

Chinese Tartars strongly object to our entering their country ; so that our researches on this subject are somewhat narrowly defined. Unfortunately, the Afghans have had little confidence in the British since 1842, so that their mountains and even the Peshawur Ranges remain yet unexplored ; but when every facility can be obtained on the Western Himalayas, I am confident there is much yet to be done. There is much interest connected with the natural history of the two vast regions, Punjab and Himalayas, so intimately adjoining each other, yet so very different in climate and appearance ; and sure am I that well will he be repaid for his trouble who zealously investigates their hidden treasures.

During nearly seven years I resided in various parts of India, commencing at Poonah in the Deccan ; afterwards I journeyed through Scinde, and passed across the upper provinces, and was some time stationed on the lower Himalayan Ranges near Simla ; I then traversed the Punjab northwards to Peshawur, and twice visited Cashmere and Ladakh. In my excursions I made it a rule to commit to paper minute descriptions of every animal I killed ; and, although by means of comparison and the assistance of friends I have been enabled to identify more than half my collection, I find a large number of species remain yet unnamed, many of which are doubtless rare and interesting. I am sensible, however, of the amount of gratitude I owe to many friends for their counsel and assistance, among others, to Mr. Moore, Curator of the Derby Museum, Liverpool, who not only afforded me every facility for examining specimens in that rare collection, but also rendered me valuable assistance by placing the excellent library of reference of that institution at my disposal.

Since these notes were begun, I have been informed by my very kind friend, J. Gould, Esq., that the rare *Pyrrhula* described in this paper, is a new species, and has been described and figured in the last number of his 'Birds of Asia.'

7. REMARKS ON THE HABITS AND HAUNTS OF SOME OF THE MAMMALIA FOUND IN VARIOUS PARTS OF INDIA AND THE WESTERN HIMALAYAN MOUNTAINS. BY A. LEITH ADAMS, SURGEON, 22ND REGIMENT. COMMUNICATED BY MESSRS. T. J. AND F. MOORE.

1. SEMNOPITHECUS ENTELLUS (Dufresne, sp.).
2. SEMNOPITHECUS SCHISTACEUS, Hodgson.
3. MACACUS RHEBUS (Audub.).

All the above species are found in the Western Himalayas ; the *M. rhesus* is probably the most common and generally distributed over the wooded districts.

4. PTEROPUS EDWARDSI, Geoff.

I found this species abundant at Poonah in the Deccan. On a

peepul tree in the centre of the great city of Poonah I have seen hundreds suspended. Although often seen on wing during the day, it is at dusk they are more generally observed, flying at great elevations with an easy sailing motion, broken now and then by the slow and regular flaps of their long wings. At sunset they converge towards the orchards and groves of mango trees, where they commit great havoc on their fruit. Not seen in the Punjab or Himalayas.

5. TIGRIS REGALIS, Gray.—*Felis tigris*, Linn.

Plentiful on the western frontier of the Punjab and banks of the Indus and Jhelum. Now scarce in many parts of the Deccan; occasionally seen near Poonah. A few stray along the base of the Himalayas as far as Attock on the Indus, and in the jungles of the Salt Range; but it seldom frequents the Himalayan Valleys, although individuals at times wander a considerable distance inwards. One was killed at Poonch among the southern Cashmere Ranges.

6. LEOPARDUS VARIUS, Gray.—*Felis pardus* (Linn.).

Called Chetah, Sher (names applied likewise to the Tiger and all the larger species of the genus), Bagh, &c. by the natives of the Himalayas, where it is pretty common, frequenting dense jungles or forests; preys chiefly on musk-deer or domestic animals, such as sheep, dogs, goats, &c. The presence of a Chetah is often discovered by the barking of foxes, the loud bellowing of the Cashmere stag, harsh cries of the bulbuls and beautiful long-tailed pie (*Pica erythrorhyncha*). This is the most common species found on the lower ranges of the Western Himalayas. It appears however, if not subject to great variety, there are yet species undiscovered. The natives of various districts speak with confidence in regard to species very different in appearance; and I see no reason to doubt the authenticity of their various accounts. I shall give them as recorded in my "notes," written on different occasions. It would seem, the species are confined to localities where their particular description of prey abounds. Thus I have heard of the Burrel hay found at high elevations; this species preys chiefly on Burrel (*Pseudois Nahoor*, Hodgson) and Musk-deer. Colour, a dirty white with black spots.

This is probably the *Leopardus uncia* found on the northern ranges of Cashmere and in Ladakh; skins are brought from Afghanistan and sold in the bazars at Peshawur. On the lower Himalayan Ranges the natives mention a Panther closely allied to the *F. pardus*, but of smaller size, called Adeer hay, which they say is common. Not having seen this animal, I am unable to say whether it is a variety or another species. A Leopard which preys chiefly on Goral (*Nemorhedus goral*), called Goral hay, is said likewise to frequent certain districts of the middle ranges; much smaller than the last, and of a light fawn colour. Altogether my information on this subject refers to five different sorts of Chetah:—

1st. The BAGH, or, as it is sometimes called, Bay herra (*Leopardus varius*; *Felis pardus*, Linn.).

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- 2nd. BURREL HAY, probably *Leopardus uncia*.
 3rd. A Leopard without spots, found in Tibet and Chinese Tartary. The description given me of this animal was very meagre.
 4th. The ADEER HAY, probably only a variety of the *Leopardus varius*. Its head is said to be much like that of a bull-dog.
 5th. GORAL HAY. A small sort; might be one of the Tiger Cats.

7. LEOPARDUS HORSFIELDI (Gray).

This species I once examined; it was killed near Simla; the natives said they are not uncommon on the ranges around that station. Kills partridges and pheasants.

8. LEOPARDUS TORQUATUS, Fred. Cuv.

Very common at Poonah in the Deccan.

9. LEOPARDUS BENGALENSIS (Desm. sp.).

The common Jungle Cat of the plains of India and lower Himalayan Ranges, I have often thought identical with the last.

