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NOTES ON MAMMALS OF BALTISTAN AND THE VALE OF
KASHMIR, PRESENTED TO THE NATIONAL MUSEUM BY
DR. W. L. ABBOTT.

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DR. W. L. ABBOTT has very generously presented to the Museum the skins and skulls of a number of species of Kashmir mammals, the majority of which were unrepresented in the collection.

Among them are three species of Voles (*Arvicola*), which appear to be undescribed, and also a new geographical race of *Mus ariavus*. The specimens of the Rhesus monkey also seem to me to be worthy of a separate subspecific name. The discovery of the recently-described *Sminthus concolor* in Kashmir extends the range of that species a thousand miles.

The collection was made between 1891 and 1893.

SEMNOPITHECUS SCHISTACEUS, Hodgson.

Dr. Abbott obtained two specimens of this fine monkey at Kaj Nag. He states that in both specimens the face, ears, palms, and soles were black, and the callosities dusky. The iris is clear brown. He gives the following dimensions:

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Measurements and weight.	21842. ♂, jr., Kaj Nag.	21843. ♀, Kaj Nag.
	<i>Inches.</i>	<i>Inches.</i>
Length of head and body in straight line	25	23.5
Length of tail vertebrae	26.5	26
Girth	22	24
	<i>Pounds.</i>	<i>Pounds.</i>
Weight	30	32

21842. Male, young. Kaj Nag, April 16, 1892. 8,000 feet.

21843. Female. Kaj Nag, April 16, 1892. 8,000 feet.

MACACUS RHESUS VILLOSUS, new subspecies.

Dr. Abbott obtained in Lolab the skins of five monkeys, which appear to represent a variety of the common *M. rhesus*. I at first supposed them to represent *M. assamensis*, but after a careful comparison with Anderson's description of the type of that species I became convinced that they were not the same. They present the following characters: Fur long and dense, and moderately wavy; ears hairy; hair of the crown directed backward, not radiating; upper surfaces, from the crown to the rump, nearly uniform rusty-brown, but brightest and purest posteriorly. Outside of fore limbs dull gray, overlaid proximally by the brown color of the shoulders. Thighs rust-colored; hind feet pale, sooty; chin, neck, breast and inside of fore limbs gray, with a slight yellowish admixture; belly and inside of the hind limbs yellow-brown, paler than the back. Face dusky; cheeks grayish yellow-brown. At the postero-external base of the ears is a tuft of rather long gray hairs, with reduced rust-colored tips; ears clothed with grayish hairs, but with a blackish fringe about the upper margin. Callosities pale in color and closely surrounded by fur. Tail thick, dark gray above. Iris pale brown.

Dr. Abbott gives the following measurements of the fresh specimens:

Measurements and weight.	20123. ♂, Lolab, Sept. 8, 1891.	20120. ♂, Lolab, Sept. 8, 1891.	20124. ♂, Lolab, Sept. 9, 1891.	20121. ♂, jr., Lolab, Sept. 9, 1891.	20122. ♂, jr., Lolab, Sept. 9, 1891.
	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>
Length of head and body	23½	22	23	19	14
Length of tail, with hairs	9½	11	11	10½	7½
Length from between shoulders to end of longest finger	23½	22½	22	18½	13½
Length from middle of rump to end of middle toe	24½	23	23	19½	14
Girth of chest	19¾	20½	19½	15½	11½
Girth of belly	23½	22½	24	18½	12½
	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>
Weight	34	31	24	15	6

It will be observed from the foregoing table that the length of the hind limb, measured from the middle of the rump, is almost exactly equal to the length of the head and body. The fore limb is only slightly

shorter. The average length of the tail in the four adult specimens is slightly less than half that of the head and body, or about 48 per cent.

The skull of one of the males is of the following dimensions:

Measurements.	35488, ♂, Lolab, Kashmir.
Total length from anterior margin of premaxilla to occipital crest...	<i>mm.</i> 136
Basilar length from anterior margin of foramen magnum to anterior margin of premaxilla.....	97
Length of palate.....	54
Length of upper molar series.....	35
Zygomatic breadth.....	97.5
Height of orbit.....	23.5
Breadth of orbit.....	30
Length of anterior nares.....	22
Breadth of anterior nares.....	14
Depth of mandible at coronoid process, vertically.....	55

All the specimens were taken in the pine forests at Lolab, in the Vale of Kashmir, in September, 1891, at an elevation of 7,500 feet.

