

I. A NEW GENUS AND SOME NEW SPECIES AND
SUBSPECIES OF ABYSSINIAN RODENTS.

BY CHILDS FRICK.

(PLATES I-V.)

The forms herein described were collected by members of the party during a ten months' journey, which was made by the author from Dirre Doua, Abyssinia, to Nairobi, British East Africa (1911-1912).

STENOCEPHALEMYS¹ gen. nov.

A large soft-furred, big-eared rat with white feet and tail, occurring in the Chilalo mountains at an elevation of ten thousand feet above sea-level. It shows resemblances to *Epimys*, but differs so essentially in certain features of the skull, that it seems best to place it in a separate genus, for which I propose the name *Stenocephalemys*, with reference to the characteristic narrowness of the frontals.

CHARACTERS. *Skull*.—Remarkable constriction of the interorbital region, and posterior position of the narrowest point; anterior portion of frontal broader than the posterior, which results in a peculiar pinching in of the shortened frontal portion of the brain-case, accompanied by a stretching of the squamosals, which here form an unusually large portion of the anterior lateral roof of the cranium; width and strength of malar portion of zygomatic arch together with narrowness of antorbital plates and open oval shape of suborbital foramina; elongation and marked slenderness of maxillary-premaxillary region; strongly arched postero-anterior profile of upper surface of skull; smallness of bullæ.

The form most nearly approaching the new genus in its peculiar orbital constriction is *Dasymys*, but *Dasymys* differs in the arrangement of its molar pattern and in entirely lacking the posterior narrowness of the frontals and other important characters of the skull (see Plate I, figs. 6-10 and Table of Ratios.) In the development of the maxillary-nasal region the small forest-mouse, *Epimys tulbergi endorobæ* Heller, is very similar to the new genus, the nasals of this *Epimys* being almost proportionately as long as, and the width of the anterior

¹ στενός = narrow, κεφαλή = head, and μῦς = mouse.

orbital plate and the depth of the maxillaries being even less than, those of the latter; the arrangement of the molar cusps is also similar in both forms; on the other hand *E. t. endorobæ* widely differs from the new genus in totally lacking its peculiar and characteristic development of the orbital and frontal portions of the skull (see Plate II, figs. 6-10, and the following Table of Ratios).

TABLE OF RATIOS.

	Type (No. 11).	Cotype (No. 32).	<i>Dasymys</i> ² sp.	<i>Epimys tul- bergi endo- robæ</i> . ³
Ratio of anterior width to posterior width of frontals	1.40	1.10	.87-.79	.50
Ratio of length of nasals to greatest length of skull . . . . .	.46	.44	.40-.38	.41
Ratio of maxillary depth at fronto-maxillary suture to greatest length of skull . . . . .	.22	.24	.27-.27	.20

Dentition.—Similar to that of *Epimys* in the proportions of the molars and in the arrangement of their cusps.

Pelage.—Of the same general character as that of some of the sylvicoline species of *Epimys*, soft, exceedingly long and thick, the color of upper and lower surfaces distinctly differentiated.

1. *Stenocephalemys albocaudata* sp. nov.

Type from Inyala Camp, Chilalo Mountains, southern Abyssinia, collected February 18, 1911. (Original field No. D. G. R. 11.)

CHARACTERS. *Skull*.—Remarkable interorbital constriction of frontal region, supra-orbital ridges approaching to within 1 mm., and posterior position of narrowest point; squamosals largely supplanting frontals in formation of brain case; excessive elongation of maxillary nasal region; unconstricted base of suborbital foramina, and comparative narrowness of spreading anterior orbital plates; markedly arched superior profile of cranium.

Dentition.—Incisors ungrooved, yellow anteriorly, upper pair recurved, lower procumbent; molars worn smooth (see No. 32 for cusps, which are arranged in three longitudinal rows as in *Epimys*); combined length of M^2 and M^3 slightly greater than M^1 .

² *Dasymys* ♀, No. 162463 U. S. N. M. and No. 165237 U. S. N. M., the latter specimen figured on Plate I, figs. 6-10.

³ *Epimys tulbergi endorobæ* Heller, ♀, No. 163402 U. S. N. M., figured on Plate II, figs. 6-10.

Pelage.—Exceptionally soft and long; median and posterior portions of back mottled saccardo-umber;⁴ flanks pinkish buff and sharply defined from gray of underparts. Main coat bi-colored; slate-gray basal fur tipped dorsally with cinnamon to pinkish buff, and ventrally with white; grayish tone of underparts due to prominence of dark basal fur; mottled effect of upper back due to same cause together with intermixture of coarser black hair; hair of rump max. 24.5 mm.; outer portions of arms and thighs pinkish buff mixed with gray, inner portions gray; upper portions of carpus, tarsus, and feet thickly covered with white hair, which projects beyond the light-colored claws; under sides of feet flesh-colored; pollex rudimentary, with nail in place of claw; tail sub-equal or equal to combined length of head and body (14 annulations per 10 mm.) light flesh-colored, thickly covered with white hair.

Besides the type the collection of the writer contains four other specimens: No. 12, an old female, No. 13, an immature specimen taken at the Inyala Camp, and two younger specimens (Nos. 32 and 24) captured at Hora Mountain Base Camp.

MEASUREMENTS.

	No. 11 ♂, Mm.	No. 12 ♀, Mm.	No. 32 ♂, Mm.	No. 24 ♀, Mm.
Length of head and body.....	190	176	144	144
Length of tail.....	161	164	....	144
Length of pes.....	31.5	31.5	31	32
Greatest length of skull.....	41.1	....	38.4	36.3
Basilar length.....	33.8	....	32.3	30.2
Condyllo-incisive length.....	38.8	....	37	34.8
Zygomatic breadth.....	21	....	20	18.8
Interorbital breadth.....	3.4	....	4.2	4.2
Squamosal breadth.....	15	....	15	14.1
Length and breadth of nasals.....	19.4×5	18×5	17×5	4.6
Length of diastema.....	12.4	12	11.5	10.2
Alveolar length of upper tooth-row....	9.1	8.8	8.4	8
Length of palatal foramen.....	10.3	10	9.2	8.5
Depth of brain-case.....	10.7	....	10.3	10.2
Length of bullæ.....	6	....	6	5.8
Depth of maxillaries at fronto-nasal suture.....	10	10	9.6	8.5
Condyllo-incisive length of mandible...	25	....	23.8	21.5

Genus OTOMYS. Cuvier.

The collection contains two comparatively light-colored species of *Otomys* with the incisive grooving, molar lamination, and soft, thick

⁴ Ridgway, "Color Standards and Nomenclature," 1912.

pelage characteristic of *O. jacksoni* Thomas (see P. Z. S., 1891, p. 184) from Mt. Elgon. The first, which I designate as *O. helleri* is represented by a large specimen from the Chilalo Mountains; the second, *O. malkensis*, from the village of Malka in Sidamo, by a smaller and slightly darker specimen. To avoid confusion both are described as subspecies of *O. jacksoni*. When compared with specimens in the U. S. National Museum, they come nearest in color to *O. orestes* Thomas.

MEASUREMENTS.

	No. 21 ♂ (<i>O. helleri</i>), Mm.	No. 29 ♂ (<i>O. malkensis</i>), Mm.	Type of <i>O. jacksoni</i> in B.M., Mm.
Length of head and body.....	175	127	120
Length of tail.....	82	83	50
Length of pes.....	27.5	26	26
Greatest length of skull.....	.....	36.5	36
Basilar length.....	.....	31	28
Condylo-incisive length.....	.....	35.5	.....
Zygomatic breadth.....	.....	19	18
Interorbital breadth.....	4.5	3.8	.....
Length and breadth of nasals.....	19×7.5	17×7	.....
Length of diastema.....	9.5	8.5	8.5
Alveolar length of upper row of teeth..	11	9.7	.....
Length of palatal foramen.....	8.5	6.6	6
Length of mandible.....	.....	22	.....

2. *Otomys jacksoni helleri* subsp. nov. (Plate III, figs. 1-5.)

Type from Chilalo Divide Camp, Abyssinia, altitude 9,000 feet, "heath-zone." (Original field-number E. A. M., 7531, Feb. 17, 1912.)

GENERAL CHARACTERS.—Has the excessively long, soft fur, incisive grooving, and molar lamination of *O. jacksoni* Thomas (*l. c.*), but has a larger, more massively built skull, and far greater size of body. The length of head and body of *O. j. helleri* is 175 mm. as against 120 mm. in the case of *O. jacksoni (typicus)*.

