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Equatorial Africa and Abyssinia

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NEW RACES OF CARNIVORES AND BABOONS FROM EQUATORIAL AFRICA AND ABYSSINIA

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Further systematic study of the collection of African mammals in the U. S. National Museum has led to the discovery of the new races described in the present paper. The material was received from the Smithsonian African Expedition under the direction of Col. Theodore Roosevelt, and the Paul J. Rainey Expedition, unless otherwise noted.

AONYX CAPENSIS HELIOS, new subspecies

Nyanza Clawless Otter

Type from the Sotik District, 40 miles' southwest of Kericho Station, British East Africa; adult female, Cat. No. 175750, U. S. Nat. Mus.; collected by H. J. Allen Turner, Oct., 1912; original No. 1181.

Characters.—*Aonyx capensis helios* resembles *menlecki* of Abyssinia closely in coloration, having the top of the snout as far as the interorbital region and the tip of the ears white as in that species, but it differs by its much smaller body size. *Hindei* of the Tana River drainage differs by the absence of white on the top of the snout and the tips of the ears, by smaller or shorter mastoid processes and narrower or more slender zygomatic arches, but resembles it closely in body size.

Coloration of the body and limbs dark seal-brown, deepest on back and palest on underparts, where it is burnt umber in color. Top of head seal-brown like the body. Underfur on body pale drab-gray. The throat, sides of head to the level of the eyes and ears, lips and top of snout, patch above eye and tip of ear, silky white in striking contrast to the general dark brown color. The lips at angle of mouth and the sides of the snout are dusky brown in color.

Measurements.—No flesh measurements are available. The tanned skin measures in length of head and body 700 mm. and in tail 470 mm. Skull: condylo-basal length, 127; basal length, 117; zygomatic breadth, 91; mastoid breadth, 84; interorbital constriction, 30; breadth across interorbital processes, 38.5; post-orbital constrict-

tion, 27; length of palate, 57; width of narial opening, 18; width of mesopterygoid fossa at suture, 11; greatest diameter of M^1 , 16.5; condylo-basal length of mandible, 85. Skull old, with the sutures all obliterated, but the teeth show well defined cusps.

Remarks.—The type is the only specimen in the National Museum. A female topotype of *hindei* from the Thika River, however, is in the collection also collected by H. J. Allen Turner. The skull of this specimen is practically the same age and size as the type, but differs from it by the possession of the first upper premolars, narrower narial opening, heavier zygomatic arches and longer mastoid processes. The race here described is doubtless confined to the Nile drainage and is the Uganda or Nyanza representative of the giant Abyssinian otter, *menlecki*, the largest known race. From typical *capensis* of South Africa it differs by the presence of white tips to the ears, but is otherwise quite identical to it in color and size of body, and is perhaps best considered an intermediate race between *capensis* and *menlecki*.

FELIS LEO ROOSEVELTI, new subspecies

Abyssinian Lion

Type from the highlands of Abyssinia near Addis Ababa, presented by Emperor Menelik to President Roosevelt in 1904; old male, Cat. No. 144054, U. S. Nat. Mus.; original (Nat. Zoöl. Park)

No. $\frac{1151}{5307}$

Characters.—*Felis leo roosevelti* is readily distinguishable from the other described races by the greater breadth of the skull, the wider mesopterygoid fossa and the smaller size of the cheek teeth. The zygomatic arches are bowed outward to so great an extent that the outline of the skull is quite triangular. Externally this race is characterized by large body size, dark tawny coloration and heavy black tipped mane.

Coloration.—The dorsal coloration is tawny, lined over the middle of the back with black tipped hairs; sides of body tawny-ochraceous without, darker spots and merging gradually into the lighter ochraceous underparts. Mane heavy, extending from the forehead to behind shoulders and over the whole throat and chest areas to the forelegs and tuft on back of elbows; length of individual hairs on nape 14 inches; color effect distinct blackish, but mixed considerably by tawny hair; shoulders darkest, the hair chiefly black with short terminal tawny tips; front of mane about head and forethroat lightest.

without black, the hair uniform tawny; flanks without any evidence of a mane. Tail like the back in color, except the terminal four inches which are furnished with a heavy black tuft in which the hair is black to the roots. Outside of legs like the back in color, inside ochraceous-buff like the underparts; hair on underside of toes black in conformity with the black footpads. Head tawny black lined like the back in color, the black ear patches and the deep black eyelashes alone showing contrast; whiskers mixed black and white; ears tawny, marked on the back by a broad band of black occupying the middle half of the ear, the base and tip tawny; inner side of ears ochraceous.

