

Some parts of the road on the mountain require a good deal of repair and widening, and it would be requisite to sink tanks at the watering places and cut paths to and from them; but taking every thing into consideration, it is my opinion that a battalion of Pioneers sent one week in advance, would render the road quite passable for an army. The want of sufficient open ground to encamp in, would prove an inconvenience, but does not exist for many marches.

The importance of the new road we were exploring, the circumstances of the country we passed through, never before having been traversed by an European, and the manners of the natives we met with, being but little known, have induced me to make this unusually long report to you, in the hope that some of the information it contains may perhaps hereafter prove useful, should the Aeng road again be passed by British troops.

I have &c. &c.

(Signed) T. A. TRANT,

Lieut. H. M. 95th Regiment,

Deputy Assistant Quarter Master General.

To the Quarter Master General of the Army, Fort William.

Judicial Department, the 7th November, 1837.

(True Copies,)

(Signed) F. J. HALLIDAY,

Officiating Secretary to the Government of Bengal.

Capt. MANSON'S Journal of a Visit to Melum and the Oonta Dhoora Pass in Juvahir. Edited by J. H. BATTEN, Esq. C. S. for the Journal of the Asiatic Society.

In our Proceedings for March 1842 will be found an account of the recovery of a part of Captain Herbert's Journal of the Mineralogical Survey in the Himalaya, and in those of August the kind offer of our most zealous and able associate Mr. Batten, Assistant Commissioner in Kemaon, to edit Captain Manson's Journal, which forms part of Captain Herbert's papers, which we need not add was most gratefully accepted by the Society. The following paper is the one which he there alludes to, and the reader, or the intending traveller, will peruse it with the satisfaction of knowing that its details and its experience are fully confirmed by two more travellers in those dangerous regions.

The scientific geologist and naturalist will perhaps at first regret that they do not find more details falling in with their studies, but we must beg of them to reflect that the writers and editors of such papers, though they may lay no claim to scientific qualifications (so difficult to acquire in India,) are nevertheless rendering a service of first rate importance to the cause of science; and this is the important service of *pioneering*. We could say much on this subject, for few remember, and many keep out of sight, what they owe to the humble and often forgotten labours of those who have undertaken the thankless work of chronicling a first exploration, or their first labours in a new branch of science: but we may comprise it all in a single question. What will not some future Humboldt, with guides like these ready to mark out his path, be able to accomplish amongst the yet hidden wonders of the stupendous mountains of India?—H. P.

15th September.—First march beyond Boocæ* up the bed of the
 Specimens Raálím torrent; fall of the torrent very great; di-
 25 to 41. rection of it about N. and by E. About six miles
 up, another stream falls into it, whose course is about E. N. E. when
 the former turned a little to the west of North.

N. B.—Crossed the stream over a snow-bed at the Sáábá (or Great) Oodear. A specimen of red raspberry, ripe, and very pleasant to the palate. Marched at 7h. 50m. and reached our ground at 4h. 5m., distance about twelve miles, road pretty good. No tent up; slept under a large rock (or Oodear†); heavy rain during the night. At 6 P. M. thermometer 50°.

16th September.—7 A. M. thermometer 45°; barometer 20.250; t. m. and air 52°; m. t. 45° 5'. Marched at 10h. 36m. A. M. The road continued for a mile up the bed of the torrent, the rock chiefly gneiss, little or no granite; ground on the right bank sloping, steep on the left, strata generally dipping to the N. E.; commenced a short but steep ascent from the torrent, passed through a few birch trees, (the only ones on

* In Webb's map, (Indian Atlas, No. 66.) Bhoocæ on the left bank of the Goree river is noted, above which to the north are also marked the Snowy Peaks, Nos. XVI, XVII, and XVIII of the Kumaon Survey, on the same side of that river; but no mention is made of the Raálím river which joins the Goree opposite the Pass called Leepooke Than, or Hurdol, and beneath the Peaks XVI and XVII. When the route by the Goree, owing to the loss of bridges or an unusual fall of snow, or the carrying away of the road is closed, the Juhahir Bhootias proceed to Raálím along the torrent of that name, and so on towards Melum.—J. H. B.

† Odhéar is a *cave*, or any arched recess in the rocks, and used by the Bhootias for the shelter of themselves and sheep with their loads.—J. H. B.

the road); the path then continued along the sloping side of the mountain, ascending occasionally, with a little descent here and there. Ground covered with the wild strawberry? (or potentilla.) Little or no rock visible; gradually changing from gneiss to a kind of mica slate, and from that into a greywacke and talcose clay slate. Arrived at our tents at 2h. 45m. P. M., distance about five miles. The village of Raálim, about two miles further on, consists of about twelve mows (families.—J. H. B.) The torrent to this had a northerly course, and from this as far as visible to a large snow bed; its course* is about N. E.—4h. 15m. P. M. barometer 19.207; t. m. 54, air 50; m. t. 49°.

N. B.—Could procure only twenty-one coolies from the village. A road leads from this up the bed of the torrent, four days' journey for loaded men, to the village of Sheebooh† in Dhurma, but very bad and dangerous.

17th September.—8 A. M. thermometer 42°. Marched at 9h. 32m.

Specimens A. M., and commenced a very steep ascent; the
50 to 54. rock to the top of the Pass of Bircheegung, clay slate, talc slate, and greywacke, and near the Pass, a few blocks of quartz. The whole ascent occupied three and half hours; the higher we ascended, we felt the difficulty of breathing greater, and consequently the fatigue of walking; found I could not walk more than from ten to twenty paces, according to the steepness of the ascent, my legs feeling as if they would drop off. When two-thirds up the ascent, a snow storm came on, (but the snow melted as fast as it fell to the ground,) when the thermometer immediately fell to 32°. At the top of the Pass, at 1 P. M. it was 30°. As we ascended, vegetation gradually decreased, and towards the summit of the Pass, wholly disappeared, and nothing but broken fragments of clay and talc slate and quartz presented themselves to the eye. The Pass, judging from the time taken to ascend it, and from all vegetation ceasing, must be at least 15,000 feet; but owing to the lad who carried part of the apparatus belonging to the barometer having preceded me some distance, I was unable to

* From the sketch and the text, it appears that the writer does not mean by *course* and *direction* of the Raálim, the course of its current (for, that is in a southerly direction,) but the line of ascent along its bed, and towards its sources.—J. H. B.

† Seeboo.—J. H. B.

set it up. The vegetables up the ascent consisted chiefly of a species of potentilla and dwarf juniper, which did not rise more than six inches from the ground. On the descent, the rocky fragments continued much lower down than on the opposite side without vegetation. The descent occupied two and half hours near the bed of the Goree river, whose course* here, towards Melum, is about N. W. and by N., when it takes a direction more to the N. Crossed a small torrent near its junction with the Goree on a *sanga*. The temperature of the water was 46°, air 51°, and moist thermometer 48°. The snow continued to fall for about two hours from 12 to 2 P. M., and for about three-quarters down the descent, when thermometer rose to 40°; towards the bottom of the descent, the neighbouring mountains covered with birch jungle and a species of dwarf rhododendron. Arrived at the village of Tola, consisting of from thirty to forty houses at 4h. 25m. P. M., being about seven hours on the road; being one of the most fatiguing marches I ever made. The rock down the descent, chiefly clay slate. The sides of the mountains near Tola have a very shattered and precipitous appearance.