10. CHAUS LIBYCUS, Gray.—*Felis chaus* (Guld. sp.).

I killed a fine specimen of this species near Rawul Pindee; it is pretty common in the Punjab, and preys chiefly on domestic poultry, rats, and mice.

11. HYÆNA STRIATA, Zimmermann.

Very generally distributed over the Deccan, Scinde, and Punjab, and on the lower Himalayan Ranges. It prowls about the stations at night, and is very destructive to poultry; kills likewise sheep and dogs. Not seen in the Valley of Cashmere.

12. CUON PRIMEVUS, Hodgson.

Ram hun of the Cashmerees.

Although not rare on the high ranges of the Western Himalayas, extending northwards beyond even the limits of forest, the Ram hun is seldom seen. So cunning and stealthy are its habits, that native sportsmen, long familiar with its depredations, have never seen the animal. When seen, it is generally in packs. A friend informed me he saw a herd of Deer (*Cervus cashmirensis*) pursued by a pack. It appears they pass the day in caves or burrows, and hunt at early morn and in the afternoon. I have frequently followed their trail for miles across the Pinjal Mountains, and even discovered places where they had lain only a few hours before, but on every occasion was unable to discover them. Lieutenant Abbott, 75th Regiment, killed a fine specimen near Allahabad Serai, on the southern ranges of Cashmere, which afterwards proved identical with the specimens of the animal in the Honourable East India Company's Collection in London. It is, however, by no means common on the last-mentioned mountains. Native reports relative to the Wild Dogs of the Western Himalayas are very various, and often contradictory. From the accounts I was enabled to glean

from shikarees and natives resident on the mountains, it appears there is considerable variety in the colour of this species, or that these discrepancies relate to different species. The *Cuon primævus* is bold and ferocious; natives say there are few of the larger quadrupeds they will not attack, and that Ibex, Deer, Burrel, &c., are frequently killed by them.

Note.—In a collection of skins brought from the Kara Korum Mountains in the north of Ladakh by my friend Lieutenant Peyton, 87th Regiment, I saw that of a Wild Dog, probably a new species. The skin was imperfect; and, judging from its length, it appeared the animal was about the size of the Ram hun; nose pointed, hair long and thick, containing much of the under-wool called peshm; prevailing colour *white*, with splashes of black on the back and hips; tail short, somewhat bushy, with the tips of the hairs black. I was informed they are frequently found near the dwellings of the natives, and that they prey on *Caprovis argali*, Nahoor, and Tibet Antelope (*Pantholops hodgsonii*). This may be a species of Wolf; anyhow its existence in Ladakh is very likely unknown, nor have I been enabled to discover any species approaching its description on any part of the Western Himalayas. The Pariah Dog is often forced to depend entirely on its own exertions, and wanders over large tracts of country in the plains of India; but I have not known it do so on the Western Himalayas.

13. CANIS FAMILIARIS, Linn.

a. A domestic variety, resembling in every particular the Shepherds' Dog or Colly, is generally distributed over the western ranges, particularly in Cashmere.

b. A large and formidable breed, of a similar appearance to the last, is raised in the district of Chamba on the Himalayas; but, like many other varieties of hill animals, they pine away and die when brought to the plains of India.

14. CANIS AUREUS, Linn.

Geeder of the natives.

Abundant all over India, Punjab, and lower Himalayan Ranges, including the Vale of Cashmere. In the latter situation, they appear to thrive better and grow to a larger size than anywhere in the plains. There is great reason for thinking it frequently breeds with the Pariah Dog, as I have met with individuals of the latter so like the Jackal, that there was not the slightest point of difference in appearance and habits.

15. CANIS LUPUS, Linn.

Seen occasionally among the ravines of the Punjab, but does not frequent the Himalayas.

16. VULPES BENGALENSIS (Shaw?).

Deccan; Scinde (perhaps the Punjab?).

17. *VULPES PUSILLUS*, Blyth, J. A. S. B. 1854, p. 730.

My specimens agree with the descriptions of the above author, and likewise with *V. leucopus*, Blyth, which I think will turn out only a variety of *V. pusillus*. This Fox is larger than the *V. bengalensis*; and, although common in the Punjab, I did not see it in Scinde or in the Deccan.

18. *VULPES FLAVESCENS*, Gray.

I purchased specimens of this Fox at Leh in Ladakh, and was told by the natives that it is common in the surrounding country. I likewise killed a female and its cub on the Pir Pinjal Ranges of Cashmere, which, on comparison, proved identical with this species. Although larger than the next species, they are similar. At certain seasons of the year the hair is thick, and contains much peshm.

19. *VULPES MONTANUS*, Pearson.

Loh of Cashmere.

Is generally distributed over the lower and middle regions of the western ranges, and never visits the plains. Its favourite haunts are cultivated districts; preys on poultry, Partridges, Pheasants, &c.

Note.—In the Vale of Cashmere, among the ravines, a Fox is common, larger than the *V. montanus*, and of a lighter colour; it burrows in the sides of the little sand banks (called kirawas). It is known to the natives by the name of "Shawul," to distinguish it from the "Loh," which they say is another species. I have seen the Loh on the surrounding mountains, but never in the valley. I was unfortunate in not obtaining a specimen of the Shawul, although I saw many. It preys on poultry, &c.

20. *HERPESTES GRISEUS* (Geoff.).

Deccan; Scinde; Punjab. Pretty common.

21. *HERPESTES NYULA*, Hodgson.

Afghanistan; neighbourhood of Peshawur: easily domesticated, and has been known to breed with the last species.

22. *MARTES FLAVIGULA* (Bodd.).

Lower and middle regions of the Western Himalayas. Common; is easily domesticated, and may be taught to follow its master like a dog. When moving about, it is constantly uttering a low chuckle, which is prolonged into a harsh cry when the animal is excited; very active and playful in the tame state. Its food consists of poultry, eggs, Partridges, and Pheasants. A tame specimen in my possession used to hunt after Snakes and Lizards, which it devoured greedily. The summer and winter dress varies considerably, being much lighter in colour during the latter season, while the dark robe of midsummer so much resembles that of the *M. gwatkinsii*, that I doubt if one could easily tell the difference at that season.

