. *Cephalophus spadix* Lyon and Osgood, Bull. 62, U. S. Nat. Mus., p. 11. January 28.

1914. *Cephalophus spadix* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 2, p. 532.

Specimen.—One, the type from—

German East Africa: Mount Kilimanjaro, at a high altitude, 1 (Abbott).

This specimen, which had been on exhibition since 1892, was dismounted and placed among the types in November, 1912.

CEPHALOPHUS JOHNSTONI Thomas.

1901. *Cephalophus johnstoni* Thomas, Proc. Zool. Soc. London, vol. 2, p. 89. May 7. (Toro, Uganda; type in British Museum.)

1914. *Cephalophus natalensis johnstoni* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 2, p. 531.

Specimens.—Two skulls with head skins, as follows:

Uganda: Kampala, 2 (T. Roosevelt).

CEPHALOPHUS IGNIFER Thomas.

1903. *Cephalophus ignifer* Thomas, Proc. Zool. Soc. London, vol. 1, p. 226. August 6. (Eldoma Ravine, British East Africa, 7,200 feet; type in British Museum.)

1910. *Cephalophus ignifer* Roosevelt, African Game Trails, Amer. ed., p. 475; London ed., p. 487.

1912. *Cephalophus harveyi kenix* Lönnberg, Ann. and Mag. Nat. Hist., ser. 8, vol. 9, p. 65. January. (Forests near Nairobi, British East Africa; type in Zoological Mus., Stockholm.)

1914. *Cephalophus natalensis ignifer* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 2, p. 530.

Specimens.—Three, from localities as follows:

British East Africa: Eldoma Ravine, 1 skeleton (K. Roosevelt); Dagoreti, 1 (Klein); Ngong Hill, Nairobi, 1 (Klein).

The three East African "red duikers," *johnstoni*, *ignifer*, and *harveyi*, are listed by Roosevelt and Heller in the Life-Histories of African Game Animals as subspecies of *Cephalophus natalensis* of South Africa. Until the entire genus is carefully monographed there seems little to be gained in arbitrarily assigning these local forms as races of one of the older described species, with which actual intergradation is doubtful. The red duikers are apparently not generally

distributed and just what forms are really connected by series of intergrades remains to be worked out when better series of specimens are available for study.

CEPHALOPHUS HARVEYI (Thomas).

1892. *Cephalophus nigrifrons* True, Proc. U. S. Nat. Mus., vol. 15, p. 476. October 26. (Specimen from Taveta; not of Gray.)
1893. *Cephalolophus harveyi* Thomas, Ann. and Mag. Nat. Hist., ser. 6, vol. 11, p. 48. January. (Kahe Forest, south slope of Mount Kilimanjaro, German East Africa; type in British Museum.)
1914. *Cephalophus natalensis harveyi* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 2, p. 530.

Specimen.—One, as follows:

British East Africa: Taveta, 1 (Abbott).

The skin of this specimen is mounted in the exhibition hall; the skull is in the study collection.

No specimens from the type localities of the following named forms of the subgenus *Cephalophus* are in the collection: *Cephalophus rubidus* Thomas,[1] from Ruwenzori, considered by Heller as doubtless synonymous with *Cephalophus johnstoni*[2]; *Cephalophus emini* Noack,[3] described from a skin, without head and neck, received from Bukoba, German East Africa, but probably originally from further west, perhaps in Mannyema District; *Cephalophus adersi* Thomas,[4] from Zanzibar; and *Cephalophus barbertoni* Kershaw,[5] from Mount Elgon.

CEPHALOPHUS MONTICOLA MUSCULOIDES Heller.

Plate 29.

1913. *Cephalophus monticola musculoides* Heller, Smithsonian Misc. Coll., vol. 61, No. 7, p. 9. July 31. (Kakumega Forest, British East Africa; type in U. S. National Museum.)
1914. *Cephalophus monticola musculoides* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 2, p. 535.

Specimens.—Eight, as follows:

British East Africa: Kakumega, 8, including five flat hunters' skins (Heller).

CEPHALOPHUS MONTICOLA ÆQUATORIALIS (Matschie).

1892. *Cephalolophus æquatorialis* Matschie, Sitz.-ber. Ges. nat. Freunde Berlin, p. 112. (Chagwe, Uganda; type in Berlin Museum.)
1914. *Cephalophus monticola æquatorialis* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 2, p. 534.

Specimen.—One, as follows:

Uganda: Kampala, 1 (Heller).

[1] Proc. Zool. Soc. London, 1901, p. 89. May 7, 1901.
[2] Roosevelt and Heller, Life-Hist. African Game Anim., vol. 2, p. 532. 1914.
[3] Zool. Anz., vol. 27, p. 405. March 22, 1904.
[4] Ann. and Mag. Nat. Hist., ser. 9, vol. 2, p. 151. August, 1918.
[5] Ann. and Mag. Nat. Hist., ser. 9, vol. 11, p. 596. May, 1923.

Measurements of specimens of Cephalophus.

Form and locality.	No.	Sex.	Head and body.	Ear.	Skull: Greatest length.	Condylobasal length.	Palatal length.	Zygomatic breadth.	Greatest length of nasal.	Interorbital breadth.	Length of mandible.	Maxillary tooth row.	Mandibular tooth row.	Observations.
Cephalophus spadix.														
G. E. A.: Mt. Kilimanjaro	[1] 34707	Male	[2] 965	108	235	216	120	103	95.4	58.5	177	66.9	72.7	m^3 moderately worn.
Cephalophus johnstoni.														
Uganda: Kampala	164552	Male			185	173	100	84	79.2	44.2		54.1		m^3 moderately worn.
Do	164553	Female			185	174	100	85	78.6	41.4		53.5		m^3 not in place.
Cephalophus ignifer.														
B. E. A.:														
Eldoma Ravine	164843	Male						80	71.8	42.4	138			m^3 not in place.
Dagoreti	184234	Female			173	168	92	74	66.3	38.9		50.4		m^3 little worn.
Ngong Hill, Nairobi	182399	...do			176	168	89	73	66.3	36.6	136	52.1	56.2	Do.
Cephalophus harveyi.														
B. E. A.: Taveta	34708	Male	[3] 856		180	168	94	80	58.7	47.6	138	50.2	54.8	m^3 considerably worn.
Cephalophus monticola musculoides.														
B. E. A.: Kakumega	[1] 182388	Male			120	112	56	55	39.3	30.2	93	33.9	37.7	m^3 moderately worn.
Do	182394	...do			112	101	53	50	34.1		81			m^3 not in place.
Do	182387	Female			119	109	59	53	36.9	27.3	87	34.0	36.8	m^3 moderately worn.
Cephalophus monticola æquatorialis.														
Uganda: Kampala	164554	Male			112	103	54	49	37.3	27.8	86	33.5	34.8	m^3 moderately worn.

[1] Type.
[2] Measurements of head and body and of ear from dry skin (from True, Proc. U. S. Nat. Mus., vol. 13, p. 288. 1890).
[3] From mounted specimen (True, Proc. U. S. Nat. Mus., vol. 15, p. 476. 1892).

The following manuscript notes on the type-specimen of this species were made by Heller in Berlin:

Cephalolophus aequatorialis Matschie. Type, A 5579, male; Chagwe, Uganda. Skin flat, raw; skull perfect. Dorsal color walnut or chocolate; sides ecru drab. Skull old, molars worn. Greatest length of skull, 118; condylo-incisive length, 108; zygomatic width, 52.5; nasals, 40×40; length of orbit, 26; height of orbit, 24; premaxillary length, 32; diastema, 36; upper tooth row, 34.5; length of mandible, 89.

In addition to these two subspecies of *monticola*, three other forms of the subgenus *Philantomba* have been described from the regions covered by this report, as follows: *Cephalophus pygmæus sundevalli* Fitzinger,[1] from Eastern Africa (coast opposite Zanzibar Island?); *Cephalophus lugens* Thomas,[2] from Urori, Usangu, German East Africa; and *Cephalophus schusteri* Matschie,[3] from Uluguru Mountains, Morogoro, German East Africa.

Genus SYLVICAPRA Ogilby.

1837. *Sylvicapra* Ogilby, Proc. Zool. Soc. London, 1836, p. 138. June 27. (*S. grimmia.*)

Names proposed for bush duikers from localities within the scope of this report, and from which we have no specimens, are as follows: *Antilope madoqua* Rüppell,[4] from Abyssinia; *Cephalolophus abyssinicus* Thomas,[5] proposed as a substitute name for *Antilope madoqua* Rüppell on the grounds that this name is preoccupied by the *Antilope madoka* of Hamilton Smith, 1827; *Cephalophus grimmia lutea* Dollman,[6] from Mount Maroto, northeast Karomojo, Central Province, Uganda; and *Sylvicapra grimmia lobeliarum* Lönnberg,[7] from high up on Mount Elgon, Uganda.

SYLVICAPRA GRIMMIA DESERTI Heller.

Plate 30.

1913. *Sylvicapra grimmia deserti* Heller, Smithsonian Misc. Coll., vol. 61, No. 17, p. 4. October 21. (Voi, British East Africa; type in U. S. National Museum.)

1914. *Sylvicapra grimmia deserti* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 2, p. 544.

Specimens.—Five, from the following localities:

British East Africa: Maji-ya-chumvi, 1 (Heller); Mariakani, 1 (Heller); Voi, 3 (Heller).

For measurements of specimens of this and other forms of *Sylvicapra* see pages 84–85.

[1] Sitz.-ber. K. Akad. Wiss. Wien, vol. 59, pt. 1, p. 166. 1869.
[2] Proc. Zool. Soc. London, p. 393. 1898.
[3] Sitz.-ber. Ges. nat. Freunde Berlin, p. 352. July, 1914.
[4] Neue Wirb. Abyss., Säug., p. 22. 1835.
[5] Proc. Zool. Soc. London, 1892, p. 427.
[6] Abstr. Proc. Zool. Soc. London, 1914, p. 26. April 14, 1914.
[7] Revue Zool. Africaine, vol. 7, p. 181. 1919.

SYLVICAPRA GRIMMIA HINDEI (Wroughton).

1910. *Cephalophus abyssinicus hindei* Wroughton, Ann. and Mag. Nat. Hist., ser. 8, vol. 5, p. 273. March. (Fort Hall, British East Africa; type in British Museum.)

1910. *Cephalophus abyssinicus hindei* Roosevelt, African Game Trails, Amer. ed., p. 475; London ed., p. 487. (Part.)

1914. *Sylvicapra grimmia hindei* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 2, p. 544.

Specimens.—Eleven, from localities as follows:

British East Africa: Bondoni, Kapiti Plains, 1 (Pease); Isiola River, 1 (T. Roosevelt); Kasorongai River, 3, including one large fetus in alcohol (Mearns, Loring); Machakos Road Station, 1 (K. Roosevelt); Ngong Hill, Nairobi, 1 (Klein); Potha, Kapiti Plains, 1 (Loring); Southern Guaso Nyiro, 1 (Heller); Wambugu, 1 (Mearns); "British East Africa," 1 flat skin (Heller).

The specimen from Potha is mounted and on exhibition.

I am not at all satisfied, from a study of this material, that only a single form is included among the duikers here listed under *Sylvicapra grimmia hindei*. There are unaccountable variations in size and in minor skull characters between specimens from Mount Kenia and the Northern Guaso Nyiro and those from farther south, but the material is entirely inadequate and many of the specimens are not sufficiently comparable as to age for conclusive results.

SYLVICAPRA GRIMMIA ALTIVALLIS Heller.

Plates 30, 31.

1910. *Cephalophus abyssinicus hindei* Roosevelt, African Game Trails, Amer. ed., p. 475; London ed., p. 487. (Part.)

1912. *Sylvicapra grimmi altivallis* Heller, Smithsonian Misc. Coll., vol. 60, No. 8, p. 10. November 2. (Summit of Aberdare Range near Kinanagop Peak, 10,500 feet, British East Africa; type in U. S. National Museum.)

1914. *Sylvicapra grimmia altivallis* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 2, p. 542.

Specimens.—Four, as follows:

British East Africa: Aberdare Mountains, 4 (Rainey, T. Roosevelt).

SYLVICAPRA GRIMMIA NYANSÆ Neumann.

1905. *Sylvicapra abyssinica nyansae* Neumann, Sitz.-ber. Ges. nat. Freunde Berlin, p. 89. March. (Kwa Kitoto, Kavirondo, British East Africa; type in Berlin Museum.)

1910. *Cephalophus abyssinicus nyansæ* Roosevelt, African Game Trails, Amer. ed., p. 475; London ed., p. 487.

1914. *Sylvicapra grimmia nyansæ* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 2, p. 541.

Specimens.—Three, from localities as follows:

British East Africa: Eldoma Ravine, 1 (T. Roosevelt); Guas Ngishu Boma, Guas Ngishu Plateau, 1 (K. Roosevelt); "British East Africa," probably Guas Ngishu Plateau, 1 (White).

Measurements of specimens of Sylvicapra.

Form and locality.	No.	Sex.	Head and body.	Tail vertebræ.	Hind foot.	Ear.	Skull: Greatest length.	Condylobasal length.	Palatal length.	Zygomatic breadth.	Greatest length of nasal.	Greatest breadth of nasals.	Length of mandible.	Maxillary tooth row.	Mandibular tooth row.	Condition of m^3.
Sylvicapra grimmia deserti.																
B. E. A.:																
Voi	[1]182219	Male	810	110	260	105	168	156	81	70	62	30	127	51.0	54.3	Little worn.
Do	182223	Female	820	.....	260	120	171	158	83	72	55	30	130	49.8	53.8	Moderately worn.
Mariakani	182291	...do	880	110	265	105	164	154	80	73	54	27	125	48.0	52.0	Considerably worn.
Maji-ya-chumvi	182262	...do	840	110	255	106	167	155	81	75	57	31	128	46.6	52.9	Moderately worn.
Sylvicapra grimmia hindei.																
B. E. A.:																
Ngong Hill, Nairobi	182400	Male	.....	.....	.....	.....	158	148	76	72	57	29	118	45.8	48.7	Little worn.
Potha, Kapiti Plains	161977	...do	800	100	253	103	164	152	75	73	53	28	123	47.2	52.3	Moderately worn.
Machakos Road	161979	Female	910	110	285	130	167	154	79	73	.....	28	123	50.0	54.2	Little worn.
Kasorongai River	163255	...do	970	155	260	108	171	158	81	76	53	30	128	48.5	54.2	Moderately worn.
Do	163259	...do	902	135	287	.....	174	162	86	75	56	31	133	49.5	54.8	Considerably worn.
Sylvicapra grimmia altivallis.																
B. E. A.:																
Aberdare Mountains	182187	Male	820	100	270	100	166	157	82	75	55	28	126	50.5	55.8	Unworn.
Do	182189	...do	870	105	265	105	157	145	72	74	50	28	120	48.3	52.9	Do.
Do	[1]164746	Female	940	110	270	109	168	159	80	77	58	31	130	48.7	49.7	Considerably worn.
Do	182188	...do	930	105	270	107	166	156	82	77	53	27	127	44.8	47.8	Do.
Sylvicapra grimmia nyansæ.																
B. E. A.: Guas Nglshu Boma.	164615	Female	960	110	260	97	170	157	81	74	63	29	.....	44.6	.....	Much worn.

Sylvicapra grimmia roosevelti.																
Lado: Rhino Camp	[1] 164664	Male					156	144	73	67	56	30	118	48.8	53.3	Not completely erupted.
Uganda: Butiaba	164663	...do	800	125	227	91	162	150	73	69	53	27	116	48.8	52.3	Do.

[1] Type.

The following manuscript notes on the type-specimen of this form were made by Heller in Berlin:

Sylvicapra abyssinica nyansae Neumann. Type, A 5590, ♂, Kwa Kitoto, Kavirondo; flat, raw skin (marked type by Neumann). Skull represented by top of cranium and horns only. Color light buffy drab, medially black lined; feet chocolate brown, not blackish. Color closest to Nile specimens but less bright.

SYLVICAPRA GRIMMIA ROOSEVELTI Heller.

Plate 32.

1912. *Sylvicapra grimmi roosevelti* Heller, Smithsonian Misc. Coll., vol. 60, No. 8, p. 9. November 2. (Rhino Camp, Lado Enclave; type in U. S. National Museum.)

1914. *Sylvicapra grimmia roosevelti* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 2, p. 539.

Specimens.—Four, from localities as follows:

Lado: Rhino Camp, 2 (T. Roosevelt, Cuninghame).

Uganda: Butiaba, 1 (K. Roosevelt); Upper Nile, 1 skull (Davidson).

Genus OREOTRAGUS Smith.

1834. *Oreotragus* A. Smith, "South African Quart. Journ., vol. 2, p. 212." (*O. oreotragus.*)

1841. *Oritragus* Gloger, Naturgesch., vol. 1, p. xxxiii. (*O. oreotragus.*)

One form of the klipspringer known from Abyssinia is not represented in the Museum collection. This is *Oreotragus oreotragus saltatrixoides* (Wagner), 1855 (*Calotragus saltatrixoides* Temminck, Equiss. Zool. Côte de Guiné, part 1, Mamm., p. 191, *nomen nudum; A[ntilope] saltatrixoides* Rüpp., Wagner, Schreber's Säug., suppl., vol. 5, p. 412, 1855).

For measurements of specimens of *Oreotragus* see page 88.

OREOTRAGUS OREOTRAGUS SCHILLINGSI Neumann.

1902. *Oreotragus schillingsi* Neumann, Sitz.-ber. Ges. nat. Freunde Berlin, p. 172, November. (Dönje Ngaptuk, northwest of Mount Kilimanjaro, German East Africa; type in Berlin Museum.)

1910. *Oreotragus oreotragus schillingsi* Hollister, Smithsonian Misc. Coll., vol. 56, No. 2, p. 3. March 31. (Part; specimen from Elmenteita.)

1910. *Oreotragus schillingsi* Roosevelt, African Game Trails, Amer. ed., p. 475; London ed., p. 487.

1910. *Oreotragus oreotragus* Loring, in Roosevelt, African Game Trails, Appendix C., Amer. ed., p. 484; London ed., p. 495.

1914. *Oreotragus oreotragus schillingsi* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 2, p. 576.

Specimens.—Twenty, from localities as follows:

British East Africa: Deep Dale, Sotik Road, 2 (Rainey); Kapiti Plains, 1 skull (Loring); Lime Springs, Sotik, 1 (K. Roosevelt); Nairobi, 2 skulls (Mearns); Narossura River, 1 skull (Folsom); Njoro Osolali, Sotik, 2, including one odd skull (K. Roosevelt);

Sotik, 2 (Draper); Ulukenia Hills, 3, including one odd skull (Loring, Rainey).

German East Africa: Near head of Sironera River, western edge of Serengeti Plains, 6 (Clark, Lindsay).

The series of specimens from Serengeti Plains, German East Africa, includes two skins and four skulls. Two of the skulls unquestionably belong with the skins, but as they are not matched each specimen has been given a separate number in the museum catalogue. Mr. Elton Clark records the weights of two females collected by himself at this locality as 24 and 29 pounds.

The Sergenti Plains skins differ somewhat in color from the average run of skins of *schillingsi* from British East African localities, and approach closely in this regard specimens of *Oreotragus oreotragus aceratos* [1] collected near Beira, Portuguese East Africa. The females from Serengeti Plains, however, have well-developed horns like *schillingsi*, and may be intermediates, connecting these two subspecies in general characters.

Heller made the following manuscript notes on the type specimen in Berlin:

Oreotragus schillingsi Neumann. Type, A 11, 06 (specimen not marked type). Nayaputuk. O. Schillings. Skin flat, raw, hair rubbed and worn on flanks. Skull perfect but uncleaned; adult, the molars worn: unsexed. Condylo-incisive length, 138; zygomatic breadth, 80; upper tooth row, 57; length of mandible, 122.

OREOTRAGUS OREOTRAGUS AUREUS Heller.

Plate 33.

1910. *Oreotragus oreotragus schillingsi* Hollister, Smithsonian Misc. Coll., vol. 56, No. 2, p. 3. March 31. (Part: specimens from Laikipia.)

1913. *Oreotragus oreotragus aureus* Heller, Smithsonian Misc. Coll., vol. 61, No. 13, p. 7. September 16. (Summit of Mount Lololokwi, British East Africa; type in U. S. National Museum.)

1914. *Oreotragus oreotragus aureus* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 2, p. 574.

Specimens.—Seven, from localities as follows:

Uganda: "Uganda," 1 skull (British Mus.).

British East Africa: Kurseine, 1 (Rainey); Mount Lololokwi, 2 (Heller); Ngare Nyuki, 2 (Rainey); Rumathe River, 1 (Rainey).

All female specimens of this subspecies examined are without horns:

OREOTRAGUS OREOTRAGUS SOMALICUS Neumann.

1902. *Oreotragus somalicus* Neumann, Sitz.-ber. Ges. nat. Freunde Berlin, p. 174. November. (Sheikh, Goolis Mountains, British Somali; type in British Museum.)

Specimens.—Two, from —.

British Somali: Berbera, 2 (Swayne).

---

[1] *Oreotragus aceratos* Noack, Zool. Anz., vol. 21, p. 11. January 16, 1899. (Bwemkuru Region, Lindi, German East Africa.)

Measurements of specimens of Oreotragus.

Form and locality.	No.	Sex.	Head and body.	Tail vertebræ.	Hind foot.	Ear.	Skull: Condylobasal length.	Greatest breadth.	Palatal length.	Length of orbit.	Length of nasal.	Breadth of nasals.	Length of horn.	Length of mandible.	Maxillary tooth row.	Mandibular tooth row.	Observations.
O. o. schillingsi.																	
G. E. A.: Serengeti Plains	200859	Female	.....	.....	.....	.....	125	75.2	65.5	32.2	38.3	24.8	65.5	104	.....	.....	m^3 not yet in place.
Do	200960	.....	.....	.....	.....	.....	.....	72.2	.....	33.2	.....	.....	64.0	106	.....	.....	Do.
Do	200964	.....	.....	.....	.....	.....	.....	.....	65.0	34.1	38.8	18.9	.....	105	52.3	54.8	m^3 much worn.
B. E. A.:																	
Njoro Osolali	163024	Male	770	60	227	85	132	80.0	67.1	36.3	37.3	.....	.....	110	55.4	59.2	m^3 moderately worn.
Do	163025	Female	.....	.....	.....	.....	133	78.6	75.8	32.8	42.4	24.2	85.0	117	49.3	53.8	Do.
Lime Springs	163023	...do	.....	90	238	93	135	81.5	65.7	33.2	39.6	21.2	90.9	.....	59.5	.....	Do.
Deep Dale	181844	Male	840	98	228	87	127	71.4	67.7	31.5	38.6	17.8	82.2	102	.....	.....	m^3 not yet in place.
Do	181845	...do	820	95	220	87	130	76.1	68.0	32.4	40.4	20.4	89.3	109	49.5	55.8	m^3 considerably worn.
Nairobi	162856	...do	.....	.....	.....	.....	.....	80.8	.....	33.2	39.8	21.6	.....	103	48.3	53.2	m^3 moderately worn.
Ulukenia Hills	182336	...do	.....	.....	.....	.....	133	82.9	73.5	33.0	41.0	22.8	95.1	114	47.5	52.0	m^3 much worn.
Do	164532	Female	.....	.....	.....	.....	130	82.5	71.3	32.2	41.7	26.3	94.9	110	47.7	51.6	Do.
Kapiti Plains	161988	...do	.....	.....	.....	.....	130	75.7	65.2	32.3	34.3	20.2	77.8	108	.....	.....	m^3 not yet in place.
O. o. aureus.																	
B. E. A.:																	
Ngare Nyuki	182181	Female	830	75	230	90	132	79.9	71.3	32.3	44.2	19.6	.....	114	49.4	53.4	m^3 considerably worn.
Do	182182	...do	750	85	225	90	119	71.8	60.4	28.7	34.8	14.4	.....	99	.....	.....	m^3 not yet in place.
Rumathe River	182180	...do	870	95	225	90	131	78.3	70.4	32.2	45.4	23.3	.....	116	47.4	52.2	m^3 considerably worn.
Kurseine	182177	Male	790	60	223	92	126	75.4	68.4	31.7	39.5	22.3	97.2	105	49.6	52.0	Do.
Mount Lololokwi	[1]182149	Female	830	75	225	93	128	78.3	70.1	32.3	40.4	22.2	.....	111	51.9	55.1	m^3 moderately worn.
Do	182150	...do	840	90	235	90	125	77.0	69.2	30.3	43.5	22.3	.....	107	49.7	52.0	m^3 unworn.

[1] Type.

Genus OUREBIA Laurillard.

1841. *Ourebia* LAURILLARD, Dict. Univ. Hist. Nat., vol. 1, p. 622. (*O. ourebi.*)
1846. *Scopophorus* GRAY, Ann. and Mag. Nat. Hist., vol. 18, p. 232. October. (*O. ourebi.*)
1899. *Oribia* LYDEKKER, Great and Small Game Africa, p. xi (pro *Ourebia.*)

All of the forms of the oribi which have been described from East Africa are represented in the National Museum collection, with the exception of *Ourebia gallarum* Blaine [1] from Lake Helene, east of the headwaters of the Omo River, 60 miles south of Addis Ababa, Abyssinia. The validity of this species has, however, been questioned by Roosevelt and Heller.[2]

For measurements of specimens of *Ourebia* see table, page 90.

OUREBIA MONTANA MONTANA (Cretzschmar).

1826. *Antilope montana* CRETZSCHMAR, Atlas Reise im nördlichen Afrika von Eduard Rüppell, vol. 1, p. 11. (Fazogli Hills, Blue Nile, southeastern Sudan.)
1910. *O[urebia] montana* HOLLISTER, Smithsonian Misc. Coll., vol. 56, No. 2, p. 5. March 31. (Specimen from 120 miles east of Lado.)
1914. *Ourebia montana æquatoria* ROOSEVELT AND HELLER, Life-Hist. African Game Anim., vol. 2, p. 558. (Part; not of Heller.)

Specimens.—Two, as follows:

SUDAN: Mongalla Province, 120 miles east of Lado, 1 (Smith); Mongalla Province, 190 miles east of Lado, 5° 20′ N., 34° 30′ E., 1 (Smith).

OUREBIA MONTANA ÆQUATORIA Heller.

Plates 34, 35.

1910. *Ourebia montana* ROOSEVELT, African Game Trails, Amer. ed., p. 475; London ed., p. 487. (Not of Cretzschmar.)
1912. *Ourebia montana æquatoria* HELLER, Smithsonian Misc. Coll., vol. 60, No. 8, p. 12. November 2. (Rhino Camp, Lado Enclave; type in U. S. National Museum.)
1914. *Ourebia montana æquatoria* ROOSEVELT AND HELLER, Life-Hist. African Game Anim., vol. 2, p. 558. (Part.)

Specimens.—Fourteen, from the following localities:

LADO: Rhino Camp, 11, including two odd skulls (T. Roosevelt, Mearns, Heller).

UGANDA: Nimule, 3 (Mearns, T. Roosevelt).

The Nimule specimens, while somewhat intermediate in characters between true *montana* and *æquatoria*, go best with the specimens from Rhino Camp, on the west bank of the Nile. The Nile Valley form, as thus restricted, is not sharply marked from either *O. montana montana* or *O. m. cottoni*, and unquestionably intergrades directly with both.

---

[1] Ann. and Mag. Nat. Hist., ser. 8, vol. 11, p. 147. January, 1913.
[2] Life-Hist. African Game Anim., vol. 2, pp. 558–559. 1911.

Measurements of specimens of Ourebia.

Form and locality.	No.	Sex.	Head and body.	Tail vertebræ.	Hind foot.	Ear.	Skull: Greatest length.	Condylobasal length.	Palatal length.	Zygomatic breadth.	Height of rostrum at m^2.	Length of orbit.	Width of palate at m^2.	Length of horn.	Length of mandible.	Upper tooth row.	Observations.
Ourebia montana montana.																	
Sudan:																	
Mongalla Province	112998	Male	.....	.....	.....	.....	163	152	89	73	47	33.3	24.8	101	128	51.0	m^3 little worn.
Do	112997	Female	.....	.....	.....	.....	178	165	89	68	50	32.7	24.3	.....	134	47.8	Do.
Ourebia montana æquatoria.																	
Uganda:																	
Nimule	164714	Male	970	85	303	108	176	165	96	75	53	33.9	27.2	102	135	51.6	m^3 moderately worn.
Do	164716	Female	920	98	280	98	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Lado:																	
Rhino Camp	[1]164713	Male	960	80	280	107	176	166	102	73	52	31.2	25.8	117	137	52.7	Do.
Do	196970	...do	.....	.....	.....	.....	168	156	89	69	51	31.7	26.8	94	.....	53.9	m^3 not yet in place.
Do	164743	Female	920	85	286	110	178	167	102	68	47	29.7	26.7	.....	.....	50.5	m^3 moderately worn
Do	164744	...do	.....	.....	.....	.....	173	161	97	70	48	32.8	24.8	.....	132	44.9	m^3 much worn.
Ourebia montana cottoni.																	
B. E. A.:																	
Kabalolot Hill	181892	Male	1,030	75	297	102	172	163	94	76	52	33.8	24.2	119	132	47.9	m^3 considerably worn.
Guas Ngishu Plateau	155415	...do	.....	.....	.....	.....	168	157	94	73	50	29.7	25.2	123	.....	52.8	m^3 moderately worn.
Do	[2]155422	...do	.....	.....	.....	.....	175	163	98	77	54	32.7	26.5	115	.....	47.4	m^3 considerably worn.
Do	163240	...do	1,045	95	305	106	170	159	93	78	55	33.3	27.8	97	136	53.0	m^3 moderately worn.
Do	163242	...do	920	65	300	104	171	160	95	77	55	32.2	27.8	116	132	45.7	Do.
Do	163243	...do	1,020	50	280	100	173	160	95	74	52	30.9	25.2	113	134	50.5	Do.
Do	163244	...do	990	70	305	110	172	160	92	77	52	31.5	27.8	142	133	47.5	Do.
Do	163245	...do	.....	.....	.....	.....	170	160	94	79	54	31.7	28.7	99	132	51.8	Do.

Do.	164617	...do.	990	70	290	100	169	159	98	76	53	32.2	28.7	127	132	49.6	m^3 considerably worn.
Do.	164496	Female...	1,090	105	300	110	172	162	97	74	48	32.8	27.2	.....	132	47.7	m^3 much worn.
Do.	164613	...do.	.....	.....	.....	.....	179	167	100	75	50	31.7	27.6	.....	136	52.0	m^3 moderately worn.
Ourebia kenyæ.																	
B. E. A.: "Near Nairobi"..	162857	Male.	.....	.....	.....	.....	163	153	88	74	49	31.8	27.6	103	.....	49.2	m^3 little worn.
Ourebia haggardi.																	
B. E. A.: Mariakani.	182284	...do.	970	.....	295	100	163	154	99	72	50	32.8	25.3	110	123	52.6	m^3 not yet in place.

[1] Type.

[2] Type of "*Ourebia microdon*" Hollister.

OUREBIA MONTANA COTTONI Thomas and Wroughton.

Plate 36.

1908. *Ourebia cottoni* Thomas and Wroughton, Ann. and Mag. Nat. Hist., ser. 8, vol. 1, p. 178. February. (Sirgoit Rock, Guas Ngishu Plateau, British East Africa; type in British Museum.)

1910. *Ourebia microdon* Hollister, Smithsonian Misc. Coll., vol. 56, No. 2, p. 4. March 31. (South of Nzoia River, Guas Ngishu Plateau, British East Africa; type in U. S. Nat. Mus.)

1910. *O[urebia] cottoni* Hollister, Smithsonian Misc. Coll., vol. 56, No. 2, p. 5. March 31.

1910. *Ourebia cottoni* Roosevelt, African Game Trails, Amer. ed., p. 475; London ed., p. 487.

1911. *Oribia microdon* Lydekker, Suppl. Game Anim. of Africa, p. 10.

1914. *Ourebia montana cottoni* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 2, p. 560.

Specimens.—Twenty-nine, from localities as follows:

British East Africa: Guas Ngishu Boma, Guas Ngishu Plateau, 5 (K. Roosevelt, Heller); Guas Ngishu Plateau, 11, including two odd skulls (White); Kabalolot Hill, Sotik, 2 (Rainey); Kampiya bibi, Guas Ngishu Plateau, 3 (T. Roosevelt, K. Roosevelt); Nzoia River, Guas Ngishu Plateau, 4 (K. Roosevelt, White, T. Roosevelt); Sigaa, 1 (Draper); Sirgoit, 30 miles south, 3 (T. Roosevelt).

With this large series of specimens, showing the variations within the race, it is impossible to recognize *Ourebia microdon* Hollister as a form distinct from *Ourebia montana cottoni*. The specimens from Sotik seem inseparable from material from the Guas Ngishu Plateau.

OUREBIA KENYÆ Meinertzhagen.

1905. *Ourebia kenyæ* Meinertzhagen, Abstr. Proc. Zool. Soc. London, No. 16, p. 15. March 14. (Fort Hall, British East Africa;[1] type in British Museum.)

1910. *O[urebia] kenyæ* Hollister, Smithsonian Misc. Coll., vol. 56, No. 2, p. 5. March 31. (Specimen from "near Nairobi.")

1914. *Ourebia montana kenyæ* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 2, p. 561.

Specimen.—One odd skull, as follows:

British East Africa: "Near Nairobi," 1 (Mearns).

This skull was presented to Dr. E. A. Mearns by one of the game rangers in Nairobi with the information that it was obtained in that general region. Inasmuch as the species is not known from the immediate vicinity of Nairobi, it is probable that the specimen was originally obtained near Fort Hall or Mount Kenia, northeast of Nairobi, the only region where this oribi is at present known to occur.

[1] See Lydekker, Cat. Ungulate Mamm. Brit. Mus., vol. 2, p. 141. 1914.

OUREBIA HAGGARDI (Thomas).

1895. *Neotragus haggardi* Thomas. Ann. and Mag. Nat. Hist., ser. 6, vol. 15, p. 187. February. (Lamu, British East Africa; type in British Museum.)
1914. *Ourebia montana haggardi* Roosevelt and Heller. Life-Hist. African Game Anim., vol. 2, p. 562.

Specimen.—One, as follows:

British East Africa: Mariakani, 1 (Heller).

There is certainly no excuse for considering this very distinct oribi a subspecies of *montana*. Both *Ourebia kenyæ* and *O. haggardi* are, so far as known, entirely isolated from other forms; and while I have not seen skins of *kenyæ* the coloration of *haggardi* is so different from that of the races of *montana* that its full specific status can not be questioned. The subspecies of *montana* are reddish while *haggardi* is a decidedly drab or grayish animal. Both *kenyæ* and *haggardi* have black tails, and these two forms are no doubt closely related.

Genus RAPHICERUS Smith.