18th September.—A halt, a fine clear day, 9 A. M. thermometer 49°; 2 P. M. air 62°, in sun 66°; moist thermometer 51°. In the sun covered with wool (black,) and laid on a dark soil, it rose to 117°. Nunda Debee visible, bearing West. Two days journey from this village, a good deal of level ground, well cultivated, in the neighbourhood of Tola. The inhabitants dirty and ill-looking, and the village surrounded by filth; demand one rupee for six and half seers of attah, which at Munsaree, six days' journey the direct road, was procured at the rate of twenty-four seers per rupee. They have here fine Tartar sheep, for which they ask two rupees each; they have nearly twice the bulk of a Plain sheep, and have long twisted horns.—4h. 15m. P. M. barometer 20.235, air 765.5, moist thermometer 47°.

N. B.—Purchased three large Tartar sheep for two rupees each, two of them a male and one female for breeding.†

* Vide note marked † preceding page—J. H. B.

† Lieut. J. A. Weller, Executive Engineer and Officiating Assistant to the Commissioner of Kumaon, has just arrived from a tour to Juwahir, and has kindly added some side notes to this Journal in addition to my own; besides very handsomely placing parts of his own Journal at my disposal for the use of the Asiatic Society.—J. H. B.

19th September.—7 A. M. thermometer 48° 5', moist thermometer 39°. Very fine clear morning, towards noon became cloudy, and it rained gently all the afternoon.

Picked up near the village specimens No. 55 to 61, most of them containing copper (?) Some disseminated, some in small veins, and some in pyrites. This ore seems to occupy very generally the rocks up the bed of a small stream which runs close to the south of the village; it does not appear in any of the soft friable, slaty rock, which is the general rock, but in that of the harder kinds, and in quartz.

20th September.—Halt; morning cloudy, gentle rain during the forenoon, cleared up a little towards 4 o'clock. At 2 P. M. thermometer 52° 5', moist thermometer 48°. The ooaah jhow* is just ripe here, and is being cut. It is sown sometime in the month of May. Turnips are grown here, but they are small and strong; they say they were brought from Dhurma.

They say it is two days' journey from Melum to the Pass, and from thence four days to Neetee; two alternate days no village to encamp at, the whole road within our own boundary.†

They travel for five days from the bottom of the other side of the Pass, before they come to any Tartar habitation. There is no chokee near the Pass at present, to prevent any traveller approaching the opposite side. There is a road from the Pass through the Tartar frontier to Branse, fifteen days journey.

21st September.—Halt; morning fair and clear, fresh snow on all the high neighbouring peaks. 10 A. M. thermometer 46°, thermometer in sun 52°, hoar frost in the shade at this hour. Observed the hour of noon to-day, and found our watches a quarter of an hour too fast. The people here say, they are not subject to be visited by severe storms at this season, (the Equinox,) and that only a little rain and snow fall. There has blown, however, every day since our arrival here, a very unpleasant cold wind, which sets in about 12 or 1 P. M., and continues till near sunset. The Bhoteeahs here reside in the hot

* Ooa Jow, *Hordeum coeleste*.—J. H. B.

† Not if Oonta Dhoora is our boundary; as that Pass has to be crossed to reach Gertee, which is intermediate between Oonta Dhoora and Neetee. See Sketch No. 1.—J. A. W.

season at Saeen, and the Puhán,* (an old man,) is a regular Jew in all his dealings, even endeavouring to find out what will be offered for an article before he himself will fix any price, even to the smallest trifles. 1h. 45m. P. M. ther. in open air 50° 5'. moist ther. 43° 5', since 12 A. M. it has gradually become cloudy and windy, and is now raining, but not heavily. The grains, &c. grown here are ocah jhow, phāpher, † turnips, surāṅn. ‡

22d September.—Fine day, but snow falling on the highest peaks. Marched at 1 P. M., the road partly level along the side of the mountain; numerous slips, and some parts precipitous and dangerous. The rock between Tola and Boṅpēr has a much less slaty structure than that near the former village, but continues very metalliferous to within about a mile of Boṅfer; some of the specimens picked up contain rather large crystals of copper (?) very well defined, but rather scattered through the rock. The general character of the rock is

Specimens (I think) graywacke, some very hard, and specimens
61 to 75. broken off with much difficulty. A good deal of
quartz was also observed along the road, &c. No. 67 is chiefly composed of felspar. Some specimens procured in this march have attached to them some well defined crystals of quartz, &c. The sides of the mountains, whence all the rocks from which the specimens were procured, have a very shattered appearance. There can be little doubt of their containing some large deposits of ore, which might be discovered, I should think, without much difficulty. On the road about half way, found a large deposit of decomposed felspar, some veins of it beautifully white.

Plants Collected.

Two species of juniper, one in seed, the other just coming into flower. A shrub very like the sweet-briar, but with no smell. A small herbaceous plant differing in appearance, but with the same scent as the plant well known by the name of "old man," or southernwood. The gooseberry, just ripe. The currant, (no fruit.)

* Head of the village, Malgoogar—Lumberdar.—J. H. B.

† A species of Polygonum.—J. H. B.

‡ Sinapis dichotoma—J. H. B.

The Bis.

The natives here have an idea, that people passing through a jungle of this plant, (wolf's-bane,) are subject to illness, becoming at times wholly insensible; but I was inclined to think this illness arose from the quick circulation of the blood in the fatigue of ascending in a rarefied air; and this day my supposition is apparently verified, for in trying my pulse by a watch with a second hand, I found on standing still after a little bit of steep ascent, that my pulse beat at the rate of 160 in a minute. A seapoy's, (a hill man,) who was with me, beat at the rate of 172. I found also, that in walking on level ground, my pulse beat about 130. It is therefore most probable, that the great fatigue experienced in climbing ascents at this height, is owing to the increased circulation of the blood.*

N. B.—Arrived at the village of Boörfer, about five miles, at 4h. 40m. P. M., (forty or fifty houses) situated in an open part of the valley with numerous fields about. The valley of Mertolee† on the opposite side of the river about half way. Crossed on a *sanga* rather a large stream close below the village, the bed of it very wide, five or six punchakies‡ in the course of it.

23rd September.—Thermometer at 10 A. M. 56°, moist thermometer 41°. Early in the morning hoar frost on the ground, and a film of ice, the thickness of a shilling, on the water in the *su-raee*. Night and morning beautifully clear; not the smallest speck of

* It is singular that on the 29th May 1842, I walked nearly all the distance from Doong across the Oonta Dhoora Pass, including the whole ascent and descent of the Pass unaided, without feeling any unusual fatigue. Two Booteas walked up the Pass with me; five other Booteas, a hill servant, and a Mussulman of the plains, accompanied me (on jooboos,) and no one of the party complained of, or appeared to feel unusual oppression. I recrossed the Pass, walking, on the 5th June, with exactly a similar result.—J. A. W.

Lient. Weller is not singular in his exemption from suffering in rarefied air; as during a six years' residence in the hills, I have found that the European travellers to great heights are affected by, or free from, the painful effects of rarefaction in about equal numbers. I myself am a great sufferer. The generality of those affected find their powers of motion and muscular exertion extraordinarily paralysed. The natives do not attribute the effects indiscriminately to 'nirbisi,' or aconite—and indeed the worst oppression is felt above the reach of all vegetation. 'Bish ke howa' (The poisoned air) is the general expression for the cause of the oppression, though it is true that certain plants are often quoted as the root of the evil.—J. H. B.