Skull.—The posterior portion of that of the type is unfortunately broken, the molars are worn. Compared with *O. j. malkensis* (see below), *O. helleri* is heavier throughout. The greater breadth of the orbital region, the longer and wider nasals, the development of the sub-orbital foramen, the depth of the maxillary region, the size of the molars, and the breadth of the incisors are all particularly noticeable. The dentition of the two forms agrees in that in both the lower incisors have two deep grooves, the upper pair a deep outer and very indis-

tinct inner groove, (see Fig. I, p. 12) and the posterior upper molar has seven laminae. (Lamination of the series $\frac{3-2-7}{4-2-2}$.)

Pelage.—In general character identical with, but longer, coarser, slightly lighter, and more olivaceous than, the smaller *O. j. malkensis* (see below), somewhat resembling *O. thomasi* Osgood from the Guaso Nyiro, very distinctly differing from the dark forms, *O. elgonis* Wroughton, *O. tropicalis* Thomas, and *O. irroraratus* Brants, and most like *O. orestes* Thomas (see above). Dorsal area Dresden-brown⁵ in general appearance, sides lighter toned and but slightly differentiated from the drab-like under parts. Upper pelage very long and soft; fur bicolored, composed of a thick covering of comparatively short hair (24 mm. in length) intermixed with longer hair (32 mm. in length). Basal portion of entire coat slate-gray; tips of thick upper covering (1/10 of total length) vary from light buff on the sides to antimony-yellow on the back, longer scattered hair banded subterminally to terminally with broad black annulations; tips of under parts shorter and light buff-colored, general grayish appearance due to prominence of faded basal fur; outer portions of arms and legs same as sides, inner portions as under parts; end of snout, hair about eyes, and anterior ear-tufts antimony-yellow; posterior ear-patches of uniform, long, faded, light buff hair, ears large, sparsely clad; tail short, well covered with bristles, dark above, light buff below, (annulations 11 per 10 mm.); upper parts of feet gray, washed with buff; toes worn dark, claws light to translucent.

I take pleasure in naming this fine Abyssinian mountain form after Mr. Edmund Heller, who has so greatly assisted the writer in comparing his material with that at the Smithsonian Institution.

3. ***Otomys jacksoni malkensis*** subsp. nov. (Plate III, figs. 6-10.)

Type from vicinity of Malka, Sidamo, Abyssinia, altitude 7,000 ft. (Original field number G. D. R. 29, March 3, 1912.)

GENERAL CHARACTERS.—Lighter colored than *O. jacksoni* (*typicus*) from Mt. Elgon (by published description, *l. c.*), with which it agrees in the proportions of the skull and body. (See table of measurements under *O. j. helleri*.)

Skull.—Fully adult. Measurements agree with those of *O. jacksoni* (see measurements above).

⁵ Ridgway *l. c.* (*cf.* footnote 4).

Pelage.—Upper parts dark cinnamon-brown⁶ in tone, sides lighter, demarcation between same and drab-gray under parts better defined than in the larger *O. j. helleri*. Tips of hair over upper parts ochraceous to light buff; on lower parts gray washed with light buff; anterior and ocular portions of face without the light markings of the larger species; ears well clad, contrasting with the poorly clad, to much worn ears of *O. j. helleri*; light posterior orbital patches same in both subspecies; tail dark above, light below (annulations 14 to 10 mm. against 11 to 10 mm. in the larger form); covered with dark light-tipped hair, claws light to translucent.

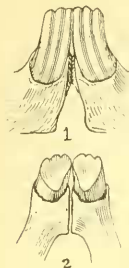


FIG. 1. Lower incisors of type (No. 29). 1. Viewed from in front; 2. from above. $\times \frac{2}{1}$

Genus GERBILLUS Desmarest.

4. *Gerbillus bilensis* sp. nov.

Type from dry plain near Bilen, Abyssinia. (Original field-number 7519, Dec. 19, 1911.)

GENERAL CHARACTERS.—In markings and coloration closely agrees with the description of the much larger *G. pyramidum* Geoffroy of Egypt (see J. Anderson, "Zoology of Egypt," 1902, p. 255) and differs from *G. pygargus* Cuvier from Suakin (*l. c.*, p. 256) and *G. pulvinatus* Rhoads from southern Abyssinia, which it more nearly resembles in size, by its pronouncedly dark median dorsal area, black eye-lids, dark postocular stripes, and strongly buff coloration of the under surface of the tail.

Skull.—The hinder portion of the skull of the type is gone; the molars are somewhat worn. Compared with the type of *G. pulvinatus* Rhoads,⁷ the general proportions are the same, but the interorbital region is slightly broader.

Pelage.—Median portion of back and rump heavily marked with black, anterior and lateral portions bright ochraceous buff (*cf.* Ridgway), under parts pure white. Individual hairs of upper flanks and back light slate-gray at base and light ochraceous buff at tips, which

⁶ Ridgway, *l. c.* (*cf.* footnote 4).

⁷ *Proc. Acad. Nat. Sciences of Philada.*, Vol. 48, 1896, p. 537. The writer has had access to the specimens through the kindness of Mr. Witmer Stone, the Curator in charge.

MEASUREMENTS.

	No. 7519, Type <i>bilenensis</i> , mm.	Rhoads' Type <i>pulvinatus</i> , mm.	No. 92, <i>pul-</i> <i>vinatus</i> ♂, mm.	No. 91, <i>pul-</i> <i>vinatus</i> ♀, mm.
Length of head and body.....	92.	.....	86.	8.
Length of tail.....	139-151.0	137.	127-137	130-137
Length of hind foot.....	25.5	24.5	25.	24.5
Greatest length of skull.....	.....	30.6	31.1	27.2
Basilar length of skull.....	.....	22.2	22.6	19.2
Condylo-incisive length.....	.....	26.5	.....	23.5
Zygomatic breadth.....	.....	.....	16.2	14.2
Interorbital breadth.....	5.9	5.6	5.5	5.1
Squamosal breadth.....	.....	13.4	13.7	12.7
Length of nasals.....	11.6	13.	11.8	9.8
Breadth of nasals.....	2.6	2.6	2.3	2.1
Length of diastema.....	7.2	7.8	8.	6.6
Alveolar length of upper row of molars	3.8	4.	4.1	4.
Length of palatal foramen.....	4.6	5.2	5.7	4.5
Length of bullæ.....	.....	10.6	11.5	10.2
Depth of brain-case.....	.....	9.1	.....	8.8
Depth of maxillaries at fronto-nasal suture.....	.....	7.1	.....	6.3
Length of mandible.....	15.	15.	15.3	13.5

over the dark area of the back are surtipped with black and intermixed with long black hair; hair of lower flanks white at base, but with light ochraceous buff tips, which blend into the pelage of the upper parts, and are sharply defined from the uniformly white hair of the under parts; coloration of the outer side of the thighs continuous with that of the flanks; arms and inner sides of thighs white; sides, shoulders, and muzzle light ochraceous buff; the bright coloring of muzzle continued further down on sides of face than in *G. pulvinatus* Rhoads, where the white of the chin encroaches on the same; occiput dusky; slight markings beneath eye and half-way between corner of eye and tip of nose, distinctly backwardly prolonged superciliary line, and small post-auricular patches, white; margins of eye and oblique streak posterior to same, dusky; main portion of tail light ochraceous buff, dorsally marked with black, below paler, but without the white streaking of *G. pulvinatus*; pencilled portion well-developed, black above, white below (max. length of hair 12 mm.)

The collection of the writer contains two specimens of a *Gerbillus* collected at the Oasis of Hor, just south of the Abyssinian border, which in the proportions of the skull appears similar to Dr. A. Donaldson Smith's *Gerbillus pulvinatus* from Sheik Hussein (see description

by Rhoads). The type of the latter has unfortunately been so long in alcohol that it is impossible to determine the color of the pelage, but the outlines of the markings appear to agree with those of the specimens from Hor, and a dry skin of an immature specimen in the Smith Collection, which has been referred to the type has the same markedly pinkish tone. The new subspecies from Sadi Malka differs from all of these in the darker shading of its dorsal areas, and in the ochraceous buff, instead of pinkish buff, coloration of the lateral portions of its coat.

Genus *TATERA* Lataste.

5. *Tatera nigricauda bodessæ* subsp. nov.

Type from Sagan River, Bodessa, Abyssinia; altitude 5,000 feet. (Original field-number 312 E. A. M., June 6, 1912.)

GENERAL CHARACTERS.—Much smaller, but in other respects somewhat strongly resembling *T. nigricauda nyama* Dollman⁸ from the northern Guaso Nyiro, but the black tail is shorter-haired, the color of the body less brightly rufescent, due to the comparative lightness of the coat and the resulting greater prominence of the slaty color of the under fur, the head is darker, and the white and black ocular markings more pronounced.

Length of pes 34.6 versus 36. in *T. nigricauda nyama*.

Skull.—Fully adult, but molars show scarcely any wear. Of the same type as skulls of the series of *T. n. nyama* Dollman in the U. S. N. M., but of markedly smaller size than those of the latter of equal age.

