Catalogue of the mammals of western Europe (Europe exclusive of Russia) in the collection of the British Museum / by Gerrit S. Miller.

London :BMNH,1912.
http://www.biodiversitylibrary.org/bibliography/8345

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buffy white, the spots roundish, varying from 2 to 5 mm. in diameter, those on middle of back smallest and most distinct, those at sides larger and tending to become confluent. Sides pale cream-buff with faint dark shading, this colour passing rather abruptly into bright buff of chest, belly, and inner surface of hind legs. Chin, throat, and under side of neck as far as fore legs like sides but still paler, rather sharply contrasted with colour of belly. Muzzle, cheeks, eye-ring (about 2 mm. wide) and ill defined area extending behind eye nearly to ear, cream-buff. Crown and stripe 5 mm. wide below eye russet sprinkled with cream-buff. Feet pale cream-buff; heel and ankle clear russet. Tail a dull buffy russet below, fringed with cream-buff, a grizzle of blackish and cream-buff above.

Skull and teeth.—The only skull examined is imperfect. It is smaller than that of *C. citellus*, and apparently less deep at middle, though dorsal profile is similarly convex throughout. Rostrum narrower and not so deep as in *C. citellus*, but not peculiar in form. Incisive foramina reduced to mere slits barely 5 mm. in width, and so short that their length is scarcely equal to diameter of alveolus of upper incisor. Palate and interorbital region narrower than in *C. citellus*, but interorbital breadth greater than breadth of rostrum. Mandible smaller and less robust than that of the related species but not peculiar in form. The teeth do not differ appreciably from those of *C. citellus*.

Measurements.—Adult female from Galicia, Hungary (from well-made skin): head and body, 200; tail, 40; hind foot, 32; ear, 7. For cranial measurements see Table opposite.

Specimen examined.—One, from Galicia, Hungary.

1. Galicia; Hungary. Purchased (Prulière). 86. 4. 2. 2.

Genus **MARMOTA** Blumenbach.

1777. *Glis* Erxleben, Syst. Regni Anim., I, p. 358 (part). Not *Glis* Brisson, 1762.
1779. *Marmota* Blumenbach, Handb. der Naturgesch., I, p. 79 (*alpina* = *marmota*).
1780. *Arctomys* Schreber, Säugethiere, pl. CCVII (*alpina* = *marmota*).
1780. *Lagomys* Storr, Prodr. Meth. Mamm., p. 39 (Renaming of *Arctomys*).
1811. *Lipura* Illiger, Prodr. Syst. Mam. et Avium, p. 95 (*hudsonius* = *monax*).
1857. *Arctomys* Blasius, Säugethiere Deutschlands, p. 278.
1904. *Marmota* Trouessart, Catal. Mamm. Viv. Foss., Suppl., p. 343. Frisch (Natursystem der vierfüss. Thiere, 1775, p. 9), cited as authority, but this writer not binary (see Thomas and Miller, Ann. and Mag. Nat. Hist., 7th ser., xvi, pp. 461–464, October, 1905).

Type species.—*Marmota alpina* Blumenbach = *Mus marmota* Linnæus.

Geographical distribution.—Northern Hemisphere from the

Alps eastward through Asia and North America to the Atlantic coast of the United States.

Characters.—Strictly terrestrial *Sciuridæ*, including the largest members of the family; form robust, Meline rather than Sciurine in general aspect; tail short and bushy, scarcely or not flattened; cheek pouches rudimentary or absent; cranial and dental characters essentially as in *Citellus*, but skull with rostrum nearly as deep as brain-case, and with heavy postorbital processes standing out nearly at right angles with main axis of skull; anterior upper premolar always large and well developed.

Remarks.—About two dozen species of *Marmota* are now known, the majority of them occurring in Central Asia. One of these extends its range westward into eastern Hungary; while a single species is peculiar to the Alps and Carpathians.

KEY TO THE EUROPEAN SPECIES OF *MARMOTA*.

Colours noticeably varied, the head blackish, with contrasted pale muzzle, the back much less yellowish than sides, the tail conspicuously black on terminal third; skull with posterior border of postorbital process decidedly in front of narrowest portion of postorbital constriction (Alps and Carpathians) ..... *M. marmota*, p. 932.

Colours not varied, the entire animal a yellowish brown overlaid on upper parts with black, the head slightly darker than body, without contrasted pale muzzle, the tail inconspicuously blackish at tip; skull with posterior border of postorbital process nearly over narrowest portion of postorbital constriction (eastern Hungary) ... *M. bobak*, p. 937.

MARMOTA MARMOTA Linnæus.

1758. [*Mus*] *marmota* Linnæus, Syst. Nat., I, 10th ed., p. 60.

1779. [*Marmota*] *alpina* Blumenbach, Handb. der Naturgesch., I, p. 80 (Substitute for *Marmota*).

1801. *A*[*rctomys*] *m*[*armota*] *tigrina* Bechstein, Gemeinn. Naturgesch. Deutschlands, I, 2d ed., p. 1029.

1801. *A*[*rctomys*] *m*[*armota*] *alba* Bechstein, Gemeinn. Naturgesch. Deutschlands, I, 2d ed., p. 1030.

1801. *A*[*rctomys*] *m*[*armota*] *nigra* Bechstein, Gemeinn. Naturgesch. Deutschlands, I, 2d ed., p. 1030.

1857. *Arctomys marmota* Blasius, Säugethiere Deutschlands, p. 280.

1904. [*Marmota*] *marmotta* Trouessart, Catal. Mamm. Viv. Foss., Suppl., p. 343.

1910. *Marmota marmota* Trouessart, Faune Mamm. d'Europe, p. 129.

Type locality.—Alps.

Geographical distribution.—Alps and Carpathians. Frequently referred to as occurring in the Pyrenees, but this probably an error.*

Diagnosis.—Size medium (head and body about 550, tail

* *See* Trutat, Bull. Soc. d'Hist. Nat. de Toulouse, XI, p. 110, 1877.

about 150, hind foot about 93 mm.; condylobasal length of fully adult skulls. 92 to 98 mm.); colours noticeably varied, the head usually blackish with contrasted pale muzzle and cheeks, the back blackish or greyish, the shoulders, sides and underparts tawny or yellowish, the tail with extensive black terminal area; skull somewhat elongate, the postorbital processes standing so far forward that their hinder border is decidedly in front of narrowest portion of postorbital constriction; anterior face of incisors deep orange.

External characters.—Form heavy and badger-like, the legs short and muscular, the tail about one-third as long as head and body, densely haired but not flattened, the head short, with inconspicuous ears and rather broad, rounded muzzle. Ear shorter than adjacent fur, its general outline rounded, but with a slight backward projection above; when laid forward the extremity extends less than half way to eye. Muzzle pad bare at middle, its outline not sharply defined above, the naked area extending downward as a narrow line across upper lip, and outlined on each side by a deep groove running downward from corresponding nostril. Feet robust, with long, slightly curved fossorial claws, those of fore feet somewhat the better developed; fore foot with no trace of pollex or its nail,* the third digit decidedly longer than the others, the fourth, second and fifth successively shorter; palm naked, with three confluent pads at base of digits, and two larger, rounded pads occupying posterior half of palm, that on inner side somewhat projecting; hind foot with third digit slightly longer than the sub-equal third and fourth, the fifth and first successively much shorter; hallux well developed, extending to middle of first phalanx of second digit, its claw like those of other toes but slightly smaller; sole naked except at heel; four sub-equal, partly confluent pads at base of digits, immediately behind these two smaller tubercles, that of inner side smallest. Mammæ: p 1—1; a 2—2; i 2—2=10.