† Meaning below Murtolee village.—J. A. W.

‡ Water mills.—J. H. B.

cloud visible. Marched at 11h. 30m. A. M., descended to the river over a *sanga* immediately below the village; the *sanga*, or rather the stream, was seventeen paces wide, or about forty feet; near the banks of the stream the turf was very thick and short, and delightful to walk on. About two miles came to a small village; five or six houses, (Mápari,) close to which the gooseberry was growing, of which there were two species, one with a smooth stalk, the other rough and bristly; saw no currant bushes.* The rocks, clay slate and greywacke, with a good many masses and fragments of quartz, and as I approached the village of Páchoo, the rock became of a reddish brown clay on the weather surface, but grey in the fracture; many of the fragments contained ore in some quantity; all the fragments and masses have descended from the height above. There are two villages called Páchoo† on either side of a large stream which comes down from the direction of

Specimens
76 to 89.

Nundee Debee,‡ and which are crossed on a small *sanga*. There are six or eight mowas§ in the first, and ten or twelve in the second, (which I was told paid forty rupees a year to Bijjee Sing.) These villages|| are about three miles below Melum. Arrived at Melum at 4h. 45m. P. M., stopped a good while on the road.¶ Recrossed the Gooree immediately below Melum, which is situated in an open spot of ground of some extent on the opposite side. At about half a mile runs in a N. E. direction the Goonka, up which lies the road to the Pass; the other stream, they say, was the shortest course, being only one day's journey.

N. B.—This stream below Melum, was only thirteen paces, or about thirty-two feet across, having diminished in its breadth about eight feet. The Goonka joins it about a mile below this.

* I saw currants at Melum on the 25th May, the young fruit just out. Plants strong and flourishing.—J. A. W.

† Páchoo on the north bank is rent free in "suda-burt" tenure, for the feeding of pilgrims to Manessurouwer.—J. H. B.

‡ Gānaghur on the south, Páchoo on the north bank of Páchoo River. A fair is held here annually one day, in the rains.—J. A. W.

§ The Peak of which appears (West) magnificently grand and near; from the north bank of Páchoo River in ascending.—J. A. W.

|| "Mowasahs," or families.—J. H. B.

¶ Have a very good extent of level culturable land along the right bank of the Gooree.—J. A. W.

¶ i. e. From the N. E.—J. H. B.

Since leaving Tola, nothing like a tree has been visible, and the general aspect of the country is consequently very barren. A very unpleasant strong southerly wind blew all day, and seems to be the prevailing wind here, as the open parts or fronts of the houses here have generally a northern aspect. There is a high mountain at the back of the village, which separates the two streams, which defends it perhaps from the northerly winds, and on either side the mountains descend within a quarter or half a mile, and the only opening is to the south.

The crows in this part appear to differ from the common crows; they fly in pairs, are few in number; their note resembles that of the sea-gull more than the crow,* to which in fact it bears not the slightest similitude. There are a good many of the common† blue pigeon, which fly in flocks near the villages. Saw one large snippet about half way, and passed over a good deal of swampy ground, when I expected almost to have flushed a woodcock,‡ as they are found sometimes near Almora in the winter, and descend probably from this quarter. One of our party, Mr. — purchased a sheep with five horns at the village of Boõrfër, for two rupees and twelve annas; the owner asked one rupee per horn for it.

Plants.

1. Dwarf juniper with ripe berries, (black).—2. Ditto a few, not in flower or fruit.—3. The shrub resembling the sweet-briar in fruit.—4. The gooseberry in fruit, (two species).—5. A species of barberry with leaf, not in flower or fruit.

24th *September*.—Halt 8 A. M., thermometer 37°; moist thermometer 31°. Hoar frost on the ground, sun just on Milum, (fine morning.) 12h. 20m. P. M. barometer 19.900, thermometer, moist 69° thermometer, air 66° 5', moist thermometer 42°. Bare thermometer held in the hand to the rays of the sun 69°. 12h. 45m. thermometer covered with black wool and laid on the ground in the sun rose to

* This is I believe the English chough. I saw them high up in the snow, and again about 15 miles across Oonta Dhoora; some have red, some yellow feet and beaks. The plumage is very soft, and of a deep purple black.—J. A. W.

† Far more like the wood pigeon. Black and white, and grey and white plumage. But blue pigeons are also met with even higher than Melum.—J. A. W.

‡ I constantly looked for woodcock, but never flushed one. From November to March they are (some years more than others) very abundant round Almora, Petoraghur and Lohoghaut. Fifty brace have been killed in a season by one Officer.—J. A. W.

122°. A party came in from Bhote, (or Tartary,) this forenoon, bringing with them five ponies, three jubboes* and a flock of sheep. As they approached the village, a party of musicians with tom-toms went out to meet them, and serenade them in; four of the ponies had riders, the fifth led. The party has been eighteen days coming from Gurtope. They say the snow on the Pass is mid-deep.† In the afternoon strolled up the Goree, and at the distance of a mile and half, or perhaps a little more, saw the snow-bed whence issues the Goree; it has a large high bank with a complete earthy appearance, which stretches across the valley from one range of mountains to the other, (some hundred feet,) and the river (the people say) is not seen above this; but at the distance of perhaps about four or five miles, there is a small pool of dark water which is very deep, and where the people sometimes resort to bathe, (as a religious act.) One man who accompanied me in my walk had bathed in it, but did not go deeper than his middle. To this pool of water, of forty or fifty haths or cubits in extent, the bed of snow continues uninterrupted, with an unequal surface, having numerous undulations. No water is visible beyond the pool above mentioned. There is a very small stream 2 or 300 yards on this side the snow-bed on the right bank of the river, to which the snow-bed

* The cross breed of the Thibet yak and Hill cow, pronounced jubboos.—J. H. B.

† *Extract from Lieut. Weller's Journal, May 25th, 1842.*—"I went to see the source of the Goree River, about a mile N. W. from Milum. The river comes out in a small but impetuous stream, at the foot of apparently a mass of dirt and gravel, some 300 feet high, shaped like a half moon. This is in reality a mass of dark coloured ice, (bottle green colour,) extending Westward to a great distance, and covered with stones and fragments of rock, which in fact form a succession of small hills. I went along this scene of desolation for a long space, but could not nearly reach the end. Here and there were circular and irregularly-shaped craters (as it were) from 50 to 500 feet diameter at top, and some of them 150 feet deep. The ice was frequently visible on the sides; and at the bottom was a dirty sea-green coloured pool of water apparently very deep. Into one of these craters I rolled down numerous large stones from off the edge, and in a few seconds huge masses of ice rose from below, seemingly detached by the agitation of the water. The bases of the hills on either side, and frequently far up their faces, are one succession of landslips, but from their distance I do not believe it possible that the debris in the centre of the snow-bed valley can have fallen there from the side hills. *Query?* May not a separate hill at some remote time, have been gradually reduced by landslips, the Goree River and torrents in the rains carrying down the fallen earth and stones, and reducing the mass to what we now see? Nagoo Boorha tells me, that his father (who lived to 98 years) remembered the source of the Goree nearly opposite Milum, and Nagoo himself has seen the recession of the snow-bed some 3 or 400 yards in the course of 40 years."

reached in the memory of some of the oldest men of the village, but it has gradually broken away, which may perhaps indicate some amelioration of the temperature in this quarter.—The river runs past Milum in a N. W.* direction, and towards the snow-bed nearly North.†

The man who came in from Gurtope, wore round his neck a pair of goggles,‡ made apparently of black horse hair, worn when crossing over snow. For the coarse broad cloth which is carried to the fair at Gurtope, they say they receive generally 25 rupees for the length of two breadths, which ought to be about 3 yards; allowing the cloth, which is generally the case, to be $1\frac{1}{2}$ yard wide, little more than 8 rupees per yard; but it must be of the coarsest kind, and such perhaps as is sold in Calcutta for 3 rupees per yard. The bones§ which are brought by the Bhoteahs for sale at the fair held at Bageswur, it appears they purchase at Gurtope, and consequently they are not found amongst the Himalaya, which had formerly given an interest to these productions, but which must now, if the above account prove true, cease altogether.