Measurements.—Measurements of tanned skin: head and body, 1,780 mm.; tail, 700; hindfoot (bone still in place), 350. Skull old, the sphenoidal and occipital sutures anchylosed and the sagittal and lambdoidal crests well developed. Greatest length from occipital crest to tip of premaxillæ, 333 mm.; condylo-basal length, 297; zygomatic breadth, 255; interorbital constriction, 69; post-orbital constriction, 60; width across post-orbital processes, 104; nasals, 92 x 62; upper cheek teeth series, 73; length of upper carnassial, 35; width of mesopterygoid fossa at suture, 45; distance between bullæ across basi-occipital, 26; condylo-basal length of mandible, 230.

Remarks.—The type was received alive March 19, 1904, and deposited in the National Zoölogical Park at Washington where it lived until November 14, 1906. Owing to its short stay in captivity it may be taken as a normal specimen of the lion inhabiting the Abyssinian highlands. Neither the hair covering nor the condition of the skull shows any abnormalities due to its life in the Zoölogical Park. Judging by its skull it was an old animal well along in middle life at its death, and was doubtless fully adult when captured by the Abyssinians. Another adult male specimen from Abyssinia, also from the National Zoölogical Park, is in the National Museum. This specimen agrees with the type in the broad character of the skull and small size of the teeth. A specimen received from the Sudan, sent by the Sirdar, Sir Reginald Wingate, to the National Zoölogical Park, is also a member of this race. The skull of this specimen is even wider than in the type and exceeds in this dimension the record lion skull from Delago Bay, South Africa, now in the Berlin Museum. The two Abyssinian and the Sudan skulls are easily distinguishable by their great width, wide mesopterygoid fossa and small cheek teeth, from a series of 30 male skulls of *massaica* of equal age in the National Museum from British East Africa, shot by Colonel and Kermit Roosevelt, Paul J. Rainey, John Jay White, and Dr. W. L.

Abbott. Specimens have also been examined at the British and Berlin museums from south and west Africa. The west African skulls are easily distinguishable from east or south African specimens by their small size, great breadth and large carnasial or cheek teeth. The Abyssinian lion approaches this western type in the breadth of skull, but the teeth are of the small eastern type, and the large skull also distinctive of the east coast lions. Distinctly the largest of all is the South African lion, now quite extinct. The skull averaged at least an inch longer in length than any of the equatorial races, but was relatively quite narrow. In coloration the Cape race resembled the Abyssinian, being tawny bodied with a black mane. The Somali lion, the nearest geographical ally of the Abyssinian, is a light-buffy colored desert race, closely resembling and doubtfully distinct from the Masai lion. It is much shorter maned and smaller in body size than the Abyssinian. The characters assigned by Noack in the original description of *Felis leo somaliensis* of larger ears and longer tail are not applicable to the race, these parts having the same proportionate size as in other members of the group. Noack's description was based on a pair living at the Berlin Zoölogical Gardens, and the characters he assigned to the race, are merely such as appeared upon casual observation and are not founded upon actual measurements of a specimen. Doctor Matschie has informed me that the types have been exchanged by the Berlin Zoölogical Gardens with animal traders and their present abode is unknown. The unfortunate condition of these types is a good illustration of the loss and confusion to systematic work so often attendant upon the pernicious custom of naming species from living specimens. In the present case we have no exact characters and no knowledge of the skull structure of the race described, merely a few casual observations to which are attached a general locality of doubtful value. Several of the types of African big game mammals are to-day living in various zoölogical gardens. Special efforts should be made by such institutions to keep trace of these types and upon their death deposit the specimens in the largest available public museum where they may be preserved and accessible to zoölogists for comparison.

