

ART. II.—*Journal of a trip through Kunawur, Hungrung, and Spiti, undertaken in the year 1838, under the patronage of the Asiatic Society of Bengal, for the purpose of determining the geological formation of those districts.*—By THOMAS HUTTON, Lieut., 37th Regt. N. I. Assistant Surveyor to the Agra Division.

PART I.

Towards the close of the year 1837, a proposal was made to the Asiatic Society of Bengal, to undertake, with their patronage and assistance, an expedition into the Spiti Valley, where the late Dr. Gerard, some years since discovered the fossil exuvixæ of marine mollusca; but which interesting discovery was never followed up by a close examination of the geological formation in which they occurred.

The proposal meeting with the approbation of the Society, I proceeded with as little delay as possible to Simla, whence in a few days having completed my arrangements, and procured all necessaries for the journey, I started on the 14th of May, 1838.

So many travellers have at various times passed over the first four stages of my journey, and the appearance and productions of the country from Simla to Kotgurh have been so often described, that it would be tedious to repeat the information already published; and I shall therefore pass over the four first stages of my trip and commence my notes from the military post of Kotgurh, where I arrived on the 19th of May.

Here previous to starting for Kunawur, I received a visit from a vuzeer of the Bussaher Rajah, who, at the kind suggestion of Colonel Tapp, the Political Agent, furnished me with some information regarding my route, and also sent with me one of his Churriahs or Chupprassees, to accompany me as far as Spiti, in order to procure provisions for my followers, and to give any assistance which his knowledge of the people and their different dialects would enable him to furnish.

From Kotgurh, the road winds down a steep and somewhat sudden descent of about four thousand feet to the bank of the Sutledge, along which it continues, with an occasional moderate ascent and descent, to the village of Dutnuggur, which is generally the first stage towards Rampore.

To avoid as much as possible the heat of the march, which along the bed of the river is little inferior to that of the provinces, I took the

pugdundee, or village road across the brow of the hill, by the village of Logo, where iron is procured, which is also a nearer route than by the descent to Kaypoo. A walk of about three miles and a half brought me gradually down to the Sutledge, where the thermometer which at Kotgurh at sunrise stood at 54° , now rose at ten o'clock A.M. to 98° ; this sudden change of climate from temperate to torrid was by no means an agreeable transition to a pedestrian traveller, with more than half his march still before him. Passing the village of Neert or Neertnuggur, a few miles farther on brought me to Dutnuggur, and the end of my day's journey, right glad to seek a rest and a shelter from the burning sun, beneath the grateful shade of a large burgut tree.

The presence of this beautiful tree is of itself sufficient to stamp the character of the climate of Dutnuggur, and looking around we find along with it the peepul, the bukkiné, the pomegranate, and the plantain, with many shrubs abundant in the hot provinces of India. All these, with the exception of the burgut, are indigenous to the soil, but that noble tree was long since brought from the plains by some traveller now many years dead and gone, and the date even of its arrival is now alike forgotten with the name of him who brought it.

Beneath the shade of its spreading branches I pitched my tent, and amused myself until the arrival of my baggage, with watching the parrots and minas as they threw down in showers the red fruit with which the tree was loaded; even in this delightful shelter the thermometer stood at 92° , while in the sun it rose to 120° at 12 o'clock.

Those who have figured to themselves the valley of the Sutledge to consist of a large river winding beautifully through a broad and fertile vale, well cultivated and studded with habitations and villages, will feel a degree of disappointment and surprise, on finding it in reality to be no more than a steep and rugged mountain glen of unusual grandeur, with a broad and rapid torrent roaring and foaming as it rushes impetuously along the bottom over the fragments of rock, which everywhere strew its bed, causing its waters to curl and rise in waves, which hurl the white spray on high, and give to the surface of the stream the appearance of a ruffled sea.

Broad and fertile valley there is none, but in its place are frowning hills rising high on either side from the water's edge, clothed, and that scantily, with tufts of grass and shrubs, while near their ragged crests are scattered dark groves of bristling pines, giving to the scene an air of stern and bold magnificence, which cannot fail to impress the traveller with an idea that some vast and more than usual agent has been the means of stamping the landscape with unwonted grandeurs.

The banks and bed of the river are thickly strewed with rolled and water-worn fragments of every size, from the pebble to the mass of many pounds in weight, and seemingly brought down from great distances, as many of them evidently belong to formations which do not occur in these lower parts.

Boulders of quartz of gypsum, hornblende and mica slates, porphyritic gneiss, sienite and sand stones, are heaped together in confusion along the river's course, while here and there above the stream are vast beds of the same rolled stones embedded in clay and debris. These are situated solely at the lower part of the valley, commencing a little above Rampore, and increasing in magnitude from thence downwards; they are chiefly, if not altogether, situated at those places where the river takes a rapid turn, and have evidently been thrown up or deposited in the back current or still waters of the deep floods, which must have brought down the sediment and stones of which they are composed. These vast deposits of alluvial matter are horizontal, or rather preserve the line of level of the river, and upon their wide and flattened surface the traveller is pleased to see a rich and smiling cultivation. These beds are sometimes far from each other, at other places they extend along both banks of the river, by the action of whose current they have evidently been severed. Upon such are the villages of Neert, Dutnuggur, Kaypoo, and many others on both banks built, and surrounded by a beautiful and luxuriant vegetation.

Rivers of the present day are known to accumulate and deposit large beds of sand and other debris in the eddies or back waters which they make when winding through rocks or strata of unequal hardness, but these deposits of the Sutledge are not the gradual accumulations of months and years, but from their massiveness and the enormous blocks or boulders which they contain, must evidently owe their origin to a larger body of water than is now supplied even in the rainy season; they must owe their origin to some vast and perhaps oft-repeated floods from the upper parts of the district, such as the sudden outpouring or bursting of some extensive lake, which has brought down and deposited vast fragments of rocks, whose true site is situated many miles from the deposits which now contain them, and which tower up for two and even four hundred feet above the river's present level.

To state here the causes from which these beds have sprung would be to anticipate, and we shall see as we travel onwards into Spiti, that a solution is presented in the appearances which that valley exhibits.

Towards evening, the clouds began to gather thick and heavily, and

thunder growled nearer and nearer, preceded by a gale of wind that nearly tore my tent away. The rain came drifting up the valley, and curiously, but very civilly, kept the opposite bank of the river to where I was encamped, shrouding the mountains from my sight as it passed along, without even giving me a sprinkling.

The harvest had commenced at Dutnuggur as also at Kotgurh, and the sickle was in the field. In some instances the reaper and the plough were at work on the same ground, the one preparing the soil for the second crop, almost as soon as the other could gather in the first one. The first crop here consists, as in all these lower parts, of barley, wheat, poppies, and some minor grains, which are ripe in the months of May and June, when the fields are again made ready and sown with the autumn crop.

On the morning of the 21st, I resumed my pilgrimage by a good broad road along the left bank of the river, and a walk of nine miles brought me to Rampore, the capital of Bussaher.

After leaving Dutnuggur, there is scarcely any cultivation on the left bank of the Sutledge, owing to the rocks rising more abruptly from the stream, between which and their own base there is sometimes little more breadth than what is occupied by the road; at Rampore, although the town stands upon a broad flat at a turn of the river, there is no cultivation, except a few gardens in which the burgut again appears.

This place is therefore strictly speaking a manufacturing town, where those of its inhabitants who are not engaged in travelling with grain into Ludak and Chinese Tartary, are employed in the manufacture of pushmeena chuddurs, which are made from the under wool of the Tartar goats, called by the people "pushm" whence the word "pushmeena". These chudders or shawls are sold according to their quality and texture at from fourteen to twenty-five rupees each.

Rampore is also the winter residence of the Rajah, and is selected on account of the mildness of its climate at that season. To avoid the great heat which it experiences in summer, he usually repairs with his court to Sarahun, which from its greater elevation is free from such intense heat as is felt at Rampore, whose elevation is only 3,400 feet above the sea, while Sarahun is rather more than 7,000 feet, or about the height of Simla.

It is here that in the beginning of November the great fair is held, which draws together the people from the upper hills to barter the produce of those elevated tracts for that of the lower hills and plains. Here may be seen commingled in one grotesque assemblage the Tar-

tars of Hungrung, of Spiti, of Ludak and Chinese Tartary, with the inhabitants of Kunawur, of the lower hills and plains, and sometimes also with those of Europe.

Among these different tribes little or perhaps no money is exchanged, but the dealer in tobacco or grain offers to the seller of wool or woollen cloths an equivalent quantity of merchandise for that which he requires, and thus in a very short time the produce of either country or district has changed masters.

The greatest good humour and mirth prevails at this periodical "gathering of the clans," and few quarrels occur. Should two dealers however happen to fall out, or, as sometimes occurs, should the wine cup have been used too freely and broken heads ensue, the Rajah levies on the disturbers of the peace a fine according to the circumstances of the delinquents, which is paid in anything they may possess, whether money, sheep, or merchandise.

At this season the articles brought into the market from the upper hills, are blankets and sooklat from Lubrung, Khanum, Soongnum, and other places in upper Kunawur;—raisins, neozas, cummin seed, sheep, goats, and ghee from the lower parts;—chowrees, birmore, pushm wool, byangee wool, silver and gold dust in small quantities, borax and salt, numdahs, &c., from Ludak and different parts of Tartary.

These are exchanged for opium, celestial barley and wheat, tobacco, iron, butter, ghee, treacle or ghoor, linen cloths, brass pots, &c. all of which meet with a ready and profitable sale in the upper parts of the country.

Within the last three or four years, the traders from Ludak have purchased opium, which they did not take previously. Ghee is not purchased for Ludak or Tartary, but butter is taken instead, and forms a great ingredient in the mess, which they make of tea and flour, and which forms their food, as the chupattee or bannock does that of the low country people. It is purchased at Rampore at about eight seers for the rupee, and sells again in Tartary at four and five seers, so that cent per cent is no uncommon profit on this one article. Tobacco is also in great demand, and always brings a good profit to the trader.

Of the different articles manufactured in the upper parts, I shall again have occasion to revert in speaking of the several places where they are made, and I shall therefore pass on to the Rajah and his court, ere I take leave of the capital, and plunge into the woods and forests of Runawur. The Rajah is an ugly, common looking fellow, of about thirty years of age, and is of the Chuttree caste of Hindoos.

He is married, but has no legitimate offspring to succeed him, although he has a son and a daughter by some mistress or frail damsel, who doubtless, like a highland lassie of the olden time, would have thought it a crime to refuse the laird anything in her power to bestow. Should he die and leave no legitimate heir to succeed him, his territories will fall to the British Government.

He has three chief vuzeers who manage the affairs of his territories, and who in time of war would take command of his forces, as it is contrary to the custom of the country for the Rajah to do so in person. These three are equal in rank, and their office is hereditary.

Below them are several inferior officers also called vuzeers, whose office is not hereditary, but who are elected or rather nominated by the Rajah annually, and they seem to be thannadars of different pergunnahs; among this class is Puttee Kaur, Dr. Gerard's friend, who has lately been appointed vuzeer of Hungrung. The personal attendants or immediate household of the Rajah, consists of two sets of men called Churriahs, and Hazrees.

The Churriah derives his name from part of his duty being to carry the Churree, or silver stick, on occasions of ceremony before the Rajah. His duties are chiefly those of a Chupprasee, and he is sent into different pergunnahs to collect the revenue, to report any misconduct, and to see that the people are equitably assessed, that is, to point out who may be taxed more heavily, and who should be excused,—and in fact, to ferret out and report to the Rajah the conduct and circumstances of all his subjects.

Those who are smart, and acquit themselves to the satisfaction of their chief in this system of espionage, are usually high in favour, and receive occasional substantial presents in token of his approbation, while those who are lukewarm, lazy, or who are wanting in tact, get nothing but their trouble, for the Rajah gives no pay to his servants, their services on the contrary being compulsory.

The Churriahs form a body of from sixty to eighty men, never exceeding the one or falling short of the other number; they have three officers who, in the language of the country, are called "Pulsur," "Buttoong-gee," and "Naigee," answering to Soobadar, Jemedar, and Burkundauze. They are exempt from military service, and remain with the Rajah. They are drawn from the district of Kunawur, and are compelled to obey summons, unless it graciously pleases his Highness to excuse them, in which case however he takes good care to exact a fine for their non-attendance.

Some wisdom is shown in the selection of this body, as none are

taken but men in easy circumstances, who possess either lands or flocks, the Rajah rightly thinking that those who are well off, will be more likely to keep a sharp eye on the discontented or troublesome characters, than those who have all to gain, and nothing to lose. He has also the satisfaction of reflecting that in case of misconduct they possess the means of paying a heavy fine.

The Hazrees are a larger body of men than the Churriahs, and they sometimes perform the same duties, but in general they act as Chowkeydars or guards to the Rajah, being distributed round his camp or his palace by night, in a chain of sentries. They consist of one hundred and forty men, and have one officer called a "Gooldar"

Of their number, however, no more than forty or fifty of the smartest are required to be in attendance; the others are suffered to remain at home. They are fighting men, and in time of war would join the forces.

There is no standing army or any regular soldiery since the British Government extended its protection to Bussaher, and even before that time it resembled an half-armed mob, rather than a military force, having no uniform, and each man being armed according to circumstances, some with matchlocks, some with swords, and others who possessed neither, arming themselves with sticks and branches of trees.

This rabble was commanded by the three vuzeeers if the enemy was in force, or by two or one according to the exigency or trifling nature of the disturbance.

The Rajah pays a tribute of 15,000 rupees annually to the British Government, which is levied in coin on the inhabitants according to their circumstances, some paying two annas, others four annas, and onwards to ten rupees, which is not exceeded except by the three vuzeeers who pay twelve rupees each annually.

The amount of private revenue which the Rajah himself derives from Bussaher is very uncertain, and cannot be fully ascertained as it is paid in kind, consisting of lambs and kids, blankets, and other manufactures, wool, neozas, raisins, and rice from Chooara, across the Burenda pass, which is I believe the only grain he receives. If the season be bad and the flocks are sickly, or the young ones die, that portion of the revenue is excused for that year, and so likewise if the fruits or crops fail, so that his revenue varies according to the goodness or unfavourableness of the seasons. It may perhaps be roughly computed at from fifty to fifty-five thousand rupees annually.

For crimes and misdemeanours, fines are levied according to the

nature of the offence and the circumstances of the offending parties, these fines though nominally amounting to a certain number of rupees are always levied in goods.

Thus when the village of Junggee in Kunawur neglected to furnish me with coolies to carry my baggage, the Rajah ordered a fine of one hundred rupees to be levied on the inhabitants, which was to be realised in anything they had to give. The same punishment would have been inflicted on the Churriah who accompanied me to Spiti, had he refused to go. When the Rajah ordered him to prepare for the journey, he was on his way to Simla, to be present at his master's interview with the Governor General, and having already been in Spiti he felt no desire to return to it, consequently he declined going, and offered to pay a fine of five rupees if the Rajah would excuse him and appoint somebody else; but the Rajah turning to him said,—No, no, if you disobey my orders I shall not ask for five rupees, but make you pay one hundred. This was enough, for bad as was the prospect of a journey into the dreary district of Spiti, far worse for the Churriah would have been the infliction of such a fine, and he therefore departed without another word.

From Rampore to Gowra, the next stage is a long and fatiguing ascent all the way. The road winds up the side of a very steep hill, and is strewn with blocks of stone, so thickly in some places as to resemble the bed of a torrent rather than the high road between the Rajah's summer and winter residence.

The first part of the ascent is over a nearly bare hill, but the scenery improves farther on, and the way is cheered by the occurrence of a scattered forest of oaks, mulberries, rhododendron, and the "Pinus excelsa" or Cheel. From the crest of the ascent, a pretty view is obtained of the surrounding country; a small amphitheatre is spread beneath, the foreground consisting of gradually sloping hills shelving away towards the river, which winds along unseen below. This slope was studded over with the bright hue of the ripening crops, while round them rose thickly wooded hills, backed in their turn by the dazzling splendour of the snowy range.

From the brow of this hill the road dips suddenly down again into a thickly wooded dell, from whence it rises on the opposite side to the village of Gowra. Thinking to avoid this second ascent, I followed a bye path through the forest, and a precious scramble I had of it. The soil was so thoroughly impregnated with decomposing chlorite, that it was with some difficulty I could manage to keep upon my feet, from the greasy saponaceous nature of the rock; and when at last I

reached the stream at the bottom of the glen, from which the road again ascended, I found that the pugdundee I had chosen to follow led along the side of a hill which was daily yielding to the weather, and falling down in masses, which left a nearly perpendicular mural cliff to scramble up. Hands and knees were in some places necessary in order to avoid slipping back again, and this by the greatest exertion. We passed over some masses which the weather had detached, and which were actually tottering to their fall, and were hanging almost by nothing over the deep glen below. On my return to this place, two months and a half afterwards, in the rains, these masses had all been hurled down, and their fragments were scattered in the bed of the stream ; yet another pathway had been made by the villagers to save a mile or two, and it is doubtless doomed, like its predecessors, to fall at no distance of time into the glen. This time I preferred the steepness of the road, to the wet and slippery pugdundee. We managed however to get over safe enough, and my people gave me Job's comfort, by telling me there were far worse roads ahead ! Save me, thought I from bye paths in future, and I felt by no means inclined to exclaim with the courtier in *Bombastes*, "Short cut or long, to me is all the same !"

Gowra is a small village, and contains but few houses. It is situated far above the Sutledge, which winds along unseen in the depths below, and the hoarse roar of its turbid waters is even scarcely heard. Here were apples, apricots, mulberries, and citrons bearing fruit, and the barley was nearly all carried from the fields.

In the woods around the village plenty of game is found, such as the monal, college pheasant, black partridge, and chikore. At this place I halted on the 22nd of May, and the next morning after a walk of an hour and a half arrived at a small village called Mujowlee, where I again encamped, as the rest of the way to Sarahun, which is the proper march, was all up hill, and had I attempted it, my baggage and tent would not have arrived until night, and I should have got no dinner into the bargain, which to a traveller in such a country is by no means either pleasant or comfortable. The road from Gowra to Mujowlee is very good indeed, and vies in some places with those of Simla ; it lies through very pretty woods of oak, firs, mulberry, and many others common to the lower hills ; the wild dog-rose with its snowy flowers, spreading over the tops of the underwood or climbing high into some tall oak, was in abundance, and almost every villager had a thick roll or necklace of the flowers hung round his neck, or stuck in a bunch on one side of his bonnet. •

From Mujowlee we descended into a steep khud or glen, at the bottom of which by a frail and ricketty sangho of twigs, which is continually carried away by the rise of the waters, we crossed a stream which runs down and joins the Sutledge about a mile or two lower. From this we toiled up a long and steep ascent on the side of a hill, very prettily wooded with oaks, firs, horse chesnuts, walnuts, peaches, apricots and bukkines, intermingled with the raspberry, blackberry, and white dog-rose. The number of fine mulberry trees which for the last few marches had every where occurred near villages, led me to inquire if the silk-worm was known to the people, and if so, why they did not import and cultivate it. Such an insect it seemed had been heard of, but nobody appeared to know what it was like, nor had any one ever thought of introducing it to the hills; and the reply was, "We are hill people, what do we know of silk-worms?"

Nevertheless I see no reason why the insect should not thrive well in these villages along the Sutledge, where the summer enjoys a warmth unknown to Europe, and where the winter is certainly not so severe as in our native land. Food for the insect is in abundance, and is at present useless. At Simla, in the summer of 1837, I saw many caterpillars of a species of silk-worm feeding on a mulberry tree, in a garden there, which shows that very little care would cause it to become an useful article of trade in the lower hills. It is indeed very probable that the insect does already occur in the places I have alluded to, although it is at present unknown to the inhabitants, who are too busily employed in the cultivation of their fields to bestow a thought on "Entomology!"

Were the insect introduced, and the people instructed in its management, which could be easily done by sending skilful hands from the plains, I have no doubt, from conversations which I held with them on the subject, that they would gladly give their attention to its cultivation; but the introduction of it must be made by those who are in some authority, as the people themselves are far too poor to run the risk of expense which any experiment might entail upon them.

After gaining the summit of the ascent from Mujowlee we leave the pergunnah of Dussow, and drop over the frontier ridge of the district of Kunawur, arriving by a short and gradual descent at the town of Sarahun.

This is the usual summer residence of the Bussaher Rajah, who flies from the heat of his capital in the month of May, and returns again in time for the annual fair of November.

The elevation of Sarahun is about 7,300 feet above the sea, and it

is situated in a beautifully wooded recess or amphitheatre formed by the hills advancing round it in a semicircle behind ; while in front they slope down in the direction of the Sutledge, from which again on the opposite bank rise the dark and usually barren hills of Kooloo.

The heights all round were in the month of May still deeply covered with snow, which however does not remain, but melts away as the rainy season sets in.

The village of Sarahun, for it cannot be called a town, has a shabby and ruinous appearance, and except at the season when the Rajah honors it with his presence, is nearly deserted. It boasts of no manufactures. At the time of my arrival the Rajah had gone to Simla to wait upon the Governor General, and having on this occasion drawn around him his retainers, the place was left with scarcely an inhabitant, except a few old women and children.

Journeying onwards from Sarahun, the road was at first tolerably level and easy, but after a mile or two it changed to a steep ascent over stones of all sizes, and sometimes overhanging the khud at places where the weight of snows had caused the whole to slip down, and where a plank or the trunk of a tree had been thrown across the gap to supply the deficiency.

The whole way was however very pretty and well wooded, and we crossed two or three streams which came rushing down from the snows on the heights, to join the Sutledge below us. One of these streams at eleven A. M. had a temperature of 45°, while the air at the same time was at 89°. From the ridge of the hill we descended for some way through a beautiful forest, in which at last, after a walk of eight good miles, we encamped at noon, surrounded by oaks, rhododendra, walnuts, horse chesnuts, apricots and mulberries ; many of the horse chesnuts were magnificent trees, and covered with their conical bunches of flowers, which with the scarlet blossoms of the rhododendron arboreum, gave a pleasing effect to the surrounding scenery. In one part of the forest we found vast beds of a large flag iris in full bloom, and quite distinct from the small species which I saw on my way to the Burrenda pass in 1836. It is not perhaps generally known that the fruit of the horse chesnut produces a beautiful and permanent dye, and as it may be procured in some abundance in the hills, the following recipe, taken from the Saturday Magazine, may not be unacceptable to those who residing in the hills, may wish to avail themselves of the produce of the country.

“ The whole fruit of the horse chesnut cut in pieces when about the size of a small gooseberry, and steeped in cold soft water, with as much

soap as will tinge the water of a whitish colour, produces a dye like anotta; the husks only, in the same manner with cold water and soap, produce a dye more or less bright according to the age of the husk. Both are permanent and will dye silk or cotton, as much of the liquor as will run clear being poured off when sufficiently dark."

During the past night at Sarahun we experienced some heavy showers of rain, accompanied by thunder and lightning which cooled the air, and gave us a delightful day to travel in. Many of the heights which before had begun to look black from the melting of the snows, were now again completely covered with a sheet of dazzling whiteness. The day continued cloudy with some heavy showers in the afternoon, and snow appeared to be falling heavily over all the neighbouring peaks.

Several flocks of sheep and goats passed our encampment during the day, on their way from Rampore to the upper parts of Kunawur; each animal was laden with flour, which is carried in small bags thrown across their backs and confined there by a crupper and band across the chest, with another under the belly, answering the purpose of a girth. Each carries according to its strength from six to twenty seers* in weight, and they form the chief beasts of burthen throughout the country, travelling ten and twelve miles daily with ease and safety over rocky parts where mules and horses could not obtain a footing.

From this encampment we continued our march, still through the forest, to the village of Tranda; the road in many places was very precipitous and rocky, and numerous rudely constructed flights of steps occurred at those places where the ascent was too abrupt and rocky to cut a road. Before climbing the last steep hill to Tranda we came to a deep glen, with a roaring torrent hurling itself along towards the Sutledge with headlong fury; over this had once been a goodly sangho bridge, composed of three trees thrown across from rock to rock, with planks of wood nailed transversely across them, but the weight of the winter snows had thrown the bridge all on one side with an awkward slope to the gulph below, and had torn half the planks away, leaving wide intervals at which there was nothing left to walk on but the round trunk of a single tree; and the dazzling foam of the waters seen beneath as the torrent rushed along, imparted to the passenger the feeling, that the crazy bridge was gliding from beneath his feet, and made it dangerous to attempt the passage. Two only of my people crossed it, and they were laughed at for their folly.