23. *MARTES ABIETUM*, Ray.

Skins of this species are brought from Afghanistan, and sold in the bazars of Peshawur: the dealers have informed me the animal is a native of the mountainous parts of that country. I have not seen it on the Himalayas.

24. *MUSTELA SUBHEMACHALANA* (Hodgson).

I killed a fine specimen of this elegant species in the Valley of Cashmere, close to a farm-yard; the natives said it commits great depredations among their poultry and eggs.

25. *MUSTELA ERMINEA*, Linn.

Found in several districts on the lower and middle regions of the Western Himalayas.

26. *URSUS ISABELLINUS*, Horsf.

Brown and White Bear of Europeans.

Reech, *Baloo* of the natives of the western Himalayan Ranges.

Harput of the Cashmerees, where it is likewise known as the *Reech* and *Baloo*.

The distribution of this species on the Western Himalayas is not so general as in the case of the Black Bear (*Helarctos tibetanus*). A few are found at the sources of the Ganges and Jumna, but none in Little Tibet. Their head quarters are among the mountains and little valleys north-west of the Vale of Cashmere, where, until within the last few years, they were extremely common. In the Valley of Wurdwun, about six miles long, and not more than one in breadth, situated among the ranges north of Islamabad, Brown Bears were so abundant, that as many as thirty were killed during the spring of 1851 by one individual. They are now almost extinct in these regions, owing to the numbers of European sportsmen annually visiting Cashmere. In size, this species is larger than the next. The largest male, out of many hundreds I have examined, measured 7 feet 6 inches from snout to tail; height 3 feet 5 inches; round the body (behind the shoulders) 58½ inches; round the arm 24 inches; ditto thigh 37 inches. The Brown Bear prefers high and rugged mountains near the confines of persistent snow; and nowhere is his fancy in this respect better gratified than among the noble mountains and valleys of the Cashmere Ranges.

During winter they repair to caves in inaccessible rocks, and there form beds of decayed plants (usually ferns), on which they lie until spring, when, as soon as the snow melts and vegetation appears, they issue from their retreats. They are then very lean and voracious, and will attack sheep or goats; even ponies are said to have been killed by them. The fur in winter and spring is thick, long, and shaggy, but becomes thinner and darker in colour as the season advances; so that towards autumn the under fur has disappeared, and the white collar on the chest (indistinct in the winter garb) is now very visible. This has doubtless given rise to the many mis-

takes regarding different species of Brown Bears. The shades of colour vary much. I observed that the bears seen in spring were always lighter in colour than in autumn; and occasionally an almost white variety was to be met with, and various shades, from a dirty brownish white to a dark brown. Many of the old males were very dark brown, and several females a lighter brown; but I found that these varieties were not dependent on age or sex. It is difficult to say what Brown Bears will not eat; however, it appears they prefer vegetable to animal food. Tender roots and shoots of plants, fruits, flesh of Ibex (killed by avalanches), Deer, Cattle, &c., are greedily devoured by them. One was killed by a friend of mine feeding on the carcass of a Cashmere Deer, which it had evidently surprised and killed when bringing forth young, as a new-born calf lay close beside the mother. During spring, shortly after leaving their higher resting-places, they seldom roam any distance from their retreats, and feed on the grassy slopes close to the melting snow, on which they are fond of lying during the heat of the day. As the season advances, they increase in bulk, and become very fat by the end of October, particularly after feeding on walnuts and apples. They are very fond of a description of small white carrot, abundant in shady ravines, and the roots of the wild strawberry, which they tear up with their fore paws. This Bear is by no means so expert at climbing as its Black congener, and consequently is seldom seen in trees. The she-bear appears in spring with one or two cubs, and rarely three; the latter, when caught very young, are easily domesticated, and become harmless and playful; indeed the old ones are far from being ferocious, and, unless when severely wounded and hard pressed, never attempt to charge their pursuers. Its eyesight is bad; and the sportsman usually finds he can approach within a few yards, provided the wind is favourable; but if otherwise, their acute sense of smell will enable them to discover danger a long way off.

27. HELARCTOS TIBETANUS (F. Cuv.).

Black Bear of Europeans.

The native names are the same as those mentioned above for the Brown Bear. To the best of my knowledge, this species is not found in Tibet; anyhow, the name has not been well selected, as the species is generally distributed over the lower ranges of the Western Himalayas. Unlike the *U. isabellinus*, it does not hibernate, and prefers the wooded mountain-sides of the lower chains to the high and bare slopes of the interior. Its favourite resort in summer is among thick jungle, near fields of Indian corn or vineyards, where it commits great depredations during the grain and fruit seasons, devouring tender shoots of plants, wild rhubarb, bark of trees, apples, grapes, walnuts, and Indian corn. Natives allege they sometimes eat flesh and kill sheep; but this must only be when hard pressed for food, as the species is eminently a vegetable feeder. They are expert climbers, and during the fruit season in the Vale of

Cashmere mount to the topmost branches of the walnut and mulberry trees. Whole crops of Indian corn have been completely destroyed in one night by these unwelcome intruders. The farmers build raised platforms in their fields, on which watchmen sit all night and keep up a continual screaming in order to frighten them away. The bears retire from feeding at daybreak, and pass the day in sleep among the dense jungles, repairing to their feeding-grounds at dusk. Although not generally confined to one locality, I have known individuals of both this and the brown species choose some rocky ridge near a spring, where they remain for years, moving up and down the same pathway until a deep stair-like track has been made by their treading always in the same foot-prints. When the two species meet, the Brown is almost invariably the first to turn tail; it is therefore seldom they are seen near one another. It was only in Cashmere that I ever saw the two together. Natives say, during autumn, when the two species repair to jungles to feed on wild apples and walnuts, as the Brown Bear cannot climb, he waits until the other has ascended, and then feeds on the walnuts knocked down by the Black Bear. Both these species possess great powers of smell; indeed it would appear their security from danger is almost alone dependent on this sense, as their eyesight is by no means good. A bear will discover the presence of the hunter fully a mile off, if the wind is favourable. Should he have cause of suspicion, the bear commences to snuff the air, looks excited, walks a few steps in the direction from which the wind blows, raising his head and moving it from side to side until satisfied of the danger; he then turns tail and scampers up the mountain-side at a rapidity few who have seen the animal in confinement would imagine it capable of. There are many instances of this species having attacked both natives and Europeans when approached suddenly in thick jungle. If frightened on a steep mountain-side, it often coils itself in the form of a ball, and rolls down the declivity. I have seen one in this way roll down a hill side for upwards of 300 yards without stopping. The young are born in spring, and remain with the parent during summer. One is the general produce; but not unfrequently two or even three are born at one litter.

