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BY

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NEW SUBSPECIES OF MAMMALS FROM EQUATORIAL AFRICA

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Further study of the collection of mammals from British East Africa and Uganda now in the United States National Museum, secured by the Smithsonian African Expedition under the direction of Colonel Roosevelt and the Paul J. Rainey African Expedition, has brought to light the several new forms of carnivores and rodents described in the present paper.

THOS

Jackals and Coyotes

The jackals and their American representatives the covotes are separable from the true wolves, which are typical of the genus Canis, by several constant dental characters which seem to justify the recognition of the group under the generic name Thos first proposed by Oken in 1816 for the Indian jackal, Canis aureus. Oken placed four specific names under his group name Thos, the last of which, Canis vulgaris, he particularly mentions as being the Thos of the ancients and on this account it should stand as the type of the genus. Canis vulgaris is a synonym of C. aureus. Thos may be defined as a group of Canidae having long slender Vulpes-like canines, small outer incisors, small carnassials, upper molar teeth with well marked cingulums and the fourth lower premolar with a minute extra cusp on its hinder border. The genus Canis or the wolves are distinguishable by their much thicker and shorter canines; their greatly enlarged outer incisors which are more than twice the size of the inner ones, being somewhat hyena-like in this respect; large carnassial teeth; upper molars without a definite cingulum; and the fourth lower pre-molar without a third cusp on its posterior border.

East equatorial Africa or rather Northeast Africa generally is supplied with more species of jackals than any other region. Three distinct species are found living together on the same plains over most of the territory of British East Africa. The most distinct of the three species in coloration is the black-backed or *T. mesomelas* which has the black of the back sharply marked off from the bright rufous of the sides. The Indian species, *T. aureus*, which here reaches

its southern limit in Africa, approaches mesomelas closely in shape of skull and the large size of its reddish ears but differs by the broken character of its black dorsal area which merges indefinitely into the color of the sides. The best marked species of the three in skull characters is the side-striped jackal or T. adustus which has a long slender snout and very long Vulpes-like canine teeth. In body coloration, however, it is not always easily distinguishable from the Indian but it may be recognized with certainty by its small dark colored ears and the presence of a more or less well marked white tail tip. An excellent series consisting of 68 specimens of skins with their skulls are in the National Museum from British East Africa representing the three species referred to above. A comparison of this material shows several well marked forms occupying definite geographical or faunal areas. The races of African jackals thus far described have come from South Africa or from Abyssinia and the Sudan and none of the names thus far proposed seem to be applicable in a restricted sense to the East African races which are described in the following pages.

KEY TO THE RACES AND SPECIES OF JACKALS OCCURRING IN BRITISH EAST AFRICA

- A' Black of back not sharply defined against light color of sides; foreleg marked by a black stripe in front; chin dark brown or blackish in marked contrast to the light color of the throat.

 - B² Sides merging gradually into the dark color of the back; backs of the ears ochraceous; tail black tipped; snout short, the nasal bones not extending as far posteriorly as the maxillaries; bony palate not reaching as far posteriorly as last molar......T. aureus

B¹ Size larger; underparts ochraceous with dark hair bases

T. mesomelas elgonae

B² Size smaller; underparts white or light buff; the hair uniform to

THOS ADUSTUS BWEHA, new subspecies

Elgon Side-striped Jackal

Type from Kisumu, British East Africa; adult male, number 182342, U. S. Nat. Mus.; collected by Edmund Heller, January 20, 1912; original number 2663.