* A seer is 2 lbs.

A flock of sheep arriving while we were deliberating on the best method of crossing the stream, decided our plans at once. It was impossible for even these sure footed animals, laden as they were, to cross in safety, at least their owners would not run the risk; and in a short time therefore young trees were felled and placed across a narrower part of the stream, and covered over with bundles of twigs laid on transversely. Over this the sheep led the way unhesitatingly, and we followed in their wake. From this we climbed the ghat to Tranda, where I encamped amidst a forest of majestic Kaloo pines. From Tranda I proceeded to Nachar, a pretty walk of about eight miles, some parts being steep and rugged. The road at first ascended for a short distance, and then turning round the hill brought us to a steep descent, down which it fell somewhat abruptly in a zigzag manner to the bottom of a wooded glen. In many parts it wound backwards and forwards so suddenly, from the steepness of the hill, that on looking upwards it was no pleasant object to behold the long train of my baggage coolies slowly winding downwards in a zigzag line above my head, and while thus standing below the crazy looking scaffolding, which in many places formed the road, I could not help thinking to myself, "If those fellows with their loads should chance to come tumbling through, how terribly they would spoil the crown of a certain gentleman's hat,"—and the feeling made me hasten on to avoid the fancied, but not improbable danger.

Nachar is a small village situated at some height above the Sutledge, on the slope of the left bank. The thick forests and rocky glens from this place downwards to Sarahun, may be deemed the head quarters of the *Gooral* and *Thar* antelopes, the latter being known here by the name of "*Eimoo*." Thèr, and black and red bears are also met with, the first and last inhabiting the higher and colder portions of the range.

Bears are not found generally throughout Kunawur until the season when the grasses are ripening, and it then becomes a matter of great difficulty to prevent the vineyards being robbed at night.

Large dogs and men at this season keep nightly watch, making a continued shouting and firing of matchlocks to keep off the invader. They also commit sad havoc in the autumn crop of phuppra. At other times they are said to retire to the higher parts of the forests, where they lie concealed among the deep caves of the rocks, feeding on various roots and acorns. The Thibet bear is abundant on the heights above Nachar, as also the red variety. Here they are both said to attack and kill sheep and goats, and they are often such a

nuisance that it is considered a feather in a man's cap to shoot one. The elder brother of the Churria who accompanied me to Spiti had killed no less than fifteen bears, and was looked upon as a Nimrod in consequence.

The red variety is said to differ in nothing from the common black or Thibet species, except that it is red while the other is black. Both are said to possess the white band across the breast, but that it is constant in neither. I strongly suspect that subsequent research will prove that there are at least *two* if not *three* distinct species in these hills, namely, the Thibet bear, the red bear, and another black species without the white crescent on the breast, of smaller size and greater ferocity.

The natives say, both black and red live together in the same haunts, and that when both come down to feed at night in the vallies, the red one does not always return to the heights, but remains in the lower haunts of the black bear. If this statement be correct it would argue a greater difference in the species than that of colour, for why should climate act on some and not on all, since all are in turn found equally near the snows. If colour were the only difference, then the red one by staying in the haunts of the black bear would resume his former colour, and the black one by going to the heights would become red; but as this is said not to be the case, and that both black and red can reside together either high or low, it goes far to prove a specific distinction; the red bear is however found chiefly near the summits of the ridges, while the black one inhabits the lower and more wooded tracts in the thick forests of oak, where they feed upon the acorns and other fruits. Both species in the autumn make nightly incursions into the fields of phuppra, which they destroy in quantities, and they also in the summer approach the villages and steal the apricots.

In the winter time when food is scarce they are said to tear down the wooden hives, which are built into the walls of the houses, and to devour the honey, nor is this the extent of their plundering, for they have been known to force open the door of the sheep house, and run away with the fattest of the flock. A lad who accompanied me, hearing the questions I asked regarding these animals, very gravely declared that when the bee-hives were too high to be reached from the ground, the bears went to the forest and brought a long pole, which they planted against the wall and used as a ladder! We all laughed at this thumping fib, which was evidently made for the occasion, but he only persisted in it the more, and at last swore that he had seen them do so!!

Some are said to store their dens with grass and herbs, in which they keep themselves warm during the prevalence of the snows; others select the hollow trunk of some large decaying tree in which they form a similar warm bed. This however I look upon as a fable. There are not many about Cheenee and Punggee, and above those places they are not founded; the greatest numbers therefore inhabit the lower parts of Kunawur.

During the winter in those parts where the Emoo, the Gooral, and the Thér are found, it is the custom when the snow has fallen somewhat deeply, so that the animals cannot avail themselves of their natural speed, for parties of eight and ten men to assemble with their matchlocks and sally forth to the chace, guarding their legs from the snow by two pairs of woollen trowsers, and a warm thick pair of woollen shoes. He who is lucky enough to get first shot at the quarry is entitled by the rules of the Kunawur sporting clubs, provided he has fired with effect, to the skin of the animal, and the rest of the party share equally of the flesh, whether they have had a shot or not. The skin is the most valuable part of the prize, and out of it many useful articles are made, such as soles for their shoes, bags to carry grain and flour, and belts, &c. so that to get the first shot at the game is not only as much a point of honour as getting the brush in a fox hunt at home, but is also a source of profit to the lucky sportsman.

The bear is not held in much dread by the people of Kunawur, for in the season when they have young ones parties go forth to the chace with a few dogs and armed only with heavy *sticks*. When a bear with cubs is unkennelled by the dogs she at first makes off in great alarm, but as the dogs soon overtake and keep the cubs at bay until the huntsmen come up, she retraces her steps and wages war in defence of her young. Some skill and agility are now required by the hunters to avoid a hug, and at the same time to administer some weighty blows over the animal's head and snout, until having received a hearty cudgelling from the party, she once more makes off after her cubs, who have profited by the delay to get well ahead. The dogs however again overtake them, and again and again the poor mother returns to defend them, and receives a thrashing, until tired and exhausted she secures her own escape and leaves her offspring in the hunter's hands. Bears and leopards are sometimes killed by constructing an immense bow, charged with one or more arrows. A bait is placed to entice the animals, and connected with the bow string in such a manner that when seized the arrows are discharged into the animal's body, and with such force as often to pierce

it through and through. The skins are cured and sold at a rupee and two rupees each to the Tartars and Lamas, who take them to the upper districts and dispose of them at a profit, or make them into shoes, &c; opposite to Nachar, on the Kooloo side, the wild dog is also said to be abundant, but so difficult is it to get a sight of the animal that the natives never go in quest of it, and indeed they have such a fear of it that even if they found one, they would not fire, as they say if only wounded the whole pack turn upon the hunter and destroy him. In this there is doubtless much exaggeration, but nevertheless the idea, however erroneous, is sufficient to deter the shikarre from the chace. These dogs are also found in the forests of Chooara, where, hunting in packs, they destroy deer and other game; even the leopard and the bear are said to fly before them, and will not remain in the same jungles. They also attack the flocks, and commit great havoc. I heard of an instance where a shepherd lay in wait for their coming, armed with a matchlock, with which, from the shelter of his hut, he intended to shoot or scare them away from his fold, which they had on a former night attacked. Alas, however, for the weakness of human resolves, no sooner did the pack arrive than the shepherd's courage vanished, and like that of Bob Acres in the Rivals, fairly oozed out at the palms of his hands, and he was afraid to fire; for said he, very prudently, "Who knows if I only wound one but that they may pull down my house and attack me; no, no, let them eat their mutton in peace;" and so in truth they did, for the next morning the coward found twenty-five sheep killed and mangled by his midnight visitors. This animal is also said to exist in Chinese Tartary, and is called "Chungkoo."

It is in the forests of these lower hills, that the various beautiful species of the pheasant tribe are found, and none but the Chikore and gigantic partridge are seen in the upper portions of Kunawur.

On the 28th of May I left Nachar and travelled for a mile or two over a capital road, descending to the Sutledge, which I crossed by the Wangtoo bridge. This although dignified with the name of a bridge, is in truth no more than a good broad sangho; it is constructed entirely of wood, and consists of three or more long trunks of trees thrown across the river, the ends resting on buttresses of stone masonry, and supported by three rows of projecting beams or slanting piles. On these buttresses stand two covered gateways through which the bridge is entered on from either side; across the trees, are nailed planks of wood, and the sides were formerly protected by a slight railing, though it has now almost entirely disappeared.

The space of the sangho is the breadth of the river, or eighty feet, and its height from the water, which I measured with a plummet, was fifty-seven feet.

In former years before the invasion of Kunawur by the Goorkhas, a good bridge existed here, but it was broken down by the inhabitants of the districts, to cut off the communication across the river and check the advance of the enemy. It was never afterwards rebuilt, until the time of Capt. Kennedy, when the present sangho was thrown across.

According to accounts received from the natives, the present bridge was built by them, and Captain Kennedy on the part of Government furnished the means, to the amount of two thousand rupees. Others say that it was built at the suggestion of Capt. P. Gerard, when stationed as commercial agent at Kotgurh, with the view of facilitating the communication with Chinese Tartary and the upper portions of Kunawur, as the fleece of the Choomoortee sheep, called byangee wool, was then in demand, and purchased for the British Government.

The glen is at this point very narrow, and confined by the dark rocks of gneiss rising up abruptly on either side, and affording merely space sufficient for the bed of the river. Beneath the bridge the river rushes like a sluice, and has such a deafening roar that the voice of a person speaking on it is scarcely heard. From this, a short quarter of a mile brought us to the Wungur river, which runs down from the Kooloo side to join the Sutledge a little above the Wangtoo bridge; we crossed its stream by another sangho, and then addressed ourselves to climb the hill, which rose above us to the height of 2000 feet.

Up this ascent we toiled in a temperature of 98° over a road strewn thickly with the sharp cutting fragments of gneiss and granite, and wearied with the heat and fatigue of climbing in a midday sun. We felt vexed and disheartened on arriving at the top, to find that our labour had been all in vain, for on the opposite side of the hill the road again dipped down to the very edge of the Sutledge, while far away in the distance we could see a second long ascent to be travelled up ere we could find shelter and refreshment at the village of Churgong. The heat and length of this day's march were very painful, as the road often lay along the very brink of the river, the glare from whose waters was almost insufferable, which added to the fatigue of walking, or rather scrambling over the rocks and stones that were strewn along the banks, and the hoarse incessant roar of the foaming stream, completely fagged us all, and it was late in the evening ere my tent and baggage made their appearance.

Scarcely had we arrived at the end of the march, when to add to our discomfort a heavy thunder storm suddenly broke over us, obliging us to seek shelter where we could, and soaking my bed and other things which were still far in the rear. In the evening I witnessed one of the most beautiful rainbows I had ever beheld ; the sun was just dipping to the ridges of the hills, and shining on the vapoury clouds that were floating up the valley, caused the bright colours of the rainbow to stand forth most brilliantly, one end resting on the river's brink while the wide arch was thrown across the valley and was lost beyond the snow-clad summits of the other bank.

It was nearly opposite to this village, on the left bank of the Sutledge, that the conflict took place between the Goorkhas and Kunawurrees, in which the advanced guard of the former experienced so warm a reception as to make them glad to come to terms, and a treaty was accordingly entered into, stipulating that so long as the Goorkhas refrained from entering Kunawur, a yearly tribute should be paid to them. This treaty, I believe, was never infringed, and remained in force until the expulsion of the Goorkhas from these hills by the British forces.

My people were so tired with the long march from Nachar, that they begged hard for a halt at this place : as I was anxious to push on however, and the next stage was said to be a short one, I did not comply with the request, and accordingly proceeded on the morrow to the village of Meeroo.

Nearly the whole way was up hill, and in some places steep and rugged, but it got better by degrees, until entering a forest of prickly leafed oaks it became very good and continued so, although still up hill, to the end of the march. The heat and consequent fatigue of climbing steep hills under a burning sun were almost intolerable, and I wished many a time that we were among the snows which capped the range along whose sides we were toiling. Few things are more calculated to strike the naturalist, in wandering through the grand and beautiful scenery of these stupendous hills, than the almost total absence of living creatures ; days and days he may travel on, through woods that seem to promise shelter for every various form, so diversified are the trees and plants which they produce ; yet, save the crow, or the swallow as it skims along the open grassy tracts, scarcely a living thing is met with ; all seem to shun the intermediate heights ; and while the bear and leopard, deer, and goats, flock to the higher ridges near the snow, the various species of the feathered race cling to the lower woody tracts, where sheltered and secure they rear their

young. At Meeroo the temple was adorned with about twenty pairs of horns of the sikeen and wild sheep ; the former animal is an ibex, and is said to have been once plentiful here among the snows, but of late years it has entirely disappeared from the neighbourhood. Some of the horns on the temple are of large size and were placed there by the fathers and grandfathers of the present generation, none of whom recollect seeing the living animal near the village, although there are some old men among them too. I inquired if I might take some of the horns, to which they replied with feigned astonishment, " they are presented to Devi, and who will dare to rob her temple?" I disclaimed, of course, all intention of *robbing her*, but suggested that as she had now possessed the horns for some time, she might perhaps be willing to take something else *in exchange!* To this they said, she could have no objection ; and after a little bye play among themselves, a hoary headed old sinner stepped forward and informed me that " the devil was willing to sell his horns at two rupees a pair !" I agreed to give it, but on examination it was found that the whole batch of them were worth nothing, being quite rotten and decayed from age and exposure to the elements, so I declined taking them. The wild sheep is still occasionally found on the heights above the village, and sometimes also a stray *jahgee*, or horned pheasant. I had made repeated inquiries regarding the actual existence of an unicorn in any part of the hills, but although I found many who had heard of such an animal, and believed in its existence, I could meet with no one who had ever seen it.

Here however I encountered an old man who had travelled much in the interior, and various parts of the mountains, and who declared that he had once beheld the unicorn. I was of course all attention, and on the tiptoe of delight with the idea that I should now have an opportunity of describing this long considered fabulous animal, and of ending discussion past, present, and future, as to its existence. Alas, my visions were doomed to fleet away, for after a long and close examination, in which it was necessary to listen to a rigmarole history of the old man's birth, parentage, and education, and his never ending travels into Tartary to purchase wool, which he had done regularly every summer of his life for forty years, it turned out to be nothing more than an ugly clumsy rhinoceros which he had seen in the possession of the Rajah of Gurwhal, and which he described as being like an elephant without a trunk, and having a horn on its nose.

From Meeroo we had an up hill march all the way, and crossed the first snow at a stream over which it formed an arch, so hard and solid

that it did not yield to the tread, though the sun at 10 A. M. was shining on it at a temperature of 82°, while the stream beneath was as low as 38°.

From this spot commenced a long ascent over the side of a grassy hill, strewn with sweet smelling violets and the little scarlet "pheasant's eye," and near the summit of which we encamped, being about three miles from Rogee, which is the usual stage, but being situated off the road at half a mile down the Khud, I preferred staying where I was for the night. From this place we had a good view of the Burrenda Pass which was indeed apparently only separated from us by the deep glen through which the Sutledge flows; it was still thickly covered with snow, and looked like a deep notch cut in the snowy range. The hill above our encampment was also heavily covered with snow, from which throughout the day, immense beds or avalanches, loosened by the heat of the sun, were constantly precipitated into the glen below, or falling from rock to rock with a heavy and deadened roar like distant thunder, and resembling in their course some mighty cataract. Towards evening as the sun dipped behind the range and the first chills of night were coming on, these sounds gradually died away, and the snow became once more bound up by frost. The height of my camp here was 9,897 feet, and the little lagomys and the chough were now first seen among the rocks that overhung us; here too, I once more found the purple iris, discovered in my trip to the Burrenda pass, but it had not yet put forth a single bud. On the 31st of May I continued my march towards Chini, by a good road that continued to ascend for some distance, and at length brought us to an elevation where many beautiful plants of iris were in full bloom; it was the same as that found at my last encampment, and among them was a single root bearing a pure white flower, showing modestly among the deep purple of the neighbouring plants, like a fair bride surrounded by the gay and glad attire of the bridal train.

A little farther up the ascent, at about 10,500 feet, I took some splendid specimens of a new species of *peepa*, the largest of that genus I have yet seen belonging to our Presidency. They were adhering by a thin viscous plate to the stalk of a coarse grass, growing at the roots of juniper and a species of furze bush, the latter beautifully covered with yellow flowers. The species being new to science, I have given it the name of "*Peepa kunawurensis*," from the district in which I obtained it. Here too the rhubarb was growing abundantly, and as I had now tasted no vegetables for many days, I gathered some of the stalk and had an excellent stew for my dinner.

About three miles from Chini we came to a place where the whole hill-side had slipped away into the Sutledge, forming a mural precipice of several thousand feet from its base to the summit. The rock was thus a perpendicular cliff, and the road which leads along the face of it is a mere scaffolding, somewhat resembling that used by builders against the side of a house. Looking down from this exalted station the Sutledge is seen, narrowed by the distance to a stream, as it winds along below at the perpendicular depth of 4,000 feet. This though an awkward place to look at, and somewhat like walking in the gutter of a fourteen storied house in the "gude town o' auld Reekie," is nevertheless perfectly strong and safe, and almost capable of allowing two people to walk abreast, so that unless one wishes to look below into the yawning abyss, it may be passed over without having been once seen. That it is safe, may be gathered from the fact that flocks of sheep and goats laden with attah and grain, pass over it almost daily during the summer months, as also men; in fact it is the high road in every sense of the term between Rampore and Tartary.

Much has been said and written concerning the dangers of the way, but the road, taking it on an *average*, has hitherto been *excellent*, and though here and there, from stress of weather, it is at times a little broken and perilous, yet those places are so few, and continue for such short distances, that they cannot be allowed to characterise it, or to admit of its being called dangerous or even bad.

True enough it is, that one of these bad places may be the means of breaking a man's neck if he chance to slip, but the answer to that is, that he who cannot keep his feet, or who grows giddy at the sight of the depths below, has no business to travel over "bank and brae." The road is kept in repair by the zemindars of villages, by order of the Rajah, and much credit is, I think, due to them for the manner in which they perform the task; for with very little additional care to that which is now bestowed upon it, it might vie with any of those of the lower hills, and is even now superior to them in many parts.

There is no spot, in fact, even the worst, which a man ought to turn away from, and though I would not recommend a lady to try them, I can safely say, that I have crossed many a worse place in the khuds near Simla, while in search of objects of natural history. But after all, the difficulties of a road will be always estimated according to the imagination or temperament of the traveller; for he who is accustomed to mountain scenes, or to scramble over all places as they may occur, will laugh at that from which another man would turn away; habit is a great thing even here, and that which seems

dangerous at first, becomes nothing when one is accustomed to it. Thus it may happen that others shall follow in my path and laugh at that which I have called bad or dangerous.

The scenery from Meeroo to Chini is beautifully grand and imposing, the snowy range on the left bank being spread along the whole way like a fair white sheet, and raising its ragged outline far above all vegetation, till it attains, as in the bold giant peaks of the Ruldung group overhanging Chini, an elevation of twenty-two thousand feet above the sea.

The right bank of the river presents a marked contrast to this bold and awful grandeur, the hills receding more gradually and with a less shattered look, being thickly clothed to their very summits with noble forests of pines of many species, as the Kayloo, Neoza, Spun, and Cheel.

Chini, though a tolerable sized village for the hills, has a poor and ruinous appearance about it ; it is situated in the midst of cultivation which is plentifully irrigated by streams from the snows above, which come dashing down in a sheet of foam as white as the snow beds from which they issue. Chini is rather the name applied to several small villages or hamlets scattered among the cultivation and resting on the slope of the right bank, than that of any one in particular. This is not uncommon in Kunawur, and occurs also at the next stage, where several are again comprehended under the one name of Punggee.

On the opposite side of the Sutledge, a few miles higher up its course than Chini, is situated the village of Pooree, famous for producing the best kismish raisins in Kunawur. It is also the residence of one of the vuzees, and has a *joola* of *yák's* hair ropes over the river from which a road leads up to the Burrenda pass.

On the 1st June I proceeded to Punggee, where a number of my coolies whom I had brought from Simla became alarmed at the accounts they heard people give of the scarcity and dearness of provisions in Spiti, and refused to accompany me farther. Remonstrance and advice were alike thrown away upon them, and finding that neither promises nor threats had any effect, I gave the order to the Churriah to furnish me with the necessary number. On his announcing my order to them in the Kunawur language, a most amusing scene took place ; men and women, old and young, threw themselves at once with such hearty good will upon my baggage, each scrambling for a load, that I fully expected to see half the things torn to pieces in the scuffle. After much noise and laughter each succeeded in obtaining something, and off they all trudged right merrily towards

Rarung with their burdens, joking to each other as they passed the astonished mutineers, who little expected to see me thus far from home so speedily supplied with carriage. In fact they had somewhat reckoned without their host, and thought that as I was so far advanced into the hills, they might safely dictate the terms on which they wished to be retained. Five of the number afterwards repented and followed me to the next stage, begging to be reinstated, which I granted, but fourteen others went back sulkily to Simla.

In Kunawur the women often carry quite as much as the men, and several of them marched along with apparent ease under burdens which the effeminate Simla coolies pronounced to be too heavy. One fine stout Kunawuree, whipped up in the scramble four bags of shot, amounting in weight to 56 seers, or 112 lbs, and carried them on his back the whole march, which is hilly and over the worst bye paths I ever saw, even in the hills. Two men had previously brought these same bags from Simla, and grumbled at the weight which was allotted to them, namely 28 seers each. The hardy Kunawuree demanded only two annas for his work, while the Simla men had refused to carry half the weight for three annas a day. While on this subject it may not be amiss to inquire why, since throughout Kunawur and all the neighbouring districts, the coolie demands but two annas per diem for his labour, those of Simla are allowed to refuse to take less than three? For two months and a half I had occasion to hire daily a number of these men at every stage; not one ever dreamed of asking more than a paolee, or two annas, nor was there hesitation and grumbling in lifting their allotted loads; each took his burden on his back and trudged merrily along with it to his journey's end. On returning to Kotgurh not a man would move under three annas, and all objected that the loads were too heavy, although the same had often been carried for long and fatiguing stages by the women of Kunawur. The weight allotted to each coolie is, by order, not to exceed thirty seers, but when was a coolie hired within the British rule, who did not hesitate and often refuse to carry twenty seers? They will come and lift the load, pronounce it too heavy, and walk off, and as far as I know, there is no redress for it, or at least I never heard of any one getting it. It is childish to fix a load at thirty seers and yet leave the coolies at liberty to reject half the weight if it so please them. The Kunawur coolie carries more, carries quicker, and demands less for his labour, than those within our rule; with whom the fault may lay, I do not presume to say, but it seems to me that a remedy for the evil might easily be found, by an order from

those in authority regulating the fare of a coolie to be two annas a day, marching or halting, and that any man plying as a coolie and refusing to lift a load not exceeding the regulated weight, shall be subject to punishment, or be turned out of the bazar, and not allowed to ply again. For the purpose of seeing these orders carried into effect, a coolie mate or police Chupprasee could be appointed from out of the many idle hangers on, of the Political Agent, and the coolies might be ticketed or licensed to ply. From Simla to Bhar, which is in reality but three marches, a greater imposition still exists, for no coolies will go either up or down under twelve annas, which is at the rate of four annas a day, and often the demand, when Simla is filling or people are returning to the plains, is one and even two rupees. In former days things were much better managed, for there are those still living in the hills who remember a coolie's hire to have been two annas marching, and one and a half halting. Now, however, every coolie talks of non-interference, and the rights of a British subject! and threatens you with his vakeel and a lawsuit, and many other combustibles besides.

There is perhaps no bazar in India where the European is more at the mercy of the native than in that of Simla, for there exists no Nerick of any kind, and I have heard it maintained by those in authority, "that a man may demand what he pleases for his labour or his goods;" which is in other words to say, that the native may be as exorbitant as he pleases, and the European must pay the piper!

No one can more warmly advocate the strict administration of justice between man and man, than I do, whatever be his colour, whatever be his situation in life; but it appears to me by no means either just or necessary to uphold the native on all occasions, or to consider the European as always in fault. Such a system tends materially to lower the dignity of the British character without in the least increasing the popularity of him who adopts it, for the shrewd native is ever willing to join with the European in the cry, "'Tis a very bad bird that befouls its own nest!"