- ²⁰¹²⁰/₃₅₄₈₅. Male. Lolab, Kashmir, September 8, 1891. TYPE.
- ²⁰¹²¹/₃₅₄₈₆. Male, young. Lolab, Kashmir, September 9, 1891.
- ²⁰¹²²/₃₅₄₈₇. Male, young. Lolab, Kashmir, September 9, 1891.
- ²⁰¹²³/₃₅₄₈₈. Male. Lolab, Kashmir, September 8, 1891.
- ²⁰¹²⁴/₃₅₄₈₉. Male. Lolab, Kashmir, September 9, 1891.

FELIS TORQUATA, F. Cuvier.

Dr. Abbott assigns to this species, with hesitancy, a skull (No. 36396) which he obtained in the Lolab Valley, Kashmir. He remarks: "This cat was shot in a jungle close to a village and was thought to be a tame specimen. I am not now sure that it was not a wild one. The tame cats in Kashmir resemble the wild ones almost exactly. This one's skin (not preserved) agreed with the description of *F. torquata*."

CANIS AUREUS, Linnæus.

A single skull (No. 36395) from the Vale of Kashmir has been labeled by Dr. Abbott as belonging to this species.

VULPES MONTANUS, (Pearson).

There are two specimens of this handsome fox in the collection, one from the Shigar Valley, Baltistan, and a second from the Vale of Kashmir. They agree well with the description given by Mr. Blanford,* except that the ears are white within, and there is no black spot in front of the eye. The fur is very thick and long in the winter specimen.

* Blanford, Fauna of British India, Mammalia, 1888, p. 153.

Dr. Abbott gives the following dimensions (and the weight) of the specimen taken in May:

Measurements and weight.	21693 ♂, Vale of Kashmir.
Length of head and body (straight)	<i>Inches.</i> 27.75
Length of tail, with hairs	20.50
Height at the shoulder	16.50
Weight.....	<i>Pounds.</i> 13

20410. Male. Shigar Valley, Baltistan, January 10, 1892. 8,000 feet.

²¹⁶⁹³
36394. Male. Vale of Kashmir, May 20, 1893.

PUTORIUS CANIGULA, (Hodgson).

A normal specimen of this weasel, which is in the collection, confirms Mr. Blanford's conjecture regarding the occurrence of the species in Kashmir. It is from Sonamarg in that State.

20400. Male. Sonamarg, Kashmir, March 31, 1892. 8,600 feet.

URSUS THIBETANUS, F. Cuvier.*

Dr. Abbott gives dimensions of three Himalayan black bears which he obtained, as follows:

Measurements and weight.	20119, ♀, Lolab.	21844, ♂, Lolab.	21845, ♂, jr. Lolab.
	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>
Length of head and body.....	60	62	53
Length of tail, with hairs	4	5	4
Length of fore leg from top of scapula.....	35		
Chest girth.....	34	37	39
		<i>Pounds.</i>	<i>Pounds.</i>
Weight		175	160

²⁰¹¹⁹
30424. Female. Lolab, Vale of Kashmir, June 23, 1891.

21844. Male. Lolab, Vale of Kashmir, June 25, 1891.

21845. Male, young. Lolab, Vale of Kashmir, June 26, 1891.

URSUS ISABELLINUS, Horsfield.

I am unable to follow Blanford in uniting this species with *Ursus arctos*. It appears to me to present differences in the shape of the skull, and also in the length of the intervals between the teeth and in the shape of the last upper molar. This tooth is very long and has the posterior moiety directed obliquely outward.

* *Ursus torquatus*, Wagner.

Dr. Abbott obtained skins of two Isabelline bears. Both bears were taken in spring, were very thin, and had two cubs with them. He gives the following dimensions (and the weight):

Measurements and weight.	21691. ♀, Nag Marg. <i>a</i>	21692. ♀, Krishna- gunga range. <i>b</i>
	<i>Inches.</i>	<i>Inches.</i>
Length of head and body in straight line.....		50.05
Length of head and body along the curves.....	61	
Length of tail vertebrae.....	4	4.5
Length of tail, with hairs.....		6.5
Girth of chest.....	42	37
Girth of belly.....	45	
Height at shoulder.....		29
Weight.....	<i>Pounds.</i> 175	<i>Pounds.</i> 130-140

a The measurements of this specimen are from the skinned carcass. The following from the unskinned animal are too small, as it was in *rigor mortis* when measured and could not be properly stretched out:

Total length along curves.....	50.0 inches.
Length of tail with hair.....	4.5 inches.
Girth of chest.....	49.0 inches.
Height at shoulder.....	28.5 inches.
Height at rump.....	27.5 inches.

b Dr. Abbott remarks that the bear could not be well stretched out and that the length is too short and the height (29 inches) too great.

$\frac{21691}{36392}$. Female. Nag Marg, Kashmir, May 16, 1893.

$\frac{21692}{36593}$. Male. Krishnagunga range, Kashmir, April 26, 1893.