Characters.—The Elgon side-striped jackal, Thos adustus bweha, resembles most closely the Abyssinian race kaffensis described by Neumann from the headwaters of the Sobat River in southwestern Abyssinia. It may be distinguished from that race by the much darker color of the legs and the reddish character of the dorsal hair basally. From *notatus* it differs by the darker underparts which are washed with ochraceous-rufous, and are dark haired basally throughout. The legs are a deep russet heavily black lined on their upper parts, the hind quarters being especially deep and rich in coloring. The back is heavily black-lined and merges into the black of the sides so that the side-striped effect is quite obscured or absent entirely. The tail is not conspicuously white-tipped as in *notatus*, this feature being reduced to a few scattered white hairs hidden among the black hairs of the tip. The tail is shorter and the foot averages smaller than that of *notatus*. The flesh measurements of the type were: head and body, 720 mm.; tail, 310; hindfoot, 148; ear from notch, 90. Skull: condylo-incisive length, 152; greatest length, 160; zygomatic width, 82; interorbital width, 27; postorbital width, 30; nasals 13.4×58; length of upper cheek to front of canine, 68; width of mesopterygoid fossa, 14.5; length of palate, 80; length of incisive foramina, 10. The skull shows considerable age, the sagittal crest being a high knife-like ridge and the basisphenoidal sutures obliterated. This specimen is unfortunately somewhat abnormal having two pairs of upper carnassial teeth, the smaller pair being inside the larger.

The collection contains three additional adult males from the type locality and two from the Uasin Gishu Plateau. The latter are more heavily lined with black than those from the Kavirondo country, but otherwise are quite indistinguishable from them. Two skins and four skulls are in the National Museum from Mashonaland, which represent the Zambesi race *holubi*. These are distinguishable from

bwcha by their rufous-backed ears and their larger skulls and body

size generally.

The Swahili name for the jackal and the one commonly adopted by the interior tribes now in touch with European civilization is bweha. Distinctive names for the three species occurring together throughout the country do not appear to be in use among any of the tribes.

THOS ADUSTUS NOTATUS, new subspecies

Loita Side-striped Jackal

Type from the Loita Plains, British East Africa; young adult male, number 181486, U. S. Nat. Mus.; collected by Edmund Heller, April

16, 1911; original number 2033.

Characters.—Thos adustus notatus may be distinguished from all other races by its white underparts, the whole throat, chest and belly being white, the hair of the throat and chest being white to the roots but dark gray basally on the belly. From typical adustus of South Africa it may be further distinguished by its smaller size, the skull being decidedly smaller, by its drab instead of russet ears and the brighter rufous of the dorsal hair basally. It resembles adustus in the light color of its legs which are ochraceous-buff, the foreleg having a black stripe from the shoulder to the knee. The tail is conspicuously tipped by pure white as in adustus. It differs from bweha of the Kavirondo and Uasin Gishu region by its light underparts, light colored legs, white tipped tail and distinctiveness of the black side stripe. The tail is considerably longer than in bweha but the general body size is the same.

The flesh measurements of the type were: head and body, 715 mm.; tail, 390; hindfoot, 165; ear from notch, 80. Skull: condylo-incisive length, 152; greatest length, 157; zygomatic breadth, 80; interorbital width, 26.5; postorbital width, 30.5; nasals, 14×58; length of upper cheek teeth to outer edge of canine, 70; length of upper carnasial, 13.9; width of mesopterygoid fossa, 14.8; length of palate, 79. Skull somewhat immature with distinct sutures and lacking a sagittal crest.

Besides the type there is in the National Museum another adult male from the Loita Plains which resembles the type closely in color and an immature female from the same locality which shows a fulvous wash on the underparts, which may be a sexual color difference rather than individual in character. The type has been compared with two adult male specimens from south of the Zambesi River representing typical adustus.

THOS AUREUS BEA, new subspecies

Southern Golden Jackal

Type from the Loita Plains, British East Africa; adult female, number 162904, U. S. Nat. Mus.; collected by Edmund Heller, July 4, 1909; original number, 200.

Characters.—Thos aureus bea may be distinguished from the more northern African races by its much smaller body size and lighter coloration generally, the ears and legs being of a decidedly lighter fulvous shade. Compared to variegatus, the Abyssinia race, the size is much less, the difference in skull length being 25 millimeters less. Typical aurcus of India differs only racially from these North Africa jackals which have usually been treated as a race of anthus originally described from Senegal. In skull characters and coloration the African resembles the Indian and Asiatic races of aureus so closely that their relationship is better shown by placing them under the Indian jackal as subspecific forms. The present form is the most southern race and the only one to extend south of the equator. It doubtless reaches its extreme southern limit in central German East Africa but no specimens have yet been reported from that region. In a general way this jackal coincides, in its geographical range, with the striped hyena throughout Africa and Asia.

