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MAMMALS FROM EQUATORIAL AFRICA

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FOUR NEW SUBSPECIES OF LARGE MAMMALS FROM EQUATORIAL AFRICA

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The subspecies of large mammals described in the present paper are based on material in the United States National Museum collected in East Africa by the Smithsonian African Expedition under the direction of Col. Theodore Roosevelt and the Paul J. Rainey African Expedition.

HIPPOTAMUS AMPHIBIUS KIBOKO, new subspecies

East African Hippopotamus

Type from Lake Naivasha, British East Africa; adult male, Cat. No. 162979, U. S. Nat. Mus.; shot by Theodore Roosevelt, July 20, 1909; original (Heller) number, 280.

Characters.—*Hippopotamus amphibius kiboko* is characterized by the wide nasal bones, great elevation of the orbits and the lambdoidal crest above the interorbital region which has a deeply concave surface in consequence, and the less constriction of the rostral part of the skull. From typical *amphibius* of the Nile it is further distinguishable by its smaller body size and smaller canine teeth. It may be distinguished from *capensis* of South Africa and the Zambesi river system by its more circular orbit, the lighter body coloration and the more heavily haired ears and tail tuft. The skull differences between *constrictus* of Angola and Naivasha specimens have been shown by Miller¹ to consist of greater rostral constriction, less elevation of the upper rim of the orbits, shorter mandibular symphysis and smaller teeth in the former.

Coloration.—Color of the tanned skin grayish-olive deepest on the back and lightest on the underparts where it becomes a pinkish drab on belly, axillae and groins. Hair covering absent except on tip of tail, inside of ears and on muzzle. The tail is furnished by a conspicuous tuft of seal-brown hair $4\frac{1}{2}$ inches long attached like a mane to the ridge of the flattened tail. Ears heavily haired on the inside by olive-brown hair three-fourths of an inch in length. The great lips of the muzzle as far back as the nostrils support a scattered growth

¹ Smith. Misc. Coll., 1910, vol. 54, No. 7, p. 1.

of stiff buffy brown tufts of hair placed at regular intervals apart like the bristles of a clothes brush.

Measurements.—The flesh measurements of the type were: head and body, 3,710 mm.; tail, 510; hindfoot, 550; ear, 95. Skull: condylo-basal length, 720; zygomatic width, 442; rostral constriction, 138; nasals, 415 by 48; orbit, 60 by 80; height of orbital rim above median interorbital region, 42; width of crown of M², 46; length of upper tooth row including PM², 255; length of mandibular symphysis, 203; height from angular to coronoid process, 380; circumference of lower canine, 173; length of lower canine beyond alveola, 255.

Remarks.—A series of eight skulls and four skins from Lake Naivasha in the National Museum show wide nasal bones, ranging in least width from 40-49 mm. as against 27-38 for the Nile and 29-32 for the Zambesi skulls. Naivasha skins compared with two skins from the Zambesi are much lighter in color and heavier haired on the inside of the ears and tip of the tail. The Zambesi skins (tanned) are olivaceous-black on the upper parts and dark-olive gray on the lower with the hair on the muzzle buff in color. A large number of *Hippopotamus* skulls have been examined and measured, some sixty-five in all, from the Nile, Zambesi, Lake Ngami, Congo Basin, Gambia, Liberia, Angola, and Abyssinia in the British, Berlin, Congo and several American museums, including the eighteen in the National Museum. The measurements of this large series of skulls have been available for comparison with the Lake Naivasha material upon which the present race is based. A specimen from the Athi River in the National Museum agrees with the Naivasha skulls in proportions and shape. The range of *kiboko* doubtless extends from the Rift Valley eastward to the sea coast. The hippopotamus in British East Africa is familiarly known among the European residents by its Swahili name, *kiboko*.

PHACOCHOERUS AFRICANUS BUFO, new subspecies

Nile Warthog

Type from Rhino Camp, Lado Enclave, Egyptian Sudan; immature female skull, Cat. No. 164796, U. S. Nat. Mus.; collected by Edmund Heller, Jan. 25, 1910; original number, 617.

Characters.—*Phacochoerus africanus bufo* differs from *aliani* of Abyssinia and East Africa by the greater breadth and length of the post-orbital or parietal portion of the skull, the flatter interorbital region and the greater length of the premaxillæ beyond the bases of the tusks. Other minor differences from *aliani* are the absence

of elevation in the parietal or lambdoidal crests which are on the same level as the interorbital region, the narrowness of the choanæ posteriorly and the smaller size of the tympanic bullæ.