Colour.—Upper parts a grizzle of black and light buff, the exact proportions of the two sufficiently variable to produce considerable individual differences in the general effect, but top of head usually blackish finely ticked with whitish buff in evident contrast with less dark neck, and back behind shoulders usually darker than region in front; underfur of back slaty black at base, the tips of the hairs forming a buffy or greyish band about 7 mm. wide; when this band is conspicuously grey it imparts to dark area of back a peculiar metallic sheen or lustre; muzzle nearly to level of front of eye whitish or buffy in abrupt contrast with dark crown; cheeks a coarse grizzle of blackish and buffy white; underparts and inner surface of legs a clear yellowish tawny-buff, this colour suffusing outer surface of legs and sides of body, also a conspicuous area extending upward immediately behind shoulder and partly separating dark

* Verified in twenty skins.

region of neck from that of back; feet buff, somewhat lighter than outer surface of legs; tail black or blackish brown, suffused to a varying degree with buff, the light colour most conspicuous at and near base.

Skull.—Apart from its much greater size the skull of *Marmota marmota* resembles that of *Citellus citellus* in most of its more essential features. The depth at front of brain-case and in interorbital region is relatively less, and in adult individuals there is a well developed sagittal crest on posterior half of brain-case, with the result that dorsal profile while equally convex in

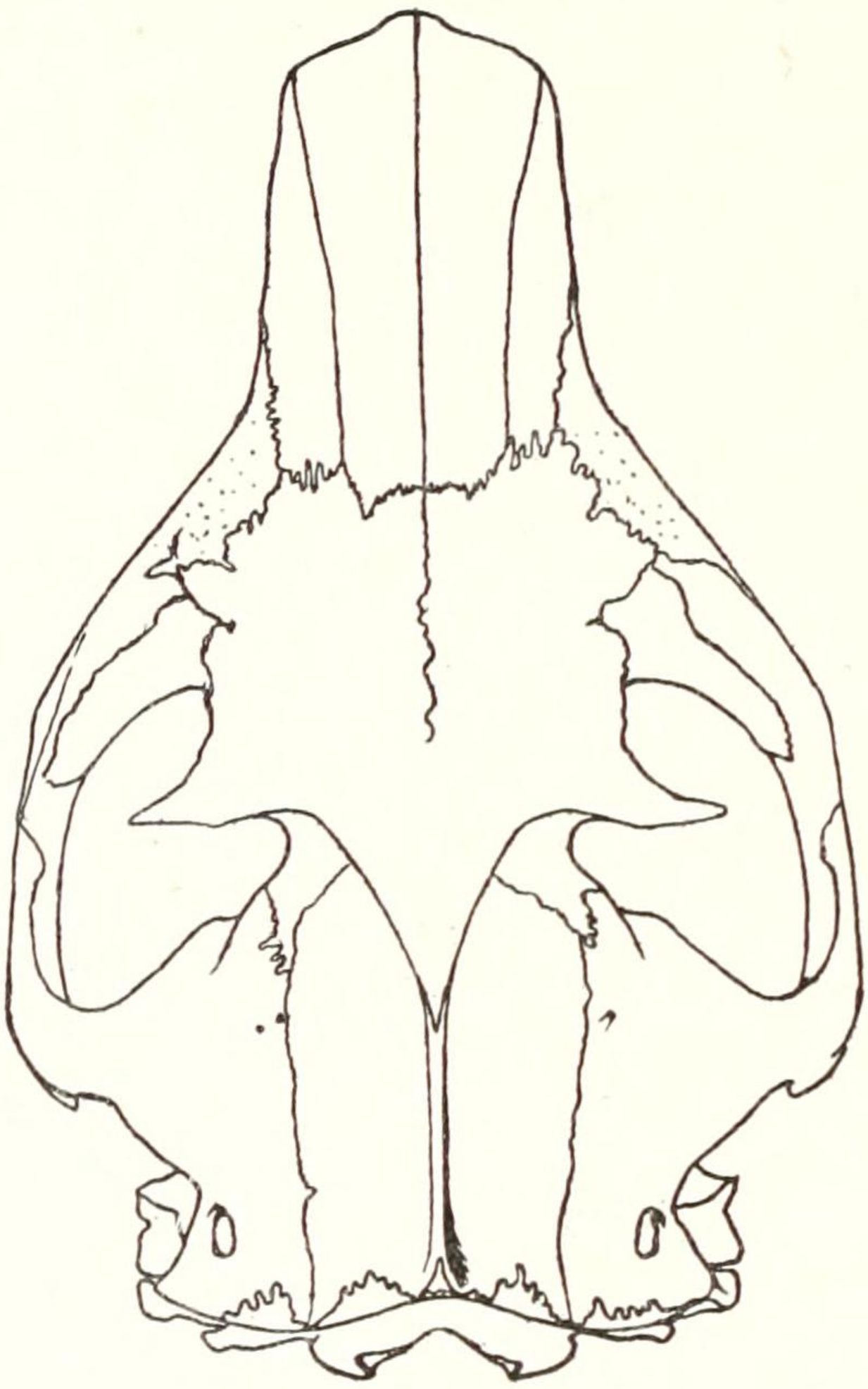

FIG. 190.

Marmota marmota. Slightly reduced.

front is noticeably flattened posteriorly as compared with the smaller animal. Ventral profile with no special peculiarities. Outline of brain-case somewhat obscured by the enlarged squamosals, the area of which, when skull is viewed from above, considerably exceeds that of parietals; constriction in front of lambdoid region relatively wider and more evident than in *Citellus citellus.* Lambdoid crest high, sometimes projecting backward sufficiently to conceal occipital region in dorsal view. Occiput lower relatively to its width than in *C. citellus*, the arch slightly pointed at middle and essentially as high as middle