Note.—On the ranges near the plains of the Punjab a Bear is found rather smaller than the above; its fur is longer, and that on the paws and snout of a rust-colour. This may only be a variety; but the distinctions stated are worthy of attention. I have seen several skins; and all were marked as I have described; and I find in the 'Calcutta Sporting Review' for September 1848, a similar remark by "Mountaineer" (the well-known and observant Mr. Wilson, of Mussooree), who likewise says that a species with a white mark on the forehead is spoken of by the natives of a district near Mussooree; but from my own personal experience and the information I have received from native and European sportsmen on the Himalayas, I have hitherto been able to discover only the two decidedly distinct species here mentioned. The varieties in regard to shades of colour have doubtless caused many to assert that there are two or

more species of Brown Bears; but I repeat, and I think it is the experience likewise of those who are conversant with the habits, &c. of the *U. isabellinus*, that these varieties are merely casual, and not even dependent, in every instance, on age or sex. In 'Vigne's Travels in Cashmere,' he says, "The female Brown Bear can be distinguished from the male by colour;" this, as I have shown, is not the case, the only difference being that the male is the larger.

The *Ursus labiatus* does not frequent the W. Himalayas, the Punjab, or Scinde.

28. *ERINACEUS COLLARIS*, Gray.

Deccan; Scinde; Punjab, and lower Himalayan Ranges: common.

29. *MUS BANDICOTA*, Bechst.

Although common at Poonah in the Deccan, I never saw this species in the Himalayas or Punjab, nor do I think it is found in these regions.

30. *HYSTRIX LEUCURUS*, Sykes.

Scinde, particularly on the banks of the Indus, Punjab, Himalayas, and Vale of Cashmere. Not uncommon. Much prized, both by natives and Europeans, as an article of food.

31. *LEPUS NIGRICOLLIS*, Fr. Cuv.

Scinde; Deccan; Punjab; not the Himalayas.

32. *LEPUS MACROTUS* (Hodgson).

On the plains of the Punjab, along the base of the Himalayan Chain. It extends up the valleys of the lesser ranges for some distance. There are no hares in the Vale of Cashmere, although the country is very inviting.

33. *LEPUS OIOSTOLUS* (Hodgs.).

Ladakh: around the fresh- and salt-water lakes abundant; burrows or secretes itself under rocks.

34. *LAGOMYS ROYLEI*, Ogilby.

Common in particular localities on the Western Himalayas, and nowhere more abundant than on the steep and rugged mountains of Cashmere. It is likewise common on the Choor Mountain, near Simla.

35. *LAGOMYS*, sp.?

Plentiful in Ladakh.

36. *GERBILLUS INDICUS* (Hardw.).

Common in the Deccan, Scinde, and Punjab.

37. *SCIURUS PALMARUM*, Linn.

Deccan, Scinde, and Punjab.

Note.—I saw, on two occasions, in the dense pine forests of Cashmere, a Squirrel very like the *S. vulgaris*, I believe, found in Afghanistan.

38. ARCTOMYS BOBAC, Schreb.

“*Drun*” of Cashmere.

Red Marmot of Europeans.

Is confined to localities at high altitudes on the W. Himalayas, and prefers fertile and secluded situations, where vegetation returns rapidly and is luxuriant. There this active creature spends the summer months, surrounded by a plentiful supply of food, until forced to its burrow by the snows of winter. In habits they are social, and form their burrows in gentle slopes, or under stones, on which they delight to sit, and, on the approach of danger, emit a loud wailing cry, which is repeated by the others. In this way a continuous wailing is heard for miles along these solitary mountainsides. On the approach of danger, or after the wailing is over, it darts into its burrow. The favourite food of the species consists of roots and plants, which it would appear they store up for winter, seeing that they hibernate for 4 or 5 months, and in some localities for a longer period. It is seldom they are found at any great distance from their burrows; they delight in sitting erect on their haunches at the entrances. During progression they leap, at times running a few steps, using the tail to assist them. The Bearded Vulture is a formidable enemy to this and the next species. The valley of the Dras River, Ladakh, Wurdwun Pass, Cashmere, and at elevations on the neighbouring ranges, from 8000 to 10,000 feet above the level of the sea, are localities where they abound.

39. ARCTOMYS TIBETANUS, Hodgson.

White Marmot of Europeans.

On the plains of Rupshoo Ladakh this species is common, and frequents suchlike situations as the last, but at higher elevations and in a more barren country. I never saw it under an elevation of 12,000 feet, and often on ridges from 16,000 to 17,000 feet above the level of the sea. It prefers the bleak and barren mountains of the interior to the fertile valleys of the southern ranges. It is larger than the last species. Colour a dirty yellowish-white, with the tips of the hairs black.

40. PANTHOLOPS HODGSONI (Abel).

“*Sous*” of the natives bordering on Chinese Tartary.
Tibet Antelope of Europeans.

Found on the borders of Chinese Tartary, N.E. of Almorah, and in the northern parts of Nobra Ladakh, where it is called *Sous* by the natives, who say it is abundant on the mountains beyond Yarkund. This fine, handsome creature wanders in large herds among the bare and almost pastureless wastes of Nobra, where, in the summer of 1854, my friend Lieutenant Peyton, 87th Fusileers, killed up-

wards of fifteen fine males. I measured the horns of twelve of his largest specimens; the longest horn was 27 inches in length. It is worthy of remark, that in many of the above-mentioned specimens clusters of the larvæ of an insect, enveloped in cocoons of the size of a sparrow's egg, were found under the skin on the back and hind quarters. This did not seem to interfere with the health of the animal, as all the species he killed were fat and in good condition.