The type is an adult female in fresh pelage, the back being heavily lined or overlaid by black from the nape to the tip of the tail which is wholly black and has the hair everywhere basally vinaceous. The underparts are whitish or pale buff, the hair being uniform to the roots. The backs of the ears and the legs are bright ochraceous, the forelegs having a black stripe in front over the knee similar to the black stripe on adustus. Worn specimens often have the median area of the back lacking the black hair tips but the sides still retaining them, which produces a side-striped effect quite similar to the sidestriped effect of adustus. Young and immature specimens lack the black lining of the back and are consequently much lighter colored than the adults.

The flesh measurements of the type were: head and body, 640 mm.; tail, 275; hindfoot, 140; ear from notch, 99. Skull: condyloincisive length, 140; greatest length, 150; zygomatic breadth, 77; interorbital breadth, 23.5; postorbital constriction, 26; nasals, 13.2×53; length of upper cheek teeth including canine, 65; length of upper carnassial, 15.5; length of palate, 71; width of mesopterygoid fossa, 14; length of incisive foramina, 11.

Five specimens are in the National Museum from the plains north of Mount Kenia which mark the eastern limits of the Laikipia Plateau. Two additional specimens from the Loita Plains, one from the Rift Valley near Mount Suswa and another from Lake Naivasha complete the series.

THOS MESOMELAS ELGONAE, new subspecies

Highland Black-backed Jackal

Type from the Uasin Gishu Plateau, British East Africa, altitude 8,000 feet; adult male, number 164699, U. S. Nat. Mus.; collected by Edmund Heller, November 13, 1909; original number, 466.

Characters.—Thos mesomelas elgonae resembles most closely the Athi or coast race memillani but may be distinguished from it by its darker coloration, larger size and heavier coat. The underparts are darker than those of the desert race, being ochraceous-buff, the hair basally being quite grayish and the sides are duller ochraceous-rufous. The tail is tipped with black and the backs of the ears are tawny. From mesomelas of South Africa this race differs by its less rufous underparts and absence of rufous on the head.

The type measured in the flesh: head and body, 600 mm.; tail, 325; hindfoot, 150; ear from notch, 100. Skull: condylo-incisive length, 141; greatest length, 145; zygomatic breadth, 84; interorbital width, 28.5; postorbital constriction, 30; nasals, 13×48; length of upper cheek teeth including canine, 62.5; length of palate, 70; width of mesopterygoid fossa, 14.3; length of upper carnassial, 16.5.

A series of 10 specimens are in the collection from the type locality, which agree with the type in the character of their ventral coloration and long heavy coat. This is a highland race confined apparently to the upper elevations of the Nile watershed.

THOS MESOMELAS MCMILLANI, new subspecies

Athi Black-backed Jackal

Type from Mtoto Andei station, British East Africa, altitude 2,500 feet; adult female, number 181483, U. S. Nat. Mus.; collected by Edmund Heller, April 5, 1911; original number 2003.

Characters.—Thos mesomelas memillani differs from typical mesomelas of South Africa by its smaller body size and less rufous coloration. The underparts are especially light, the throat and belly being white or pale buff instead of rufous as in mesomelas and the hair of these parts is light to the roots rather than grayish basally.

This race approaches in its light coloration closely *schmidti* of Somaliland but it differs from this form by the absence of rufous on the head and the white tipped tail. The tip of the tail is marked by a tuft of white hair, a feature not found in the series of 35 skins from the Loita Plains and the northern Guaso Nyiro districts, all of which have black tips. The type is in fresh pelage and has the black back well marked and sharply contrasted from the bright ochraceous-rufous sides and legs. The hair of the back basally is hair-brown of Ridgway. The backs of the large ears are ochraceous and the chin is white like the throat in color.