26397. Male, jr. Krishnagunga Valley, Kashmir, April 26, 1893 (skull).

OVIS VIGNEI, Blyth.

The skins of three male sheep were obtained. So far as regards the horns, they agree perfectly with the descriptions of *O. vignei*. In coloration, however, they seem to approach *O. cycloceros*. The general color is rufous brown, the short beard is made up of very dark brown and white hairs mingled, the legs below the knees and hocks are entirely white (though more or less stained from the soil), and the muzzle is also white. There is a distinct dark lateral line in the adults, terminating anteriorly in one case in a rather broad blotch. It will be seen that in many of these particulars the coloration of these skins differs from the original description by Blyth,* who, however, as Dr. Selater has remarked, apparently had *Oris cycloceros* also in mind. Blyth's description was taken from a painting (by Vigne). He states among other things that the muzzle is not white and that the limbs are brown. In repeating this description, however, in the Annals and Magazine of Natural History† he adds a footnote, in which he gives the characters of some specimens from the Hindu Kush Mountains, "identified by Mr. Vigne as, without doubt, the same as *O. vignei*." In this description he emphasizes the fact that the muzzle is white, and states in addition that the limbs are covered with short white hair and that the belly is also white.

* Proc. Zool. Soc., London, 1840, p. 70.

† Vol. 7, 1841, pp. 251-253.

The description contained in this footnote is much more fully applicable to Dr. Abbott's specimens than the original one, and it seems probable that Vigne's sketch, on which the latter was founded, was either incorrect in many particulars,* or represented a young male in summer pelage.

Dr. Abbott gives the following dimensions of fresh specimens:

Measurements.	20407, ♂.	20408, ♂.	21847 ♂.
	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>
Length of head and body ^a	56	53	57
Length of tail to end of hairs	6.5	6	6
Girth of chest.....	42.5	35	38
Girth of belly.....	43	.....	45
Depth of chest in straight line.....	16	.....	15.5

^aNote by Dr. Abbott: "These animals were shot in very difficult ground, so that measurements are only approximate, particularly the length and height."

The specimens obtained are as follows:

20407. Male. Shigar Valley, Baltistan, January 1892. 10,000 feet.
 20408. Male, young. Shigar Valley, Baltistan, January 1892. 10,000 feet.
 21847. Male. Shigar, Baltistan. 9,000 feet.

CAPRA SIBIRICA, Meyer.

Two skins of males from Baltistan represent this species. They are in winter pelage and very dark. The colors of the two skins are almost identical, and the markings are very sharply defined, in which latter feature they appear (as well as may be learned from the descriptions of various authors) to differ from ordinary specimens of *C. sibirica*. The following is a description of one of these skins, No. 20409: Face, neck, breast, fore legs, shoulders, the lower part of the flanks, the thighs, a line along the spine and the tail, strong umber-brown. The hind legs are also brown, but have a sharply-defined, large, oblong, white (or cream-colored) mark on the postero-external part of the metatarsus, extending from the hock to the outer false hoof, and prolonged between the latter and the true hoof.

A white mane (tinged with brown at the extremities of the hairs) extends along the spine from the middle of the nape to the shoulder. The brown of the shoulders follows, and behind this the whole back is occupied by a large elliptical white mark, or saddle (somewhat washed with brown), which is bisected longitudinally by a dark-brown spinal line, as already stated. Belly whitish. Ears white at the base anteriorly, brown elsewhere. The beard is blackish brown, with a few soiled-white hairs at its base. A narrow white area surrounds the anal region. All the hairs are white or whitish at the base—purest where the extremities are merely tinged with brown, and less so where they are dark.

*The same remark applies to the figure published by Dr. Scater in 1860. (Proc. Zool. Soc., London, 1860, pl. 79.) It does not agree with the diagnosis which it accompanies.

This description tallies in all essential points with that for male specimens in winter pelage from the Saján Mountains identified with *Capra sibirica* by Radde,* but scarcely with Blanford's diagnosis of the species in the Fauna of British India, where it is remarked (p. 504), "In winter the general color is yellowish white, tinged with brown, or greyish." Not less unsatisfactory is the phrase in Sterndale's diagnosis, "dirty yellowish white in winter"† Under the heading of varieties of *Capra sibirica*, however, Blanford remarks:‡

A very dark-colored ibex is said to occur in Baltistan, but is, according to Scully, merely the old male in winter vesture. Ibex from Siberia and from the Thian Shan Mountains north of Káshgar have the abdomen and the back of the carpus and tarsus white, contrasting sharply with the front of the legs, which is very dark brown. Col. Biddulph, to whom I am indebted for calling my attention to this character, is of opinion that the Thian Shan animal is true *C. sibirica* and the Himalayan one distinct, in which case the latter would take the name of *C. sakin*. I have only been able to examine one undoubted Himalayan skin, and cannot say if the difference is constant.