FELIS LEO NYANZÆ, new subspecies

Uganda Lion

Type, a flat skin, from Kampala, Uganda, gift of the European residents to Colonel Roosevelt; adult male, Cat. No. 164551, U. S. Nat. Mus.; received Dec. 30, 1909; original (Heller) No. 580.

Characters.—*Felis leo nyanza* differs from *massaica* of British East Africa by its darker tawny coloration and short mane. In coloration it closely resembles the Abyssinian lion, but lacks the heavy black mane of that species and the large body size. The skull is smaller and narrower than *massaica*, but resembles it in the relative size of the cheek teeth and mesopterygoid fossa.

Coloration.—Dorsal coloration ochraceous-tawny vermiculated slightly with black on median line; sides ochraceous without darker spots; belly buffy-ochraceous. Mane short, not extending on shoulders except on median dorsal line where it forms a narrow ridge of hair 2 inches wide by 10 inches long; length of hair on middle of neck only 3 inches; color tawny throughout, only showing dark brownish color at tips of hair on crown and shoulders. Limbs like the back in color, the thighs posteriorly with a blackish stripe; under-side of toes seal-brown. Head tawny like back. Ears chiefly tawny, the black area being reduced to a narrow line.

Measurements.—Measurements of the flat skin: head and body, 1,990 mm.; tail, 890; ear, 100. Skull missing, only the premaxillaries, canine and incisor teeth and nasal bones preserved with the skin. These indicate a fully adult animal. An adult male specimen in the British Museum from Mulema, Uganda, collected by Colonel Delme-Radcliffe is quite identical with the type in color and may be taken as representing the race here described. This specimen has a narrow, short skull with rather small teeth. The dimensions are: greatest length, 363 mm.; condylo-incisive length, 324; zygomatic width, 230; interorbital width, 74; post-orbital constriction, 66; width across post-orbital processes, 111; length of upper carnassial tooth, 37; nasals, 116 x 69; condylo-basal length of mandible, 237.

Remarks.—The Uganda race of the lion does not apparently share the close approximation to its west African representative that is exhibited by much of the mammal fauna of the region. The broad skulled, large-tooth form of west Africa is strikingly different from the narrow skulled, small-tooth *nyanza* which is a close ally of *massaica*.

FELIS PARDUS FORTIS, new subspecies

Highland Leopard

Type from the Loita Plains, Southern Guaso Nyiro district, British East Africa; adult male, Cat. No. 181600, U. S. Nat. Mus.; collected by Mr. Aggate in the bush country bordering his farm, and purchased by Paul J. Rainey, May 31, 1911; original (Heller) No. 2309.

Characters.—*Felis pardus fortis* is a large race which attains the maximum size, the skull exceeding in length that of any other African or Asiatic race. The skull is further distinguishable by its narrowness, the small size of the tympanic bullæ and the absence of the first upper premolar. Body size large, with long pelage, dark coloration, and numerous small rosetted spots, the central color of which it not differentiated in shade from the general ground color. *Fortis* in color most resembles *suhilica*, but is easily distinguishable by the darker ground color which is uniform in shade with the central portion of the rosetted spots. Male skulls of *suhilica* differ in their much smaller size, the largest being seven-eighths of an inch less in length than the type of *fortis*, decidedly larger bullæ, and presence of a well developed first upper premolar. The bullæ in *fortis* do not rise to the level of the mastoid process, the skull when placed on a level resting upon the bullæ, but in *suhilica* they extend well beyond the mastoid.

Coloration of the type.—Ground color on median line of back cinnamon-brown, paling on sides to ochraceous-tawny, and on underparts and inside of limbs to whitish or pale buff. The rosetted spots on the back are small and broken into two or three sections, the central portion being uniform in color with the cinnamon-brown ground color; on the sides of the body the central portion is darker than the ground color as usual among leopards. The underparts, legs, head, and basal part of tail are marked by solid black spots. The terminal portion of the tail is solid blackish with a narrow median whitish band on the underside. Ears tawny like the ground color of the head and marked by a broad band of black across the middle of the back.