1827. *Raphicerus* H. Smith, Griffith's Cuvier's Anim. Kingd., vol. 5, p. 342. (*R. campestris.*)
1846. *Calotragus* Sundevall. K. Vet. Akad. Handl. (1844), p. 192. (*R. campestris.*)
1846. *Rhaphoceros* Agassiz, Nomencl. Zool., Index Univ., p. 321. (pro *Raphicerus.*)
1860. *Pediotragus* Fitzinger, Sitz.-ber. Math.-Nat. Cl. K. Akad. Wiss., Wien, vol. 42, p. 396. (*R. campestris.*)
1896. *Raphiceros* Thomas, Proc. Zool. Soc. London, p. 796. (pro *Raphicerus.*)
1897. *Rhaphiceros* Lydekker, Zoological Record, vol. 33, Mamm., p. 28. (pro *Raphicerus.*)
1908. *Rhaphicerus* Lönnberg, Sjöstedt's Kilimandjaro-Meru Exped., Mamm., p. 40. (pro *Raphicerus.*)

The East African steinbok has a wide distribution without geographical variation of consequence. No characters have been noted in an excellent series of specimens collected over the country from the Laikipia Plateau to the border of German East Africa by which more than one form could be recognized. No specimens from the type region in central German East Africa are at hand for comparison; neither are specimens available from the Kilimanjaro region, the type-locality of an additional race described by Doctor Lönnberg;[1] but this form is considered identical with the wide ranging *Raphicerus campestris neumanni* by Roosevelt and Heller.[2]

[1] *Rhaphicerus neumanni stigmatus* Lönnberg, Sjöstedt's Kilimandjaro-Meru Exped., Mamm., p. 40. 1908.
[2] Life-Hist. African Game Anim., vol. 2, p. 566. 1914.

RAPHICERUS CAMPESTRIS NEUMANNI (Matschie).

1894. *Pediotragus neumanni* MATSCHIE, Sitz.-ber Ges. nat. Freunde Berlin, p. 122. (Northern Ugogo, German East Africa; type in Berlin Museum.)

1910. *Nototragus neumanni* ROOSEVELT, African Game Trails, Amer. ed., p. 475; London ed., p. 487.

1914. *Raphicerus campestris neumanni* ROOSEVELT AND HELLER, Life-Hist. African Game Anim., vol. 2, p. 565.

Specimens.—Thirty, from the following localities:

BRITISH EAST AFRICA: Engare Narok River, Sotik Road, 1 (Rainey); Kasorongai River, 2 (Mearns); Kitanga, Athi Plains, 5 (Medlicott, Mearns, T. Roosevelt, Pease); Laikipia Plateau, 5 (T. Roosevelt, K. Roosevelt, Heller); Lime Springs, Loita Plains, 1 (Rainey); Lion Kopje, Loita Plains, 1 (Rainey); Naivasha Station, 1 (Mearns); Njoro Osolali, Sotik, 1 (Heller); Nyeri, 1 skull (K. Roosevelt); Olarakeri, Sotik, 2 (T. Roosevelt, Heller); Ragged Rocks, Suswa Plain, 1 (Rainey); Salt Marsh, Sotik, 1 (Heller); Southern Guaso Nyiro River, 2 (Mearns, Draper); Telek River, Loita Plains, 3 (Rainey); Ulukenia Hills, 1 skull (Loring); Ulu Station, 1 skull (Johnston); Wami Hill, Kapiti Plains, 1 (K. Roosevelt).

The following manuscript notes on the type specimen of this subspecies were made by Heller in Berlin and are on file in the National Museum:

Pediotragus neumanni Matschie. Type, ♂, A 5591, Guirui; O. Neumann. Flat skin, raw. Skull with snout and mandible missing; old, molars worn. Color: tip of snout median streak seal brown, but crown and rest of snout sorrel like back; the seal brown streak is described as lacking, but though small it can be seen on skin. Upper tooth row, 46.3; zygomatic width, 73; length of orbit, 29; height of orbit, 28; post palatal length, 52; width of palate at m^3, 29.

Genus NESOTRAGUS von Düben.

1847. *Nesotragus* VON DÜBEN, Öfvers. K. Sv. Vet. Akad. Förh., vol. 3 (1846), p. 221. (*N. moschatus.*)

In addition to the two forms of the pygmy antelope listed below, two others have been described from East Africa. These are *Nesotragus moschatus* von Düben, 1847 (*Cephalophorus zanzibaricus* Layard, 1861), the type of the genus, from some small island in Zanzibar harbor; and *Nesotragus moschatus akeleyi* Heller[1] from Mount Kenia, the type specimen of which is in the Field Museum of Natural History, Chicago.

[1] Smithsonian Misc. Coll., vol. 61, No. 7, p. 1. July 31, 1913.

NESOTRAGUS DESERTICOLA Heller.

Plate 37.

1913. *Nesotragus moschatus deserticola* Heller, Smithsonian Misc. Coll., vol. 61, No. 7, p. 2. July 31. (Maji-ya-chumvi, British East Africa; type in U. S. National Museum.)

1914. *Nesotragus moschatus deserticola* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 2, p. 552.

Specimens.—Two, as follows:

British East Africa: Maji-ya-chumvi, 2 (Heller).

NESOTRAGUS KIRCHENPAUERI Pagenstecher.

1885. *Nesotragus kirchenpaueri* Pagenstecher, Jahrb. Hamb. Wiss. Anst., vol. 2, p. 36; Nat. Mus. Hamburg Ber., 1884, p. 36. (Gross-Aruscha, Mount Kilimanjaro, German East Africa: type in Hamburg Museum.)

1892. *Nanotragus moschatus* True, Proc. U. S. Nat. Mus., vol. 15, p. 478. October 26. (Not of von Düben.)

1913. [*Nesotragus moschatus*] *kirchenpaueri* Heller, Smithsonian Misc. Coll., vol. 61, No. 7, p. 3. July 31. (Specimen from Kilimanjaro.)

1914. *Nesotragus moschatus kirchenpaueri* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 2, p. 554.

Specimen.—One, as follows:

German East Africa: Mount Kilimanjaro at 6,000 feet, 1 (Abbott).

With so few specimens for study I can not form any opinions of value on the validity of these species of *Nesotragus*. Doctor Lönnberg, who compared specimens from the Nairobi and Kenia regions with material from Kilimanjaro and with von Düben's types of *Nesotragus moschatus*, preserved in the Stockholm Museum, referred all of his material to *moschatus*.[1]

Genus MADOQUA Ogilby.

1837. *Madoqua* Ogilby, Proc. Zool. Soc. London, pt. 4, 1836, p. 137. (*M. saltiana*.)

The range of the Abyssinian and Somaliland dikdiks of the genus *Madoqua* does not include any part of East Africa covered by the Smithsonian expeditions and the species are therefore poorly represented in the collection.

MADOQUA PHILLIPSI GUBANENSIS Drake-Brockman.

1892. *N[eotragus] saltiana* True, Proc. U. S. Nat. Mus., vol. 15, p. 477, footnote. October 26. (Specimen from Berbera; not *Cerophorus saltiana* Blainville.)

1909. *Madoqua phillipsi gubanensis* Drake-Brockman, Ann. and Mag. Nat. Hist., ser. 8, vol. 4, p. 49. July. (Golis foothills, 35 miles south of Berbera, British Somaliland; type in British Museum.)

Specimen.—One, as follows:

British Somali: Berbera, 1 (Swayne).

[1] Kungl. Sv. Vet. Akad. Handl., vol. 48, pp. 153–154. 1912.

Genus RHYNCHOTRAGUS Neumann.

1905. *Rhynchotragus* NEUMANN, Sitz.-ber. Ges. nat. Freunde Berlin, p. 88. March. (*R. guentheri.*)

The long-snouted dikdiks are well represented in the collection; but the museum does not contain specimens of three forms described from the area covered by this report. These include the typical races of each of the species, *Rhynchotragus kirkii* (Günther)[1] described from Brava, Italian Somaliland; and *Rhynchotragus guentheri* (Thomas)[2] from central Ogaden, Abyssinia; as well as a form, probably a subspecies of *kirkii*, described by Neumann from Tisso (Kwa Meda), North Ugogo, German East Africa, as *Rhynchotragus thomasi.*[3]

For measurements of specimens see page 98.

RHYNCHOTRAGUS GUENTHERI WROUGHTONI Drake-Brockman.

1900. *Madoqua guentheri* THOMAS, Proc. Zool. Soc. London, p. 804. (Specimens from "Webi Dawi, Somali." one of which is listed below; not *Madoqua guentheri guentheri* Thomas, 1894.)

1909. *Rhynchotragus guentheri wroughtoni* DRAKE-BROCKMAN, Ann. and Mag. Nat. Hist., ser. 8, vol. 4, p. 51. July. (Foot-hills of Mount Abul Kassim,[4] Wabi River, Abyssinia, within 20 miles west of Sheikh Husein; type in British Museum.)

1914. *Rhynchotragus guentheri smithi* ROOSEVELT AND HELLER, Life-Hist. African Game Anim., vol. 2, p. 625, map. (Part; not of Thomas.)

Specimen.—One, as follows:

ABYSSINIA: Webi Dawa, near El Dere, about 200 miles east of Lake Stefanie, 1 (Smith).

RHYNCHOTRAGUS GUENTHERI SMITHII (Thomas).

1901. *Madoqua guentheri smithii* THOMAS, Proc. Zool. Soc. London, 1900, pt. 4, p. 804. April 1. (Thirty miles southeast of Lake Stefanie, on the boundary between Abyssinia and British East Africa; type in British Museum.)

1907. *Madoqua* (*Rhynchotragus*) *nasoguttatus* LÖNNBERG, Arkiv Zool., vol. 4, No. 3, p. 1. June 7. (Twenty kilometers southwest of Lake Baringo, British East Africa; type in Swedish Nat. Hist. Mus., Stockholm.)

1914. *Rhynchotragus guentheri smithi* ROOSEVELT AND HELLER, Life-Hist. African Game Anim., vol. 2, p. 626.

Specimens.—Twenty-seven, from localities as follows:

UGANDA: Berkate-Turkwell Junction, 3 (White).

BRITISH EAST AFRICA: Engare Ndare River, 1 (Rainey); Kara Water, Marsabit Road, 1 (Rainey); Kurseine, 3 (Rainey); Longaya Water, Marsabit Road, 4, including two odd skulls (Rainey); Marsabit Road, 1 skull (Rainey); Merelle Water, Marsabit Road, 7,

[1] *Neotragus kirkii* Günther, Proc. Zool. Soc. London, 1880, p. 17.

[2] *Madoqua guentheri* Thomas, Proc. Zool. Soc. London, 1894, p. 324.

[3] *Rhynchotragus thomasi* Neumann, Sitz.-ber. Ges. nat. Freunde Berlin, 1905, p. 89. March, 1905.

[4] Spelled Abugasin on Dr. A. Donaldson Smith's map in the Geographical Journal, vol. 16, p. 712, 1900.

including one large fetus in alcohol (Rainey); Mount Gargues, 1 (Heller); Mount Lololokwi, 4 (Heller); Northern Guaso Nyiro, 2 (Rainey).

The two skins from the junction of the Berkate and Turkwell Rivers, which should represent Lönnberg's *Madoqua nasoguttatus*, have the muzzles well flecked with white, but scarcely more so than the average marked skin of *smithii*. The skulls of these two specimens do not differ in any essential respect from numerous other skulls of *smithii* listed above.

RHYNCHOTRAGUS KIRKII MINOR Lönnberg.

1910. *Rhynchotragus kirki hindei* Roosevelt, African Game Trails, Amer. ed., p. 475; London ed., p. 487. (Part.)

1912. *Rhynchotragus cavendishi minor* Lönnberg, Ann. and Mag. Nat. Hist., ser. 8, vol. 9, p. 65. January. (Thorn bush north of the Northern Guaso Nyiro, below Chanler Falls, British East Africa; type in Stockholm Museum.)

1914. *Rhynchotragus kirki minor* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 2, p. 629.

Specimens.—Fourteen, from the following localities:

British East Africa: Engare Ndare River, 2 (Rainey); Kara Water, Marsabit Road, 6, including one odd skull (Rainey); Lakiundu River, 1 (Rainey); Marsabit Road, 1 (Rainey); Merelle Water, Marsabit Road, 2 (Rainey); Mount Lololokwi, 1 (Heller); Northern Guaso Nyiro, 1 (K. Roosevelt).

RHYNCHOTRAGUS KIRKII NYIKÆ Heller.

Plate 38.

1892. *Neotragus damarensis* True, Proc. U. S. Nat. Mus., vol. 15, p. 477. October 26. (Not of Günther.)

1913. *Rhynchotragus kirki nyikæ* Heller, Smithsonian Misc. Coll., vol. 61, No. 7, p. 3. July 31. (Ndi, British East Africa; type in U. S. National Museum.)

1914. *Rhynchotragus kirki nyikæ* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 2, p. 630.

Specimens.—Nine, from the following localities:

British East Africa: Maji-ya-chumvi, 3, including one large fetus in alcohol (Heller); Mount Sagalla, 1 (Heller); Ndi, 1 (Heller); Taveta, 4 (Abbott).

Cranial measurements of adult specimens of Rhynchotragus.

Form and locality.	No.	Sex.	Total length.	Condylo-basal length.	Greatest breadth.	Greatest length of nasal.	Front of orbit to tip of pre-maxilla.	Length of mandible.	Upper tooth row.	Lower tooth row.
R. guentheri wroughtoni.										
Abyssinia: Webi Dawa	112993	Male	102	96	53.6	10.7	48.9	74.6	34.2	36.1
R. guentheri smithii.										
Uganda:										
Berkate-Turkwell Jct	173006	Male	115	106	59.3	13.9	56.1	78.7	39.0	40.8
Do	173008	...do	120	112	57.2	12.2	57.7	87.1	37.2	39.3
B. E. A.:										
Mount Lololokwi	182153	...do	110	100	56.9	13.7	52.3	80.8	38.1	39.6
Do	182145	Female	118	110	54.2	15.6	58.2	86.4	38.7	41.7
Merelle Water	182098	Male	110	100	53.3	11.1	55.1	76.0	33.4	34.4
Do	182197	...do	114	105	56.8	11.8	54.8	80.5	36.2	37.8
Do	182205	...do	114	105	55.9	12.5	56.7	82.4	37.4	38.8
Do	182198	Female	114	105	57.1	13.8	57.3	83.3	37.6	38.9
Do	182204	...do	113	107	55.5	13.5	56.5	83.7	36.5	38.6
Longaya Water	182072	Male	116	108	57.1	9.8	56.2	81.8	36.1	37.9
Do	182422	...do	115	107	57.6	12.9	57.0	83.0	37.9	39.7
Kurseine	182176	...do	112	103	55.8	13.2	54.4	75.8	36.2	38.3
R. kirkii minor.										
B. E. A.:										
Kara Water	182055	Male	105	98	53.2	15.0	49.8	78.3	34.7	36.6
Do	182057	...do	102	96	51.2	18.0	48.3	76.1	35.5	37.8
Do	182058	...do	107	100	54.4	18.7	52.3	78.5	32.7	35.2
Do	182060	Female	111	105	50.4	20.3	54.0	83.7	37.2	39.3
Merelle Water	182108	Male	107	99	55.4	21.1	50.7	79.7	33.7	36.0
Do	182088	Female	105	95	51.7	18.7	49.3	78.5	35.5	38.3
Lakiundu River	182035	...do	112	103	51.8	16.6	52.8	79.8	36.0	37.5
Engare Ndare River	182159	Male	107	100	53.3	21.1	52.1	.....	35.3	.....

R. kirkii nyikæ.										
B. E. A.:										
Taveta	34709	Male	106	98	53.3	19.7	48.8	.....	37.1	38.3
Do	34780	...do	110	104	55.8	24.2	54.0	80.8	38.2	38.7
Do	34781	Female	115	109	52.0	17.2	55.7	83.9	36.2	37.5
Ndi	[1]182228	Male	116	107	56.7	18.4	57.3	84.8	37.4	38.9
Mount Sagalla	182255	...do	112	104	55.0	19.0	54.8	83.3	36.8	38.7
Maji-ya-chumvi	182268	...do	110	101	56.6	18.6	51.4	78.6	34.4	38.0
Do	182269	Female	112	105	54.3	.....	54.8	.....	35.9	38.3
R. kirkii hindei.										
B. E. A.:										
Mtoto Andei	181823	Male	110	102	56.5	14.9	52.4	79.9	36.2	38.2
Ngong Hills	182401	...do	115	108	61.8	22.3	53.3	84.4	37.3	40.3
Do	162860	Female	.....	.....	53.2	.....	.....	.....	32.6	.....
R. kirkii cavendishi.										
B. E. A.:										
Southern Guaso Nyiro	163041	Male	120	111	62.3	23.7	57.5	87.8	37.7	39.1
Do	163043	...do	117	108	61.3	20.9	57.1	83.5	38.7	38.2
Do	163036	Female	117	109	57.3	19.3	56.3	86.5	36.2	37.3
Telek River	181952	Male	116	109	58.8	20.8	56.8	86.7	38.9	40.6
Lake Naivasha	163038	...do	120	109	60.0	23.6	56.3	87.3	40.1	43.3
Do	163039	...do	122	113	61.2	23.3	59.0	91.6	41.4	44.3
Do	163040	Female	116	108	57.9	22.0	56.8	87.2	37.4	38.5
Loita Plains	165506	...do	119	110	57.5	21.8	57.0	88.8	37.3	38.6
G. E. A.:										
Serengeti Plains	201008	Male	123	114	61.1	19.4	59.4	89.3	38.2	**42.3**
Do	201009	Female	119	111	58.7	21.6	55.8	89.3	40.2	40.2

[1] Type.

RHYNCHOTRAGUS KIRKII HINDEI (Thomas).

1902. *Madoqua kirkii hindei* THOMAS, Ann. and Mag. Nat. Hist., ser. 7, vol. 10, p. 242. September. (Kitui, British East Africa; type in British Museum.)

1910. *Rhynchotragus kirki hindei* ROOSEVELT, African Game Trails, Amer. ed., p. 475; London ed., p. 487. (Part.)

1914. *Rhynchotragus kirki hindei* ROOSEVELT AND HELLER, Life-Hist. African Game Anim., vol. 2, p. 631.

Specimens.—Five, from localities as follows:

BRITISH EAST AFRICA: Bondoni, Kapiti Plains, 1 (Heller); Mtoto Andei, 1 (Heller); Ngong Hills, Nairobi, 3, including two odd skulls (Mearns, Klein).

RHYNCHOTRAGUS KIRKII CAVENDISHI (Thomas).

1898. *Madoqua cavendishi* THOMAS, Proc. Zool. Soc. London, p. 278. (Probably from region of Lake Baringo, British East Africa;[1] type in British Museum.)

1909. *Madoqua langi* ALLEN, Bull. Amer. Mus. Nat. Hist., vol. 26, p. 153. March 19. (Lake Elmenteita, British East Africa; type in American Museum of Natural History, New York.)

1910. *Rhynchotragus kirki hindei* ROOSEVELT, African Game Trails, Amer. ed., p. 475; London ed., p. 487. (Part.)

1914. *Rhynchotragus kirki cavendishi* ROOSEVELT AND HELLER, Life-Hist. African Game Anim., vol. 2, p. 632.

Specimens.—Twenty-three, from the following localities:

BRITISH EAST AFRICA: Agate's, Loita Plains, 1 skull (Folsom); Amala River, 1 (Rainey); Lake Naivasha, 3 (Heller); Loita Plains, 3 skulls (Mearns); Southern Guaso Nyiro, 11 (Mearns, Loring, T. Roosevelt, Heller); Telek River, Loita Plains, 2 (Rainey).

GERMAN EAST AFRICA: Serengeti Plains, 2 odd skulls (Clark).

The specimens from the Serengeti Plains resemble in all particulars skulls from the Loita Plains and Naivasha Lake regions of British East Africa. The range of the species *Rhynchotragus thomasi* Neumann was said by the describer to reach the country immediately southeast from Victoria Nyanza, although the type locality of the form is far to the southeast in Ugogo. The type specimen of *R. thomasi* was examined by Heller in the Berlin Museum, and the following notes made by him, on file in the National Museum, may well be put on record here:

Rhynchotragus thomasi Neumann. Type (marked on label), A5581, Tisso (Kwa Mede), North Ugogo. O. Neumann, coll. Skin stuffed; color rich ochraceous rufous on back, sides, neck, and head; only back of thighs and rump grayish; legs pure ochraceous rufous. Two other flat skins from the type locality are decidedly grayer, and more buffy in tone rather than ochraceous rufous; underparts white. The skull of the type could not be found in the Berlin Museum. Neumann says it is not at his house and must be in the museum. There is a topotype skull, ♀ A5580, O. Neumann; immature, last molar not erupted.

[1] Erroneously given in original description as "probably the neighborhood of Lake Rudolf." See Roosevelt and Heller, Life-Hist. African Game Anim., vol. 2, p. 632. 1914.

Genus REDUNCA Smith.

1816. *Cervicapra* Blainville, Bull. Soc. Philom., p. 75. May. (*R. redunca;* not *Cervicapra* Sparrman, 1780.)

1827. *Redunca* H. Smith, Griffith's Cuvier's Anim. Kingd., vol. 5, p. 337. (*R. redunca.*)

1841. *Nagor* Laurillard, Dict. Univ. Hist. Nat., vol. 1, p. 621. (*R. redunca.*)

1843. *Elcotragus* Gray, List. Spec. Mamm. Brit. Mus., p. xxvi. (*R. arundinum.*)

1865. *Helcotragus* Kirk, Proc. Zool. Soc. London, 1864, p. 657. February. (pro *Elcotragus.*)

1912. *Orcodorcas* Heller, Smithsonian Misc. Coll., vol. 60, No. 8, p. 13. November 2. (*R. fulvorufula.*)

The four known species of reedbucks have been placed in three different genera or subgenera, but it does not seem necessary or advisable that they be so separated. Two species are well known over most of eastern Equatorial Africa and the occurrence of some form of the South African *Redunca arundinum*, in the Bahr-el-Ghazal Province of Sudan, has been announced by Blaine.[1]

REDUNCA BOHOR COTTONI (Rothschild).

1900. *Cervicapra bohor* Thomas, Proc. Zool. Soc. London, p. 804. (Specimens from southern Sudan, 150 miles east of Lado; not *Redunca bohor bohor.*)

1902. *Cervicapra redunca cottoni* Rothschild, in Powell-Cotton's Sporting Trip through Abyssinia, Appendix 3, Mamm., p. 470. (Between the Bahr-el-Zerafe and the Bahr-el-Jebel, Sudan.)

1902. *Cervicapra redunca donaldsoni* Rothschild, in Powell-Cotton's Sporting Trip through Abyssinia, Appendix 3, Mamm., p. 471. (East of Lado, near Sudan-Uganda boundary, and western Somaliland; no type designated.)

1910. *Redunca redunca donaldsoni* Roosevelt, African Game Trails, Amer. ed., p. 475; London ed., p. 487.

1914. *Redunca redunca cottoni* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 2, p. 486.

Specimens.—Six, from the following localities:

Sudan: Mongalla Province, 150 miles east of Lado, 2 (Smith).

Uganda: Nimule, 60 miles north, 4 (T. Roosevelt, Heller, Loring).

On the basis of our own material I should be inclined to recognize *Redunca bohor donaldsoni* (Rothschild) as a valid subspecies. The two specimens listed above from Sudan were collected not far from the type locality, which is near the Sudan-Uganda boundary. The male has long wide-spreading horns, very different from any shown by the small series from nearer the Nile, below Nimule; but both Lydekker[2] and Heller,[3] who have examined more material from these regions than is available in America, state that the horn characters ascribed to the two races do not hold good as constant differences. It is perhaps doubtful if *cottoni* is in itself well differentiated from typical *bohor* of Central Abyssinia; the characters of the various

[1] Ann. and Mag. Nat. Hist., ser. 8, vol. 11, p. 288. March, 1913.

[2] Cat. Ungulate Mamm. Brit. Mus., vol. 2, p. 218. 1914.

[3] Life-Histories of African Game Anim., vol. 2, p. 486. 1914.

races are largely based on the shape of the horn, and there is apparently much individual variation in this respect among the northern reedbucks.

REDUNCA BOHOR WARDI (Thomas).

1900. *Cervicapra redunca wardi* THOMAS, Ann. and Mag. Nat. Hist., ser. 7, vol. 6, p. 304. September. (Mau Plateau, British East Africa; type in British Museum.)

1910. *Cervicapra redunca wardi* HOLLISTER, Smithsonian Misc. Coll., vol. 56, No. 2, p. 6. March 31.

1910. *Redunca redunca wardi* ROOSEVELT, African Game Trails, Amer. ed., p. 475; London ed., p. 487.

1914. *Redunca redunca wardi* ROOSEVELT AND HELLER, Life-Hist. African Game Anim., vol. 2, p. 485.

Specimens.—Twenty-two, from localities as follows:

UGANDA: Kabula Muliro, 1 (K. Roosevelt); Katwe, 3 (T. Roosevelt).

BRITISH EAST AFRICA: Amala River, 1 (Rainey); Fort Hall, 1 skull (Mearns); Guas Ngishu Boma, 5 (T. Roosevelt, Heller); Guas Ngishu Plateau, 1 skull (Stephenson); Kabalolot Hill, Sotik, 1 (Rainey); Kamiti Farm, 1 skull (Heatley); Nzoia River, Guas Ngishu Plateau, 2 (White, K. Roosevelt); south of Sirgoit, Guas Ngishu Plateau, 2 (T. Roosevelt, K. Roosevelt); Telek River, 2, including one odd skull (Rainey, Heller).

GERMAN EAST AFRICA: Ikoma, 1 odd skull (Clark); Nyanza, east shore of Lake Tanganyiki, 1 (Raven).

The common East African bohor reedbuck has a wide distribution. Specimens from the Sotik do not appear to differ from those from the Guas Ngishu Plateau, Kapiti Plains, or the Kenia region. The horns vary but little in the series at hand, though one old male from Kapiti Plains and one specimen from the Guas Ngishu Plateau have them conspicuously longer and more widely spread than is usual.

A female collected on the Guas Ngishu Plateau November 2 was nursing young.

Writing of this species on the Guas Ngishu Plateau, Colonel Roosevelt says: [1]

> It was astonishing how close the reedbuck lay. Again and again we put them up within a few feet of us from patches of reeds or hollows in the long grass. A much more singular habit is the way in which they share these retreats with dangerous wild beasts; a trait common also to the cover-loving bushbuck. From one of the patches of reeds in which Kermit and I shot two hyenas a reedbuck doe immediately afterward took flight. She had been reposing peacefully during the day within fifty yards of several hyenas! Tarlton had more than once found both reedbuck and bushbuck in comparatively small patches of cover which also held lions.

A subspecies of the bohor reedbuck from Ankoli, southwestern Uganda, described by Blaine as *Cervicapra bohor ugandæ* [2] is not represented in the collections of the National Museum.

[1] African Game Trails, Amer. ed., p. 339. 1910.

[2] Ann. and Mag. Nat. Hist., ser. 8, vol. 11, pp. 289, 291. March, 1913.

The specimen collected by Mr. H. C. Raven at Nyanza, on the eastern shore of Lake Tanganyika, has the legs slightly more rufous than in skins from British East Africa, but it is an immature female, with the permanent teeth not yet in place. Adult skins from this region may show that a new geographical race should be recognized.

REDUNCA BOHOR TOHI Heller.

Plates 39, 40.

1892. *?Eleotragus arundinaceus* True, Proc. U. S. Nat. Mus., vol. 15, p. 472. October 26. (Not *Eleotragus arundinaceus* Gray=*Antilope arundinaceus* Bechstein=*Antilope arundinum* Boddaert=*Redunca arundinum*.)

1913. *Redunca redunca tohi* Heller, Smithsonian Misc. Coll., vol. 61, No. 7, p. 10. July 31. (Mariakani, British East Africa; type in U. S. National Museum.)

1914. *Redunca redunca tohi* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 2, p. 487.

Specimens.—Eight, from localities as follows:

British East Africa: Mariakani, 6 (Heller); Taveta, 2 (Abbott).

Heller found this coast subspecies inhabiting the grassy park-like country between the cocoa-palm zone and the desert nyikæ. It apparently extends inland only to the slopes of Mount Kilimanjaro.

REDUNCA FULVORUFULA CHANLERI (Rothschild).

Plates 40, 41.

1895. *Cervicapra chanleri* Rothschild, Novit. Zool., vol. 2, p. 53. February. (Jambeni Mountains, about 45 miles northeast of Mount Kenia, British East Africa; type in U. S. National Museum.[1])

1909. *Redunca chanleri* Lyon and Osgood, Bull. 62 U. S. Nat. Mus., p. 11. January 28. (History of type specimen.)

1910. *Redunca fulvorufula chanleri* Roosevelt, African Game Trails, Amer. ed., p. 475; London ed., p. 487.

1914. *Orcodorcas fulvorufula chanleri* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 2, p. 479.

Specimens.—Twenty-one, from the following localities:

British East Africa: Agate's, Loita Plains, 3 (T. Roosevelt, Mearns, Loring); Engare Ndare River, 2 (Rainey); Jambeni Mountains, 1 (Chanler); Kapiti Plains, 1 odd skull (Loring); Kasorongai River, 1 (Heller); Kilima Kui, Kapiti Plains, 1 (T. Roosevelt); Kitanga, 2 (T. Roosevelt); Njoro Osolali, Sotik, 2 (K. Roosevelt); Sigaa, 1 (Draper); Southern Guaso Nyiro River, 2, including one odd skull (Loring); Ulukenia Hills, 4 odd skulls (Loring, Rainey, Mearns); Wami Hill, Kapiti Plains, 1 (K. Roosevelt).

[1] Lydekker, in Cat. Ungulate Mamm. British Mus., vol. 2, p. 224, 1914, writes that the type skull, of which the British Museum possesses a cast, is in the Tring Museum. The entire specimen, skin, and complete skeleton, of the specifically designated type is in the United States National Museum. See Lyon and Osgood, Bull. 62 U. S. Nat. Mus., pp. 11, 12. 1909. In November, 1912, the mounted skin of the type was taken down and made into a flat study specimen.

Colonel Roosevelt writes of the rock reedbuck on the Kapiti Plains:[1]

On the steep, rocky, brush-clad hills there were little klipspringers and the mountain reedbuck or Chanler's reedbuck, a very pretty little creature. Usually we found the reedbuck does and their fawns in small parties, and the bucks by themselves; but we saw too few to enable us to tell whether this represented their normal habits. They fed on the grass, the hill plants, and the tips of certain of the shrubs, and were true mountaineers in their love of the rocks and rough ground, to which they fled in frantic haste when alarmed. They were shy and elusive little things, but not wary in the sense that some of the larger antelopes are wary.

Loring found a single well-developed fetus in a female killed May 6 on the Kapiti Plains.

An additional subspecies of *Redunca fulvorufula* has been described by Neumann as *Cervicapra fulvorufula schoana*.[2] No specimens from the type region, the mountains about Lake Abaya and Gandjule, Abyssinia, are available for comparison, but no satisfactory characters are given in the original description to distinguish the proposed race from *R. f. chanleri*.

Genus KOBUS Smith.

1840. *Kobus* A. Smith, Ill. Zool. South Africa, pl. 28. October. (*K. ellipsiprymnus*.)

1876. *Cobus* Buckley, Proc. Zool. Soc. London, p. 284. (pro *Kobus*.)

Two closely related species of waterbucks are found in East Africa, each divisible into a number of geographical forms. The subspecies of *ellipsiprymnus* are found in the eastern coast region while the forms of *defassa* are confined to the interior.

KOBUS ELLIPSIPRYMNUS KURU Heller.

Plate 42.

1892. *Kobus ellipsiprymnus* True, Proc. U. S. Nat. Mus., vol. 15, p. 471. October 26. (Not *Kobus ellipsiprymnus ellipsiprymnus* of South Africa.)

1913. *Kobus ellipsiprymnus kuru* Heller, Smithsonian Misc. Coll., vol. 61, No. 13, p. 6. September 16. (Taveta, Kilimanjaro district, British East Africa; type in U. S. National Museum.)

1914. *Kobus ellipsiprymnus kuru* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 2, p. 506.

Specimens.—Three, as follows:

British East Africa: Taveta, 3, including one odd skull (Abbott).

This waterbuck should be compared with specimens of *Kobus ellipsiprymnus kulu* Matschie,[3] described from Maliwe, 42 kilometers west from Kilwa, on the Matandu River, near the coast of German East Africa, which was apparently unknown to Heller at the time he named this coast form from British East Africa. The localities

[1] African Game Trails, Amer. ed., p. 56. 1910.

[2] Sitz.-ber. Ges. nat. Freunde Berlin, p. 99. 1902.

[3] Mitt. Zool. Mus. Berlin, vol. 5, pt. 3, p. 561. June [August], 1911.

are so widely separated, however, that the two forms are doubtless distinct.

At the time that the original description of *Kobus ellipsiprymnus kuru* was printed the skull of the type specimen could not be found. It has since been located in the collection and placed with the types. It is an immature male, with the last molar not yet erupted. One of the skins from Taveta is mounted in the exhibition series.

KOBUS ELLIPSIPRYMNUS THIKÆ Matschie.

1910. *Kobus ellipsiprymnus* Roosevelt, African Game Trails, Amer. ed., p. 475; London ed., p. 487. (Not of Ogilby.)

1910. *Kobus ellipsiprymnus thikae* Matschie, Sitz.-ber. Ges. nat. Freunde Berlin, p. 411. 1910. (Thika River, north of Dönyo-Sabuk, south of Mount Kenia, British East Africa; type in Powell-Cotton collection at Quex Park, Birchington, Kent, England.)

1912. *Kobus ellipsiprymnus canescens* Lönnberg, Kungl. Sv. Vet. Akad. Handl., vol. 48, No. 5, p. 160. 1912. (Northern Guaso Nyiro River, British East Africa; type in R. Nat. Hist. Mus., Stockholm.)

1914. *Kobus ellipsiprymnus thikæ* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 2, p. 502.

Specimens.—Ten, from localities as follows:

British East Africa: Fort Hall, 1 (Mearns); Juja Farm, 3 (K. Roosevelt, T. Roosevelt); Mtoto Andei, 1 (Heller); Nairobi, 1 (Tarlton); Neumann's Boma, Northern Guaso Nyiro, 1 (T. Roosevelt); Northern Guaso Nyiro River, 1 odd skull (K. Roosevelt); Tana River 2 odd skulls (McCutcheon).

This race is distinguished from the last by its lighter color. Our single skin from the Northern Guaso Nyiro at Neuman's Boma, which represents Lönnberg's *Kobus ellipsiprymnus canescens*, seems quite inseparable from specimens from south of Mount Kenia. In the series from Juja Farm and vicinity are both lighter and darker specimens; some have distinctly lighter colored necks and faces than the specimen from Neuman's Boma.

A still paler form, *Kobus ellipsiprymnus pallidus*, has been described by Matschie [1] from the Powell-Cotton collection; the type-specimen from Hal-be, on the Shebeli River, Italian Somaliland. Specimens from the lower Northern Guaso Nyiro River, especially in the neighborhood of Lorian Swamp, are frequently very pale, sometimes completely white; but these individuals range in herds with animals of normal color, with which they breed. Several accounts of these white waterbucks have been printed. Mr. A. B. Percival has written the following interesting note: [2]

Two very interesting examples of white waterbuck, male and female, both full grown, have recently been brought from the Northern Guaso Nyiro by Lord Gifford.

[1] Sitz.-ber. Ges. nat. Freunde Berlin, p. 410. 1910.

[2] Journ. East Africa and Uganda Nat. Hist. Soc., vol. 1, No. 2, p. 110. 1911.

He informs me that he saw in the one troop two bucks, three does, and two young, one of the latter being suckled by an ordinary-coloured cow. The eyes were normal in colour and not pink, so they are not Albinos.