Dr. Abbott gives the following dimensions of the fresh specimens:

Measurements and weight.	20409♂.	21846♂.
	Braldu Valley.	Braldu Valley.
	Inches.	Inches.
Length of head and body.....	67	65
Tail to end of hairs.....	11	10.5
Height at shoulder (curved).....	39	39
Height at rump (curved).....	42	42
Girth of chest.....	48	48
Girth of belly.....	58	..
Depth of chest in a straight line.....	20	20 a
	Pounds.	Pounds.
Weight (about).....	250	250

a The horns of No. 21846 measure 34½ inches around the curve.

20409. Male. Braldu Valley, Baltistan, December 19, 1891. 14,000 feet.
 21846. Male. Braldu Valley, Baltistan, December 21, 1891. 21,000 feet.

PTEROMYS ALBIVENTER, Gray.

There are three normal specimens of this flying-squirrel in the collection, and also two specimens of the melanistic variety.

20125. Male. Central Kashmir, September 15, 1891.
 33491. Male. Lashkok Nullah, September 16, 1891.
 20135. Female. Western Kashmir, July 3, 1891.
 20134. Male, young. Western Kashmir, July 3, 1891 (melanistic).
 20139. Female. Central Kashmir, September 17, 1891 (melanistic).
 33493.

SCIUROPTERUS FIMBRIATUS, Gray.

Of this species there are four specimens, as follows:

20125. Male. Central Kashmir, September 15, 1891.
 20127. Male. Lashkok Nullah, September 16, 1891.
 33492. Female. Lashkok Nullah, September 16, 1891.
 20131. Male. Central Kashmir, September 20, 1891.
 33496.

* RADDE, Reisen im Süden von Ost-Siberien. 1, 1862, p. 244.

† STERNDALÉ, Mammalia of India. 1884, p. 444. ‡ *Op. cit.*, p. 504.

ARCTOMYS CAUDATUS, Jacquemont.

Two specimens of this fine marmot were collected, as follows:

$\frac{29136}{33499}$ Female. Vigh Nullah, August 1, 1891.

$\frac{29137}{38500}$ Male. Vigh Nullah, August 1, 1891.

MUS ARIANUS GRISEUS, new subspecies.

Similar to typical *Mus arianus*, Blanford, in size and proportions, but having the upper surfaces ochraceous gray, instead of rufous.

The Long-tailed Field-mouse has already been recorded by Dr. Scully as occurring in Gilgit. There are three skins in Dr. Abbott's collection which are referable to this species, but appear to represent a distinct color-variation. Mr. Blanford describes *M. arianus* as being "rufous brown above," and Mr. Thomas as "dark red."* Dr. Abbott's specimens are grayish, ochraceous brown above, which color is produced by the mingling of hairs having ocher-colored tips, with others which are black. No. 20151, which is immature, is especially gray above, and coincides in color almost exactly with ordinary specimens of *Mus musculus*.

The three specimens on which this subspecies is founded were obtained by Dr. Abbott in pine forests at high elevations—two of them in Central Kashmir and the third in the Pir Panjal Pass. He gives the following dimensions of the fresh specimens:

Measurements.	20151, ♂, Central Kashmir.	20139, ♀, Central Kashmir.	20144, ♂, Pir Panjal Pass.
	Inches.	Inches.	Inches.
Length of head and body	3 $\frac{3}{4}$	4	3 $\frac{3}{4}$
Length of tail.....	3 $\frac{3}{4}$	4 $\frac{1}{4}$	4 $\frac{1}{4}$

As Mr. Blanford and Mr. Thomas have remarked, *Mus arianus* is very closely related to the *Mus sylvaticus* of Europe, if not identical with it specifically. Mr. Thomas has brought forward the greater length of the hind foot as a distinguishing character of *M. sylvaticus*. Dr. Abbott's specimens, being dry skins, are not entirely available for critical comparisons of this kind. The length of the hind feet in two of them, measured after soaking the feet in water, are as follows: No. 20144, male, 0.833 in.; No. 20139, female, 0.875 in.

The larger of these two dimensions is still a little less than an average of measurements of *M. sylvaticus* given by Mr. Thomas, which is 0.88 in.

I may here remark incidentally that a specimen of *M. sylvaticus*, from Switzerland (No. 2995), in the National Museum, is of exactly the same color as is shown in the figure of the type of *M. arianus* in Mr. Blanford's Zoology of Persia.* If this figure is correctly colored, it seems

* Proc. Zool. Soc. London, 1881, 548.

to me that *M. arianus* may scarcely be called "dark red." None of the specimens of *M. sylvaticus*, in the National Museum, from different parts of Europe, show a strong rufous tint, except one from England.