41. *TRAGOPS BENNETTI* (Sykes).

Ravine Deer of Europeans.

Common in the Punjab, particularly on the Salt and Suliman Ranges. Seen often in small herds. Does not frequent the Himalayas westward of the Jumna.

42. *ANTILOPE BEZOARTICA* (Aldrov.).

Common Antelope.

Black Buck of Europeans.

Common in certain parts of the Punjab; more so in the Cis-Sutledge States. Deccan common.

43. *TETRACERUS QUADRICORNIS* (Blainv.).

Four-horned Antelope.

Dyrah Doon. Not seen in the Punjab. A few are found in the tiger jungles on the western frontier of the latter country.

44. *CAPRICORNIS BUBALINA* (Hodgson).

Called *Ramoo* in Cashmere.

Seerou in various other parts of the Himalayas.

The *Ramoo* is perhaps the least common of all the Ruminants frequenting the Western Himalayas. Solitary in its habits, it lives in dense jungles or secluded patches of forest, among rocks, where it moves about stealthily, and may remain for months in one locality. Its proximity is easily discovered by the heaps of dung on its accustomed tracks leading to its feeding-grounds. It is a stupid, awkward, and clumsy animal. When discovered, it usually stands and gazes at the intruder, and, unless wounded, is not even scared by the report of a rifle. Its thick hide is almost ball-proof; and instances have occurred of its making its escape with several bullets in its body. A charge of shot fired within a yard of one was found flattened under the hide (*vide* 'Calcutta Sporting Review' for September 1848).

Both sexes are alike; the length of the horn is from 8 to 10 inches. The beautiful colouring of the skin, composed of long stiff hair, black on the neck, with rufous splashes on the body, render it a valuable trophy in a sportsman's collection. When wounded and brought to bay, they fight desperately, and use their short and pointed horns against the attacks of wild dogs, which natives say are often killed by them when a pack attacks an infu-

riated Serou. The female brings forth in May or June. There is never more, I believe, than one kid at a birth.

45. NEMORHEDUS GORAL (Hardw.).

Goral of the Paharees of the lower Himalayan Ranges.
Called *Pijur* by the Cashmerees.

Inhabits the lower and middle regions of the Western Himalayas. Very common in the neighbourhood of Mussouree and Nanythal. Steep rugged hills covered with grass, and craggy, are its favourite resorts. It seldom seeks the shelter of the forest, and, like the Chamois of the Alps, delights in sporting among rocks and precipices. When alarmed, it utters a loud hissing snort, and dashes with surprising rapidity over the most dangerous and difficult places. Gregarious. The horns of the female are shorter than those of the male; otherwise the sexes are very much alike. A few frequent the Pir Pinjal Ranges of Cashmere, and on the lower hills forming the N.W. frontier of the Punjab.

46. PROCAPRA PICTICAUDA, Hodgson.

Tibet Ravine Deer of Europeans.

Found on the mountains around Leh, and ranges in the neighbourhood of the lakes of Ladakh. Seen in small herds. Habits much like those of the preceding species.

47. PORTAX TRAGOCAMELUS (Pallas).

Nylghau.

By no means common in the Punjab, although plentiful in Lower Bengal; and I scarcely think is ever seen in the country north of Lahore.

48. HEMITRAGUS JEMLAICUS (Ham. Smith).

Tare of the natives of the W. Himalayas generally.
Jugla of the Cashmerees.
Kras of the natives around Khistewar.

Common on the Pir Pinjal Ranges of Cashmere, but more so on the mountains near the banks of the Chenab at Khistewar. Frequently gregarious, and seen feeding with the Markore (*Hircus megaceros*). The horns of the female are small; and she has no mane. The young are of a light-fawn colour, with a black line down the back. Frequents steep rocky mountains, passing the day in forests and shady places.

49. CAPRA HIMALAYANA, Hodgson.

Skeen and *Kail* of the Cashmerees and natives of various parts of the W. Himalayas.

Is found on many of the lofty mountain ranges of the Western Himalayas; the principal localities may be enumerated as follows:—Aserung, Spiti, Kenewour, Chinese Tartary, Cashmere Mountains, and Ladakh. With reference to the latter country, I observed that

the species found there have shorter horns than those found on the ranges immediately north of Cashmere Valley; however, it is doubtful if they differ in any other particular. A specimen of the *Capra sibirica* from the Altai Mountains, seen in the Derby Museum, Liverpool, appears to be identical with the Ladakh variety.

On the high and rugged mountains northward of Cashmere, Ibex are found in large herds, and to the adventurous hunter offer one of the most pleasing, and at the same time exciting pastimes imaginable. My first introduction to a herd of Ibex I take the liberty to transcribe. "I had for days clambered over the dangerous rocks and snow-drifts in anxious search of Ibex; at last a herd was discovered feeding undisturbed on a grassy slope under some craggy cliffs; but as there was no cover sufficient to permit a near approach, and one fine male was standing boldly out on a pinnacle of rock over the spot where the herd was feeding, I was obliged to fire at a long range; and before the echo of the shot was heard, all disappeared among the rocks and crevices above; but in less time than it takes me to describe, every crag and peak seemed alive with Ibex gazing downwards in astonishment; the large male, uppermost of all, standing on the very brink of a precipice, seemed the sentry and leader; all appeared to be guided by his movements; for as soon as he was satisfied of his danger, his loud and shrill whistle resounded through the glen, and, as if by magic, they disappeared among the shattered rocks." During the winter they repair to sheltered and rocky situations, and feed on moss, lichens, bark of trees, and, I have been credibly informed, eat earth at this season. When the snow melts in spring, they move downwards, and feed on the scanty herbage around its margin. A species of *Nardus* seems their favourite food in summer. During winter they are thickly clad with peshmena of a white colour, which, at a distance, gives the animal a piebald appearance. The peshmena of the Ibex is softer and more valuable than that of the Cashmere goat. During summer the under-wool disappears, and the colour changes to a light brown, with a dark line down the back. The horns of the male grow to a very large size; the largest I ever saw measured $48\frac{1}{2}$ inches round the curve; their diameter and size, however, vary much: commonly they taper to a point, and proceed upwards and backwards, with the tips inclining directly downwards; some diverge a good deal, and terminate abruptly, like many of the European specimens.