Measurements.—The type is without flesh measurements. The skull measures: greatest length, 260 mm.; condylo-basal length, 236; zygomatic width, 157; interorbital width, 43; width across post-orbital processes, 75; post-orbital constriction, 37; nasals, 75 × 39; length of upper carnassial, 27; width of mesopterygoid fossa at suture, 20; condylo-basal length of mandible, 172. Skull old, the sphenoidal and interparietal sutures fully anchylosed. The type is unique in skull characters and large size among a series of 25 leopards from east equatorial Africa in the National Museum.

FELIS PARDUS CHUI, new subspecies

Nile Leopard

Type from Gondokoro, Northern Uganda: adult male, Cat. No. 164764, U. S. Nat. Mus.; collected by Edmund Heller, Feb. 26, 1910; original No. 653.

Characters.—*Felis pardus chui* is characterized by its widely isolated spots, which are few in number and separated from one another by wide interspaces of the ground color. From the leopard of British East Africa, *suhilica*, it is distinguishable by the wide interspaces between the spots, the white ground color of the upper surface of the hindfeet, the more extensive white surface to the underside of the tail and the larger body size and skull. The west African leopard, *leopardus*, has actually and relatively much larger cheek teeth, more numerous spots and smaller body size than *chui*. Pelage very short.

Coloration.—The dorsal body color is ochraceous, paling on the sides to buffy, and on the belly and underside of legs to pure white. Spots black, rosetted, the center usually darker ochraceous than the ground color, the margin in some forming a complete ring without any breaks, and distinctly ocellated in character. Spots on underside of body and on legs generally solid black without a lighter central portion. Spots on head and sides of face broken up into numerous small blotches. The tail basally with rosetted spots which become lengthened into solid streaks on the middle portion, the terminal portion having a ringed appearance with much white from the underside showing on the sides and nearly separating the black into rings.

Measurements.—Measurements of the type in the flesh: head and body, 1,240 mm.; tail, 840; hindfoot, 255; ear, 90. Skull: greatest length, 243; condylo-basal length, 225; zygomatic breadth, 150; inter-orbital constriction, 37; width across post-orbital processes, 64; post-orbital constriction, 38; nasals, 77 × 35; length of upper carnassial, 24.5; width of mesopterygoid fossa at suture, 26. Skull old, the sphenoidal and interparietal sutures fully ankylosed. First upper premolar minute and rudimentary.

Remarks.—Another specimen, an adult male from Rhino Camp, Lado Enclave, is in the National Museum which agrees in color characters and large size of skull with the type. *Chui* is a lowland race occupying the Nile Valley, and characterized by the reduced number of spots, some of which are ocellated, large body size and short pelage. A large series of *suhilica* from British East Africa have been compared with the two Nile specimens representing this race and in this series the color differences are well marked and constant.

ACINONYX JUBATUS VELOX, new subspecies

African Highland Cheetah

Type from the Loita Plains, British East Africa: adult male, Cat. No. 163096, U. S. Nat. Mus.; shot by Kermit Roosevelt, June 12, 1909; original (Heller) No. 107.

Characters.—The African highland cheetah, *Acinonyx jubatus velox*, is characterized by its large, close set black spots which predominate over the ochraceous tone of the ground color, the boldly spotted hind legs, long pelage, and large body size. From *jubatus* of the Cape region of Africa it may be recognized by its larger dorsal spots, lighter ground color and larger body size. It may be distinguished from *raineyi* by the absence of pinkish suffusion to the coat, the larger and more numerous spots, and longer pelage.

Coloration.—The dorsal ground color of the type is ochraceous, deepest on midline of back and palest on sides and belly, where it shades into cream-buff. Black spots on back circular in outline, three-quarters of an inch in diameter, interspaced with numerous smaller black spots causing the black color to predominate over the ground color on the back. The spots on the sides are larger but less numerous and cover a smaller area than the ground color. The legs and underparts are marked by oblong black spots. The feet are marked by irregular black spots, the forefeet more numerous than the hind ones, and the base of the toes also show spots above, but the hair on the underside is dusky-brown. Tail marked by large black spots above and black rings below, with the terminal portion ringed all around with black and pale buffy rings, the tip whitish. The crown of the head and the nape are marked by small black spots as far forward as the interorbital region. The whole snout from the eyes is uniform ochraceous and banded on the sides by the heavy black tear band from the eyes to the mouth. The sides of the head from eye to ear base are marked irregularly by small black spots without any suggestion of a line from eye to base of ear. The chin and the upper throat are whitish or cream-buff in color. The back of the ears are chiefly black, only the tips and the inner side being buffy. Hair of nape longer than on rest of body and forming a short mane from head to behind the shoulders. Hair on median line of breast and belly long and mane-like in character. The ventral surface of the tail is marked along its whole length by a broad mane or ruff of longer hair, tip of tail long haired, and somewhat tuft like.