Pelage.—Dorsal pinkish area buff (*cf.* Ridgway) heavily shaded with black on head, median, and especially posterior portions of back; under parts white. Individual hairs of upper pelage light slate-gray with long whitish bases (the same being characteristic of *T. nigricauda* Peters (*typica*) in contrast with the light slate-gray of *T. vicina* Peters (*typica*) and allies)^{8a} and pinkish buff tips, surtipped over darker areas with black, and mixed with usual longer black hairs; flanks less bright and pinker in tone than in *T. n. nyama*; coloration of outer sides of legs continuous with upper parts, inner sides uniform white, like under surfaces; snout and nape heavily shaded with darker; lids dusky, promi-

⁸ *Cf.* Ann. & Mag. Nat. Hist., (8) Vol. 7, 1911, p. 592. Specimen No. 183937, ♀, U. S. N. M., is of the same age as the type of the new subspecies.

^{8a} *Cf.* MB. Akad. Berlin, 1878, p. 200. *Nigricaudus* from Taita, greatest length of skull 49 mm., length of pes 41 mm.; *vicinus* from Kitui; greatest length of skull 42 mm.; length of pes 31 mm.

MEASUREMENTS.

	No. 312. (Type, ♂).	No. 183937 U. S. N. M. (<i>T. n. nyama</i>).
Length of head and body	127.	152.
Length of tail	182.	208.
Length of pes	34.5	36.
Greatest length of skull	39.6	41.
Basilar length of skull	29.1	30.4
Condylar length	34.6	36.
Zygomatic breadth	20.2	20.7
Interorbital breadth	7.	7.7
Squamosal breadth	17.	17.3
Length of nasals	16.5	17.8
Breadth of nasals	3.5	4.
Length of diastema	10.2	10.7
Alveolar length of upper row of molars	6.5	6.5
Length of palatal foramen	7.	7.5
Length of bullæ	11.	11.
Depth of brain-case	12.5	12.5
Depth of maxillaries at fronto-nasal suture	9.3	10.
Length of mandible	20.5	21.3

ment white of posterior portion of ocular rings passing into a grayish area behind, anterior corner of eye with black markings; ears well-developed, long, buffy haired at bases, tips dark; vibrissæ predominantly black with some white; tail well-clad, hair shorter than in *T. n. nyama*, anterior fourth of tail warm buff-colored with white markings underneath, posterior three-fourths black; top of tarsus light buff; upper surface of feet and toes covered with white hair, soles naked, under surface of toes slightly haired.

The collection includes an immature specimen from Wobok, Abyssinia.

6. *Tatera vicina bodessana* subsp. nov.

Type from Bodessa, southern Abyssinia; altitude 5,000 feet. (Original field-number E. A. M., 301, May 25, 1912.)

GENERAL CHARACTERS.—Resembles *T. v. pothæ* Heller,⁹ but is distinctly smaller (see measurements below) and is more darkly shaded over the posterior portion of the back and pinker in tone laterally.

Length of pes 31.5 mm. *versus* 35.5 in *T. v. pothæ* Heller.

Skull.—Similar to *T. v. pothæ*, but smaller throughout (greatest

⁹ Cf. Heller, Smith. Misc. Coll., Vol. 56, 1910, p. 2. Specimen No. 163425 U. S. N. M. is a ♂ from the Ulucania Hills, British East Africa, which is of about the same size as *Tatera vicina* Peters, *l. c.*



length 36.2 *versus* 41.3 in *T. v. pothæ*) the nasals being noticeably smaller in proportion, and the incisors lighter.

MEASUREMENTS.

	No. 301 ♂, (Type), mm.	No. 302 ♂, mm.	No. 36 ♂, mm.	No. 163425 ♂, U.S.N.M., mm.
Length of head and body.....	140.	133.	126.	144.
Length of tail.....	178.	178.	178.	178.
Length of pes.....	31.	31.5	32.	35.5
Greatest length of skull.....	36.2	.....	37.2	41.3
Basilar length of skull.....	26.8	29.	27.5	31.
Condylo-incisive length.....	29.2	33.2	32.4	36.9
Zygomatic breadth.....	17.5	18.2	18.4	.....
Interorbital breadth.....	6.5	6.3	6.5	7.1
Squamosal breadth.....	15.5	15.7	15.3	17.
Length of nasals.....	15.	.....	15.1	19.
Breadth of nasals.....	3.5	.....	3.4	4.1
Length of diastema.....	8.8	9.6	9.	10.6
Alveolar length of upper-tooth row...	6.	6.3	6.	6.6
Length of palatal foramen.....	6.	7.	6.5	7.5
Length of bullæ.....	10.5	10.8	10.9	11.1
Depth of brain-case.....	11.2	11.7	11.7	12.5
Depth of maxillaries at fronto-nasal suture.....	8.8	8.8	8.6	10.1
Length of mandible.....	18.2	19.2	18.6	21.4

Pelage.—Dorsal area pinkish buff (*cf.* Ridgway) heavily mottled with black and sharply defined from the white of the under parts. Individual hairs of upper pelage slate-gray at base and light pinkish buff at tips, which are surtipped with black over darker median area; latter portion also lightly lined with longer black hair; coloration of outer portions of legs continuous with flanks and shoulders, inner portions with white of lower coat; lids and anterior basal corners of eyes dusky; grayish markings above and behind eyes; ears buff at base, and dark at tips as in *T. v. pothæ*; tail well-clad, dark above and light buff below, with hairs at the end elongated; upper surface of feet and toes thickly covered with white hair, soles bare, under surface of toes very slightly haired; claws much weaker than in *T. v. pothæ*, translucent to dark.

Besides the type the collection of the writer contains an old adult (No. 302, ♂) and two immature specimens (Nos. 304 and 316) from the type-locality, together with a mature male from Black Abai Lake. The latter closely resembles the type, but is a trifle lighter in tone. The young are very black over the median dorsal area, the rump, and

the upper surface of the tail. The skull measurements of the old adult male (No. 302) the molars of which are much worn, are comparatively small, and similar to those of the type in the foregoing table and compare with the less aged but much larger specimen of *T. n. nyama*.

Genus EPIMYS Trouessart.

(*Coucha* Group.)

The collection of the author contains specimens of the genus *Epimys* from widely separated districts of Shoa and Sidamo, which have the "blackish" eye-ring, "bright ochre-colored" hair, and darkly tinted wrists and ankles of Heuglin's description of *M. (?) rufidorsalis*,¹⁰ but which differ from the same in their proportionately greater length of tail and in the white tipping of the fur of their under parts, being pure white, without the "dirty yellowish tinge." The collection also includes specimens from Addis Ababa, Black Abai, Gardula, and Tertale, which lack the dark ocular rings, dark ankles, and light ochraceous sides of *rufidorsalis*, and resemble Peters' *Mus hildebranti*¹¹ and certain British East African races of the same.

7. *E. rufidorsalis alettensis* subsp. nov.

Type from Aletta, Sidamo, Southern Abyssinia, altitude 6,000 feet. (Original field-number 31, D. G. R., March 6, 1912.)

GENERAL CHARACTERS.—Long soft fur, bright ochraceous buff of side-coloration, dark ocular rings and ankles.

Skull.—Badly broken; of about same size as the larger specimens of *hildebranti*, but with slightly heavier molars.

Pelage.—Upper parts bright ochraceous buff¹² thickly intermixed with black over median dorsal area; under parts grayish white to white. Deep quaker-drab hair of upper coat over median area faintly tipped with ochraceous buff and thickly intermixed with longer black-tipped hair; on shoulders and flanks strongly tipped with ochraceous buff and but very faintly lined with black; outer sides of arms and legs deep mouse-gray washed with buff; fur of under parts and inner sides of arms and legs shorter and tipped with white; dark ocular rings prominent; ears large, the distal half dark and finely covered with short hair; vibrissæ black and white; throat and chin well-covered, hairs with

¹⁰ Heuglin, "Reise in Nordost-Afrika," Vol. II, p. 70.

¹¹ Peters MB. Akad. Berlin, 1878, p. 200.

¹² Ridgway, *l. c.* (Cf. footnote 4).

dark bases and white tips, contrasting with the tendency to uniform white in *hildebranti* Peters; tail dark brown above, lighter below; flesh and hair of wrists and ankles cinnamon-brown, becoming lighter on distal portions of feet and passing into white on the toes; claws light, translucent, or speckled with darker color.

The collection includes a very young specimen (No. 32 ♀) from the type-locality, which shows the same ocular rings and dark ankles.

8. *E. rufidorsalis ankoberensis* subsp. nov.

Type from Ankober, Shoa, Abyssinia, altitude 7,500 feet. (Original field-number 7521, E. A. M., January 23, 1912.)