The type, unfortunately, is an immature skull in which the last molar is just erupting and has all of the maxillary sutures still evident. Skulls of this age from the highlands of British East Africa show a much narrower, shorter and more elevated parietal region. In the flatness of the interorbital region and in the general shape of the post-orbital part of the skull the type resembles the skull of *Phacocharus declamerei* more closely, but differs from this species as do all the *africanus* group by the presence of well-developed upper and lower incisors, and roofed over choanæ. The skull is large for the age it represents which would indicate a large adult size for this race.

Measurements.—Measurements of the skull: greatest length from lambdoidal crest to tip of nasal bones, 375 mm.; condylo-basal length, 302; zygomatic breadth, 181; least orbital width, 112; width of parietal constriction, 76; least width of parietal flat area, 45; median length of post-orbital portion of skull from orbit to lambdoidal crest, 68; maxillary constriction of skull across first premolar, 51; length of premaxillæ beyond base of tusks, 57. A series of some fifty skulls of warthogs are in the National Museum from the Loita Plains, Kapiti Plains, and Uasin Gishu Plateau which apparently represent the Abyssinian race, *aliani*. This large series shows considerable variation in shape of the post-orbital portion of the skull, but the extremes in width and length do not equal the specimen from the Lado Enclave described as the type of *bufo*. A specimen of the same age as the type from the Loita Plains has a skull length of 350, width of the parietal constriction 60, and length of post-orbital portion 52.

Remarks.—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. Warthogs 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.

EQUUS QUAGGA CUNINGHAMEI, new subspecies

Samburu Quagga Zebra

Type from Archer's Post, Northern Guaso Nyiro River, British East Africa; young adult male, Cat. No. 182157, U. S. Nat. Mus.; collected by Edmund Heller, Sept. 23, 1911; original number, 2466.

Character.—*Equus quagga cuninghamei* is distinguishable from *granti* by its darker ground color as represented by the light stripes which are pale ochraceous-buff and the lighter color of its dark stripes which are bister-brown instead of black. The skull differs from that of *granti* by the shortness of the rostral portion and the narrowness of the diastema between the cheek-teeth and the incisors and also averages smaller in length with narrower palatal width and wider lambdoidal crest. From *böhmi* of the Kilimanjaro district it differs in color in the same way as from *granti* but is further distinguishable by its much smaller body size.

Coloration of the Type.—The ground color as represented by the light stripes is pale ochraceous-buff and shows considerable contrast to the white belly and inner surface of the hindquarters. The dark stripes are uniform bister-brown on the body but darken somewhat on the head where they become seal-brown in conformity with the seal-brown nose patch. The legs below the knees and hocks are marked by lighter stripes than the body, being snuff-brown and fully striped to the hoofs. The tail tuft of long hair is black with the exception of the mixture of a few white hairs in the upper part. The ears are cream-white marked on the back at the tip by a broad area of bister-brown and another brown area near the base. The mane is well-developed, the hair having a length of 6 inches with an extent from the crown of the head to the shoulders and is striped pale-buff and seal-brown in conformity to the stripes of the neck. The body stripes are arranged quite as in *granti* or *böhmi* but there is no indication of shadow stripes anywhere. The widest stripes are the oblique ones crossing the hindquarters which have a width of $2\frac{3}{4}$ inches at their widest part. The body is crossed behind the shoulders from the last neck stripe to the first oblique stripe by four transverse stripes which completely encircle the body and join the longitudinal ventral stripe. The neck is crossed by nine transverse stripes, the anterior of which are narrow and a few of the posterior very wide. The leg stripes are broken on the inner side on the upper part of the legs, but below the knees and the hocks they completely encircle the leg and on the lower part of the pasterns immediately above the hoof they become fused into a solid dark band.

Measurements.—The flesh measurements of the type were: head and body, 1,950 mm.; tail, 460; hindfoot, 500; ear, 170. Skull: greatest length, 487; condylo-basal length, 450; greatest breadth, 175; least interorbital width, 110; rostral length from nasal-premaxillary notch to tip of premaxillæ, 136; least width of postorbital arch, 19;

width of lambdoidal crest, 63; postorbital constriction of skull, 81; palatal width across M^1 , 109; width of M^1 , 24.5; width of mesopterygoid fossa, 43. The skull is immature, all the milk molars being still in use and only the first molar being in place. An adult male skull collected with the type from the same herd has been used to determine the tooth dimensions and the length of the diastema. This skull, No. 182156, measures in condylo-basal length, 457; greatest breadth, 188; upper tooth row, 146; diastema between cheek-teeth and incisors, 84.