The average length of a full-grown Cashmere Ibex's horns varies from 28 to 40 inches round the curve. During summer the Ibex ascend as the snow melts, so that by autumn they are only found on the tops of the highest mountains. It is said the males fight during the rutting-season. A native told me he saw two fighting on the brink of a precipice in Kuloo; one lost its footing, and fell, shattered to pieces, hundreds of feet below. Many are yearly killed by falling avalanches; indeed some of the largest horns are found in snow-drifts. It appears the female gestates nine months, and has sometimes two kids, although one is the usual number. The Ibex is the most keen-sighted animal on the Western Himalayas. Native sports-

men have frequently assured me they have little sense of smell, and can be approached down the wind; but unless the hunter manages to get above the herd, he has not much chance of succeeding in his stalk, as they never anticipate danger from above, and always look downwards when disturbed. The panther, wild-dog, and bearded vulture prey extensively on this species. I killed one of the latter that had the hoof of an Ibex in its stomach.

50. CAPRA CAUCASICA.

Scinde Ibex.

The above name is given to a specimen of this species of Ibex in the British Museum.

It is found in the mountains of Beloochistan, and ranges to the north and west of Scinde.

51. HIRCUS MEGACEROS (Hutton).

Markore (Snake-eater) of the natives of the W. Himalayas and mountains around the Khyber Pass.

Rass of the natives at the sources of the Oxus.

The distribution of this species is somewhat peculiar. It is common on the ranges around the Valley of Peshawur, in Little Tibet, and all down the banks of the Indus as far as Torbela, the Suliman Range, westward of the Punjab as far as Mitenkote, at the junction of the Indus and Sutledge, on the Southern Pinjal, Cashmere, Hindoo Coosh, Afghanistan, Persia, sources of the Oxus, &c. I have not heard of its being found eastward of the river Beas, and scarcely think it ever frequents the eastern ranges of the Himalayas.

No less interesting are the peculiarities in regard to the shape and degree of curvature of the horns. All the males observed by me on the Southern Pinjal, had the horns flattened, with few twists. I killed probably one of the finest males ever procured; the horn measured in length 52 inches (round the curvatures), and had one perfect and two imperfect twists, while that of old males from the Peshawur and Suliman Mountains were rounded, straight, and twisted like a cork-screw. One pair of horns in the Museum at Kurra-choe, from Herat, resembled, again, the specimens from Cashmere, only more rounded in their configuration, and had fewer twists.

The Peshawur and Suliman specimens were perfectly straight, and rose perpendicularly from the head, while the Cashmere and Herat ones diverged backwards and outwards from the skull. I have examined different skins from nearly all the above-mentioned localities; and after allowing for the changes produced by seasons, I could not discover any differences worth mentioning. Mr. Blyth thinks this species is only a variety of the *Capra hircus*; but I cannot agree with him, and am inclined to the opinion, that the Markore is more likely the original of the domestic species, than that the latter should be considered its progenitor.

The Markore is usually found in small herds, in habits closely resembling the Ibex, feeding on steep and rocky mountains, ascend-

ing and descending in accordance with the season. Its summer and winter coat vary a good deal,—the peshmena in winter, as in the Ibex, causing its colour to appear much lighter, while in mid-summer, when this wool has disappeared, it becomes a light-greyish brown. The under parts are white at all seasons. The adult male has all the under surface of the jaws, neck, and chest, covered with long black hair, which reaches as far as the knees in old specimens. The females and young have a short black beard; and the horns of the former are flat, stumpy, and seldom more than 10 inches in length. The largest male I killed stood $11\frac{1}{2}$ hands at the shoulders; however, it is but rarely one has had the good fortune to procure such a magnificent specimen of this truly noble-looking animal.

On the authority of a native sportsman, long accustomed to the habits of the species, I was informed that the Ibex is seldom found on the same ranges with the Markore, and that the two always fight when they meet,—their mode of attack being similar to that of the tame varieties, rearing on their hind legs and striking with the base of the horn on the forehead. It is sometimes seen feeding with the Tare (*Hemitragus jemlaicus*). In regard to their eating serpents (as the name implies), natives, although not able to substantiate the assertion from personal experience, allege that it is the commonly received opinion that they do so.

52. *CAPROVIS VIGNEI* (Blyth).

1. *Hauriar* of the Punjab.
2. *Kuch* of the Suliman Mountains.
3. *Shapoo* of Ladakh and Tibet.

Like the Markore, this species inhabits countries differing much in appearance and climate. They are plentiful in Ladakh and on the ranges westward of the Indus, Khyber Pass, and Hindoo Coosh. Suliman and Salt Mountains of the Punjab. Not found on the eastern ranges, and probably not eastward of the Beas river. It is said to abound on the mountains of Persia and Western Afghanistan.

There is likewise, as in the last species, considerable diversity in regard to form and size of the horns of specimens from different places, as well as in the size of the animal. This latter, however, may be owing in a great measure to climate. For example, the specimens killed in Ladakh appeared larger than those from the Punjab mountains. The horns of the Ladakh animal had their upper surfaces rounded; and the tips proceeded more inwards than in any other variety observed.

In the Punjab it frequents bleak and barren mountains composed of low ranges, intersected by ravines and dry river-courses, where vegetation is scanty at all seasons, and goats or sheep are seldom driven to pasture. Usually found in small herds. They are fond of salt, and are generally found most abundant in the neighbourhood of the salt mines. Shy and watchful, is difficult to approach, and possesses in an eminent degree the senses of sight and smell. It is seldom seen in the daytime, being secreted among

rocks, from whence it issues at dusk to feed in the fields and valleys, returning to its retreats at daybreak.