The types of *M. arianus griseus* are as follows:

- $\frac{20151}{35514}$. Male. Mountains of Central Kashmir, September 13, 1891. 10,000 feet.
 $\frac{20139}{35302}$. Female. Central Kashmir, October 8, 1891. 8,500 feet.
 $\frac{20144}{35307}$. Male. Pir Panjal Pass, August 31, 1891. 8,500 feet.

MUS BACTRIANUS, Blyth.

There are five small mice in Dr. Abbott's collection which so closely resemble the common house-mouse, *Mus musculus*, that I have had some doubts as to whether they should not be referred to that species. As the tail, however, is shorter in every instance than the head and body, and the belly is white, or only slightly tinged with buff, I presume they really represent *Mus bactrianus*. Two specimens are from Srinagar and the remaining three from other localities in Kashmir. Dr. Abbott remarks that the species lives in the houses of the Gujar herdsmen.

The following dimensions are from the fresh specimens:

Measurements.	20150, ♂, Central Kashmir.	20397, ♀, Srinagar, Kashmir.	20142, ♀, Vale of Kashmir.	20143, ♀, Vale of Kashmir.	20149, ♂, Srinagar.
	Inches.	Inches.	Inches.	Inches.	Inches.
Length of head and body ..	$3\frac{1}{8}$	$3\frac{5}{8}$	3	3	$2\frac{9}{8}$
Length of tail.....	$3\frac{3}{8}$	$3\frac{1}{8}$	$2\frac{7}{8}$	$2\frac{5}{8}$	$2\frac{3}{8}$

The localities, etc., are as follows:

20397. Female. Srinagar, Kashmir, April 5, 1892.
 $\frac{20156}{35313}$. Male. Central Kashmir, October 17, 1891. 9,000 feet.
 $\frac{20142}{35305}$. Female. Vale of Kashmir, August 10, 1891.
 $\frac{20143}{35306}$. Female. Vale of Kashmir, August 11, 1891.
 $\frac{20149}{35312}$. Male. Srinagar, August 8, 1891.

MUS RATTUS, Linnaeus

Four specimens, as follows:

21688. Vale of Kashmir, June 5, 1893. 5,200 feet.
 21689. Male. Vale of Kashmir, June 6, 1893.
 20395. Young. Vale of Kashmir, winter, 1891-'92.
 20399. Male. Srinagar, Kashmir, April 4, 1892.

SMINTHUS CONCOLOR, Buchner.

It is a matter of surprise to find specimens of this recently described species in the collection. The types, the only known specimens, so far as I am aware, came from Kansu, China, a thousand miles eastward. Dr. Abbott's discovery of the species in Kashmir adds greatly to its known range. His two specimens agree perfectly with the original

* Persian Boundary Commission, II, Zoology and Geology, 1876, pl. v, fig. 3.

description of the species. They are both from Central Kashmir, and were obtained at an elevation of 11,000 feet. Dr. Abbott gives the following measurements of one specimen, No. 20140: Length of head and body, $2\frac{3}{4}$ inches; length of tail, $4\frac{1}{4}$ inches.

$\frac{20140}{35503}$. Male. Central Kashmir, July 21, 1891.
 $\frac{20141}{35504}$. Male. Central Kashmir, July 24, 1891.

ARVICOLA FERTILIS, new species.

Size medium. Length of head about one-fourth that of the head and body together. Tail-vertebræ one fourth to one-sixth the length of the head and body together. Ears moderate (as long as the fore feet, without the claws), overtopping the fur by about 4 millimeters.

Color above, dull grayish brown; below, pale isabelline brown. All the hairs plumbeous at the base. Those of the under surfaces are uniformly tipped with pale brown (white, tinged with burnt sienna). The hairs of the back have a subterminal ring of the same pale brown color, and blackish tips; numerous umber-brown hairs are intermingled. Ears, nose, and backs of feet umber-brown. Tail bicolored, umber-brown above and very pale sienna-brown below, corresponding with the coloration of the body. The long hairs at its extremity are chiefly from the under side and therefore light-colored. A nearly pure-white spot on the under side of the wrist in most specimens.

Dentition that of the subgenus *Atticola*, Blandford. Anterior upper molar with three outer and three inner angles. Posterior molar with two outer and two inner angles and a terminal oval lobe. (In one specimen there is an additional rudimentary angle on each side behind the other two.) Anterior lower molar with three outer and four inner angles, and an anterior oblique oval lobe, which may develop a rudimentary angle on each side.

Dimensions of the body.