But to return,—“The high road across the ghats from Punggee to Leepee being impassable from the depth of snow in which it was buried, I was obliged to change my route and proceed by a lower and more circuitous road to Rarung. On leaving the main road, we followed a byepath which dipped so suddenly and abruptly down the glen that it was with the greatest difficulty we could keep from sliding down the slope, so slippery was the ground from moisture and from the pine leaves strewed around. In some places indeed a single false step, or a

fall on the back, would have sent the unfortunate flying down into the foaming torrent below, at a rate as rapid as that of a slider on a "Russian mountain." We managed however, with much care and fatigue, to get slowly and safely to the bottom, where we crossed the river (which was furnished by the snows above) on a broken sangho, formed merely of four spars laid close together, and rendered slippery by the spray which was continually dashing over it. From this we again ascended by a road not many shades better than the one by which we had just come down, and it continued thus the whole way to Rarung.

We had also to cross many smaller snow streams, which being without sangho or stepping stones, obliged us *nolens volens* to walk through them, sometimes nearly up to the knee in water, at a temperature of 38°, or only 6 degrees above the freezing point! It was indeed anything but agreeable, for we felt as if our legs were being cut off, and I vowed *coute qui coute* to cross the ghats on my return, whether they were blocked with snow or not. The forest all along this march was composed of Kayloo and Neoza pines. These names are only applied by the inhabitants of the lower hills and plains, the trees being known in Kunawur as the "Kelmung," and the "Kee," and the fruit or edible seed of the latter is alone called "Neoza."

From Rarung we had rather a better road than yesterday, but still bad, being chiefly over sharp blocks of granite and gneiss. This day we encamped at Jung-gee, and again proceeded on the morning of the 4th of June towards Leepee. The hills on the road from Punggee to Leepee have a shattered and decomposing aspect, vast masses being annually brought down by the action of the frost and snow, leaving in some parts high mural cliffs rising perpendicularly above the path to eight hundred and a thousand feet, while at their base is stretched a wide field of disjointed fragments of every size mixed up with beds of sand, decomposing mica slates, and felspar. These slope more or less gradually down to the river's edge, often at two and three thousand feet lower than the base of the cliffs. If a snow stream happens to descend near these accumulations, its waters are turned upon them by artificial drains, and in a few short months the former barren waste is seen to smile with young vineyards and rich crops of barley. But if, on the other hand, as too often happens, there is no stream near, the sands are left barren and dry along the river's course, sometimes increasing from fresh supplies from above, at others partially swept away by the force of the river when swollen by the melting snows in June and July. In the descent of these falling masses

whole acres are sometimes ploughed up, and the trees of the forest are crushed or uprooted by the rocky avalanche, more completely than if the axe had cleared the way for cultivation. This devastation is chiefly caused by the alternations of heat and frost ;—the power of the sun during the day acting on the beds of snow, causes innumerable streams to percolate through the cracks and crevices of the rocks and earth, which being frozen again during the frosts of night, cause by expansion the splitting of the granite into blocks, which being loosened by the heat of the following day from the earth which had tended to support them, come thundering down with fearful rapidity and irresistible weight through the forests which clothe the mountain's sides. After proceeding somewhat more than half way to Leepee, my guide, whose thoughts were " wool gathering," very wisely took the wrong road, and led me down a steep glen, at the bottom of which had once been a sangho across the stream, and the road from it was a somewhat nearer route to Leepee ; but alas ! when we arrived at the bottom the torrent had washed away the bridge, and although we might have forded the stream, we learned from some shepherds that it would be labour lost, as the road up the opposite side of the glen had given way and followed the bridge down the stream, so that it was impassable. In this dilemma we had nothing left for it, but to reascend on the side we were on, and the shepherds gave us some comfort, by saying we need only climb up a little way, when we should find a path. To work we went accordingly, setting our faces to the hill with a willingness that did not last very long, for we found that the short way of a Kunawurree was something like the " mile and a bittock" of bonnie old Scotland, " aye the langer, the farther we went."

This was truly the steepest hill-side I had ever encountered. Without the vestige of a path or any track, up we toiled, now grasping by the rock, and now by the roots of shrubs or tufts of grass, until at last it got so bad that we could scarcely proceed at all, partly owing to the steepness, and partly to the slippery nature of the pine leaves which thickly covered the soil. At several places the first up was obliged to let down a rope or a part of his dress to assist the others up. After a time, however, as we approached the top of the hill, and when well nigh exhausted with fatigue and heat, the ascent became more easy, and at last we debouched from the forest of pines upon a large open, swampy tract, immediately below the snows, which supplied water for a hundred rills, studded with a small yellow flowered ranunculus that I have some recollection of having seen in

similar situations in Europe. There were here many plants familiar to me, as the strawberry, the little pheasant's eye, the mare's tail, and a plant in search of which many of us in our boyish days have wandered through the fields of old England, in order to feed our rabbits, it is known, if I forget not, by the name of "queen of the meadows," or "meadow sweet," and grows abundantly, as it does here, by the side of ditches and brooks. The currant, wild rose, and dwarf willow were plentiful also, especially the latter, for which the swampy nature of the ground was particularly genial and adapted. Here we at length found the path for which we had so long toiled in vain, and now when found, as often elsewhere happens, it was not worth the trouble it had cost, being but a mere sheep track along the side of a decomposing and crumbling hill, where the footing was as insecure as well could be, and where the prospect below was inevitable death to the unfortunate who should misplace his foot or lose his balance. Time and care however took us safely to Leepee, where I was right glad to find my tent pitched; and as the Himalayan ibex or sikeen was said to be found in the neighbourhood, I determined to make it an excuse for halting a day or two. This measure had moreover become somewhat necessary, for the toil and fatigue of climbing over such broken and rugged paths as we had travelled for the last three or four days, in the heat of the noonday sun, when the thermometer generally indicated a temperature exceeding 95° , had brought on so severe a pain in my right side, that often I found it absolutely necessary to lie down for awhile on the ground, until it had somewhat abated. This, added to a severe cold, caught from the necessity we were sometimes under, of wading when profusely heated with walking, nearly knee-deep through several streams, whose waters having only recently left the beds of snow above, caused the thermometer to stand at the cooling temperature of 38° , made it necessary that I should take a rest, and while doing so, I determined to dispatch men into the upper glens in search of the long wished for ibex.

On arriving at my tent I made immediate inquiries for sportsmen, or shikarrees, and heard to my dismay that the only man in the place who knew how to handle a gun, had gone "away to the mountain's brow," to sow phuppra seed for the autumn crop. Seeing my disappointment at this unexpected piece of bad news, a little dirty, half-clad urchin offered to start off to the shikarree and tell him that a "Sahib" had arrived, which news would of itself be sufficient to bring him down. I asked how far he had to go, and when he would be back? to which he replied, "It is eight miles going and coming, but

we'll be here by sunset! At this time it was one o'clock in the day, and the first four miles were up a hill that appeared in the distance to be almost inaccessible to anything but the ibex itself, yet the hardy little mountaineer was true to his word, and returned before sunset with his friend the hunter. He was a black-faced, short, square-built fellow, with scarcely any perceptible eyes, so shaded were they by his bushy projecting eyebrows, and high cheek bones. He was well clad in woollen clothes, and round his waist was fastened a brass chain, from which was suspended a steel, a powder flask, and a long sharp knife. He was a hardy looking fellow, and from his frank and easy manner evidently one who could boldly look danger in the face, and who knew how to meet it like a man. He was as keen and anxious for a brush with the ibex, as I was to obtain one, so that powder and balls being furnished, he declared his readiness to start by break of day. As to my attempting to go with him, he laughed outright at the idea, and said at once, unless I staid where I was, he would not go, for I should infallibly break my neck, and spoil his sport into the bargain.

The chase of these animals is one often attended with great danger, from the inaccessible nature of the cliffs among which they love to roam, and there are few who are hardy enough to follow it. Often the hunter is obliged to crawl on his hands and knees along some ledge of rock projecting over a glen or chasm of several thousand feet in depth, and from such a spot laying on his belly, snake-like, he draws himself along, takes aim, and fires on the unsuspecting herd. If the shot be successful, it is still a matter of much difficulty and danger to procure the quarry, from the steepness of the rocks among which it lies, and too often the last struggle of departing life causes it, when almost within the hunter's grasp, to slip off the ledge, and fall headlong with thundering crash down into the yawning gulph, a prey to the vulture and the crow. These animals are sought for chiefly for their skins, which are either sold or made into shoes, &c. and the horns are presented as an acceptable offering to the deity, and nailed upon the walls of the temples.

Matters being soon arranged, my sturdy friend departed to the hunting ground, accompanied by a shikarree whom I had brought with me from Kotgurh, promising to do his best, but saying that most likely he would get nothing, as the summer season coming on, caused the animals to retire to the last ridges of the mountains, where no man could follow them.

About sunset on the following day, my own shikarree returned

with a long and rueful countenance, and announced the unsuccessful termination of the day's sport. They had found a small herd, chiefly of females, and had each a shot, but with no other effect than that of scaring away the game, and nearly throwing the Leepee hunter over the cliff, for the English powder I had given him caused his match-lock to recoil so violently, that both were nearly taking flight to the depths below. On inquiring for my flat-faced friend, it appeared that he was ashamed to face me again empty handed, and therefore had stopped on the hill-side for the night, at a shepherd's hut, from whence in the morning he could easily repair to his sowing in the heights. I sent him next day a large clasp knife, with a message to be ready for me on my return, when I would give him a chance of retrieving his character as a shot. His son, who undertook to deliver the knife, seemed highly delighted with the present, and declared that I should have a specimen of the sikeen on my return, but alas, as will be seen hereafter, these promises were fated to be broken.

On the 6th of June I resumed my journey, somewhat recruited by the day's rest I had enjoyed, and proceeded by a steep ghat to Labrung and Khanum. Descending to these places from the summit of the pass, the road lay through a scattered forest of Neoza and Kayloo pines, intermingled here and there with the cedar of Kunawur, the first specimen of which we saw at Leepee. It appears to be a species of juniper, and sometimes attains a goodly size, though generally it is dwarfish, and crooked in the extreme. The names by which it is known in Kunawur and Hungrung are "Lewr," and "Shoor;" its wood is esteemed as incense, and offered by the Lamas to their gods. Small quantities of it are also burned to charcoal and used in the manufacture of gunpowder. The planks obtained from it are used in the construction of temples, and they are sometimes also in demand at Simla, to make boxes with. Scattered over the more open parts, were beds of juniper and tilloo (also a species of cedar used as incense) and the yellow flowering furze already seen near Chini.

After an easy march we encamped at Labrung, a small and filthy looking place, built on the edge of a shelving hill. The town of Khanum is of goodly size, and stands opposite to Labrung, the two places being merely separated by a narrow glen. In this town many Lamas reside, but at the time of my arrival the principal of them had gone to Simla in the train of the Rajah, or in other words, "the chief had put his tail on," and their presence was required to form part of it.

The season here appeared to be far behind those of the lower parts of the district, the barley being yet green and far from ripe, while

below it had long been reaped and housed. Khanum is said to produce the best sooklat, or woollen cloth, of any town in Kunawur; it is made chiefly of the byangee wool, or fleece of the Choomontee sheep, in Chinese Tartary.

From Labrung there are two roads to Soongnum, the next stage, one lying along the base of the hills, which is very bad, and merely a bye path; the other crossing the Koonung pass, which although quite practicable, was represented as being still deeply buried in snow. My people however declined attempting the heights, and preferred taking the lower road, so I started alone with the Churriah and a guide across the mountain path.

The ascent is long and steep, as may be gathered from its crest being 5,212 feet higher than our last encampment; it is however far from difficult, and the road is excellent, but unfortunately at this season we saw nothing of it above 13,000 feet, as it lay buried in the snows, which were spread in a broad white sheet over the whole range. Following the traces of a flock of sheep which some days previously had crossed the pass, we managed to do well enough without the road.

From Labrung we first ascended through a forest of Kayloo and Neoza pines, beneath which were spread vast beds of junipers and furze, with here and there a few fine currant and gooseberry bushes loaded with small green fruit, but as yet far from ripe. Farther up, these beds of junipers increased, and were intermingled with another species growing more like a bush, and the same as is known at Leepee by the name of Tilloo.

Gradually as we mounted up the hill, the pines decreased in numbers and in size, dwindling at length to dwarfish shrubs and ceasing altogether at about 12,500 feet of elevation. Here first began the snow, lying in large fields or patches, and uniting at about 13,000 feet into one broad unbroken sheet, from whence to the summit of the pass, or 1,500 feet more, it continued so. The depth generally was not great, though in some places up to the middle or even higher; where it had drifted or had been hurled down in avalanches from above, of course the depth far exceeded the stature of a man.

The only danger in crossing these fields of snow at this season, when the thaws commence, is for loaded people, for if they fall in deep or broken snow, they run a risk of either being smothered beneath the weight of their burdens, or of losing the things they carry. The fatigue however, even to us without any loads at all, was great and distressing, owing to the steepness of the latter part of the way, for the path which winds gradually to the crest being lost to sight, we were

obliged to steer for the top of the pass by a direct line upwards, and the uncertain footing we obtained in the snow, which constantly gave way beneath our feet, caused us to slide backwards down the hill for many yards before we could stop ourselves again. The sheep track too, which had hitherto been our guide, at last failed us, and we journeyed on by guess ; we had however the whole day before us, and a bright unclouded sky, so it signified little how long we took in ascending.

About 800 feet from the crest of the pass, I observed in the snow the prints of feet, which at first I thought were those of a man, but the deep holes made by long claws at last arresting my attention, I found on a closer inspection that they were the traces of a bear. Well knowing that in dangerous places the instinct of a brute will often lead him safely through difficulties where man with all his knowledge would fail, I hailed these traces as an assurance of our safety, and at once unhesitatingly committed myself to bruin's guidance ; nor was I wrong, for following his footsteps, they gradually led me beyond the snow, and were lost.

The crest of the ridge was uncovered for about 50 feet on the southern slope, and here we again found the road, which was visible just long enough to assure us that we were in the right direction for Soongnum, and then again disappeared beneath the snows on the northern side. I have often been told by shikarrees that there are two species of bears in the hills, a black one which feeds on fruits and grain, and which is the common Thibet species, (*Ursus Thibetanus*) and another of a reddish sandy colour, which is only seen on the confines of the snow ; this species is said to feed on flesh. It is curious that the traces of the bear on Koonung pass should have been exactly on the line of direction taken by the flock, whose dung being scattered occasionally on the snow shewed that they too had gone the way that we afterwards by bruin's direction followed. It would seem at least to give some colour to the assurance that this bear lives upon flesh, for from the foot of the pass on either side, that is, from 12,500 feet to its crest, which is 14,508 feet above the sea, there was not a blade of grass perceptible, and only here and there, where the snows melted or slipped away, were a few plants of a species of "Potentilla" beginning to show themselves. If then this bear lived upon vegetables, he had nothing here but the junipers and furze. It could scarcely be possible that he had scented the grain with which the sheep were laden. The Churriah who accompanied me from Rampore, and who lives near Nachar and Tranda in Kunawur, declared that the two bears were of the same species, and that both lived on flesh as well as vegetables.

often attacking the flocks and even cows during the severity of winter, and that he himself possessing flocks, knew it to his cost. In this case it is most probable that the animal had left the forest below the pass, and traced the sheep by the scent they had left on the snow.

On gaining the summit of the pass, the thermometer only indicated a temperature of 45° at 10 A. M., and a cold keen wind was blowing from the southward. From this elevated spot we looked back over the snow-clad mountains, beneath whose summits or along whose sides we had for several days been travelling.

Viewed from this height they appeared to be nearly on a level with ourselves, and wearing a look of cold and dreary solitude, which gave a sternness to the scene not altogether pleasing to behold, as one could not help experiencing a feeling of loneliness and melancholy at the thought of losing the way, or being benighted on their hoary summits. Rising conspicuously above the rest were seen the mighty Kuldun peaks, presenting in the glare of noon a dazzling whiteness that pained the eye to view; beneath this group we had encamped at Chini.

“Far as the eye could reach, or thought could roam,” all was one broad unvarying waste of snowy peaks, unbroken by a single shrub or tree, except in the depths of the darkly wooded glen, which stretched along the bottom of the pass where we were standing. Not a sound nor a rustle even caught the ear, save the rushing of the keen wind that was drifting the snow in wreath or spray before it; not a living thing was seen to stir amidst this wild and majestic scenery. All was so calm and still that it chilled one to behold it, and but for the ragged and shattered peaks around, which told of the fearful warring of the elements upon their crests, the traveller might almost suppose that the elevation had carried him beyond the strife of storms, to which this lower world is subject. It is amidst scenes like these, where words cannot be found adequately to describe the grandeur and magnificence that every where delight the eye, that man is led involuntarily to acknowledge his own comparative weakness and insignificance, and as he views the stern cold majesty of the wintry and never fading waste of snows by which he is surrounded, spite of himself his thoughts revert to Him, the impress of whose mighty hand pervades the scene, and by whose merciful care alone, he is guided safe through countless and undreamed of dangers.

From the crest of this pass, looking north-easterly, we beheld far below us, at the depth of 5,000 feet, the town of Soongnum, to attain to which we had still before us a tolerable day's journey. On making

some remark on the length of the route from Labrung to Soongnum, the guide now for the first time informed me that it was usually made in two marches, but fearing that I should feel it cold if I slept a night on the pass, he had not told me so before, least I should have halted there. Tired with the ascent, and the toil of climbing over the slippery snow, I did not feel the least grateful to him for his consideration, which I plainly saw was more on his own account than on mine; however, as revenge is sweet, I had some consolation in the thought that he had eaten nothing that day, while I had already breakfasted, and that he would consequently be preciously hungry before he reached Soongnum. However, there was now no help for it, for the baggage had gone by a different road, so onwards and downwards we must go.

From the spot where we stood, to fully two miles and a half below us, was spread one pure unbroken sheet of driven snow; beyond this for half a mile more it was broken and lying in detached masses. No vestige of a road was seen of course, until far below where the snow had ceased. There was however no danger, although the descent was somewhat steep; and the guide setting the example, we seated ourselves on the snow, gave a slight impetus at starting to set us in motion, and away we went on the wings of the wind, at a rate which seemed to the inexperienced to argue certain destruction. I had not gone very far, when I began to feel my seat rather *moist* and *chilly* from the melting of the snow, and by no means pleasant to the feeling, so I dug my heels well in, and brought myself to a stand still. Another of the party wishing to follow my example, and not sticking his heels firm enough into the snow, toppled over from the rapidity with which he was descending, and rolled away heels over head a considerable way down the hill, amidst the shouts of laughter, which we sent after him. He got up as white as a miller, with his eyes, mouth, and ears, crammed full of snow, and affording a capital representation of "Jack Frost."

Walking, although requiring some care to keep myself from falling, was far preferable to the chilly seat; and after sundry slips and slides, I succeeded, much to my satisfaction, in reaching a spot where the snow had melted away. But my situation after all was not much mended, for the cutting wind that was blowing from the pass, soon converted my moistened inexpressibles into a cake of ice, which was infinitely worse than the melting snow, and my legs and feet soon became so benumbed by the cold, that it was painful to move at all. Seating myself once more, by direction of the guide, I took off

my shoes and socks, and proceeded with a handful of snow to rub my feet and ankles, which although somewhat painful at first, soon restored them to a healthy glow, and then by jumping and fast walking backwards and forwards, I was enabled shortly to start again, and proceeded downwards by a path infinitely more dangerous than the snows we had just quitted.

Junipers and furze were the only signs of vegetation until we again entered a thin forest of pines lower down, through which we continued to descend until we crossed the Kushkolung river below by a capital sangho, and soon after arrived at Soongnum fairly fagged.

The fatigue of this double march may be readily conceived by those who have scaled the rugged sides of the hoary headed Ben Nevis of our fatherland; the height of that mountain above the sea does not exceed that of Subathoo in the lower hills, or about 4,200 feet, and its ascent and descent, if I recollect aright, occupies from $3\frac{1}{2}$ to 4 hours. Here we ascended from Labrung to the height of 5,212 feet, over snows which were incessantly giving way beneath the feet, and causing us to slip backward many paces, added to which was the glare from the sun, which tended not a little to increase our fatigue and discomfort. From the summit of the pass our descent was 5,168 feet in perpendicular height, but the sinuosities of the road made the actual distance travelled from Labrung to Soongnum at least 15 miles.

When we recollect also that from the snow to Soongnum we travelled in a temperature of nearly 90° , the fatigue of the whole march can scarcely be conceived by those who have not experienced it. Our ascent and descent each exceeded that of Ben Nevis by one thousand feet, and there are few who have performed that journey who were not right glad to get a rest and a bit of fresh salmon, (to say nothing of the whisky toddy) at the snug little inn at Fort William. We left Labrung at six o'clock in the morning; at 10 A. M. we reached the pass; from thence to the bottom of the snow occupied us till noon, when the thermometer indicated 89° , and from thence we arrived at Soongnum at half-past 2 P. M., making the whole time from Labrung to Soongnum, eight hours and a half; or allowing at least two hours for resting and looking at the scene, we performed the actual distance in six hours and a half.

The coolies who had gone round by a lower and somewhat longer road did not arrive until 5 P. M., when they begged for a halt the next day, which I readily granted, as much on my own account as theirs, for the nature of the road from the snow to Soongnum was as if all the sharpest stones in the country had been collected there.

by which not only were my shoes cut to pieces, but my feet blistered and swollen also.

On entering the town of Soongnum I was met by a son of the vuzeer, who welcomed me with a plate of raisins, and escorted me to a small bungalow of one room, built long ago by a Dr. Wilson. Shortly afterwards the vuzeer himself paid me a visit, and proved to be no less a person than the frank and honest Puttee Ram, the friend of Dr. Gerard, and the source from whence he derived much of his information regarding the higher portions of the hills towards Ladak and Chinese Tartary. He has only lately been raised to his present rank. Time has not slept with him, nor failed to produce upon his hardy and once active frame its usual effects. He is now grey and bent with age, and his sons have succeeded him in their trade with the people of Choomontee and Ladak. The old man entered at once into a history of his acquaintance with Dr. Gerard and Mr. Fraser, and talked with pride over the dangers he had encountered with the former in their rambles through Spiti and its neighbourhood. He asked me if I had ever heard his name before, and the old man's eyes actually sparkled with delight, when pointing to an account of one of Gerard's trips, I told him his name was printed there. He has not only been a great traveller through the upper hills, but has also visited Kurnal, Delhi, Hansi, and Hardwar, though like all true mountaineers he sighed for home, and saw no place in all his travels to equal his own rugged hills; and truly I commend him for his choice. He is a tall, strongly built, broad shouldered fellow, but hideously ugly, his eyelids being large and sticking out over his eyeballs like cups, beneath which his eyes are scarcely visible. He has indeed, a face as like a *mastiff's* as I ever saw one.

From him I obtained a man who understood the Tartar language, to accompany me through Spiti, and he assured me I should experience no difficulties, as there was now a road across some parts of the mountains where, as in the days when Gerard first visited those parts, there was none at all. He informed me also that the lake called Chum-mor-rareel was only four days' journey from Dunkur in Spiti, so I determined if possible to get a peep at it. On inquiring for fossils, he said that Spiti produced but few; chiefly ammonites (*Salick ram*) which were found near Dunkur, but that the best place to procure them was on the Gungtang pass, near Bekhur, but the Chinese were so jealous of strangers looking at their country, that if I went there I should not be allowed to bring any thing away. Besides this, the pass was at the present season impassable, and from the lateness and

quantity of the snow which had fallen, it could not be open before the middle of August. Hearing that the ibex was found at Koopa and at Poo,ee, in the neighbourhood of Soongnum, I again distributed powder and balls, and sent people to hunt them, telling them to have some ready by the time of my return. I made also some inquiries regarding the "excellent limestone" which Gerard says he discovered in this neighbourhood, and which the natives told him they should henceforth use in the construction of their buildings.