The flesh measurements were: head and body, 690 mm.; tail, 350; hindfoot, 140; ear from notch, 95. The skull shows considerable age and has a high, well developed sagittal crest. Condylo-incisive length, 137; greatest length, 146; zygomatic breadth, 82; interorbital width, 29.5; postorbital constriction, 31.5; nasals, 13.2×53; length of upper cheek teeth including canine, 62.5; length of palate, 67; width of mesopterygoid fossa, 15.5; length of upper carnassial, 15.

The type is unique in the possession of the distinct white tail tip but a large series (35) of specimens from the Loita Plains, the northern Guaso Nyiro district, Athi Plains and Taveta, Kilimanjaro district, which are closely similar to the type in their white underparts, have the tail black tipped. This race is confined to the coast drainage and the lower parts of the Rift Valley and is the only jackal which is found in the low desert nyika country.

Named for William N. McMillan to whom the Smithsonian African Expedition is indebted for his generous hospitality at Juja Farm and in Nairobi.

HELIOSCIURUS RUFOBRACHIATUS SHINDI, new subspecies

Taiti Red-legged Squirrel

Type from the summit of Mount Umengo, Taita Hills, British East Africa, altitude, 6,000 feet; adult male, number 182768, U. S. Nat. Mus.; collected by Edmund Heller, November 11, 1911; original number 4731.

Characters.—Most closely related to Heliosciurus rufobrachiatus undulatus of Kilimanjaro but differing by having paler underparts, buffy-ochraceous in tone without the rufous cast of that form. The dorsal surface is lighter with less black lining than in undulatus. The feet differ by being ochraceous and never as dark as the rufous of undulatus. There are no apparent differences in size or proportion of parts.

The flesh measurements were: head and body, 225 mm.; tail, 283; hindfoot, 55; ear, 18. Skull; condylo-incisive length, 50; zygomatic breadth, 32; nasals, 18×8.2; interorbital width, 17; postorbital width, 16.5; length of upper tooth row, 11; diastema, 11.5.

This squirrel is confined to the remnant of forest covering the extreme summit of the Taita Hills, where it is very rare. The type was the only individual seen during a fortnight's stay on the summit of Umengo Mountain. It has been compared with the type of undulatus which was collected by Dr. L. W. Abbott on Mount Kilimanjaro and is now in the National Museum. Among the Wataita tribe this squirrel is known as "shindi."

TATERA NIGRACAUDA PERCIVALI, new subspecies

Lorian Black-tailed Gerbille

Type from the Lorian Swamp, British East Africa, altitude 700 feet; adult female, number 183945, U. S. Nat. Mus.; collected by A. Blayney Percival; original number 792.

Characters.—Tatera nigricauda percivali differs from the race iconica from the middle course of the Guaso Nyiro drainage by its duller or paler dorsal coloration, the reduction of black lining on the back and the smaller body size. The pelage throughout is much shorter and thinner, a condition brought about by the extremely arid and hot conditions of the Lorian desert which lies at an altitude of only 700 feet.

Flesh measurements: head and body, 133 mm.; tail, 170; hindfoot, 35; ear, 21. Skull: condylo-incisive length, 35.5; zygomatic breadth, 20; interorbital breadth, 8; nasals, 4×16.5; length of upper tooth row, 6.5; diastema, 10.8; length of incisive foramina, 7.8; mastoid breadth of skull, 18.2.

The type is the only specimen in the National Museum.

EPIMYS KAISERI TURNERI, new subspecies

Kavirondo Bush Rat

Type from Kisumu, British East Africa; adult female, number 183395, U. S. Nat. Mus.; collected by H. J. Allen Turner; original number 5121.

Characters.—Nearest in coloration to Epimys kaiseri hindei of the Athi River drainage but decidedly darker, the dorsal surface russet rather than ochraceous, the underparts gray instead of buff, and the

feet drab, not white as in the other East African races. From *medicatus* of Mumias it differs decidedly by its shorter tail, the tail being considerably less than the head and body while in the former it is much greater. The skull differs from that of *medicatus* by its more arched dorsal profile, longer snout, smaller size and greater concavity to the antorbital plate on its outer margin.