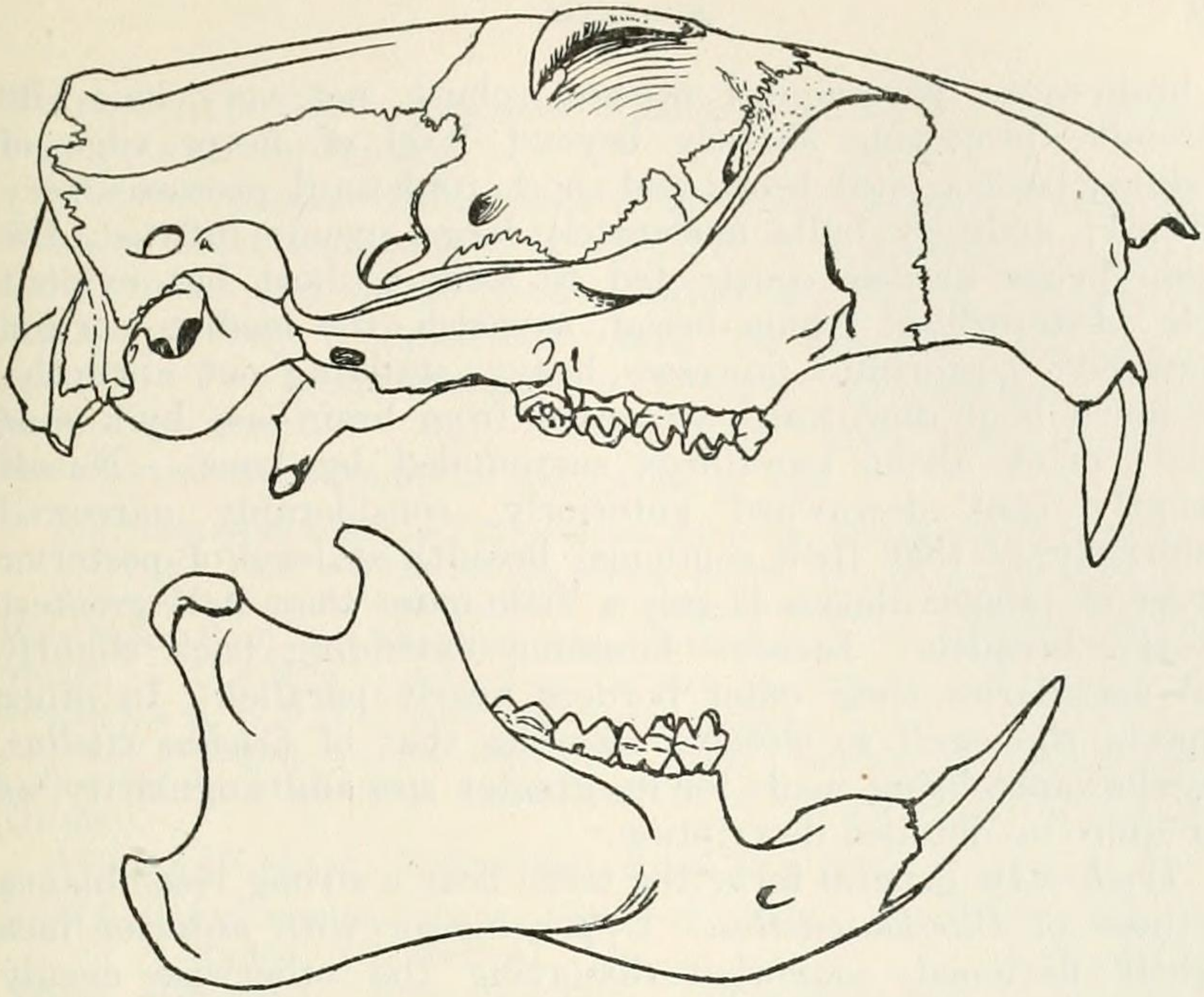

FIG. 191.

Marmota marmota. Slightly reduced.

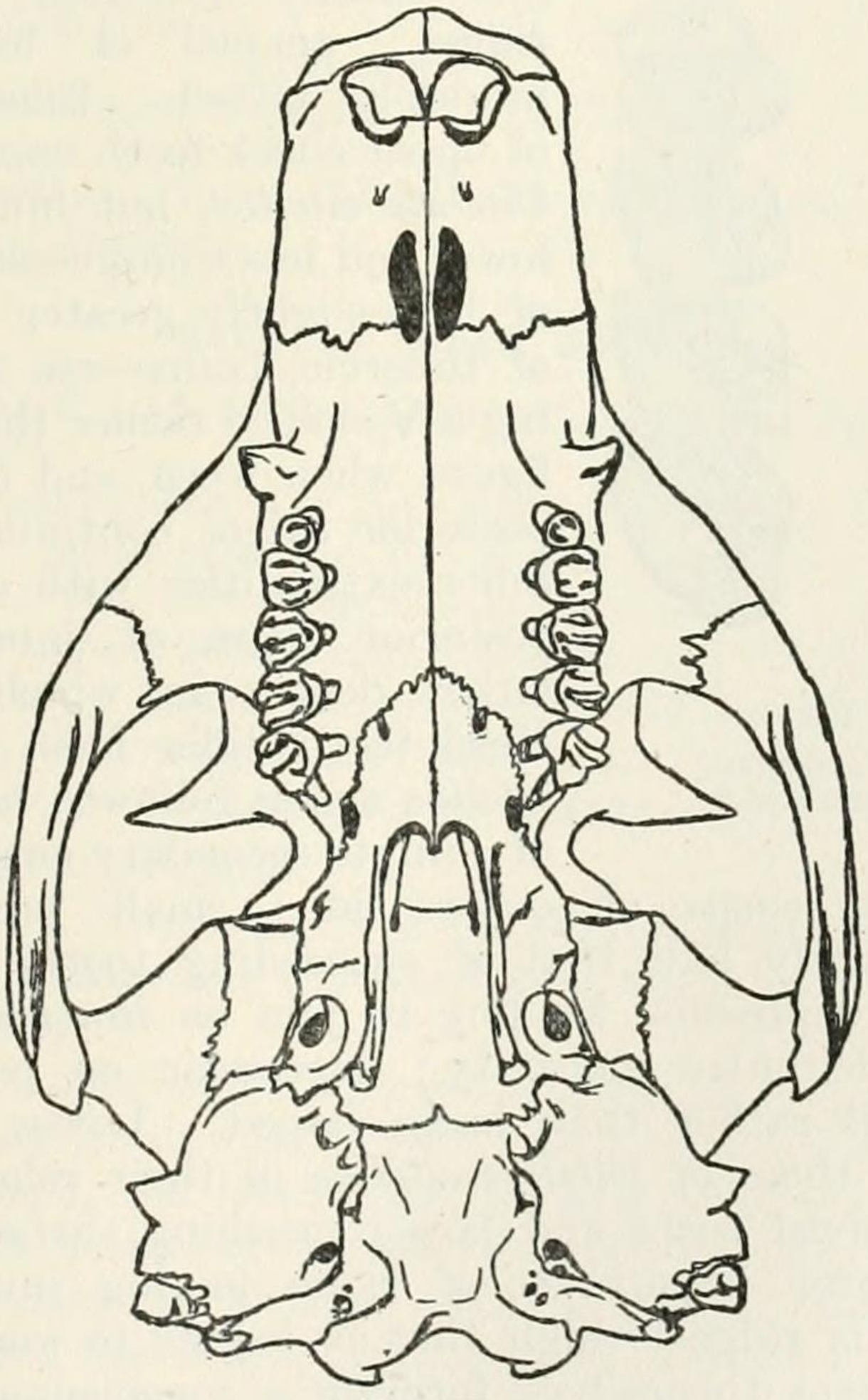

FIG. 192.

Marmota marmota. Slightly reduced.

of brain-case; paroccipital process robust, not very long, its extremity projecting silghtly beyond level of lower edge of condyle; basioccipital broad and short, its lateral processes very distinct; auditory bulla moderately large, evenly inflated, the region below meatus constricted to form a short but evident neck. Interorbital region broad, squarish, the median portion depressed; postorbital processes heavy, standing out abruptly, not much bent downward, separated from brain-case by a wide space; orbit about two-thirds surrounded by bone. Nasals abruptly bent downward anteriorly, considerably narrowed posteriorly, so that their combined breadth at level of posterior border of premaxillaries is only a little more than half greatest anterior breadth. Incisive foramina extending back slightly into maxillaries, their outer borders nearly parallel. In other respects the skull so closely resembles that of *Citellus citellus*, due allowance being made for its greater size and angularity, as to require no detailed description.