25th September.—Halt; employed in getting a lesson from Herbert in the use of the theodolite, and in preparing for our visit to the Oonta Dhura Pass. Herbert and Cole too unwell to accompany Conway and myself. Procured our bottle of gooseberries, which I boiled in the hopes of preserving them.

26th September.—Marched at 11h. 20m. A. M. Our own coolies having refused to proceed with us to the foot of the Pass, procured people and jubbos from the village. Our people were frightened I imagine at the exaggerated account of the Bhoteahs regarding the snow.

Crossing the Goonka on a *sanga* opposite Milum about a quarter mile distant; it is about the same breadth as the Gooree, but the body

* i. e. From the N. W.—J. H. B.

† From the North.—J. H. B.

‡ These horse hair goggles are far more cool, and they more protect the eye from the effects of snow-glare, than green or blue glass spectacles, or wire goggles.—J. H. B.

§ Fossil bones, *Bylee ke Hâr*, nearly always procurable in the Almora bazaar, and used as medicine! I am told, in a pounded state. I have rarely been able to obtain teeth or other characteristic specimens. The bones are chiefly those of ruminants, and are found in the hills immediately adjacent to the Sutlej, in the first part of its course through Thibet. The village of *Doompoo* is one chief site.—J. H. B.

of water appears greater; the level ground on which Milum stands, seems to be made up from the crumbled fragments of the neighbouring mountains; as the steep bank of about 150 feet, down which we descended to the Goonka, is composed of a large quantity of earth, in which are imbedded both rounded and irregular stones.

Ascended the river on its left bank, road passable, but not very good, the footing in some places very bad; no grass, nothing but loose earth and small masses of rock. Clay slate and grey silicious rock* in masses and fragments; the general appearance of the mountains extremely barren, precipitous, and shattered, the dip not procurable. The river in three or four places on either side is bounded by masses of earth and stones, (which are no doubt the debris of the overhanging mountains,) which rise in numerous places in sharp peaks, and are, in miniature, the resemblance of some of the more lofty points. Lying in the bed and sides of the river, are some huge masses of breccia or conglomerate.† The rock has not that general metallic appearance it assumed the two preceding marches, but I picked up some specimens with pyrites, some crystals (apparently dodecahedrons.) At about two miles from Milum, saw a few stunted birch trees.

At 2h. 28m. P. M. arrived at our ground of encampment at the mouth of a stream which runs nearly due East, called the ———? The general direction of the Goonka is from N. E., but inclining in its windings more from the North than from the East; from this however it comes from a due North direction for some distance. There are near this a few withered looking birch trees, and on the opposite side some dwarf juniper; but the general look of the country is extremely bleak and barren. The Bhoteeas who accompany us, are sleeping in the open air (with fires,) having brought no tent with them, and the *cave* being occupied by the few servants we have brought with us. The thermometer at sunset was 47°,

* A sandstone.—J. H. B.

† During a fall of snow or a thaw, the descent of stones is almost constant from the earthy precipices over head, and the whole of the Goonka glen at such times is a very dangerous route. Rain is never violent here, but whenever any falls, down come avalanches of stones. Some of the latter (as in Manson's sketch) are suspended on the top of the ravine precipices on little pointed peaks, and their appearance on an avalanche day is any thing but pleasant to the traveller underneath. See Sketch No. 4.—J. H. B.

and a very cold wind blowing, which has been the case from the time we marched; which, added to the glare from a light colored soil and clouded sky, made the march very unpleasant.

Beyond this, they say there is no firewood procurable, and that we must carry from this what we may require. The distance of to-day's march is, I should suppose, about five miles.*

We fell in with a party who were returning with borax, who said the snow in the Pass was not more than enough to cover the shoe, instead of covering half the body. The Bhoteeas with us also begin to say the ascent is very easy the greater part of the way, it being only steep towards the top, and that it is not so steep as the one we crossed between the Ráalim and Tola. They gave us a very different account when at Melum, thinking no doubt to deter us from visiting it.

27th September.—7h. 45m. A. M. ther. 41°, moist ther. 32°. Marched 9h. 10m. A. M., and reached our new ground at 12h. 33m. A. M.

Specimens distance about six miles. Found some clay slate
91 to 103. with varieties, and beds of harder rocks. The road continued along the left bank of the river, the (downward) course of which varied from N. E. to N., the general direction of the river from Melum to the Doong cave close to the junction of two streams, (one called the Ootah, E. from the Pass, which comes down from the N. W.; the other Lusser river, which seems to vary from the N. E. to the East,) is about N. N. E. The fall of the stream to-day is much greater than yesterday; saw the juniper growing a little beyond our old encampment; but soon lost all signs of vegetation, excepting when we approached the junction of the two streams, when we came to one or two open spots,† where the ground was pretty well clothed with a

* An ordinary march for a party with loaded sheep is five miles per day in the Passes, and eight or ten miles in the easier ground in Thibet.—J. H. B.

† Called "Mulla" and "Tulla" (upper and lower) "Sulong." The Booteas generally halt here either for the day, or for a few hours.—J. A. W.

Near this, I found on my way up to Doong in May 1841, in *situ*, a specimen of siliceous sandstone intersected by a vein of crystalline carbonate of lime, containing impressions of bivalve shells. As far as I can judge, the shells are terebratulæ, similar to some found by Gerrard in Chinese Tartary beyond Kunawur. This ground will be re-examined with care. Capt. Boys, 6th Cavalry, recently discovered on the range South-east of Mularee in the Neetee Pass, beautiful specimens also *in situ*, of shells, (either *Avicula* or *Pecten*) in secondary limestone. Both Doong in the Juwahir Pass and Mularee in the Neetee Pass, are considerably on the south side of the Boundary Pass. In 1837, (Vide Asiatic Society's Journal, 1838,) I stated my confident belief, that

short grass, and two species of moss (new to me) here and there under the lee of a rock.

Having been told by a man of Almorah, a Brahmin, in the morning, who had descended the Pass the day previous, that it was not more than two hours' ascent, and being anxious to return to our two sick companions at Melum, in spite of what the people who were with us said (having been deceived by them before,) we set off with the intention, if possible, of reaching far enough at all events to see where the Pass was, as we were told it was visible a little further on; but after ascending for one half hour, and no signs of its appearing, we returned much fatigued. The jubbos we had with us were unable to carry us. We slept under the *coddear*, there being no spot on which to pitch our tent; the night was very cold. The party we saw this morning, had been only ten days from Gartope, two of which they had halted. They had with them sheep laden with salt and borax, five or six ponies, and some jubbos.