Puttee Ram said he recollected the circumstance I alluded to, but added that Gerard *had failed* in his attempts to convert the stone into lime. He had brought some fragments of it from the Hungrung pass behind Soongnum, and having made a small kiln, he burned the stone, but instead of producing lime it melted down into a hard slag. The experiment failed, and it has never been attempted since. At Soongnum during the winter months, the weather is sometimes very severe, the whole of the surrounding hills being enveloped in one white sheet of snow, often to the depth of several feet. The town, standing at an elevation of 9,350 feet, is completely buried during heavy falls. At such times the inhabitants assist each other in clearing their roofs from the weight of snow, which not unfrequently yield to the pressure, and are converted into a heap of ruins. To guard against the rigours of such a climate, is therefore the business of the summer months, at which season, accordingly, houses are stored with fuel and grass, and the leaves of trees are accumulated for the sheep and cattle, which are safely housed till the severity of the winter has passed away. At this season there is little, often no, communication between village and village, the inhabitants contenting themselves with clearing a track from house to house in their own villages, but not venturing beyond. This does not last, however, throughout the winter, but frequent thaws take place, succeeded by fresh falls of snow.

This description is generally applicable to all places in Kunawur, and the Churriah who accompanied me said he recollected three different years in which the snow had fallen ten feet deep, even so low down as Tranda and Nachar. At Simla, in the winter of 1835-36, the snow is said to have been upwards of five feet, and I myself saw on the 10th May, 1836, some of it still lying on the northern side of Jacko, on which Simla is built.

On the 9th of June I left Soongnum, and proceeded towards the first Tartar village of Hungo, by the Hungrung pass, which rises up behind Soongnum to the height of 14,837 feet above the sea. The road

led us up a glen by the side of a stream which had its origin as usual among the snows on the pass. The ascent although greater than that from Labrung to the Koonung ghat, was more gradual, and consequently much easier; nor had we so much snow to climb over, as at the former pass. The bushes in this glen, (for trees had ceased to grow) consisted of a great number of rose, currant, and gooseberry bushes, which yielded as we ascended higher on the mountain's side to furze and junipers. Towards the summit of the pass these were so thickly spread around, and the hill had such a gradual slope, that substituting furze for heather, the scene had much of the appearance of a Highland Muir, nor was this resemblance at all lessened when with a loud whistle up sprung before us from the covert some beautiful large partridges, whose plumage is very like that of the ptarmigan in its summer dress, being a mottled mixture of white and grey minutely pencilled on the back. These birds are known in the language of Kunawur by the name of "Bhair." They are found in abundance near the snows among the covers of furze and juniper, retiring as the season advances to the extreme heights of the mountains. They delight to perch upon some high projecting crag, from whence, surveying the country below, they send forth at intervals a loud and peculiar whistle.

On the crest of the pass, which we reached at half past 10 A. M., the wind was piercingly cold, and quite benumbed our fingers, the thermometer again standing, as at Koonung, at 45°.

The view from this spot was dreary enough; the town of Soongnum was lost sight of behind an elbow of the range, and on either side therefore nothing but cold bare hills were to be seen; neither village, cultivation, nor trees appeared to break the chilling waste of snows which spread around and far below us over every mountain's side; no signs of vegetation were to be seen, save the brown and withered looking furze, which even at this advanced season of the year had scarce put forth a single leaf.

The summit of this mountain is, as Gerard has truly stated, composed of limestone; but the reason of his failing to convert it into lime for economical purposes was apparent enough. The rock is one of those secondary limestones which contain large portions of clay and sand unequally distributed through them, sometimes occurring in detached nodules, at others disseminated through the whole. These limestones therefore from containing this foreign matter, refuse to burn into lime, but usually form a hardened slag, or vitrified mass within the kiln, which exactly corresponds with

the account given me by Puttee Ram of the results of Gerard's experiments.

Our path now again lay buried deep beneath the snows which were spread on the northern face in a sheet from the crest of the hills to many hundred yards below us. Here too, although it was both deeper and extending farther down than on Koonung pass, the gradual descent of the mountain's side made it far less fatiguing to walk over. We left the pass at eleven o'clock, and though we ran at a good jog-trot sort of a pace down the hill, it took us nearly three quarters of an hour by the watch ere we had cleared the first unbroken field of snow. Beyond this it was lying in patches, and here and there quite sloppy, so that my shoes, stockings, and half way up my legs were wetted through in a few minutes; lower down still, the water was running in deep streams from the snow, and as the track which had been dignified with the name of a road, was somewhat hollowed out on the mountain's side by the action of the feet of sheep and men, it of course formed a capital aqueduct, and accordingly a pure crystal stream ran along it, in which we were obliged to walk ankle deep (for there was no other safe footing to be had) for a couple of miles nearly, the temperature of the water being 43°, while that of the sun was burning over our heads at 90°. After about three hours walking and sliding by turns, we reached Hungo, a miserable ruinous village situated in a dreary glen at the foot of the pass, on a large and nearly flat tract of well cultivated land, at an elevation of 11,413 feet, and about 3,624 feet below the crest of the Hungrung pass. The snow was lying in a solid mass from the top of one of the glens arising from near the summit of the surrounding heights, down to within 150 feet of Hungo. This is however a most unusual occurrence at this season of the year, the snows having generally all disappeared from these heights by the beginning or middle of May, excepting in some of the deep recesses and ravines at the very summit of the range. Not a tree was to be seen, even at this elevation, except a few sickly looking poplars on the banks of a stream below the village, all of which had been planted there by the hand of man. The hills rising immediately behind this village are not however bare and barren, but are well covered with the furze already mentioned, which was just beginning to put forth its beautiful yellow flowers. Along with it was another species which until to day we had not noticed; it is smaller than the other, bears the same yellow flower, and extends to a much greater elevation; both are called "*Tama*," but the last mentioned is distinguished as "*Cheenka Tama*" or Chinese furze. The other species is termed by Gerard

“Tartaric furze,” but the name is scarcely appropriate, since the plant is equally abundant over the higher hills of Kunawur, as on those of Tartary; and from the extensive range it takes, the name of “Himalayan furze” would suit it better. Besides which the species most common to the heights of Tartary is that known to the natives as the “Chinese furze.” Both these species are cut and dried in the summer months, and form nearly the only fuel the Tartars are possessed of.

Lower down the glen, the hills assume a more desolate appearance; the furze grows scantily and at last fails altogether, leaving a bare and crumbling soil, which is annually precipitated in quantities by the action of the weather into the stream which winds its way down to join the river Lee. Over the upper part of these hills the furze is also abundant, as well as an aromatic plant, which furnishes an excellent pasturage in most of these elevated regions, where grass is either scarce or not at all procurable, to large flocks of sheep and goats, as also to the cows and yâks, which are seen sometimes, to the traveller's danger and dismay, scrambling along the whole hill-side, and hurling down stones and fragments of rocks directly on his path. It often happens too that large masses are detached by the action of the frost, and come tumbling down with a thundering crash into the glens below, rending and tearing up the soils in their descent, and scattering the fragments in volleys into the air. One of my coolies had a narrow escape from a fragment of rock, below the Hungrung pass; a mass that had hitherto been supported by the bed of snow into which it had alighted from above, was now by the thawing of the snow again let loose, and came bounding down the hill with horrid crash, until striking on a projecting crag, it was shivered into fifty fragments, one of which fell in a direct line for the coolie, who frightened at the sight, and hampered by his load, fairly stuck fast to await the coming blow. By the greatest good luck he escaped unhurt, though the stone alighting full in the kiltah on his back rolled him head over heels down the side of the hill. He soon recovered himself, however, when it was found that the only damage done was a crushed leg, not of the coolie, but of *mutton*; my provisions being in the unfortunate kiltah.

On crossing the Hungrung pass a most remarkable alteration is observable in the aspect of the country. The range on which the pass is situated forms part of the northern boundary of Kunawur, separating it from the Tartar district of Hungrung, now forming a portion of Bussaher, although evidently at some former period it has been sub-

ject to, and constituted with the Spiti district an integral part of Chinese Tartary.

The change in the nature of the country is most sudden; looking from the summit of the range in a northerly direction over Hungrung, the country is seen to wear a sad and sombre air of cheerless desolation; not a tree is to be seen, and the black and crumbling hills are either wholly barren, or clothed with nothing of larger growth than the dwarf willow and the dog-rose. The hills are chiefly of the secondary class, and being more rounded in their outline, want the grand and almost terrific beauty of the towering granitic peaks which so strongly characterises the scenery of Kunawur. Villages are situated at wide intervals from each other, and cultivation is wholly confined to the immediate vicinity of them, and usually upon a confined patch of alluvial soils, evidently the deposits of some former lakes. The practice of cultivating in steps upon the mountain's sides, appears indeed to be almost universally neglected, which however is most probably owing to the nature of the hills themselves.

On the southern side of this range lies the thickly wooded district of Kunawur, where cultivation is often carried in steps nearly to the summit of the mountains, and presenting a rich and cheerful picture which delights the eye, and imparts a feeling of joyousness and security to the traveller, as he wanders on through forests of majestic pines.

From this difference in the appearance of the two districts and their inhabitants, it would seem as if nature had elevated or interposed the Hungrung range as a barrier between two countries, destined, for some purpose, to remain distinct; and furnishes to the inquisitive a source of speculative thoughts, from which it is difficult to draw any satisfactory conclusions, for the mind is almost involuntarily led to ask while contemplating this marked contrast, *why*, on the one side the forests should be allowed to advance actually to the mountain's base, while on the other not a single tree should be allowed to grow.

From Hungo, on the morning of the 9th of June, I proceeded to Leeo, which is a small village situated on the right bank of the Sing Pho or Lee river, in a basin or valley entirely surrounded by high granitic rocks. The spot has evidently formed part of the bed of a deep lake, the different elevations of the water being still apparent in the lines of rolled stones, which are seen on the hill-side, far above the level of the river.

The bottom of the lake, now furnishes a broad and level tract of land which is well cultivated, and from its warm and sheltered situa-

tion in the bosom of the hills, is highly fertile, producing in favorable seasons two crops, consisting of wheat, celestial, beardless, and common barley, with beans and peas. Apricots too are abundant, but this is the last village towards Spiti where they occur. The elevation is however only 9,362 feet, or about that of Soongnum in Kunawur.

From Leeo, I proceeded towards Chung or Chungo, leaving the village of Nako on the heights to the right. At Leeo we crossed the Lee by a crazy and not very agreeable sangho, the planks being so far apart that the water was seen rushing along at a fearful rate beneath, dazzling the eyes with the glare of the foam, as one looked down to secure the footing; a very necessary precaution, as the bridge from the bank slopes with a disagreeable curve towards the centre. From this we ascended to about 2,000 feet above the stream, which was a steep pull up, though luckily we had a cool and cloudy day. The road, which is very rocky and leads along the left bank of the Lee, lies generally over immense beds of fragments brought down by the elements from the heights above, and after one or two moderate ascents and descents, dips suddenly down, at the distance of nine miles from Leeo to the village of Chungo.

On the 12th of June I halted at this place for the purpose of laying in several days supply of grain for my people, in case we might not be able to procure any in Spiti, which, according to accounts we had received at Soongnum and other places in Kunawur, had been plundered of every thing by Runjeet's troops, after they had expelled the Rajah of Ladak. The Tartar guide, however, who accompanied me, declared the rumour to be false, as he had lately been in Spiti and found no lack of grain, and he therefore advised me not to burden myself with more coolies, which would be necessary if I carried supplies. In order to be safe I thought it advisable to carry a few days provisions in case of emergency, and lucky it was that I did so, for without them my people would on more than one occasion have had no food at all.

Chungo is situated in a basin somewhat similar to that of Leeo, but much more extensive; it is walled in as it were on every side by lofty hills, whose sides in many places bear witness to the former presence of a lake. Large beds of clay and sand enclosing rolled and water-worn pebbles of every size occur on all sides, while the flat and level bottom of the vale again furnishes a broad tract for cultivation. The elevation of Chungo is about 9,897 feet. It was once a populous and thriving place, containing nearly one hundred people, but for some

years past it has been on the decline, and is now half in ruins and deserted by most of its former inhabitants. The reasons for this falling off are entirely attributable to local circumstances.

The soil is a mixture of clay and sand, the latter predominating, and is a deposit from the waters of the lake which once filled the valley. The whole area formerly under cultivation might probably have exceeded one and a half mile square, although at present it scarcely equals one. Celestial, beardless, and common barley, wheat, phuppra, beans, and peas, constitute the crops, and one harvest is all that is obtained; which is not to be wondered at, when we consider that on the morning of the 12th of June, at sunrise, the thermometer indicated a temperature of 35°. Snow was still lying on all the surrounding heights, and fell throughout the day on the 10th and 11th of June. In former days ere the cold soil was exhausted by the constant growth of the same crops, Chungo was at the height of its prosperity, and could even export grain to other parts, so abundant were its harvests. But alas! too soon "a change came o'er the vision of its dream," and those days are gone, now never to return.

The constant drain upon a soil naturally poor and cold, soon changes its hitherto smiling and prosperous state to one of want and poverty. The barrenness of the surrounding hills, yielding not even a scanty pasturage to sheep and cattle, at once destroyed the chance of recruiting the soil, by depriving the cultivator of the only source from whence manure might have been procured; and thus, from gathering an abundant crop, the villager was first reduced to a bare sufficiency for the wants of himself and family, and finally obliged to leave his fields untilled, and to seek employment and subsistence in a happier clime. Many have thus emigrated into Spiti, Chinese Tartary, and other places, and their once well cultivated fields now exhibit a bare and hardened sand without one blade of grass, and strewed with the fragments of rock which the weather has hurled upon them from above. Could these people command annual supplies of manure, as is the case in many parts of these hills, Chungo would possess perhaps a finer cultivation than any village in Hung-rung. In Kunawur it is a common practice to mix up leaves and the young shoots of the pine trees with the dung of cattle, and this forms a capital manure for their fields, which would otherwise, in many parts, soon become nearly as impoverished as the soil of Chungo. They have moreover in most parts of Kunawur a rotation of crops, by which the soil is recruited, whereas at Chungo, one crop, and that the same for years, is all that can be produced. This village has not a tree near

it for two or three days' journey, save the usual sickly looking poplars, which are planted on the banks of rivulets and streams ; thus they are deprived of all manure both animal and vegetable, and their lands will in consequence go on dwindling from bad to worse until the place shall become barren and deserted.

The lands which are now under cultivation are coaxed to yield a scanty crop, by the annual small quantity of wheat and barley straws which are ploughed in, and by the addition of the small portion of dung which is obtained from a few goats and cows which graze on the edges of the fields, where grass and a yellow flowering lucerne spring up abundantly along the banks of the little rills, with which the fields are irrigated.

On the 13th of June, I again proceeded towards Spiti by a road which led us up the heights above Chungo. Many places on this day's march indicated the former existence of a deep water over the hills, at a height of 2,500 and 3,000 feet above the present channel of the river, which winds along beneath. Here the road stretches along the sides of hills shelving gradually towards the stream, along whose banks are wide and extensive level plains of several miles in area, and the hills receding on either side form a wide valley, bare of every sign of vegetation save the furze, the dog-rose, and the willow, with here and there a few dwarf bushes of the cedar. Trees there are none, and villages are now not seen for many days. All around seems cold and cheerless ; not a living thing to break the deep silent melancholy which pervades the scene, and the traveller feels chilled, and his spirits flag, he knows not why, as he wanders on through the dreary and barren waste.

How marked a contrast does the scene present to the rich and wooded regions of Kunawur ; here all is black and charred, and a mournful silence reigns around, unbroken save by the hoarse roar of the mountain stream, or the shrill whistle of the Bhair among the snows.

Journeying onwards from our last encampment, we came suddenly upon a deep rent or chasm in the rocks, through which at some depth below ran a rapid stream. Over this, from rock to rock a few loosely twisted ropes or withes of willow twigs were stretched to answer for the purpose of a bridge, and on these were placed large flat slabs of mica slate, apparently sufficient by their own weight alone to break through their frail support. Over this we walked, and though somewhat springy and unsteady to the tread, it was nevertheless perfectly strong, and is the only bridge for passengers and cattle. At a little distance from where we crossed, alarmed by the noise we made, up

started from among the rocks a small flock of *Burrul*, or wild sheep, which began leisurely to scale the steep sides of the glen, springing from ledge to ledge till they attained to a place of easy ascent, when, as if satisfied that they could bid defiance to pursuit, they stopped to survey our party. A shout from some one in the rear, again set them in motion towards the summit of the mountain from which we had just descended; the direction they took, lay right across the path, and just at the moment when they gained it, my shikarree came in sight, on a part of the hill above them, a shrill whistle from one of the Tartars caught the ear of the hunter, who was soon instructed by signs to blow his match and give chase.

From his greater elevation he was able to bring himself near the line the animals were taking, and at the same time to screen himself from their view until just within gun-shot, when they perceived him. In an instant a flash was seen, and the sharp crack of the matchlock, ringing in echoes among the rocks, told that the quarry had come within reach, and at the same moment off bounded the flock towards the most inaccessible part of the mountain. The shot however had not been fired in vain, for suddenly the leading sheep was seen to turn downwards and avoid the rocks, as if conscious that he had not power to scale them, and taking an easier and more slanting direction along the side of the cliff, he soon slackened his pace and laid down. The rest of the flock losing their leader turned downwards also and rejoined him. The shikarree in the meantime had reloaded, and was again warily stealing on from rock to rock upon his game, but they were now fully on the alert, and once more leaving their wounded companion, bounded up the rocks at a rapid pace. Again the bright flash of the matchlock was seen, but alas, this time there followed no report, and ere the hunter could reprime, the sheep had won the mountain's brow and disappeared. Nor had the wounded animal failed to avail himself of the chance afforded for escape, but scrambling along the side of the rocky glen, he was fast gaining on a place where a turn of the mountain would have screened him from our sight, when scrambling up a rugged and projecting ledge his strength failed him, and falling backwards with a cry of terror, we saw him, for a while quivering as he fell headlong from rock to rock, and was lost in the rush of waters at the bottom of the chasm.

No village occurring this day to bless our longing sight, we at length encamped, after a long march, on the side of the hill, at a spot where sheep are usually penned for the night when travelling with

grain. This spot was called by the Tartars Chungreezing, and here I pitched my blanket-tent at the height of 12,040 feet above the sea. We passed a cold and comfortless night owing to the high keen wind which came whistling down from the snowy peaks above us. At sunset the thermometer stood at 48°, and at sunrise on the morning of the 14th of June, again at 35°! A nice midsummer temperature! what must the winter be? On the 14th we descended by a very rugged and precipitous pathway to the bed of the Paratee river, a branch of the Lee, which comes down from lake Chummor-rareel, through Chinese Tartary, and joins the latter river above Skialkur. This we crossed by the "stone sangho," as it is called, which is formed by several enormous masses of granite which have fallen from above, and become so firmly wedge into the bed of the river, as to form a safer and more durable bridge than any that could be constructed by the natives, and which from its great weight the waters are unable to remove. A small stream which runs down into the Paratee, a little distance below this bridge, is said to be the boundary line of Bussaher and Chinese Tartary.

Here then we were in the dominions of the celestial emperor, and as we crossed the sangho we were met by a deputation from the Chinese authorities, who demanded to know what were our intentions in entering their country, and how far we had determined to travel through it, intimating at the same time very politely, that they would "prefer our room, to our company," by telling us that we need expect no assistance or supplies of any kind. I had no intention of penetrating farther than was requisite into their country, but this being the only road yet open into Spiti, I had been necessarily compelled to follow it, as after all it merely ran across a corner of their territory for about a mile or so. Wishing however to ascertain whether, after having gone through the ceremony of prohibiting our advance to satisfy their rulers, they could not be prevailed upon to wink at our proceedings, I told this rough ambassador that I would require no supplies, nor take anything from the country, if he would allow me to proceed as far as Choomontee. His reply was evidently borrowed from the Chinese officers, and was worthy of the great Bombastes himself;—"When horns grow from the heads of men, and wool is gathered from the rocks; then may the Feringee advance,—but not till then!" This was too ridiculous to be withstood, and we enjoyed a hearty laugh, while the dignified officer strutted away, pleased with the assurance that I was only crossing into Spiti.

His words brought to mind the old Scotch ballad,

“ The swan, she said, the lake’s clear breast,
 May barter for the eagle’s nest ;
 The Awe’s fierce stream may backward turn,
 Ben Cruachan fall and crush Kilchurn,
 Our kilted clans when blood runs high,
 Before the foe may turn and fly ;
 But, I, were all these marvels done,
 “ Would never wed the Earlie’s son.”—

And I thought it by no means improbable that the sequel might turn out after the same fashion ;—

“ Still, in the water lily’s shade,
 Her wonted nest the wild swan made ;
 Ben Cruachan stands as fast as ever,
 Still onward foams the Awe’s fierce river ;
 Before the foe when blood ran high,
 No Highland brogue has turned to fly ;
 Yet Nora’s vow is lost and won,
 She’s married to the Earlie’s son.

and so it may be hereafter that the “ Feringee” shall tread those now forbidden scenes, though his head be unadorned with horns, and wool be not gathered from the rocks.

It appears however from the accounts of the people, that so many travellers have at different times wandered through the upper hills, without any apparent object, save that of looking at the country, that the suspicions of the Chinese have been kept on the alert, and they are more particular than ever in enforcing their orders, especially since Runjeet’s troops in Ladak have thrown out some hints of paying them a visit, when they have settled the affairs of their late conquest. There is however little chance of their carrying the threat into execution, as Chinese Tartary holds out to them no chance of plunder save its splendid flocks of sheep, which would easily be driven far beyond their reach, and leave them a barren waste for their portion.

Having crossed the stone sangho, we proceeded up the side of a hill by what the guide termed a road, though I could not distinguish it from the surrounding mass of crumbling soils. It got better, however, as we gained the top, and a short distance brought us to a small stream, across which we stepped out of Chinese Tartary into Spiti, dependent on Ladak. From this we travelled for some miles along the side of a bare black hill of decomposing shale, and then descending to a level plain of clay and rolled stone, we crossed a river which the Tartars called “ Gew,” from its passing a village of that name in Chinese Tartary. Above this river on the opposite bank, the beds of

alluvial clays towered up to some height, and the surface being flat and studded with a few bushes was pointed out as the usual halting place. As by halting here however we should have had a long and fatiguing march on the morrow to Larree, I thought it advisable to push on for another level spot, a couple of miles farther, where the Tartars said there was a stream of good water, and shelter beneath the rocks for all my people. The road now ran along the left bank of the Spiti river, at about 300 feet above its level.

The Spiti is a larger and finer looking river than the Sutledge, and the people of the country, as well as the Kunawurees who have seen the two, say that it is never equalled by the latter, except during the winter months, when the severity of the frosts in the districts through which the Spiti flows, causes a less plentiful supply of water to fall into it.

Its waters though rapid and muddy, have in general far less of that dashing violence which the Sutledge exhibits. This is most probably to be attributed to the nature of the country through which it flows. The Sutledge winding its rapid course among hard rocks of the primary formation, must often meet with obstacles, which cause it to break in impotent fury on its banks, in waves which hurl the spray far on high, curling and bubbling as it flows along over stones and boulders of various sizes.

The Spiti, on the other hand, though sometimes violent and rough, more generally glides along in a broad and rapid sheet through rocks belonging to the secondary class, and whose less firm and solid texture yields to the action of the current, which sweeps their crumbling fragments irresistibly before it.

The observations of Dr. Gerard also serve to corroborate the information furnished by the natives relatively to the two rivers. According to that traveller, the greatest breadth of the Sutledge at its narrowest parts where bridges occur is 211 feet, while at other places he measured it 450 feet across. This however is low down, and after the river has received the additional waters of the Spiti and Para, united in the Lee; the true comparison therefore cannot be formed, after the junction of the two rivers, but before.

At Skialkur, according to Gerard, the Lee in breadth was ninety-two feet, and in August he thought it contained fully as much water as the Sutledge, than which it was broadest, the latter river being at their confluence but seventy-four feet. The true comparison of the Spiti and the Sutledge, must be instituted however, before the junction of the Paratec with the former, and of the Lee with the latter.

and we consequently find from the measurements of the enterprising traveller already mentioned, that the general breadth of the Spiti was from 258 to 274 feet across.

In October, he states the quantity of water to be less than that of the Sutledge, which being the season when the rigors of winter have begun in Spiti, is exactly a result corresponding to the information derived from the inhabitants of the district.