Teeth.—In general form the teeth bear a strong resemblance to those of *Citellus citellus*. Upper incisor with anterior face slightly flattened, somewhat distorting the otherwise evenly semicircular outline of cross-section, the enamel deep yellowish brown, its surface marked by about four faintly indicated longitudinal ridges; enamel of lower incisor minutely pitted. Enamel pattern of upper cheek-teeth essentially as in *Citellus citellus*, but inner tubercles lower and less compressed, the length of base slightly greater than height of tubercle, transverse ridges forming a V-shaped rather than U-shaped figure when worn, and anterior and posterior ridges continuous at their inner extremities with anterior and posterior bases of inner tubercle. Other details in which the upper cheek-teeth differ from those of *C. citellus* are as follows: no indication of minute secondary cusps or ridges between main cusps of outer side; small premolar with crown area barely half that of succeeding tooth, its anterior and posterior depression tending to join on inner side to form a narrow semicircular concavity; depression on posterior half of m^3 flattened rather than basin-shaped. Lower cheek-teeth differing from those of *Citellus citellus* in their relatively much lower, more robust cusps and larger crushing surfaces, and the relatively greater importance of ridge joining inner bases of outer cusps, this ridge so high that it begins to wear almost as soon as the cusps themselves, forming a conspicuous feature of

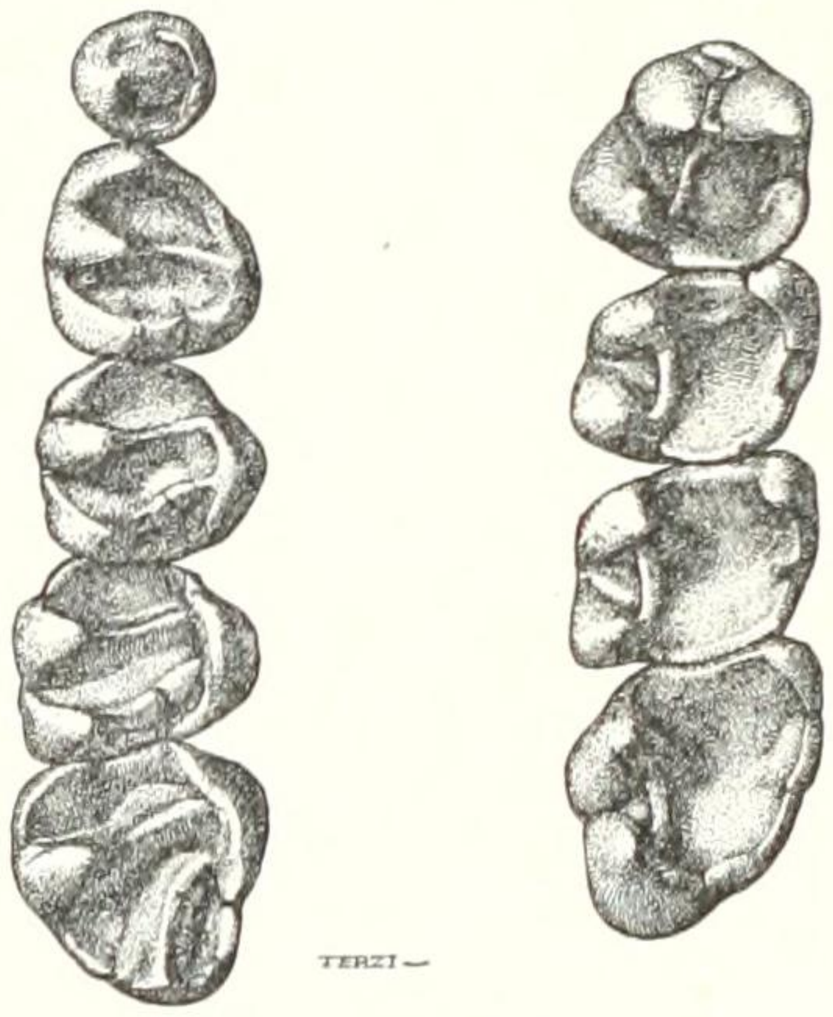

FIG. 193.

Marmota marmota.
Cheek-teeth. × 2.

the enamel pattern ; premolar with a small but evident cingulum cusp on anterior border.

Measurements.—Adult male from Barcelonnette, Basses-Alpes, France : head and body, 577 ; tail, 153 ; hind foot, 94 ; ear, 30. Adult male and female from Canton St. Gallen, Switzerland : head and body, 540 and 530 ; tail, 159 and 150 ; hind foot, 90 and 87. Two adult males from Grisons, Switzerland : head and body, 503 and 530 ; tail, 130 and 160 ; hind foot, 90 and 95. For cranial measurements see Table, p. 939.

Specimens examined.—Forty-seven, from the following localities:—

FRANCE : Near Barcelonnette, Basses-Alpes, 8 (B.M. and Mottaz).

SWITZERLAND : Salanfe (at foot of Dent du Midi), Valais, 1 (Mottaz) ; Meiringen, Bern, 2 ; Engstlen Alp, Unterwalden, 1 ; Engelberg, Unterwalden, 1 (U.S.N.M.) ; Schaufigg, Grisons, 3 ; Canton Grisons (no exact locality), 4 (U.S.N.M.) ; Rheinwaldhorn, Grisons, 1.

ITALY : Vagna Valley, near Mte. Rosa, Novara, 1 (Genoa) ; Aosta Valley, Turin, 20 (Turin) : Argentera, Cuneo, 3 (Turin) ; Maritime Alps, 1 (Genoa).

AUSTRIA-HUNGARY : Felkaerthal, Tatra Mountains, Hungary, 1.

2 ♂, 2 ♀.	Barcelonnette, Basses-Alpes, France. (*C. Mottaz.*)	O. Thomas (P).	8. 8. 10. 145. 63–65.
Skull.	Meiringen, Bern, Switzerland. (*Koeserman.*)	Tomes Collection.	7. 1. 1. 195.
1.	Engelberg, Unterwalden. (*Koeserman.*)	Tomes Collection.	7. 1. 1. 131.
♂, 2 ♀.	Schaufigg, Grisons. (*Zollikofer.*)	O. Thomas (P).	2. 8. 4. 31–33.
♂.	Rheinwaldhorn, Grisons. (*Zollikofer.*)	O. Thomas (P).	2. 8. 4. 30.
1.	Felkaerthal, Tatra Mountains ; Hungary.	Poprad Museum (E).	7. 4. 19. 1.

MARMOTA BOBAK Müller.

1776. *Mus bobak* P. L. S. Müller, Natursyst. Suppl. u. Regist. -Band, p. 40 (Poland).
1778. *Mus arctomys* Pallas, Nov. Sp. Quadr. Glir. Ord., p. 75 (Poland).
1780. *Arctomys bobac* Schreber, Säugethiere, pl. CCIX (description, IV, p. 738, 1782). Renaming of *Mus arctomys*.
1811. *Arctomys baibac* Pallas, Zoogr. Rosso-Asiat., p. 155 (Poland).
1857. *Arctomys bobac* Blasius, Säugethiere Deutschlands, p. 283.
1904. [*Marmota*] *bobac* Trouessart, Catal. Mamm. Viv. Foss., Suppl., p. 343.
1910. *Marmota bobac* Trouessart, Faune Mamm. d'Europe, p. 129.

Type locality.—Poland.

Geographical distribution.—From Poland and eastern Hungary (Galicia and Bukowina) eastward into Asia. Exact limits of range not known.

Diagnosis.—Size essentially as in *Marmota marmota* ; colours uniform, the entire animal a yellowish brown overlaid on upper parts with black, the head slightly darker than body, without contrasted pale muzzle or cheeks, the tail blackish at extreme tip only ; skull relatively broader than in *M. marmota*, and post-orbital processes standing so far back that their hinder border is nearly over narrowest portion of postorbital constriction ; teeth

somewhat heavier than those of *M. marmota*, especially the lower molars ; anterior face of incisors whitish or pale orange.