Measurements	20146 35509 ♀, Central Kashmir.	20147 35510 ♀, Pir Panjal Mountains.	20148 35511 ♂, Pir Panjal Mountains.	59293, ♂, Kaj Nag Mountains.	21690, ♂, Kishnag- unga Val- ley.
	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>
Head and body *.....	4.59	4.50	3.375	4.25	4.125
Tail vertebræ .....	.80	1.05	1.87	.70	1.125
Tail, with terminal pencil*	1.00	1.25	.....	1.00	.....
Ear from the orifice.....	.35	.40	.35	.33	.58
Hind foot, without claw .....	.61	.61	.57	.62	.....

* These measurements were made on the fresh specimens by Dr. Abbott; the rest are from the dry skins.

† Dr. Abbott gives 1.625 inches for the tail and hairs, but I think this must be an error, and have substituted a measurement of the vertebræ from the dry skin.

Dimensions of the skull.

Measurements.	35509, ♀.	35510, ♀.	35511, ♂.
	mm.	mm.	mm.
Total length		25.5	23.5
Zygomatic breadth.....	15	16	14.5
Length of nasals.....	7	7.5	7
Length of superior molar crowns.....	5.5	6	6

Localities.—Central Kashmir, the Pir Panjal range, and the Kaj Nag Mountains.

This species appears to closely resemble *Arvicola wyunei*, Blanford, and may, perhaps, be only a geographical race of the same. It has, however, considerable longer ears and shorter tail. It also differs in color, being yellowish-brown, rather than "dark rich brown," or "dark chestnut," which are the colors given by Mr. Blanford for *A. wyunei*. The type of the latter species is from Murree (Marri), which is in Rawul Pindee, about one hundred miles west of the Pir Panjal pass and across the Jhelum River.

Dr. Abbott remarks that the surface of the ground in many of the alpine valleys of the Pir Panjal range is completely honeycombed by the burrows of this species. The elevations at which the species were obtained are indicated in the following list of specimens:

- $\frac{29146}{38509}$. Female. Central Kashmir, August 2, 1891. 12,000 feet.
 $\frac{29147}{35510}$. Female. Pir Panjal range, August 30, 1891. 8,500 feet. TYPE.
 $\frac{29148}{35511}$. Male. Pir Panjal range, August 30, 1891. 8,500 feet.
 59293. Male. Kaj Nag Mountains, April 23, 1891. 8,000 feet.
 21690. Male. Krishnagunga Valley, May 10, 1893. 7,000 feet.

ARVICOLA MONTOSA, new species.

Size of the single specimen, small. Tail vertebrae about one-third the length of the head and body together. Ears as long as the fore foot from the wrist (without the claws), but not overtopping the quite long fur. Soles with six tubercles; the hindermost in the middle of the sole. Behind this point the sole is hairy.

Color above, dull grayish brown, as in *A. fertilis*, but considerably paler than in that species. Under surfaces white, very lightly tinged with brown, and the gray of the base of the hairs plainly seen. Feet white. Tail bicolored, corresponding with the coloration of the body. The long hairs at the extremity are mostly from the upper side of the tail and therefore dark. Ears clothed within with short yellowish-brown hairs. The anterior outer margin, except at the tip, with long hairs like those of the body. A tuft of long, nearly pure-white hairs behind the ears. Nose dusky brown. Claws pale, overhung with long white hairs.

Dentition that of the subgenus *Alticola*, and similar to that of *A. blanfordi*, but with four external angles on the posterior upper molar. Internal angles of the same tooth, three in number. Anterior lower

molar with four external and four internal angles. The first external angle as long as the others—not shorter, as in *A. blanfordi*. In the posterior lower molar the middle external and internal angles alternate, and the space between them is, therefore, not lozenge-shaped.

Dimensions of the body.

Measurements.	20145 35508 ♂, Central Kashmir.
	<i>Inches.</i>
Head and body *	3.625
Tail-vertebræ	1.15
Tail, with terminal pencil *	1.25
Ear from the orifice .....	.45
Hind foot, without claw .....	.71

* These measurements were made on the fresh specimen by Dr. Abbott.

Dimensions of the skull.

Measurements.	35598 20145 ♂, Central Kashmir.
	<i>mm.</i>
Total length	24
Zygomatic breadth	14
Length of nasals	7
Length of superior molar crowns	6

Locality.—Central Kashmir, 11,000 feet.

This species resembles *Arvicola roylei*, but differs in the form of the teeth. The color is paler than in *A. roylei*, and the ears are longer, though not overtopping the fur.

Dr. Abbott notes that the single specimen obtained was caught in a tent on October 4, snow being on the ground at the time.

20145 Male. Central Kashmir, October 4, 1891. TYPE.
35508

ARVICOLA ALBICAUDA, new species.

Similar to *A. blanfordi* in size and color, but with a shorter, entirely white tail. Dentition like that of *A. roylei*.