Remarks.—The skin of the adult male having been lost it has been necessary to take an immature specimen as the type. There is in addition to the type skin another skin of the same age taken at the same time. This latter specimen is quite identical in color with the type. There are in the National Museum for comparison a series of 30 skins of *granti* from the Athi and Loita Plains. Specimens of *granti* of the same age differ from the type by their whitish or cream ground color and darker stripes which are seal-brown in color. The stripes of the old adults of *cunninghamei*, however, as observed in the live specimens in the field are darker than the type somewhat but are not deep black as in *granti*. The lighter color of the dark stripes is no doubt due to the arid conditions and intense heat and sunlight to which the Northern Guaso Nyiro race is subject. *Cunninghamei* is a desert race occupying the Northern Guaso Nyiro watershed from its junction with the Guaso Narok eastward to its termination in the Lorian swamp. Northward the race reaches at least as far as the northern slopes of the Lorogi Mountains and southward as far as the north bank of the Tana River. The race is named for R. J. Cunningham, the well-known Safari leader of British East Africa, to whose efforts are due the preservation of many of the big game specimens collected by the Smithsonian African expedition under the direction of Colonel Roosevelt.

CROCUTA CROCUTA FISI, new subspecies

Marsabit Spotted Hyaena

Type from Merille Waterholes, midway between the Northern Guaso Nyiro River and Mount Marsabit; adult male, Cat. No. 182078, U. S. Nat. Mus.; collected by Edmund Heller, July 23, 1911; original number, 2385.

Characters.—*Crocuta crocuta fisi* is characterized by its light, pale buff, ground color, the small size of the dark spots on the back and the short pelage. *Germinans* of the highlands of British East Africa has a much darker ground color either ochraceous, cinnamon or drab,

the dorsal spots are larger, the largest fully twice the size of the spots in *fisi* and the pelage is longer and heavier. The Somaliland race *rufipicta* differs decidedly by having reddish rather than blackish spots, darker ground color and smaller body size.

Coloration.—Ground color of the type pale buff spotted irregularly over the back by rather small black spots varying in diameter from a quarter to three-fourths of an inch, and covering an area only about one-quarter that of the ground color. Spots heaviest and most distinct on mid line of the back and faintest on the neck, sides of the body, underparts, and shoulders; the head and feet unspotted. The tail is basally like the back in color with a few dark spots, the terminal one-half being covered by a bushy black tuft of longer coarse hair. The feet are uniform olive-brown to the toes in contrast to the spotted upper portions of the legs. The head is grizzled buffy and blackish on the crown and sides, the snout, muzzle, lips and chin being uniform dusky black in contrast. The whiskers and the long hairs above the eyes are black. The throat and sides of the head below the ear are uniform light buff without darker spots. The back of the ears show a grizzled appearance due to the scantiness of the short buffy hair which allows the blackish skin to show through. The ears on the inner side are more heavily clothed by longer whitish hair. The hair is short, the length on the rump being only one-half of an inch. The nape is furnished with a short mane of uniform light buff color in which the longest hairs have a length of two inches.

Measurements.—The flesh measurements of the type were: head and body, 1,150 mm.; tail, 295; hindfoot, 225; ear, 100. The skull measures: condylo-basal length, 250; greatest length, 256; zygomatic breadth, 156; breadth of palate across carnasials, 98; length of upper tooth row including canine, 95; length of lower tooth row including canine, 102; length of upper carnasial on outside edge, 35; inter-orbital width, 58; post-orbital width, 47; width across post-orbital processes, 74; nasals, 54 x 27; width of mesopterygoid fossa at suture, 26; condylo-basal length of mandible, 176. The skull is that of a young adult having the sphenoidal and parietal sutures still evident. No skull difference has been detected between this race and *germinans* owing to the great individual variation to which this structure is subject. Both narrow and wide types of skulls are found in specimens from the same locality and every intermediate stage between these. The female skulls exceed the male decidedly in size.

Remarks.—The desert region lying between Mount Marsabit and the Northern Guaso Nyiro River is represented in the National Mu-

seum by a series of ten skins and eighteen skulls of this race collected by the Rainey expedition. The skins show remarkable uniformity in color and relative size of spots and differ in this respect greatly from the variable *germinans* no two skins of which are quite alike in shade or extent of dark spots. They are readily distinguishable from a large series of *germinans* from the Loita Plains and Uasin Gishu Plateau by their lighter ground color and smaller and less numerous dark spots on the back. The young and the immature specimens are much more heavily spotted and have the ground color darker than the adults. They closely resemble in color the young of other races and it is not until they become adult that their color characters become apparent. *Fisi* is a light-colored desert race having the same bodily size as the highland races. The spotted hyaena is known to the Swahili and other coast tribes as *fisi*.