External characters.—Essentially as in *Marmota marmota*, but thumb present as a small though distinct tubercle bearing an evident appressed nail. Mammæ : $p\ 2-2$, $a\ 2-2$, $i\ 1-1=10$.

Colour.—Entire animal a light yellowish brown, the head suffused with a darker brown, the back, sides of body and outer surface of limbs clouded with blackish hair-tips, these most numerous over posterior half of back, but nowhere obscuring the

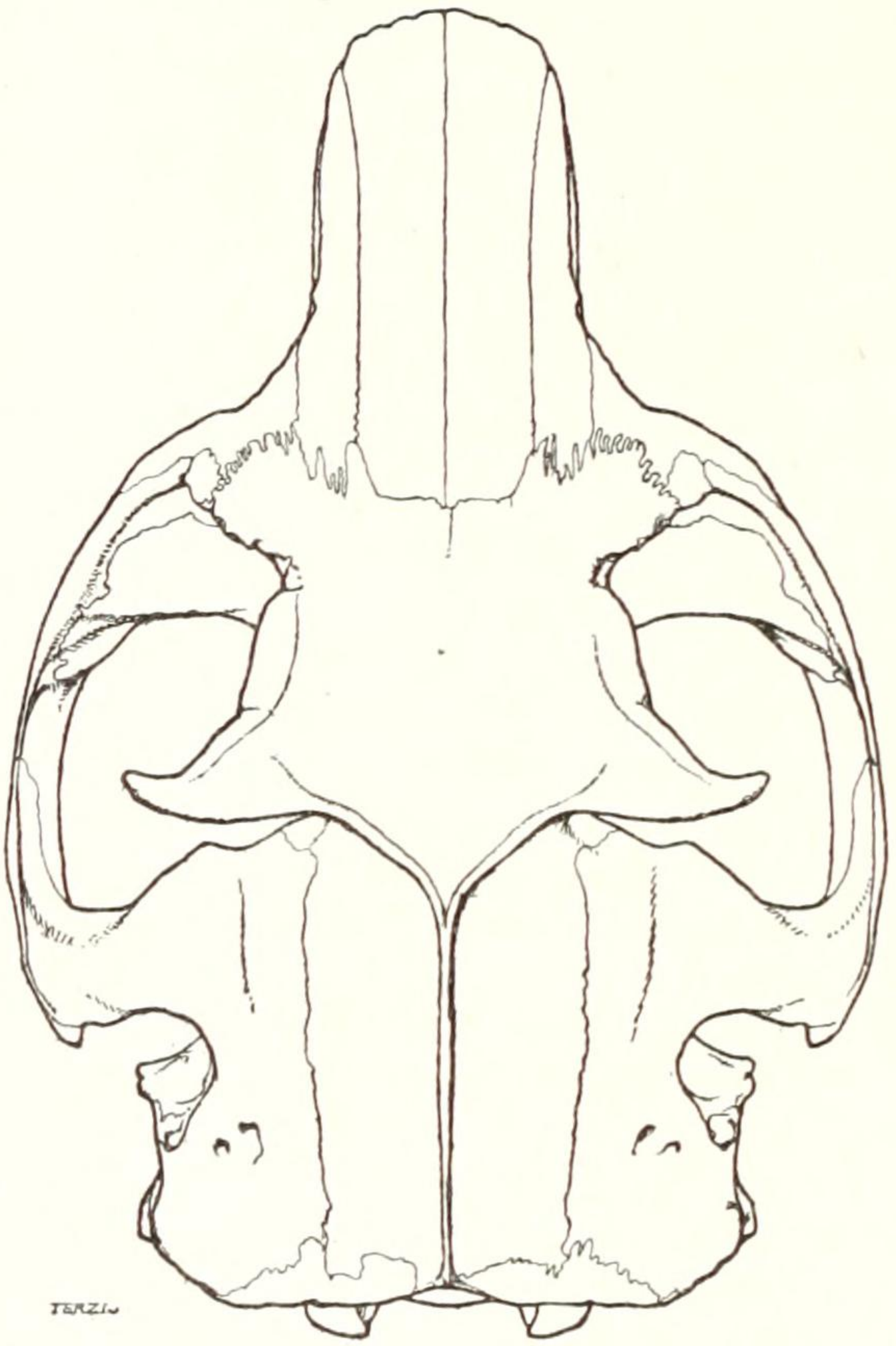

FIG. 194.

Marmota bobak. Slightly reduced.

ground colour ; feet a clear yellowish brown ; underparts and inner surface of limbs like back but slightly darker and more tawny, the hairs without blackish tips ; tail essentially similar, the extreme tip dark brown or blackish ; underfur everywhere dull yellowish, the hairs with slaty bases.

Skull and teeth.—The skull, though of about the same length as that of *Marmota marmota*, is broader and more robust in general form, and all ridges for muscular attachment are more prominent. Nasals less abruptly bent downward anteriorly and less narrowed posteriorly, their combined breadth at level of

CRANIAL MEASUREMENTS OF *MARMOTA MARMOTA* AND *M. BOBAK*.

Locality.	Number.	Sex.	Condylobasal length.	Zygomatic breadth.	Rostral breadth over canines.	Interorbital constriction.	Postorbital constriction.	Mastoid breadth.	Occipital depth.	Nasal.	Diastema.	Mandible.	Maxillary tooth-row.	Mandibular tooth-row.	Observations.
M. marmota.															
France: Barcelonnette, Basses-Alpes . .	8. 8. 10. 145	♂	87·6	55·6	18·6	24·8	18·8	39·6	24·8	37·8	22·4	61·2	22·4	19·8	Teeth slightly worn.
,, ,,	8. 8. 10. 63	♂	91·4	56·8	19·0	25·0	18·8	41·4	26·0	39·6	24·0	64·0	22·4	20·4	,, ,,
,, ,,	Co. 109 Mottaz	♂	85·0	52·0	18·0	22·4	17·6	38·2	24·0	35·0	22·0	59·6	21·6	20·8	,, ,,
,, ,,	5689 Mottaz		98·0	61·2	21·2	28·8	18·2	43·8	27·8	43·0	25·2	69·8	22·4	20·4	,, much worn.
,, ,,	Co. 110 Mottaz	♀	86·0	53·0	18·4	23·0	17·6	39·6	24·6	36·0	23·0	61·0	21·8	20·8	,, slightly worn.
,, ,,	8. 8. 10. 64	♀	92·0	57·4	20·4	27·0	18·4	42·0	26·0	37·6	24·2	64·6	22·0	19·4	,, much worn.
,, ,,	8. 8. 10. 65	♀	93·0	59·0	20·0	—	18·0	42·6	26·6	—	24·6	65·0	22·2	20·0	,, ,,
Switzerland: Meiringen, Bern .	7. 1. 1. 195		96·6	62·0	20·0	26·0	18·0	43·0	26·0	40·0	26·0	67·0	22·6	21·4	,, slightly worn.
,, ,,	7. 1. 1. 195*bis*		95·0	62·2	20·6	29·4	19·6	43·4	27·0	41·0	26·6	—	22·0	—	,, ,,
Canton St. Gallen	115221	♂	95·0	63·2	20·8	29·6	18·8	42·8	27·8	40·8	25·8	68·6	22·0	19·8	,, much worn.
Schaufigg, Grisons	2. 8. 4. 32	♀	94·0	60·6	21·0	27·2	19·0	41·4	25·4	39·6	24·4	—	22·6	—	,, slightly worn.
,, ,,	2. 8. 4. 33	♀	95·0	61·6	20·4	27·4	19·6	42·4	26·8	41·4	25·6	69·6	23·0	22·0	,, ,,
Grisons, no exact locality . .	115219	♂	96·6	60·8	20·6	29·6	19·6	44·2	27·0	40·4	26·2	67·8	21·2	19·8	,, moderately worn.
,, ,,	115220	♂	90·8	57·8	18·8	25·2	18·2	40·4	26·2	37·8	23·8	65·2	21·0	19·4	,, slightly worn.
,, ,,	115222	♂	93·0	62·2	20·2	28·2	19·0	42·8	26·0	39·2	24·2	64·6	21·4	20·2	,, moderately worn.
Rheinwaldhorn, Grisons .	2. 8. 4. 30	♂	96·0	61·0	20·0	26·0	19·0	43·8	26·6	42·0	27·0	67·0	22·4	20·4	,, slightly worn.
M. bobak.															
Russia: no exact locality .	46. 2. 2. 1		97·0	65·2	19·2	25·2	15·8	46·6	29·0	39·8	25·2	71·4	23·0	22·6	,, moderately worn.
. . .	46. 2. 2. 21		97±	64·8	20·6	25·0	15·8	45·6	—	42·6	27·2	70·8	23·0	22·6	,, much worn.