When suddenly alarmed, the males give a loud shrill whistle like the Ibex, which is an invariable signal for the departure of the herd, which keeps moving all the rest of the day until dusk. Their bleat is like that of the tame species; and the males fight in the same way: but the form of the body and infraorbital glands simulate the Deer; hence it is often called the "Deer Sheep." It equals the Deer in speed and activity.

The female gestates seven months. The rutting-season is in September. The young are often caught, but are difficult to rear. I attempted to rear several; and although they became very tame, and took to a she-goat, all eventually died of a distemper accompanied by a discharge from the nose and cough. The lungs were found, after death, in an inflamed state, in fact, well-marked cases of acute pneumonia; with care, however, they can be domesticated; and I have seen them become as docile and tame as any of the domestic varieties. The males, however, are apt to become pugnacious and unmanageable.

53. CAPROVIS ARGALI (Pallas).

Nu ang of the Ladakees and Tibetians.

The borders of Ladakh towards the north, and its lakes, may be said to be the most southern limits of this species, and these only in winter and spring. A few are met with at the sources of the Ganges. Large herds wander over the mountains around Yarkund and north of Nobra. I was told by a friend, who had shot many in the latter country, that in all his experience of Himalayan shooting, he had never beheld a more interesting sight than when viewing a herd of some twenty of these noble-looking animals dashing past him, led by a fine old male, which he killed, and whose horns measured 3 feet 2 inches round the curve, and 1 foot 6 inches round its greatest circumference. The horns of the female are flat, narrow, and curve backwards, the length being seldom more than 18 inches.

54. OVIS ARIES, Linn.

Var. Hunniah Sheep.

Black-faced Sheep of Ladakh.

Plains of Roopshoo Ladakh, where herds of these animals are reared by the nomadic races of Tartars. The 4-horned varieties are not uncommon. Variety Dumba, or Cahool Dumba, is met with in Peshawar and N.W. frontier districts of the Punjab. Common.

55. PSEUDOIS NAHÖÖR, Hodgson.

1. *Sná* of Tibet.

2. *Naboo* of Ladakh.

3. *Burrel* of Europeans and natives.

Is found in Ladakh, Nobra, and Great Tibet. Seems confined to those countries on the Western Ranges. Judging from the great

numbers of horns I found in the cairns in Roopshoo Ladakh, it would appear that the animal abounds in that country, although I seldom saw it during my travels, and was unfortunate in not procuring a specimen. The horns of individuals from different regions differ much in size and curvature. This induced Mr. Blyth to consider the Burrel found in the Borendo Pass as forming a distinct species (*vide* P. Z. S. 1840, p. 68; *Ann. Nat. Hist.* 1841, vol. vii. p. 249).

56. *MOSCHUS MOSCHIFERUS* (Linn.).

Custuree of Cashmere, where it is likewise known by the name "Russ."

Generally distributed over the middle and lower regions of the Western Himalayas, never found on the plains of India. The habits of this species resemble the Ramoo in some respects; only the former is much more common. Never seen in herds, and seldom more than two together. Being in great request on account of its musk, it is surprising the little creature is not more uncommon. During autumn, and when rutting, the musk is strong and most eagerly sought after; but in summer I could not discover, beyond a rank offensive odour from the dark pigmentary substance which the bag contains, even the trace of musk when the contents were tested by smell.

The *Custuree* frequents mountain-sides, where grassy ridges alternate with little belts of forest or dense jungle. In the latter it secretes itself by day, and at dusk or in the morning moves silently across the bare ridges to feed. Its mode of progression is performed by a series of jerking leaps, now and then stopping to reconnoitre, or, having advanced a few steps, continues these fantastic-looking movements. They are by no means shy, and seldom run any distance when disturbed; if chased into jungle, they seek the densest part, and secrete themselves. They are never heard to utter any sort of cry, even in the rutting-season, unless caught, when they emit a series of loud and harsh screams. Its foot-prints are very distinctive; for, in addition, the two long hind toes form impressions which at once betray its presence: in this way it is seldom difficult to discover an individual, if the track is fresh; for it is fond of remaining in one locality, and, like the Ramoo, dungs daily on the same spots. There is considerable diversity in regard to the colour of individuals,—so much so, that a casual observer seeing only skins would be apt to conclude that there are many species; but having observed closely these differences, I conclude they are owing chiefly to age and the nature of the localities they frequent. Indeed it is seldom one finds two skins entirely alike. Some are very dark on the upper parts, with black splashes on the back and hips; under parts white, or a dirty white. Others are of a yellowish-white all over the upper parts, with the belly and inner sides of the thighs white*. A brownish-black variety is common. Not a few had white

* I have not been able to compare this variety with *M. leucogaster*, said to be found in Ladakh, which is doubtful, as I do not think any species of Musk Deer is found in Ladakh proper.

spots arranged longitudinally on the back ; the latter, I found, were young, as all the males marked in this way had short canine teeth.

The canine teeth of the male are from 2 to 3 inches in length (rudimentary in the female). The use of these organs, unless for defence, I have not been able to discover. The natives say they are used to dig up the roots of plants ; then why are they so slightly developed in the female? The males attempt to use them when caught. I was informed by native sportsmen, that during copulation the male seizes the female by the ears ; and in many instances I have found females with the ears slit or part wanting, I fancy, caused by the sharp teeth of the male. A spotted fawn is born in April, which remains but a short period with the parent. Bearded Vultures, Eagles, Chetahs, and Leopards destroy numbers of old and young ; and they are frequently found buried in avalanches.

57. POËPHAGUS GRUNNIENS (Linn.).

A few are found during winter on the southern slopes of the Kara Korum Mountains, Nobra ; but they move northwards towards Chinese Tartary as the snows melt in spring, where they are said to abound. Two fine males were killed by Lieutenant Peyton, 87th Fusileers, in March 1854, in the first-mentioned district. One of his trophies measured, round the curve of the horn, 2 feet $4\frac{1}{2}$ inches ; greatest circumference, 1 foot ; span between the points, 1 foot 8 inches. This may be considered a fair average of the dimensions of a male's horns. The tame varieties will not live out of their native country ; all the specimens brought southward died shortly after arrival in the Vale of Cashmere.