After the waters of the Spiti and Paratee rivers have united to form the Lee, the Tartars usually apply to it the name of "Singpho," which in their language appears to signify "a river"; while smaller streams and muddees, are called "Rokpho," or nullahs. Each river is therefore distinguished by the name of the country through which it flows, or sometimes even by that of a village on its banks. Thus the Lee evidently derives its name from the village of Leeo, and is the "Lee-ka-Singpho"; the Paratee, rising from lake Chummor-rareel, and flowing through Chinese Tartary, is called the "Cheen-ka-Singpho," or "Para-ka-Singpho," derived from the Para or Paralassa mountains; and the Spiti is the "Spiti-ka-Singpho." The word Para signifies lofty, and thus Paratee is literally, "Lofty-water," or a "river of high source," "tee" signifying water in Kunawur. Paralassa would therefore appear to signify a lofty mountain range, as "Kylas" is known to signify lofty peaks in Kunawur. The Lingtee, a minor stream which joins the Spiti above Dunkur, but of which Gerard makes no mention; and the "Gew" flowing down from Chinese Tartary into the Spiti below Larree, receive the names of "Lingtee-ka-Rokpho" and "Gew-ka-Rokpho" both derived from villages on their banks. After resting awhile beneath the shade of an overhanging rock and refreshing myself with a few hard biscuits, and a draught from the turbid stream, we again set ourselves in motion, and a walk of two or three miles brought us to an extensive piece of level ground, where the guide said we were to encamp, and accordingly we halted, right glad to get a rest and shelter from the sun, in the shade of the rocks around us.

Creeping into the caves which are scooped out by the wandering shepherds as a place of shelter for the night, most of the party soon fell fast asleep, for we had travelled several miles in a temperature of 120°, and the glare from the rapid waters below our path, in conjunction with the heat from the rocks, tended to induce a feeling of langor and fatigue, which from the proximity of the snow on the heights above us, we had little expected to feel. We had thus wiled away about two hours in the arms of Morpheus, when we were aroused

by the noisy arrival of some of the people with my tent and baggage, and proceeding in search of water, we now first ascertained to our dismay that the stream was dry; fuel, too, another most essential necessary, was likewise wanting; so bestowing a few hearty growls on the Tartar for his stupidity, we once more proceeded in search of a snow stream and some bushes.

Luckily we soon came to a spot which furnished the latter, but as there was no stream near we were obliged to content ourselves with the water of the muddy river.

Here then we encamped once more on the hill side, without having seen the vestige of a habitation throughout this second day of our wanderings in Spiti. Around us, however, were plenty of rocks to afford shelter to my people in case of a storm or bad weather, and as the day was fine and warm, we managed to make ourselves tolerably comfortable in spite of muddy water, and a scarcity of fuel, which latter consisted solely of the dried stalks and roots of a small shrub growing among the rocks near us.

During the day's march we had passed over many level tracts of alluvial soils which seemed so well adapted for cultivation and villages, that I remarked to the guide my surprise that so much level land should remain neglected, while so much trouble was expended in Kunawur on strips on the hill side. He replied that many a longing eye had often been directed to these plains, but the difficulty or rather impossibility of conveying water to them, had deterred all from settling there.

These broad alluvial deposits are now all high above the river's course, and from the precipitous nature of the rocky banks within which it is confined, no aid could be derived from it.

Rain is here almost unknown, falling only like angel's visits, and even then so sparingly as to be of no use except to allay the clouds of dust for a few hours.

The only season, then, in which much moisture is obtained, is precisely that in which no vegetation can be produced, namely in the winter months, when falls of snow are both heavy and frequent, and continue often, more or less, from August till the end of April.

Of these broad flats the people would gladly avail themselves could water be procured to irrigate them, and smiling fields and prosperous villages would soon appear where all is now barren and desolate. On similar deposits are the villages of Leeo, Chango, Soomra, and Larrec, built where streams flow down from the surrounding heights to fertilize the soil. They are, however, almost all subject to a great

want of manure, and their fields in consequence soon become impoverished, and do not yield a suitable return for the care and labour which are bestowed upon them.

Thus at each of these places, with the exception of Leeo, many fields once under cultivation are now left barren, and their owners have been compelled to seek that subsistence for their families in some more favoured spot, which their native soil denied them.

THOMAS HUTTON, *Capt.*

CANDA HAR,
8th December, 1839.

*Assistant Paymaster and Commissariat
Offt. S.S.F.*

ART. III.—*Notes on various Fossil Sites on the Nerbudda ; illustrated by specimens and drawings.*

In the following paper I propose to place on record the progress made in fossil discoveries from Hoshungabad up the Nerbudda river, to Jubulpoor, a distance of some 200 miles.

Hoshungabad has already been brought to the notice of the Society as a large deposit, a field zealously followed up by Major Ouseley, then in charge of that district, by whose exertions the upper jaw now laid before the Society has been brought to light, having served for years, unknown, as a Dhobee's board for washing clothes on, ere a cognoscent eye lit upon it; for at first, it had the appearance only of an oblong square mass of the conglomerate of the river, excepting at one small point, which led to its development and present form. I am sorry to say that some of the teeth were injured in entrusting the chiselling to a country gentleman, whose geological notions of matrix and fossil, were not matured. The teeth of this elephantine head are thought by a friend of mine, to belong to that species denominated African.

The second specimen laid before the Society, is that of a slender tusk, imbedded in the conglomerate of the river, the several pieces of which, joined together, amount to a length of five feet nine inches and a half. To what animal did this belong? The portion of tusks of elephants that we possess, being at least treble the present in circumference.

Next are drawings No. 3 and 9, frontal and base of a Buffalo skull, from the same locality; exhibiting in one, the condyles of the foramen magnum, orbit; portion of horn, and general base of the skull; the other shewing the massy forehead, (nearly eleven inches between the orbits), and angle of the horn in contrast with the Bovine skull to be noticed hereafter.

Journal of a trip through Kunawur, Hungrung, and Spiti, undertaken in the year 1838, under the patronage of the Asiatic Society of Bengal, for the purpose of determining the geological formation of those districts.—By THOMAS HUTTON, Lieut., 37th Regt. N. I. Assistant Surveyor to the Agra Division.

P A R T II.

On the 15th of June, the thermometer, at sunrise, indicated 47°, at an elevation of 10,522 feet above the sea. This morning we started betimes, and once more proceeded in search of the habitations of men.

About a quarter of a mile from camp, we had to cross a torrent, whose waters were luckily at this early hour of the day, reduced by the frosts on the heights from which it came, but yet its force was such, that it required some care and exertion of strength, to enable a man to stem it safely. Seeing me make preparations to wade through it with the rest, a couple of sturdy Tartars at once came forward, and while the one stooped down and offered me his back, the other, before I could say a word, had bound me to it with his red sash, like any other load, and away they trudged into the stream, where after several awkward stumbles, caused as much by their laughter at my apparent uneasiness as from the violence of the stream, they gained the opposite bank in safety, and released me from bondage. They then gave assistance to several of the loaded people, and seemed to care little about the coldness of the stream, although its temperature was 36°, and the hour of the morning, seven.

The streams, whose waters are supplied from the melting of the snows above, are often only passable in the early hours of the day, when their sources are still bound up by the frosts of the preceding night, swelling so rapidly towards the afternoon, under the influence of the sun's rays, that neither man nor beast can stem them. I saw an instance of this in a stream at Hungo, where at four o'clock in the afternoon its breadth was upwards of twenty feet, while at seven next morning, when I crossed it, it was, though still strong and violent, barely eight feet across.

While on the subject of rivers, it may not be amiss to notice an error which Dr. Gordon has inadvertently fallen into. In his account of a voyage down the Indus to Bombay, he attributes the small quantity of water observable in the Sutledge and Garra, during the winter months, to have been occasioned by the failure of the rains in the hills, during the preceding season.

The fact is, that these rivers are not at all dependent on the rains for their supplies, but like all those which have their sources in the hills, are fed, during winter, from the snows alone; and the small quantity of water remarked by Dr. Gordon, was occasioned by the severity of the frosts in the upper hills, which had bound up their sources in ice.

The rivers of the plains are most swollen during the months of June, July, August, and September, because at that season the frosts on the snowy ranges are less severe, and the snow melts away beneath the influence of the summer heats from all the inferior elevations, supplying the rivers with abundance of water, which again gradually decrease in violence as fresh autumnal frosts and falls of snow occur.

This too is annually proved to be the fact by the rapid rise in all these rivers during the hot months, before the rainy season has commenced.

As the rivers are most swollen during the prevalence of the monsoon, it may appear to the inhabitants of the plains that the rise of the waters is to be wholly attributed to the rainy season, and that the volume of their waters diminishes as the rains gradually die away. This, however, would prove a very erroneous idea, for although undoubtedly rivers after *coming within* the influence of the monsoon, receive immense additions from the drainage of the surrounding country, yet it must be remembered that they are not at all affected by the rains through a great portion of their passage through the mountains, and especially in those regions where they take their rise.

Thus they could merely receive those additions *during the prevalence* of the monsoon, and whether the rainy season had been heavy, or the reverse, it would exercise no influence over the rivers during the winter months, or in any way affect the quantity of water at that season.

The sources of all the larger rivers from these hills are situated far beyond the influence of the periodical rains, and consequently the total failure of the monsoon could but affect them during that particular

season, and then only in those parts within its influence. Did these rivers owe their origin to the rains, the remark would have been correct enough, but as they derive their source from lakes, and are fed by snow waters till they have passed through the outer barriers of the snowy range, it must be apparent that the shallowness of their streams in winter is owing solely to the severity of the frosts above.

The volume of such rivers during winter, even many hundreds of miles from their sources, will always furnish a sure, and never-failing index to the rigour or mildness of the seasons in the mountain tracts from which they take their rise; for if the winter be mild above, the rivers will possess a more abundant supply than when the contrary is the case, and the changes too, which take place above, such as frosts and thaws, will always be marked by corresponding changes in the volume of the rivers.

An instance of this kind fell under my own observation during the passage of the Indus, in January 1839, near Shikarpore, by His Majesty Shah Shooja. During the few days occupied in crossing his troops, the river fell amazingly, so as to lay bare some sand banks which had the day previous been deeply covered with water. This was of course occasioned by severe frosts in the regions of the Himālaya through which the Indus and its various tributaries flow, and shortly after, I received letters from the hills, which stated that the winter in the higher tracts had been severe, and that much snow had fallen. The subsequent melting of this snow a little later in the spring, again caused such a rapid rise in the waters of the river, as to add greatly to the labours and anxiety of the engineers who were constructing a bridge of boats at Bukkur for the passage of the army of the Indus, for the swell of the waters was so great as to threaten the destruction of the bridge, by sweeping away the boats.

In the stream we had just waded through, a man and his pony last year in attempting to ford it at midday, were swept down by the force of the current, and hurried into the Spiti, where they were both lost in the rush of waters.

Our path from this treacherous torrent continued tolerably level, along the side of the river; one while broad and good, as it led us across the alluvial flats, and again affording scarcely room for the foot of any living creature, save the sheep and goats which had formed it.

About half way between our last encampment and the village of Larree, to which we were journeying, stands Soomra, situated on the right bank of the river, and within the district of Hungrung; it is built on one of the accumulations of alluvion so often alluded to; and in which the valley abounds.

Many of its fields are now uncultivated, and the village itself, though appearing to possess many houses, is occupied by *three* families only, each consisting of from six to eight souls. There were lately two other families residing here, but they could not rear sufficient to recompense them for their labour, and have emigrated to some other place.

Near this we fell in with a large flock of beautiful sheep from Choomoortee, which was travelling to Dunkur for grain. The sheep are driven from village to village with the wool on, and as the required quantity is cut from their backs, they are laden with the grain which is received in exchange; and which, when the fleece is all disposed of, is carried up into Chinese Tartary and sold at a profitable rate.

The wool of the Choomoortee breed is very fine, and much longer than that of the low country sheep; it is therefore in much repute, and purchased for the purpose of making birmore, sooklat, and blankets.

The wool called "pushm," from which shawls and pushmeenas (shawl stuffs) are made, is entirely obtained from a breed of goats resembling those to which the name of "Cashmere," has been applied; they are often four or five horned, and do not thrive below Pooee and Soongnum in Kunawur, both because they are unable to bear any degree of heat, and on account of the humidity of the lower climates. Their true habitat is in the higher and remoter regions of Chinese Tartary, where they attain to their greatest perfection.

The pushm is a remarkably fine wool, very silky and soft to the feel, and grows at the roots of the long hair with which the animal is clothed. It is obtained in the summer months by *shearing* the goats, in the same manner as sheep, and afterwards separated from the hair, which is not thrown away, but reserved for the purpose of making ropes, as hemp is unknown in these higher tracts. This wool is afterwards brought to the lower hills for sale, and forms one of the chief exports from Tartary. The pushmeenas, which are manufactured from it, are chiefly from Rampore and Cashmere.

The skins of this breed are also used by the Tartars as an article of dress for the winter, and form with their long hair and thick pushm. a

warm and comfortable garment, which is worn with the hair inwards, in the manner of a cloak.

A fine pushm is also obtained from the large breed of Tartar dogs, usually termed "Thibet mastiffs" (*Canis Molossus, var Thebitanus*), but it is not in sufficient quantities to form an article of commerce, although it is said to be far superior in quality to that of the goats.

Captain Herbert remarks, that, "the Government has not succeeded in introducing the shawl goat either into Hungrung or Kunawur. This as regards the former district is a mistake, for although they will not thrive in the more humid climate of Kunawur, they abound in Hungrung and in Spiti, although the breed is not reputed so good or productive of wool, as that of higher Tartar districts.

This third march at length brought us to an inhabited place, and there we halted for the day. The village of Larree is situated on the left bank of the Spiti, on a deposit of alluvial soils. It is nevertheless a poor place, and contains but *three* families, consisting of about twenty souls. There are some good flocks and herds of yáks belonging to this village, which however were all away on the heights at graze, the neighbourhood of Larree producing nothing in the shape of pasture. Here growing in the fields among the grain, were many plants of a very pretty and delicate iris, which I had observed also at Chango, in Hungrung; it forms the third species I have met with in my trip. The flowers are of a pale blue, and the petals delicately veined with a darker tint; there was also a white variety of the same, occurring in some abundance. Another very beautiful flower was also seen spreading along the ground in stony or otherwise barren places, and bearing a large white blossom; it occurs throughout Tartary, and in some of the higher parts of Kunawur, and in the former country is called "Kābrā."

On our arrival at this village the people refused to have any thing to say to us, and to our demand of grain, &c., they declared they possessed none, as in the preceding year the village had been plundered by Runjeet's troops, and the present crop was not yet ripe. This my guide declared to be a lie, as he knew they had plenty, but were fearful that we should help ourselves without giving payment for what we took.

After a long parley they were induced to bring a small quantity of flour, which they offered for sale at four seers for the rupee. This,

I at once refused to take at such a rate, as I knew they were selling it much cheaper among themselves, and I had purchased it at Chango at twelve seers.

I therefore opened my own store and supplied my people for the day, but even the knowledge that we could do without their grain failed to reduce its price. Nor was I more fortunate in obtaining a sheep for my own use; for they would not produce a fat or a healthy one, but brought me an *old ewe*, which looked like the mother of the flock, and declining to buy her, I was necessitated to take a two year old he-goat, or to go without my dinner.

Leaving Larree on the 16th of June, I continued my route towards Dunkur. A short walk, during which we had to ford two streams, brought us to the village of Tābo, which is chiefly inhabited by Lamas, who cultivate the soil, and attend also upon the takoordwara, or temple, which is a large building, and ornamented inside with a number of earthen figures of their gods, by no means badly executed. These are arranged along the walls of the principal rooms, which are also painted with many grotesque figures and flowers connected with their mythology.

Last year when the Ladak rajah was obliged to seek protection in Bussaher from Runjeet's troops, the figures in this temple were sadly mutilated. The houses of the Lamas were pulled down, and the noses and hands of the idols were cut off and thrown into the river. This outrage is generally attributed by the people to their invaders, but in reality it seems that it was perpetrated by the followers of the Ladak rajah themselves, who when deserted by their master, thought to ingratiate themselves with their conquerors, by assuming the same form of turban, and mutilating the gods of their own countrymen. If asked who defaced the images, the Lamas always accuse the "Singa," as they term the Seikhs, but when questioned as to the numbers who invaded them, all accounts agree in stating *six* or *seven* men, and the rest were the adherents of the Ladak rajah. These fellows also, finding the opportunity favourable, and knowing that the blame would be laid upon others, plundered every village in Spiti, and levied a fine of fifteen rupees on each, with a threat that they would repeat the visit. Every excess is however attributed to the Seikhs.

From Tābo we proceeded towards Pokh, or Pokhsa, by a road which

one while led us along the margin of the Spiti, and at another, up over crumbling rocks of slate which overhung the river. These heights were sometimes of a frightfully dangerous nature, the soil being so loose and crumbling, that often the pathway had slipped down altogether into the waters below, and left a gap over which we were obliged to pass by making holes for our feet, while we literally overhung the roaring torrent at a height which made one shudder to behold. I am quite sure that had I been left to myself, I should have fallen from the very care I took to avoid it, and from the mere fear lest I *should* fall; but the people about me were well used to such kind of places, and seemed to regard them no more than would a goat or a sheep, and as one gave me a hand to steady me forward, and another kept a hand at my back to reassure me, I managed to get across well enough, although I should previously have been very much inclined to say that the place was impracticable. So much however does habit hide the danger of any place, that on my return I walked along it without assistance, and without the least idea of falling, though the coolies preferred sliding down an easier part of the hill, and walking knee-deep in water.

A far more dangerous passage than this, was wading along the margin of the river Spiti, at a place where its waters had swallowed up the road. Descending gradually from the heights already mentioned, the pathway lies along the margin of the stream, at a place where the rocky mountain is too precipitous to be scaled. When the river is unswollen by the melting of the snows the road thus runs between it and the mural cliff which rises from the bank. Now, however, at this late period the waters washed against the cliff itself, and left no passage for about 200 feet, but through the stream. Taking hold of each other's clothes with one hand, and pressing the other firmly against the rock, we slowly and cautiously entered the rapid stream, groping along the bank up to our waists in water, whose temperature was any thing but hot, and whose force was such, that had any one lost his footing among the stones and fallen, he would inevitably have been carried down by the current, and most probably drowned. The distance, however, was not very great, and we reached the road again in safety, where it once more emerged from the river's bed. Luckily this cold bath occurred but a short distance from our journey's end, and hastening on we soon arrived at Pokh, where we were glad to strip off our dripping garments and warm ourselves at a blazing fire in the open air.

Pokh is a small and shabby looking village, and the houses, like all those of Hungrung and Spiti, are built partly of stone and partly of mud, or unbaked bricks, that is, of stone for the foundation, and bricks above; the walls are usually daubed over with whitewash, which, is obtained from beds of friable gypsum occurring among the clays at the lower end of the valley; the windows and doors are small, particularly the former, which are often not above eighteen inches square, and have a red frame or border. As usual there are no trees, except a few poplars and willows on the margin of a stream. There are, however some rose bushes and dwarf cedars in a glen behind the village.

Opposite Pokh, on the right bank of the river, is a large patch of cultivation, and a few houses, called "Pokh-mă-rüng," although the two are usually known under one name. The cultivation indeed belongs to the inhabitants of Pokh, and a communication is kept up by means of a joola, or number of ropes stretched across the river, on which passengers slide over. This joola had unfortunately given way just before my arrival, and two or three people who had gone over, were consequently obliged to remain on the opposite bank, for to swim the river at this season was impossible. The ropes used in the construction of this dangerous bridge, if such it can be called, are made of willow twigs twisted strongly together, and about the thickness of a man's wrist; these are sometimes four or five in number, and are fastened on either bank to an upright post driven into the ground. From these ropes a loop descends, in which the person sits, and pulls himself along. Many fruitless attempts were made to convey a new rope across the river, by fastening a stone to a long string, and endeavouring to throw it over to the other side, but not one man in the village could succeed, for the stone invariably fell into the middle of the stream. The Churriah and Tartars who were with me also tried their best, but with the same want of success. A bow and arrows were then resorted to, but they also failed to reach the bank, and the experiment was abandoned. The Mookiah of the village then said he would furnish a yāk, to whose tail one end of the rope was to be fastened, and the animal driven into the stream; if he succeeded in reaching the opposite shore, well and good; but if, as was most probable, the beast failed, and was drowned, he would abide the loss. As the yāk had to be brought from the heights where he was at graze with the herd, I did not see the experiment tried, but on my return

from Dunkur some days afterwards, the ropes were still lying at Pokh, and no joola had been conveyed across, so I conclude that the experiment had either failed, or had not been resorted to, although I forgot to make the inquiry.

On the heights, in the neighbourhood of Pokh and Larree, the wild sheep is said to abound, but there were no hunters in the villages to send in quest of them, and the only one of whom Soomra could lately boast, was now no more.

In the past winter he had described a flock upon the heights behind his village, at no great distance, and seizing his matchlock had started for the chase which was destined to be his last. Night came and passed; the day succeeded and passed also, yet no hunter returned; and at last alarmed at his prolonged absence, his son started in search of him, but all in vain. The traces of his footsteps were followed for some distance up the mountain's side, when, as if the hunter had been spirited away, or vanished into air, they suddenly ceased at a large fresh field of broken snow. Days and weeks passed on, and the wonderful occurrence of his disappearance had begun to be forgotten, when a sudden thaw took place, and his body was seen yet fresh among the snows, at the place where his footsteps had ceased. His gun was in his hand, and he lay as if in a sound sleep; but he was cold and stiff, for he "slept the sleep that knows no waking;" he had been smothered in an avalanche from the heights above him. His were the fields at Soomra which we saw lying barren and neglected, for his family had left the place.

Of birds, we saw but few, and they were chiefly the raven, and two species of chough, or red-legged crows. Chikores were abundant, and the shrill whistle of the Bhair, or Ladak partridge, was occasionally heard high up among the snows. Of the smaller birds, none but the hardy little sparrow was seen, and I could not help thinking that he, like the sons of Britain, appears in every corner of the earth.

Leaving Pokh at sunrise on the morning of the 17th of June, we travelled for about three miles along a flat and extensive plain, strewed thickly over with boulders of every size. From this we ascended a short but steep hill, in a N.W.b.W. direction, the river taking a somewhat sudden turn, forming an elbow, on the outside of which stands the village of Mānēss below the Mānērūng pass, a difficult and

dangerous road, which leads from Spiti into Kunawur, about seventeen miles from Soongnum.

From this turn the bed of the Spiti becomes much broader, and numerous sand banks, or islands, are seen, some bare and barren, others producing shrubs of the barberry, causing the river to divide into many channels, which gives a pleasing effect to the scene. A walk of four miles along the hill side, brought us at length to our encampment beneath the fort of Dunkur.

The fort and village of Dunkur are built high above the Spiti, among the ragged spires which crown the time-worn rocks that form its bank. This rock is inaccessible on every side, with the exception of that by which it is connected with the main range of hills, of which indeed it forms a spur, or offshoot towards the river. A stream descends on one side of it from the heights, and in former days a covered way existed from the fort to its banks, by which the garrison were enable to obtain water unperceived by the enemy; this has however long since fallen into decay, and its ruins now alone serve to mark the line along which it formerly descended. As a place of strength, Dunkur was well calculated to hold out against the rude bow and arrow warfare, as once practised in these high tracts, but as a check to troops armed in the modern style, even without guns, it is insignificance itself.

The only spot I could find to encamp on here, was on a small patch of grass, immediately at the foot of the cliff on whose crest the fort was perched, and which towered up some hundred feet above us. Near us were encamped a party of shepherds from Choomoortee, who had just arrived to sell their wool and purchase grain. It is the custom among these people to give an order, while the crops are yet green and on the ground, for any amount of grain they may require, which when the crop is ripe, is stored up by the cultivator until the summer of the ensuing year, when the shepherd arrives with his flock, gives the wool in exchange, and receives his grain, which he puts into small bags, brought with him for that purpose, and drives his flock thus laden back into Chinese Tartary.

In the evening when the flock was brought back from pasture, I had an opportunity of witnessing the mode of shearing. The sheep whose fleece had been selected, were caught, thrown upon one side, and their legs bound together, when a shepherd having sharpened the long knife

which he carries at his waist, proceeded with expedition to strip off the wool, singing all the time, and joking with his comrades, who were likewise busily engaged around him. In a very short time the whole of the flock, save a few thin sheep, were sheared, and the wool being twisted into bundles, was carried up to the fort, to which also the next morning the sheep were driven, when having each received a load of from ten to twenty seers, they descended and took the road back to Choomoortee.