posterior border of premaxillary fully three-fourths greatest combined breadth anteriorly. Orbit larger than in the related species, the postorbital process situated so far back that its tip lies over a point decidedly behind middle of temporal fossa instead of over middle, and its posterior border nearly overhangs deepest part of postorbital constriction and anterior border of squamosal. Brain-case noticeably broader in proportion to its length, and foramen magnum wider relatively to its height. Auditory bullæ larger than in *Marmota marmota*, the area of each bulla appearing greater than that of basioccipital and condyles instead of about equal to it. Palate relatively narrower posteriorly, and incisive foramina wider in proportion to their length than in *M. marmota*. Mandible more robust than in the related animal, especially in front; sigmoid flexure longer and less concave.

Teeth essentially as in *Marmota marmota* as regards form, but anterior surface of incisors pale yellowish instead of deep orange, and cheek-teeth more robust, a character especially noticeable in second and third lower molars.*

Measurements.—Male and female from Russia (skins): head and body, 600 and 530; tail, 190 and 160; hind foot, 90 and 89. For cranial measurements see Table, p. 939.

Specimens examined.—Two, both from Russia.

Family PETAURISTIDÆ.

1855. *Pteromyinæ* Brandt, Mém. Acad. Imp. Sci., St. Petersburg, 6th ser., Sci. Nat., VII, p. 151.
1857. *Sciurina* Blasius, Säugethiere Deutschlands, p. 266 (part).
1879. *Pteromidæ* Anderson, Anat. and Zool. Researches, Expeds. Yunnan, p. 278.
1891. *Sciurinæ* Flower and Lydekker, Mammals, living and extinct, p. 450 (part).

Geographical distribution.—Wooded portions of Northern Hemisphere south to the Malay region and the southern United States. In Europe confined to Scandinavia and northern Russia.

Characters.—Like the *Sciuridæ*, but with fore and hind limbs connected by a broad fold of skin extending to wrists and ankles, supported anteriorly by a stiff cartilaginous process growing from wrist, the membrane serving as a parachute by means of which gliding flight is effected.

Remarks.—The *Petauristidæ* are so sharply differentiated from the *Sciuridæ*, that it seems preferable to recognize the two groups as families. Eight genera are known,† one of which is represented in Europe.

* This difference between the teeth of *M. marmota* and *M. bobak* is of much importance in determining the identity of subfossil remains.

† See Thomas, Ann. and Mag. Nat. Hist., 8th ser., I, pp. 1–8, January, 1908.

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biitfy white, the spots roundish, varying from 2 to 5 mm. in diameter, those on middle of back smallest and most distinct, those at sides larger and tending to become confluent. Sides pale cream-buflf with faint dark shading, this colour passing rather abruptly into bright buff' of chest, belly, and inner

surface of hind legs. Chin, throat, and under side of neck as far as fore legs like sides but still paler, rather sharply contrasted with colour of belly. Muzzle, cheeks, eye-ring (about 2 mm. wide) and ill defined area extending behind eye nearly to ear, cream-buff". Crown and stripe 5 mm. wide below eye russet sprinkled with cream-buff'. Feet pale cream-buff"; heel and ankle clear russet. Tail a dull buffy russet below, fringed with cream-buff', a grizzle of blackish and cream-buff" above.

SJcull and teeth. — The only skull examined is imperfect. It is smaller than that of C. cifellus, and apparently less deep at middle, though dorsal profile is similarly convex throughout. Rostrum narrower and not so deep as in C. citellus, but not peculiar in form. Incisive foramina reduced to mere slits barely 5 mm. in width, and so short that their length is scarcely equal to diameter of alveolus of upper incisor. Palate and interorbital region narrower than in C. citellus, but interorbital breadth greater than breadth of rostrum. Mandible smaller and less robust than that of the related species but not peculiar in form. The teeth do not differ appreciably from those of C citellus.

Measurements. — Adult female from Galicia, Hungary (from well-made skin) : head and body, 200 ; tail, 40 ; hind foot, 32 ; ear, 7. For cranial measurements see Table opposite.

Specimen cxamiyied. — One, from Galicia, Hungary.

1. Galicia; Hungary. Purchased (Pruliere). 86.4.2.2.

Genus MARMOTA Blumenbach.

1777. Glis Erxleben, Syst.Regni Anim., i, p. 358 (part). Not Glis Brisson, 1762.

1779. Marmota Blumenbach, Handb. der Naturgesch., i, p. 79 (alpina = marmot a).

1780. Arctoniys Schreber, Saugethiere, pi. ccvii {alpina = marmota).

1780. Lagomys Storr, Prodr. Meth. Mamm., p. 39 (Renaming of Arctomys).

1811. Lipura Illiger, Prodr. Syst. Mam. et Avium, p. 95 (hudsonhis = monax).

1857. Arctomys Blasius, Saugethiere Deutschlands, p. 278.

1904. Marmota Trouessarfc, Catal. Mamm. Viv. Foss., Suppl., p. 343.

Frisch (Natursystem der vierfiiss. Thiere, 1775, p. 9), cited as authority, but this writer not binary (see Thomas and Jliller, Ann. and Mag. Nat. Hist., 7th ser., xvi, pp. 461-464, October, 1905).

Type species. — -Marmota alpina Blumenbach = Mits marmota Linnceus.

Geographical distribution. — Northern Hemisphere from the

[Begin Page: Page 932]

Alps eastward through Asia and North America to the Atlantic coast of the United States.

Characters. — Strictly terrestrial Sciuridse, including the largest members of the family ; form robust, Meline rather than Sciurine in general aspect ; tail short and bushy, scarcely or not flattened ; cheek pouches rudimentary or absent ; cranial and dental characters essentially as in CiteUus, but skull with rostrum nearly as deep as brain-case, and with heavy postorbital processes standing out nearly at right angles with main axis of skull ; anterior upper premolar always large and well developed.

Bemarks. — About two dozen species of Marmoia are now known, the majority of them occurring in Central Asia. One of these extends its range westward into eastern Hungary ; while a single species is peculiar to the Alps and Carpathians.

KEY TO THE EUEOPEAN SPECIES OF MABMOTA.

Colours noticeably varied, the head blackish, with contrasted pale muzzle, the back much less yel-

lowish than sides, the tail conspicuously black on terminal third ; skull with posterior border of postorbital process decidedly in front of narrowest portion of postorbital constriction (Alps and Carpathians) M. marmoia, p. 932.