28th September.—Time 5 A. M. ther. 37°, moist ther. 32°, very cold. Soon after sunset last night, thick clouds collected all round the surrounding heights, which did not disperse till the sun rose this morning.

Marched at 9h. 25m. A. M. and commenced the ascent, crossing the river over a bridge of stones, which were piled on nearly a natural bridge of rocks; at about half a mile, came to a huge bed of snow, from whence the river issued, being I suppose about twelve feet wide; the snow-bed I should think 300 feet thick, covered with fragments of rock from the neighbouring mountain. The road, if it can be so called, very bad, and in many places the footing very insecure; this snow-bed continues for about half a mile or perhaps a little more; it has numerous fissures in it, and from the edges many large icicles, three feet long, were hanging in some places. It had a regular stratified appearance, and dipped to the S. W., just the reverse of the neighbouring mountains. Now and then the stillness of the scene was disturbed by the

fossils would be found on the hither side of the Passes, in the tract of country which lies north of the Himalayan granite peaks, and the gneiss and mica slate strata; but south of Thibet, its rocks being apparently of the same secondary character as that of the oolitic (?) series in Europe, and being quite different from the great primary chain of the Himalayan peaks; the central mountains, and the tertiary strata (so rich in terrestrial fossils) of the Sub-Himalayan Ranges.—J. H. B.

falling of small fragments of rock, dislodged by the melting of the snow. After completing the ascent of the snow-bed,* saw the stream flowing over a small valley at a very placid rate, and entering the snow-bed at a similar opening to the one where it has its exit. The road continued along the base of the mountain on the left bank, all the mountains on the opposite side, being the north-face, were covered with snow to their base, as well as those at the head of the small valley which had beds of snow in the hollows, or rather glens, and from one of them the river appeared to take its course. The road continued in this direction N. W., very good for a mile and a half with very little ascent, we then turned to the N., and commenced rather a steep ascent over a mass of white siliceous rock, the debris of the mountain above. On reaching the summit, we came to another rather level piece of ground, but covered with large fragments of a darker rock and a blacker soil. We then had another ascent over the same kind of rock and soil, and on reaching the top came in sight of the Pass. A little further on, crossed two snow-beds; one, the 1st, from two to three hundred yards; the 2d, not more than sixty or seventy yards wide; it appeared in some places to be fresh snow. After crossing these, the last ascent to the Pass presented itself, and appeared easy enough, being quite free from any snow; but owing to our present elevation, we found the difficulty of ascent so great, that we were obliged to have recourse to the jaded jubbos; but finding mine quite unable to carry me up, I dismounted and made another attempt to ascend on foot, but had not taken more than six paces, before I found myself quite unable to proceed from excessive weakness in the limbs and loins. I therefore made the guide,

* At or near this point on the 28th May 1841, my own further progress to the Pass was rendered quite impossible from the depth and softness of the snow, which was falling heavily in a thick mist. It was not without great difficulty, and some danger that I got back to Doong on a jooboo's back. There also the snow was so heavy, and the appearance of the atmosphere so threatening, that the Bhooteeahs recommended an immediate flight to Milum, Doong being a very dangerous place for avalanches, and the road to Milum likely to become more and more unsafe every moment. I accordingly moved, and my whole party arrived the same day safe, but in a miserable plight, at Milum. On the 29th May 1842, Lieut. Weller found the whole route almost entirely bare of snow, and he was able to penetrate more than twelve miles beyond Oonta Dhoora to Bulcha Ghat, without difficulty. The last winter was very mild in the Himalaya, and the usual bad weather in the spring months was quite absent. In general, June and not May, is the earliest month for the opening of the Passes.— J. H. B.

who was with me, tie a cloth round under my arms, and then fastened it to the jubboo's tail, by which means I ascended to the steepest part with very tolerable fatigue, and was relieved from that insupportable weariness of the limbs.

From the top of the Pass ran a small stream of water.* Long before we reached this part of our journey, all signs of vegetation had disappeared, and here the mountain was covered with small fragments of rock, clay slate, &c. The strata of the heights to the right and left of the ascent were very much contorted in all directions. We were one hour and twenty-five minutes in accomplishing this last ascent, which we afterwards descended in twenty-five minutes.†

On reaching the summit of the Pass,‡ an immense sea of mountains lay before us, gradually diminishing in size from the N. W. to the North, in which latter direction our guide told us lay Gertope, to which place two roads led, the nearest one, by which two other ranges were to be crossed by Khyllas, the other by Doompoo, by which only one other range, in fact a continuation of the range on which the Pass is situated, was to be crossed. The people, with their sheep laden, cross these ranges in one day. The mountains to the N. W. were partially covered with snow, (and the Pass on the northern face completely

* On 29th May last, nearly the entire side of the Pass had water trickling down it.—J. A. W.

† On the 29th May last, I walked up it with ease in one hour and fifteen minutes.—J. A. W.

‡ This account as to routes and general geography is based on incorrect information. Moreover, from Oonta Dhoora no view is obtainable into Thibet, though this Pass has been usually considered the frontier of the two countries. The range visible to the North from Oonta Dhoora is Bulcha, the real termination of the Cis-Sutlej, Himalaya and the sea of mountains visible to the North-west is within, i. e. Southward of, the prolongation of the above mentioned Bulcha range to the Westward. Whenever the water from the Northern slopes of the Himalaya flows into the valley, (or rather series of plateaus divided by ravines,) through which the Sutlej takes its early course, the last range of the Himalaya may be said to be passed. Whenever, as at Neelung, beyond Gāngootree and Topeedoonga and Lufkel, beyond Oonta Dhoora, (the Juwah Pass,) the streams rising even on the North face eventually flow Southward, and join the great Cis-Himalayan rivers, that country is properly, (i. e. geographically, not geologically) within the Himalaya chain, whatever elevation may have been crossed to reach it, and, however, nominally the said chain may have previously terminated in a political frontier. Compare with Captain Manson's account that now appended from the Journal of Lieutenant Weller, Engineers, and my own observations from the crest of the Neetee Pass, published in the Asiatic Society's Journal of 1838.—J. H. B.

so and very steep,) but it gradually disappeared to the N. E. and the mountains diminished in size. No sign of vegetation was visible in any direction even with the help of a telescope.

There is a road leads from this Pass to the westward to Neetee, which, according to our account, is four days; and towards three days' journey at each alternate stage, there is a village.*

The summit of the Pass is very rounded, and in some places the strata of clay slate crops in nearly a vertical position, but dipping a little to the W. S. W. Many, indeed almost all the fragments of rock up the ascent, were very much intersected with veins of felspar.