GENERAL CHARACTERS.—Comparatively large size of body and skull, dark ocular rings and ankles.

Skull.—Compared with other races of *E. coucha* Smith this is longer and broader, showing greater development of the brain-case and nasals.

Pelage.—Upper dorsal area prevalently hair-brown¹³ in color, slightly speckled with buff-tipped hair; sides bright buffy; under parts pallid mouse-gray; dark ocular rings prominent, tip of nose white, ears very large, with the usual fine covering; tail strongly bicolored, skin and hair dark above, and hair below thick and white; ankles hair-brown and sharply contrasted with the white-furred distal parts of feet and toes.

9. *E. hildebranti gardulensis* subsp. nov.

Type from Gardula, Southern Abyssinia; altitude 4,000 feet. (Original field-number 44, ♂, D. G. R., March 27, 1912.)

GENERAL CHARACTERS.—Slightly larger, but agreeing in the proportions of skull and body with the series of *E. neumani* Heller from the northern Guaso Nyiro, in U. S. National Museum, the general appearance of the upper parts resembling *E. neumanni*, and being almost identical with that of the slightly smaller *E. panya* Heller *l. c.*, from Juja Farm, and the lower surface differing from both *E. neumanni* and *E. panya* by the entire lack of the usual buffy over-wash.

Skull.—Proportions very similar to, but slightly larger than, those of *E. neumani* Heller.

Pelage.—Dorsal area generally avellaneous,¹⁴ median portion dark to blackish, due to thick intermixing of longer black hair (the light-tipped fur is never surtipped with black as in *Arvicanthis* and some

¹³ Ridgway, *l. c.* (Cf. footnote 4).

¹⁴ Ridgway, *l. c.* (See footnote 4).

other genera); sides lighter and divided from pallid mouse-gray of under parts by a bright buffy line; slate-gray fur of ventral surface evenly tipped with pure white; tail slightly darker above than below, annulations prominent (13 per 10 mm.) and but slightly haired; feet and toes white-furred.

Color of dorsal area of series of nine specimens (Nos. 44 ♂, 86 ♂, 37 ♀, 55 ♂, 53 ♀, 313 ♂, 83 ♂, 80 ♀, and 89, *juv.*) varies from drab-gray in a specimen from Tertale to vinaceous-buff in one from Black Abai Lake.

The collection includes a specimen (No. 7520) from Addis Ababa, which differs from the specimens described above, and corresponds with Peter's description of *E. hildebranti (typicus)* in the strong "ochre color" of its under parts, the white of same being heavily washed with buff along the sides and mid-ventral line. This specimen also differs from *E. gardulensis* in having heavier fur and in the exceptional blackness of its dorsal area. Tails of specimens from Addis and Tertale are much the shortest of the series, and the only specimens in which tails measure less than the combined length of head and body.

MEASUREMENTS.

	No. 44 ♂ (Type), mm.	No. 37 ♀, Black Abai, mm.	No. 7520 ♂, Addis, mm.	No. 313 ♂, Tertale, mm.	No. 7521 ♂, Ankober, mm.
Length of head and body..	120.	112.	131.	15.	133.
Length of tail.....	120.	113.	107.	07.	154.
Length of pes.....	25.	24.5	24.5	23.5	28 ?
Greatest length of skull....	33.3	32.5	31.6	30.6	34.9
Basilar length.....	26.6	26.1	26.	23.9	28.1
Condylo-incisive length....	31.4	30.4	30.1	28.5	32.5
Zygomatic breadth.....	.....	15.5	.....	14.1	16.4
Interorbital breadth.....	4.6	4.4	4.6	4.4	4.9
Squamosal breadth.....	13.	12.1	12.4	12.2	13.6
Length of nasals.....	12.6	12.9	12.6	12.6	14.1
Breadth of nasals.....	3.4	3.5	3.3	3.1	4.
Length of diastema.....	8.5	8.6	8.6	8.	9.4
Alveolar length of upper tooth-row.....	5.6	5.4	5.1	5.1	6.3
Length of palatal foramen..	7.6	7.	7.7	7.1	7.5
Depth of brain-case.....	9.	8.5	9.3	8.5	9.1
Depth of maxillary at fronto- nasal suture.....	7.6	7.5	7.4	7.	7.6
Length of mandible.....	17.6	17.6	17.5	16.5	19.1

Genus ARVICANTHIS. Lesson.

Three distinct forms of *Arvicanthis abyssinicus* Rüppell, taken in widely separated localities, Chilalo (altitude 9,000 feet), Sadi Malka

(3,000 feet), and Gardula (4,000 feet), differ from the species represented in the U. S. National Museum and from descriptions of those in the British Museum, and are described below as new subspecies.

The first, a large form from the Chilalo Mountains, by its heavy molars and strongly built skull, together with its short tail, well defined dorsal line, and lightly lined coat, is quite distinct from the latter two, which differ from each other mainly in color and in the proportionate length of their longer tails, the specimens from Sadi Malka tending to resemble *A. testicularis jebelæ* Heller and those from Gardula *A. a. nubilans* Wroughton.

10. ***Arvicanthis abyssinicus blicki*** subsp. nov. (Plate IV, figs. 1-5.)

Type from Hora Mountain Base Camp, South Chilalo Mountains, Abyssinia, altitude 9,000 feet. (Original field-number 26, ♂, D. G. R., Feb. 28, 1912.)

GENERAL CHARACTERS.—A large light-colored form with short tail, prominent median dorsal line, undifferentiated lower parts, and exceptionally heavy molars.

Length of foot 33 mm.; of tail 150 mm.; alveolar length of upper tooth-row 8.5 mm.

Pelage.—The tawny olive¹⁵ coloration of the dark median area and light-lined pinkish buff of the lateral portions of the back pass into wood-brown and drab-gray on the under parts. Black hair of scant dorsal lining long (23 mm.), main coat bi-colored, bases of hair warm sepia, tips light buff on under parts and sides to warm buff on upper and posterior portions of back; hairs of rump 9.5-11.5 mm. in length; outer portions of arms and legs same as back; throat and inner portions of limbs scantily haired and faded inner coat prominent; small post-auricular patches of soft white hair; ear-covering and sides of snout warm buff; tail well clad, buff below and on sides, black-brown above (in some specimens whole tip is black); hair of body at base of tail ochraceous tawny; feet gray, washed with warm buff; claws opaque black throughout.

Skull.—Strongly built and exceptionally broad, especially in zygomatic region (zygomatic breadth 19-21 mm. in series of eight specimens, against 18.5 in typical *A. abyssinicus* Rüppell);¹⁶ frontals depressed between strong supra-orbital ridges, which send spurs into

¹⁵ Ridgway, *l. c.* (cf. footnote 4).

¹⁶ Cf. Dollman, *Ann. and Mag. Nat. Hist.* (8), Vol. 8, 1911, p. 334, *et seq.*

orbit; dorsal frontal maxillary line much curved; palatal foramina without usual mid-lateral expansion; post-palatal foramina fairly large, opposite heel of M^2 ; molars very broad and heavy with markedly heavy cusps, arranged in typical Arvicanthis pattern; alveolar length of upper row of teeth 8.5 mm., compared with 7 mm. in *A. abyssinicus* Rüppell (cf. Dollman, *l. c.*) and 8 mm. in the larger *A. niloticus* Desmarest (cf. Dollman, *l. c.*) and attaining in Specimen No. 15 (a very old female) a measurement of 9.4 mm. (see table below).

MEASUREMENTS.

	Type									
	26, ♂, Mm.	401, ♀, Mm.	14, ♂, Mm.	15, ♀, Mm.	21, ♂, Mm.	28, ♂, Mm.	16, ♀, Mm.	403, ♀, Mm.	18, ♂, Mm.	
Length of head and body.	164	161	164	164	164	150	143	158	158	
Length of tail.	103	111	111	110	110	104	92	113	111	
Length of pes.	30	29.5	31	32	29	30.5	28	31.5	27	
Greatest length of skull.	35.8	35.2	.....	.....	.....	35.7	.....	33.4	32.8	
Basilar length of do.	31	30.7	.....	.....	.....	31.3	29	28.5	28.2	
Condylar-incisive length of skull.	35	34.5	.....	.....	.....	35.3	.....	32.5	32	
Zygomatic breadth.	29	19.5	20.8	.....	.....	19.1	19	18.6	19.6	
Interorbital constriction.	5	5.1	5.3	5	4.7	4.7	4.8	4.7	4.6	
Squamosal breadth.	14	14	.....	.....	.....	13.9	13.5	13	14	
Length of nasals.	14	13.5	.....	14	12	13.5	12.5	12.5	12.5	
Breadth of nasals.	4.5	4.4	4.6	4.5	4.4	4	4.5	4.4	4	
Length of diastema.	9.5	9.5	10	10.3	10	9.3	9	8.5	8.5	
Alveolar length of upper tooth-row.	8.5	8.5	8.7	9.4	8.5	8.5	8.5	8.5	8.1	
Length of palatal foramen.	7	7	7.5	7.5	7.5	7.5	7	6.5	6.5	
Length of bullæ.	6.5	6.5	.....	.....	6.7	6.5	6.6	6.5	6.5	
Depth of brain-case.	10	10.5	.....	.....	.....	10.4	10	9.7	10.3	
Depth of maxillaries at fronto-nasal suture.	11	10.5	11	11.3	9.7	9.5	9.5	9	9.3	
Length of mandible.	22	22	23	24.5	23	22	21	21.5	20	

The author's collection contains a series of seventeen specimens, twelve large adults, three small adults, and two immature, all taken February 24, 25, and 28, on treeless plain by Hora Mountain Base Camp, where they were seen running about in the daytime pursued by hawks. The pelage of most specimens is much worn and therefore patchy in appearance, the light tips of the dorsal hairs having been broken off over considerable areas. Specimen No. 18 shows the widest variation in color, tending toward buffy brown in contrast with the tawny olive of the type.