Ears visible in the fur. Thumb with a rudimentary claw. Tail two-fifths the length of the head and body, densely clothed with rather long hairs. Posterior portion of soles densely hairy. Fur on the back, 15 mm. long.

Color above, pale reddish gray, the hairs dark plumbeous at the base, with a subterminal ring of pale yellow, and brown tips. The peculiar pale tint of the back is produced by the mingling of these three colors. Ears clothed with long hairs; those of the margin pale orange-brown. Upper lip and all under surfaces pure white; the hairs gray in the lower half. Fore and hind feet and tail pure white, the hairs white to the base.

Dimensions of the body.

Measurements.	No. 20393, ♀ Braldu Valley, Baltistan.	
	<i>Inches.</i>	<i>mm.</i>
Head and body.....	4.25	107
Tail.....	1.75	44.5
Ear, from base of orifice, from the dry skin .....	.56	14
Hind foot, without claw, from the dry skin .....	.64	16

The teeth closely resemble those of *A. roylei*, and have the same number of angles throughout, but the anterior loop of the first upper molar is transverse, and the first inner angle of the anterior lower molar is not longer or more curved than the succeeding ones.

Dimensions of the skull.

Measurements.	20316 ♀ 20393 ♀ Braldu Valley.	
	<i>mm.</i>	
Basilar length, from outer margin of foramen magnum to end of premaxilla.....	25	
Zygomatic breadth.....	15	

20393. Female. Braldu Valley, Baltistan, December 19, 1891. TYPE.

LEPUS TIBETANUS, Waterhouse.

Dr. Abbott gives measurements of six fresh specimens of this hare, four of which are in the collection. All of them were obtained in the Shigar Valley, Baltistan, January 9 and 10, 1892.

Measurements and lists of specimens.

Cat. number.	Locality.	Sex.	Length of head and body.	Length of tail.	Weight.
			<i>Inches.</i>	<i>Inches.</i>	<i>Pounds.</i>
20403	Shigar valley	♂	17.5	4.25	3.25
20404	.....do	♀	18.5	4.50	4.00
20405	.....do	♂	17.5	4.50	3.50
20406	.....do	♀	16.0	5.00	4.00
21840	.....do	♂	17.5	4.00	3.25
21841	.....do	♂	17.25	4.50	3.50

LAGOMYS ROYLEI, Ogilby.

There is one specimen in the collection from Nagmarg, Central Kashmir, taken at an elevation of 9,000 feet. It is a fall specimen and has the middle of the back black in color, produced by the massing together of the long black tips of the hairs. The entire sides of the head and body are rust-colored. The breast is also rust-colored and a broad line of a paler tint extends thence backward above the middle of the belly. Elsewhere the under surfaces are whitish.

Dr. Abbott gives the length of the one specimen obtained as 8 inches, but I think he has included in this the hind feet. The length of the head and body in the dry skin is $6\frac{3}{4}$ inches (173 mm.).

The dimensions of the skull are as follows:

Measurements.	35501, ♀, Nagmarg.
Basilar length, from inferior margin of foramen magnum to posterior margin of incisors	mm. 34.5
Length of nasals	15.0
Length of cheek teeth.....	8.0

$\frac{29138}{33501}$. Female. Nagmarg, Central Kashmir, October 22, 1891. 9,000 feet.

LAGOMYS GRISEUS, Blanford.

Blanford does not recognize this species as belonging to the fauna of India, but Dr. Abbott's two specimens agree perfectly with the description and figures of it in the Zoology of the Second Yarkand Mission, and I conclude that they should be assigned here rather than to the closely allied *L. macrotis*. The adult, No. 20396, measured $8\frac{1}{4}$ inches when fresh, and the younger individual, 7 inches. Dr. Abbott notes the following regarding the species: By no means common at this season at any rate (December); probably hibernates. The Baltis say they are very common, living among the rocks and glacial moraines.

The dimensions of the skull of the adult are as follows:

Measurements.	36814 ♂, 20396.
	mm.
Basilar length*.....	37.4
Greatest zygomatic breadth.....	21.5
Least width of frontals.....	5.0
Length of nasals	16.5
Greatest breadth of nasals anteriorly.....	5.9
Length of crowns of upper molars and premolars	8.7
Upper incisors to premolars	10.8
Lower incisors to premolars	7.6
Length of crowns of lower molars and premolars	8.2

* From lower margin of foramen magnum to posterior edge of alveolus of large incisor.

$\frac{29396}{36814}$. Male, Doru Nullah, Baidn Valley, Baltistan, December 1, 1891. 10,000 feet.

$\frac{29394}{36815}$. Female, young. Dras Valley, Kashmir, November 12, 1891. 9,000 feet.