Two subspecies of *Kobus ellipsiprymnus* have also been described by Matschie from extreme southern German East Africa, just within the limits of the area included by this report. These are *Kobus ellipsiprymnus kondensis*,[1] from Mwaya, northwestern end of Lake Nyassa; and *Kobus ellipsiprymnus lipuwa*[2] from the same locality.

Colonel Roosevelt was much impressed by his first introduction to the waterbuck, at Juja Farm, and wrote as follows:[3]

The waterbuck is a stately antelope with long, coarse gray hair and fine carriage of the head and neck; the male alone carries horns. We found them usually in parties of ten or a dozen, both of bulls and cows; but sometimes a party of cows would go alone, or three or four bulls might be found together. In spite of its name, we did not find it much given to going in the water, although it would cross the river fearlessly whenever it desired; it was, however, always found not very far from water. It liked the woods and did not go many miles from the streams, yet we frequently saw it on the open plains a mile or two from trees, feeding in the vicinity of the zebra and the hartebeest. This was, however, usually quite early in the morning or quite late in the afternoon. In the heat of the day it clearly preferred to be in the forest, along the stream's edge, or in the bush-clad ravines.

KOBUS DEFASSA HARNIERI (Murie).

1867. *Antilope harnieri* MURIE, Proc. Zool. Soc. London, p. 5. (White Nile, Sudan; type in Darmstadt Museum.)

1910. *Kobus defassa harnieri* ROOSEVELT, African Game Trails, Amer. ed., p. 475; London ed., p. 487.

1910. *Kobus defassa breviceps* MATSCHIE, Sitz.-ber. Ges. nat. Freunde Berlin, p. 424. (Pembe, between Dufile and Matete, on the Nile, Lado Enclave; type in coll. of Powell-Cotton, Quex Park, Birchington, Kent, England.)

1910. *Kobus defassa ladoensis* MATSCHIE, Sitz.-ber. Ges. nat. Freunde Berlin, p. 426. (Matete, between Dufile and Lado, on the Nile, Lado Enclave; type in Powell-Cotton coll.)

1910. *Kobus defassa griseotinctus* MATSCHIE, Sitz.-ber. Ges. nat. Freunde Berlin, p. 427. (Kerri, near Kero, north of Lado, Lado Enclave; type in Powell-Cotton coll.)

1914. *Kobus defassa harnieri* ROOSEVELT AND HELLER, Life-Hist. African Game Anim., vol. 2, p. 495.

Specimens.—Nine, as follows:

LADO: Rhino Camp, 9, including five odd skulls (Mearns, T. Roosevelt, K. Roosevelt, Loring).

In addition to the proposed forms listed above in the synonymy of *Kobus defassa harnieri*, another form, perhaps distinct, has been described by Matschie[4] from the west side of the outlet of Albert Nyanza, Lado Enclave, as *Kobus defassa albertensis*. Still more sub-

[1] Mitt. Zool. Mus. Berlin, vol. 5, pt. 3, p. 556. June [August], 1911.
[2] Mitt. Zool. Mus. Berlin, vol. 5, pt. 3, p. 560. June [August], 1911.
[3] African Game Trails, Amer. ed., pp. 109, 110. 1910.
[4] Sitz.-ber. Ges. nat. Freunde Berlin, p. 426. 1910.

species have been described by the same author from just outside the limits of this report, in eastern Belgian Congo.[1]

KOBUS DEFASSA UGANDÆ Neumann.

1905. *Kobus unctuosus ugandae* NEUMANN, Sitz.-ber. Ges. nat. Freunde Berlin, p. 92. March. (Maiandja [Maanja] River, Uganda; type in Neumann coll.)

1910. *Kobus defassa ugandæ* ROOSEVELT, African Game Trails, Amer. ed., p. 475; London ed., p. 487. (Part.)

1914. *Kobus defassa ugandæ* ROOSEVELT AND HELLER, Life-Hist. African Game Anim., vol. 2, p. 496.

Specimens.—Three, as follows:

UGANDA: Nabea, Budonga Forest, 1 odd'skull (Raven); Buhuka, 1 (Draper); Nkyanuna, 1 (K. Roosevelt.)

KOBUS DEFASSA NZOIÆ Matschie.

1910. *Kobus defassa ugandæ* HOLLISTER, Smithsonian Misc. Coll., vol. 56, No. 2, p. 5. March 31. (Not of Neumann.)

1910. *Kobus defassa ugandæ* ROOSEVELT, African Game Trails, Amer. ed., p. 475; London ed., p. 487. (Part; not of Neumann.)

1910. *Kobus defassa nzoiae* MATSCHIE, Sitz.-ber. Ges. nat. Freunde Berlin, p. 417. (Guas Ngishu Plateau, British East Africa; type in coll. of Powell-Cotton, Quex Park, Birchington, Kent, England.)

1910. *Kobus defassa fulvifrons* MATSCHIE, Sitz.-ber. Ges. nat. Freunde Berlin, p. 418. (East from Kitosh, between the Nzoia and the Guaso Masa Rivers, British East Africa; type in Powell-Cotton coll.)

1914. *Kobus defassa nzoiæ* ROOSEVELT AND HELLER, Life-Hist. African Game Anim., vol. 2, p. 498.

Specimens.—Seven, from localities as follows:

BRITISH EAST AFRICA: Eldoma Ravine, 12 miles north of, 1 (T. Roosevelt); Guas Ngishu Plateau, 5 (K. Roosevelt, T. Roosevelt); Nzoia River, Guas Ngishu Plateau, 1 (White).

One male from the Guas Ngishu Plateau, collected by Theodore Roosevelt, is mounted in the exhibition series.

KOBUS DEFASSA TJÄDERI Lönnberg.

1907. *Cobus defassa tjäderi* LÖNNBERG, Arkiv Zool., vol. 4, No. 3, p. 7. June 7, 1907. (Northwestern part of the Laikipia Plateau, west of the junction of the rivers Guaso Nanek and Guaso Nyiro, British East Africa; type in R. Nat. Hist. Mus., Stockholm.)

1910. *Kobus defassa ugandæ* ROOSEVELT, African Game Trails, Amer. ed., p. 475; London ed., p. 487. (Part; not of Neumann.)

1910. *Kobus defassa powelli* MATSCHIE, Sitz.-ber. Ges. nat. Freunde Berlin, p. 415. (Laikipia Plateau, east of Lake Baringo, British East Africa; type in coll. of Powell-Cotton, Quex Park, Birchington, Kent, England.)

[1] *Kobus defassa avellanifrons* Matschie, Sitz.-ber. Ges. nat. Freunde Berlin, 1910, p. 419 (Beni, on the road to Kasindi, west of Ruwenzori, Belgian Congo); *Kobus defassa cottoni* Matschie, Sitz.-ber. Ges. nat. Freunde Berlin, 1910, p. 420 (Kasindi, near mouth of Semliki River, at Albert Edward Nyanza, Belgian Congo); *Kobus defassa dianae* Matschie, Sitz.-ber Ges. nat. Freunde Berlin, 1910, p. 421 (Sassa Rive east side of Albert Edward Nyanza, Belgian Congo).

1910. *Kobus defassa angusticeps* Matschie, Sitz.-ber. Ges. nat. Freunde Berlin, p. 416. (Laikipia Plateau, north of Lake Baringo, British East Africa; type in Powell-Cotton coll.)

1914. *Kobus defassa tjaderi* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 2, p. 500.

Specimens.—Two, from localities as follows:

British East Africa: Lake Naivasha, 1 (K. Roosevelt); upper Southern Guaso Nyiro River, south of Lake Naivasha, 1 odd skull (Mearns).

KOBUS DEFASSA RAINEYI Heller.

Plates 43, 44, 45.

1913. *Kobus defassa raineyi* Heller, Smithsonian Misc. Coll., vol. 61, No. 13, p. 5. September 16. (Amala River, British East Africa; type in U. S. Nationa Museum.)

1914. *Kobus defassa raineyi* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 2, p. 498.

Specimens.—Six, from localities as follows:

British East Africa: Kabalolot Hill, 1 odd skull (Rainey); Loita Plains, 1 odd skull (Rainey); Telek River, 4 (Rainey).

If the *Kobus adolfi-friderici* of Matschie, 1906,[1] described from the upper Orangi River, near the Massai Steppe, south of Ikoma, German East Africa, should prove beyond doubt to be a member of the *defassa* group, then this name should unquestionably take the place of *Kobus defassa raineyi* Heller. The two type localities are close together and specimens of the same species from each place are usually indistinguishable. There is, however, apparently some doubt as to the specific identity of *adolfi-friderici* as the description is based on the head alone, and the two waterbucks, *defassa* and *ellipsiprymnus*, are, in very many cases, not surely identifiable by characters of the skull and horns. The common waterbuck (*Kobus ellipsiprymnus*) has, moreover, been recorded as reaching, at its most westerly point of distribution in central Africa, the region of the Serengeti Plains, near Ikoma. The form described as *adolfi-friderici* is with little doubt merely a geographical race of one of the two widely distributed species, *ellipsiprymnus* or *defassa*, but until its specific relationship shall be settled beyond doubt it seems better to list the above specimens under *Kobus defassa raineyi*, of which proposed race all are virtually topotypes. Lydekker, in 1908,[2] considered *adolfi-friderici* a subspecies of *ellipsiprymnus*, but in 1914,[3] he lists it among the forms of *defassa*.

Other described forms of the *Kobus defassa* group, all from Abyssinia and German East Africa, and not represented by specimens in the collections of the United States National Museum, are as follows:

[1] "Weidwerk in Wort und Bild, vol. 15, p. 234. April 1, 1906."

[2] Game Animals of Africa, p. 196. 1908.

[3] Cat. Ungulate Mamm. Brit. Mus., vol. 2, p. 235. 1914.

Kobus defassa defassa (Rüppell)[1] from Lake Dembea (=Lake Tana), Abyssinia (syn., *Antilope defassa*, var. *abyssinica* Wagner, Schreber's Säugth., Suppl., vol. 5, p. 435, 1855); *Kobus defassa hawashensis* Matschie,[2] from the Hawash River, near boundary line between Ankober and the Assobot H'lls, Abyssinia; *Kobus defassa matschiei* Neumann,[3] from mouth of the Galana River, Lake Abaya, Abyssinia; *Kobus penricei frommi* Matschie,[4] from Lake Mkwera, west from Lake Rukwa, in southern Ufipa, German East Africa; *Kobus penricei münzneri* Matschie,[5] near Mtanga, near Lake Rukwa, southwestern German East Africa; and *Kobus unctuosa uwendensis* Matschie,[6] from the east shore of Lake Tanganyika, near Isawa, German East Africa.

Genus ONOTRAGUS Gray.

1872. *Onotragus* Gray, Cat. Rum. Mamm. Brit. Mus., p. 17. (*O. leche.*)
1913. *Onototragus* Heller, Smithsonian Misc. Coll., vol. 61, No. 7, p. 12. July 31. (pro *Onotragus.*)

Specimens of the Nile species of the lechwe antelope were collected by the Smithsonian African Expedition.

ONOTRAGUS MEGACEROS (Fitzinger).

1855. *Adenota megaceros* Fitzinger, Sitz.-ber. K. Akad. Wiss., Wien. vol. 17, p. 247. (Bahr-el-Abiad, below 7° N., Sudan; type in Vienna Museum.)
1859. *Kobus maria* Gray, Ann. and Mag. Nat. Hist., ser. 3, vol. 4, p. 296. (Awan, Bahr-el-Ghazal, 6° 70′ N., Sudan; type in British Museum.)
1910. *Kobus maria* Roosevelt, African Game Trails, Amer. ed., p. 475; London ed., p. 487.
1914. *Onotragus megaceros* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 2, p. 519.

Specimens.—Four, as follows:

Sudan: Lake No, Bahr-el-Ghazal, 4 (T. Roosevelt, K. Roosevelt). One of these specimens is mounted.

The name *Adenota megaceros* Fitzinger, 1855, barely escapes classification as a *nomen nudum;* many authors have, indeed, refused to accept it as a valid name and have used for the species the name proposed by Gray in 1859, *Kobus maria.* It is apparent from a reading of Fitzinger's account that he purposely refrained from describing the animal as this was to be done by Heuglin, the collector, who had already furnished the species with a name in manuscript, as mentioned by Fitzinger. In Fitzinger's account of Heuglin's collection, however, he does refer to the new species as a large antelope, distinguished from its close relatives *Adenota kob*, *forfex*, and *leche*, not

[1] *Antilope defassa* Rüppell, Neue Wirb. Abyssin., p. 9, pl. 3, 1835–1840.
[2] Sitz.-ber. Ges. nat. Freunde Berlin, p. 413. 1910. (Powell-Cotton coll.)
[3] *Kobus unctuosus matschiei* Neumann, Sitz.-ber. Ges. nat. Freunde Berlin, p. 92. March, 1905.
[4] Mitt. Zool. Mus. Berlin, vol. 5, pt. 3, p. 563. June [August], 1911.
[5] Mitt. Zool. Mus. Berlin, vol. 5, pt. 3, p. 567. June [August], 1911.
[6] Mitt. Zool. Mus. Berlin, vol. 5, pt. 3, p. 570. June [August], 1911.

alone by the distinctive coloration but also by the *great* horns, which are peculiar to the old males. It does not seem possible, therefore, rightly to dispose of *megaceros* as a *nomen nudum*.

Genus ADENOTA Gray.

1847. *Adenota* GRAY, List Osteol. Spec. Brit. Mus., p. 146. (*A. kob*.)

The kob, in eastern central Africa, is largely confined to the watershed of the great lakes and the Nile, where numerous specimens were collected by the first Smithsonian African expedition.

ADENOTA KOB LEUCOTIS (Peters).

1854. *Antilope leucotis* PETERS, Ber. Königl. Akad. Wiss. Berlin, 1853, p. 164. (Sobat River, Sudan; type in Berlin Museum.)

1910. *Kobus leucotis* ROOSEVELT, African Game Trails, Amer. ed., p. 475; London ed., p. 487.

1914. *Adenota kob leucotis* ROOSEVELT AND HELLER, Life-Hist. African Game Anim., vol. 2, p. 514. (Part.)

Specimens.—Four, as follows:

SUDAN: Mouth of Bahr-el-Zeraf, 4 (T. Roosevelt, K. Roosevelt).

Included in this series are two adult males, with last molars moderately worn, in the full black pelage; and two females in the normal red coat of the sex.

The *Adenota kob notata* described by Rothschild[1] from Ahmed Agha, Bahr-el-Abiad, Sudan; type in the Tring Museum, must be very closely related to this form.

ADENOTA KOB NIGROSCAPULATA Matschie.

1899. *Adenota nigroscapulata* MATSCHIE, Sitz.-ber. Ges. nat. Freunde Berlin, p. 15. (Bahr-el-Gebel, between 6° and 7° north, Sudan; type in Darmstadt Museum.)

1906. *Cobus vaughani* LYDEKKER, Field, vol. 108, p. 693. October 20. (Wau, 28° 10′ E., 7.30′ N., Bahr-el-Ghazal, Sudan; type in British Museum.)

1910. *Kobus vaughani* ROOSEVELT, African Game Trails, Amer. ed., p. 475; London ed., p. 487.

1914. *Adenota kob leucotis* ROOSEVELT AND HELLER, Life-Hist. African Game Anim., vol. 2, p. 514. (Part.)

Specimens.—Four, as follows:

SUDAN: Lake No, Bahr-el-Ghazal, 4 (K. Roosevelt, T. Roosevelt).

Two young males in this series, with short horns and with the last molars not yet erupted, are in the red coat, with dark markings on forelegs and shoulders and on the sides above the hind limbs. An adult male with fully developed horns, and with the last molar moderately worn, is of almost the same color. Another adult male, with the last molar moderately worn, has much more blackish mixed throughout the pelage, especially on the face, cheeks, and neck.

[1] Ann. and Mag. Nat. Hist., ser. 8, vol. 12, p. 575. December, 1913.

ADENOTA KOB ALURÆ Heller.

Plate 46.

1910. *Kobus kob thomasi* Roosevelt, African Game Trails, Amer. ed., p. 475; London ed., p. 487. (Part.)

1913. *Adenota kob aluræ* Heller, Smithsonian Misc. Coll., vol. 61, No. 7, p. 11. July 31. (Rhino Camp, Lado Enclave; type in U. S. National Museum.)

1914. *Adenota kob aluræ* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 2, p. 512.

Specimens.—Nine, as follows:

Lado: Rhino Camp, 8 (T. Roosevelt, K. Roosevelt, Mearns).

Uganda: Buhuka, 1 (Draper).

The kob described by Rothschild in December, 1913,[1] from Albert Edward Nyanza as *Adenota kob neumanni*, is a form closely related to *aluræ*; perhaps identical with it.

ADENOTA KOB THOMASI (Sclater).

1896. *Cobus thomasi* Sclater, Proc. Zool. Soc. London, 1895, p. 869. (Berkeley Bay, Victoria Nyanza, on boundary between Uganda and British East Africa; body skin of type in British Museum.)

1896. *Adenota thomasi* Neumann, Proc. Zool. Soc. London, 1896, p. 192. (Uganda; type in British Museum.)

1910. *Kobus kob thomasi* Roosevelt, African Game Trails, Amer. ed., p. 475; London ed., p. 487. (Part.)

1914. *Adenota kob thomasi* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 2, p. 510.

Specimens.—Nine, as follows:

British East Africa: Nzoia River, Guas Ngishu Plateau, 9 (T. Roosevelt, K. Roosevelt).

The weights of three adult males are recorded as 220, 230, and 240 pounds.

Genus AEPYCEROS Sundevall.

1847. *Æpyceros* Sundevall, K. Sv. Vet. Akad. Handl., 1845, p. 271. (*A. melampus.*)

Specimens of both of the two subspecies of the impala that have been described from this region are in the collection.

For measurements of specimens see page 113.

[1] Ann. and Mag. Nat. Hist., ser. 8, vol. 12, p. 575. December, 1913.

AEPYCEROS MELAMPUS SUARA (Matschie).

1892. *Æpyceros melampus* TRUE, Proc. U. S. Nat. Mus., vol. 15, p. 472. October 26. (Specimens from Taveta and Kilimanjaro; not of Lichtenstein.)

1892. *Strepsiceros suara* MATSCHIE, Sitz.-ber. Ges. nat. Freunde Berlin, 1892, p. 135. (Near Tabora, German East Africa; based on skull and horns of lesser koodoo, skin of impala, and a painting of an impala by Böhm.)[1]

1895. *Apyceros suara* MATSCHIE, Säug. Deutsch-Ost-Afrikas, p. 129. (Name restricted to impala.)

1910. *Æpyceros melampus suara* ROOSEVELT, African Game Tails, Amer. ed., p. 475; London ed., p. 487. (Part.)

1914. *Æpyceros melampus suara* ROOSEVELT AND HELLER, Life-Hist. African Game Anim., vol. 2, p. 615. 1914. (Part.)

Specimens.—Thirty-four, as follows:

BRITISH EAST AFRICA: Juja Farm, 2 (T. Roosevelt); Kabalolot Hill, 3, including 1 odd skull (Rainey); Laikipia, 1 (K. Roosevelt); Lake Hannington, 1 (K. Roosevelt); Lake Naivasha, 1 skull (Heller); Lime Springs, Sotik, 2 (Rainey); Njoro Osolali, 1 (K. Roosevelt); Sigaa, 1 (Draper); Southern Guaso Nyiro River, 11, including 1 odd skull (T. Roosevelt, Mearns, Draper, K. Roosevelt); Taveta, 4 (Abbott); Telek River, 1 skull (Heller); Ulukenia Hills, 1 skull (Loring).

GERMAN EAST AFRICA: Mount Kilimanjaro, 3 (Abbott); Serengeti Plains, western edge, 2, including 1 odd skull (Clark).

Specimens from the Athi Plains, from the Kilimanjaro region, and from the Sotik are indistinguishable. It is to be regretted that no complete skins from Laikipia, Lake Hannington, and Naivasha are available for comparison; but head skins from the first two localities seem clearly to belong here rather than with the next form.

AEPYCEROS MELAMPUS RENDILIS Lönnberg.

1910. *Æpyceros melampus suara* ROOSEVELT, African Game Trails, Amer. ed., p. 475; London ed., p. 487. (Part.)

1912. *Æpyceros melampus rendilis* LÖNNBERG, K. Sv. Vet. Akad. Handl., vol. 48, No. 5, p. 164. 1912. (Thornbush country north of the Northern Guaso Nyiro River, British East Africa; type in R. Nat. Hist. Mus., Stockholm.)

1914. *Æpyceros melampus suara* ROOSEVELT AND HELLER, Life Hist. African Game Anim., vol. 2, p. 615. 1914. (Part.)

Specimens.—Three, from the following localities:

BRITISH EAST AFRICA: Lakiundu River, 1 (Rainey); Northern Guaso Nyiro River, 2 skulls (Heller).

This form, judging by the single skin of an adult male from the Lakiundu River, is very well marked. This skin is much darker, more mahogany-red, than any impala skin in the rather extensive series from other parts of British East Africa or from northern German East Africa, all of which are distinctly more rusty, or paler

[1] See Roosevelt and Heller, Life-Hist. African Game Anim., vol. 2, pp. 615 and 620. 1914. Facts based upon notes made by Heller in Berlin.

reddish. The skulls of the two forms, *rendilis* and *suara*, seem indistinguishable, and, as will be seen from the accompanying table of measurements of adult male specimens, the characters of the nasal bones, as used further to differentiate the two by Doctor Lönnberg, do not hold good in our series. The northern form seems to be restricted to the Northern Guaso Nyiro region, as head skins with full-length necks from Laikipia and Lake Hannington are clearly of the southern race. Lydekker [1] lists specimens from Lake Elmenteita and Naivasha under *rendilis*, but these should doubtless be referred to *suara*. No specimens from the actual type locality of *rendilis* are in the collection.

Measurements of skulls of adult male specimens of Æpyceros.

Form and locality.	No.	Condylo-basal length.	Greatest length.	Interorbital breadth.	Greatest length of nasals.	Greatest breadth of nasals.	Orbit to tip of premaxilla.	Upper tooth row.	Condition of m^3.
A. m. suara.									
G. E. A.: Serengeti Plains	201012	262	274	77	99	34.2	160	77	Moderately worn.
B. E. A.:									
Taveta	34699	275	287	75	97	32.8	168	76	Do.
Kabalolot Hill	181893	263	275	77	94	30.0	158	78	Considerably worn.
Do	181920	263	273	78	85	33.2	160	80	Do.
Southern Guaso Nyiro	163198	259	270	78	96	34.0	158	77	Moderately worn.
Do	163199	264	274	74	92	30.8	164	78	Do.
Do	163200	266	274	75	96	32.3	163	77	Considerably worn.
Do	181858	262	273	78	86	31.5	158	79	Moderately worn.
Ulukenia Hills	163207	256	270	76	89	35.1	158	79	Considerably worn.
Juja Farm	162000	272	281	74	92	29.2	164	80	Do.
Do	162001	257	264	73	86	28.8	152	80	Moderately worn
Naivasha	163205	261	273	73	91	29.6	163	77	Do.
Lake Hannington	163203	261	271	74	91	29.1	157	76	Considerably worn.
Laikipia	163204	262	278	78	93	32.7	165	80	Do.
A. m. rendilis.									
B. E. A.:									
Lakiundu River	182063	.....	.....	79	.....	33.2	.....	84	Moderately worn.
Northern Guaso Nyiro	163201	271	284	79	95	30.7	165	76	Considerably worn.
Do	163202	268	280	80	97	34.0	163	74	Much worn.

[1] Cat. Ungulate Mamm. Brit. Mus., vol. 3, p. 11. 1914.

Genus GAZELLA Blainville.

1815. *Gazella* Rafinesque, Analyse de la Nature, p. 56. (*Nomen nudum.*)
1816. *Gazella* Blainville, Bull. Sci. Soc. Philom., p. 75. May. (*G. dorcas.*)
1821. *Dorcas* Gray, London Med. Repos., vol. 15, p. 307. April 1. (*G. dorcas.*)
1844. *Leptoceros* Wagner, Säugth. Schreber, Suppl., vol. 4, p. 422. (*G. leptoceros.*)
1869. *Eudorcas* Fitzinger, Sitz.-ber. Akad. Wien, vol. 59, pt. 1, p 159. February. (*G. rufifrons lævipes.*)
1872. *Korin* Gray, Cat. Rum. Mamm. Brit. Mus., p. 39. (*G. rufifrons.*)
1885. *Nanger* Lataste, Act. Soc. Bordeaux, vol. 39, p. 183. (*G. dama mhorr.*)
1907. *Matschiea* Knottnerus-Meyer, Archiv f. Nat., 72 Jahrg., Heft 1, p. 57. January. (*G. granti.*)

The gazelles of British East Africa are well represented in the museum collections, but the rich antelope fauna of Somaliland, Abyssinia, and Sudan, where many distinct species occur, is almost without representation.

The type-species of *Cerophorus* Blainville, 1816,[1] has, so far as I am aware, never been fixed. Since this name has equal date with *Gazella, Alcelaphus, Tragelaphus, Boselaphus, Oryx, Rupicapra,* and *Ovibos,* all proposed as subgenera in the same paper, and has priority over many other names of horned ruminants, it seems especially important that it be disposed of. I therefore now select, as the type of *Cerophorus* Blainville, the first-mentioned species, *Capra cervicapra* Linnæus. The name *Cerophorus* thus becomes a synonym of *Antilope* Pallas, 1766.

GAZELLA LITTORALIS LITTORALIS Blaine.

1912. *Gazella isabella* Miller, Proc. U. S. Nat. Mus., vol. 42, p. 171, pl. 15. April 13. (Not of Gray.)
1913. *Gazella littoralis* Blaine, Ann. and Mag. Nat. Hist., ser. 8, vol. 11, p. 295. March. (Khorasot, Nubian Desert, Sudan; type in British Museum.)
1914. *Gazella littoralis* Lydekker and Blaine, Cat. Ungulate Mamm. Brit. Mus., vol. 3, p. 76.

Specimens.—Eight, as follows:
Sudan: Jebel Bawati, Nubia, 8 skulls (Harrison).

GAZELLA PELZELNII Kohl.

1886. *Gazella pelzelnii* Kohl, Sitz.-ber. zool.-bot. Ges. Wien, p. 4. (Berbera, British Somaliland; type in Vienna Museum.)

Specimens.—Three, as follows:
British Somaliland: Berbera, 3 skulls (Swayne).
These were received from Dr. P. L. Sclater.

---

[1] Bull. Sci. Soc. Philom., p. 74. May, 1816.

GAZELLA SPEKEI Blyth.

1863. *G[azella] spekei* Blyth, Cat. Mamm. Mus. Asiatic Soc., p. 172. (Somaliland; type in Calcutta Museum.)

Specimen.—One, as follows:

British Somaliland: Somaliland Plateau, 1 skull (Swayne). Received from Dr. P. L. Sclater.

GAZELLA THOMSONII THOMSONII Günther.

1884. *Gazella thomsonii* Günther, Ann. and Mag. Nat. Hist., ser. 5, vol. 14, p. 427. December. (Kilimanjaro district, British East Africa;[1] cotypes in British Museum.)

1892. *Gazella thomsonii* True, Proc. U. S. Nat. Mus., vol. 15, p. 473. October 26.

1914. *Gazella thomsoni thomsoni* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 2, p. 601.

1914. *Eudorcas thomsoni thomsoni*, var. *arushae* Zukowsky, Archiv f. Nat., 80 Jahrg., Abt. A, Heft 1, p. 77. (South of Mount Meru, Arusha, German East Africa; coll. Dr. A. Berger.)

1914. *Eudorcas thomsoni bergerinae* Zukowsky, Archiv f. Nat., 80 Jahrg., Abt. A, Heft 1, p. 80. (South of Mount Meru, German East Africa; coll. Dr. A. Berger.)

Specimen.—One, as follows:

British East Africa: Taveta, 1 (Abbott).

Skin mounted and on exhibition; skull in the study series.

With an intimate knowledge of the country inhabited by *Gazella thomsonii*, and after a study of the large series of specimens of this gazelle contained in the United States National Museum collections, supplemented by an examination of the material preserved in most of the European museums, Mr. Heller recognized only two races of the species as worthy of name.[2] These were the typical subspecies of the Kilimanjaro region and the northern and western form described by Doctor Lönnberg as *Gazella thomsoni nasalis*.

The restricted distribution of the species would lead one to expect few valid geographical races. Nevertheless so many as 22 forms have been named. These have, in the main, been based on slight variations in the horns and skulls as shown by a very limited number of individuals. After careful study of our excellent series of 105 specimens, of which no less than 79 are from a single restricted region—the Loita Plains, west of the Southern Guaso Nyiro River—it is quite impossible for one to believe that many of these named forms represent valid subspecies—that is, such geographical races as are usually recognized by most systematic vertebrate zoologists in

[1] No specific locality in original description; see Lönnberg, Sjöstedt's Kilimandjaro-Meru Exped., Mamm., p. 45, 1908; Hollister, Smithsonian Misc. Coll., vol. 56, No. 2, p. 6, 1910; Knottnerus-Meyer, Sitz.-ber. Ges. nat. Freunde Berlin, 1910, pp. 106, 121, March, 1910; Roosevelt and Heller, Life-Hist. African Game Anim., vol. 2, p. 601, 1914; Lönnberg, Novit. Zool., vol. 21, p. 158, February, 1914; Lydekker, Cat. Ungulate Mamm. Brit. Mus., vol. 3, p. 84, 1914; Zukowsky, Archiv f. Nat., 80 Jahr., Abt. A, p. 102, 1914; Schwarz, Erg. Zweiten Deutsch. Zentral-Afrika-Exped. 1910–11, vol. 1, p. 1000, June, 1920.

[2] Roosevelt and Heller, Life-Histories African Game Animals, vol. 2, pp. 599–608. 1914.

our trinomial nomenclature. They are for the most, it would seem, merely such ordinary "individual variations" as exist among all mammals, and such as are especially conspicuous among those bearing horns or antlers. The growth of horn is dependent in a measure rarely appreciated upon the vitality of the individual; and the effects of climatic conditions and other causes, from season to season, with the resulting variations in the food supply, are practically unknown. Several more "forms," based on characters and measurements of skulls and horns, and each differing from any named "race," could be described from our Loita series alone. The attempts to account for certain peculiarities in horn shape in some individual animals by classing the specimens as mixtures ("Bastarde") between two or more named races seem little less than absurd. It is unusual to find two pairs of horns even approximately alike; and in a large series like our Loita and Southern Guaso Nyiro collection of Thomson's gazelles, there is wide diversity between the extremes of variation. This obtains not only for horns, but for shape and relationships of certain variable bones of the skull as well.

I am now able to recognize in the National Museum collection four apparently valid geographical races of this gazelle. One of these, the Athi and Kapiti Plains form, was ignored by Heller; and specimens representing the fourth race, which I have referred to *Gazella thomsonii ruwanæ* Knottnerus-Meyer, have reached the museum since the time of Heller's work. Because of lack of material from certain regions I have not synonymized names for several of the described forms. It is probable that some of these may be recognizable for valid geographic races, although I feel quite confident that the number of names is far too great. Some of these names are discussed under other subspecies, but seven, from the Kilimanjaro region south and westward to the Wembere Steppe, and not mentioned elsewhere, may be listed here as a matter of record. These, with their type localities, are: *Eudorcas schillingsi* Knottnerus-Meyer,[1] between Lake Natron and Kilimanjaro, German East Africa; *E. ndjiriensis* Knottnerus-Meyer,[2] West Ndjiri Swamp, German East Africa; *E. sabakiensis* Knottnerus-Meyer,[3] East Ndjiri Swamp, German East Africa; *E. wembaerensis* Knottnerus-Meyer,[4] Wembere Plains, German East Africa; *E. manyarae* Knottnerus-Meyer,[5] Lake Hohenlohe, south of Lake Eyasi, German East Africa; *E. thomsoni macrocephala* Zukowsky,[6] southern Wembere Plains, German East Africa; and

[1] Sitz.-ber. Ges. nat. Freunde Berlin, 1910, No. 3, p. 113. March, 1910.
[2] Sitz.-ber. Ges. nat. Freunde Berlin, 1910, No. 3, p. 115. March, 1910.
[3] Sitz.-ber. Ges. nat. Freunde Berlin, 1910, No. 3, p. 115. March, 1910.
[4] Sitz.-ber. Ges. nat. Freunde Berlin, 1910, No. 3, p. 119. March, 1910.
[5] Sitz.-ber, Ges. nat. Freunde Berlin, 1910, No. 3, p. 120. March, 1910.
[6] Archiv f. Nat., 80 Jahrg., Abt. A, Heft 1, p. 68. 1914.

E. t. marwitzi, Zukowski,[1] northern Wembere Plains, German East Africa.

For measurements of specimens of the races of *Gazella thomsonii* see tables on pages 119 and 120.

GAZELLA THOMSONII BERGERI (Knottnerus-Meyer).

1910. *Gazella thomsoni* Roosevelt, African Game Trails, Amer. ed., p. 475; London ed., p. 487. (Part.)

1910. *Eudorcas bergeri* Knottnerus-Meyer, Sitz.-ber. Ges. nat. Freunde Berlin, No. 3, p. 116. March. (Near Nairobi, British East Africa; type in Berlin Museum.)

1914. *Gazella thomsoni nasalis* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 2, p. 602. (Part; not of Lönnberg.)

Specimens.—Twelve, as follows:

British East Africa: Juja Farm, 1 (Heatley); Kamiti Farm, 5 (T. Roosevelt, K. Roosevelt, Heatley, Mearns, Heller); Kapiti Plains, 2, including one odd skull (T. Roosevelt, Loring); Ulukenia Hills, 4, including three odd skulls (Loring).

GAZELLA THOMSONII NASALIS Lönnberg.

1908. *Gazella thomsoni nasalis* Lönnberg, Sjöstedt's Kilimandjaro-Meru Exped., Mamm., p. 46. (Northern British East Africa; based on figure in Sclater and Thomas, Book of Antelopes, vol. 2, pl. 68.[2])

1910. *Gazella thomsoni nasalis* Hollister, Smithsonian Misc. Coll., vol. 56, No. 2, p. 6. March 31.

1910. *Gazella thomsoni* Roosevelt, African Game Trails, Amer. ed., p. 475; London ed., p. 487. (Part.)

1910. *Eudorcas baringoensis* Knottnerus-Meyer, Sitz.-ber. Ges. nat. Freunde Berlin, No. 3, p. 109. March. (Lake Solei, south of Lake Hannington British East Africa; type in Berlin Museum.)

1910. *Eudorcas nakuroensis* Knottnerus-Meyer, Sitz.-ber. Ges. nat. Freunde Berlin, No. 3, p. 110. March. (Lake Nakuro, British East Africa; type in Berlin Museum.)

1914. *Gazella thomsoni nasalis* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 2, p. 602. (Part.)

1914. *Eudorcas thomsoni dongilanensis* Zukowsky, Archiv f. Nat., 80 Jahrg., Abt. A, Heft 1, p. 74. (Dogilani Plains, Southern Guaso Nyiro, British East Africa; coll. von Plessen.)

1914. *Eudorcas thomsoni nakuroensis* Zukowsky, Archiv f. Nat., 80 Jahrg., Abt. A, Heft 10, p. 146.