Soon after we had encamped, a scuffle took place between these shepherds and my Tartar guide from Leeo, and the latter at last came into camp with a fine fat looking sheep. I was at first inclined to look upon this as a daring highway robbery, but it soon appeared that in the previous year the guide had advanced the sum of five rupees to these shepherds for pushmeena wool, which they were to bring down for him, when they descended to the Rampore fair. This wool had been supplied in part only, and two rupees were consequently still due, for which the Tartar fearing lest he should be cheated, had seized the sheep in question. As the animal however with its fleece was worth more than double the sum required, the shepherds came and entered into an explanation, which seemed satisfactory to both parties, as the animal was restored. I laughed at the guide for being so easily pacified, and told him he would never get his money or his wool, but he replied quite confidently, that the shepherds had pledged their word, and therefore there was no fear, as a Chinese Tartar never broke his promise.

With the wool on these sheep are remarkably handsome animals, and have somewhat the appearance of the large English breeds, but when shorn, they present such a different picture with their long thin limbs and narrow carcass, that one would not know them to be the same animals.

They differ much, also, from the breeds of the lower hills; standing higher on their legs, and the horns wanting that solidity and strength which those of Kunawur possess. There is generally a black longitudinal stripe down the middle of the horn. I was anxious to purchase one or two of this breed, but the people very honestly assured me that they would not live below, on account of the dampness of the climate.

Most of these sheep were formerly purchased by the British Government by an agent appointed for that purpose at Kotgurh, but

from some cause or other it was not found to answer, and the speculation as abandoned. I have been told that a difficulty existed in inducing the Tartars to sell to the British agent, they preferring to trade with the people of the higher tracts.

Whatever might have been the case in those days I know not, but at present I can confidently say, that the Tartars would gladly supply the Government with any amount they might require. They will not, it is true, bring their flocks down, because the climate is unfavourable to them, and also because at the season of the Rampore fair the sheep which are sheared early in summer do not possess a full fleece. The wool however which is cut in the beginning of the year, is sold by the Chinese shepherds to the Tartars of Hungrung and Spiti, and the traders from Kunawur, and it is these people who would supply the market if a demand were made for the wool, and who could procure it from above, in any quantity they chose to pay for.

The failure is far more likely to have been caused by the avarice of the low country traders, who purchasing the wool cheaply above, and perhaps, as is often the case, intermixed with hairs,* dispose of it again at a rate so exorbitant as to prevent its yielding a remunerating price in the home markets of Europe.

Had the agent instead of remaining in the lower hills paid an annual visit to Tartary, and purchased his wool directly from the shepherds themselves, instead of taking it from the hands of the traders, he would not only have procured a better, but a cheaper article.

In case this wool should ever again become an article of speculation either to the Government or to individual enterprise, it may not be considered superfluous to offer here a few remarks on the method to be adopted in procuring it.

In the first place I would warn the speculator against trusting to native agents, but would recommend him to make his purchases himself. He would probably not be allowed to enter the country under the protection of China, but he might with ease and safety every summer repair to Hungrung or to Spiti, where the Chinese shepherds would not fail to meet him by appointment, and furnish any quantity of wool he might have ordered in the preceding year.

* Since this was written, I have been informed that such was actually the case, and that the wool was found to be so intimately mixed up with hairs as to render it unseparable, without incurring a ruinous expense in cleaning it!!

It would be necessary therefore for him to make one trip in order to see the shepherds, and enter into arrangements with them for a supply to be delivered in the following summer at any Tartar station they might decide upon, and also to ascertain *what goods* they would require in return ; for money, I imagine, would be held in less estimation than saleable and useful commodities.

Having made his arrangements, he would again in the following summer have to repair to the appointed place, where he would find the shepherds (as I did at Dunkur) ready with their flocks, and he would thus be able to select his own fleece, and see it shorn before him.

It would therefore be his own fault if any hair or extraneous matter were received with it. Of this, however, as long as the wool did not pass through the hands of agents, there would be no fear, for it is those gentry who adulterate the article in order to increase its bulk, and so derive from the inexperienced trader a greater profit.

The next point to be considered, is the carriage of the wool to the lower hills, and this indeed would be the chief expense.

The method to be adopted, must be the same as that resorted to by the hill people themselves, which is, to load it on the backs of sheep and goats.

For this purpose it would be necessary to purchase a large flock, which during the winter season would find an abundant pasture in the lower tracts, or even in the plains, and in the summer and rainy season would be roaming over the grassy tracts of the upper hills.

The first cost of these animals would be the chief expense, but even this would in the course of one or two seasons repay the outlay by the kids and lambs which would be produced, while something also would be recovered by the sale of the wool and ghee obtainable from the flock.

With his flock therefore the speculator would transport to the Tartar districts, flour, grain, salt, iron, ghee, butter, cloth, sugar, and other articles in demand among the people, and for which, if his purchases were judiciously made either in the plains or lower hills, he might not uncommonly receive cent per cent on his outlay.

The profit thus made upon his own merchandise, would not only more than pay for his wool, but would even nearly, if not altogether, defray the expense of transporting it to the plains, and thus indeed when once the prime cost of his flock had been realised, the speculator might be said to receive his wool for nothing. From the profit arising

on his merchandise also, he would be enabled, should competition be feared from the present traders, to afford to take the wool at a higher rate than they can afford to do, and thus he could effectually drive them from the market, and establish a monopoly.

The experiment is at all events worthy of another trial, since the former failure is entirely to be attributed to the inexperience of the agent, and the rascality of the traders who supplied him.

On the following morning, having left behind me four people to receive supplies, I marched on towards Leedung, crossing the Lingtee river not far from Dunkur. A walk of about seven miles brought us to a miserable village of a few huts, which the guide told me was Leedung, so we halted for the night. After my tent was pitched, and the people had eaten their dinners, we all proceeded in search of fossils in the ravines and water-courses which came down from the heights along the river's bank. Here, however, nothing worth the trouble was found, but as I was searching at some distance from the rest of the party, a lad, whom I recognised as having been with the Dunkur commandant, came cautiously towards me, making signs that there was nothing to be had below, and then pointing to the palm of his hand, and looking towards the summit of the range of hills behind his village, he gave me to understand that for a reward he would lead me up the pass, where I should find something worth having. To this I readily agreed, and at once gave him a small red necklace to make the compact binding. He then in broken Hindostanee, and by signs, told me that I must keep to myself his having given this information, as the killadar had given orders that no one should show me the path up the heights. I afterwards discovered that he was an arrant cheat, and had taken me in with his story, as the killadar only alluded to the passes into Ladak; however I of course promised silence, and when he had pointed out the road, we parted, and I returned to my tent, when I gave orders to the coolies to be ready to accompany me up the heights the next morning.

About a quarter of a mile from Leedung is another small village called Larra. In speaking of either place the Tartars invariably apply the names of both, as Larra-Leedung. This custom is not however peculiar to Spiti, but prevails also in Kunawur when two villages are near each other; thus in Spiti we find Larra-Leedung and Chism-Këburr to be applied to the villages of Larra and Lee-

dung, and of Chism and K&eburr, the two last being also on different banks of the river; and in Kunawur the names of Dabling-Doobling are always taken together, though they belong to different villages.

The crops at Leedung were very poor and backward, and it is a great chance if they ripened before the snow fell again; the cultivation higher up the river too, is seldom ready for the reaper before the end of September, and is often wholly destroyed by an early fall of snow.

In the morning I started with about a dozen people up the mountain path, and after a toilsome ascent of 3,000 feet, reached the pass above Leedung. Beyond this was stretched a wide and undulating plain, shelving gradually to a stream far away in the distance; the pass and all the neighbouring hills were yet covered deeply in some places with snow, and the whole scene was one of cold and dreary solitude, with not a tree to intercept the view, nor ought of vegetation but the furze.

Beyond the shelving tract of land which spread down from the ghat, arose again a mighty snow-clad range of hills lifting its hoary head to an elevation varying from fifteen to twenty thousand feet above the sea. Here on the summit of the pass, which is 15,200 feet, an extensive bed of decomposing shale gave a black and charred appearance to the soil, while high on either hand rose mural cliffs of brimstone interstratified with sandstones of different textures; these were splitting by the action of the frost, and falling in heavy masses down the ghat, where low down they formed vast beds of broken fragments of every size. Crossing this pass and descending along the shelving plain, we came, to my surprise, suddenly upon a village situated in the hollow formed by the undulating and blackened hillocks of shale which rose in all directions, looking like heaps of coals and cinders. Beyond this, the Tartar lad pointed to some dark ravines, or water-courses, where he said the fossils were to be found. Thither we of course repaired, but though we searched long and closely throughout the day, a few broken and useless specimens of the casts of Ammonites and Belemnites were all that we collected, and after wandering among the snows and swamps and muddy fields, at an elevation of 14,000 feet, from seven in the morning until 5 p. m., I returned weary and disheartened to the pass, from whence we again descended to our camp at Leedung.

Though puzzled to account for my want of success, I had nevertheless seen enough of the formation on the heights to feel convinced

that fossils must exist there, if they were really to be found in the Spiti valley, and I consequently determined to devote another day to a further search. Accordingly on the morrow I broke up my encampment, and repaired to the village we had seen on the heights above Leedung, among the regions of snow. Having now plenty of time to look about me, I commenced a closer search in the bed of a snow stream, which had scooped a narrow channel through the decomposing shales. Here I was soon rejoiced to find that I had at last "hit the nail upon the head," and a large supply of Belemnites rewarded me for wading ankle deep up the chilly stream. Along with these a few broken Ammonites were also found, and a species of bivalve shell, which the Tartars termed "puthur ka muchlee," or fossil fish.

From this place, which was elevated 15,250 feet above the level of the sea, and covered here and there with beds of snow, I proceeded, after several hours search, to the village about a mile farther down, where my tent was pitched and my people had all arrived.

The following day was again devoted to a search for more and better specimens in various directions, but to very little purpose; and seeing now no prospect of obtaining more, and being unable from the depth of snow to search the lake of Chumor-ra-reel, now only three days journey from us, I was reluctantly compelled to give the order to retreat, for our provisions had dwindled to one day's supply, and there was here no prospect of procuring more for love or money.

The village at which we had encamped was called "Gewmil," and had an elevation of 14,104 feet, yet here, in spite of reviewers and reviews, surrounded in the month of June by deep and extensive beds of snow, a fine and healthy tract of cultivation smiled, like "some bright emerald midst the desert waste." At this season, however, the wheat and barley was barely six inches above the ground, and from the elevation of the tract, it seldom ripens before the first days of October. The hills around it on every side are clothed to their summits with the Chinese furze (*Astragalus* of Royle) which notwithstanding the advanced season of the year, had scarcely put forth a single leaf. This backwardness was however somewhat unusual, and was owing to the lateness of the last fall of snow, which throughout the upper parts both of Kunawur and Spiti, had fallen two months later in the season than is generally experienced; so heavy indeed was the snow still lying on many of the higher passes, that it is more than

probable they could not have been free from it, or open to travellers before the fresh autumnal falls occurred.*

The season of 1837, which in the Provinces, from want of rain, brought sickness and scarcity upon the inhabitants, was also a time of trial and misery to the poor Spiti Tártars, inhabiting the villages beyond the fort of Dunkur. It was, however, not the want, but the excess of rain, a thing so unusual in those parts, which caused the failure of their crops, by rotting them on the ground; and the little that escaped this scourge, and which would eventually have ripened, was cut off so early as the month of August by a heavy fall of snow which crushed and beat down the grain, and rendered it useless. At the time therefore when I visited those parts, so far from being able to furnish me with supplies, the wretched people were actually reduced, like beasts of the field, to seek for herbs and wild roots with which to satisfy the cravings of hunger, and they were rendered almost frantic with delight by the gift of a handful of meal, which, though straitened as we were ourselves, it would have been inhuman to deny them. Many have been obliged to leave their homes and go as labourers to Ladak, who were lately in possession of cultivated lands.

This, it would appear, is by no means an uncommon occurrence in the higher portions of the valley, for the people in speaking of the quantity of grain likely to be gathered from their fields, always put in the proviso, "if the snow does not fall early."

Around the village of Gewmil, many ponds are found for the reception of the snow water, from which the daily quantity requisite for the irrigation of the crops is supplied. On one of these, at this enormous height, were a pair of Brahminee ducks, which had fled from the summer heats of the Gangetic Provinces to revel in the cool and secluded retreats afforded on the snowy heights of Tartary.

Here, too, among the frowning cliffs, the raven and the vulture-eagle were seen, as also the red-legged and yellow-billed choughs.

From one of the peaks, behind this village, which attained the height of 14,714 feet, I beheld the course of the Spiti river, winding its way for miles along the valley, until it was lost in a turn of the mountains. From this spot I looked down upon the village of Larra, whose houses and cultivation showed like mere specks, when seen from a perpendicular height of 2,700 feet.

* This proved to be the case, as the Tártars could not descend to the Rampore fair.

Viewed from this elevated station also, the majestic grandeur of the neighbouring hills, which enclose the river like two lofty walls, sink into comparative insignificance, and appear with their snow-capped summits like so many glittering pyramids of sugar; yet they attain to an elevation above the sea of seventeen to twenty thousand feet, and their hoary and time-scarred heads are crowned by everlasting and unfading snows.

It had been my earnest wish to cross the mighty Pralassa range of mountains, from whose snows the Spiti river is supplied, and to visit the beautiful and extensive lake of Chummor-ra-reel, of which Gerard speaks, but from the unusual depth of snow over all the passes, I found this to be impossible; for although I had plenty of time before me, and could have waited till the thaws had commenced, yet the chance that before they could be crossed the autumnal falls would again commence, added to the total impossibility of obtaining provisions for my people, rendered it necessary that I should beat a speedy retreat from the inhospitable valley, and thus I was reluctantly obliged to quit the district without having accomplished one of the most wished for objects of my journey.

This lake is said by Gerard to abound with fish, and to be covered in the summer months by flocks of ducks, geese, and other water-fowl, which resort there from the heats of the Provinces. From Puttee Ram and others who have often visited the spot, I heard that its waters were salt, and could not be drank, as they acted like medicine, so that travellers and the wandering Tartar shepherds who sometimes inhabit the borders of the Lake in their black tents of blanket, are obliged to use the water of the snow streams and springs in its neighbourhood.

From these facts an interesting subject of inquiry arises; namely, whence did this Lake, situated at an elevation of at least 16,000 feet above the sea and surrounded by hills, whose summits are usually capped with snow throughout the year, derive the fish with which it is now stocked? Are they identical with the species common to our rivers of the Gangetic Provinces, or are they distinct and peculiar to the Lake itself?

Doubtless there are many who will infer that they are identical with the species of the Provinces, and that the Lake being the summer resort of water-fowl, the ova have been deposited in its waters through their agency. But to this opinion I feel decidedly averse, from the

fact, that such a sudden transfer of the ova of species belonging to hot climates, to the waters of a lake which is elevated so far above the natural abode of the species, and which are often *ice bound* for several months in the year, would render the ova thus transported totally unfruitful; and that the climate of these regions is totally different from that of the plains, is a fact which is fully established by the migration of birds to them during the summer season.

Again, those birds may resort there from the plains of China, as well as from those of Hindoostan, and as it is equally probable that ova would have been brought from both countries, we should find species of fish peculiar to either country, not only being together in the same climate, but in a climate which differs widely from the natural habitat of all the species.

Moreover, I question whether the ova *could* have been brought from the plains of either country, because the birds by whose agency the waters should have been stocked, quit the rivers of the plains, and resort to those high regions in order to *avoid* the hot season in which the ova are *produced*; therefore the ova could not have been brought by them.

If, again, the lake was stocked with fish through the agency of the water fowl which resort to it, how is it that the smaller lakes and ponds have not been similarly stocked also, for both at Nako in Hungrung, and at Gewmil on the heights of Spiti, I observed the Brahminee duck, so common in the plains of India, yet the ponds at those places do not contain a single fish?

But as the birds do not arrive at the lake in question, in the course of one or even two days, but make various halts in their journey from the plains, it is at once apparent, that the undigested ova which they are supposed to have brought with them, should have been voided rather in the ponds of the intermediate stages, than in the waters of these stupendous regions.

But the most decided proof, perhaps, that this lake was not stocked from the rivers of the plains by the agency of birds, exists in the fact that its waters are *salt*, and strongly impregnated with borax; consequently the ova of species adapted for an existence in pure fresh rivers and ponds, could not have been productive in regions and waters decidedly inimical to their constitutions.

The question however, is one of some moment, and worthy of being fully sifted. I am myself inclined to believe, as will be more fully seen

hereafter in my geological notice of the Spiti valley, that those species may be peculiar to the lake or lakes of those lofty regions, and that they date their existence from the period when those waters first became adapted to support the species which now inhabit them, and that date I fix as *posterior* to the Mosaic Deluge, when, as I shall hereafter have occasion to notice at some length,* the Himalayan ranges were first upheaved, and many climates were called into existence, requiring new creations to inhabit them, as they themselves were new.

It was for the purpose of endeavouring to elucidate this point, that I felt so anxious to obtain a passage to the Lake Chummor-ra-reel, and my disappointment may therefore be conceived, when I found the pass impracticable from the unusual depth of snow which had fallen so late in the season as the month of April, and which indeed fell again, as I witnessed, for three successive days, during the latter end of June, even so low down as Pokh in the bottom of the valley.

The clearing up of these doubts is a subject well worthy the serious attention of any naturalist who may have the means and the inclination to visit the lake in question.

On the 23d of June, we proceeded once more towards Dunkur by a most precipitous path, which wound backwards and forwards on the side of the hill in such a zig-zag manner that we were almost in a line one above another. The loose nature of the gravelly soil by no means added either to our comfort or safety, for those behind were continually showering down vollies of dust and stones upon the heads of those who were below. This descent at length brought us to the side of a brawling stream, whose waters were dashing over the precipitous rocks with headlong violence in their passage to join the Lingtee river, many hundred feet below us. At the very place where this stream was the most violent, and where it fell over the rocks in a long sheet of foam, a faint shout of many voices reached my ear above the hoarse roar of the cataract, and looking upwards, I beheld to my horror and dismay, a large fragment of rock, rolling down the side of the hill directly upon me. So hampered was I for room, with the steep crumbling hill on the one hand, and the deep chasm on the other, that I should undoubtedly have stuck fast to await the coming blow, had not a Tartar near me, with more presence of mind than gentleness, pulled me flat on my back and allowed the fragment to fly pass us into

* A Theory of the Earth.

the stream. On inquiry, it appeared that the rock had been displaced by a goat which I had that morning bought for my people, and which being refractory, a man was hauling along by a rope round its horns, and thus in the resistance and scramble of its feet it had nearly made me pay dear for my generosity. A few miles farther on brought us down to the Sangho, across the Lingtee, and on the road to Dunkur, where after a hot walk of about eight miles we halted for the night.

It is perhaps sometimes as well for us that we cannot lift the curtain and peep behind the screens, or we should leave many things undone that our ignorance of coming events prompts us to undertake; and thus it was with me, for had I been at all aware of the fatigues and discomforts which awaited me, I do not think that even my love of science would have tempted me into those bare and chilling scenes.

To describe the numerous shifts and annoyances that a traveller meets with, would be but labour lost, and after all, from him who is snugly ensconced "in his ain ingle neuk," or comfortable parlour, these would but elicit a smile, and therefore it is useless to enlarge upon them, as they must be felt, ere they can be fully appreciated. Not the least of them however is the following; every inch of level ground that can be rendered available is cultivated, and it often happens that the only spot the traveller can find on which to pitch his tent, is one on which, to judge from the deep accumulations of their dung, large flocks of sheep and goats have been folded since the days of the good old patriarch Abraham. Here then "the weary and way-worn traveller" is necessitated to pass a night of sleepless wretchedness, stifled by the stench which arises in almost perceptible fumes from the ground, and devoured by the myriads of fleas whose irritating bite effectually banishes the overtures of that sleep which is so necessary to furnish strength to meet the labours of the morning's march.

Often have I been reduced to banquet on a goat which might, for ought I know to the contrary, have been as aged as myself, and the father of a goodly progeny, strong, tough, and sinewy, as well could be; yet hunger is the best sauce, and bad as I might have thought such fare, when better was procurable, I nevertheless have managed to make a hearty meal off "sinewy Billy" and barley cakes, and blessed my stars that matters were no worse.

To recount the incidents of each day as I retraced my steps through Spiti to Hungrung and Kunawur, would be merely to repeat what has

already been written, and it will therefore suffice to say, that the same streams were waded through, and the same broken and rocky paths were traversed, till we again arrived in safety at the village of Chungo. Having halted here a couple of days to refresh my people, and also to procure specimens of the wild sheep, which abound in the neighbouring cliffs, I once more started with the intention of going to Leeo, but the Vuzeer Puttee Ram, who was now on his way back to Soongnum from the fort of Skialkur, where he had been to inspect the store of arms &c., advised me to take a passing peep at Nako, which he described as a nice cool halting place. I therefore changed my plans and marched to Nako on the heights above Leeo, Puttee Ram sending me a Ghoont to carry me up the hill. The road for the greater part of the way was the same as I had travelled over from Leeo to Chungo, when on my upward journey to Spiti; it was so stony and rugged, that I preferred trusting to my own legs rather than to those of the Ghoont, in spite of the people's assurance that he would carry me safely. The village of Nako, like all the others of these regions, is a collection of small dirty huts, with flat roofs, and built of unbaked bricks of large size, intermingled with slabs of stone, or usually, as in Spiti, of stone for the foundation, and of bricks above. There is a good deal of cultivation about it, and water is plentiful. There is a small pond of good depth near the village, on which were several Brahminee ducks.

The village boasts of two or three takoordwaras, or Lama temples, which contain a few very badly formed clay images of their gods. The people have no objection to a traveller entering their temples, which is a great convenience, as I found more than once when my tent was in the rear, after a long march. At Nako I took possession of one of them, which afforded me a cool retreat during the heat of the day.

The walls of these temples are usually daubed over on the outside with red, whilst on the inside they are painted with numerous grotesque figures of gods, men, and animals; they are generally square built, and contain one room.

The largest of the kind I saw during my journey was at the village of Tabo in Spiti, where there are three or four rooms all decorated with figures. This temple is the largest in the district, and is consequently the head quarters of the Lamas. It contains an immense collection of manuscripts, which are said to contain all the mysteries of

the Lama religion, and on certain occasions are read to all who are willing to listen. There was besides the larger rooms of images, an inner apartment in which a small lamp was burning, and into which I was requested not to set my unhallowed foot, as none but the priests themselves were allowed, except *à la distance!* to inspect what was within. It contained a small altar, placed before a god, with a brazen lamp burning on it; there were also brazen utensils of all sorts and sizes, musical instruments, such as tom-toms and cymbals and a quantity of raw ribs of meat, apparently of mutton, with which, like the jolly friars of olden times, no doubt they were wont to regale themselves.

There are a few Lamas resident at Nako, where they are zemindars. They occasionally receive presents from the brotherhood in China, of small carpets, tea cups, pieces of silk, &c. One of these men coming to pay me a visit and to show all the curious things in his possession, doubtless with a view to tempt me to become a purchaser, the conversation by some chance turned upon the subject of how Lamas were made, and who could become one. He said there were no really good Lamas either in Hungrung or Spiti, as it had become somewhat customary to make a Lama of any wealthy zemindar, who happened to have a family, while properly speaking no Lama, should either marry or have children.

I asked him if I could be made a Lama, to which he replied there could be no objection provided I would study for some months among them, and be initiated into the mysteries of their religion, with regard to the resurrection or reappearance of the Grand Lamas after death. We did not get on very satisfactorily, as the Kunawurrees who were standing by, burst into a loud laugh at my explanation of the case, which displeased the Lama and made him drop the subject.

It seems however from what he said, that when a Grand Lama dies, an inventory is made of all his effects, which are carefully sealed up until his reappearance in life to claim them.

In explanation whereof, he said, suppose a Grand Lama were to die in Chinese Tartary, his effects would be carefully guarded;—some time afterwards perhaps he might appear at Nako in Hungrung, in the form of some Lama's child.

This is known to be the new Grand Lama, from his laying claim to the sealed up effects of the deceased Grand Lama. He is then

asked what those effects consist of, and where they are?—and he accordingly states them one after another.