CROCIDURA MURINA, (Linnaeus).

Of the five specimens of this species collected in Srinagar and the Vale of Kashmir, three were obtained in summer and two in winter. The former are brownish on the back (the tips of the hairs being of that color) while the later are slate-gray. This difference in color, therefore, appears to be seasonal.

In one of the largest specimens, No. 21686, the fifth minute upper tooth is concealed by the fourth and sixth from without, while in others it is visible to a greater or less extent.

Dimensions of three specimens.

Measurements.	20154, ♀. Srinagar.	21686, ♂. Srinagar.	21687, ♀. Vale of Kashmir.
Length of head and body.....	<i>Inches.</i> 5½	<i>Inches.</i> 5¾	<i>Inches.</i> 4¾
Length of tail.....	2¾	3½	2¾

- $\frac{20153}{36416}$. Male. Vale of Kashmir. June 29, 1891.
 21678. Female. Vale of Kashmir. June 2, 1893.
 20398. Male (?). Vale of Kashmir. Winter, 1891-'92.
 $\frac{20154}{33514}$. Female. Srinagar. October 29, 1891.
 $\frac{21686}{36391}$. Male. Srinagar. May 25, 1893.

CROCIDURA ARANEA, (Linnaeus).

One specimen:

- $\frac{20155}{33515}$. Female. Mountains of Central Kashmir. September 13, 1891; in pine forest, 10,000 feet.

VESPERUGO (ADELONYCTERIS) SEROTINUS (Schreber).

The specimens of this species differ very much in color from the American form which has been assigned to the same. The tips of the hairs above are pale ashy yellow, giving a hoary appearance. The forearm is much longer, reaching 2.2 inches.

21685. Female (?). Vale of Kashmir, May 29, 1893.
 21684. Male. Vale of Kashmir, April 10, 1893.

VESPERUGO PIPISTRELLUS, (Schreber).

Two specimens from the Vale of Kashmir are in the collection.

VESPERTILIO MURINUS, Linnaeus.

One alcoholic specimen, No. 21809, female, from the Vale of Kashmir.

In connection with the foregoing catalogue I have thought it desirable to compile a list of all the species of mammals which have been definitely recorded by Blanford, Sterndale, Jerdon, Anderson, Selater, Scully, Hügel, Lydekker, and other writers, as occurring in the north-western portion of Kashmir, that is, in the Vale of Kashmir, Baltistan and Gilgit. The list is as follows:*

Mammals of Northwestern Kashmir.

<i>Macacus rhesus.</i>	<i>Herpestes auropannctatus.</i>
<i>Macacus rhesus villosus.</i>	<i>Herpestes thysanurus.</i>
<i>Semnopithecus schistaceus.</i>	<i>Herpestes mungo</i> (?).
<i>Felis uncia.</i>	<i>Canis lupus.</i>
<i>Felis torquata.</i>	<i>Canis aureus.</i>
<i>Lynx isabellinus.</i>	<i>Cyon dukhunensis.</i>

*The names of species included in Dr. Abbott's collection are in italics.

- Vulpes montanus.*
Mustela flavigula.
Mustela foina.
Putorius erminea.
Putorius subhemachalaanus.
Putorius canigula.
Putorius alpinus.
Lutra vulgaris.
Ursus isabellinus.
Ursus tibetanus.
Talpa micrura (?)
Crocidura aranea.
Crocidura murina.
Rhinolophus hipposideros.
Rhinolophus ferrum-equinum.
Megaderma lyra.
Plecotus auritus.
Synotis darjelingensis.
Otonycteris hemprichi.
Vesperugo serotinus.
Vesperugo discolor.
Vesperugo borealis.
Vesperugo pipistrellus.
Harpiocephalus tubinarius.
Vespertilio longipes.
Vespertilio megalopus.
Vespertilio murinus.
Eupetaurus cinereus.
Pteromys albiventer.
Sciuropterus fimbriatus.
- Arctomys caudatus.*
Smithus concolor.
Mus rattus.
Mus bactrianus.
Mus sublimis.
Mus arianus.
Mus arianus griseus.
Nesokia bengalensis.
Arvicola roylei.
Arvicola blanfordi.
Arvicola fertilis.
Arvicola montosa.
Arvicola albicauda.
Cricetus phaeus.
Cricetus fulvus.
Cricetus isabellinus.
Hystrix leucura.
Lepus tibetanus.
Lagomys roylei.
Lagomys griseus.
Lagomys macrotis.
Oris rignei.
Capra sibirica.
Capra falconeri.
Hemitragus jemlaicus.
Nemorhædus bubalinus.
Nemorhædus goral.
Cervus cashmerianus.
Moschus moschiferus.