Specimens.—Ninety, from the following localities:

British East Africa: Amala River, 1 (Rainey); Engare Narok, 1 odd skull (Loring); Kabalolot Hill, 21 (Rainey); Laikipia Plateau, 1 (Heller); Lake Elmenteita, 3, including one odd skull (White); Lake Naivasha, 3, including one odd skull (Mearns, Heller, Loring); Lime Springs, 5 (Rainey, K. Roosevelt); Loita Plains, 5, including

[1] Archiv f. Nat., 80 Jahrg., Abt. A, Heft 1, p. 71. 1914.

[2] Name proposed for "the northern variety," as distinguished from the typical form from Kilimanjaro. Lydekker (Cat. Ungulate Mamm. Brit. Mus., vol. 3, p. 85, 1914) states that the type, from "British East Africa," is a mounted skin and skull, number 91.1.6.3, in the British Museum.

one odd skull and one complete skeleton (Rainey, Tarlton); Nakuru, 1 odd skull (K. Roosevelt); Ngare Nyuki River, 2 (Rainey); Palm Springs, 5 (Rainey); Southern Guaso Nyiro River, 30 (Mearns, T. Roosevelt, K. Roosevelt, Loring, Tarlton, Draper, Heller); Telek River, 12, including three odd skulls (Rainey, Johnston).

In Heller's field journal of the Rainey Expedition is an account, dated Kabalolot Hill, April 30, 1911, of a chase on horseback to capture a young Thomson's gazelle. Although only about one week old, this little animal gave Mr. Rainey a hard run of four or five miles before he was overtaken and captured.

As compared with the excellent series from the Sotik our material from northern localities is far from satisfactory. It might be expected that sufficient specimens from the vicinity of Lake Hannington, Lake Nakuro, and Naivasha would make it possible to recognize more forms; but the available material shows no characters of value between specimens from northern and southern localities.

GAZELLA THOMSONII RUWANÆ (Knottnerus-Meyer).

1910. *Eudorcas ruwanae* KNOTTNERUS-MEYER, Sitz.-ber. Ges. nat. Freunde Berlin, No. 3, p. 121. March. (Ruwana Steppe, east of Victoria Nyanza, German East Africa; type in Berlin Museum.)

Specimens.—Two, as follows:

GERMAN EAST AFRICA: Between Guta and Ikoma, 2 (Clark).

This is one of the smallest subspecies of *Gazella thomsonii*. The specimens are virtually topotypes and, considering their small size, are referred to *ruwanæ* without hesitation. Four other forms have been described from nearby localities, some of which are doubtless synonymous with *ruwanæ*. These are *Eudorcas biedermanni* Knottnerus-Meyer,[1] from Schirati, eastern shore of Victoria Nyanza, German East Africa; *E. mundorosica* Knottnerus-Meyer,[2] from Mundorosi Plains, German East Africa; *E. thomsoni behni* Zukowsky,[3] from south of Ikomo, German East Africa, said to be still smaller than *Gazella thomsonii ruwanæ;* and *E. t. seringetica* Zukowsky,[4] from the Seringeti Plains, German East Africa. From further south, in Usukuma, have been described *Eudorcas langheldi* Knottnerus-Meyer,[5] and *E. thomsoni dieseneri* Zukowsky.[6] We have no material from this region.

[1] Sitz.-ber. Ges. nat. Freunde Berlin, 1910, No. 3, p. 110. March, 1910.
[2] Sitz.-ber. Ges. nat. Freunde Berlin, 1910, No. 3, p. 117. March, 1910.
[3] Archiv f. Nat., 80 Jahrg., Abt. A, Heft 1, p. 61. 1914.
[4] Archiv f. Nat., 80 Jahrg., Abt. A, Heft 1, p. 93. 1914.
[5] Sitz.-ber. Ges. nat. Freunde Berlin, 1910, No. 3, p. 111. March, 1910.
[6] Archiv f. Nat., 80 Jahrg., Abt. A, Heft 1, p. 63. 1914.

External measurements of specimens of Gazella thomsonii.

Subspecies and locality.	No.	Sex.	Head and body.	Tail vertebræ.	Hind foot.	Ear.
Gazella thomsonii bergeri.						
B. E. A.:						
Kapiti Plains	162002	Male	1,090	205	350	130
Kamiti Farm	162006	do	1,110	210	350	122
Do	162007	do	1,000	195	325	118
Gazella thomsonii nasalis.						
B. E. A.:						
Ngare Nyuki	182183	Female	1,010	215	310	112
Laikipia Plateau	164024	do	1,100	200	300	.....
Lake Naivasha	163060	Male	1,080	215	335	115
Southern Guaso Nyiro River	163049	do	1,070	265	355	155
Do	163053	do	1,200	205	338	122
Do	163055	do	1,130	240	345	133
Do	163056	do	1,100	190	320	120
Do	164515	do	1,130	240	322	122
Do	164585	do	1,120	225	335	127
Do	163050	Female	1,100	220	310	110
Do	163057	do	1,010	195	315	112
Do	163059	do	1,025	225	340	120
Lime Springs	181864	Male	1,040	205	315	125
Do	181871	do	1,090	235	325	117
Do	181866	Female	1,040	230	310	110
Palm Springs	181875	Male	1,070	220	335	125
Do	181877	do	1,030	225	330	120
Lolta Plains	181880	do	1,080	215	325	125
Do	181883	do	1,020	200	330	130
Kabalolot Hill	181884	do	1,130	190	325	128
Do	181900	do	1,040	190	330	122
Do	181904	do	1,040	255	330	120
Do	181909	do	1,040	220	325	125
Do	181910	do	1,100	220	325	124
Do	181924	do	1,000	200	324	120
Do	181929	do	1,050	250	325	122
Do	181937	do	1,080	225	325	118
Do	181918	Female	1,020	190	300	102
Do	181925	do	1,080	245	327	120
Do	181926	do	1,020	215	305	108
Telek River	181942	Male	1,090	260	323	125
Do	181944	do	1,070	250	330	122
Do	181948	do	1,130	235	330	135
Gazella thomsonii ruwanæ.						
G. E. A.: Between Guta and Ikoma	200862	Male[1]	995	175	310	.....

[1] Height at shoulder, 600.

Measurements of skulls of adult males of Gazella thomsonii.

Subspecies and locality.	No.	Condylo-basal length.	Greatest breadth.	Palatal length.	Front of orbit to tip of premaxilla.	Greatest length of nasals.	Greatest breadth of nasals.	Maxillary tooth row.	Condition of m^3.
G. t. thomsonii.									
B. E. A.: Taveta...	34706	.....	88	.....	.....	49.4	26.9	53.5	Moderately worn.
G. t. bergeri.									
B. E. A.:									
Kapiti Plains...	162002	198	87	104	102	50.7	29.6	57.0	Do.
Do.....	163061	194	84	102	102	54.2	28.4	57.1	Do.
Ulukenia Hills..	163179	192	85	103	102	52.7	28.4	57.4	Considerably worn.
Juja Farm.....	162005	191	86	105	104	52.1	28.8	55.8	Moderately worn.
Kamiti Farm...	162006	194	86	109	107	53.3	30.4	60.6	Do.
Do.....	162007	192	85	100	100	45.8	29.4	56.3	Do.
G. t. nasalis.									
B. E. A.:									
Lake Elmenteita	155426	.....	85	.....	.....	42.4	23.9	57.4	Little worn.
Do.....	155427	198	85	100	100	54.0	26.5	53.3	Moderately worn.
Do.....	155428	195	88	104	104	50.7	29.6	55.5	Do.
Lake Naivasha.	162175	.....	88	102	99	44.7	27.9	60.2	Do.
Do.....	163060	196	88	103	101	48.2	28.5	58.0	Do.
Loita Plains....	181880	197	87	105	103	49.0	29.5	60.3	Considerably worn.
Do.....	181883	202	88	103	109	57.9	28.3	56.6	Much worn.
Do.....	182415	201	88	108	109	48.2	27.8	59.3	Considerably worn.
Do.....	182416	196	88	105	99	38.8	26.3	55.8	Much worn.
SouthernGuaso. Nyiro.	163052	195	85	102	101	46.6	27.3	56.7	Moderately worn.
Do.....	163053	207	93	107	109	54.5	30.8	57.1	Do.
Do.....	163058	188	87	102	98	53.6	28.6	50.5	Much worn.
Do.....	172903	199	88	104	103	50.2	29.4	56.9	Moderately worn.
Kabalolot Hill..	181904	205	84	108	107	49.9	26.6	56.2	Do.
Do.....	181924	195	86	104	100	46.8	27.3	59.0	Do.
Do.....	181929	195	88	105	103	53.5	25.1	55.7	Much worn.
Do.....	181932	199	86	104	101	59.8	30.6	56.8	Considerably worn.
Telek River....	181942	195	90	105	101	46.3	27.9	58.2	Moderately worn.
Do.....	181944	199	88	104	104	53.7	28.3	56.6	Do.
Do.....	181949	198	86	108	105	54.0	30.8	59.1	Do.
Do.....	181954	199	87	105	105	52.8	34.2	57.5	Do.
Engare Narok..	163065	191	88	101	102	52.2	31.6	56.3	Do.
Amala River...	181973	200	92	109	108	52.8	29.9	56.9	Considerably worn

GAZELLA SŒMMERRINGII BERBERANA (Matschie).

1893. *Antilope sœmmeringi berberana* MATSCHIE, Sitz.-ber. Ges. nat. Freunde Berlin, p. 65. (Near Berbera, British Somaliland; type in Berlin Museum.)

Specimens.—Five, as follows:

BRITISH SOMALILAND: Berbera, 5, including two head skins and three skulls (Swayne).

These specimens were received from the Zoological Society of London through Dr. P. L. Sclater.

GAZELLA GRANTI ROBERTSI Thomas.

1903. *Gazella granti robertsi* Thomas, Proc. Zool. Soc. London, vol. 2, p. 119. (Near Mwansa, Speke Gulf, Victoria Nyanza, German East Africa; type in British Museum.)

1910. *Gazella granti robertsi* Roosevelt, African Game Trails, Amer. ed., p. 475; London ed., p. 487.

1914. *Gazella granti robertsi* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 2, p. 588.

Specimens.—Forty, from the following localities:

British East Africa: Everego, 1 (Draper); Loita Plains, 10, including five odd skulls (Rainey); Southern Guaso Nyiro River, 24, including eight odd skulls (T. Roosevelt, K. Roosevelt, Mearns, Heller, Cuninghame, Tarlton); Telek River, 3, including one odd skull (Rainey).

German East Africa: Southwest of Ikomo, on western edge of Serengeti Plains, 2 (Clark).

GAZELLA GRANTI ROOSEVELTI Heller.

Plates 47, 48.

1910. *Gazella granti granti* Hollister, Smithsonian Misc. Coll., vol. 56, No. 2, p. 6. March 31. (Not of Brooke.)

1910. *Gazella granti* Roosevelt, African Game Trails, Amer. ed., p. 475; London ed., p. 487. (Not of Brooke.)

1913. *Gazella granti roosevelti* Heller, Smithsonian Misc. Coll., vol. 61, No. 7, p. 4. July 31. (Kitanga Farm, Athi Plains, British East Africa; type in U. S. National Museum.)

1914. *Gazella granti roosevelti* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 2, p. 590.

Specimens.—Nineteen, from the following localities:

British East Africa: Bondoni, Kapiti Plains, 3 (T. Roosevelt, K. Roosevelt); Kapiti Plains, 2 (T. Roosevelt); Kitanga Farm, 2 (T. Roosevelt, K. Roosevelt); Lake Elmenteita, 2 (White); Lake Naivasha, 1 skull (Mearns); Nairobi, 2 skulls (Mearns); Pagazi River, 2 (Draper); Potha, Kapiti Plains, 2 (Mearns, Loring); Suswa Plains, 2 (Rainey); Tana River, 1 skull (Hepburn).

The weight of an adult male from Kapiti Plains is recorded as 171 pounds.

GAZELLA GRANTI SERENGETÆ Heller.

Plates 48, 49.

1892. *Gazella grantii* True, Proc. U. S. Nat. Mus., vol. 15, p. 473. October 26. (Not *G. granti granti* Brooke.)

1913. *Gazella granti serengetæ* Heller, Smithsonian Misc. Coll., vol. 61, No. 7, p. 5. July 31. (Taveta, British East Africa; type in U. S. National Museum.)

1914. *Gazella granti serengetæ* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 2, p. 596.

Specimens.—Six, from localities as follows:
British East Africa: Taveta, 4 (Abbott).
German East Africa: Mount Kilimanjaro, 2 (Abbott).

GAZELLA GRANTI RAINEYI Heller.

Plate 50.

1910. *Gazella granti notata* Hollister, Smithsonian Misc. Coll., vol. 56, No. 2, p. 7. March 31. (Not of Thomas.)
1910. *Gazella granti notata* Roosevelt, African Game Trails, Amer. ed., p. 475; London ed., p. 487. (Not of Thomas.)
1913. *Gazella granti raineyi* Heller, Smithsonian Misc. Coll., vol. 61, No. 7, p. 6. July 31. (Isiola River, Northern Guaso Nyiro, British East Africa; type in U. S. National Museum.)
1914. *Gazella granti raineyi* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 2, p. 592.

Specimens.—Twenty-nine, from the following localities:
British East Africa: Archer's Post, 3 (Rainey); Engare Ndare River, 3 (Rainey); Isiola River, 3 (Rainey); Laikipia Plateau, 2 (White, K. Roosevelt); Lakiundu River, 1 skull (T. Roosevelt); Marsabit Road, 8 (Rainey); Northern Guaso Nyiro River, 8, including three odd skulls (T. Roosevelt, Heller); Rumathe River, Northern Guaso Nyiro, 1 (Rainey).

The weight of an adult male from Northern Guaso Nyiro is recorded as 115 pounds.

GAZELLA GRANTI BRIGHTI Thomas.

1900. *Gazella granti brighti* Thomas, Proc. Zool. Soc. London, p. 805. (150 miles east of Lado, in Sudan; type in British Museum.)
1900. *G[azella] g[ranti] smithi* Thomas, Proc. Zool. Soc. London, p. 806. (pro *brighti*.)

Specimen.—One, as follows:
Sudan: 160 miles east of Lado, 1 (Smith).

Three described subspecies of Grant's gazelle are not represented by specimens in the National Museum. These are the typical form, *Gazella granti granti* Brooke,[1] from Ugogo, German East Africa; *Gazella granti notata* Thomas,[2] Loroghi Mountains, British East Africa; and *Gazella granti lacuum* Neumann,[3] near Lake Zwai, Abyssinia. Specimens of the closely related *Gazella petersi* Günther, of the coast region of British East Africa, are also lacking.

[1] *Gazella granti* Brooke, Proc. Zool. Soc. London, 1872, p. 602.
[2] Ann. and Mag. Nat. Hist., ser. 6, vol. 20, p. 479. 1897.
[3] Sitz.-ber. Ges. nat. Freunde Berlin, 1906, p. 243.

Genus LITOCRANIUS Kohl.

1886. *Litocranius* Kohl, Ann. Hofmus., Wien, vol. 1, p. 79. (*L. walleri.*)
1887. *Lithocranius* Sclater, Zool. Rec., vol. 23, Mamm., p. 54.

The two described forms of the gerenuk seem poorly differentiated, but our material is hardly adequate for a decision as to the validity of the northern race. The specimens are listed under their respective names on purely geographical grounds.

LITOCRANIUS WALLERI WALLERI (Brooke).

1878. *Gazella walleri* Brooke, Proc. Zool. Soc. London, p. 929. (Coast near Juba River, Italian Somaliland;[1] co-type in British Museum.)
1910. *Lithocranius walleri* Roosevelt, African Game Trails, Amer. ed., p. 475; London ed., p. 487.
1914. *Lithocranius walleri* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 2, p. 610.

Specimens.—Twenty-one, from localities as follows:

British East Africa: Kara Water, Marsabit Road, 2 (Rainey); Kurseine, 1 (Rainey); Lakiundu River, 2 (Rainey); Marsabit Road, 5, including three odd skulls (Rainey); Merelle Water, Marsabit Road, 1 (Rainey); Neuman's Boma, 2 (T. Roosevelt); Northern Guaso Nyiro River, 8, including two odd skulls (K. Roosevelt, Rainey).

LITOCRANIUS WALLERI SCLATERI Neumann.

1897. *Lithocranius walleri* Elliot, Field Mus. Zool. Ser., vol. 1, p. 126. June.
1899. *Lithocranius sclateri* Neumann, Sitz.-ber. Ges. nat. Freunde Berlin, p. 19. (Northern Somaliland.)

Specimens.—Six, from localities as follows:

British Somali: Berbera, 5 (Swayne); Marodijeh, 1 (Elliot).

Genus ORYX Blainville.

1816. *Oryx* Blainville, Bull. Sci. Soc. Philom., p. 75. May. (*Oryx gazella.*)[2]

A subspecies of the oryx, intermediate between *Oryx beisa annectens* and *O. b. callotis*, has recently been described by Lord Rothschild.[3] No definite type locality is given, but the new race is said to inhabit southern British East Africa in the "country between the ranges of *O. g. callotis* and *O. g. annectens.*" This might mean any one of three widely separated regions—near the coast south of the mouth of the Tana River, the country about Makindu on the Uganda Railway, or, still farther to the westward, the Rift Valley south of Mount Suswa. No specimens representing the race are included in the collections of the National Museum. Rothschild treats all the forms

[1] Sclater and Thomas, Book of Antelopes, vol. 3, p. 230. 1898.
[2] *Antilope oryx* Pallas= *Capra gazella* Linnæus.
[3] *Oryx gazella subcallotis* Rothschild, Ann. and Mag. Nat. Hist., ser. 9, vol. 8, p. 209. August, 1921. Type in British Museum.

of *Oryx beisa*, as well as the still more distinct *Oryx leucoryx* of Arabia, as subspecies of the South African *Oryx gazella*, but this view is not in accord with the intergradation theory of subspecies, not even with the extreme theory of "intergradation by characters." The inclusion of these species within the limited genus *Oryx* would seem to show their relationship sufficiently without actually implying direct intergradation.

ORYX BEISA BEISA (Rüppell).

1835. *Antilope beisa* RÜPPELL, Neue Wirbelth. Abyssin., p. 14. (West of Massaua, Eritrea.)

Specimen.—One, as follows:

BRITISH SOMALI: Berbera, 1 (Swayne).

ORYX BEISA GALLARUM Neumann.

1902. *Oryx beisa gallarum* NEUMANN, Sitz.-ber. Ges. nat. Freunde Berlin, p. 99. April. (Balinga Modjo, southern Ennia-Gallaland, Abyssinia; type in Berlin Museum.)

Specimens.—Two, as follows:

ABYSSINIA: Between Adis Ababa and Dire Dawa, 2 (Philip).

Concerning these specimens of the oryx, Hoffman Philip has written to the Museum as follows:

These specimens were shot February 27, 1910, about 8 miles from the camp of Ella Bella, on the Assabot road, between Adis Ababa and Dire Dawa (between 9° and 10° north latitude, 41° and 42° longitude). The oryx, with a band of about five others, were sighted in a depression between two summits (probably a spur of the Obora Mountains), at an altitude of about 4000 feet. A fresh track of a greater Kudu was seen near the same place. This band of oryx apparently ranged over these hills at an altitude of from, perhaps, 4000 to 5500 feet, during the dry season. They are very shy and are frequently hunted by the natives. They walked in a single file when not alarmed. The shots were taken at very long range, part of the band having congregated in the shade of a large thorn tree. The hill was steep, rocky, and bare, except for occasional groups of thorn trees and thickets of thorn bushes; dried grass was plentiful, however. A Wart Hog was seen on one of the hills near by. The oryx displayed great pluck and tenacity of life—the male, though shot through the lungs and with both legs broken at the knees by another shot, made a determined leap with the hind legs when approached, a vicious lunge of the horns barely missing the writer.

ORYX BEISA ANNECTENS Hollister.

1910. *Oryx annectens* HOLLISTER, Smithsonian Misc. Coll., vol. 56, No. 2, p. 7. March 31. (Laikipia Plateau, vicinity of Northern Guaso Nyiro River, British East Africa; type in U. S. National Museum.)

1910. *Oryx beisa annectens* ROOSEVELT, African Game Trails, Amer. ed., p. 475; London ed., p. 487.

1914. *Oryx beisa annectens* ROOSEVELT AND HELLER, Life-Hist. African Game Anim., vol. 1, p. 339.

Specimens.—Twenty-five, from localities as follows:

BRITISH EAST AFRICA: Archer's Post, 4, including one odd skull (Rainey, Heller); Isiola River, 1 (Rainey); Laikipia Plateau, 7

(T. Roosevelt, White, Heller); Northern Guaso Nyiro River, 13, including seven odd skulls (T. Roosevelt, Rainey, K. Roosevelt, Heller).

The weight of a male from the Northern Guaso Nyiro is recorded as 400 pounds.

ORYX BEISA CALLOTIS Thomas.

1892. *O[ryx] callotis* THOMAS, Nature, vol. 45, p. 526. March 31. (East Africa.)
1892. *Oryx callotis* THOMAS, Proc. Zool. Soc. London, p. 195. (Neighborhood of Mount Kilimanjaro, British East Africa; type in British Museum.)
1892. *Oryx callotis* TRUE, Proc. U. S. Nat. Museum, vol. 15, p. 470. October 26.
1914. *Oryx beisa callotis* ROOSEVELT AND HELLER, Life-Hist. African Game Anim., vol. 1, p. 346.

Specimens.—Four, from localities as follows:

BRITISH EAST AFRICA: Taveta, 3, including one odd skull (Abbott); Voi, 1 (Folsom).

Genus EGOCERUS Desmarest.

1822. *Egocerus* DESMAREST, Mamm., vol. 2, p. 475. (*E. leucophæus.*)
1827. *Aegocera* BERTHOLD, Latreille's Fam. Thierr., p. 61. (pro *Egocerus.*)
1827. *Aigocerus* H. SMITH, Griffith's Cuvier's Anim. Kingd., vol. 4, p. 161; vol. 5, p. 324. (*E. leucophæus.*)
1842. *Œgocerus* LESSON, Nouv. Tabl. Règne Anim., Mamm., p. 179. (pro *Egocerus* Desmarest.)
1845. *Ozanna* REICHENBACH, Säugeth., vol. 3, p. 126. (*E. niger.*)
1846. *Hippotragus* SUNDEVALL, K. Vet. Akad. Handl., 1844, p. 196. (*E. leucophæus.*)
1846. *Ægoceros* SUNDEVALL, K. Vet. Akad. Handl., 1844, p. 196. (pro *Egocerus.*)
1859. *Ægocœrus* GERVAIS, Zool. et Paléont. Franç., ed. 2, p. 139. (pro *Egocerus.*)
1914. *Egoceros* ROOSEVELT AND HELLER, Life-Hist. African Game Anim., vol. 1, p. 326. (pro *Egocerus.*)

Two forms of the roan antelope and one form of the sable are known from this region. The distribution of the roan is irregular and broken, and the sable in East Africa is confined to small areas near the coast. Specimens of the roan antelope from German East Africa are particularly desired.

EGOCERUS EQUINUS LANGHELDI (Matschie).

1898. *Hippotragus langheldi* MATSCHIE, Sitz.-ber. Ges. nat. Freunde Berlin, p. 181. (Tabora, German East Africa; Langheld coll.)
1899. *Hippotragus rufo-pallidus* NEUMANN, Proc. Zool. Soc. London, 1898, p. 850. (Upper part of River Bubu, about midway between Irangi and Mount Gurui, German East Africa.)
1910. *Ozanna equinus langheldi* ROOSEVELT, African Game Trails, Amer. ed., p. 475; London ed., p. 486.
1914. *Egoceros equinus langheldi* ROOSEVELT AND HELLER, Life-Hist. African Game Anim., vol. 1, p. 329.

Specimens.—Nine, from the following localities:

BRITISH EAST AFRICA: Eldoma Ravine, 12 miles north, 3 (K. Roosevelt); Kabalolot Hill, 2 (Rainey); Mau Hills, 15 miles north of Ravine, 3 (T. Roosevelt); Sigaa, 1 (Draper).

EGOCERUS EQUINUS BAKERI (Heuglin).

1863. *Hippotragus bakeri* Heuglin, Nov. Act. Acad. Leop.-Carol., vol. 30, Abh., pt. 2, p. 16. (30 miles northwest of Nahut [Gadabi] Mountains, between the upper Atbara and Bahr el Salaam Rivers, near Abyssinian border, Sudan.[1])

1910. *Ozanna equinus bakeri* Roosevelt, African Game Trails, Amer. ed., p. 475; London ed., p. 487.

1914. *Egoceros equinus bakeri* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 1, p. 332.

Specimens.—Six, from localities as follows:

Lado: Rejaf, 1 (T. Roosevelt).

Uganda: Gondokoro, 3, including two odd skulls (Heller, Mearns); Nimule, 60 miles north, 2 (K. Roosevelt).

EGOCERUS NIGER ROOSEVELTI (Heller).

Plate 51.

1910. *Ozanna roosevelti* Heller, Smithsonian Misc. Coll., vol. 54, pt. 6, p. 1. March 3. (Shimba Hills, British East Africa; type in U. S. National Museum.)

1910. *Ozanna roosevelti* Roosevelt, African Game Trails, Amer. ed., p. 475; London ed., p. 486.

1914. *Egoceros niger roosevelti* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 1, p. 333.

Specimens.—Four, as follows:

British East Africa: Shimba Hills, 4, including one odd skull (K. Roosevelt, Falmestock.)

Genus TRAGELAPHUS Blainville.

1816. *Tragelaphus* Blainville, Bull. Sci. Soc. Philom., p. 75. May. (*T. sylvaticus.*)

In addition to the names for bushbucks mentioned in the following pages, and several proposed for species or races in Abyssinia and Belgian Congo, four forms have been described from Uganda, from regions not represented in the Museum collections. These are *Tragelaphus cottoni dodingae* Matschie,[2] Kedef Valley, western foothills of the Dodinga Mountains; *Tragelaphus locorinae* Matschie,[3] Narringepur, south of Dodinga Mountains; *Tragelaphus locorinae laticeps* Matschie,[4] northwestern base of Mount Debasien, north of Mount Elgon; and *Tragelaphus scriptus heterochrous* Cabrera,[5] west slope of Mount Elgon.

[1] Schwarz, Erg. Zweiten Deutschen Zentral-Afrika-Exped. 1910–11, vol. 1, pp. 1007, 1008. June, 1920.
[2] Sitz.-ber. Ges. nat. Freunde Berlin, 1912, p. 556. December, 1912.
[3] Sitz.-ber. Ges. nat. Freunde Berlin, 1912, p. 564. December, 1912.
[4] Sitz.-ber. Ges. nat. Freunde Berlin, 1912, p. 565. December, 1912.
[5] Bol. Real Soc. española Hist. nat., vol. 18, p. 275. 1918.

TRAGELAPHUS SCRIPTUS BOR Heuglin.

1877. *Tragelaphus bor* Heuglin, Reise in Nordost-Afrika, vol. 2, p. 122. ("Req-Sumpfes und in Bongo," Bahr-el-Ghazal, Sudan.)

1910. *Tragelaphus scriptus bor* Roosevelt, African Game Trails, Amer. ed., p. 475; London ed., p. 486.

1912. *Tragelaphus cottoni* Matschie, Sitz.-ber. Ges. nat. Freunde Berlin, p. 552. December. (Farajala, west of Lado, on the Koda, a tributary on the left side of the Bahr-el-Gebel, Lado; type in Powell-Cotton collection, Quex Park, Birchington, Kent, England.)

1912. *Tragelaphus cottoni meridionalis* Matschie, Sitz.-ber. Ges. nat. Freunde Berlin, p. 555. December. (Three days north of Wadelai, Bahr-el-Gebel, Uganda; type in Powell-Cotton collection, Quex Park, England.)

1914. *Tragelaphus scriptus bor* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 2, p. 437.

Specimens.—Seven, from localities as follows:

Lado: Rhino Camp, 6 (T. Roosevelt, K. Roosevelt, Mearns).

Uganda: Sixty miles north of Nimule, 1 (K. Roosevelt).

TRAGELAPHUS SCRIPTUS DELAMEREI Pocock.

1900. *Tragelaphus delamerei* Pocock, Ann. and Mag. Nat. Hist., ser. 7, vol. 5, p. 95. January. (Sayer, northeastern limits of Laikipia Plateau, British East Africa;[1] type in British Museum.)

1905. *Tragelaphus haywoodi* Thomas, Abstract Proc. Zool. Soc. London, No. 21, p. 9. June 13. (Nyeri, British East Africa; type in British Museum.)

1909. *Tragelaphus tjaderi* Allen, Bull. Amer. Mus. Nat. Hist., vol. 26, p. 148. March 19. (Nakuru, British East Africa: type in American Mus. Nat. Hist., New York City.)

1910. *Tragelaphus dama* Hollister, Smithsonian Misc. Coll., vol. 56, No. 2, p. 9. March 31. (Not of Neumann.)

1910. *Tragelaphus scriptus heywoodi* Roosevelt, African Game Trails, Amer. ed., p. 475; London ed., p. 486.

1912. *Tragelaphus haywoodi brunneus* Matschie, Sitz.-ber. Ges. nat. Freunde Berlin, p. 549. December. (West side of Mount Kenia, British East Africa; type in Powell-Cotton collection, Quex Park, Birchington, Kent, England.)

1912. *Tragelaphus eldomae* Matschie, Sitz.-ber. Ges. nat. Freunde Berlin, p. 550. December. (Mau Forest at Eldoma Ravine Station, British East Africa; type in Powell-Cotton collection, Quex Park, Birchington, Kent, England.)

1914. *Tragelaphus scriptus delamerei* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 2, p. 430.

Specimens.—Eighteen, from localities as follows:

British East Africa: Engare Narok River, 2 (Rainey); Guas Ngishu Plateau, 3 (T. Roosevelt, K. Roosevelt); Kabalolot Hill, 1 (Rainey); Lake Naivasha, 4, including two odd skulls (Mearns); Lake Nakuru, 1 (K. Roosevelt); Nyeri, 1 (K. Roosevelt); Nzoia River, Guas Ngishu Plateau, 1 (White); Southern Guaso Nyiro River,

[1] Erroneously given in original description as Sayer, Somaliland; see Roosevelt and Heller, Life-Hist. African Game Anim., vol. 2, p. 430, 1914; Lydekker, Cat. Ungulate Mamm. British Mus., vol. 3, p. 171, 1914.

2 (Mearns); Tana River, 1 odd skull (Stephenson); Telek River, Loita Plains, 1 (Rainey); Ulu Station, 1 odd skull (Rainey).

TRAGELAPHUS SCRIPTUS OLIVACEUS Heller.

Plate 52.

1913. *Tragelaphus scriptus olivaceus* Heller, Smithsonian Misc. Coll., vol. 61, No. 13, p. 1. September 16. (Maji-ya-chumvi, British East Africa; type in U. S. National Museum.)

1914. *Tragelaphus scriptus olivaceus* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 2, p. 434.

Specimens.—Two, as follows:

British East Africa: Maji-ya-chumvi, 2 (Heller).

TRAGELAPHUS SCRIPTUS MASSAICUS Neumann.

1892. *Tragelaphus scriptus roualeynii* True, Proc. U. S. Nat. Mus., vol. 15, p. 471. October 26. (Not of Gordon-Cumming.)

1902. *Tragelaphus massaicus* Neumann, Sitz.-ber. Ges. nat. Freunde Berlin, p. 96. April. (Upper Bubu River, northwestern Irangi, German East Africa; type in Berlin Museum.)

1908. *Tragelaphus sylvaticus meruensis* Lönnberg, Sjöstedt's Kilimandjaro-Meru Exped., Mamm., p. 48. (Meru Steppe, German East Africa; type in R. Nat. Hist. Mus., Stockholm.)

1914. *Tragelaphus scriptus massaicus* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 2, p. 433.

Specimens.—Five, from the following localities:

British East Africa: Mount Mbololo, 2 (Heller); Mtoto Andei 1 odd skull (Heller); Taveta, 2 (Abbott).

Mr. Heller made the following manuscript notes on the type specimen of this race in the Berlin Museum:

Tragelaphus massaicus Neumann. Type, A 5588, ♂. Upper Bubu, O. Neumann. Skin marked type by Neumann. Flat skin, tanned; hair of ears and neck slipped badly. Collar quite distinct; white chevrons, white mane, and three transverse body stripes; white spots on flanks; head and neck ochraceous. Skull of type not labeled by Neumann and now mixed with a lot of others of his, all without labels.

TRAGELAPHUS SCRIPTUS DAMA Neumann.

1902. *Tragelaphus dama* Neumann, Sitz.-ber. Ges. nat. Freunde Berlin, p. 97. April. (Kavirondo, east shore of Victoria Nyanza, British East Africa; type in Berlin Museum.)

1910. *Tragelaphus scriptus dama* Roosevelt, African Game Trails, Amer. ed., p. 475; London ed., p. 486.

1914. *Tragelaphus scriptus dama* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 2, p. 435.

Specimens.—Three, from localities as follows:

Uganda: Kabula Muliro, 1 (T. Roosevelt); Katwe, 2 (K. Roosevelt).

The supposed type-specimen, in the Berlin Museum, is described in Heller's manuscript notes as follows:

Tragelaphus dama Neumann. Skin, ♂, A 5587. Kavirondo, O. Neumann. Flat skin without legs or head (cut in front of collar). Color buffy ochraceous; row of spots on sides and a cluster on flanks; three spots above fore legs also. No skull; native skin only.

TRAGELAPHUS SCRIPTUS SASSÆ Matschie.

1912. *Tragelaphus dianae sassae* Matschie, Sitz.-ber Ges. nat. Freunde Berlin, p. 561. December. (Sassa, Lake Albert Edward, Belgian Congo; type in Powell-Cotton collection, Quex Park, Birchington, Kent, England.)

Specimens.—Six, as follows:

German East Africa: Nyanza, east shore of Lake Tanganyika, 6 (Raven).

These specimens are provisionally referred to *Tragelaphus scriptus sassæ*, no specimens from the type locality being available for comparison. They certainly can not be referred to *T. s. dama* because of their darker color and the presence of indistinct transverse stripes on the sides of the old males, while the single female is conspicuously less marked than females of *dama* or of *massaicus*. The oldest males are not nearly so dark as males of *T. s. delamerei* of comparable age; and are somewhat darker than specimens of *T. s. massaicus*. The series includes four adult males, one young male, and one adult female. There is great variation among the skins of males, no two being alike. Some show a distinct row of white spots along the flanks and a group of such markings on the hind quarters. Five or six light transverse stripes are faintly indicated in some, and the dorsal crest is usually whitish over the posterior two-thirds of its length. The female skin is much more reddish than any of the males.

Genus LIMNOTRAGUS Sclater and Thomas.

1872. *Hydrotragus* Gray, Cat. Rum. Mamm. British Mus., p. 49. (*L. spekii;* not of Fitzinger, 1866.)

1900. *Limnotragus* Sclater and Thomas, Book of Antelopes, vol. 4, p. 90. (*L. spekii.*)

Only a single specimen of the rare sitatunga is contained in the East African collections.

LIMNOTRAGUS SPEKII (Sclater).

1863. *Tragelaphus spekii* Sclater, in Speke's Journ. of Discovery of Source of the Nile, p. 223. (Karague, west of Victoria Nyanza, German East Africa; type in British Museum.)

1910. *Limnotragus spekii* Roosevelt, African Game Trails, Amer. ed., p. 475; London ed., p. 486.

1914. *Limnotragus spekei* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 2, p. 440.