58. CERVUS CASHMERIENSIS (Falconer, MSS.), Gray, Cat. Ung. Furc. B. M. p. 199.

Barra Singa and *Hauglu* of the Cashmerees.

May be identical with *C. wallichii* (Cuv.) of the Nepal forests ; however, I have not had an opportunity of instituting a comparison between the two. The Cashmere forests seem the head quarters of this species on the Western Ranges ; for it is seldom if ever met with between Mussourie and the Vale of Cashmere. The dense forests and fertile valleys of the latter country are particularly inviting to this species. In habits and general appearance the Cashmere Stag bears a striking resemblance to the Red Deer. Although it is seldom now a-days that individuals of the latter species escape the hunter so long as to attain the size and magnitude of the Barra Singa, yet I think it will be found that the horns of those killed in the forests of Scotland in former years are equal in size to any at present met with in Cashmere. It is in the dense pine forests on the Northern Pinjal, and in the many beautiful valleys among these ranges, that we find the species most abundant. There are very few on the Southern Ranges. In the secluded depths of these solitudes they lie all day, to issue forth at dusk and feed on the grassy hill-sides, or descend even into the Valley of Cashmere when forced

by the snows of winter. An adult stag averages 13 hands in height. The colour of the coat varies but little in the sexes or with the seasons of the year: dark liver-colour, with reddish patches on the inner sides of the hips; belly and lower parts white, or a dirty white. The male has the hair on the lower surface of the neck long and shaggy (wanting in the female); the horns large, and usually very massive, with from 10 to 15 or more points, according to age: the largest pair of horns I have measured were 4 feet round the curves, with 6 and 7 points. They are shed in March; and the new horn is not completely formed until the end of October, when the rutting-season commences, and the loud bellowings of the stags are heard all over the mountains.

During rigorous winters, they are frequently driven to seek for shelter and food around the villages in the valleys, when many are destroyed by natives, who hunt them with dogs. The Chetah (*Felis pardus*), Wild Dogs, and Bears are said to kill the young. In winter and until the horns are shed, both sexes are found together, generally in large herds. Afterwards they separate, the males roaming about singly, while the females retire to the denser parts of the forests, where they bring forth their young—a spotted calf, which retains its markings until the third or fourth year. The colour of the upper parts of the young specimens is generally more rufous than in the adult, with the spots arranged longitudinally. The species is seldom confined to one locality, but roams from forest to forest, preferring grassy glades alternating with dense forest, where there is a copious supply of water. It is not often seen during the day, and moves about so stealthily, that by moonlight it is difficult to discover its presence when within a few yards of you. It is only during the rutting-season the sportsman is certain of success; as the decayed twigs crackle under his feet, the noble stag, bellowing, approaches towards him in expectation of meeting a rival or mate. In this way I have known many fine males killed in the forests near the Shalimar gardens in the Valley of Cashmere. The contents of the infraorbital cavity are much prized by the natives as a medicine for the cure of a hundred ills.

59. *AXIS MACULATA*, Brookes.

Deyrah Doon, common; but not found in the Punjab, and never on the Western Himalayas.

60. *HYELAPHUS PORCINUS*, Sundev.

Para of natives and Europeans.

In the jungles on banks of the Punjab rivers; Scinde. Common.

61. *CERVULUS VAGINALIS* (Bodd.).

Kakur of the natives on the lower ranges of the Western Himalayas.

“Barking Deer” of Europeans.

Is generally distributed over the lower ranges of the Western

Himalayas, at elevations under 9000 feet, and prefers gentle wooded slopes, oak forests, &c., to bare hill-sides. Although nowhere abundant, as many as twelve are often met with in one small jungle; however, they seldom form societies, and are oftener found singly than otherwise. Stealthy in its habits, it is often met with when least expected; when frightened, like the Musk Deer, it runs for a short distance, only to turn and gaze at the intruder. Its bark is loud and harsh, and commonly heard at dusk or in the morning. When running, I have often heard a clattering sound, evidently caused by the hind and fore feet striking as in horses when they "over-reach."

62. *ASINUS HEMIONUS* (Pallas).

Kiang of Ladakh.

Is common in herds on the plains and mountains around the fresh and salt lakes of Ladakh. Its favourite food appears to consist of a species of *bent* growing abundantly all over the mountains, and a wild *Vicia* having deep-red flowers, also the scanty herbage by the sides of springs and around the lakes. It runs at great speed, and ascends and descends steep mountain-sides with much agility. Timid and wary, when started, it scampers across the plain for some distance, then turns round, advancing a few steps to reconnoitre. A Tartar servant informed me that the young are sometimes caught by the natives of Yarkund, and used as beasts of burden.

The Tangum piebald ponies (Nat. Lib. vol. xii. p. 291) are brought in large numbers to the markets of Leh. Kafilas (droves) laden with brick tea, cloth, &c., are brought from Yarkund, and exchanged for grain with the Cashmere and Kistewar merchants. On the way to Leh, the caravans are not unfrequently overtaken by snow storms, when nearly all perish. In many places the route is only traceable by the bones of horses. This variety is shy and timid, and at first has a strong dislike for Europeans; however, it soon gets accustomed to its new master, and is in great request in the European stations. I have known from £20 to £30 offered for a good Yarkund pony.

63. *SUS SCROFA* (Linn.).

Abundant in the jungles on the banks of the Punjab rivers, and all over the cultivated districts of the Punjab and lower Himalayan Ranges. Very common on the banks of the Indus, and in the Scinde jungles. Very destructive to grain. They feed at night, and destroy the wheat by always eating the tops.

8. ON THE *DYSIDEA PAPHILOSOSA* OF DR. JOHNSTON.

BY DR. J. E. GRAY, F.R.S., V.P.Z.S., ETC.

(Radiata, Pl. X.)

Dr. G. Johnston, in Magazine of Natural History (vii. 494, f. 60), described and figured an animal which is parasitic on old shells,