This is sometimes deemed sufficient proof; but if doubts still remain, the effects of the deceased are brought and *mixed* with other things, and the young aspirant is desired to show what are his, and what are not.

If further proof be still necessary, the child is desired to give some token that he is the Grand Lama, which he does by commanding them to carry him to some spot which he points out, and there he places his hand or his foot on a rock or large stone; when—“*mirabile dictu*,”—if the spirit of the Lama be really within him, the impression remains indented upon the rock!!

This is deemed conclusive, as well it might be, and the urchin is at once proclaimed Grand Lama; presents are showered upon him from all quarters far and near, and he is carefully instructed in the rites and mysteries of his religion, and in due time proceeds to his head quarters in Chinese Tartary.

Among the rocks, but chiefly on the crumbling accumulations of debris in the neighbourhood of Nako, and even at Chungo, there is a plant found whose root is long and strikes perpendicularly downwards to some depth, the outer coat or fibres of which produce a rich and beautiful crimson dye. It is said however to be fugitive, but this may arise from ignorance of any chemical mode of fixing it. It is used by the Lamas to stain their images. The Tartars call it “*kham*.” Behind Nako, at some distance, rises the mighty mountain called in the language of the country “*Purgule*,” and towering aloft to a height which exceeds 20,000 feet. It derives its name from its form, the word signifying “*cone-shaped or conical*,” hence it is applied, like the term “*Kyllass*,” to any mountain of that form.

From Nako I proceeded a short down hill march to Leeo, which is situated in the bed of the valley below, at a depth of 3,000 feet. The day was excessively hot at this place, which is completely shut in by hills rising on every side to the height of seven and eight thousand feet above it. Its crops of barley, wheat, and peas, were beautifully rich and luxuriant, and the numerous apricot trees were loaded with fruit, though as yet small and unripe. The grain is reaped at this village towards the latter end of July and beginning of August. In the district of Spiti the harvest takes place in the lower and more sheltered

situations, such as Larree, Pokh, Maness, and Dunkur, in the month of August, while in the upper parts of the valley, at Larra, Leedung, Keeling, and Gewmil, on the heights, the grain is never ripe before the end of September and beginning of October. At the last named village it is ready about fifteen days later than at the others, which are situated on the river's banks, as might be expected from the difference in elevation, the village of Gewmil being at a height of 14,104 feet above the sea, while the others are from 12,200 to 12,500 feet.

Last year, in the month of August, the snow fell so heavily at Gewmil, that the whole crop was beaten down and destroyed. This present year of 1838, towards the end of June, the crops though healthy looking, were not more than four or five inches above the ground. It is surprising however to see with what rapidity the vegetation of the upper hills is brought to maturity. When I arrived early in June at Hungo, Leo, and Chungo in Hungrung, their crops of barley and wheat were not more than six or seven inches in height, while on my return, three weeks afterwards, they were all in full ear, and would be ready for the reaper in July. This however is scarcely to be wondered at, when we notice the difference of temperature in that short space of time.—

At Hungo, elevation 11,413 feet by boiling point,

	<i>Sunrise.</i>	<i>Noon.</i>	<i>Sunset.</i>
10th June	41°	85°	60°
3rd July	60°	96°	64°
Difference in 23 days	19°	11	4

At Leo, elevation 9,362 feet by boiling point,

	<i>Sunrise.</i>	<i>Noon.</i>	<i>Sunset.</i>
11th June	45°	100°	50°
2nd July	56°	110°	70°
Difference in 22 days	11	10	20

At Chungo, elevation 9,897 feet, boiling point,

	<i>Sunrise.</i>	<i>Noon.</i>	<i>Sunset.</i>
12th June	35°	82°	56°
29th June	43°	90°	69°
Difference in 17 days	12°	8	13

(*To be continued.*)

JOURNAL

OF THE

ASIATIC SOCIETY.

Journal of a trip through Kunawur, Hungrung, and Spiti, undertaken in the year 1838, under the patronage of the Asiatic Society of Bengal, for the purpose of determining the geological formation of those districts.—By THOMAS HUTTON, Lieut., 37th Regt. N. I., Assistant Surveyor to the Agra Division.

PART III.

On the 3rd July I retraced my steps to Hungo, and found a very different aspect to that I had witnessed in the beginning of June; then the snow was lying deep on all the surrounding hills, and within a few yards of the village itself. The yellow flowering furze was the only plant that seemed hardy enough to face the chilling waste of snows that spread around. Now, the wintery sheet had melted all away, except towards the summits of the mountains, the furze had lost its golden flowers—and in their place were others of various kinds scattered through the fields or on the mountain's side. The loud sharp whistle of the bhair was hushed, and had given place to the shrill chirp of the cricket and the grasshopper. A tinge of green was seen to pervade each mountain side, and the cultivation round every village was of the brightest and richest hue. In short, the glad smile of summer shone around at every step, and the chill white garment of the winter was fast receding to its farthest limits. How marked a contrast, was produced in one short month! Had I returned by any other route, I should undoubtedly have been tempted to describe these hills as bare

and unproductive of ought, save furze. How cautious therefore should the traveller be, lest noting down too hastily his first impressions, he be lead to pronounce that country barren, which at another and more favourable season, he would find rich in plants and cultivation. Such indeed, I am told, has been the case at this very mountain of *Hungrung*; M. Jacquemont, who crossed it in summer, when all was "blythe and gay," having passed some severe critical remarks on Messrs. Herbert and P. Gerard, who crossing it some years previously in autumn, when all the beauty of the scene was over, had pronounced it wanting in botanical treasures. Both parties were somewhat hasty, the one seeming to think the district always rich in flowers, and the other, that it never was so; neither seem to have taken into consideration the effects to be expected from change of seasons, and truly when I first crossed the Pass in June, I was inclined to adopt an equally hasty conclusion; for the very look of the place, so still and lonely, so bare and sad, seemed to strike a chill upon me, and to depress my spirits, so that on my return, the beauty that every where met the eye appeared to have been conjured up by magic, or like the sudden and well managed shifting of a winter scene, to one of smiling summer.

From *Hungo* we ascended to the *Hungrung* Pass, which is the boundary between *Kunawur* and the Tartars of "*Hungrung within*." In place of the cold sheet of snows that was every where spread around when I last travelled over this ground, the *Chinese furze*, the wild shalot, yellow potentilla, rhubarb, and several other plants now enriched the scene, and the delicate flowers of "*Saxifraga ciliata*," were abundant.

On recrossing the *Hungrung* Pass, I once more entered *Kunawur*, and bid a long adieu to Tartary and Tartars.

I am far from thinking, with the late Dr. Gerard, that "the Tartars are the finest fellows I ever met with,"—nor can I give them the preference over the *Kunawurrees*. That they are frank and free enough in their manner, I allow; but I often found them too much so, and so troublesomely curious and inquisitive were they, that it was sometimes only by threatening them with the stick, that I could keep my tent free from them. As to their honesty, it appeared to me very like the honour which is said to exist among thieves;

they are true and honest among themselves, *because* they find it mutually their interest to be so, in a country where each is necessarily more or less dependent on his neighbour for assistance;—but in their dealings with a stranger, they do not hesitate to lie and cheat as much as any of the people of the plains of India.

Of this I had several good proofs while among them, one instance of which was practised at Dunkur. Being sadly in want of provisions for my people, I had, with much difficulty, at length prevailed upon the killadar of the fort to sell me ten rupees worth of wheaten flour. The money was paid in advance, and it was agreed that I should march to Leedung, and leave behind me three or four of my people to receive and bring it on the next morning. Accordingly I proceeded to the fossil site, and halting there one day, we consumed all the provisions we had with us. Instead of furnishing the flour by noon on the stipulated day, it was not produced and delivered over to my people until late in the dusk of the evening, when it was too dark to see its quality, which was of course exactly the aim of the seller; for on its arrival in my camp the next day, it proved to be instead of wheat, for which I had paid a higher price than it was selling for among themselves, coarse barley meal, of the worst description, and which even the coolies refused to eat. Luckily we purchased enough at Leedung for the day's consumption. This was so evident an endeavour to take me in, and pocket the difference in price, by giving me bad barley instead of good wheat, that I instantly returned it, and demanded the strict fulfilment of the agreement, under pain of helping myself. My demand was acceded to immediately, as even then I only got seven seers for the rupee, while among themselves it was selling from ten to twelve seers.

Another instance of their roguery which annoyed me excessively, occurred during the short march from Nabo to Leeo. I had purchased an enormous pair of horns with the skull of a shawl goat, and had placed them on a kiltah, or basket, containing specimens of rocks and minerals. On arriving at Leeo the horns had disappeared, and all inquiry to discover the thief was fruitless: they now no doubt grace some pile dedicated to their favourite Devi. This theft however, was the least of the evil, for the rascally Tartar, thinking his load too heavy,

had thrown away a number of valuable rock specimens also. So much for *Tartar morals*.

If coolies are required from a village in Spiti, no man will move without first receiving his four annas, and it is then by no means improbable, that he will set down his load about half way, and leave you in the lurch, or he will leave part of it behind, and carry on the rest, telling you very coolly that it is too heavy, although perhaps the whole does not amount to twenty seers.

Sometimes again, no man will stir even if you offer him double pay and a light load, for fear the Mookiah of the village, who happens to be absent, should feel displeased at his giving you assistance, and in this case the load must be left behind until you can send back a man for it from the next stage. If asked whether they will sell you a sheep or goat, flour or birmore (woollen stuff,) they invariably tell you there is no such thing to be had in the village, either because the season has been bad and the crops have failed, or because somebody has robbed them; while at the same time they have plenty of every one of the articles demanded; but their fears that the traveller will take what he fancies, without giving them payment for the same, at once prompts them to tell a lie as the safest mode of escape. When once assured of payment, however, they bring their goods forward, although at a most exorbitant price, thinking, no doubt, that as a paying customer is seldom met with, the best way is to make the most of him when he does appear.

It is very true that all this may originate from the mode in which they are treated by their governors, and that if they were more happily circumstanced they would behave otherwise; but with the causes of their behaviour, I have nothing to do, and I therefore speak of the Tartar as I found him.

These remarks however are much more applicable to the Tartars of Spiti than to those of Bussaher, or as they term themselves by way of distinction, both from the Tartars of other districts and from the Kunawurrees, "Tartars of Hungrung within."

The Tartars of Hungrung are subject to Bussaher; those of Spiti to Lādāk; and the Chinese Tartars to China; these although essentially the same people, have nevertheless their peculiarities and distinctions both in dress, and language.

The dress of the Tartars consists in general of a strong and thick birmore, which is manufactured by themselves from the wool of the Thibetan sheep. The coat or body dress fits somewhat tightly over the breast and shoulders, and has long sleeves; it descends as far as the knees, but is not plaited like the dress of Kunawur; they wear also large loose trowsers with the ends tucked up, and tied at the knee, causing them to fall in large bags nearly to the ankle. The foot is encased in a strong, and clumsily made shoe of leather, to which is attached a woollen stocking reaching to the knee, where it is confined by a garter beneath the trowsers.

This stocking is generally of two colours, the lower half being red or yellow, and the upper half blue. This is the dress of a decently clad person, but in general they are seen clothed in rags and tatters of the filthiest kind, their stockings patched with yellow, red, blue, and every colour of the rainbow, yet bearing no more resemblance to *Tartars*—to which the fanciful imagination of a former traveller has likened them—than do the patched, and parti-coloured rags of an English beggar, to the neatly arranged colours of a Highland plaid.

To the above dress is often added a red linen sash, in which is stuck a knife, and a steel tobacco pipe, called a “gungsah”; it is sometimes inlaid with silver, and rudely worked, and is manufactured in Spiti from the iron which is imported from the lower hills. The bowl for the tobacco, and the *tout en semble* have very much the form of an English tobacco pipe. The Chinese Tartars have them made of brass, and neatly ornamented; a small leathern purse in which is kept the tobacco in a dried state, and a steel, or chuckmuch for striking a light, are also suspended from the waist by a string, or sometimes a brass chain.

Round the neck is worn a necklace of pieces of amber and coloured stones, and many of the devout have also a long string of wooden beads, which are counted over as they hum an invocation to their deity.

In the form of head dress there is some difference; that of Hungrung being usually a close fitting cap, with a flap to protect the ears and nape of the neck, and which in the summer is turned up. The Tartars of Spiti wear the same, as also a kind of bag-shaped cap, the upper part of which flaps over one side of the face; this last is also worn in Ludak.

The Chinese Tartars again are usually bare headed, with the hair in front cut close, or gathered back into a long plaited tail, which falls down behind.

The women are certainly, without exception, the ugliest I ever beheld, and usually vie with the men in filthiness of dress and person. They are fond of red garments, which consist of a woollen petticoat reaching to a little below the knee, with trowsers and boots similar to those of the men ; a blanket is also usually thrown across the shoulders, and fastened in front upon the breast with a large steel needle or piece of string.

In Kunawur a kind of brooch made of brass, and called "peehook," is used instead of the needle, and looks better.

Some wear a cap like the men, but generally the hair is thrown off the forehead, plaited into numerous long tails, and hangs down the back, where it is kept from flying about in the wind by a girdle, which confines it to the waist ; this is sometimes of leather, and is studded over with pieces of amber and coloured stones ; another similar strap of leather is also worn on the head, hanging from the forehead over the crown and down the back, this too is studded like the former with stones or glass of different colours, and is used both as an ornament and as a means of keeping down the back hair by its weight.

When kept neat and clean, as some of them are, this style of head dress has a very pleasing effect.

Both men and women have very low, flat foreheads, small eyes, broad flat faces, and high cheek bones, which together with a cloak of goat's skins worn by the women with the hair inwards, gives to their square short figures very much the appearance of the pictures we see of the Esquimaux.

To the Tartars of Hungrung and Spiti, feelings of modesty appear to be totally unknown, or if known, they are disregarded. Men and women too, may sometimes be seen unblushingly bathing together in the same stream, in a state of nakedness.

The Tartars of Spiti are stout made, athletic looking fellows, but they are poor spiritless cowards, forming in this respect, if report speaks truth, a marked contrast to the tribes of Chinese Tartary, who are represented as a bold and fearless people, though of a mild and gentle disposition.

When the Rajah of Ludak was lately expelled by the troops of Runjeet Singh, and forced to seek shelter in Spiti, the Tartars assembled to the number of 400 men, and posted themselves at a gorge, in order to check the advance of the Seiks, who were reported to have entered the district. The position they had chosen was one where a handful of resolute men might have held an army at bay, and they valiantly looked forward to the defeat of their enemies.

When the foremost of the Seiks appeared, a single matchlock was discharged, doubtless with the intent to strike a panic into the advancing foe, but it had unfortunately quite a contrary and unforeseen effect, for no sooner was the report heard, than, without stopping to witness the result of the shot, off scampered the Tartars, as hard as they could scramble over the hills, and the enemy, who amounted after all to no more than *six* men, marched through the district and compelled the Rajah, (who fled on hearing of the result of the *battle*,) to seek protection in Bussaher.

When I asked the Tartars how they could be such cowards as to run from six men, they replied that they did not know at the time that their enemies were so *few in number*, or they would have fought them!!

Throughout the districts of Hungrung and Spiti, as also in the upper parts of Kunawur, where the Bhuddist religion prevails, oblong piles of stones are constantly met with by the road side, and the custom is always to pass, so as to leave them on the right hand; in the observance of this the Tartars are very scrupulous. On these piles are numerous slabs of various sizes, with inscriptions engraven in the characters of Thibet by the Lamas, who appear to be the only people who can read them. These inscriptions "hieroglyphics," as Dr. Gerard has termed them, are usually the sentence "*Oom manee paimee hoong*," repeated two or three times on the same slab; others bear longer sentences from their sacred books, and all are analogous to the tombstones of our own country. When a person dies the body is burned to ashes, and intimation being given to the Lamas or priests, a stone is prepared and engraven with some sacred sentence, and when ready to be deposited on the pile of stones, or "*manee*" as it is termed, the friends and relations of the deceased person assemble, and repairing to the spot, walk several times round the manee,

repeating the sentence "*Oom manee paimée hoong*," as fast as they can, in a sing-song voice. After this the Lama deposits the stone, and the party retires.

The slabs placed on these piles are sometimes very creditably carved; at others quite the reverse, being mere thin slabs of slate, with the letters scratched on the surface.

The word "*manee*" is also applied to a small brass barrel-shaped instrument, about two or three inches long, which is made to revolve round an axis, one end of which is held in the hand; the oftener this is made to revolve during the day, the greater chance the person has of going to heaven. It is laid aside while the possessor is employed in laborious work, or any occupation requiring the assistance of both hands, but the instant that task is accomplished, the whirling of the *manee* is resumed. In it are enclosed a few scraps of paper, inscribed by the Lamas with some sacred sentences.

The district of Spiti is said to contain about forty villages, and four hundred families; so that if we allow six and a half persons as an average to each family, which will certainly be the utmost, it will furnish a population of about two thousand six hundred souls. In point of scenery and general appearance, the features of the country throughout are far different, and less attractive than the hills of Kunawur.

Through the latter country we see the mountains towering aloft in ragged and shattered pinnacles, bearing full witness to the mighty and irresistible nature of the agency which has torn their firm strata asunder, and hurled them aloft in spires of various forms. Such are the usual characters of primary formations in every country.

The sides of the mountains are there clothed often to their very crests with forests of oak and pines, cheering the traveller, and robbing the gigantic and snow-clad mountains of their terrors. Villages and cultivation are met with at no great distance from each other; and all bespeaks the presence of industry and plenty.

Throughout the Tartar districts of Hungrung and Spiti, all wears a different aspect,—a dull and melancholy air of desolate sadness, seems to pervade the scene;—the mountains, less bold and rugged, have a blackened and charred appearance, caused by the de-

composing strata of clay-slates and shales in which they abound. These hills are of the secondary formation, and their outline more gradual and rounded, wants that air of majesty and grandeur which the primary class possesses. Here are no trees, no forests to take off the sombre aspect of the view,—but a bare and barren waste of crumbling soils meet the eye at every turn. Broad and sterile tracts of alluvial deposits are also traversed in the bed of the valleys, now high above the river's course, and which seem from their appearance to invite the hand of industry to cultivate the soil, yet days may be passed without a village being met with to gladden the cold and dreary solitude. /

If even a village be found, no welcome is seen in the eyes of the half scared inhabitants, who, fearful lest their stores should be taken from them without payment, either deny that they possess any thing at all, or abandon their huts at the approach of the intruder. When assured that no force will be used towards them, they become, on the other hand, such harpies, that it is impossible to procure the commonest article without paying a most exorbitant price for it. A great inconvenience arises from the want of a copper currency. Throughout the districts of Hungrung and Spiti, as far as I travelled, nothing could induce the people to receive pice; they have no use for them among themselves, as every thing is on a system of barter,—wool for grain, woollen stuffs for salt, tobacco, &c.,—but no money generally speaking passes from hand to hand among them. The only time therefore when they find the use of money is at the annual fair held at Rampore in the month of November, at which season they purchase the various articles and supplies which are to last them till the same time in the ensuing year,—or which are to be taken up into the higher and remoter hills. In exchange for these things, which consist of goor, tobacco, iron, grain, &c. they give to the dealers, biangee* wool, pushm, sooklant, birmore, chowrees, blankets, borax, &c.

Even here therefore they pursue a system of barter with the people of the lower hills and plains, and their money is only useful when they wish to purchase some trifling articles, such as beads, looking glasses, &c., from those to whom their merchandise would be useless.

* A term applied to Thibet sheep wool.

In Spiti the only coins which are received, are the old Culdar rupees, and a small silver money of Ludak, of four annas in value, called a "Powlee."

Thus, as no pice are current, the value in full must either be taken for your money, or you pay four annas for that which is worth but one. The way my people used to manage, was to club together to take a certain quantity of anything, so as to have the full value of their money; but I was constantly obliged to pay four annas for the cup of milk for my breakfast, or drink my tea without it.

In Hungrung, which is under the government of the Bussaher Raja, another silver coin, worth two annas, and also sometimes termed a "Powlee," though more properly a "Timashé,"* is current, as it is likewise in Kunawur. Still, except in Kunawur, no pice are received, and the people say they have no use for them. Formerly there existed a *brass* currency in Hungrung and Kunawur, but it has long since fallen into disuse. The inconvenience, however, is not so great in Hungrung, because the Powlee is of only half the value of the Ludak coin. Silver money is always readily received, because it can be applied to various purposes, either in paying the rents, &c. to their governments, or by melting down into ornaments.

Lead is found in the neighbourhood of Pokh, but in such small quantities that no mines are worked, and it is only when a supply of balls are required, that any one will take the trouble of going in search of it.

The district of Spiti may be said to produce no trees at all, except a few poplars and willows planted round the villages, to serve for economical purposes when required, and which being all planted by the hand of man cannot properly be admitted into a list of the productions of the country, or suffered to be at all characteristic. No fruits of any kind are seen, neither grapes, peaches, apricot, apples, walnuts, nor in fact any of those fruits which are so abundant in Kunawur. Of shrubs, the "Himalayan" and "Chinese fruze"† are the most abundant, and form the chief fuel of the people; these are cut and dried in the summer months, and stored up on the flat roofs of their houses, where they form thick stacks against the

* Is this a corruption of "Timour Shah-i?"

† Astragalus.

rigors of the winter season. Besides the furze there are few shrubs met with, save the dog-rose, and a creeping plant called "Kábráh," which spreads along the ground, bearing a large and beautiful white flower. The rose is sometimes cut and stored up also with the furze for fuel. Growing wild over the almost barren hills, amidst the loose and crumbling soils, is a small plant bearing a pea-shaped flower, of a pale rose colour, the leaves of which when bruised are thought by the shepherds to be efficacious in the curing of maggots in sheep, and which when applied to the infected part, is said to cause the insects to drop out; it is called "Taksha."

A traveller journeying through this district in the summer months, would fancy, from the few sheep and cattle seen about the villages, that flocks and herds were wanting; the fact however is far otherwise. In June when I passed up and down the valley of the Spiti, I scarcely saw either a sheep or a goat, excepting the flocks laden with grain, and which did not belong to the district. Of cows there were a few, but yakchas* none. This is owing to the custom which prevails, not only here but in Hungrung and Kunawur also, of sending the flocks to the higher regions, where, when the snows have melted away, a rich vegetation soon springs up, affording a pasture that the lower tracts cannot produce. Grasses, potentillæ, wild onions, rhubarb, and herbs of various kinds abound over these tracts, intermingled with the furze, and extending to the height of 16,000 feet above the sea. The sheep and goats are tended during the day, and penned at night, sometimes on the open mountain side, guarded by several dogs, or enclosed in temporary huts called Dogress.

The yaks, on the other hand, are turned loose on the pastures, and left at large to roam at will, and to take care of themselves during the summer, and are only reclaimed when the ploughing season or the winter arrives. They are employed both as beasts of burthen and in the tilling of the ground, though former travellers have denied that they are used in husbandry. For the former purpose, however, ponies and goats or sheep are preferred, as the yak cannot travel for many consecutive days without being knocked up. In the plough they have much more the appearance of

* Yák or Yakcha is the name of the Tartaric or Yak ox (*Bos porphygus*.)

large shaggy bears than of oxen, and like true mountaineers they evince the greatest impatience under a yoke, and it is therefore necessary for two men to attend the plough,—one directing the plough, while the other walks before and leads the cattle, which are guided from the nose like the oxen of the plains.

It has been said that the yak is so savage, as often to put to flight the inhabitants of a whole village. To this opinion I can by no means assent, for though I have often passed a herd at graze upon the mountains, or carrying burthens along the road, I never saw the least sign of vice among them, nor did they attempt to run at any body. On the contrary, I pronounce them to be gentle and timid, evincing always much more disposition to run from, than at, one; such too, was the character given of them by the Tartars. It is very probable that a savage animal may occasionally be found, as we know to be the case with the cattle of our own country,—but this is only an exception, and cannot justify the sweeping assertion that the breed is savage.

The best proof of their gentleness is found in the fact, that a herd of twenty and thirty yaks is often driven by a mere child, and I could hear of no instance in which the urchin needed farther assistance.

In the higher parts of Kunawur and in Tartary, the yak itself is the breed of cattle in most general use, but in the less elevated tracts, and in lower Kunawur, several cross breeds are used.