Colours not varied, the entire animal a yellowish brown overlaid on upper parts with black, the head slightly darker than body, without contrasted pale muzzle, the tail inconspicuously blackish at tip ; skull with posterior border of postorbital iJrocess nearly over narrowest portion of postorbital constriction (eastern Hungary) ... M. bobak, p. 937.

MARMOTA MARMOTA Linna?US.

1758. [Miis] marmota Linnaeus, Syst. Nat., i, 10th ed., p. 60.

1779. [^Mannota'] alpina Blumenbach, Handb. der Naturgesch., i, p. 80 (Substitute for Marvwta).

1801. A[rctoviys] m[armota'] tigrina Bechstein, Gemeinn. Naturgesch. Deutschlands, i, 2d ed., p. 1029.

1801. A[i-ctomys] m[an7iota^ alba Bechstein, Gemeinn. Naturgesch. Deutschlands, I, 2d ed., p. 1030.

1801. A[i-ct07nys'] vi[annota] nigra Bechstein, Gemeinn. Naturgesch.

Deutschlands, i, 2d ed., p. 1030.

1857. Arctomys marmoia Blasius, Siiugethiere Deutschlands, p. 280.

1904. [Marmoial marmotia Trouessart, Catal.]\Iamm. Viv. Foss., SuppL, p. 343.

1910. Marmoia marmoia Trouessart, Faune Mamm. d'Europe, p. 129.

Type localifj/. — Alps.

Geograpliical distrihufion. — Alps and Carpathians. Frequently referred to as occurring in the Pyrenees, but this probably an error.*

Diaiinoxh. — Size medium (head and body about r).")0, tail

* See Trutat, Bull. Soc. d'Hist. Nat. de Toulouse, xi, p. 110, 1877.

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about 150, hind foot ahout i)3 inni. ; condylobasal leiigtli of fully adult skulls. 92 to 98 nun.) ; colours noticeably varied, the head

usually blackish with contrasted pale muzzle and cheeks, the back blackish or greyish, the shoulders, sides and underparts tawny or yellowish, the tail with extensive black terminal area ; skull somewhat elongate, the postorbital processes standing so far forward that their hinder border is decidedly in front of narrowest portion of postorbital constriction ; anterior face of incisors deep orange.

External cliararters. — Form heavy and badger-like, the legs short and muscular, the tail about one-third as long as head and body, densely haired but not flattened, the head short, with inconspicuous ears and rather broad, rounded muzzle. Ear shorter than adjacent fur, its general outline rounded, but with a slight backward projection above ; when laid forward the extremity extends less than half way to eye. Muzzle pad bare at middle, its outline not sharply defined above, the naked area extending downward as a nairow line across upper lip, and out-lined on each side by a deep groove running downward from corresponding nostril. Feet robust, with long, slightly curved fossorial claws, those of fore feet somewhat the better developed ; fore foot with no trace of pollex or its nail,* the third digit decidedly longer than the others, the fourth, second and fifth successively shorter ; palm naked, with three confluent pads at base of digits, and two larger, rounded jaads occupying posterior half of palm, that on inner side somewhat projecting ; hind foot with third digit slightly longer than the sub-equal third and fourth, the fifth and first successively much shorter ; hallux well developed, extending to middle of first phalanx of second digit, its claw like those of other toes but slightly smaller ; sole naked

except at heel ; four sub-equal, partly confluent pads at base of digits, immediately behind these two smaller tubercles, that of inner side smallest. Mammaj :j^1 — 1; «2 — 2; i 2 — 2 = 10.

Colour. — Upper parts a grizzle of black and light bufl', the exact proportions of the two sufliciently variable to produce considerable individual differences in the general effect, but top of head usually blackish finely ticked with whitish bufl" in evident contrast with less dark neck, and back behind shoulders usually darker than region in front ; underfur of back slaty black at base, the tips of the hairs forming a bufiy or greyish band about 7 mm. wide ; when this band is conspicuously grey it imparts to dark area of back a peculiar metallic sheen or lustre : muzzle nearly to level of front of eye whitish or buffy in abrupt contrast with dark crown ; cheeks a coarse grizzle of blackish and buffy white ; underparts and inner surface of legs a clear yellowish tawny-buff, this colour suffusing outer surface of legs and sides of body, also a conspicuous area extending upward immediately behind shoulder and partly separating dark

* 'S'erified in twenty skins.

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i-egion of neck from that of back ; feet buff", somewhat liglitei-

than outer surface of legs ; tail black or blackish brown, sufiused to a varying degree with buff, the light colour most conspicuous at and near base.

Shill. — Apart from its much greater size the skull of Marmota marmota resembles that of Citellus citellus in most of its more essential features. The depth at front of brain-case and in interorbital region is relatively less, and in adult individuals there is a well developed sagittal crest on posterior half of brain-case, with the result that dorsal profile while equally convex in

Fic;. 190.
Mannola marmota. Slightly reduced.

front is noticeably flattened posteriorly as compared with the smaller animal. Ventral profile with no special peculiarities. (Outline of brain-case somewhat obscured by the enlarged squamosals, the area of which, when skull is viewed from above, considerably exceeds that of parietals ; constriction in front of lambdoid region relatively wider and more evident than in Citellus citellus. Lambdoid crest high, sometimes projecting backward sufficiently to conceal occipital region in dorsal view. Occiput lower relatively to its width than in C. citellus, the arch slightly pointed at middle and essentially as high as middle

Fig. 191.

Marmota marmota. Slightly reduced.

Flo. 192.

Mannota iiianiwta. .Sliglitlv reduced.

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of brain-case ; paroccipital process robust, not very long, its extremity projecting silghtly beyond level of lower edge of condyle ; basioccipital broad and short, its lateral processes very distinct ; auditory bulla moderately large, evenly inflated, the region below meatus constricted to form a short but evident neck. Interorbital region broad, squarish, the median portion depressed ; postorbital processes heavy, standing out abruptly, not much bent downward, separated from brain-case by a wide space ; orbit about two-thirds surrounded by bone. Nasals abruptly bent downward anteriorly, considerably narrowed posteriorly, so that their combined breadth at level of posterior border of premaxillaries is only a little more than half greatest anterior breadth. Incisive foramina extending back slightly into maxillaries, their outer borders nearly parallel. In other resi^ects the skull so closely resembles that of Citellus citeUus, due allowance being made for its greater size and angularity, as

to require no detailed description.

Teeth. — In general form the teeth bear a strong resemblance to those of Citellus citellus. Upper incisor with anterior face slightly flattened, somewhat distorting the otherwise evenly semicircular outline of cross-section, the enamel deep yellowish brown, its surface marked by about four faintly indicated longitudinal ridges ; enamel of lower incisor minutely pitted. Enamel pattern of upper cheek-teeth essentially as in Citellus citellus, but inner tubercles lower and less compressed, the length of base slightly greater than height of tubercle, transverse ridges forming a V-shaj^ed rather than U-shaped figure when worn, and anterior and posterior ridges continuous at their inner extremities with anterior and posterior bases of inner tubercle. Other details in which the upper cheek-teeth differ from those of C. citellus are as follows : no indication of minute secondary cusps or ridges between main cusps of outer side ; small premolar with crown area barely half that of succeeding tooth, its anterior and posterior depression tending to join on inner side to form a narrow semicircular concavity ; depression on posterior half of vi^ flattened rather than basin-shaped. Lower cheek-teeth

diftering from those of Citellus citellus in their relatively much lower, more robust cusps and larger crushing surfaces, and the relatively greater importance of ridge joining inner bases of outer cusps, this ridge so high that it begins to wear almost as soon as the cusps themselves, forming a conspicuous feature of

Via. 193.

ilarmota inamnuta.