Flesh measurements of the type: head and body, 155 mm.; tail, 135; hindfoot, 27; ear, 22. Skull: condylo-incisive length, 35; zygomatic breadth, 19; interorbital breadth, 5.5; nasals, 4.8×16; length of upper tooth row, 6.5; diastema, 10; length of incisive foramina, 8.5.

Ten specimens besides the type are in the collection from Kisumu where they were secured in the papyrus beds on the margin of Kavirondo Bay. This race appears to be confined to the papyrus beds of the Victoria Nyanza, the rising country immediately back of the lake being occupied by the long-tailed, light-colored medicatus.

Named for H. J. Allen Turner of Nairobi to whom the writer is indebted for much assistance in collecting mammal specimens throughout the Kavirondo country.

EPIMYS CONCHA ISMAILIAE, new subspecies

Gondokoro Multimammate Mouse

Type from Gondokoro, Uganda; adult male, number 165108, U. S. Nat. Mus.; collected by J. Alden Loring, February 23, 1910; original number 9056.

Characters.—This race is allied most closely to Epimys conchablainei of Chak-Chak, Bahr-el-Ghazal River, but may be distinguished by its larger feet and longer tail. The coloration is quite as in blainei, the dorsal surface being wood-brown slightly darker on the midline and the underparts are white, the hair basally dark gray.

The flesh measurements of the type were: head and body, 108 mm.; tail, 115; hindfoot, 24. Skull: Condylo-incisive length, 26.5; zygomatic breadth, 13.5; interorbital width, 4.1; nasals, 3.4×12; length of upper tooth row, 4.7; diastema, 7.4; length of incisive foramina, 6.8.

A series of 20 specimens are in the National Museum. Ten of these are from the type locality and the others are from Nimule and the stations just north of it on the Gondokoro Road which follows the east bank of the Nile.

EPIMYS KAISERI CENTRALIS, new subspecies

Nile Bush Rat

Type from Rhino Camp, Lado Enclave, British East Africa; adult male, number 165035, U. S. Nat. Mus.; collected by J. Alden Loring, January 11, 1910; original number 8633.

Characters.—The coloration of this race resembles closely that of Epimys kaiseri norae of the northern Guaso Nyiro drainage of British East Africa but differs by its less buffy tone to the dorsal surface and by the much shorter tail and wider skull.

Flesh measurements of the type were: head and body, 148 mm.; tail, 162; hindfoot, 30. Skull: condylo-incisive length, 35; zygomatic breadth, 19; interorbital width, 5.8; nasals, 4.5×15; length of upper tooth row, 5.8; diastema, 10; length of incisive foramina, 9.

A series of 38 specimens are in the National Museum from Rhino Camp, Lado Enclave. Others somewhat less typical in character are from Unyoro, Uganda, and from Nimule and Gondokoro in northern Uganda.

MUS GRATUS SORICOIDES, new subspecies

Taita Pygmy Mouse

Type from Mount Mbololo, Taita Hills, British East Africa; adult male, number 183544, U. S. Nat. Mus.; collected by Edmund Heller, November 8, 1911; original number 4675.

Characters.—Like Mus gratus of Ruwenzori but underparts much more buffy or rather ochraceous in tone. Body size somewhat less, both the feet and skull being smaller but the tail is longer. The dorsal color is bister-brown lined by black medially and bordered on the lower sides by an indefinite band of bright fulvous. The underparts are ochraceous, the hair basally gray. Feet buffy. This race is confined to the remnants of forest still left on the extreme summits of the Taita Hills at elevations of 5,000 or 6,000 feet. Two additional specimens are in the collection from Mbolobo Mountain and one other from Umengo Mountain.

Flesh measurements of the type: head and body, 60 mm.; tail, 59; hindfoot, 13; ear, 11. Skull: condylo-incisive length, 17.3; zygomatic breadth, 9.3; interorbital breadth, 3.5; nasals, 2.3×8.2; length of upper tooth row, 3.3; diastema, 4.5; length of incisive foramina, 4.2.

OENOMYS HYPOXANTHUS VALLICOLA, new subspecies

Naivasha Rusty-nosed Rat

Type from Lake Naivasha, British East Africa; adult female, number 162614, U. S. Nat. Mus.; collected by J. Alden Loring, July 15, 1909; original number 6640.