To the Westward, were seen some very lofty snow peaks, but none were visible which were known to any of the people; which added to the circumstance of the collection of numerous thick clouds about, and the want of time, prevented my taking the bearings of any of them. There was a sharp piercing wind blowing from the South, and not the slightest shelter procurable, and it was with some difficulty that I set up the barometer, my hands being benumbed with the cold. The height of the Pass is about 17,500 feet. The barometer and thermometer being as follows:—

Time 3h. 10m. P. M., barometer 15.550, temp. of air 34°, temp. of mercury 39°, moist ther. 32°, the water freezing immediately it was exposed to the air. The thermometer covered with black wool laid on the ground, sheltered pretty well from the wind, and exposed to the sun's rays, only rose to 64°. During the greater part of the ascent my pulse did not rise above 150°, the last part of the ascent I did not time the beats. We were five hours in ascending, remained on the top about 1h. 20m., and accomplished the descent in two and half hours; the first part of the descent, about four miles, we came down in an hour, which in ascending had occupied us three, of which we halted about ten minutes near the foot of the last ascent. The jubbos we had with us, we found had had little or no food the two preceding days, which prevented their being of that use they might have been, for they are certainly fine animals for such a country, and are very sure footed. Soon after we commenced our descent, snow began to fall, but fortunately not in any quantity, although the clouds were dark and

* No names given to halting places.—J. A. W.

threatening, and we reached our quarters under the rocks at 6h. 20m. P. M., after an absence of about nine hours. Near this *oodear* on the opposite side of the river, we were told that about eight or nine years ago in this same month, two parties of Bhoteeas, with 200 or 300 sheep coming from Tartary were lost in a snow storm, and that at this season snow constantly falls; but they say there has been very little snow the last two years.

N. B. Learnt that the fossil bones* which are brought by the Bhoteeas for sale at Bageswur, are not found in the Himalaya, but purchased by them at Gertope. Neither are the Saligrams† found among them, but are brought from the same place. On our return towards Munsaree, picked up specimens of the latter, and some quartz crystals on the top of the peaks above Saeru, which had been left as offerings by travellers, and which may possibly account for those found in a Pass to the westward by the Gerards.

29th September.—At the Doong *oodear*, time 10h. 35m. A. M., barometer 18.190, temp. of air 44° 5', mercury 45°, moist ther. 34°.

N. B. Water boiled at 185° of Far. Marched at about 1h. 20m. A. M., and reached Milum a little before 6 P. M., but stopped for some time on the road, sketching and picking up specimens, the road nearly one continued descent, and on numerous places the footing very precarious; the descent being much more difficult than the ascent in that respect, but of course not nearly so fatiguing. Found our invalids very little improved, and very anxious to leave Milum, and resolved marching back towards Munsaree the following day.

30th September.—Milum. Marched 12 A. M., and arrived at the village of ——— about 6 P. M., but loitered a good deal on the road; the road pretty good, excepting immediately below Pachoo, when after crossing a small *sanga* over a stream which comes down from the direction of Nundee Debee, there is a very difficult steep ascent for some hundred feet, composed of earth and

* In regard to the fossil bones, this observation is quite correct, but not so in regard to the shells.

† Vide preceding geological note.—Ammonites are plentiful, and were found by me three miles beyond the Neetee Pass, with their usual accompaniment of belemnites. Lieutenant Weller found at Lufkel, beyond the Juwahir Pass, vast quantities of these fossils, all in situ in black clay slate with limestone.—J. H. B.

stones. In one part, observed signs of stratification, and on examining it closely, found it consisted of fine earth, alternating with beds of small gravel, but quite safe.

Found fragments of granite* and gneiss in the bed of the stream. The general formation to-day continues to be clay slate. Purchased several fine Tartar sheep for one rupee eight annas to one rupee twelve annas each; they are beautiful animals, and have very fine wool.

1st October.—Marched at 12 A. M. and arrived at Luspa at 3h. 20m.

Specimens P. M., road very indifferent. Formation, clay slate
111 and 112. as we approached Luspa. There was a very steep ascent from the river, the width of which is very much increased, as I could not throw a stone across it. A little before we came to Luspa, the road passed under some very lofty and precipitous rocks, a perfect wall for some distance, where a slip had occurred about four years ago; the footing in some places rather bad. A little beyond this, came suddenly on a fine open space or valley, up which, at about half a mile, is situated the village of Luspa on a rising piece of ground.

Vegetation† has been rapidly increasing every step we took from the village of Reelkote, and the whole face of the country is losing the barren and naked appearance of the upper part of the valley.

2d October.—Ther. 9° 45', barometer 20.035, air 55°, moist ther. 46°. Marched at 12 A. M., arrived at Bodar, (on the right bank of the Gooree, no valley); at 5h. 30m. P. M. moved very slowly, distance from ten to eleven miles, road execrable, crossed the river twice, once over a large *sanga*, and recrossed over four small ones, more like ladders thrown

* The higher peaks hereabouts are all of granite and gneiss; soon after, below Luspa, these rocks become the exclusive formation, and the Tartaric series are left behind.—J. H. B.

† Nothing can be more striking than the passage from the extreme barrenness of the upper Passes to the gorgeous vegetation of the lower, where first the birch and dwarf rhododendron, then the ragha firs and yews, then sycamores, horse chesnuts, oaks, alders, box, &c., and then all these intermixed with the most rich under-wood and innumerable flowers in turn delight the eye. To a Thibetan all these things are novelties, a willow being the only tree larger than a juniper bush, which he has ever seen. The Lama of Toling, when a refugee at *Almora*, where the country is bleak from want of trees, though fertile, said, "Ah! *this* is a proper country like my own. The tree forests between this and the Snowy Pass are very *bad* indeed, and spoil the scenery!"—J. H. B.

from rock to rock, where the river has a very great fall a little below a very lofty precipice, and where the whole mountain forms a complete wall from the summit to its base, which is washed by the stream: besides the ladders across the stream, there were several others along the road, which would have been impassable without them. Passed snowbeds, one with a very singular appearance, having a complete archway through which a stream passed which fell from a great height over a steep precipice immediately behind it; the front part of the arch had melted away. Below Luspa, about a mile near the bed of the Gooree, large blocks of granite. Formation to Boodur, gneiss with granite veins.

3rd October.—9h. 45m. A. M. barometer 22.545, air 64° mercury 65° 5', moist ther. 57°. Marched at 11h. 20m. A. M. Arrived at Rarra at 3h. 45m. P. M., stopped about an hour or so on the road to sketch; road very bad over rocks and ladders. General direction of river, N. Gneiss the whole way, no granite blocks beyond the commencement of the march. Trees of various kinds growing, day warm, found white pantaloons pleasant. Rarra* lies about half an hour's ascent up the mountain after crossing a small torrent over a *sanga*, which comes from the West, and which has a precipitous fall. The fall† of the Gooree is also great, and I regret I was unable to ascertain the fall from Boodur, owing to the man with the barometer having preceded me some distance.

Passed numerous parties of Bhoteeahs on their road to Munsaree, with sheep and goats laden with salt and borax. They were halted near this, and started about the middle of the night, and kept up such an incessant noise, as to keep me awake nearly all night.‡ Heavy showers of rain fell during the evening, and early part of this night. Formation gneiss.

4th October.—Fine morning and cold wind blowing; 8 A. M. ther.

* The waterfalls up the Barra glen are some of the grandest in the hills.—J. H. B.

† Near Boodur, or more properly Bugdoar, the fall of the Gooree is tremendous, in some spots at the rate of not less than 800 feet per mile. The Aluknunda in some parts of the road to Buddrinath has an ascertained fall of 650 feet in a mile, and the descent of the Mundakinee river, below Kedarnath, is one continuous cataract for about two miles. Such are the Himalayan torrents.—J. H. B.

‡ The sheep and goats cannot travel in the day time after the sun becomes hot; hence these night marches.—J. H. B.