Cheek-teeth. X 2.

[Begin Page: Page 937]

the enamel pattern ; premolar with a small but c%i(leut cingulum cusp on anterior boi-der.

Mcasureme.Hts. — Adult male from Barcelonnette, Basses- Alpes, France : head and body, 577 ; tail, 153 ; hind foot, 94 ; ear, 30. Adult male and female from Canton St. Gallen, Switzerland : head and body, 540 and 530 ; tail, 159 and 150 ; hind foot, 90 and 87. Two adult males from Grisons, Switzerland : head and body, 503 and 530; tail, 130 and 160; hind foot, 90 and 95.

For cranial measurements see Table, p. 939.

Specimens examined. — Forty-seven, from the following localities: —

France: Near Barcelonnette, Basses-Alpes, 8 (B.M. and Mottaz).

Switzerland: Salanfe (at foot of Dent du Midi), Valais, 1 (Mottaz); INIeiringen, Bern, 2 ; Engstlen Alp, Unterwalden, 1 ; Engelberg, Unterwalden, 1 (U.S.N.M.) ; Scliaufigg, Grisons, 3 ; Canton Grisons (no exact locality), 4 (U.S.N. INI.) ; Rheinwaldhorn, Grisons, 1.

Italy : Vagna Valley, near JIte. Rosa, Novara, 1 (Genoa) ; Aosta Valley, Turin, 20 (Turin) : Argentera, Cuneo, 3 (Turin) ; llaritime Alps, 1 (Genoa).

Austria-Hungary : Felkaerthal, Tatra Mountains, Hungary, 1.

2(^,2?. Barcelonnette, Basses-Alpes, 0. Thomas (p). 8. 8. 10. 145.

Prance. (C. Mottaz.) 63-65.

Skull. Meiringen, Bern, Switzer- Tomes Collection. 7. 1. 1. 195.
land. [Koeserman.)
1. Engelberg, Unterwalden. Tomes Collection. 7. 1. 1. 131.

{Koeserman.)
S, 2 ?. Schaufigg, Grisons. 0. Thomas (p). 2. 8. 4. 31-33.

[Zollikofer.)
S. Rheinwaldhorn, Grisons. O. Thomas (p). 2. 8. 4. 30.

{Zollikofer.)

1. Felkaerthal, Tatra Moun- Poprad Museum 7. 4. 19. 1.

tains; Hungary. (e).

MARMOTA BOBAK Miiller.

1776. Mas hohak P. L. S. Miiller, Natursyst. Suppl. u. Regist. -Band, p. 40

(Poland).

1778. Mus ardomys Pallas, Nov. Sp. Quadr. Glir. Ord., p. 75 (Poland).

1780. Ardomys hohac Schreber, Siiugethiere, pi. ccix (description, iv,

p. 738, 1782). Renaming of Mus ardomys.

1811. Ardomys baibac Pallas, Zoogr. Rosso-Asiat., p. 155 (Poland).

1857. Ardomys bobac Blasius, Siiugethiere Deutschlauds, p. 283.

1904. [Mar7tiota] bobac Tro^essart, Catal. Mamm. Viv. Foss., Suppl., p. 343.

1910. Marmota bobac Trouessart, Faune Mamm. d'Europe, p. 129.

Type locality. — Poland.

Geographical disfribution. — From Poland and eastern Hungary (Galicia and Bukowina) eastward into Asia. Exact limits of range not known.

Diagnosis. — Size essentially as in Marmota marmota ; colours uniform, the entire animal a yellowi.sh brown overlaid on upper parts with black, the head slightly darker than body, without contrasted pale muzzle or cheeks, the tail blackish at extreme tip only ; skull relatively broader than in M. marmota, and post-orbital processes standing so far back that their hinder border is

nearly over narrowest portion of postorbital constriction ; teeth

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somewhat heavier than those of M. niarmota, especially the lower molars ; anterior face of incisors whitish or pale orange.

External characters. — Essentially as in Marmota mariiiota, but thumb present as a small though distinct tubercle bearing an evident appressed nail. Mammae : p 2 — 2, a 2 — 2, / 1 — 1 = 10.

Colour. — Entire animal a light yellowish brown, the head suffused with a darker brown, the back, sides of body and outer surface of limbs clouded with blackish hair-tips, these most numerous over posterior half of back, but nowhere (jbscuring the

Fig. 194.

.VariHiita hohak. Slightly reduced.

ground colour ; feet a clear yellowish brown ; underparts and inner surface of limbs like back but slightly darker and more tawny, the hairs without blackish tips ; tail essentially similar, the extreme tip dark brown or blackish ; underfur everywhere

dull yellowish, the hairs with slaty bases.

ShuU and teeth. — The skull, though of about the same length as that of Marmota marmota, is broader and more robust in general form, and all ridges for muscular attachment are more prominent. Nasals less abruptly bent downward anteriorly and less narrowed posteriorly, their combined breadth at level of

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posterior border (jf premaxillary fully three-fourths greatest combined breadth anteriorly. Orbit lai'ger than in the related species, the postoibital process situated so far back that its tip lies over a point decidedly behind middle of temporal fossa instead of over middle, and its posterior border nearly overhangs deepest part of postorbital constriction and anterior border of squamosal. Brain-case noticeably broader in proportion to its length, and foramen magnum wider relatively to its height. Auditory bullte larger than in Marmota marmota, the area of each bulla appearing greater than that of basioccipital and condyles instead of about equal to it. Palate relatively narrower

^josteriorly, and incisive foramina wider in proportion to their length than in M. marmota. Mandible more I'obust than in the related animal, e.specially in front ; sigmoid flexure longer and less concave.

Teeth essentially as in Marmota marmota as regards form, but anterior surface of incisors pale yellowish instead of deep orange, and cheek-teeth more robust, a character especially noticeable in second and third lower molars.*

Measurements. — Male and female from Russia (skins) : head and body, 600 and 530 ; tail, 190 and 160 ; hind foot, 90 and 89. For cranial measurements see Table, p. 939.

Specimens exaviincd.—Tv/o, both from Russia.

Family PETAURISTID^.

1855. Ptermnyinn- Brandt, M6m. Acad. Imp. Sci., St. Petersburg, Gth ser., Sci. Nat., VII, p. 151.

1857. Sciurina Blasius, Saugethiere Deutschlands, p. 2G6 (part).

1879. Pteromichu Anderson, Anat. and Zool. Researches, Expeds. Yunnan, p. 278.

1891. Sciurimr Flower and Lydekker, Mammals, living and extinct, p. 450 (part).

Geographical distrihutlon. — Wooded portions of Northern Hemisphere south to the Malay region and the southern United States. In Europe confined to Scandinavia and northern Russia.

Characters. — Like the Sciuridse, but with fore and hind limbs connected by a broad fold of skin extending to wrists and ankles, supported anteriorly by a stifi" cartilaginous process growing from wrist, the membrane serving as a parachute by means of which gliding flight is effected.

Remarks. — The Petanristldse are so sharply difl'erentiated from the Sciuridce, that it seems preferable to recognize the two groups as families. Eight genera are known,f one of which is represented in Europe.

* This difierence between the teeth of M. marmota and M. bobak is of much importance in determining the identity of subfossil remains.

t See Thomas, Ann. and Mag. Nat. Hist., 8th ser., i, pp. 1-8, January, 1908.