Named after my companion, Mr. J. C. Blick.

11. *Arvicanthis abyssinicus mearnsi* subsp. nov. (Plate IV, figs. 6-10.)

Type from Sadi Malka, Hawash River, Abyssinia, altitude 2800 ft. (Original field number 7522 E. A. M., January 29, 1912.)

GENERAL CHARACTERS.—Length of tail equal to, or greater than, combined length of head and body, and grayish olive tone of body coloration.

Skull.—Generally very similar to *A. a. raffertyi* (see description below), but viewed laterally shows less depth in the maxillary region, and a more flattened brain-case; all suggesting *A. testicularis jebelæ* Heller (see comparative table of measurements below). The posterior portion of the incisive foramina, however, is shorter and not narrowed down as in the latter and the breadth of the skull is greater.

Pelage.—Black-lined dorsal area deep grayish olive to brownish olive¹⁷ posteriorly, median line absent; under parts whitish, sharply differentiated from sides, and washed with buff along mid-ventral line and at sides. Individual hairs of main coat dark at base, dorsally with terminal to sub-terminal bands of cartilage or cream-buff, and ventrally with white to light buff tips; hairs of rump 1.15 mm.—18.5 mm. in length; flanks, sides of face, outer portions of arms and legs deep to dark olive-buff; ocular rings, sides of muzzle, and hairs of ear cream-buff; skin of throat and inner arms bare; vibrissæ black; tail buff below, dark above; hairs of rump at base of tail sagal-brown;¹⁸ feet gray, strongly washed with buff, claws brown with horny tips. In general external appearance this new subspecies somewhat resembles *A. a. jebelæ* Heller, but its upper parts are much darker, due to the black lining, which is less distinct in *A. a. jebelæ*. The size of the body is less than that of the latter, and its tail is proportionally longer.

The writer's collection contains four specimens, all taken at Sadi Malka on January 29, 1912. No. 7523 shows a slight variation in color from the type, being lighter and more brownish olive in tone.

I have named this new sub-species after Dr. Mearns, collector of the type, and ornithologist of the expedition.

¹⁷ Ridgway, *l. c.* (cf. footnote 4).

¹⁸ Measurements from specimen in United States National Museum.

MEASUREMENTS.

	No. 7522, ♂, (Type), Mm.	No. 7523, ♂, Mm.	No. 7524, ♂, Mm.	No. 38, ♂, Mm.	<i>A. testicularis</i> <i>jebelae</i> Mm.
Length of body and head . . .	141	136	132	132	153
Length of tail	138	145	137	143.5	143
Length of pes	29	28.5	27	27	28-29
Greatest length of skull . . .	34	34.2	33.3	32.2	34
Basilar length of skull	27.5	27.7	27	26.5	28
Condyllo-incisive length of skull	32	32.1	31.3	30.5	32
Zygomatic breadth . . . . .	...	17.1	17	16.6	16.1
Interorbital constriction . . .	5.4	5.2	5.2	5	5
Squamosal breadth	13.2	13.4	13.2	13	12.7
Nasals, length and breadth	13 × 4	12.3 × 4.3	12.3 × 4.2	11.8 × 4	13.2 × 3.7
Length of diastema	8.2	8.2	8.1	7.6	8.5
Alveolar length of upper tooth-row	7	7	6.6	6.5	6.8
Length of palatal foramen . .	7	7	6.7	6.7	7.1
Depth of brain-case	9.8	9.6	9.5	9.3	9.5
Depth of maxillary region at fronto-nasal suture	8.5	8.6	8.6	8.3	8.7
Length of mandible	18.7	18.7	17.8	17.6	19

12. *Arvicanthis abyssinicus raffertyi* subsp. nov. (Plate V.)

Type from Gardula, Southern Abyssinia, altitude 4,000 feet. (Original field number D. G. R. 59. Collected March 29, 1912.)

GENERAL CHARACTERS.—Rufescent, with tail of medium length, and neither dorsal stripe nor white post-auricular patches. Very similar in color to certain specimens of *A. a. nubilans* Wroughton in the U. S. National Museum, and also appearing to resemble Mr. Dollman's description of *A. a. zaphiri*, but lacks the broad brain-case and large pes of the latter.

Squamosal breadth of brain-case 13.8 against 15.2 of *A. a. zaphiri* Dollman¹⁹ and 14.2 of *A. a. nubilans* Wroughton; average length of pes 27.5-28.5 versus 31 of *A. a. zaphiri*.

Skull.—General proportions very similar to those of *A. a. nubilans* Wroughton from Kisumu in the U. S. National Museum. A series of specimens shows great variations in size. (See measurements below.)

Pelage.—Dorsal area cinnamon-brown²⁰ to ochraceous tawny, heavily lined with black and sharply differentiated from the gray of under parts. Black lined main pelage of upper parts with broad light-colored terminal

¹⁹ Dollman on "*Arvicanthis abyssinicus* and allied East-African Species, with Descriptions of Four New Forms," *Ann. and Mag. Nat. Hist.* (8), Vol. 8, 1911, p. 334.

²⁰ Ridgway, *l. c.* (cf. footnote 4).

MEASUREMENTS.

	No. 59 ♂ (Type), Mm.	No. 55 ♂, Mm.	No. 61 ♀, Mm.	No. 38 ♀, Mm.	No. 65 ♂, Mm.	No. 56 ♀, Mm.	No. 7548 ♂, Mm.	No. 60 ♀, Mm.	No. 40 ♂, Mm.	No. 68 ♂, Mm.	No. 64 ♀, Mm.
Length of head and body.....	149	145	132	129	176	144	143	132	113	148	134
Length of tail.....	128	129	....	114	123	107	113	112	105	114	106
Length of hind foot.....	27.8	28.5	27.5	27.5	28.5	27.5	29.5	28	27	28.5	24.5
Greatest length of skull.....	35.3	36.5	....	35.6	34.7	34.4	33.8	33.7	33.7	32.5	....
Basilar length.....	28.3	29.7	29.4	....	29	27.5	27.5	28.3	27.3	26	26
Condyllo-incisive length.....	33	34.5	33.4	....	33.5	....	32.5	32.1	32	30	30
Zygomat� breadth.....	17.9	18.3	17.8	18.4	18	17.8	17.6	16.5	17.5	16.5	16.5
Interorbital breadth.....	5.3	5.8	5.8	5.3	5.8	5.5	5.1	5.3	5.4	5	4.9
Squamosal breadth.....	13.8	13.7	13.3	13.9	13.2	13.7	13	13	13.5	13.5	13
Length of nasals.....	13	13.3	....	14	12.5	12.5	12.5	13	12.6	12.5	....
Breadth of do.....	4.2	4.7	....	4.6	4.8	4.5	4.4	4	4	4	....
Length of diastema.....	9	9.5	8.7	9.2	9	8.7	8.5	8.8	9	7.5	8.2
Alveolar length of upper-tooth-row.....	7.1	6.7	7	7.1	7.5	7.5	6.7	7	6.5	7	6.5
Length palatal foramen.....	6.5	7	6.7	7	7	7	6.5	7	6.1	5.5	6.1
Depth of brain-case.....	10.7	10.7	10.1	....	10.5	10.5	10	10.3	10.2	....	10
Depth of maxillaries.....	10	10	9.6	10.1	10	9.5	9.7	9.2	9.4	8.5	9
Length of mandible.....	19.05	20.7	20	20.1	19.5	20	....	....	....	18.5	18

to subterminal rings of light ochraceous to ochraceous-buff; hair of rump 11.5–20 mm. in length; under parts gray with three indistinct longitudinal buffy lines, *i. e.*, two lateral, bordering dark coloration of the sides and a single median line; outer covering of arms and legs continuous with ochraceous tawny flanks and shoulders; throat and undersides of arms and legs sparsely covered with hair; ocular rings, sides of snout, scant short covering of ears, and anterior basal tuft ochraceous-buff; lower side of tail ochraceous buff, upper side black; hair of rump at base ochraceous buff; anal region of the same color mixed with white; feet ochraceous buff with toes tending to become dark through wear; claws brown with horny tips.