54° 5'. Marched at 10h 18m. A. M. Arrived at the top of the Pass* at 11h. 12m. A. M. ascent tolerably easy, but slippery in many places, in consequence of the rain and the flocks of sheep which had Passed over it; ascended the whole without being obliged to stop to take breath. Pulse never exceeding 140 in a minute, nor the number of inspirations 32 ther., 11h. 30m. A. M. barometer 21.645, air 62° 5', mercury 64°, moist ther. 57°.

A very little below the Pass, tried the heating power of the sun on the thermometer exposed from 12 A. M. to 12h. 15m. P. M., the one with the black wool rose to 125°, the plain one without it to 95°; they were laid on a book with red leather cover, the bulbs being about an inch above it, sheltered from the little air that was stirring by two tin boxes, the sun shining on one, by which of course some heat was reflected on the thermometers. A slight cloud passed over, which put a stop to the experiment; however, they rose very little the last five minutes. Arrived at our old encamping ground on the bank of the Saëen, near its junction with the Gooree, at 3h. 45m. P. M., descent very long and tedious, the first part very steep† down numerous flights of steps; the road lying in many places just round the brow of the mountain, overhanging the stream below. The whole road composed of gneiss, little or no granite observed. Numerous and various trees growing on the northern face of the mountain, the point to which the strata dip.

Passed numerous parties of Bhotecas halted on the road, either on their way to, or returning from Milum, mostly the former, their sheep laden with grain. Our party had received for the salt they carried down four measures of *dhan*, (rice in the husk,) for one of salt and two of wheat.

* Hurdol or Leepoo-ke-than.—J. H. B.

† The Hurdol Pass separates Upper or Mulla, from Lower or Tulla, Juwahir, and is the most difficult mountain to cross which I have ever seen. The banks of the Gooree are so steep, that the road cannot keep near the river, and this Pass becomes unavoidable. To a person ascending from the South, while loaded sheep are descending the steps, the danger of being 'extinguished' by the fall of a rock on his head, is imminent. A pony belonging to one of my party, being alarmed by the sheep, started and fell over the precipice, and was dashed to pieces. It took a man one hour and a half to walk down to the spot where the poor animal lay! The man went for the saddle, but the article had no longer form, and scarcely, material, and his labor was lost.—J. H. B.

Picked up on the top of the Pass various specimens of Saligrams, which had been left as offerings by the Bhotecas and others on their way to and fro. A little rain fell in the afternoon, and it continued very cloudy the whole evening. Fell in with a party from the neighbourhood of Leah Thull, carrying up grain, &c. for sale. They say they receive a measure of salt for one of rice. On enquiring of two Bhoteca lads of the village of Luspa, who were with me, learnt that the usual rate of exchange throughout all the villages in Upper Jowahir, (or Bhotec as some call it,) is one measure (or quoin) of rice, two of wheat, three of attah, and three of barley for one of salt. Now we purchased the latter articles at the rate of sixteen seers of eighty-four sicca weight for one rupee.

5th October.—Marched at 7h. 10m. A. M., and arrived at the village of Jult, the residence of the Bhotecas in Milum in Munsaree; the ascent from the river is very steep and rocky, and not rideable for more than a few hundred yards. Arrived at the village at 10h. 15m. A. M. It contains some of the best houses I have seen,* much superior to those at Milum, or in any of the villages in Upper Jowahir. The people here when we were encamped at Kantee, about one and half mile off on our way up, refused to give us any supplies or coolies, and said they would not obey a dozen purwanahs of the Judge's, should he send them, which was the cause of our now encamping at this village, which is somewhat out of our way. The day since noon has been cloudy, and some heavy showers of rain have fallen. Passed within the distance of a mile this morning about 700 sheep and goats on their way to Milum, and I suppose as many more passed me before I commenced counting. The sheep used for carriage are bred in Dhanpoor and Gurhwal, and are small. The large Tartar sheep is not so employed, not being capable, I imagine, of bearing the heat; for I have observed that a flock of these sheep we have with me, during the last two days, appear to suffer very much from the change of temperature.

6th October.—(Jult.) A halt, time 11h. 35m. A. M., barometer 24.065, air 72°, mercury 72°, moist ther. 63°.

* Jult, Gorpata, Looring, Duratee, &c. contain not only the best houses in Jowahir, but excel in size and appearance the greater part of the Almorah houses, and are decidedly the most substantial and handsome villages in the whole hills from the Sutlej to the Kales. The wood-work and the masonry are both admirably carved in the principal houses.—J. H. B.

1h. 15m. P. M. ther. 74° 5', moist ther. 64°.

3h. 50m. „ „ 73° „ 64°.

5h. 50m. „ „ 70° 5' „ 62°.

7th October.—Marched at 7h. 40m. A. M., breakfasted about two-thirds up the ascent, and reached the Kalee Moondee Pass in forty minutes from thence, in all two and half hours from Jult. Kalee Moondee Pass, time 1h. 30m. P. M., barometer 21.725, air 70°, mercury 81° 5', ther. moistened with milk, (no water procurable,) 63°, ther. (black wool) in the sun 123° 5'; reached our tents in one and a quarter of an hour from the Pass, pitched near a beautiful waterfall,* at the foot of which was a fine pool of water beautifully clear and deep enough to bathe and swim in, the centre of it being upwards of six feet deep; jungle very thick the whole way down the descent. Observed a new variety of pitcher plant; in all I have seen on the range six varieties, one yellow, one large white, one small ditto, one large pink, one small ditto spotted, and one blue.

On approaching the Pass, the rock changed from gneiss to mica slate, which rock continued some way down, and it then changed to gneiss with beds of white talc slate. Ther. 60° at about 6h. 30m. P. M., evening cold, dew beginning to fall; a few clouds, no shelter for our servants and coolies. Observed the raspberry plant, (the one with runners) near the waterfall, and the blue cowslip† or oxlip growing without the usual long footstalk.

8th October.—6 A. M. ther. 51° 5'. Marched at 6h. 50m. A. M., and reached the top of the ascent in forty minutes; road very bad, unable to ride over any part of it. Gneiss white talc slate, and at the summit mica slate. A little on the descent, gneiss again; descent very steep, and road bad. Arrived at the village of Gheergaon in one hour and fifty-five minutes, whole distance completed in two and three-quarters of an hour; several small villages in this neighbourhood. This Pass‡ is somewhat higher than the one we crossed yesterday.

9th October.—Fine morning. Marched 7h. 8m. A. M., arrived at Kantee, (the cypress village,) at 9h. 30m., on the road 2h. 20m.,

* Ayar Panee.—J. H. B.

† *Primula purpurea*.

‡ Called Betoola Ghatee.

road pretty good along the course of the stream, which falls into the Ramgunga at Teejum. Rock near Geergaon, gneiss; a little below, the white talcky rock,* and limestone with blocks of gneiss.

10th October.—Marched at 6h. 40m. A. M., fine morning. At the *Sanga*† a little below Ramarree, ther. 9° 40' A. M., barometer 26.595, air 65°, mercury 69°, moist ther. 61° 5'. Road to the *Sanga* generally very good along the side of the stream; a few places very bad for the ponies, ascent to Ramarree very steep, occupied only half an hour. Arrived at Ramarree at 10h. 30m., halted nearly an hour on the road, which would make the marching distance about three hours; rock generally limestone. The cheer tree‡ first made its appearance near the junction of the Jukkeela, N. with the Ramgunga.