Specimen.—One, as follows:

UGANDA: Kampala, 1 (K. Roosevelt).

Matschie has described a sitatunga from south of Victoria Nyanza at Sindi, Ugalla, German East Africa, naming it *Tragelaphus* (*Limnotragus*) *ugallae*.[1]

Genus STREPSICEROS Smith.

1815. *Strepsiceros* RAFINESQUE, Anal. Nat., p. 56. (*Nomen nudum.*)
1827. *Strepsiceros* HAMILTON SMITH, Griffith's Cuvier's Anim. Kingd., vol. 5, p. 365. (*S. strepsiceros.*)
1837. *Calliope* OGILBY, Proc. Zool. Soc. London, vol. 4, 1836, p. 138. June. (*S. strepsiceros;* not of Gould, 1836.)
1908. *Strepsicerastes* KNOTTNERUS-MEYER, Archiv f. Nat., Jahrg. 69, vol. 2, Jahresb., Mamm. f. 1902, p. 113. (*S. imberbis.*)
1910. *Strepsicerella* ZUKOWSKY, Wild und Hund, vol. 16, No. 12, p. 206. March 25. (*S. imberbis.*)
1912. *Ammelaphus* HELLER, Smithsonian Misc. Coll., vol. 60, No. 8, p. 15. November 2. (*S. imberbis.*)

The greater and lesser koodoos have been placed in different genera by some recent authors. Schwarz [2] has lately reviewed the subject, and includes both species in a comprehensive genus *Tragelaphus*, which includes also the bushbucks, sitatungas, and nyalas. Schwarz places the bongo in the genus *Taurotragus*.

STREPSICEROS IMBERBIS AUSTRALIS (Heller).

Plate 53.

1913. *Ammelaphus imberbis australis* HELLER, Smithsonian Misc. Coll., vol. 61, No. 13, p. 2. September 16. (Longaya Water, Marsabit district, British East Africa; type in U. S. National Museum.)
1914. *Ammelaphus imberbis australis* ROOSEVELT AND HELLER, Life-Hist. African Game Anim., vol. 2, p. 445.

Specimens.—Two, as follows:

BRITISH EAST AFRICA: Longaya Water, Marsabit Road, 2 (Rainey, Johnston).

STREPSICEROS STREPSICEROS BEA Heller.

Plate 54.

1910. *Strepsiceros strepsiceros* ROOSEVELT, African Game Trails, Amer. ed., p. 475; London ed., p. 486.
1913. *Strepsiceros strepsiceros bea* HELLER, Smithsonian Misc. Coll., vol. 61, No. 13, p. 3. September 16. (Donyo Gelsha, on the escarpment east of Lake Baringo, British East Africa; type in U. S. National Museum.)
1914. *Strepsiceros strepsiceros bea* ROOSEVELT AND HELLER, Life-Hist. African Game Anim., vol. 2, p. 449.

---

[1] Jahrb. Inst. Jagdkunde, vol. 2, pt. 4, p. 179, fig. 88, 1913.

[2] Huftiere aus West-und Zentralafrika, Ergebnisse der Zweiten Deutschen Zentral-Afrika-Expedition 1910–911 vol. 1, Zoologie, p. 1026. June, 1920.

Specimens.—Three, from localities as follows:

BRITISH EAST AFRICA: "British East Africa," 1 skull (Ellis); Donyo Gelsha, on the escarpment east of Lake Baringo, 2 (K. Roosevelt).

Of the pair of greater koodoos collected by Kermit Roosevelt near Lake Baringo, the male has been mounted and is now on exhibition; the female is the type.

Genus BOOCERCUS Thomas.

1850. *Euryceros* GRAY, Glean. Menag. Knowsley Hall, p. 27. (*B. eurycerus;* not *Euryceros* Lesson, 1830.)

1902. *Boocercus* THOMAS, Ann. and Mag. Nat. Hist., ser. 7, vol. 10, p. 309. October. (*B. eurycerus.*)

1905. *Boocerus* TROUESSART, Cat. Mamm., Suppl., Fasc. 3, p. 731. (pro *Boocercus.*)

Most of the known specimens of the East African bongo were purchased from natives and are therefore without definite history as to exact locality and other information. The National Museum is fortunate in possessing three specimens, a male, female, and young, killed by white hunters and with complete data.

BOOCERCUS ISAACI Thomas.

1902. *Boocercus eurycerus isaaci* THOMAS, Ann. and Mag. Nat. Hist., ser. 7, vol. 10, p. 309. October. (Eldoma Ravine, British East Africa; type in British Museum.)

1910. *Boöcerus eurycerus isaaci* HOLLISTER, Smithsonian Misc. Coll., vol. 56, No. 2, p. 9. March 31.

1910. *Boocercus isaaci* ROOSEVELT, African Game Trails, Amer. ed., p. 475.

1914. *Boocercus eurycerus isaaci* ROOSEVELT AND HELLER, Life-Hist. African Game Anim., vol. 2, p. 452.

Specimens.—Eight, from localities as follows:

BRITISH EAST AFRICA: Enjoro, Mau Forest, 2 (K. Roosevelt); Mau Escarpment, 5 (White, Ross, McMillan); near Nakuro, Mau Forest, 1 (Grey).

The two specimens, female and young, shot by Kermit Roosevelt at Enjoro, and the old male shot by George Grey and presented by him to the collection of the Smithsonian African Expedition, through Col. Theodore Roosevelt, are complete specimens with skulls. The skull of the young animal shows the milk dentition. The five skins presented by John Jay White, W. N. McMillan, and Maj. C. J. Ross were all purchased from natives, but were said to come from the forests of the Mau Escarpment. The skins all vary remarkably in the number and width of the lateral body stripes. These range from from 10 to 14 in number, and in only three skins are alike in number on right and left side. Some of the skins have the stripes broad while in others the stripes are very narrow. There is likewise great

variation in the amount of blackish on the head, neck, limbs, and underparts. The adult female skin lacks almost entirely the blackish underparts of the male.

Genus TAUROTRAGUS Wagner.

1822. *Oreas* Desmarest, Mamm., vol. 2, p. 471. (*T. oryx;* not of Hubner, 1806.)
1855. *Taurotragus* Wagner, Suppl. Schreber's Säug., vol. 5, p. 438. (*T. oryx.*)
1891. *Doratoceros* Lydekker, Field, London, vol. 78, p. 130. July 25. (*T. oryx.*)
1894. *Orias* Lydekker, Royal Nat. Hist., vol. 2, p. 267. (pro *Oreas.*)

The eland is well represented in the collections from British East Africa, and specimens of the giant eland were secured by the Smithsonian African Expedition in Lado.

TAUROTRAGUS ORYX PATTERSONIANUS Lydekker.

1906. *T[aurotragus] oryx pattersonianus* Lydekker, Field, London, vol. 108, p. 579. September 29. (Laikipia Plateau, British East Africa; type in British Museum.[1])
1910. *Taurotragus oryx pattersonianus* Hollister, Smithsonian Misc. Coll., vol. 56, No. 2, p. 10. March 31.
1910. *Taurotragus oryx livingstonii* Roosevelt, African Game Trails, Amer. ed., p. 475; London ed., p. 486. (Not of Sclater.)
1914. *Taurotragus oryx pattersonianus* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 2, p. 467.

Specimens.—Fourteen, from localities as follows:

British East Africa: Guas Ngishu Plateau, 1 (White); Kilima Kui, Kapiti Plains, 1 (T. Roosevelt); Laikipia Plateau, 2, including one odd skull (T. Roosevelt); Lime Springs, Sotik, 1 (Rainey); Loita Plains, Sotik, 2 odd skulls (Rainey, Johnston); Nairobi, 1 (Tarlton); Northern Guaso Nyiro, 2, including one odd skull (K. Roosevelt, Heller); Southern Guaso Nyiro, 4 (T. Roosevelt, K. Roosevelt, Heller).

TAUROTRAGUS GIGAS (Heuglin).

1863. *Boselaphus gigas* Heuglin, Nov. Act. Acad. Caes. Leop., vol. 30, art. 2, p. 19. (West of the upper White Nile, 7° north, Bahr-el-Ghazal, Sudan; type in Stuttgart Museum.[2])
1910. *Taurotragus gigas* Roosevelt, African Game Trails, Amer. ed., p. 475; London ed., p. 486.
1914. *Taurotragus derbianus gigas* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 2, p. 459.

Specimens.—Three, as follows:

Lado: Twenty-five miles west of Rejaf, 3, including one odd skull (K. Roosevelt, T. Roosevelt).

[1] Erroneously stated in original description that the type-specimen came from Portuguese East Africa; see Lydekker, Novit. Zool., 1907, p. 324.

[2] Schwarz, Zweiten Deutschen Central-Afrika-Exped. 1910–11, vol. 1, p. 1023. June, 1920.

Order PERISSODACTYLA.

Family EQUIDÆ.

Genus EQUUS Linnæus.

1758. *Eqvus* Linnæus, Syst. Nat., ed. 10, vol. 1, p. 73. (*E. caballus.*)
1762. *Equus* Brisson, Regn. Anim., ed. 2, p. 12. (*E. caballus.*)
1841. *Hippotigris* Hamilton Smith, Jardine's Nat. Libr., Mamm., vol. 12, p. 321. (*E. zebra.*)
1912. *Megacephalon* Hilzheimer, Abh. Senckenberg. Nat. Ges., vol. 31, p. 95. (*E. grevyi;* not of Temminck, 1844, Gray, 1846.)
1912. *Dolichohippus* Heller, Smithsonian Misc. Coll., vol. 60, No. 8, p. 1. November 2. (*E. grevyi.*)
1913. *Ludolphozecora* Griffini, Atti Soc. Italiana Sci. Nat. Mus. Milano, vol. 51, p. 382. March. (*E. grevyi;* pro *Megacephalon* Hilzheimer.)

The common quagga-zebra group and the Grevy zebra group have both been recognized as full genera by various authors, but there does not seem to be valid reason for their exclusion from the genus *Equus*. If it is desirable to divide the genus into subgenera, then I should recognize both *Hippotigris* and *Dolichohippus* as such, giving them equal rank with *Asinus* and typical *Equus*.

EQUUS GREVYI GREVYI Oustalet.

1882. *Equus grevyi* Oustalet, La Nature, vol. 10, pt. 2, p. 12. June 3. (Abyssinia; based on living example in Jardin des Plantes, Paris.)
1898. *E[quus] faurei* Matschie, Sitz.-ber. Ges. nat. Freunde Berlin, p. 170. November. (Abyssinia.)
1910. *Equus grevyi* Roosevelt, African Game Trails, Amer. ed., p. 474; London ed., p. 486.
1912. *Dolichohippus grevyi* Heller, Smithsonian Misc. Coll., vol. 60, No. 8, p. 1. November 2.
1914. *Dolichohippus grevyi* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 2, p. 700.
1915. *Equus grevyi* Hay, Proc. U. S. Nat. Mus., vol. 48, p. 554. April 8.

Specimens.—Nineteen, from the following localities:

Abyssinia: "Abyssinia," 2, including one complete skeleton (Menelik, Bureau of Animal Industry); Arussi, 1 (Makonnen).

British East Africa: Archer's Post, 2 (Rainey); Lakiundu River, 2 (Rainey); Longaya Water, Marsabit Road, 1 (Rainey); Northern Guaso Nyiro River, 11, including three odd skulls (K. Roosevelt, T. Roosevelt).

A subspecies of *Equus grevyi* from Somaliland, *E. g. berberensis*, has been described by Pocock.[1] No specimens representing this form are in the collection.

One of the Abyssinian specimens listed above was presented to President Roosevelt by Emperor Menelik of Abyssinia in 1904 and

[1] Ann. and Mag. Nat. Hist., ser. 7, vol. 10, p. 308. October, 1902.

was deposited in the National Zoological Park, where it lived until December 4, 1919. Three of the Roosevelt specimens from the Northern Guaso Nyiro are mounted in an exhibition group showing zebra and oryx.

EQUUS QUAGGA BÖHMI Matschie.

1892. *Equus böhmi* MATSCHIE, Sitz.-ber Ges. nat. Freunde Berlin, p. 131. October. (Pangani River, German East Africa; type in Berlin Museum.)

1914. *Equus quagga böhmi* ROOSEVELT AND HELLER, Life-Hist. African Game Anim., vol. 2, p. 693.

Specimen.—One, as follows:

BRITISH EAST AFRICA: Mtoto Andei, 1 (Heller).

Mr. Heller made the following note on the type-specimen of this race, which he examined in Berlin:

Equus böhmi Matschie. Type A 5589. Pangani. Kuhnert Coll. Flat skin, without head, tail, or legs; tanned. Shadow stripes only on hips and thighs, and only on outside, disappearing on flanks and inside of thighs.

EQUUS QUAGGA GRANTI de Winton.

1896. *Equus burchelli granti* DE WINTON, Ann. and Mag. Nat. Hist., ser. 6, vol. 17, p. 319. April. (Thika River Valley,[1] British East Africa; type in British Museum.)

1910. *Equus burchelli granti* HOLLISTER, Smithsonian Misc. Coll., vol. 56, No. 2, p. 10. March 31.

1910. *Equus burchelli granti* ROOSEVELT, African Game Trails, Amer. ed., p. 474; London ed., p. 486.

1911. *Equus quagga*, var. *goldfinchi* RIDGEWAY, Nature, London, vol. 86, p. 245. April 20. (Rift Valley, British East Africa.)

1912. *Hippotigris burchelli granti* HELLER, Smithsonian Misc. Coll., vol. 60, No. 8, p. 3. November 2.

1914. *Equus quagga granti* ROOSEVELT AND HELLER, Life-Hist. African Game Anim., vol. 2, p. 687.

1915. *Equus quagga granti* HAY, Proc. U. S. Nat. Mus., vol. 48, p. 555. April 8.

Specimens.—Sixty-six, from the following localities:

BRITISH EAST AFRICA: Agate's, Southern Guaso Nyiro, 9 (Mearns, Rainey, T. Roosevelt, Loring); Athi Plains, 2 odd skulls (Eagle); Guas Ngishu Plateau, 3, including two odd skulls (Stephenson, White); Kabalolot Hill, 8, including one odd skull (Rainey); Kamiti Farm, 3, including two odd skulls (T. Roosevelt); Kapiti Plains, 3 odd skulls (Loring, Mearns); Kasorongai River, West Kenia, 1 odd skull (Mearns); Kedong Valley, 1 (Rainey); Kilima Kui, Kapiti Plains, 1 (K. Roosevelt); Kitanga Farm, 3 (T. Roosevelt); Lake Baringo, 2 odd skulls (K. Roosevelt); Lime Springs, Sotik, 1 (Heller); Loita Plains, 3 (Rainey); Nairobi, 2 odd skulls (Mearns); Palm Springs, Loita Plains, 1 (Rainey); Southern Guaso Nyiro River, 10, including seven odd skulls (T. Roosevelt, Loring, Mearns, Tarlton); Suswa Plains, 2 (Rainey); Tana River, 2 odd skulls (Hepburn, Witherill);

[1]See Lydekker, Cat. Ungulate Mamm. Brit. Mus., vol. 5, p. 31. 1916.

Telek River, Loita Plains, 2 (Rainey); Ulukenia Hills, 3 odd skulls (Loring); West Kenia Plains, 4 (Loring).

A male specimen of this zebra from Kitanga Farm weighed 650 pounds.

EQUUS QUAGGA CUNINGHAMEI Heller.

Plate 55.

1914. *Equus quagga cuninghamei* Heller, Smithsonian Misc. Coll., vol. 61, No. 22, p. 3. January 26. (Archer's Post, Northern Guaso Nyiro River, British East Africa; type in U. S. National Museum.)

1914. *Equus quagga cuninghamei* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 2, p. 694.

Specimens.—Three, as follows:

British East Africa: Archer's Post, 3, including one odd skull (Heller).

Family RHINOCEROTIDÆ.

Genus DICEROS Gray.

1821. *Diceros* Gray, London Med. Repos., vol. 15, p. 306. April 1. (*D. bicornis.*)

1827. *Dicerus* Billberg, Syn. Faunæ Scandinaviæ, vol. 1, Mamm., tab. A.

1841. *Opsiceros* Gloger, Handb. Naturg., vol. 1, p. 125. (*D. bicornis.*)

1862. *Rhinaster* Gerrard, Cat. Bones Mamm. Brit. Mus., p. 282. (Not of Gloger, 1841.)

1867. *Keitloa* Gray, Proc. Zool. Soc. London, p. 1025. (*R. keitloa* Gray=*D. bicornis.*)

Although the museum collection contains a splendid series of specimens of the black, or hook-lipped, rhinoceros from East Africa, no specimens of the typical *Diceros bicornis* from South Africa are available for comparison.

DICEROS BICORNIS HOLMWOODI (Sclater).

1892. *Rhinoceros bicornis* True, Proc. U. S. Nat. Mus., vol. 15, p. 479. October 26.

1893. *Rhinoceros bicornis holmwoodi* Sclater, Proc. Zool. Soc. London, p. 517. (Probably Udulia, northeastern Usukuma, 50 miles south of Speke Gulf, German East Africa; type in British Museum.)

1910. *Diceros bicornis* Roosevelt, African Game Trails, Amer. ed., p. 474; London ed., p. 486.

1914. *Diceros bicornis bicornis* Roosevelt and Heller, Life-Hist. African Game Anim., vol. 2, p. 651.

Specimens.—Thirty-three, from the following localities:

Uganda: Gondokoro, 1 skull (Heller).

British East Africa: Amala River, 1 skull (Rainey); Juja Farm, 1 (T. Roosevelt); Kasorongai River, 4 skulls (Mearns); Kilima Kui, 1 (T. Roosevelt); Lake Naivasha, 1 skull (Mearns); Meru, 1 skull (K. Roosevelt); Mikindu, 10 miles northwest of, 1 skull (Ellis); Mount Elgon, northeast foothills, 1 pair horns only (White); Mount Kenia, 1 skull (Clark); Nairobi, 1 skull (Percival); Southern Guaso Nyiro River, 11, including six odd skulls (T. Roosevelt, K. Roosevelt,

Heller, Mearns, Loring, Cuninghame); Tana River, 3 skulls (Hepburn, Perie, Witherill); Taveta, 4, including one fetus and one odd skull (Abbott); Telek River, Loita Plains, 1 (Rainey).

Six of the above listed specimens include the skeletons.

Not having seen specimens of typical *Diceros bicornis* of South Africa in this connection, I am unable to add any information regarding the validity of the East African subspecies of the black rhinoceros. Some recent authors have refused to recognize *holmwoodi* as a distinct race, but it would seem almost unbelievable that the animals of British East Africa and Uganda could not be distinguished by some character from those of South Africa.

DICEROS BICORNIS SOMALIENSIS (Potocki).

1900. *Rhinoceros bicornis somaliensis* POTOCKI, Sport in Somaliland, p. 82. (Ogaden, Abyssinia.)

1914. *Diceros bicornis somaliensis* ROOSEVELT AND HELLER, Life-Hist. African Game Anim., vol. 2, p. 656.

Specimens.—Seven, from the following localities:

BRITISH EAST AFRICA: Archer's Post, 1 skull (Rainey); Isiola River, 2, including one fetus (Rainey); Lakiundu River, 3, including one fetus and one odd skull (Rainey); Longaya Water, Marsabit Road, 1 skull (Rainey).

Not all of these specimens from the Northern Guaso Nyiro region are typical of *somaliensis*, but the series as a whole seems best referred to that race rather than to the subspecies *holmwoodi* of the region from Mount Kenia southward in British and German East Africa. The name *Rhinoceros cucullatus* Wagner, 1835,[1] given to an animal of unknown origin and doubtfully attributed to Abyssinia, seems quite unidentifiable but perhaps refers to an Asiatic species. The type-specimen is said to be in the museum at Munich and if so its status might be determined.[2] *Rhinoceros brucii* Lesson,[3] listed by Schwarz [4] as a valid name based on Blainville's *Rhinocéros d'Abissinie*,[5] with type-locality at Tscherkin, between the Bahr Salaam and the Atbara Rivers, northwestern Abyssinia, is a *nomen nudum*.

Genus CERATOTHERIUM Gray.

1867. *Ceratotherium* GRAY, Proc. Zool. Soc. London, p. 1027. (*C. simum.*)

The splendid series of specimens of the white, or square-lipped, rhinoceros, collected by Col. Theodore Roosevelt and party in the Lado Enclave, gives the Museum a good representation of this rare mammal.

[1] Schreber's Säugth., vol. 6, p. 317, pl. 317F. 1835.

[2] Schwarz (Ergebnisse der Zweiten Deutschen Zentral-Afrika-Exped. 1910–11, vol. 1, p. 871, June, 1920), however, writes: "Typus im Münchener Museum; nach frdl. Mitteilung von Prof. Leisewitz vielleicht ein Artefakt."

[3] Nouv. Tabl. Règne Anim., Mamm., p. 159. 1842.

[4] Ergebnisse der Zweiten Deutschen Zentral-Afrika-Exped. 1910–11, vol. 1, p. 870. June, 1920.

[5] Journ. Phys., vol. 85, p. 168. 1817.

CERATOTHERIUM COTTONI (Lydekker).

1908. *Rhinoceros simus cottoni* LYDEKKER, London Field, vol. 111, p. 319. February 22. (Lado Enclave; type in British Museum.)
1910. *Diceros simus cottoni* ROOSEVELT, African Game Trails, Amer. ed., p. 474; London ed., p. 486.
1913. *Ceratotherium simum cottoni* HELLER, Smithsonian Misc. Coll., vol. 61, No. 1, pp. 2 and 19.
1914. *Ceratotherium simum cottoni* ROOSEVELT AND HELLER, Life-Hist. African Game Anim., vol. 2, p. 660.

Specimens.—Seventeen, as follows:

SUDAN: Bahr-el-Ghazal District, 3 skulls (Prentice, Davidson).

LADO: Rhino Camp, 14, including five skeletons, one fetus, and eight odd skulls (T. Roosevelt, K. Roosevelt, Heller).

Three specimens collected by Colonel Roosevelt at Rhino Camp, male, female, and young, are mounted in an exhibition group.

Order PROBOSCIDEA.

Family ELEPHANTIDÆ.

Genus LOXODONTA Vigors.

1827. *Loxodonta* [VIGORS], Zool. Journ., vol. 3, p. 140. January. (*L. africana.*)

Until a satisfactory revision of the African elephants, based upon the material contained in all of the museums of the world, has been made, it will be impossible to say how many of the described forms are really distinct, or to allocate specimens to them with any degree of accuracy. There are unquestionably a number of valid subspecies and nothing is to be gained, at present, by grouping specimens under one name if they can be fairly well sorted geographically under the various described races. The actual distinguishing characters of the subspecies are imperfectly known, as the forms have been described on different features of the anatomy, without comparison of proper material.

LOXODONTA AFRICANA ALBERTENSIS (Lydekker).

1906. *Elephas africanus albertensis* LYDEKKER, Field, London, vol. 107, p. 1089. June 30. (Southern end of Albert Nyanza, Belgian Congo or Uganda; type in British Museum.)
1910. *Elephas africanus peeli* ROOSEVELT, African Game Trails, Amer. ed., p. 476; London ed., p. 487. (Part.)
1914. *Loxodonta africana capensis* ROOSEVELT AND HELLER, Life-Hist. African Game Anim., vol. 2, p. 715. (Part; not of Cuvier.)

Specimens.—Four, from localities as follows:

LADO: Rhino Camp, 2 odd skulls (Mearns, Heller).

UGANDA: Kibala, 1 ear (Draper); Kisingo, 1, skull and ears only (T. Roosevelt).

Only one elephant from the Congo is in the National Museum collection, and this is insufficient as a basis of comparison with *Loxodonta africana africana,* the type locality of which has been fixed by Heller in the Congo Basin.[1]

The specimens listed above, from western Uganda and Lado, which may possibly represent two forms, are likewise insufficient for satisfactory comparison with *Loxodonta africana peeli* of British East Africa. They are here recorded under *albertensis* on geographical grounds alone, and the distinction of this race from earlier named forms is by no means clear. Roosevelt and Heller included all of the described forms of East African elephants, excepting *oxyotis* of the Blue Nile region, with the South African *Loxodonta africana capensis.* This is unquestionably wrong, as the South African elephant represents a subspecies quite distinct from the East African races. How many of the East African subspecies will eventually stand is of course uncertain, but *Loxodonta africana knochenhaueri* (Matschie),[2] described from Barikiwa, southern German East Africa, is probably a valid form, distinct from *peeli* of the Kenia region in British East Africa.

The male from Kisingo, Uganda, was shot by Colonel Roosevelt, December 28, 1909. The field catalogue gives its height as 10 feet, 9 inches.

LOXODONTA AFRICANA PEELI (Lydekker).

1907. *Elephas africanus peeli* LYDEKKER, Proc. Zool. Soc. London, p. 393. August. (Aberdare Mountains, British East Africa; type in collection of C. V. A. Peel, Oxford, England.)

1910. *Elephas africanus peeli* ROOSEVELT, African Game Trails, Amer. ed., p. 476; London ed., p. 487. (Part.)

1914. *Loxodonta africana capensis* ROOSEVELT AND HELLER, Life-Hist. African Game Anim., vol. 2, p. 715. (Part; not of Cuvier.)

Specimens.—Eleven, from localities as follows:

BRITISH EAST AFRICA: Meru, 10 to 15 miles east of Boma, 7, including one complete skin and skull, one skull with skeleton, two odd skulls, and three pairs of ears (T. Roosevelt, Heller, K. Roosevelt); Mount Kenia, west slope at 7,000 to 8,500 feet, 2, including one complete skin and skeleton and one odd tooth (T. Roosevelt, Mearns); Nyeri, 1, teeth only (Mearns); Southern Guaso Nyiro River, 1 skull only (Mearns).

LOXODONTA AFRICANA CAVENDISHI (Lydekker).

1907. *Elephas africanus cavendishi* LYDEKKER, Proc. Zool. Soc. London, p. 395. August. (Lake Rudolf, British East Africa; type in British Museum.)

1914. *Loxodonta africana capensis* ROOSEVELT AND HELLER, Life-Hist. African Game Anim., vol. 2, p. 715. (Part; not of Cuvier.)

[1] Roosevelt and Heller, Life-Hist. African Game Anim., vol. 2, pp. 715, 716. 1914.

[2] *Elephas africanus knochenhaueri* Matschie, Sitz.-ber. Ges. nat. Freunde Berlin, 1900, p. 197.

Specimen.—One, as follows:

British East Africa: Koya Water, Marsabit Road, 1 skull (Rainey).

The tusks of this elephant, a female, were extraordinarily long. They were retained as trophies by Mr. Rainey, but were measured at the National Museum, before they were sent to him in June, 1920. At that time the heaviest tusk weighed 28 pounds, and the two measured 5 feet, 7 inches, and 5 feet, 10 inches, respectively.

LOXODONTA AFRICANA OXYOTIS (Matschie).

1900. *Elephas* (*Loxodonta*) *oxyotis* Matschie, Sitz.-ber. Ges. nat. Freunde Berlin, p. 196. (Upper Atbara River, Abyssinia; type in Berlin Mus.)

1914. *Loxodonta africana oxyotis* Roosevelt and Heller, Life Hist. African Game Anim., vol. 2, p. 739.

1914. *Elephas oxyotis* Baker, Rep. Nat. Zool. Park, Ann. Rep. Smithsonian Inst., 1914, p. 77.

Specimen.—One, as follows:

Sudan: Blue Nile, 1 skin and skull (National Zoological Park).

This specimen, a male, was received alive at the National Zoological Park, August 8, 1913, from the Government Zoological Garden, Giza, Egypt. At that time it was 5 feet, 5½ inches, high at the shoulder, and weighed 1,700 pounds. It died June 28, 1916.

Order HYRACOIDEA.

Family PROCAVIIDÆ.

Genus PROCAVIA Storr.

1780. *Procavia* Storr, Prodr. Meth. Mamm., tab. B. (*P. capensis.*)

1783. *Hyrax* Hermann, Tab. Aff. Anim., p. 115. (*P. capensis.*)

1868. *Euhyrax* Gray, Ann. and Mag. Nat. Hist., ser. 4, vol. 1, p. 46. January. (*P. habessinica.*)

Specimens of hyraxes of the restricted genus *Procavia* are not in the collection in sufficient numbers, excepting from Mount Kenia, nor from enough localities, to form the basis for any intelligent study of the genus in East Africa. The distribution of *Procavia* is evidently greatly restricted, as it seems doubtful if the collectors have overlooked the animals at many points where they occur.

For measurements of specimens see page 141.

PROCAVIA HABESSINICA HABESSINICA (Ehrenberg).

1828. *Hyrax habessinicus* Ehrenberg, Symb. Phys., Mamm., dec. 1, sig. g. (Abyssinia; type in Berlin Museum.)

Specimen.—One, as follows:

Eritrea: Ali Bereb, Asmara, 1 (Rosenberg).

PROCAVIA MACKINDERI MACKINDERI Thomas.

1900. *Procavia mackinderi* THOMAS, Proc. Zool. Soc. London, p. 176. (Teleki Valley, 13,000 feet, Mount Kenia, British East Africa; type in British Museum.)

1910. *Procavia mackinderi* ROOSEVELT, African Game Trails, Amer. ed., pp. 472, 483; London ed., pp. 484, 494.

Specimens.—Twenty-two, as follows:

BRITISH EAST AFRICA: West side of Mount Kenia from 13,000 to 15,500 feet altitude, 22, including one odd skull (Mearns, Loring).

This series includes only seven adult animals, and the majority of the specimens are quite young.

Mr. Loring, who collected many of our specimens on Mount Kenia, has the following interesting account of the animal in Appendix C of Colonel Roosevelt's African Game Trails:

On Mount Kenia at altitudes between 12,000 and 15,000 feet we found these animals common wherever protective rocks occurred. Under the shelving rocks were great heaps of their droppings, and in the places where for centuries they had sunned themselves the stone was stained and worn smooth. At all times of the day, but more frequently after the sun had risen, they could be seen singly, in pairs, and in families, perched on the peaks. At our highest camp (14,700 feet), where on the 22d of September more than half an inch of ice formed in buckets of water outside the tent, they were often heard. They emit a variety of chatters, whistles, and cat-like squalls that can not be described in print, and we found them very noisy. Whenever they saw any one approaching they always sounded some note of alarm, and frequently continued to harangue the intruder until he had approached so close that they took fright and disappeared in the rocks or until he had passed. All along the base of cliffs and leading from one mass of rocks to another they made well-worn trails through the grass. At this time of the year many young ones about one-third grown were seen and taken.

PROCAVIA MACKINDERI ZELOTES Osgood.

1910. *Procavia mackinderi zelotes* OSGOOD, Field Mus. Nat. Hist., Zool. ser., vol. 10, No. 2, p. 5. February. (Between Naivasha and Kijabe, British East Africa; type in Field Mus. Nat. Hist., Chicago.)

Specimens.—Seven, from localities as follows:

BRITISH EAST AFRICA: Loita Plains, 1 (Heller); Mount Gargues, 1 (Heller); Mount Lololokwi, 2 (Heller); Rumathe River, 1 (Heller); Suswa Plains, 2 (Heller).

These specimens of the large-toothed, typical *Procavia* from points in British East Africa from the mountains north of the Northern Guaso Nyiro River south to the Loita, as listed above, all agree in general appearance and are readily distinguished from *Procavia jacksoni* by the cranial characters alone.

PROCAVIA JACKSONI JACKSONI Thomas.

1900. *Procavia jacksoni* THOMAS, Proc. Zool. Soc. London, p. 176. (Ravine Station, British East Africa; type in British Museum.)

Specimens.—Two, as follows:

BRITISH EAST AFRICA: Naivasha Station, 2 (Loring).

Although these specimens were collected not far from the type locality of *Procavia mackinderi zelotes* Osgood, which is between Naivasha and Kijabe, they seem clearly referable to *Procavia jacksoni* rather than to that form. Both specimens are females, and one of them is fully adult, in stage VIII as defined by Thomas.[1]

Measurements of skulls of Procavia (stage VIII).

Form and locality.	No.	Sex.	Greatest length.	Condylobasal length.	Postorbital breadth.	Zygomatic breadth.	Length of nasals, median.	Greatest breadth of nasals.	Mandible.	Upper tooth row.
P. habessinica habessinica.										
Eritrea: Asmara.....	122543	.....	91.6	88.6	26.2	55.7	23.3	21.8	79.5	35.2
P. mackinderi mackinderi.										
B. E. A.:										
Mount Kenia.....	163287	Male....	98.8	98.8	28.0	60.9	24.3	24.0	88.3	38.9
Do.....	163285	Female .	96.8	95.4	28.2	56.1	24.8	23.3	82.5	40.6
P. mackinderi zelotes.										
B. E. A.:										
Mount Lololokwi..	184791	Female .	94.2	90.8	23.6	52.1	25.2	19.7	81.5	38.6
Do.....	184792	...do.....	93.8	90.1	24.3	54.3	23.3	20.8	92.5	39.4
Rumathe River...	184793	Male....	93.7	89.1	23.4	53.5	24.2	21.5	79.7	40.3
Loita Plains.....	181563	Female .	87.9	85.5	25.7	51.3	20.0	19.5	77.1	36.8
P. jacksoni jacksoni.										
B. E. A.: Naivasha....	162825	Female .	92.9	88.5	25.6	51.9	26.0	20.4	77.2	38.2

PROCAVIA JACKSONI DÆMON Thomas.

1910. *Procavia dæmon* THOMAS, Ann. and Mag. Nat. Hist., ser. 8, vol. 5, p. 199. February. (Elgonyi, 7,000 feet, Mount Elgon, British East Africa; type in British Museum.)

Specimen.—One, as follows:

BRITISH EAST AFRICA: Kisumu, 1 (Heller).

This specimen is, unfortunately, imperfect; the hair has slipped in places, parts of the head and legs have been destroyed by some animal, and the skull has been broken into small bits. It is clearly a true *Procavia* and, so far as can be determined, agrees very well with the description of *dæmon*. The hair is dark, long, and soft.

Another form of the restricted genus *Procavia*, with which the Kisumu specimen should be compared, is *Procavia matschiei* Neumann,[2] described from Muansa, at the southern end of Victoria Nyanza, German East Africa. The following notes on the type of *matschiei*

[1] Proc. Zool. Soc. London, p. 53. 1892.

[2] Zool. Jahrb. Syst., vol. 13, p. 555. October, 1900.

were made by Mr. Heller in Berlin and are on file in the National Museum:

Procavia matschiei Neumann. Type A 5251. Muansa; Neumann. Skin mounte , somewhat faded and light. Skull perfect; very old; teeth much worn. Color: Buffy-olive, belly and dorsal spot light buff; feet pure gray. Appearance of skin distinctly lighter than *jacksoni*, but this is evidently due to fading. Skull: Length, 99; zygomatic breadth, 56.3; length of upper cheek tooth-row, 40; diastema, 10.5; interorbital constriction, 27.3; length of mandible, 77. Coronal crest united posteriorly to form a sagittal crest; skull very old and interparietal fused.

Genus HETEROHYRAX Gray.

1868. *Heterohyrax* Gray, Ann. and Mag. Nat. Hist., ser. 4, vol. 1, p. 50. January. (*H. blainvillii* Gray=*H. brucei*.)

The rock hyrax is much more generally distributed over East Africa than is either of the other genera, *Procavia* or *Dendrohyrax*.

For measurements of specimens see page 144.

HETEROHYRAX PUMILA RUDOLFI (Thomas).