The author's collection contains twenty-three specimens of different ages taken March 27–April 25, 1912, in the vicinity of Gato Camp, Gardula, and one specimen from South Abai Lake, taken March 19 (No. 7548 ♀), which differs from the rest of the series in the length of the pes, the maximum length of the pes in the series being 28.5 mm., as against 30 mm. in No. 7548, but the coloration and characters of the skull indicate that it belongs to the same species.

Individuals show considerable variation in color:²¹

1. In the distinctness of the demarcation between the sides and under parts;
2. In the tone of the under surface, which runs from white, either lightly or strongly washed with buff, to dark mouse-gray; and
3. In dorsal shading, which is partly due to age, *i. e.*, specimens with unworn to slightly worn molars average darkest and more olivescient than rufescent.

The size (by measurement of skulls and dried skins) is not dependent upon age, *i. e.*, the molars of two of six specimens (including the type) measuring in length of head and body 150 mm. and over, together with those of nine specimens averaging 135 mm. in length, show scarcely any wear, while the molars of one specimen of ten measuring under 125 mm. are well worn (No. 40).

Average length of tail 105 mm.; tail of type and Nos. 51 and 41 longest, 130 mm.; latter short-bodied and only specimen with tail exceeding combined length of head and body.

The species is named after its collector, Dr. Rafferty.

²¹ Upper pelage of No. 61 ♀ in writer's collection is identical in color with a specimen of *nubilans* Wroughton in the U. S. National Museum, No. 183050, but *A. nubilans* as a series runs lighter and the tails average less than in the new subspecies.

Genus *ACOMYS* Geoffroy.13. *Acomys hawashensis* sp. nov.

Type from Sadi Malka, Abyssinia; altitude 3,500 feet. (Original field-number D. G. R., No. "A," ♀, Jan. 31, 1912.)

In the size of tail and body this form approaches *A. dimidiatus* Cretzschmar from Egypt,²² and differs greatly from a series of *A. kempi* Dollman²³ in the author's collection in the greater length and breadth of body, tail, and feet, the larger size of ears, brighter coloration of sides, lack of subocular white patches (has tendency to the same postorbital patches) and heavier dorsal spines. In the latter feature it approaches *A. percivali*²⁴ Dollman.

Pelage.—The fawn-color of the anterior dorsal region darkens into benzo-brown on spiny rump and passes into light pinkish cinnamon on flanks and shoulders; underparts white. Hair of dorsal area stiff, modified into spines over the posterior part of same. (Maximum length of hairs 14.5 mm. *versus* 12.5 mm. in *A. kempi* and 15.5 in *A. percivali*.) Individual hairs mouse-gray in color, with whitish bases and tips of light cinnamon-drab to benzo-drab (*cf.* Ridgway *l. c.*) on upper parts, and pinkish cinnamon on sides and flanks; outer portions of arms and thighs marked with light pinkish cinnamon like shoulders and flanks, inner portions white like the under parts; head and snout fawn-colored, sides of face light like the sides of the body; no white subocular patches as in *A. kempi*; ears much larger than those of the latter species, but similarly covered with fine down, brownish and darkest towards tips; tail, which is equal to head and body in length, darkest dorsally, where the fine bristles are stouter and darkest (annulations 14 per 10 mm.). Bristle-like covering of upper surface and sides of feet white, washed with benzo-brown.

NOTES.

It is worthy of remark that the nine specimens of *A. kempi* in the collection of the author (three adults and one immature from Tertale, three from Mt. Indunumara, one from Endoto, and one from Yebo) cannot be differentiated by skull-measurements or external characters from a series of the same species in the U. S. National Museum, taken at the Northern Guaso Nyiro. Mature individuals vary slightly in

²² *Cf.* Rüppell, Atlas, 1826, p. 37; and Anderson, "Mammals of Egypt," 1902, p. 234.

²³ Annals & Mag. Nat. Hist., (8) Vol. 8, p. 125.

²⁴ Annals & Mag. Nat. Hist., (8) Vol. 8, p. 126.

the color of the back, which becomes lighter and more pronouncedly fawn with age. The very young are mouse-gray, with only a slight suggestion of drab on lower flanks. The spines are also undeveloped in the young, and the tails are smooth and mouse-gray above, contrasting with the roughened and fawn-colored tails of adults.

The nineteen specimens of a blue form taken at Gardula and the Abai Lakes, which agree in coloration and measurements with the series of *A. percivali* Dollman, in the U. S. National Museum, especially that part of the series from the Lololokui Hills (north of the Northern Guaso Nyiro River), appear to be identical with Dr. A. Donaldson Smith's alcoholic specimens from Lake Abai and eastward,²⁵ and differ from *A. kempi* Dollman:

1. By the blue instead of strongly fawn tone of the dorsal coloration;
2. By the coarser and less brilliant under parts, with a tendency to gray at the throat;
3. By the less distinct demarcation between the sides and upper parts;
4. By the longer spines (maximum length 15.5 mm. *versus* 12.5 mm.);
5. By the fact that skulls with well-worn molars average slightly larger than skulls of *A. kempi* of the same age. But both forms are somewhat variable.

EXPLANATION OF PLATES.

PLATE I.

FIG. 1. *Stenocephalemys albocaudata* Frick. Adult. (Type No. 11.) Lateral view of skull and mandible. $\frac{1}{2}$.

FIG. 2. Do. Superior view of skull.

FIG. 3. Do. Inferior view of mandible.

FIG. 4. Do. Inferior view of skull.

FIG. 5. Do. Superior view of mandible.

FIG. 6. *Dasymys* sp. (U. S. Nat. Mus., No. 165237.) Lateral view of skull and mandible. $\frac{1}{2}$.

FIG. 7. Do. Superior view of skull.

FIG. 8. Do. Inferior view of mandible.

FIG. 9. Do. Inferior view of skull.

FIG. 10. Do. Superior view of mandible.

²⁵ In the collection of the Academy of Natural Sciences of Philadelphia marked "*spinosisissimus* Peters," for the privilege of examining which the author is indebted to Mr. Witmer Stone, the Curator in charge.



PLATE II.

- FIG. 1. *Stenocephalemys albocaudata* Frick. Less mature. (Cotype, No. 32.) Lateral view of skull and mandible. $\frac{1}{2}$.
- FIG. 2. Do. Superior view of skull.
- FIG. 3. Do. Inferior view of mandible.
- FIG. 4. Do. Inferior view of skull.
- FIG. 5. Do. Superior view of mandible.
- FIG. 6. *Epimys tulbergi endorobæ*. (U. S. Nat. Mus., No. 163402, ♀.) Lateral view of skull and mandible. $\frac{1}{2}$.
- FIG. 7. Do. Superior view of skull.
- FIG. 8. Do. Inferior view of mandible.
- FIG. 9. Do. Inferior view of skull.
- FIG. 10. Do. Superior view of mandible.

PLATE III.