Measurements.—The flesh measurements of the type are: head and body, 1,300 mm.; tail, 740; hindfoot, 300; ear, 80. Skull: greatest length, 179; condylo-basal length, 163; zygomatic breadth, 136; nasals, 56 x 31; interorbital width, 40; post-orbital constriction, 59; width across post-orbital processes, 82; length of upper carnassial, 23; width of mesopterygoid fossa at suture, 25.5; condylo-basal length of mandible, 124. Skull aged, the sphenoidal and occipital sutures obliterated by anchyloses.

Remarks.—Twelve adult specimens of this race are in the National Museum, nine from the Loita Plains, two from Laikipia Plateau north of Mount Kenia and one from the Uasin Gishu Plateau. The latter specimen has an extremely long skull measuring in greatest length 200 mm., and exceeding in size any other cheetah skull examined. One other male skull from the Loita Plains attains a length of 190 mm. These dimensions would indicate that the British East African or highland cheetah is the largest of the races. The series is quite uniform in coloration and distinguishable from *raineyi* by the darker color and more numerous spots on the back which predominate in area and give the whole a general dark coloration.

ACINONYX JUBATUS RAINEYI, new subspecies

Rainey African Cheetah

Type from Ulu, Kapiti Plains, British East Africa; adult male, Cat. No. 182321, U. S. Nat. Mus.; shot by Paul J. Rainey, Oct. 13, 1911; original (Heller) No. 2639.

Characters.—*Acinonyx jubatus raineyi* is a pale colored, short haired race of the African cheetah having a light pinkish-buff dorsal ground color and large blackish spots. It resembles most closely in characters *soemmeringii* of Kordofan and the Lake Tchad region, but may be distinguished by its much larger dorsal spots, lighter ground color and the spotted hindfeet. From its nearest geographical ally, *velox*, it may be distinguished by the light dorsal ground color with its pinkish suffusion, fewer dark spots and less distinctly spotted hindfeet.

Coloration of the type.—The ground color is pale pinkish-buff, darkest on midline, where it is ochraceous-buff, and paling on the underparts to cream color. Body and legs marked uniformly by round black spots three-quarters of an inch in diameter, interspersed by occasional small spots or dots. Spots on legs and belly elongate in shape; legs spotted to the toes, the forefeet much more conspicuously than the hind ones in which the spots are small or indistinct near the toes. The toes are much spotted above and pinkish-buff like the ground color, but below they are clothed by dusky-drab hair. Tail spotted like the back with the terminal one-fourth marked by five black rings, the extreme tip whitish. Top of head and nape marked by numerous small black spots, but the snout is uniform ochraceous-buff without spots and sharply defined on the sides by a black tear stripe extending from the eye to the mouth, just behind whiskers, and passing backward to the angle of the mouth. The sides of the

head behind the eye and below the ear are marked by a few black spots, but no evident line between the eye and the base of ear is thus formed. The ears are pinkish-buff marked by a wide black band covering lower half of back. The chin and upper throat are white. Pelage short on dorsal surface, seven-eighths of an inch on the rump; nape with a short mane three inches wide from head to behind shoulders. The midline of breast and belly and the whole length of the ventral surface of the tail is furnished by a ruff or short mane of longer fluffy hair.

Measurements.—No flesh measurements of the type are available. The skull measures: greatest length, 180 mm.; condylo-basal length, 162; zygomatic breadth, 122; nasals, 55 x 31; interorbital width, 39; post-orbital constriction, 53.5; breadth across post-orbital processes, 72.5; length of upper carnassial, 22; width of mesopterygoid fossa at suture, 25; condylo-basal length of mandible, 122. Skull, young adult, the sphenoidal and parietal sutures still evident.