1910. *Procavia pumila rudolfi* Thomas, Ann. and Mag. Nat. Hist., ser. 8, vol. 5, p. 202. February. (North end of Lake Rudolf, 2,000 feet, Abyssinia; type in British Museum.)

Specimens.—Nineteen, from localities as follows:

British East Africa: Longaya Water, Marsabit Road, 9, including 3 embryos in alcohol (Heller); Marsabit Road, 1 odd skull (Heller); Merelle Water, Marsabit Road, 9 (Heller).

Heller found three embryos in a female collected at Longaya Water, July 21. These are preserved in alcohol. The parent is in stage VIII.

HETEROHYRAX BRUCEI BRUCEI (Gray).

1868. *Hyrax brucei* Gray, Ann. and Mag. Nat. Hist., ser. 4, vol. 1, p. 44. January. (Abyssinia; type in British Museum.)

Specimen.—One, as follows:

Eritrea: Ali Bereb, Asmara, 1 (Rosenberg).

HETEROHYRAX BRUCEI BAKERI (Gray).

1874. *Dendrohyrax bakeri* Gray, Ann. and Mag. Nat. Hist., ser. 4, vol. 14, p. 132. August. (Latiko, Uganda; type in British Museum.)

Specimens.—Three, as follows:

Uganda: Nimule, 3 (Loring).

Mr. Heller compared these specimens with the type of *bakeri* in London.

HETEROHYRAX BRUCEI BORANA (Lönnberg).

1912. *Procavia brucei borana* Lönnberg, Ann. and Mag. Nat. Hist., ser. 8, vol. 9, p. 66. January. (North of Guaso Nyiro, not far east of Marsabit Road, British East Africa; type in R. Nat. Hist. Mus. Stockholm.)

Specimens.—Four, as follows:

British East Africa: Mount Lololokwi, 4 (Heller).

These specimens are almost indistinguishable in color from *Heterohyrax brucei hindei*, but are smaller, with much smaller skulls. The oldest specimens, however, are not older than stage VI.

HETEROHYRAX BRUCEI HINDEI (Wroughton).

1892. *Procavia brucei* True, Proc. U. S. Nat. Mus., vol. 15, p. 459. October 26.

1910. *Procavia brucei hindei* Wroughton, Ann. and Mag. Nat. Hist., ser. 8, vol. 5, p. 107. January. (Fort Hall, Kikuyu, British East Africa; type in British Museum.)

1910. *Procavia brucei maculata* Osgood, Field Mus., Zool. ser., vol. 10, No. 2, p. 6. February. (Lukenya Mountain [Ulukenia Hills], British East Africa; type in Field Museum, Chicago.)

1910. *Procavia brucei maculata* Roosevelt, African Game Trails, Amer. ed., pp. 472, 484; London ed., pp. 484, 495.

Specimens.—Sixteen, from the following localities:

British East Africa: Kapiti Plains, 2 (Loring); Kyulu [Ongolea] Mountains, 1 (Abbott); Ndi, 2 (Heller); Sir Alfred Pease's Farm, Athi Plains, 3, including one large fetus in alcohol (Mearns); Ulukenia Hills, 8, including two large fetuses in alcohol (Loring).

Mearns and Loring each collected a female containing two large embryos.

HETEROHYRAX BRUCEI ALBIPES Hollister.

Plate 56.

1922. *Heterohyrax brucei albipes* Hollister, Proc. Biol. Soc. Washington, vol. 35, p. 135. October 17. (Telek River, Loita Plains, British East Africa; type in U. S. National Museum.)

Specimens.—Eighteen, as follows:

British East Africa: Telek Rivet, Loita Plains, 18, including six large fetuses in alcohol (Heller).

This form is readily distinguished from the related *Heterohyrax brucei hindei*, in fresh pelage, by the white underparts and white inner half of hind feet. The skull is essentially as in *hindei*.

Heller found two large embryos in each of three females collected in May. The breeding animals are in stage VIII.

Measurements of skulls of Heterohyrax (Stages VII and VIII).

Form and locality.	No.	Sex.	Greatest length.	Condylobasal length.	Zygomatic breadth.	Postorbital breadth.	Median length of nasals.	Greatest breadth of nasals.	Mandible.	Upper tooth row.
H. pumila rudolfi.										
B. E. A.:										
Marsabit Road	182065	Female	63.9	61.0	36.3	22.1	13.6	16.3	53.0	25.3
Do	182066	...do	65.0	62.1	36.1	21.0	13.0	13.4	53.3	26.2
Do	184241	...do	68.7	66.7	39.6	22.1	17.2	15.3	57.9	[1] 23.8
Do	184244	...do	68.6	66.4	39.5	21.8	14.0	15.2	57.5	26.9
H. brucei brucei.										
Eritrea: Asmara	122542		84.5	83.1	47.9	24.2	18.5	17.7	71.4	30.5
H. brucei bakeri.										
Uganda:										
Nimule	164838	Male	86.4	85.3	46.5	23.0	20.3	18.8	75.1	33.3
Do	164839	Female	91.0	88.6	47.2	25.8	20.7	20.3	77.9	32.9
H. brucei hindei.										
B. E. A.										
Ulukenia Hills	163305	Male	82.7	81.0	45.7	24.3	17.2	16.9	69.7	31.7
Do	163931	...do	83.1	80.3	45.8	23.5	22.0	20.3	70.7	32.2
Sir Alfred Pease's Farm.	161903	...do	81.2	78.8	46.2	25.6	20.1	20.1	68.8	31.7
Do	161902	Female	81.6	80.5	43.5	23.6	19.3	18.3	67.6	32.3
Kapiti Plains	161900	Male	87.0	85.3	47.0	26.1	21.3	19.7	69.8	31.7
Ndi	182235	...do	87.5	83.1	47.7	23.6	19.6	21.4	73.1	32.1
Do	184239	...do	79.0	76.8	44.8	22.7	17.6	20.6	68.0	31.0
H. brucei albipes.										
B. E. A.:										
Telek River	181561	Male	85.4	82.7	47.0	25.3	17.8	17.3	71.6	32.5
Do	[2] 181551	Female	84.3	80.3	46.4	25.6	19.5	18.2	67.8	31.7
Do	181552	...do	85.7	81.8	46.6	26.8	16.9	18.8	71.5	31.8
Do	181556	...do	79.2	76.2	46.0	24.1	16.3	17.1	66.2	30.5
Do	181562	...do	83.3	81.1	44.5	25.8	16.6	17.6	69.6	31.0

[1] Anterior premolar missing.
[2] Type.

Genus DENDROHYRAX Gray.

1868. *Dendrohyrax* Gray, Ann. and Mag. Nat. Hist., ser. 4, vol. 1, p. 48. January. (*D. arboreus.*)

The tree hyrax is poorly represented in the collection. While the animals are very abundant in the forests, they are, apparently, very difficult for the collectors to secure.

For measurements of specimens see page 147.

DENDROHYRAX VALIDUS True.

Plate 57.

1890. *Dendrohyrax validus* True, Proc. U. S. Nat. Mus., vol. 13, p. 228. September 16. (Mount Kilimanjaro, German East Africa; type in U. S. National Museum.)

1892. *Dendrohyrax validus* True, Proc. U. S. Nat. Mus., vol. 15, p. 457. October 26.

1909. *Dendrohyrax validus* Lyon and Osgood, Bull. 62, U. S. National Museum, p. 26.

Specimens.—Eight, from localities as follows:

British East Africa: Taveta, 4 (Abbott).

German East Africa: Mount Kilimanjaro, 4 (Abbott).

Doctor Abbott notes on the label of one skin that the native name for the tree hyrax on Mount Kilimanjaro is *m'ha*. His specimens were collected at 6,000 feet altitude.

DENDROHYRAX BETTONI (Thomas and Schwann).

1904. *Procavia bettoni* Thomas and Schwann, Abstr. Proc. Zool. Soc. London, No. 6, p. 23. April 26. (Rogoro, mile 346 of Uganda Railway, Kikuyu, British East Africa; type in British Museum.)

Specimen.—One, as follows:

British East Africa: Telek River, 1 (Heller).

This specimen agrees very well with the description of *D. bettoni*, but is, perhaps, somewhat lighter in color. The form possibly intergrades with *Dendrohyrax stuhlmanni* (Matschie),[1] described from Bukoba, on the southwestern shore of Victoria Nyanza, German East Africa, and this specimen may be somewhat intermediate in color.

DENDROHYRAX CRAWSHAYI CRAWSHAYI (Thomas).

1900. *Procavia* (*Dendrohyrax*) *crawshayi* Thomas, Proc. Zool. Soc. London, p. 178. (Western slope of Mount Kenia, 10,000 feet, British East Africa; type in British Museum.)

1910. *Procavia* (*Dendrohyrax*) *crawshayi* Roosevelt, African Game Trails, Amer. ed., pp. 472, 483; London ed., pp. 484, 494.

Specimens.—Two, as follows:

British East Africa: West side of Mount Kenia, 8,500 feet, 2, adult female and skin and skull of a large fetus (Loring).

Loring writes as follows of his experiences with tree hyraxes on Mount Kenia:[2]

[1] *Procavia stuhlmanni* Matschie, Sitz.-ber. Ges. nat. Freunde Berlin, p. 111. 1892.

[2] Roosevelt's African Game Trails, Appendix C, pp. 483, 484. 1910.

From the time that we reached the edge of the forest belt (altitude 7,000), on Mount Kenia, we heard these tree dassies every night, and at all camps to an altitude of 10,700 feet they were common. I once heard one on a bright afternoon about four o'clock, and on a second occasion another about two hours before sundown. Although I searched diligently on the ground for runways, and for suitable places to set traps, no such place was found. In a large yew-tree that had split and divided fifteen feet from the ground, I found a bed or bulky platform of dried leaves and moss of nature's manufacture. On the top of this some animal had placed a few dried green leaves. In this bed I set a steel trap and carefully covered it, and on the second night (October 14), captured a dassie containing a fœtus almost mature. We were informed by our "boys" that these animals inhabited hollow stumps and logs as well as the foliage of the live trees, but we found no signs that proved it, although, judging from the din at night, dassies were abundant everywhere in the forests.

At evening, about an hour after darkness had fully settled, a dassie would call and in a few seconds dassies were answering from all around, and the din continued for half an hour or an hour. The note began with a series of deep frog-like croaks that gradually gave way to a series of shrill tremulous screams, at times resembling the squealing of a pig and again the cries of a child. It was a far-reaching sound and always came from the large forest trees. Often the cries were directly over our heads and at a time when the porters were singing and dancing about a bright camp fire. Although we tried many times to shine their eyes with a powerful light, we never succeeded, nor were we able to hear any rustling of the branches or scraping on the tree trunks as one might expect an animal of such size to make. The porters were offered a rupee apiece for dassies, but none was brought in.

DENDROHYRAX CRAWSHAYI LAIKIPIA Dollman.

1910. *Procavia* (*Dendrohyrax*) *bettoni* Roosevelt, African Game Trails, Amer. ed., p. 472; London ed., p. 484. (Not of Thomas and Schwann.)

1911. *Dendrohyrax crawshayi laikipia* Dollman, Ann. and Mag. Nat. Hist., ser. 8, vol. 8, p. 131. July. (Rumruti, Laikipia Plateau, British East Africa; type in British Museum.)

Specimens.—Forty-one, from the following localities:

British East Africa: Donyio Burru Mountains, west of Lake Naivasha, 2 (Mearns, Heller); Mountains near Lake Naivasha, 8,000-9,000 feet, 15 flat native skins (Mearns); "Nairobi," purchased at. 24 flat native skins (Rainey).

All of these specimens are clearly referable to this form rather than to either of the forms described from nearby regions: *Dendrohyrax bettoni* (Thomas and Schwann),[1] from Rogoro, mile 346 of Uganda Railway, British East Africa; or *Dendrohyrax vilhelmi* (Lönnberg),[2] from Donya Sabuk, northeast of Nairobi.

[1] *Procavia bettoni* Thomas and Schwann, Abstr. Proc. Zool. Soc. London, No. 6, p. 23. April 26, 1904.
[2] *Procavia* (*Dendrohyrax*) *vilhelmi* Lönnberg, Afkiv f. Zool., vol. 10, No. 12, p. 26. 1916.

Measurements of Skulls of Dendrohyrax (Stage VIII).

Form and locality.	No.	Sex.	Greatest length.	Condylobasal length.	Zygomatic breadth.	Postorbital breadth.	Median length of nasals.	Greatest breadth of nasals.	Mandible.	Upper tooth row.
D. validus.										
B. E. A.:										
Taveta	34969	.....	95.1	90.3	51.6	26.6	23.4	19.7	75.8	35.2
Do	34970	.....	92.8	88.9	48.7	25.1	21.0	18.5	74.0	34.4
Do	34971	.....	98.0	93.2	52.8	25.5	24.4	19.4	78.9	35.3
G. E. A.:										
Mount Kilimanjaro.	[1] 34721	Male....	94.9	89.7	51.6	26.6	21.7	19.5	73.5	34.0
Do	38161	...do.....	94.8	90.4	52.9	26.1	22.3	20.6	76.4	35.4
Do	38160	Female .	95.8	91.0	51.8	26.9	22.7	20.7	76.0	33.9
D. bettoni.										
B. E. A.: Telek River.	181550	Female .	88.2	86.5	46.4	24.4	21.1	19.5	75.3	34.0
D. crawshayi crawshayi.										
B. E. A.: Mount Kenia	163300	Female .	93.2	90.8	48.8	24.8	22.3	19.3	77.8	32.7
D. crawshayi laikipia.										
B. E. A.: Donyio Burru Mountains.	162824	Female .	.....	.....	47.6	25.2	19.3	17.5	76.9	35.2

[1] Type.

EXPLANATION OF PLATES.

The scale as given is in most cases correct; but allowance should be made for slight variations from the size of the actual specimens which sometimes exist in plates made by the photographic process.

Plate 1.

Map of Eastern Equatorial Africa.

Plate 2.

Skulls of type-specimens (natural size).

Left. *Galago sotikæ* Hollister. Adult male; Cat. No. 184205.

Right. *Galago moholi cocos* Heller. Adult male; Cat. No. 181810. (=*Galago cocos.*)

Plate 3.

Skull of type-specimen of *Papio anubis vigilis* Heller. Adult male; Cat. No. 182033. One-half natural size. (=*Papio vigilis.*)

Plate 4.

Skulls of type-specimens (one-half natural size).

Upper. *Papio anubis vigilis* Heller. Adult male; Cat. No. 182033. (=*Papio vigilis.*)

Lower. *Papio anubis lestes* Heller. Adult male; Cat. No. 164633. (=*Papio lestes.*)

PLATE 5.

Skull of type-specimen of *Papio anubis lestes* Heller. Adult male; Cat. No. 164633 One-half natural size. (=*Papio lestes.*)

PLATE 6.

Skull of type-specimen of *Erythrocebus whitei* Hollister. Adult male; Cat. No. 155340. Two-thirds natural size.

PLATE 7.

Skull of type-specimen of *Lasiopyga ascanius kaimosæ* Heller. Adult male; Cat. No. 182371. Two-thirds natural size.

PLATE 8.

Skull of type-specimen of *Lasiopyga leucampyx mauæ* Heller. Adult male; Cat. No. 173002. Two-thirds natural size.

PLATE 9.

Skull of type-specimen of *Lasiopyga pygerythra tumbili* Heller. Adult male; Cat. No. 182229. Two-thirds natural size.

PLATE 10.

Skull of type-specimen of *Lasiopyga pygerythra contigua* Hollister. Adult male; Cat. No. 163327. Two-thirds natural size.

PLATE 11.

Skull of type-specimen of *Lasiopyga pygerythra callida* Hollister. Adult male; Cat. No. 162843. Two-thirds natural size.

PLATE 12.

Skull of type-specimen of *Cercopithecus centralis luteus* Elliott. Young adult female; Cat. No. 163086. Two-thirds natural size. (=*Lasiopyga pygerythra rubella* Elliot.)

PLATE 13.

Skull of type-specimen of *Lasiopyga pygerythra arenaria* Heller. Adult male; Cat. No. 182201. Two-thirds natural size.

PLATE 14.

Skull of type-specimen of *Lasiopyga albogularis kima* Heller. Adult male; Cat. No. 182242. Two-thirds natural size.

PLATE 15.

Skull of type-specimen of *Lasiopyga albogularis maritima* Heller. Adult female; Cat. No. 182272. Two-thirds natural size.

PLATE 16.

Skull of type-specimen of *Colobus abyssinicus percivali* Heller. Adult male; Cat. No. 182138. Two-thirds natural size. (=*Colobus caudatus percivali.*)

PLATE 17.

Skull of type-specimen of *Colobus abyssinicus terrestris* Heller. Adult female; Cat. No. 164756. Two-thirds natural size. (=*Colobus occidentalis terrestris.*)

PLATE 18.

Skull of type-specimen of *Colobus abyssinicus roosevelti* Heller. Adult male; Cat. No. 163261. Two-thirds natural size. (=*Colobus occidentalis roosevelti*.)

PLATE 19.

Skull of type-specimen of *Phacochœrus africanus bufo* Heller. Immature female; Cat. No. 164796. Much reduced.

PLATES 20–21.

Skull of type-specimen of *Hippopotamus amphibius kiboko* Heller. Adult male; Cat. No. 162979. Much reduced.

PLATE 22.

Skull of type-specimen of *Bubalis cokei kongoni* Heller. Adult male; Cat. No. 162992. Much reduced. (=*Alcelaphus cokii kongoni*.)

PLATE 23.

Skull of type-specimen of *Bubalis nakuræ* Heller. Adult male; Cat. No. 163130. Much reduced. (=*Alcelaphus cokii nakuræ*.)

PLATE 24.

Skull of type-specimen of *Bubalis lelwel roosevelti* Heller. Adult male; Cat. No. 164734. Much reduced. (=*Alcelaphus lelwel roosevelti*.)

PLATE 25.

Skull of type-specimen of *Bubalis lelwel keniæ* Heller. Adult male; Cat. No. 182009. Much reduced. (=*Alcelaphus lelwel keniæ*.)

PLATES 26–27.

Skull of type-specimen of *Gorgon albojubatus mearnsi* Heller. Adult male; Cat. No. 163020. Much reduced. (=*Connochætes albojubatus mearnsi*.)

PLATE 28.

Skull of type-specimen of *Cephalophus spadix* True. Adult male; Cat. No. 34707. One-half natural size.

PLATE 29.

Skull of type-specimen of *Cephalophus monticola musculoides* Heller. Adult male; Cat. No. 182388. Two-thirds natural size.

PLATE 30.

Skulls of type-specimens (one-half natural size).

Upper. *Sylvicapra grimmia deserti* Heller. Adult male; Cat. No. 182219.
Lower. *Sylvicapra grimmia altivallis* Heller. Adult female; Cat. No. 164746.

PLATE 31.

Skull of type-specimen of *Sylvicapra grimmia altivallis* Heller. Adult female; Cat. No. 164746. One-half natural size.

PLATE 32.

Skull of type-specimen of *Sylvicapra grimmia roosevelti* Heller. Young adult male Cat. No. 164664. One-half natural size.

PLATE 33.

Skull of type-specimen of *Oreotragus oreotragus aureus* Heller. Adult female; Cat. No. 182149. One-half natural size.

PLATES 34–35.

Skull of type-specimen of *Ourebia montana æquatoria* Heller. Adult male; Cat. No. 164713. One-half natural size.

PLATE 36.

Skull of type-specimen of *Ourebia microdon* Hollister. Adult male; Cat. No. 155422. One-half natural size. (=*Ourebia montana cottoni* Thomas and Wroughton.)

PLATE 37.

Skull of type-specimen of *Nesotragus moschatus deserticola* Heller. Adult female; Cat. No. 182261. Three-quarters natural size. (=*Nesotragus deserticola*.)

PLATE 38.

Skull of type-specimen of *Rhynchotragus kirkii nyikæ* Heller. Adult male; Cat. No. 182228. Three-quarters natural size.

PLATE 39.

Skull of type-specimen of *Redunca redunca tohi* Heller. Adult female; Cat. No. 182289. One-half natural size. (=*Redunca bohor tohi*.)

PLATE 40.

Skulls of type-specimens (one-half natural size).

Upper. *Redunca redunca tohi* Heller. Adult female; Cat. No. 182289. (=*Redunca bohor tohi*.)

Lower. *Cervicapra chanleri* Rothschild. Adult male; Cat. No. 49418. (=*Redunca fulvorufula chanleri*.)

PLATE 41.

Skull of type-specimen of *Cervicapra chanleri* Rothschild. Adult male; Cat. No. 49418. One-half natural size. (=*Redunca fulvorufula chanleri*.)

PLATE 42.

Skull of type-specimen of *Kobus ellipsiprymnus kuru* Heller. Immature male; Cat. No. 34694. Much reduced.

PLATES 43–45.

Skull of type-specimen of *Kobus defassa raineyi* Heller. Adult male; Cat. No. 181961. Much reduced.

PLATE 46.

Skull of type-specimen of *Adenota kob aluræ* Heller. Adult male; Cat. No. 164788. Much reduced.

PLATE 47.

Skull of type-specimen of *Gazella granti roosevelti* Heller. Adult male; Cat. No. 162009. Much reduced.

PLATE 48.

Skulls of type-specimens (much reduced).

Left. *Gazella granti serengetæ* Heller. Adult male; Cat. No. 34703.
Right. *Gazella granti roosevelti* Heller. Adult male; Cat. No. 162009.

PLATE 49.

Skull of type-specimen of *Gazella granti serengetæ* Heller. Adult male; Cat. No. 34703. Much reduced.

PLATE 50.

Skull of type-specimen of *Gazella granti raineyi* Heller. Adult male; Cat. No. 182016. Much reduced.

PLATE 51.

Skull of type-specimen of *Ozanna roosevelti* Heller. Adult female; Cat. No. 163166. Much reduced. (=*Egocerus niger roosevelti*.)

PLATE 52.

Skull of type-specimen of *Tragelaphus scriptus olivaceus* Heller. Adult male; Cat. No. 182267. One-fourth natural size.

PLATE 53.

Skull of type-specimen of *Ammelaphus imberbis australis* Heller. Adult female; Cat. No. 182073. One-fourth natural size. (=*Strepsiceros imberbis australis*.)

PLATE 54.

Skull of type-specimen of *Strepsiceros strepsiceros bea* Heller. Adult female; Cat. No. 163247. One-fourth natural size.

PLATE 55.

Skull of type-specimen of *Equus quagga cuninghamei* Heller. Immature male; Cat. No. 182157. Much reduced.

PLATE 56.

Skull of type-specimen of *Heterohyrax brucei albipes* Hollister. Adult female; Cat. No. 181551. Natural size.

PLATE 57.

Skull of type-specimen of *Dendrohyrax validus* True. Adult male; Cat. No. 34721 Natural size.

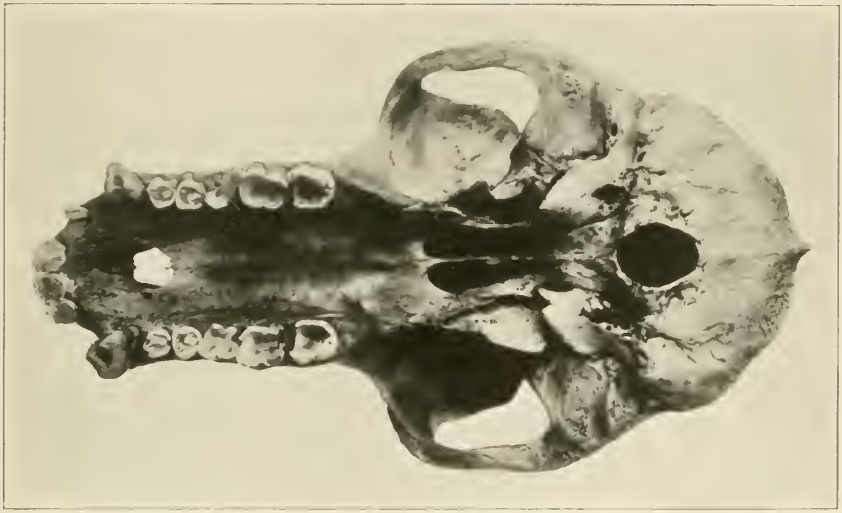
GALAGO SOTIKAE HOLLISTER. TYPE. GALAGO COCOS HELLER. TYPE.

FOR EXPLANATION OF PLATE SEE PAGE 147.

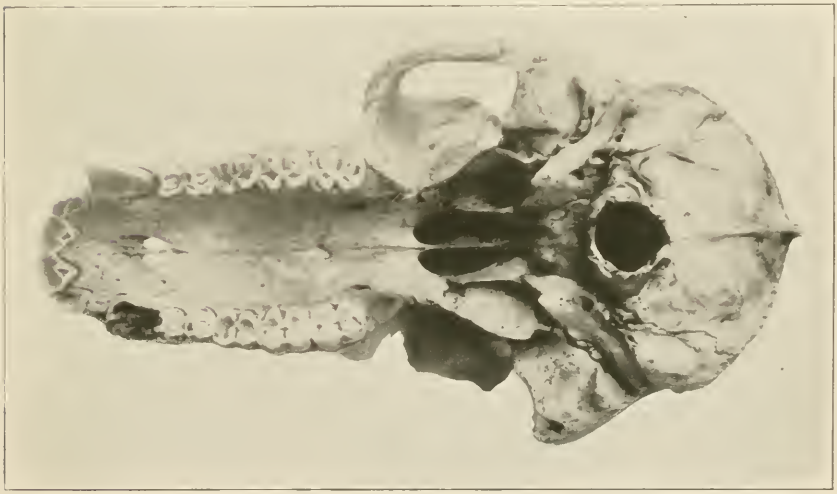
57502—24——11

PAPIO VIGILIS HELLER. TYPE.

FOR EXPLANATION OF PLATE SEE PAGE 147



PAPIO VIGILIS HELLER. TYPE.



PAPIO LESTES HELLER. TYPE.

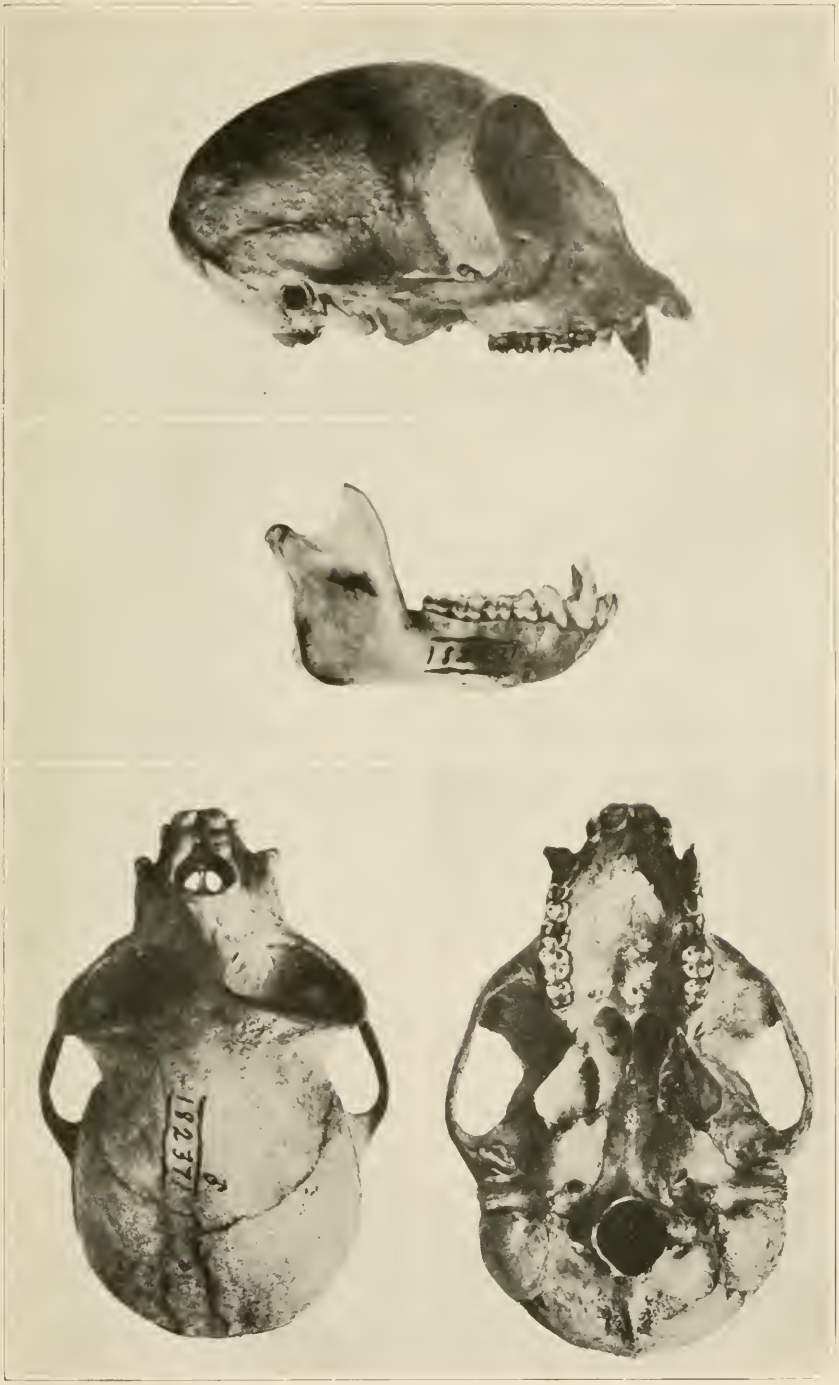
FOR EXPLANATION OF PLATE SEE PAGE 147

PAPIO LESTES HELLER. TYPE.

FOR EXPLANATION OF PLATE SEE PAGE 148.

ERYTHROCEBUS WHITEI HOLLISTER. TYPE.

FOR EXPLANATION OF PLATE SEE PAGE 148



LASIOPYGA ASCANIUS KAIMOSAE HELLER. TYPE.

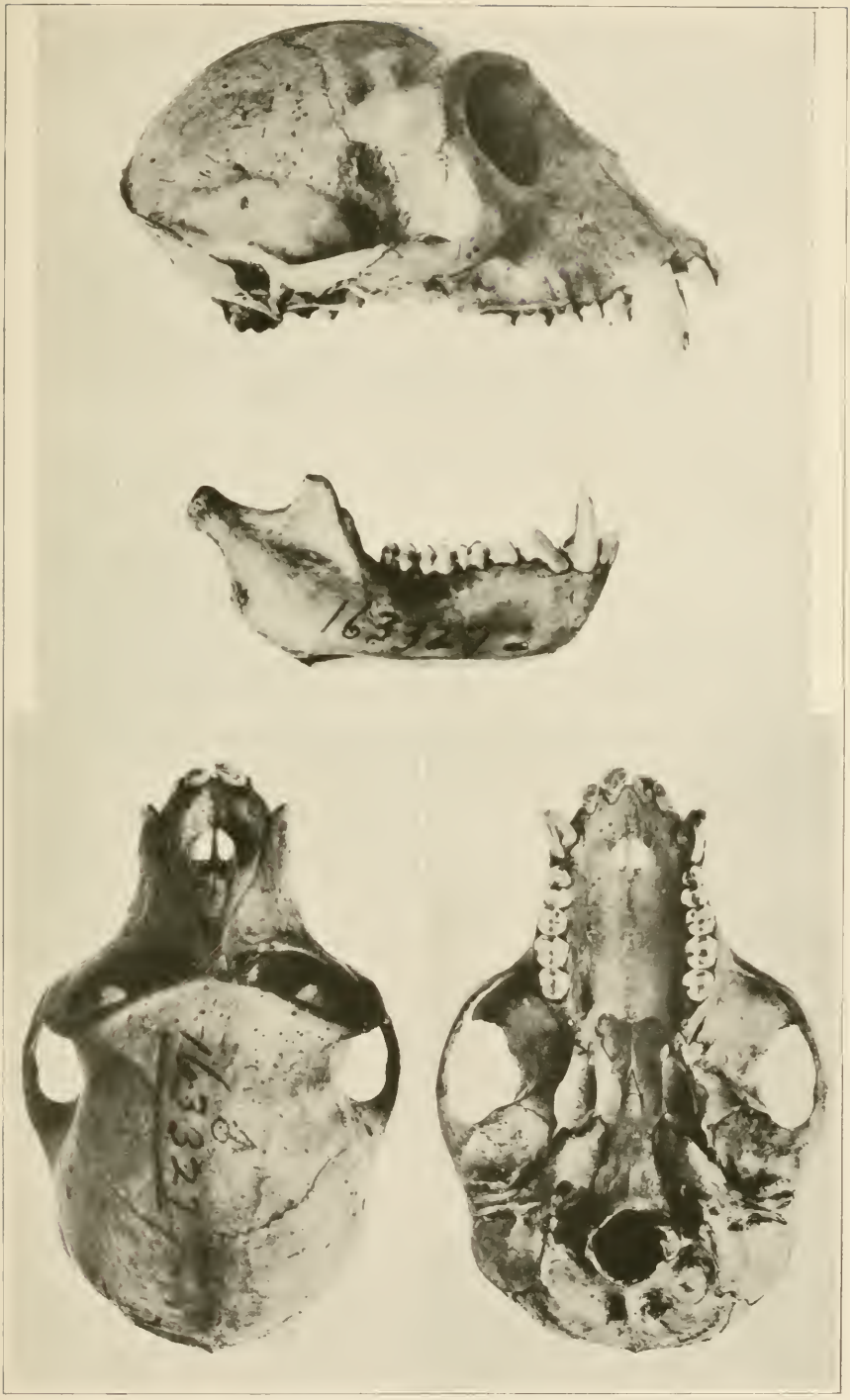
FOR EXPLANATION OF PLATE SEE PAGE 148.

LASIOPYGA LEUCAMPYX MAUAE HELLER. TYPE.

FOR EXPLANATION OF PLATE SEE PAGE 148.

LASIOPYGA PYGERYTHRA TUMBILI HELLER. TYPE.

FOR EXPLANATION OF PLATE SEE PAGE 148.



LASIOPYGA PYGERYTHRA CONTIGUA HOLLISTER. TYPE.

FOR EXPLANATION OF PLATE SEE PAGE 148.