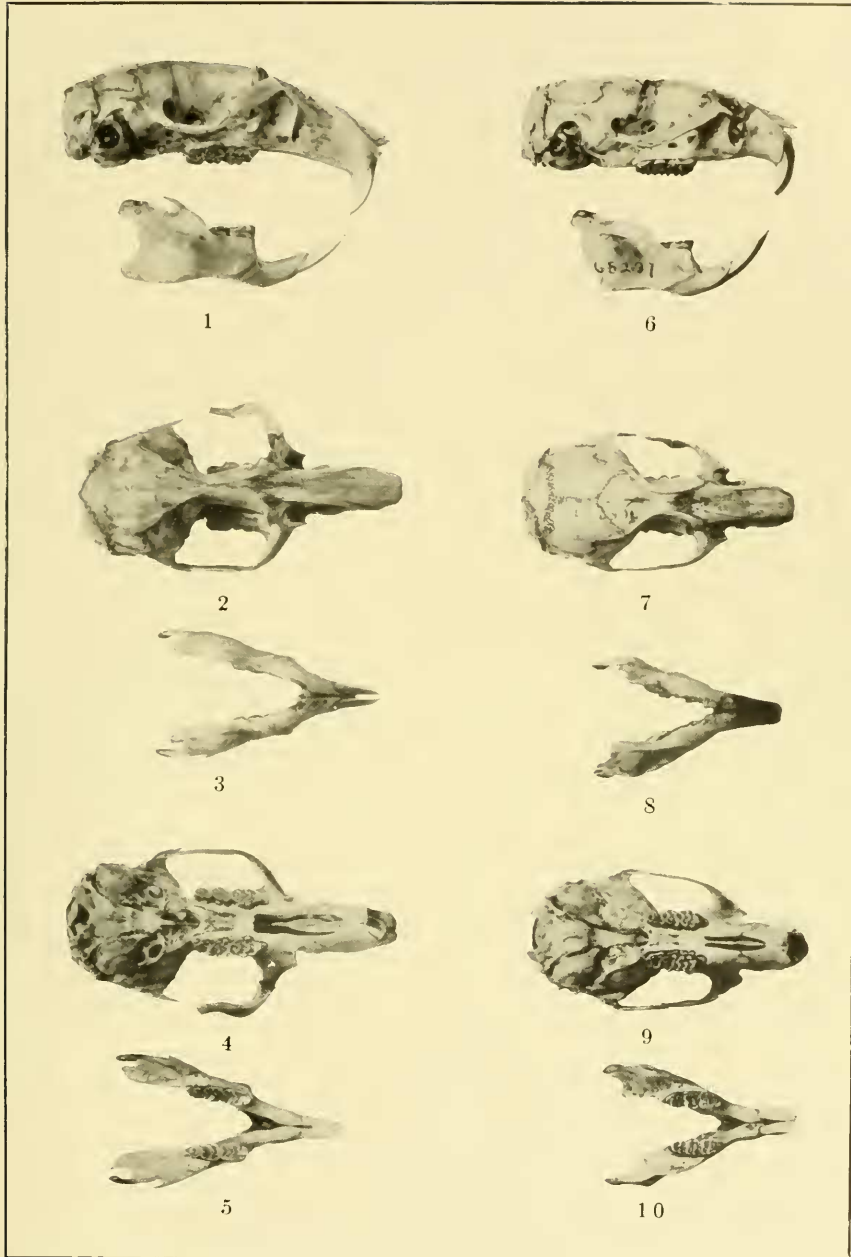
- FIG. 1. *Otomys jacksoni helleri* Frick. (Field No. E. A. M. 7531.) Lateral view of skull and mandible. $\frac{1}{2}$.
- FIG. 2. Do. Superior view of skull.
- FIG. 3. Do. Inferior view of mandible.
- FIG. 4. Do. Inferior view of skull.
- FIG. 5. Do. Superior view of mandible.
- FIG. 6. *Otomys jacksoni malkensis* Frick. (Type, Field No. D. G. R. 29.) Lateral view of skull and mandible. $\frac{1}{2}$.
- FIG. 7. Do. Superior view of skull.
- FIG. 8. Do. Inferior view of mandible.
- FIG. 9. Do. Inferior view of skull.
- FIG. 10. Do. Superior view of mandible.

PLATE IV.

- FIG. 1. *Arvicanthis abyssinicus blicki* Frick. (Type, Field No. D. G. R. 26, ♂.) Lateral view of skull and mandible. $\frac{1}{2}$.
- FIG. 2. Do. Superior view of skull.
- FIG. 3. Do. Inferior view of mandible.
- FIG. 4. Do. Inferior view of skull.
- FIG. 5. Do. Superior view of mandible.
- FIG. 6. *Arvicanthis abyssinicus mearnsi* Frick. (Type, Field No. E. A. M. 7522, ♂.) Lateral view of skull and mandible. $\frac{1}{2}$.
- FIG. 7. Do. Superior view of skull.
- FIG. 8. Do. Inferior view of mandible.
- FIG. 9. Do. Inferior view of skull.
- FIG. 10. Do. Superior view of mandible.

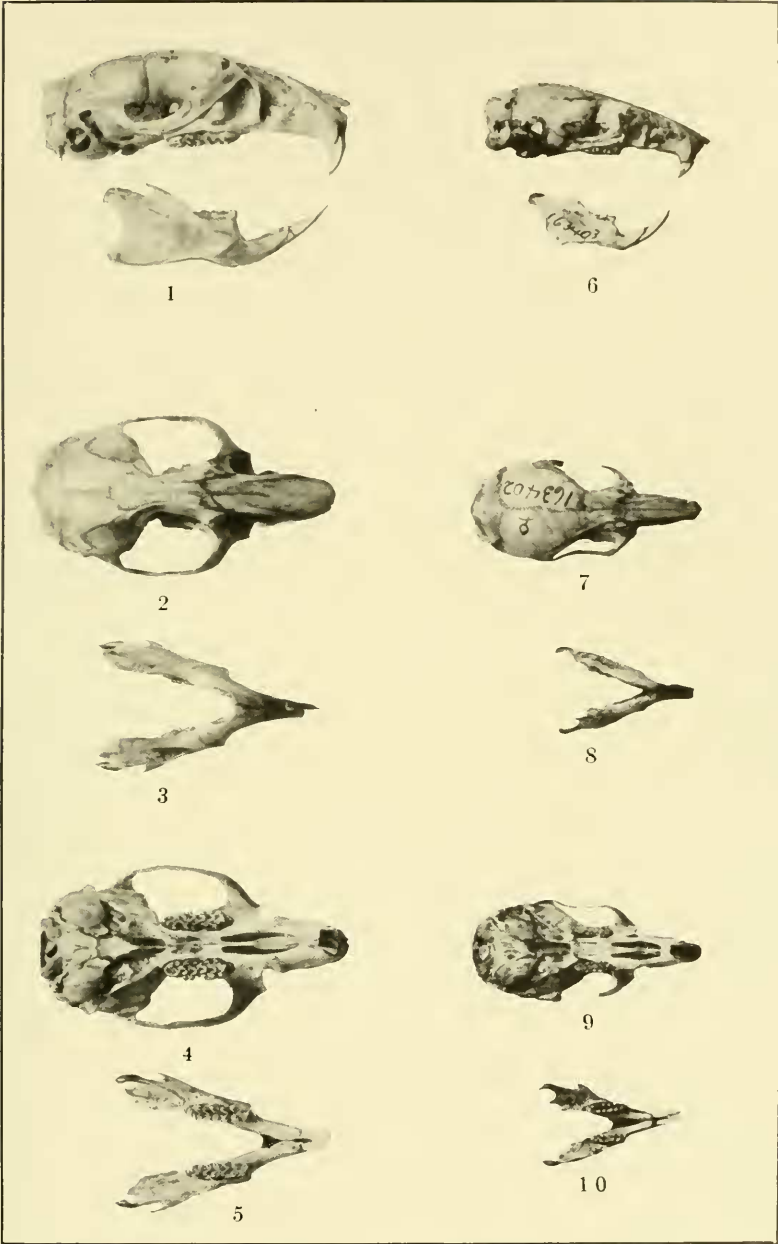
PLATE V.

- FIG. 1. *Arvicanthis abyssinicus raffertyi* Frick. (Type, Field No. D. G. R. 59, ♂.) Lateral view of skull and mandible. $\frac{1}{2}$.
- FIG. 2. Do. Superior view of skull.
- FIG. 3. Inferior view of mandible.
- FIG. 4. Inferior view of skull.
- FIG. 5. Superior view of mandible.