There are six specimens of this race in the National Museum collection, four of which are adult females and two adult males. Five of the specimens are from the Kapiti Plains near Ulu station, and one from Juja Farm. This series shows little variation in color, all being quite light colored with a distinct pinkish suffusion to the buff ground color. They differ from *velox* of the higher plateau region by the lighter ground color which predominates over the black of the spots which are in this race more widely separated. *Raineyi* represents the coast race of the cheetah which inhabits the lower slopes of the plateau region and the edge of the coast desert region about the slopes of Kilimanjaro and in the vicinity of the Tana River. The Athi and Kapiti Plains are the farthest inland point reached by this race.

PAPIO ANUBIS LESTES, new subspecies

Athi Baboon

Type from the Ulukenia Hills, Athi Plains, British East Africa; adult male, Cat. No. 164633, U. S. Nat. Mus.; collected by J. Alden Loring, Nov. 19, 1909; original No. 8234.

Characters.—*Papio anubis lestes* differs from *furax* of the Rift Valley region by the much narrower and longer rostral portion of the skull, longer tooth row, less blackish feet, shorter tail and smaller body size. From *vigilis* it may be distinguished by its darker body color, presence of black on the hands, and smaller body size.

Coloration.—General color of the type olive; hair annulated, basally hair brown with a broad subterminal band of buffy and a black tip. Skin of face quite blackish with a scattered growth of downy grayish hair. Forefeet showing a mixture of black and olive; hindfeet without blackish cast, being vermiculated like the body. Chin and throat blackish, rest of underparts vermiculated like the upperparts, but the hair of the chest and belly basally seal-brown or black.

Measurements.—Measurements in the flesh: head and body, 723 mm.; tail, 439; hindfoot, 215. Skull old, with the incisors much worn. Greatest length, 198; basilar length, 135; zygomatic breadth, 115; rostral width midway between orbit and nares, 30; length of snout from orbit to tip of premaxillæ, 110; length of upper cheek teeth series, 55. The snout in *furax* is equal in length to that of *lestes*, but it is fully a third wider measuring usually more than 40 mm.

Remarks.—Three old males of this race are in the National Museum collection from the Ulukenia Hills. They agree in having the rostrum long and narrow as in the type and are easily distinguishable by this character from skulls of *furax*. The race described as *neumanni* from the Rift Valley of German East Africa is decidedly smaller and lighter colored.

PAPIO ANUBIS VIGILIS, new subspecies

North Kenia Baboon

Type from the Lakiundu River near its junction with the Northern Guaso Nyiro, British East Africa; old male, Cat. No. 182033, U. S. Nat. Mus.; collected by Edmund Heller, July 10, 1911; original No. 2337.

Characters.—*Papio anubis vigilis* is a very long, slender snouted race of large body size. The snout has the same proportions as *lestes*, but the body size is much larger, the general coloration paler, the face grayish rather than blackish, the tail longer and the forefeet or hands without any blackish coloration. From *furax* it differs by its more slender and longer snout, lighter coloration and absence of black on the hands.

Coloration.—General color of the type light grayish olive on the shoulders, the back and rump buffy brown lightly vermiculated by black. Forelimbs like the shoulders to the finger tips, the hands not differentiated by darker color. Hindlimbs more buffy like the rump in color, but without black vermiculation, the feet uniform in color with the rest of the limb. Tail like the hindlimbs, the terminal por-

tion lighter and grayer. Skin of face mouse-gray with a downy growth of short grayish hair. Whiskers and hair on lips blackish.

Measurements.—Measurements in the flesh: head and body, 700 mm.; tail, 540; hindfoot, 190; ear, 50. Skull very old, the canines worn down level with the premolars and the molars worn down level with the gums. Greatest length, 212; basilar length, 151; zygomatic breadth, 125; width of rostrum midway between orbit and nares, 44; length of rostrum from orbit, 118; length of upper cheek teeth series, 52.

Remarks.—There is besides the type another adult male from the Northern Guaso Nyiro which agrees in length and slenderness of rostrum with the type. These two specimens are readily distinguishable by the rostral characters from a series of *furax* and *lestes* in the National Museum.