Characters.—This is a much lighter and smaller race than bacchante of the Mau and Kikuyu escarpments bounding the Rift Valley to the west and the east of Naivasha. In coloration it approaches nearer editus of Ruwenzori but is less rufous or rusty and is somewhat smaller in body size. The skull is shorter decidedly than that of editus but equals it in zygomatic width.

Flesh measurements of the type: head and body, 160 mm.; tail, 184; hindfoot, 31. Skull: condylo-incisive length, 34; zygomatic breadth, 17; interorbital width, 5.5; nasals, 4.6×15; length of upper tooth row, 7; diastema, 10; length of incisive foramina, 7.8.

Three other specimens from Naivasha are in the collection and they agree in coloration with the type.

ARVICANTHIS ABYSSINICUS VIRESCENS, new subspecies

Olivaceous Grass Rat

Type from Voi, British East Africa; adult male, number 183922, U. S. Nat. Mus.; collected by Edmund Heller, November 15, 1911; original number 4775.

Characters.—Arvicanthis abyssinicus virescens resembles nairobae most closely from which it may be readily distinguished by its darker dorsal coloration, which is heavily lined by blackish hairs having a distinct greenish iridescence. The body size is considerably smaller and the skull shows relatively smaller bulke, and teeth, and narrower and more slender nasal bones. In the tone of its dark dorsal coloration it resembles nubilans of the Kavirondo region but it differs from this race by its white underparts and its much smaller body size.

The flesh measurements were: head and body, 125 mm.; tail, 103; hindfoot, 26; ear, 16.5. Skull: condylo-incisive length, 30; zygomatic breadth, 16.8; interorbital breadth, 4.8; nasals, 4.8×12; length of upper tooth row, 6.2; width of first upper molar, 2; diastema, 8.8; length of incisive foramina, 6.2.

The type is unique. It has been compared with a large series of topotypes of both *nairobae* and *nubilans* in the National Museum and is readily distinguishable from both of these races.

LEMNISCOMYS DORSALIS MEARNSI, new subspecies

Kikuyu Single-striped Grass Rat

Type from Fort Hall, British East Africa, altitude 6,200 feet; adult female, number 163616, U. S. Nat. Mus.; collected by J. Alden Loring, September 11, 1909; original number 7152.

Characters.—Lemniscomys dorsalis mearnsi is an intensely ferruginous form of dorsalis differing from the Taita race maculosus by richer coloring and larger size. The rump and hindlegs are bright ferruginous which, farther forward on the shoulders, becomes less intense and quite ochraceous in tone. The underparts are uniform white in sharp contrast to the bright ochraceous-rufous sides.

The flesh measurements of the type are: head and body, 131 mm.; tail, 140; hindfoot, 31; ear, 12. Skull: condylo-incisive length, 33; zygomatic breadth, 17; interorbital breadth, 5; nasals, 4.4×13; length of upper tooth row, 6.5; diastema, 9.3; length of incisive foramina, 7.

Two other specimens from Fort Hall complete the series of this race which represents altitudinal as well as inland limits of this coast species.

ACOMYS IGNITIS MONTANUS, new subspecies

Marsabit Spiny Mouse

Type from the north slope of Mount Marsabit, British East Africa; altitude 4,600 feet; adult female; number 182901 U. S. Nat. Mus.; collected February 26, 1911, by A. Blayne Percival; original number, 309.

Characters.—Resembling Acomys ignitus in general features as well as in quality of the pelage but coloration much grayer and duller and size larger. Dorsal coloration vinaceous-drab, the sides brighter or pure vinaceous but not sharply marked from the darker middorsal region. Underparts and feet pure white, the hair white to the roots. Tail and ears drab-gray.

Flesh measurements of the type: head and body, 90 mm.; tail, 92; hindfoot, 17; ear, 16.5. Skull wanting. Another topotype also with skull missing is in the collection. The race is a mountain form living at an elevation of 4,000 feet or more and is larger and duller colored than the low desert forms to which it is related all of which are confined to the lower desert levels below 2,500 feet in altitude.