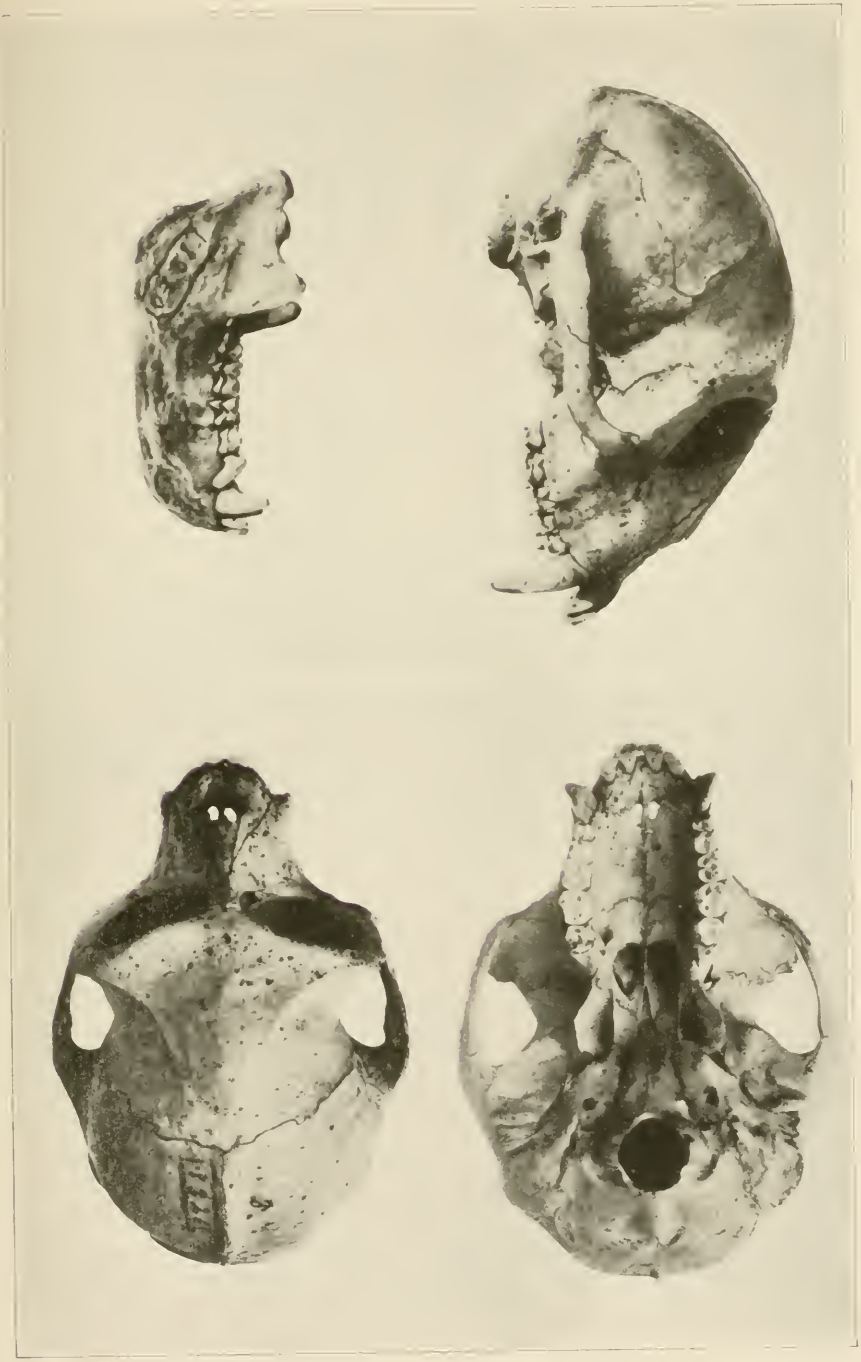
57502—24——12

LASIOPYGA PYGERYTHRA CALLIDA HOLLISTER. TYPE.

FOR EXPLANATION OF PLATE SEE PAGE 148.

CERCOPITHECUS CENTRALIS LUTEUS ELLIOT. TYPE.

FOR EXPLANATION OF PLATE SEE PAGE 148.

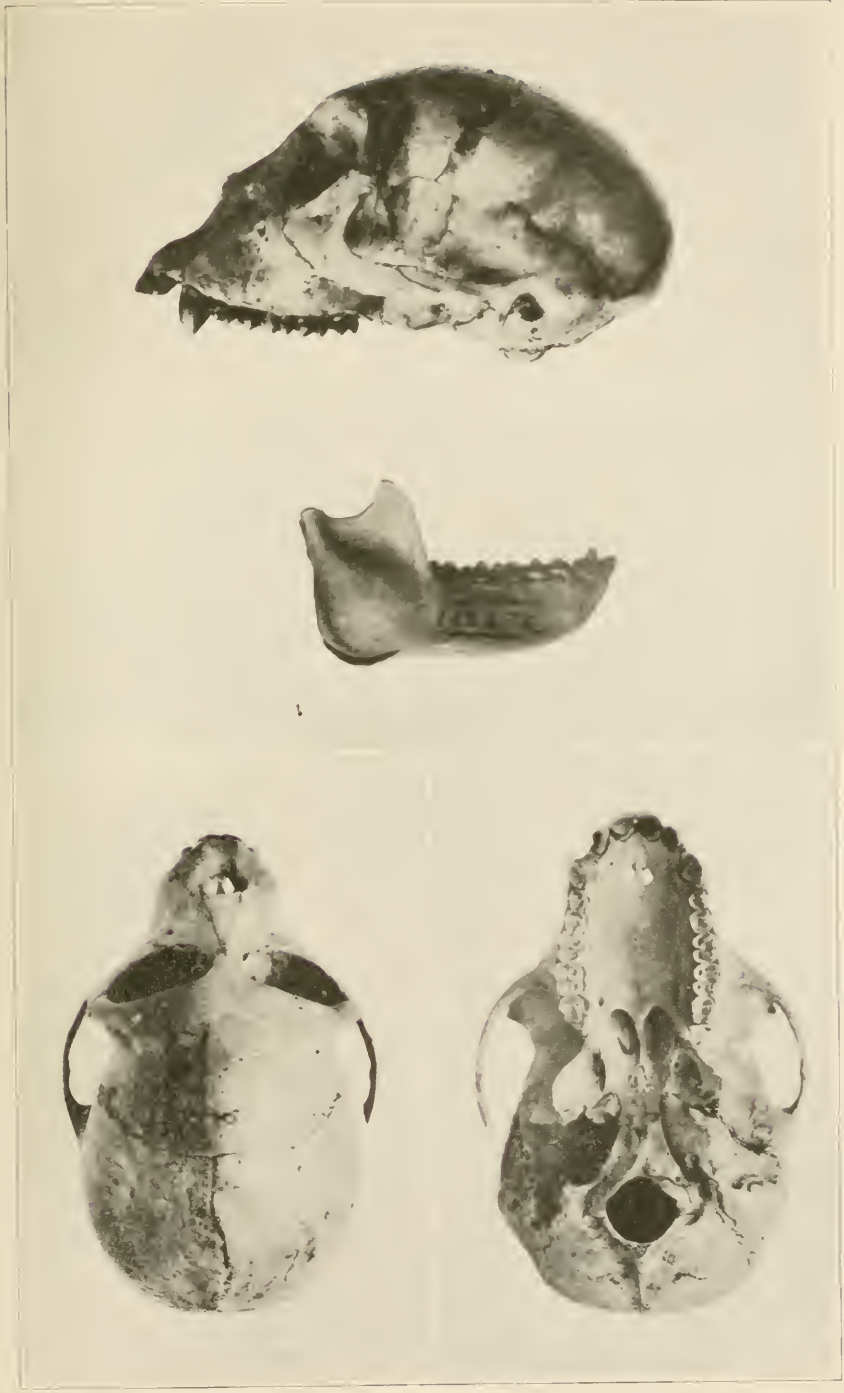


LASIOPYGA PYGERYTHRA ARENARIA HELLER. TYPE.

FOR EXPLANATION OF PLATE SEE PAGE 148

LASIOPYGA ALBOGULARIS KIMA HELLER. TYPE.

FOR EXPLANATION OF PLATE SEE PAGE 148



LASIOPYGA ALBOGULARIS MARITIMA HELLER. TYPE.

FOR EXPLANATION OF PLATE SEE PAGE 148.

COLOBUS CAUDATUS PERCIVALI HELLER. TYPE.

FOR EXPLANATION OF PLATE SEE PAGE 148.

COLOBUS OCCIDENTALIS TERRESTRIS HELLER. TYPE.

FOR EXPLANATION OF PLATE SEE PAGE 148.

COLOBUS OCCIDENTALIS ROOSEVELTI HELLER. TYPE.

FOR EXPLANATION OF PLATE SEE PAGE 149

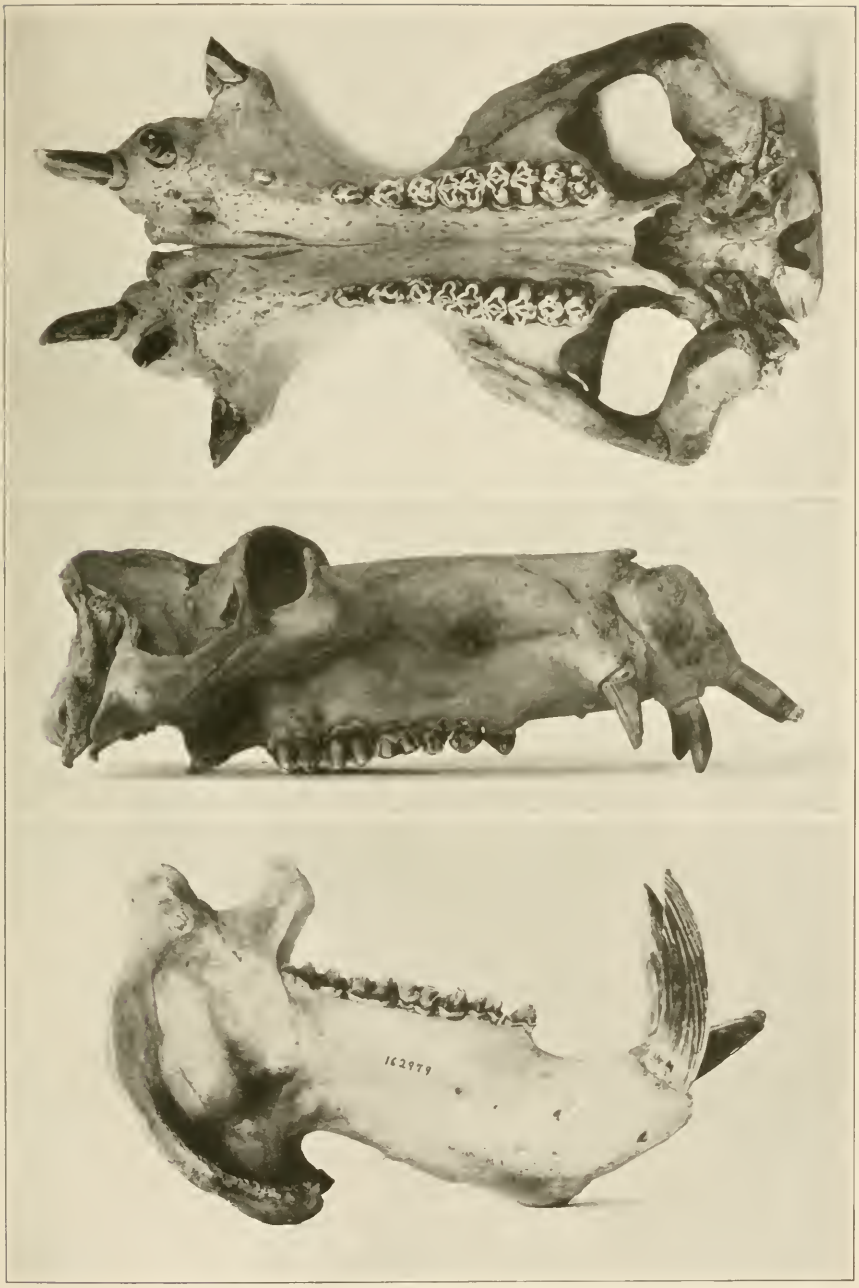
57502—24——13

PHACOCHOERUS AFRICANUS BUFO HELLER. TYPE.

FOR EXPLANATION OF PLATE SEE PAGE 149.

HIPPOPOTAMUS AMPHIBIUS KIBOKO HELLER. TYPE.

FOR EXPLANATION OF PLATE SEE PAGE 149



HIPPOPOTAMUS AMPHIBIUS KIBOKO HELLER. TYPE.

FOR EXPLANATION OF PLATE SEE PAGE 149

ALCELAPHUS COKII KONGONI (HELLER). TYPE.

FOR EXPLANATION OF PLATE SEE PAGE 149.

ALCELAPHUS COKII NAKURAE (HELLER). TYPE.

FOR EXPLANATION OF PLATE SEE PAGE 140.

ALCELAPHUS LELWEL ROOSEVELTI (HELLER). TYPE.

FOR EXPLANATION OF PLATE SEE PAGE 149.

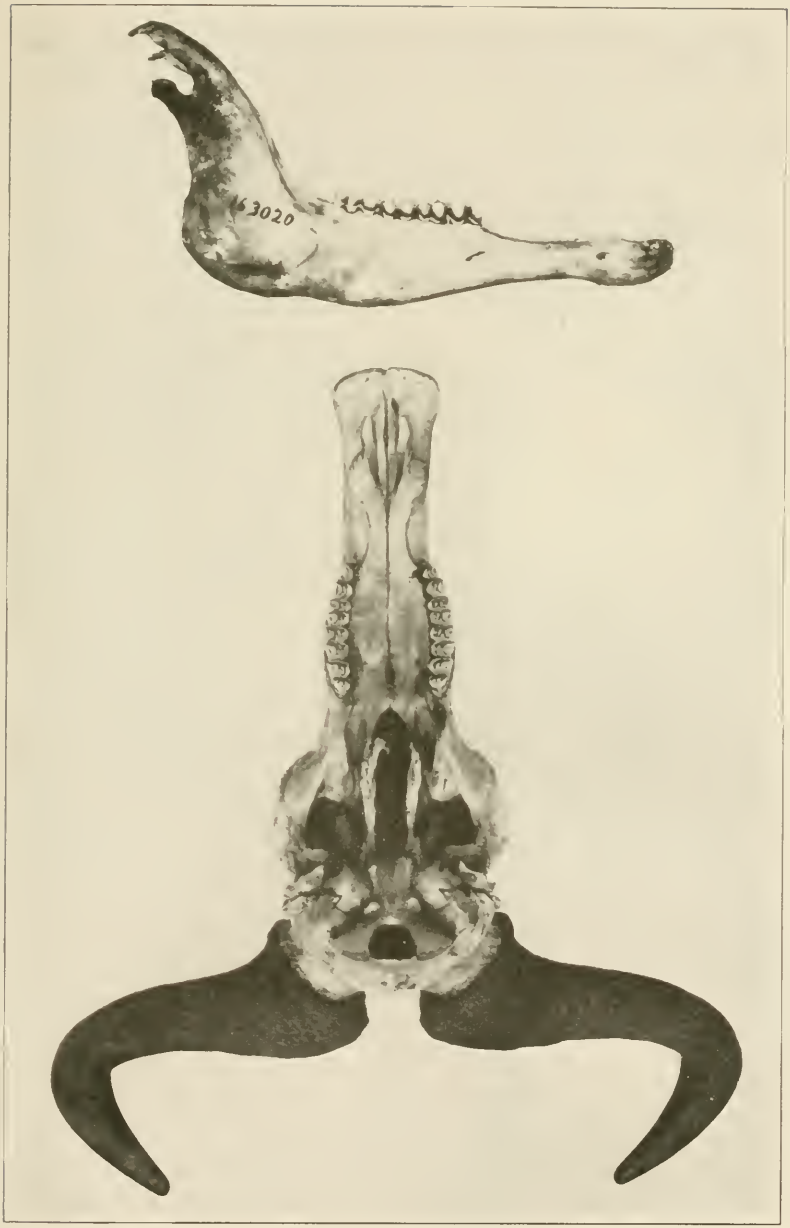
ALCELAPHUS LELWEL KENIAE (HELLER). TYPE.

FOR EXPLANATION OF PLATE SEE PAGE 149.

CONNOCHAETES ALBOJUBATUS MEARNSI (HELLER). TYPE.

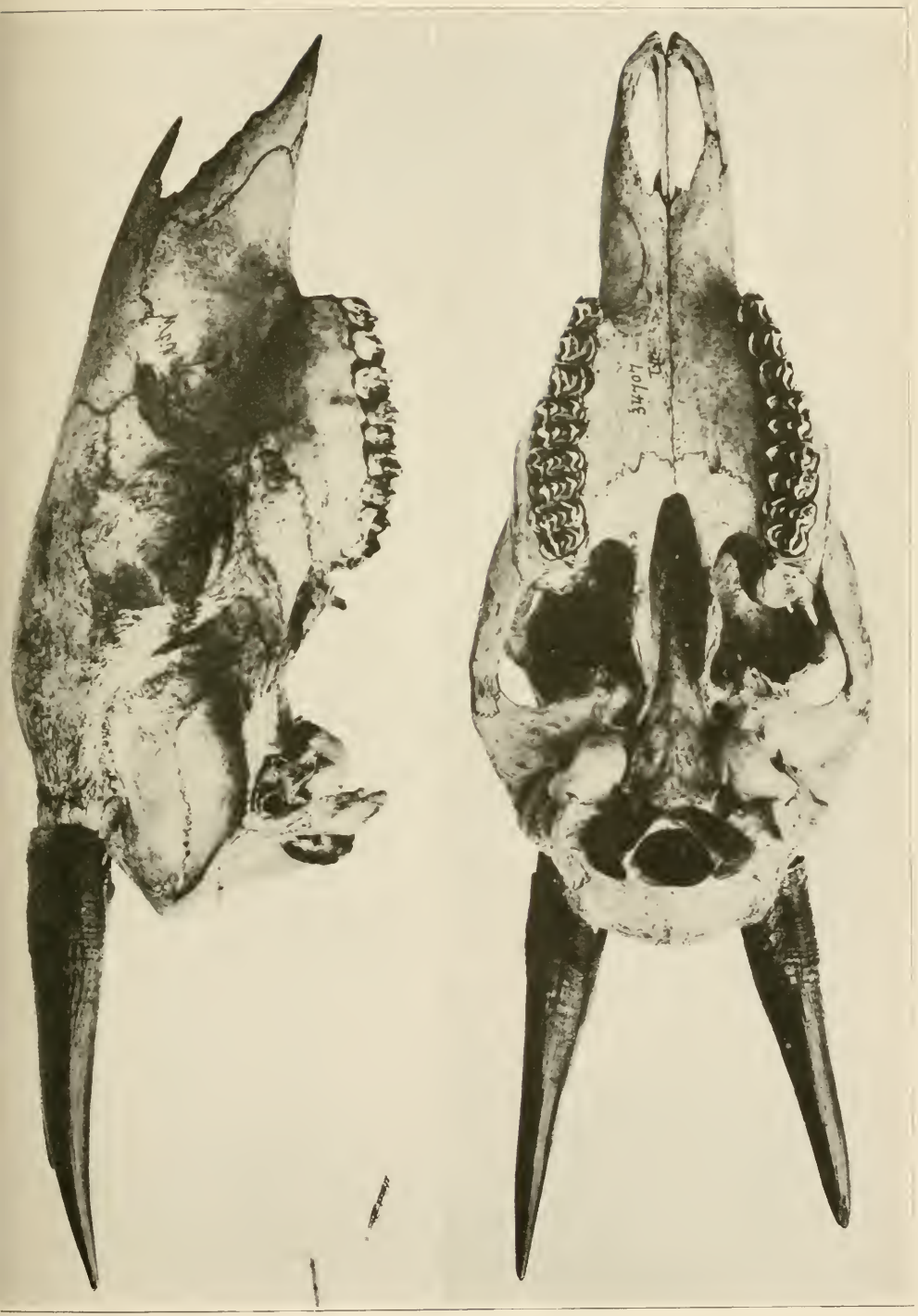
FOR EXPLANATION OF PLATE SEE PAGE 149.

57502—24——14



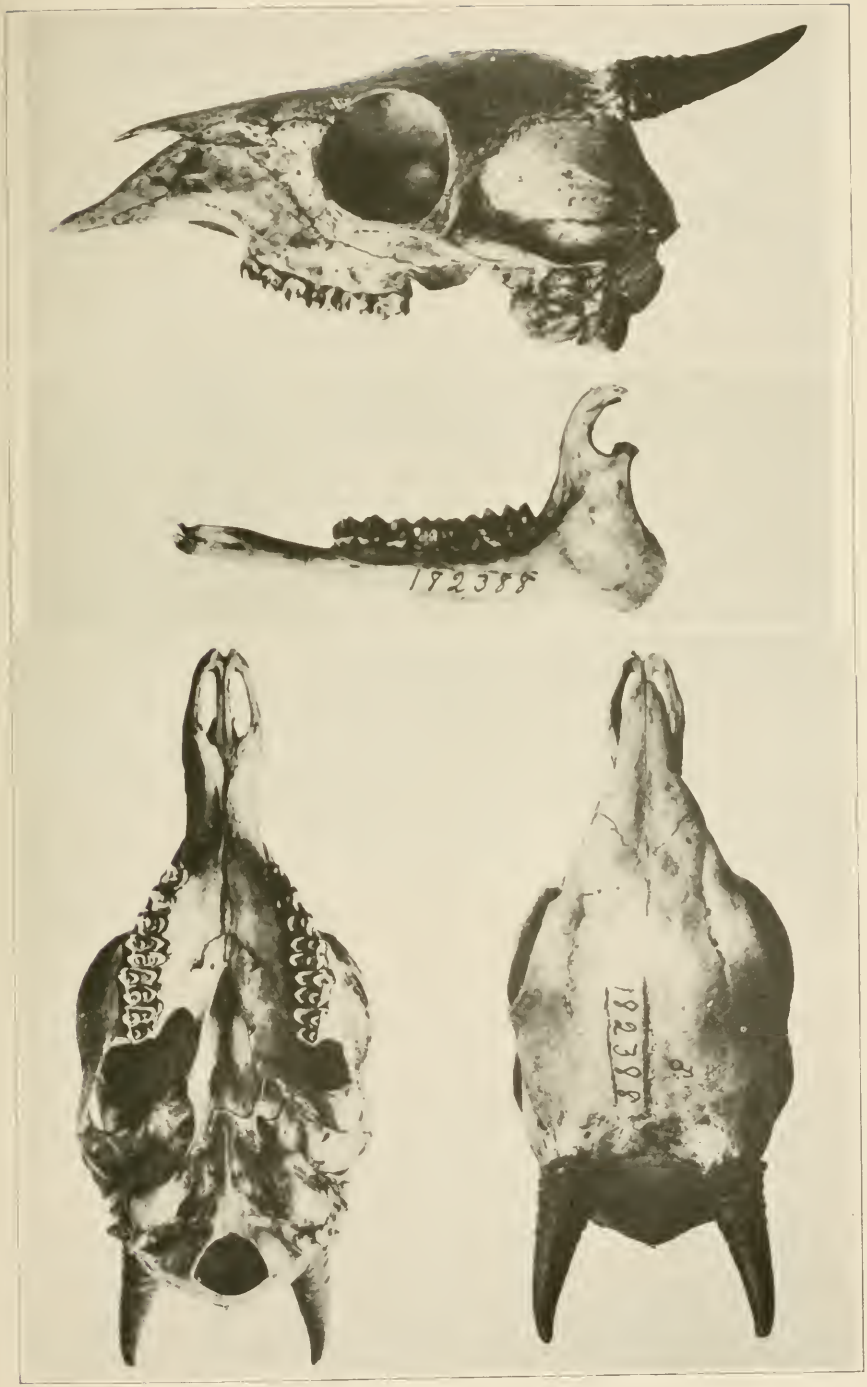
CONNOCHAETES ALBOJUBATUS MEARNSI (HELLER). TYPE.

FOR EXPLANATION OF PLATE SEE PAGE 149.



CEPHALOPHUS SPADIX TRUE. TYPE.

FOR EXPLANATION OF PLATE SEE PAGE 149.



CEPHALOPHUS MONTICOLA MUSCULOIDES HELLER. TYPE.

FOR EXPLANATION OF PLATE SEE PAGE 149.

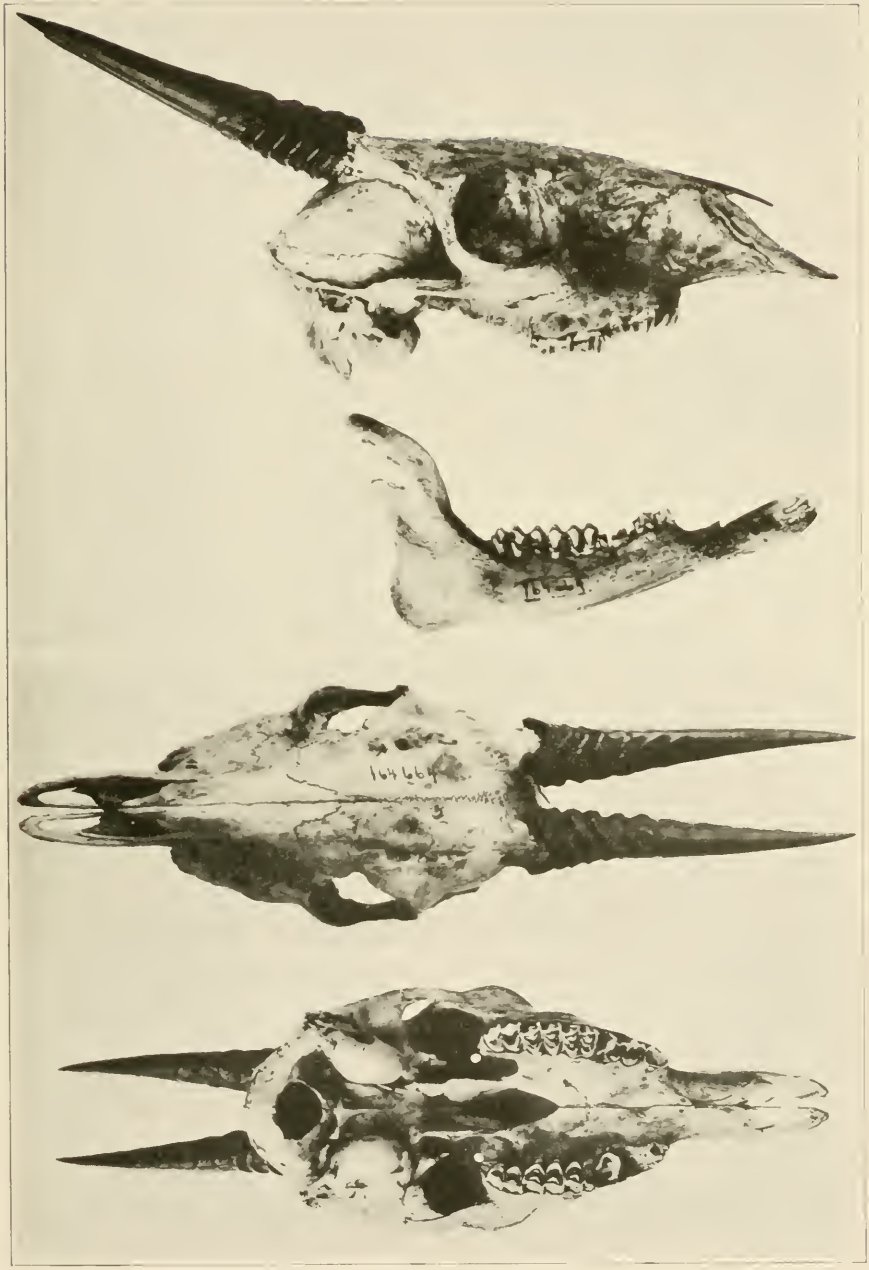
SYLVICAPRA GRIMMIA DESERTI HELLER. TYPE.

SYLVICAPRA GRIMMIA ALTIVALLIS HELLER. TYPE.

FOR EXPLANATION OF PLATE SEE PAGE 149.

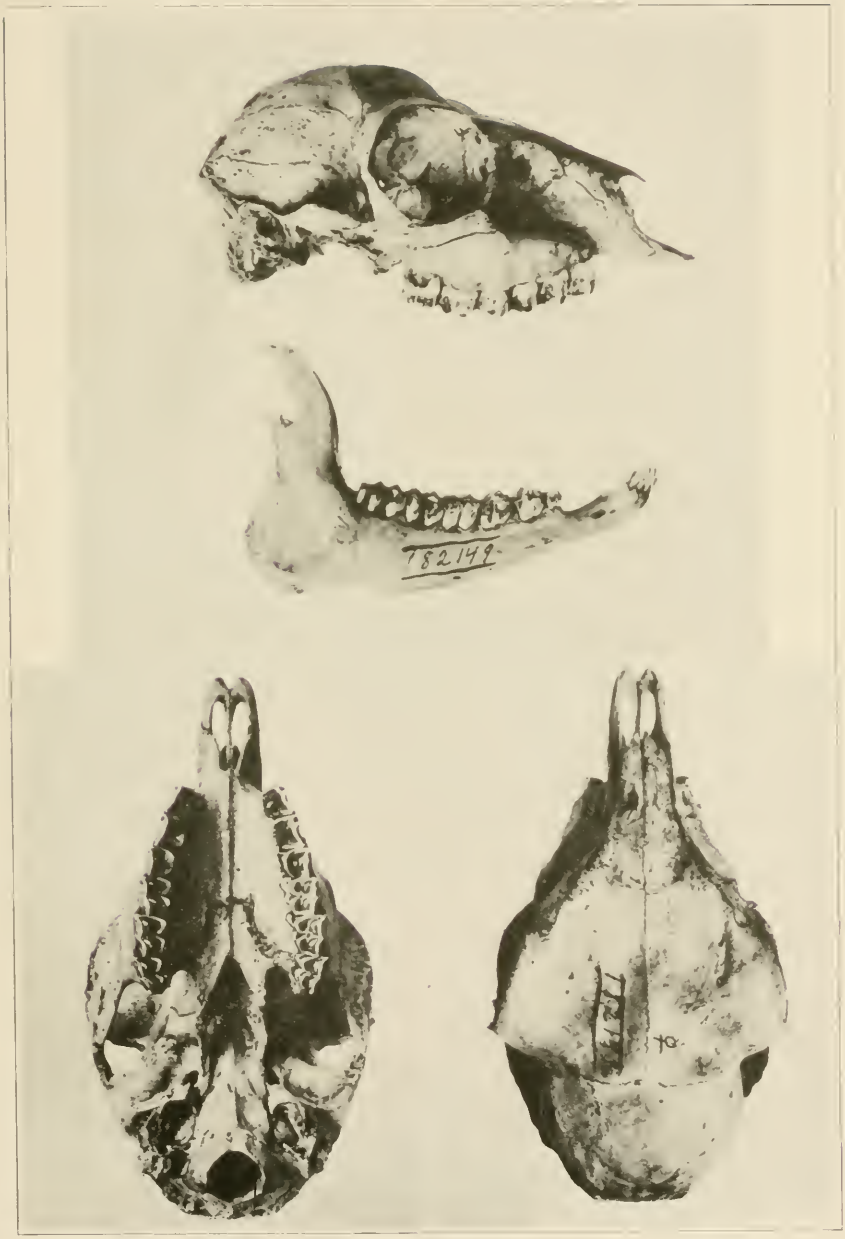
SYLVICAPRA GRIMMIA ALTIVALLIS HELLER. TYPE.

FOR EXPLANATION OF PLATE SEE PAGE 149



SYLVICAPRA GRIMMIA ROOSEVELTI HELLER. TYPE.

FOR EXPLANATION OF PLATE SEE PAGE 150.



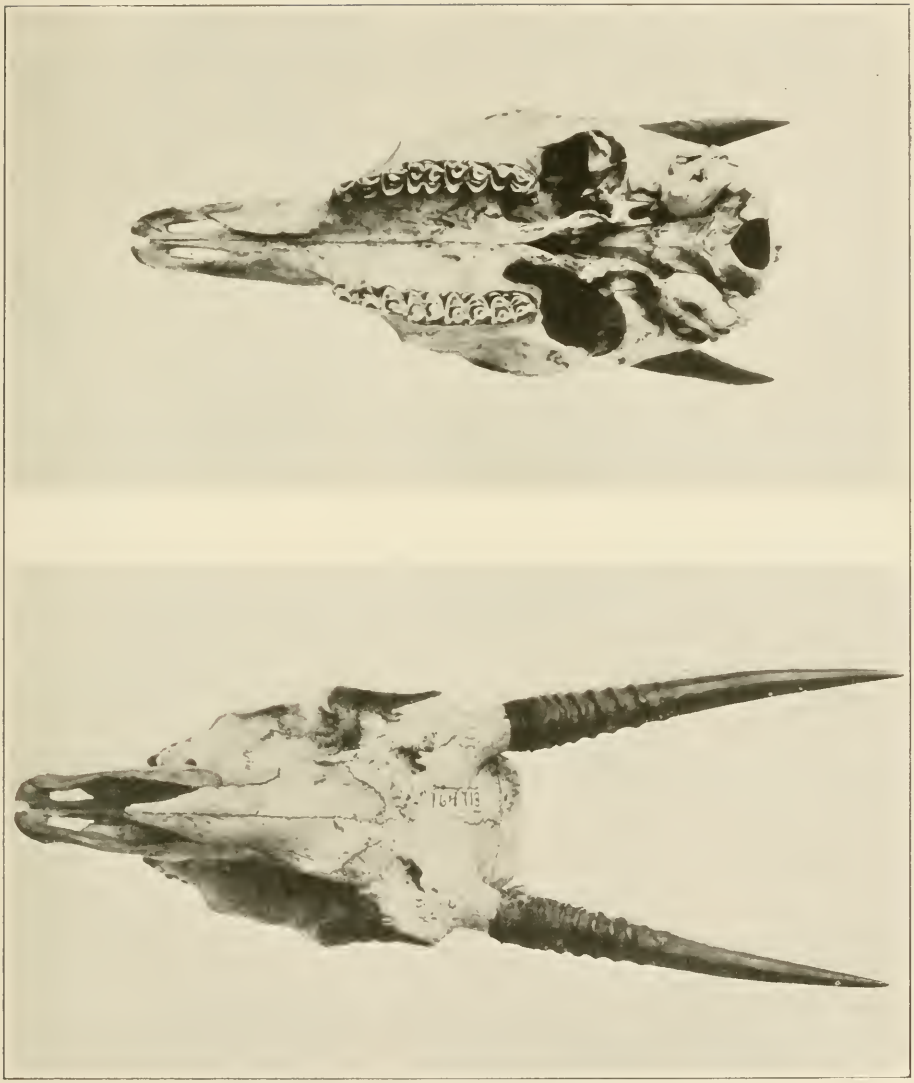
OREOTRAGUS OREOTRAGUS AUREUS HELLER. TYPE.

FOR EXPLANATION OF PLATE SEE PAGE 150.

OUREBIA MONTANA AEQUATORIA HELLER. TYPE.