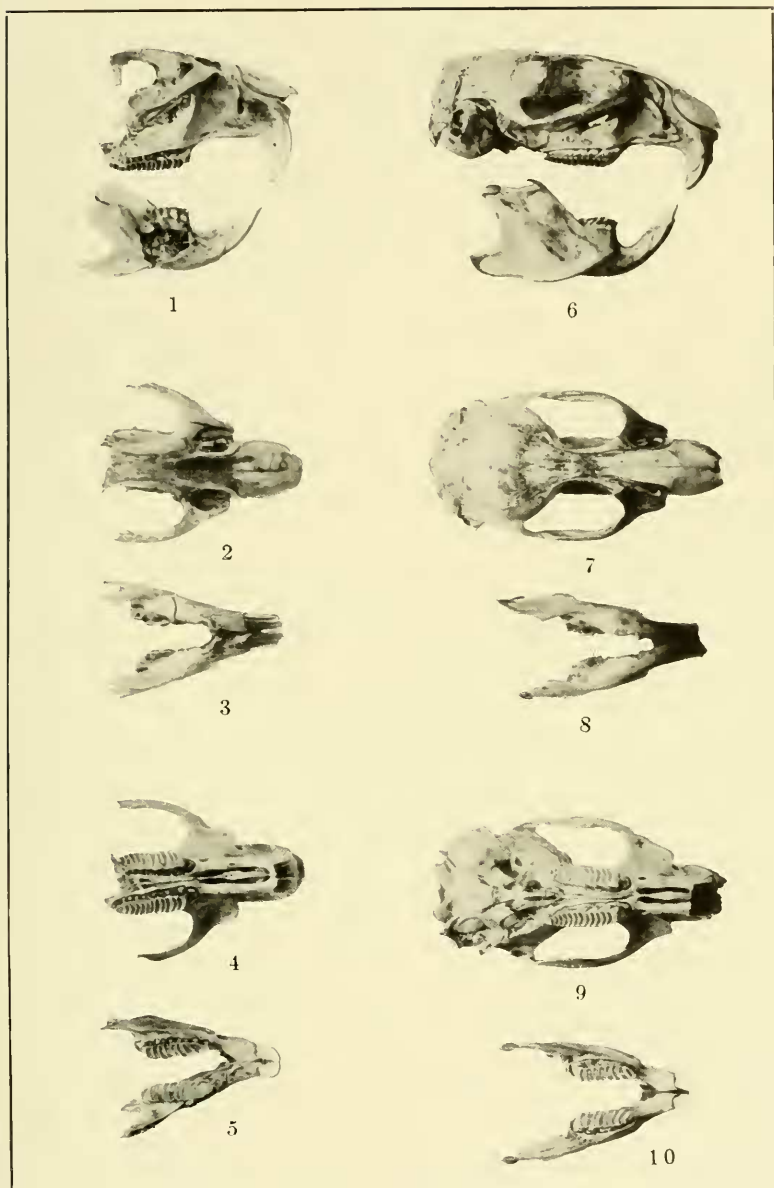
Figs. 1-5. *S. albicaudata* Frick. (Type. No. 11.) $\frac{1}{2}$.
Figs. 6-10. *Dasymys* sp. (No. 165237 U. S. N. M.) $\frac{1}{2}$.



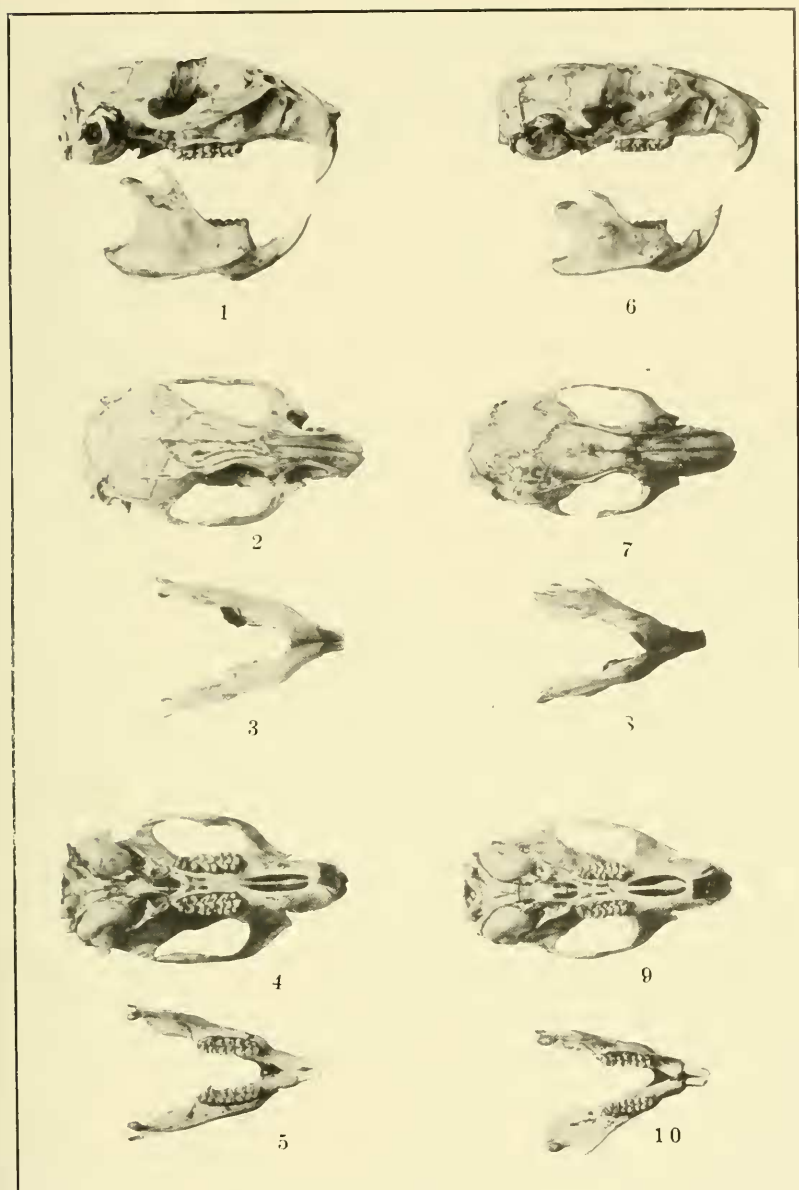


Figs. 1-5. *S. albocaudata* Frick, juv. (Cotype. No. 32.) ♂.

Figs. 6-10. *Epimys tulbergi endorobæ* Heller. (No. 163402, U. S. N. M.) ♂.

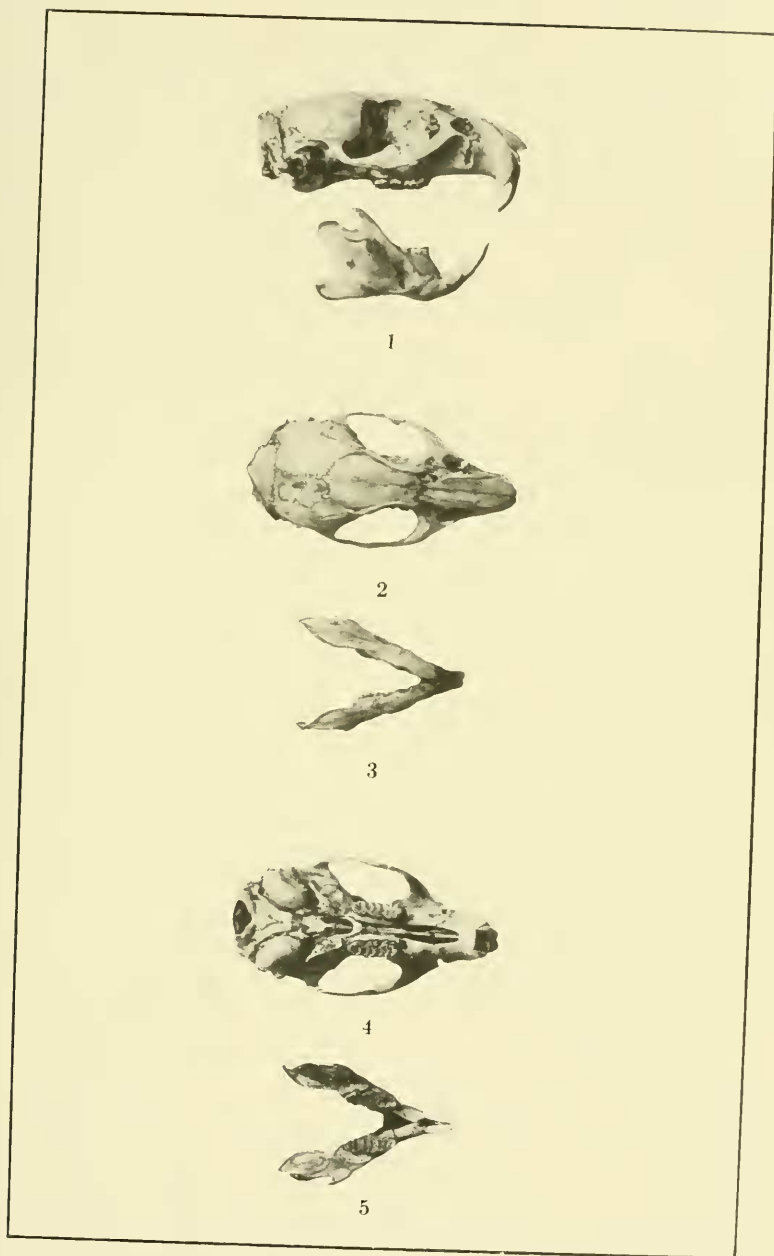


Figs. 1-5. *Otomys jacksoni mearnsi* Frick. (Type. No. 7531). $\frac{1}{2}$.
 Figs. 6-10. *Otomys jacksoni malkensis* Frick. (Type. No. 29). $\frac{1}{2}$.



Figs. 1-5. *Arvicanthus abyssinicus blicki* Frick. (Type. No. 26). $\frac{1}{2}$.

Figs. 6-10. *Arvicanthus abyssinicus mearnsi* Frick. (Type. No. 7522). $\frac{1}{2}$.



Figs. 1-5. *Arvicanthus abyssinicus raffertyi* Frick. (Type. No. 59). $\frac{1}{2}$.