11th October.—6 A. M. ther. 55° 5', moist ther. 52°, fine morning. Marched 6h. 20m. A. M., arrived at Sania 10h. 40m. A. M., halted on the road about half an hour, time in marching 3h. 50m., ascent (steep) of half an hour from Ramarree, descent thirty-five minutes to stream, which falls into the stream Muhgaree, from thence to the Pass along

the side of the stream which we crossed four or five times, occupied 1h. 50m.; rock limestone, (silicious). The high Pass above the village of Punneales is called —? Time 9h. 25m. A. M., barometer 23.685, mercury 75°, air 59° 5', moist ther. 54° 5'. Stopped about twenty minutes, and reached Sama in about one hour; rock limestone, some with talc. Up the ascent a good deal of jungle, and some parts of the road very slippery; on the descent to Sama, hills bare of trees.—5h. 10m. P. M. slight shock of an earthquake, accompanied by a noise like thunder (pretty loud,) no clouds visible, sound appeared to travel from East to West.—5h. 25m. P. M., moist ther. 56°, ther. 62° 5'. Sama is a very pretty place, with some very fine horse chesnut trees; the houses are scattered; the *Pardas* and people very attentive.

12th October.—6 A. M. ther. 53° 5', moist ther. 49°. Marched at 6h. 30m. A. M. Arrived opposite Nakoree in an hour, at Bureth in

* Talcose limestone, with the dip of the strata remarkably distinct, (steep and to N.E. generally) is the prevailing formation of the Kaleemondoe Range.—J. H. B.

† Over the Ramgunga river.—Here the travellers entered the Pergunnah of Dampoor and left Juwahir.—J. H. B.

‡ Common pine —J. H. B.

two, and at our breakfasting ground in 2h. 47m. Road along the side of the stream,* which we crossed ten or twelve times. At Nakoree, there is another stream which joins the one from Sama. Rock generally a species of limestone, with conglomerate and very frangible; another rock nearly black,† which breaks into numerous small angular fragments. At 12 A. M. in the tent ther. 79°, cool breeze blowing. 2h. 30m. P. M. marched, sun rather hot, arrived at Kubkote at 4h. 15m., road good generally, forded the river,‡ stream wide, but not deeper than half way up the thigh; encamped on a fine level spot near the bank, some little way below the houses.

13th October.—6h. 10m. A. M. ther. 49°, moist ther. 48°. Marched about 6h. 30m. A. M., thick fog in many parts of the valley, road along the right bank of the stream pretty good for some distance; did not overtake our servants, who had gone on with our breakfast things till about 12 o'clock; before reaching them, crossed a stream which comes down from Lumcholee; the ford rapid and bad, the bottom being very uneven, the depth about up to the middle. Marched again about 3 P. M., and arrived at Bagesur§ at about 4h. 45m. P. M. On the road to-day, about seven and a quarter hours. The river at Bagesur barely fordable in one part, being up to the chin of the people, whom I saw passing; current not very strong.

14th October.—Marched about 6h. 50m. A. M., and arrived at about 9h. 45m. at our tents at the foot of the flight of steps, road very good, the first steep ascent occupied only forty minutes. Marched from thence in the afternoon to Suttralee, about two hours march; a bad ascent on the road has been much improved, since we last passed it, by a native, who has made an excellent road rideable all the way. Found it very difficult to procure any supplies from the village of Suttralee

N. B.—Suttralee is the name of the *valley*.

* The Baiputtee river.

† A kind of clay slate.—J. H. B.

‡ Surjoo river.

§ Bagesur is the mart at which the Bhootees winter, and where the fairs are held for the sale of Thibetan, and Hill and Plain merchandize. It is a sacred place, being situated at the junction of the Goomtee and Surjoo river. In the hot weather and rains, the climate of the Bagesur valley is unhealthy, and the place is deserted.—J. H. B.

15th October.—Marched at 6h. 50m. A. M., and arrived at Jak-by-toolee at 9h. 20m. A. M. To the foot of the ascent is nearly four miles, we were rather more than a half an hour in reaching the top of it, without halting, the descent occupied about half an hour also; marched at one o'clock, and arrived at Almora at 4h. 20m. P. M. Distance from Jak-by-toolee between ten and eleven miles; total distance to Sattralee from sixteen to seventeen miles, but road good from the top of Kalee Muth* to our house, one hour and twenty-five minutes, distance full five miles.

* The high peak at the Northern extremity of the Almora ridge.

On the Wool of the Bactrian, or two-humped Camel, (CAMELUS BACTRIANUS,) being a Copy of an unpublished Paper forwarded to the Royal Asiatic Society of London. By Capt. THOMAS HUTTON.

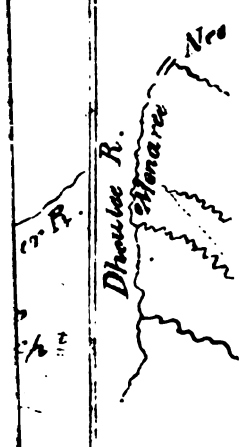
SIR,—Having lately seen a letter from Captain Arthur Conolly, regarding some specimens of wools obtained in Armenia and Koordistan, I do myself the honour to transmit samples of the “hair and wool procurable from the two-humped, or Bactrian Camel.”*

The animal is so thickly clothed during winter with this wool, and its quality appears to me so much superior to most of those shewn to me by Captain Conolly, that I should expect the article, if imported, to form a valuable commodity in the European markets. Of this, however, you will be better able to judge than I am.

I shall do myself the pleasure to preface my remarks on this article, by a few observations on the animal from which it is obtained.

“The Bactrian Camel,” as it is termed, is an inhabitant of the Kuzzack country among the Steppes of Tartary, beyond Bokhara, which, judging from the thick warm coat provided by nature for the animal's protection and comfort, must be subject to great severity of climate during the winter season. At Candahar, the animal sometimes arrives with kafilahs of merchants, and is termed “Bagdad-i,” *i. e.* “of” or “from Bagdad,” but on enquiry I find, that it does not occur

* Specimens of this wool are in the Museum of the Asiatic Society of Bengal.—Ed.



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Pass
N.

Snowed from which
Rider rises

Oonta R.

Lusser R.

Camp
27 Sep^r

5 Miles
S.W.

E
Sankor R.

Encamped 26
Sep^r

5 Miles
S.W.
Coonka R.

Melum

Glaciers

Gorie R.

Pachco

Ganaghur or Pachco

Mapan

Boorpa

Nunderja R.

Murtolee

Gorie R.

Jola

N^o 2

Cap^s Mansons and M^r Bullens Sketch of
The Route

Needee pass
Dhulee R.
Shonari

Tippee Deonga
Bulcha
Oonta Dhoora

Deorg
Lusser R.

Sankor R.

Melum

Coonka R.

Dharmua Pass

N^o 1

Sketch by Lieut^t Weller of the
Country and passes from Melum
to Oonta Dhoora and Bulcha

N.

N^o 3

Jakkula R.

Mungurh.

Birhtee

Fine Waterfall

Bullah.

Bumrarie

Dumpa

Poorloom

Sajeuna

Ootah

Ghienee

Der

Chergerie R.

Ghirgaon.

N^o 4. Stones on Peaks in the Coonka Glen
Cap^s Mansons Sketch.



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N. 3.

Eye Sketch of Melum
by Cap^s Mansons
and M^r Bullen

N^o 3

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