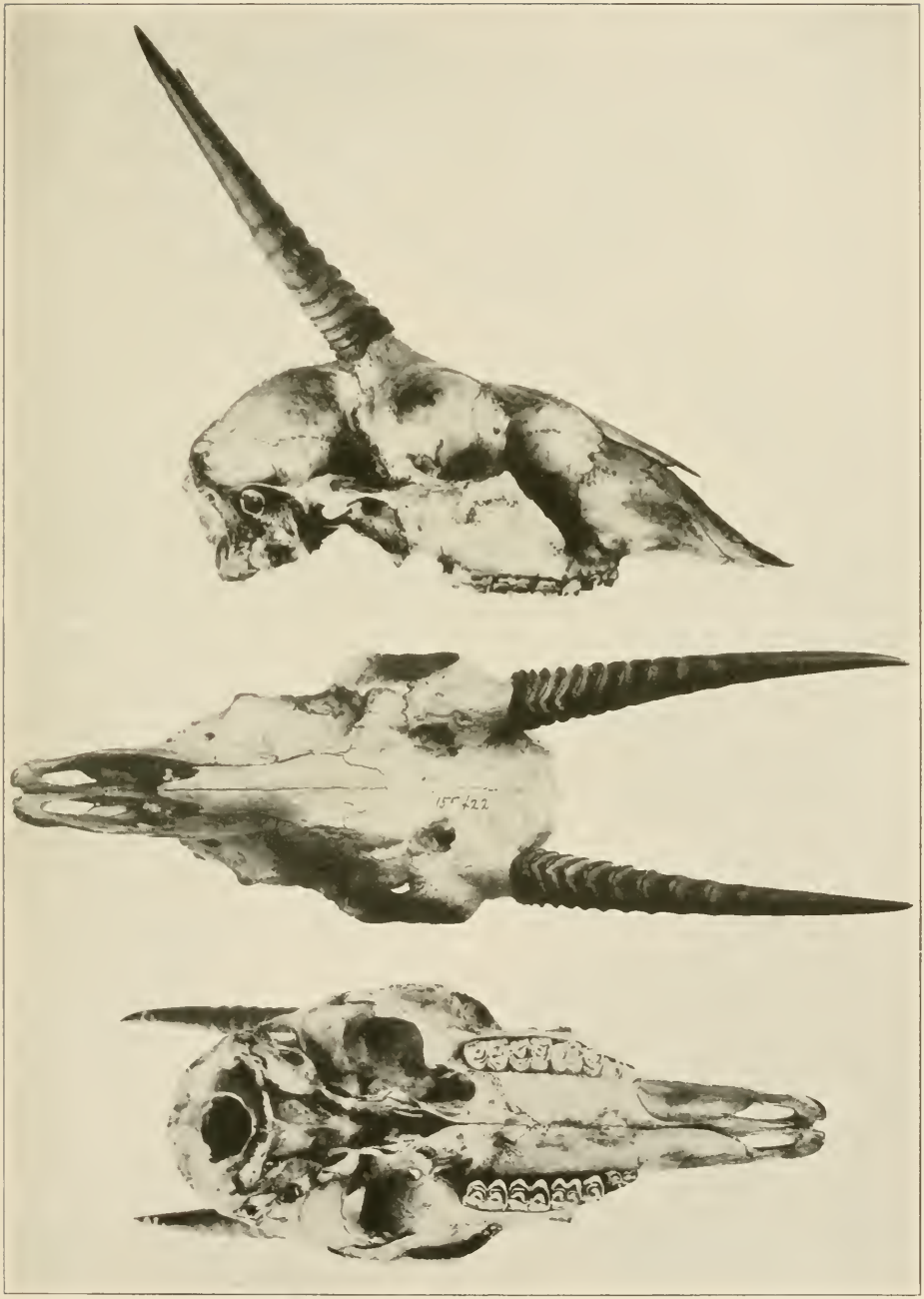
FOR EXPLANATION OF PLATE SEE PAGE 150.

57502—24——15



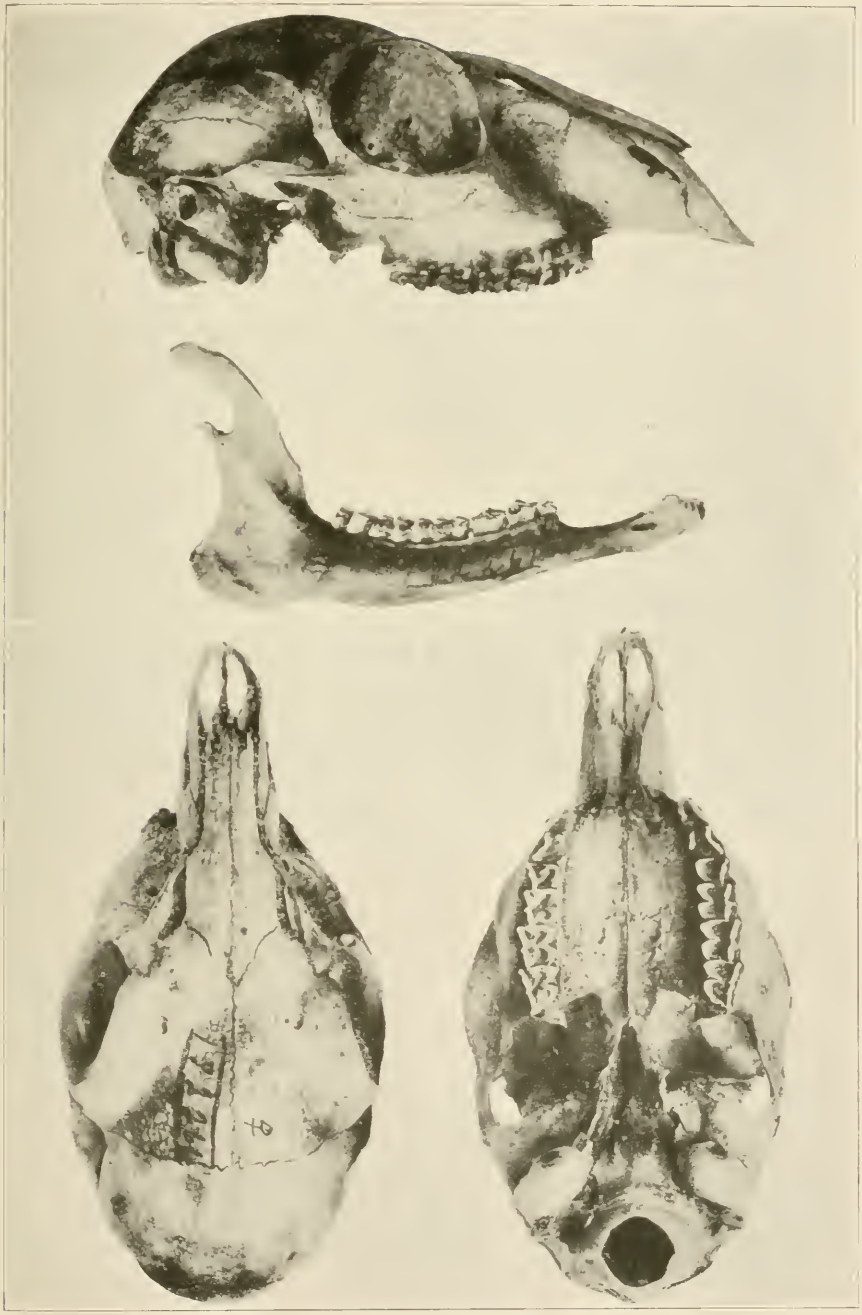
OUREBIA MONTANA AEQUATORIA HELLER. TYPE.

FOR EXPLANATION OF PLATE SEE PAGE 150.



OUREBIA MICRODON HOLLISTER. TYPE.

FOR EXPLANATION OF PLATE SEE PAGE 150.

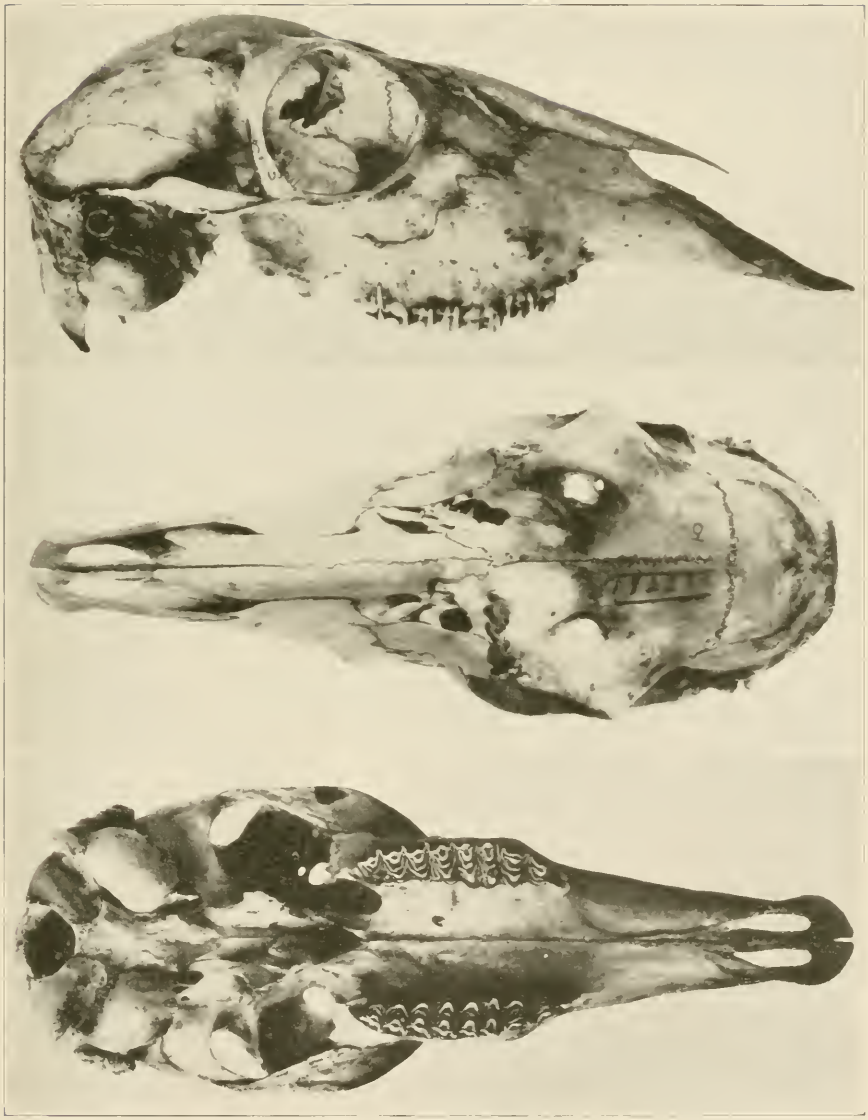


NESOTRAGUS DESERTICOLA HELLER. TYPE.

FOR EXPLANATION OF PLATE SEE PAGE 150.

RHYNCHOTRAGUS KIRKII NYIKAE HELLER. TYPE.

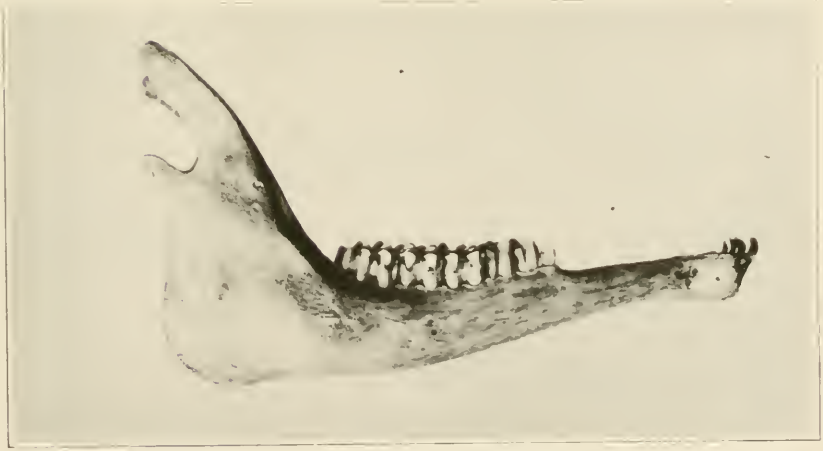
FOR EXPLANATION OF PLATE SEE PAGE 150.



REDUNCA BOHOR TOHI HELLER. TYPE.

FOR EXPLANATION OF PLATE SEE PAGE 150

REDUNCA BOHOR TOHI HELLER. TYPE.

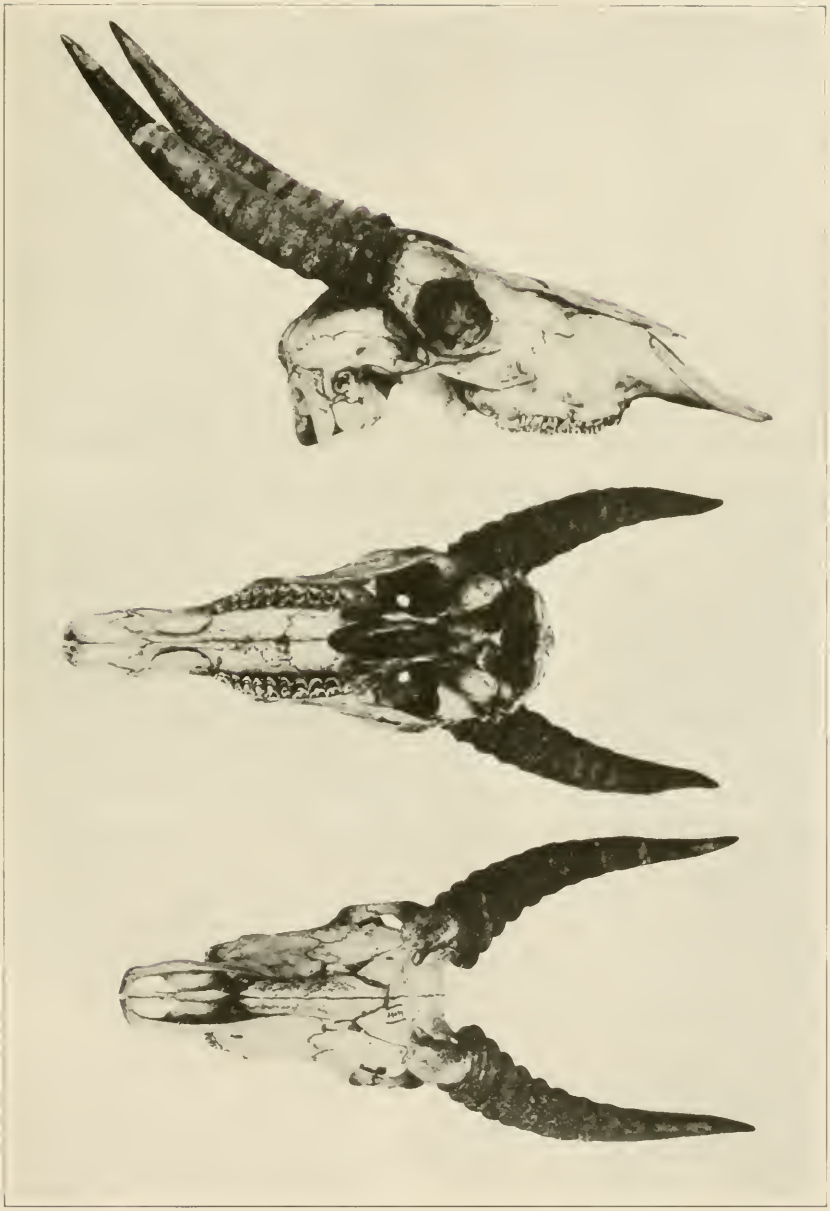


REDUNCA FULVORUFULA CHANLERI (ROTHSCHILD). TYPE.

FOR EXPLANATION OF PLATE SEE PAGE 150.

REDUNCA FULVORUFULA CHANLERI (ROTHSCHILD). TYPE.

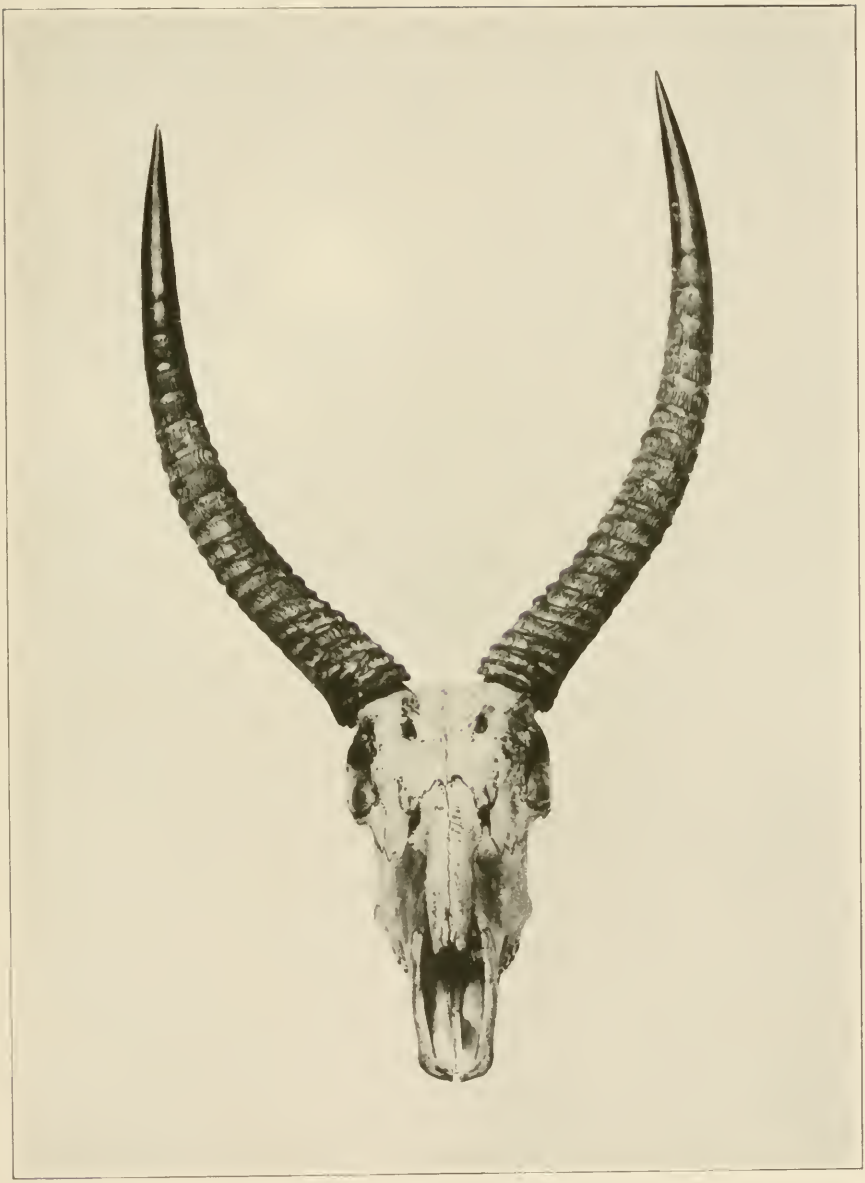
FOR EXPLANATION OF PLATE SEE PAGE 150.



KOBUS ELLIPSIPRYMNUS KURU HELLER. TYPE.

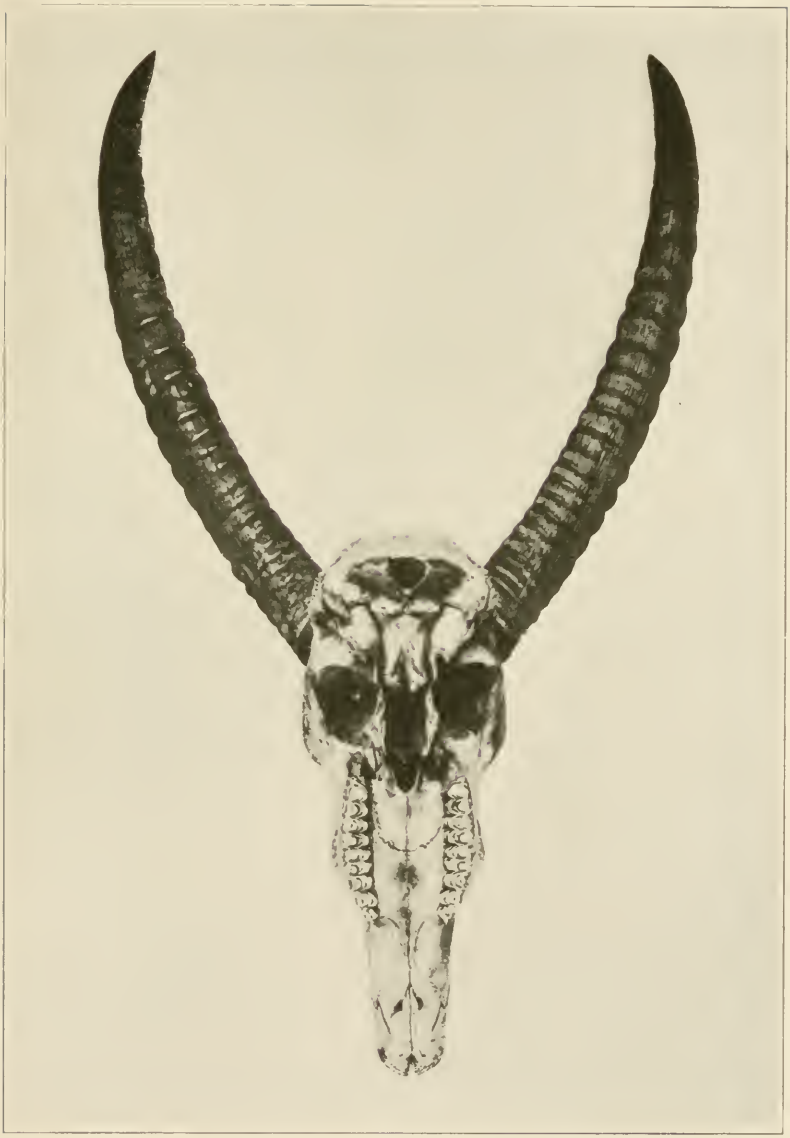
FOR EXPLANATION OF PLATE SEE PAGE 150.

57502—24——16



KOBUS DEFASSA RAINEYI HELLER. TYPE.

FOR EXPLANATION OF PLATE SEE PAGE 150



KOBUS DEFASSA RAINEYI HELLER. TYPE.

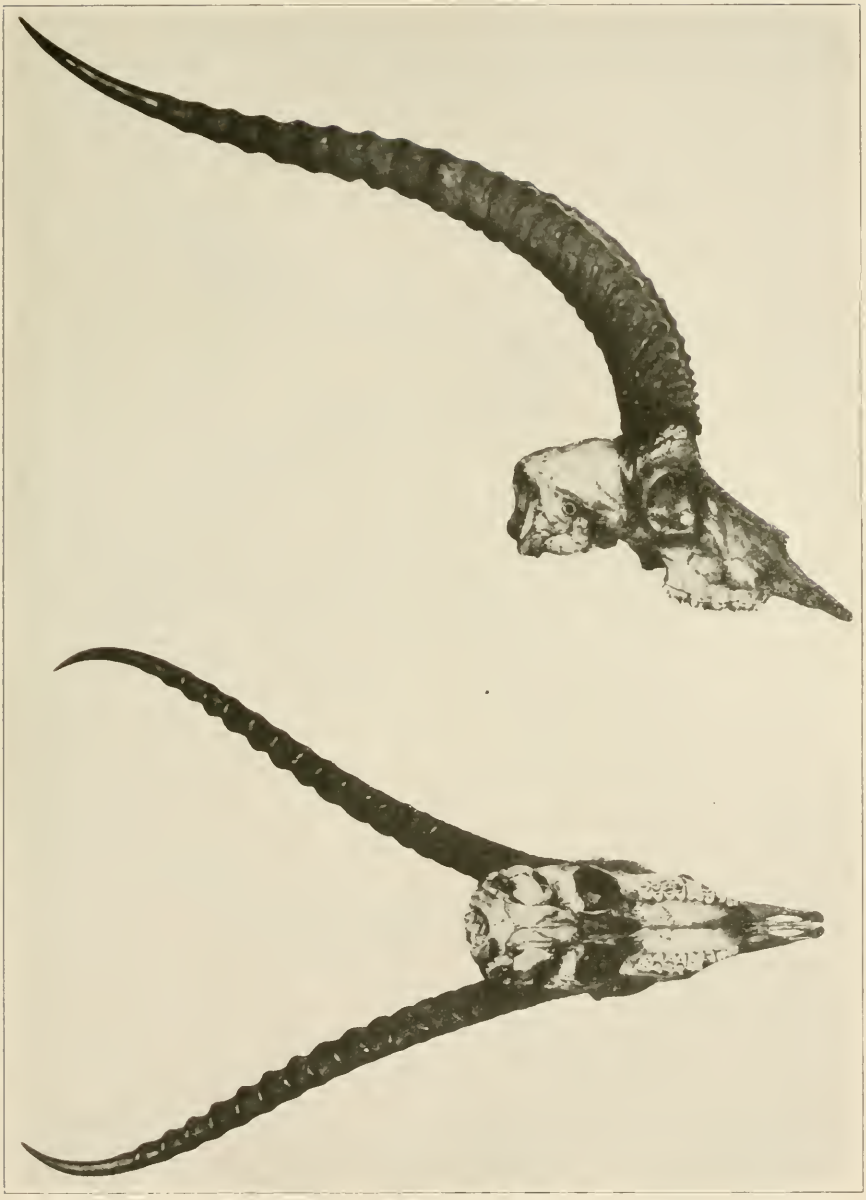
FOR EXPLANATION OF PLATE SEE PAGE 150.

KOBUS DEFASSA RAINEYI HELLER. TYPE.

FOR EXPLANATION OF PLATE SEE PAGE 150.

ADENOTA KOB ALURAE HELLER. TYPE.

FOR EXPLANATION OF PLATE SEE PAGE 150.



GAZELLA GRANTI ROOSEVELTI HELLER. TYPE.

FOR EXPLANATION OF PLATE SEE PAGE 151.

GAZELLA GRANTI SERENGETAE
HELLER. TYPE.

GAZELLA GRANTI ROOSEVELTI
HELLER. TYPE.

FOR EXPLANATION OF PLATE SEE PAGE 151.

GAZELLA GRANTI SERENGETAE HELLER. TYPE.

FOR EXPLANATION OF PLATE SEE PAGE 151.

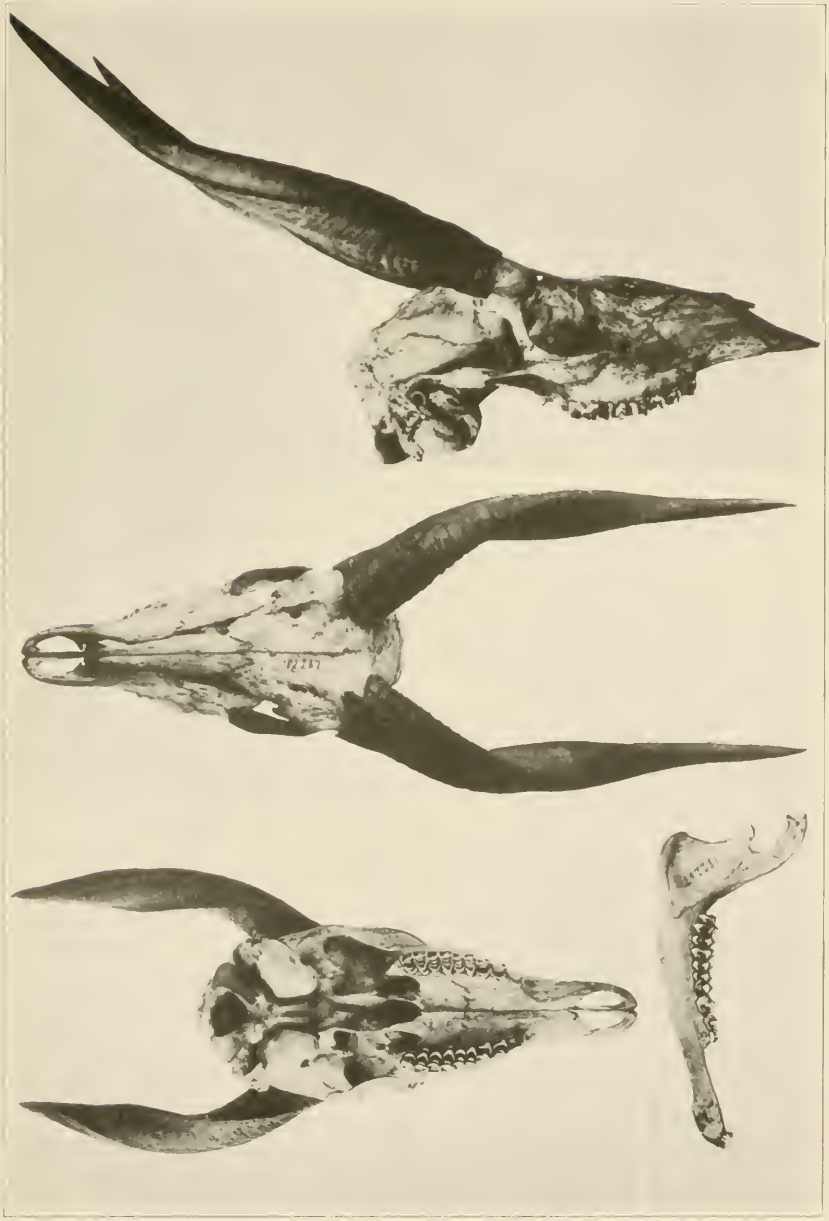
GAZELLA GRANTI RAINEYI HELLER. TYPE.

FOR EXPLANATION OF PLATE SEE PAGE 151.

57502—24——17

EGOCERUS NIGER ROOSEVELTI (HELLER). TYPE.

FOR EXPLANATION OF PLATE SEE PAGE 151

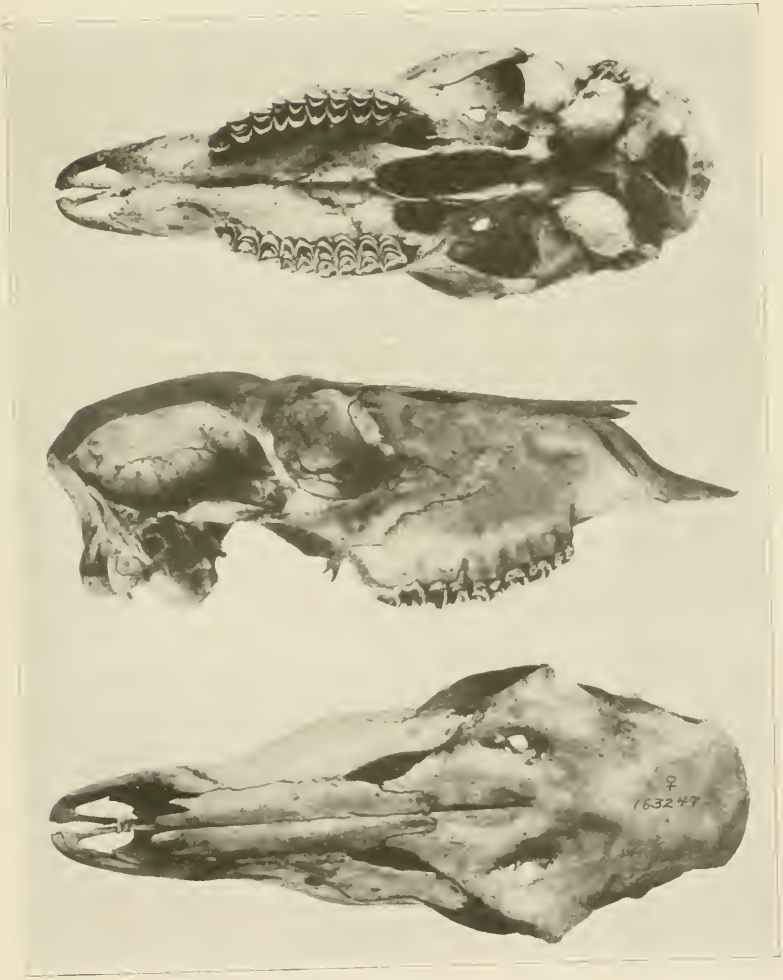


TRAGELAPHUS SCRIPTUS OLIVACEUS HELLER. TYPE.

FOR EXPLANATION OF PLATE SEE PAGE 151.

STREPSICEROS IMBERBIS AUSTRALIS (HELLER). TYPE.

FOR EXPLANATION OF PLATE SEE PAGE 151.

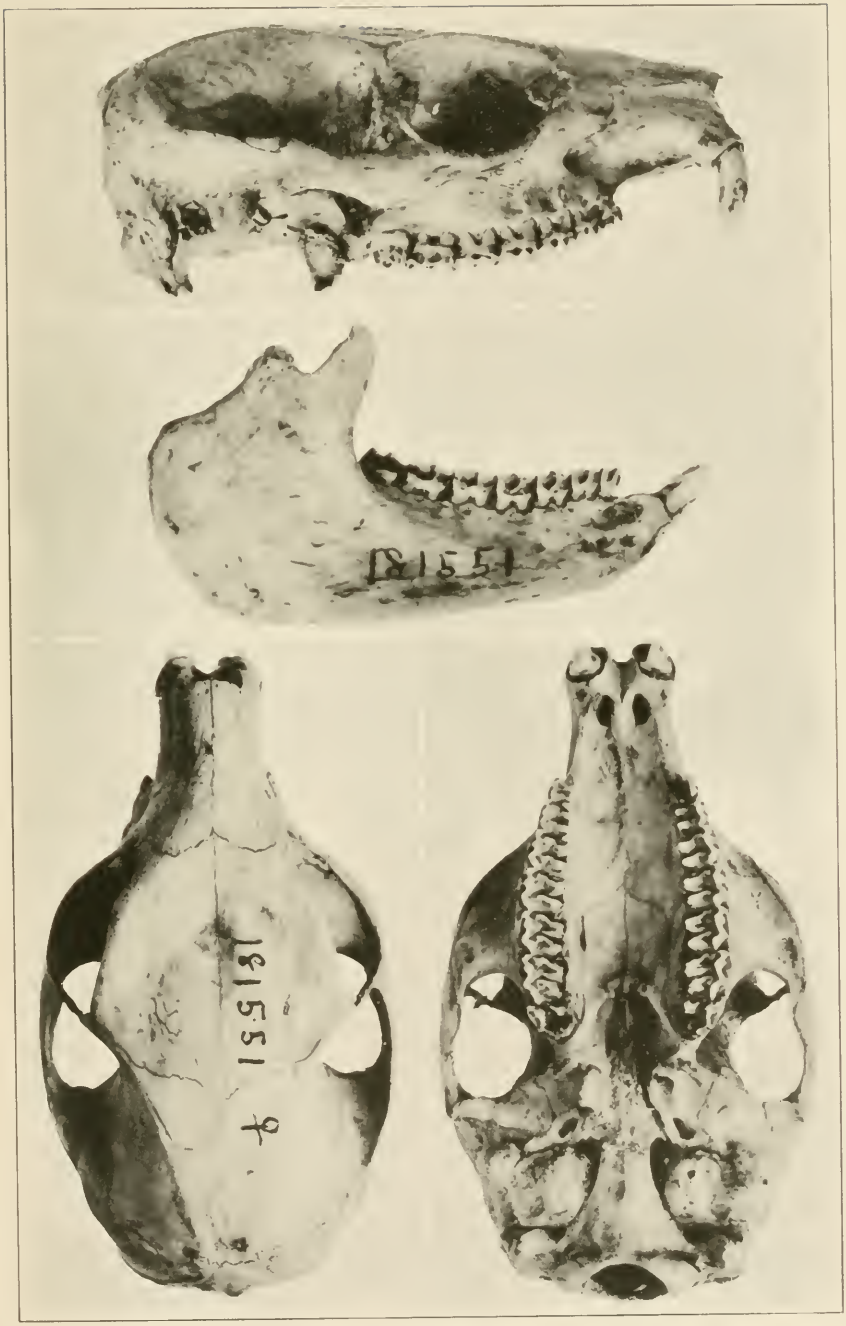


STREPSICEROS STREPSICEROS BEA HELLER. TYPE.

FOR EXPLANATION OF PLATE SEE PAGE 151

EQUUS QUAGGA CUNINGHAMEI HELLER. TYPE.

FOR EXPLANATION OF PLATE SEE PAGE 151.



HETEROHYRAX BRUCEI ALBIPES HOLLISTER. TYPE.

FOR EXPLANATION OF PLATE SEE PAGE 151.

DENDROHYRAX VALIDUS TRUE. TYPE.

FOR EXPLANATION OF PLATE SEE PAGE 151.

INDEX

[Figures in black-faced type indicate generic or specific headings.]