The *male* is termed “Yakcha,” and the *female* “Breemoo”; this is the true “*Bos grunnies*,” or Grunting ox” of Linnæus, and the “*Bos poephagus*” of Hamilton Smith. From the *Yakcha* and the common little cow of the lower hills, proceeds the “*Zo*”, and its female “*Zome*”; from these and the *Yakcha*, or *Breemoo*, proceeds the “*Strool*” and “*Stroole*.” Both these cross breeds are somewhat similar in form to the yak, but they want the long hair on the sides and tail, and are less strongly made.

From the “*Breemoo*,” or female yak, and the Hill bull, proceeds another cross breed very similar to the foregoing, and called “*Garra*” and “*Garree*.” All are employed in husbandry, and in carrying loads. Black or red are the prevailing colours, and very few are white, except at the tuft of the tail.

Besides these breeds of cattle, the people possess sheep and shawl goats, mules, and large herds of *Ghoonts*, or hill ponies. The dogs

are not numerous, and are a sadly degenerated breed of the Thibet mastiff (*Canis molossus* var *Thibetanus*).* Cats are seldom seen, but are similar to those of the lower hills, being usually of a deep grey with darker narrow transverse bands on the sides.

¶ In a country so bare of forest scenery, and presenting so little cover, it is not to be wondered at that the wild animals are few in number. The ibex, wild sheep, vulture, eagle, Indian vulture, raven, chough, chicore, bhair, sparrow, snow bunting, some pigeons and Brahminee ducks, were nearly all that were seen or heard of.

The ibex is known throughout the upper portions of Kunawur and in Tartary, by the name of "*Skeen* or *Sikeen*" and appears to be identical with the animal called by Hamilton Smith the "*Abyssinian Ibex*," or "*Capra Jaela*." It is found only in the most inaccessible parts of the mountains near the borders of eternal snows, leaping with surprising agility from crag to crag, and bidding defiance to pursuit.

It is therefore only when the heavy falls of snow on the heights where they love to range have driven them down for pasture to the lower and more accessible parts on the borders of the forests, or in the shelter of the glens, that they fall a prey to the wary hunter, who stealing on them with noiseless tread, fires on the herd from behind the shelter of some ledge that screens him from their sight.

I had no opportunity of inspecting a perfect specimen, but from the horns and skins, the following description of the "*Abyssinian Ibex*," taken from the Naturalist's Library, would appear to be appropriate.

"It is of a dirty brownish fawn colour, with a short beard, and lengthened hair under the throat down the breast, and a darkish line on the anterior part of the legs and along the back. The horns are superior in length to those of the European Ibex, forming a half circle closer on the forehead."

In the Himalayan ibex, the horns are large, rising as in the European species, "from the crest of the skull, and bending gradually backwards"; "they are flat-sided, and have the anterior surface ringed or barred with very strong cross rugged bands."

The same opinion regarding the increase of these bands with age, is prevalent in these mountains, the natives declaring that *two rings or bands* are the growth of *one year*.

* For a good figure, see "Gardens and Menageries, Zoological Society".

I showed a plate of the European ibex to the Leepee hunter, asking him if he knew what it was, and he had scarcely set eyes on it, when he exclaimed with delight, "wah, wah, it is the Skeen."

The animal has in a great degree the strong smell peculiar to the males of this genus.

The wild sheep is the same as that which in my trip to the Burrrenda Pass, in 1836, I erroneously stated to be a variety of the "*Ovis ammon*"; I had not then seen one near. Since that time, however, I have had opportunities of inspecting several fine specimens, and find it to be the "*Ovis nahoor*" of Nepal, which has been already ably described by Mr. Hodgson. It is known to the Hill people of the west as the "Burrul."

Of the "*Ovis ammon*," I could learn nothing, save that an animal apparently answering to the description, is found in Chinese Tartary, and I saw an enormous pair of its horns, nailed among other kinds, to a tree as an offering to Devi.

It is said by writers, that one of the descriptive characters of the European vulture eagle consists in its proneness to attack the flocks of sheep, dashing downwards from on high with irresistible strength, and hurling the young or sick animals over some precipice, in order that it may banquet on the crushed and mangled carcase.

If such account be true, it furnishes a strong additional reason for separating the "*Lamergeyer*" of the Swiss, from the Himalayan bird; for the latter is never known to attack aught of larger size than a barn-door-fowl, and it must be hard pressed indeed by hunger ere it will even venture that. Its food consists, as I stated on a former occasion, of carrion and offal, which it takes in company with the true vultures, or snatches from the ground in its talons after the manner of the kite (*Falcochula*) and devours it as it flies. It ranges from Subathoo in the lower hills, to the barren and snow-clad heights of Tartary.

The Chough, or red-legged crow (*Pyrrhocorax graculus*), is common over all the snowy heights of Kunawur, from 10,000 feet and upwards. In Tartary it is very abundant, and appears to be identical with the English bird, though rather exceeding it in size. In Hungrung and Spiti I observed a second species, apparently possessing the

same habits, and similar to the common chough in all, save the bill, which is much shorter, and of a bright yellow colour, instead of the rich orange of the Cornish chough. The legs are similar in both. They appeared to keep apart from the other species, and were most abundant where the former were fewest. Dunkur and the upper parts of the valley seemed to be their proper habitat. It is in all probability a known species, and comes I think into Cuvier's genus "Fregilus."

As the winter approaches, both flocks and herds are again driven down to the villages, where they are fed on fodder, which has been stored up for them during summer. This consists in a great measure of the tender shoots of a shrub, which grows over the hills, especially in Hungrung, and the upper portions of Kunawur, in great abundance. It is common wormwood, and possesses the pleasant smell of the southern-wood of England, which is I believe the same plant, or a closely allied species; where this shrub occurs in great abundance the air is often scented with it, and if trodden under foot the smell is both powerful and pleasant.

In the season when the men are on the mountains with the flocks, or carrying grain to those parts of Chinese Tartary where little or none is produced, the care of the crops around their villages devolves almost entirely upon the women, who are seen early and late throughout the day, weeding and irrigating their fields.

The chief produce of Spiti is common, celestial, and beardless barley, (nunga jow of natives) wheat, beans, peas, and phuppra, which are produced in some abundance in the lower parts of the valley from Dunkur downwards.

Dunkur is the chief mart for grain, and has a goodly patch of cultivation around it.

Birmore, a thick kind of woollen cloth, somewhat of the texture of a blanket, is made in this district of the wool which is received from the Choomoortee and Thibetan shepherds. The cloth is made in pieces of about eighteen inches wide, and varying in length from six to twelve yards, and has some resemblance to the thick woollens of which box coats are made in England. These pieces are sold generally in pairs, at five to seven rupees, according to the quality and size.

Though yaks are plentiful through this district, no chowrees are procurable, as the people neglect the tails of the animals, the long hair

of which is consequently broken as they roam among the furze of the upper tracts during summer. The villages of Nako, Chungo, Leeo, Poo,ee, and Hungo in Hungrung, are some of the places from whence chowrees are chiefly exported to the lower hills, and much care is bestowed upon their growth.

The black ones are not esteemed by the natives, and are therefore left to nature, and are either used to hang on poles, one of which is erected on the roof of almost every house as a propitiatory offering to some deity, or the long hair is plaited into ropes, which are both strong and durable. Hemp is unknown in this country, and every person of the poorer class has a rope of yak's or goat's hair twined round the waist, which serves not only as a waistband, but is also used to bind their loads upon their backs.

The white tails, however, have the hair often cut to make it grow longer, and the whole is enclosed in a bag to keep it free from dirt, and to prevent its being broken by thorns and bushes. When the hair has attained a good length, the tail is cut off, bone and all, and dried in the sun, after which the chowree, or chownree as it is termed, is sent to the lower hills for sale. In Hungrung the price asked is from 1-8 to 3-8 Co's. rupees, and even four rupees, according to the length, and the quantity of hair. At Simla double these sums are demanded by the Cashmerians, who purchase them at the Rampore fair. Formerly the price even in Hungrung was much lower, but the demand for them, since Simla has become a *fashionable resort*, has raised their value.

The same effect has been produced at Soongnum in Kunawur, with regard to the price of blankets which are there made; formerly *one* blanket was as thick as *two* of the present manufacture, and sold for the same, and often for a less price. The demand for them of late years has, however, both raised the price, and deteriorated the quality. Now, it is no longer a matter of rivalry who shall produce the *best* blankets, but who shall produce the greatest number, and the wool which formerly would have been apportioned to one, is now made into two blankets, which are sold at 3-8 and four rupees a piece at Soongnum; and at Simla from five to eight rupees by the Cashmerians.

Among the Tartars there are many families who possess no fixed habitation, but wander about from place to place, with their flocks, ac-

according as they find a market for their goods. To these people, in the language of the country, the title of "Kampa" is applied.

They live altogether in tents, or encamp beneath overhanging rocks, wandering, as the winter approaches, from their native country down to the lower parts of Kunawur and Cooloo, where they dispose of the produce of the upper hills, and subsist their flocks until the periodical rains are about to commence, at which season they again travel to their native scenes, laden with grain, iron, &c.

The Tartar who accompanied me as a guide through Spiti by order of Puttee Ram, the present vuzeer, was constantly termed "Kampa" by the people of the different villages, and at first I thought it was a title signifying some sort of authority, but it appeared on inquiry that he had once pursued the wandering trade of a Kampa, and although he was now well off, and possessed of houses and land both in Hungo and Leeo, the term still clung to him.

Another title often conferred upon him, also, was that of "Laffa," which I found to have nearly the same meaning as the word "mate" of the lower hills, that is, a servant possessing some little authority over his fellows, as the mate, or head man of a set of Japannees, the mate, or man in charge of a Dâk bungalow, and in Kunawur, the mate of a village, who is the "locum tenens" of the Mookiah when absent. Gerard more than once mentions having exchanged scarfs, or khuttubs, with the Laffa of Peenoo and other villages in Tartary, which he says is the usual custom.

During my trip through Tartary, I never even saw a single khuttub, nor did I find it necessary to offer one, although the Laffa of each place paid me a visit, and presented the usual small "nuzzur" of attah, raisins, or ghee. Gerard no doubt concluded it was necessary to present a scarf, because he had found it the custom to do so in Chinese Tartary.

All the inquiries however that I made on the subject, tended to prove that the custom only prevailed among the Chinese people, and that it was quite unnecessary to make any present at all to a person of such inferior rank as the Laffa or mate of a village.

On my return from Spiti, when starting from Leeo where my guide resided, he begged to be released from his post, as in a few days he wished to start for Choomoonce with his last year's produce, and

purchase wool for the Rampore market. Having no farther need of his services, I dismissed him with a present of five rupees, a common single bladed penknife, and some strings of imitation coral beads, as also a string of beads for his wife.

The present though partly consisting of what I thought trash, was received by him with every mark of delight, and laying the things at my feet, he knelt down and touched the ground with his forehead,* saying he had received a great reward.

On the 4th July, after an absence of nearly a month, I once more took up my abode in the small bungalow at Soongnum. It is a small flat-roofed house, of one room, and was built several years since by a Dr. Wilson on the site of an old temple. In front of the door is a post on which are nailed many horns of the ibex, wild sheep, and goats, and a similar collection is seen against the trunk of the cedar tree which overhangs the house.

The town of Soongnum is situated, according to Dr. Gerard, in latitude $31^{\circ} 45'$ and longitude $78^{\circ} 27' 24''$ east, and stands in the bottom of a glen between the high passes of Roonung and Hungrung, the one being directly in front, and the other in rear of it. The glen is called the valley, of Rūshkōlung, and runs nearly north-west and south-east. It is well watered by a stream, which runs through it from the snows on the Mānērūng Pass, above Mānes in Spiti, and joins the Sutledge a short distance below Soongnum.

From the town, extending about three miles up the stream, is a beautiful strip of cultivation of half a mile in breadth.

There are generally two crops produced during the season, the first consisting of wheat, barley, and beans, which is generally gathered in during the months of July and August, and the second of Phuppra, which is ready in all September, unless, as sometimes happens, it is destroyed by early frosts and snow.†

Turnips also of large size constitute part of the second crop, and are said to weigh two and even four pounds each. These are yellow, and when dried and pounded they are mixed with the wheaten or barley flour, and form the principal food of the inhabitants during the

* This was performing a kind of "Kotoo" !?

† In all preceding accounts of these hills, the word *Phapur*, is almost invariably substituted for Phuppra, which is correct, and is pronounced as though it were spelled "*Fuppra*."

autumn and winter seasons. From their yellow colour and farinaceous nature, they would seem to approach the Swedish species; some care is bestowed upon their cultivation, as if sown thickly, they have not room to swell, and consequently are of small size;—in order to increase their growth, the fields are thinned and the turnips planted at some distance from each other, by which means they come to perfection, and are dug in October. Besides forming part of the food of the people, they are also given to cattle during the winter.

The beans have all the appearance of the common European garden vegetable, and are used when ripe to feed cattle, or are ground into flour, and eaten by the people.

From the situation of Soongnum, between the high passes, and the direction of the valley, a strong wind generally prevails during the greater part of the day, and retards in some measure the advance of vegetation, which is here far less vigorous and forward than at the Tartar villages of Hungo, Leeo, and Chungo, the first and last of which, although at a greater elevation, are not so much exposed as Soongnum.

The manufactures here are blankets and sooklat, which are exported to the Rampore fair, where the former sell according to the quality, from three to five rupees each, and the latter at about four rupees eight annas, to six and seven rupees per pair. The latter article is, however, principally exported from Khanum and Labrung, and its quality is somewhat better than that of Soongnum.

There is a large Takoordwara, or Lama temple, in the upper part of the town, to which light is admitted by two apertures in the roof, which are protected from the weather by conical roofs of cedar wood, somewhat after the Chinese style.

About half a mile farther up the glen is another and larger temple of the same description, and near it are the huts where the "nuns," as Gerard has termed them, reside during the winter season.

These nuns are strictly speaking *female* Lamas, or priestesses, and are called "Jummoo." They are forbidden to marry, and usually wear garments of red stuff.

Some are dispersed during the summer months, and attend upon the different temples throughout the district, reading the sacred books, and performing religious ceremonies like the Lamas; others are occu-

pied in the care of their crops ; while those who are poor, and have none, roam about begging a livelihood.

In the winter, when the severity of the season generally prevents their wandering about, they assemble at Soongnum, and reside together in a collection of huts near the town, until the return of spring again disperses them. This at least was the account given of them by the natives.

The Lamas, on the other hand, reside during winter, some in the temples and others in their own private dwellings.

In some of the temples are large wooden cylinders* or barrels placed on an axis and turned by a stream of water ; they are also seen at Soongnum by the road side, with a shed built over them. The temples are often ornamented with colossal figures of their gods, which are sometimes represented in grossly indecent attitudes.

The fruits at Soongnum are apricots, apples, neozas, and grapes. The apples are of good size, and are said to be finer here than in any other town of Kunawur, and ripen about the month of October. The finest grapes are produced at the village of Ukpah on the Sutledge. At Soongnum the grapes are neither very abundant nor very good, and do not occur across the Hungrung pass at all. Apricots are seen as far as Leo, where they also cease to grow ; and in Spiti, as already mentioned there are no fruits at all. Besides these garden fruits, there are gooseberries and currants innumerable on the mountains' sides, but they are not cultivated by the natives, nor held in estimation.

From Soongnum I made an excursion up the Rūshkōlung valley, towards the village of Roopa, near which I heard that veins of copper ore were found in the rocks.

This glen is certainly much more worthy the name of a valley than any I have yet seen in the Himalayas, with the exception of the beautiful and fertile valley along the banks of the Pubbur river, leading down from the Burrenda pass through Chooara.

For three miles from Soongnum, the pathway lay through rich fields of barley, beans, and young wheat, studded with numerous apricot trees, so numerous indeed, that the whole appeared like luxuriant vegetations springing up beneath the shelter of a large orchard or forest

* These are used as the Manees above noted ; written prayers are enclosed in them, and the rotatory motion is supposed to make them acceptable.

of apricots. This strip of cultivation is about half a mile in width, and through it rushes the foaming stream of the Darboong river, which takes its rise in the snows of Mänērūng Pass above Maness in Spiti.

The spot partook more of the sweetness of one of those beautiful and picturesque vales in which our Scottish hills are so rich, than of the usual tameness of oriental Highland scenery.

Here as I walked along, I felt more pleasure than I had experienced during all my wanderings, while contrasting the beauty of this scene with the bare black hills of Spiti, to which I had been for so many days accustomed. There, all was cheerless, and almost devoid of vegetation; while here, around me lay a broad sheet of green fields, above on the mountains' side rose dark forests of neoza and kayloo pines, whose sombre tints were again relieved by the paler hue of the cedar and the willow, while bushes of the dog-rose were scattered at random through the valley, loaded with flowers, and presenting literally a mass of pink of every shade, from the dark bright tint of the opening bud, to the pale hue of the withering flower. About three miles from Soongnum the valley narrows, and becomes a mere mountain glen; cultivation ceasing for about a mile, when it again refreshes the sight around the village of Roopa. Beyond this the road ascends over broken rocks, and winds high above the bed of the torrent, through a forest composed almost entirely of cedar trees. These are mostly stunted, and very crooked, so that it is with difficulty that plants of any size fit for economical purposes can be procured. This difficulty has lately been increased by the erection of a large temple at Khanum, for which all the best trees in the district were selected, and few therefore of any size now remain.

Between Soongnum and Roopa, a large portion of the neoza pines are the property of the Bussaher Rajah, to whom the produce is annually sent down. These are generally situated on estates that have lapsed through the extinction of families, or other causes, and it is not a custom peculiar to Soongnum, but obtains also in other parts of Bussaher.

Three miles from Roopa, and seven from Soongnum, in the midst of the cedar forests, my guide stopped, and pointing upwards towards the summit of the rocks, which rose boldly and abruptly in rugged cliffs, he showed me a white mark far above the belt of trees, where

he said copper had been dug in the preceding year, but that now the weight of the winter snows had forced in the rock, filling the mines with rubbish, and the workmen had gone farther on in search of a fresh vein of metal.

Thinking that this might be merely a *ruse* to prevent my ascending to the spot, I desired him to show the way, and lead me to the abandoned mine, but he declared he had never been there, and could not guide me. Hereupon a council was held as to what was to be done, for to attempt to scale the rocks without a guide, was almost tantamount to suicide.

In this dilemma we espied at no great distance a kind of bower or hut built of green branches, torn from the cedar trees amongst which it was situated; so nicely was it calculated, from the materials of its construction and its position amidst the low and stunted trees, to escape detection, and pass for part of the brushwood, that I could scarcely believe it to be any thing else, until the guide removing a large branch, exposed a door way to view.

Within this sylvan abode was a woman with an infant in her arms both fast asleep, but being awakened by the removal of the door, she replied to our inquiries that the miners had gone in search of ore to a part of the mountain some miles distant, and would not be back for eight or ten days, and that she and an old man were left behind to burn charcoal against their return.

After some delay we succeeded in finding the man, whom we obliged very unwillingly to show us the path up the rocks.

With some grumbling at the prospect of the toil before him, he at last started, and never in my life do I wish to follow any one over such a path again.

The first four or five hundred feet were tolerably easy, being composed of loose soils and fragments of rocks, over which it was not difficult to climb, from their more gradual slope, but beyond this the rocks rose at once precipitously, presenting nothing but their ragged and projecting fragments to walk over. The ascent therefore was now hazardous from its steepness, and often caused us to stop to take breath, but the footing on the rock was firm, so that by the aid of both hands and feet, we succeeded in nearly attaining the desired spot, without once thinking how we were to descend from our aerial

position. At last a deep chasm, which had once been the bed of a snow stream from above, for a while arrested our progress, until we had cut holes or notches for our feet. This was done by the guide, who standing first on one leg and then on the other, cut or scraped with the end of a stick the holes as he advanced, all the while balancing himself over a precipice, into which, had his footing given way, he must have been hurled and dashed to atoms. He, however, was perfectly at his ease, for having formed the stepping places, he turned his back upon the precipice as with the greatest unconcern he tendered his hand to steady me over the yawning gulph. It was a place that I would gladly have returned from, but having insisted upon coming, and taunted the people for their hesitation, pride forbade my return. With a beating heart, and somewhat unsteady step, I accepted the proffered aid, and succeeded in crossing.

Two such gaps in the hill side were passed before we reached the abandoned mines, which after all were holes scraped in the rock to the depth of eight or ten feet, and which were now filled up by the splitting of the stones, and the quantity of rubbish brought down by the frost and snows of winter.

Here I picked up a few weathered specimens of the ore, which I thought a very poor remuneration for the toil I had undergone.

If the path was difficult of ascension, it will be readily conjectured that it was twice as much so to descend again; by dint of sometimes descending step by step backwards, and at others almost sitting down to it, down we got in safety, after ascending and descending a height of three thousand feet, and after a walk of seven miles from Soongnum.

The copper occurs in veins of white quartz, running parallel to the strata of greywacke, and old red sandstone, which are here the chief formations. It is worked by a few miners from Rampore, who are just enabled to earn a livelihood by the sale of the ore. A small duty paid in copper is taken by the Rajah of Bussaher, who is said to have worked the mines on his own account as a trial for one year, but the small quantity obtained, the distance of carriage, and the impossibility of working more than six months in the year, induced him to abandon the undertaking. The present miner resides in the forest near the different mines, or more properly excavations, during five or six months, and sells the produce of his labours at Soongnum.

In the autumn and winter the mines are abandoned on account of the snow, and the return of spring invariably discloses the destruction of them, by the splitting of the frost-bound rocks.

Last year (1837) the quantity of ore obtained, exclusive of the Rajah's duty, was from sixteen to seventeen maunds. Were these rocks situated in the lower hills, free from the severer action of frost and snow, they would doubtless yield a good return for the labour of working them, as the ore is by no means scarce, or only on the surface as has been stated. It occurs in veins in several parts of the mountain, and is deep seated; the fact of its occurring on the surface, is simply because the outcropping of the strata exposes it to view, but the vein dips down to the N. E. between the beds of greywacke and old red sandstone, and is thus inaccessible to the rude method practised by the people, whose excavations or mines are invariably filled up with rubbish during the winter. The ore is found on both sides of the valley, at about 13,000 feet above the sea, and 4,000 feet above Soongnum.

At the foot of the rocks I found my tent ready pitched among the cedar trees. Halting here for the night, I, on the following morning again returned to Soongnum, whence after a day's rest, I proceeded to recross the Roonung Pass.

The march from Soongnum is one of great fatigue; the road being one long continued ascent from the stream below the town to the summit of the Pass, or leading to a perpendicular height of 5,200 feet in a distance of about five miles.

The road, which on my arrival here in the beginning of June, was with the whole hill side buried deep in snows, was now on the 10th July quite free in its whole extent, with the exception of a few yards at the summit, where the snow still formed a long, and hardened belt. Flowers of many kinds were seen along the way. The "*Saxifraga ciliata*," at a height of 12,500 or 13,000 feet, was just opening into flower, and the bright colours of a yellow potentilla, tinged the whole hill side.

On the *southern face* of this mountain not a trace of snow was any where to be seen, but in its place a most beautiful and refreshing sheet of young and luxuriant vegetation, sprinkled with the bright colours of various flowers.

I call attention to these facts, because it has hitherto gone abroad to the public that the snow on the Himalaya lies longer, and lower down on the southern face, than on the northern, and as both my experience in this matter, and Dr. Lord's remarks on the Hinducush are directly at variance with this *reputed* fact, I have ventured to quote the above named gentleman's words, and shall endeavour to remove what I have found to be an erroneous impression.

"At the time of our visit," says Dr. Lord, "the snow which on the southern face extended in any quantity, to a distance of not more than four or five miles, on the northern, reached *eighteen or twenty*, and at a subsequent period, November 9th, when I made an attempt to go into Turkistan by the pass of Sir Ulung, and met with *no snow* until *within ten miles of the summit*, it actually on the northern face extended *sixty miles*, or nearly four days' journey." This is a fact which forcibly arrested my attention, as the *reverse* is well known to be the case in the Himalayan chain, where snow lies lower down on the southern face than on the northern, to an extent corresponding with 4,000 feet of perpendicular descent.

But the Himalaya and the Hinducush have the same aspect; the same general direction; lie nearly in the same latitude; and in fact are little other than integral parts of the same chain. The local circumstances however connected with each are precisely reversed. The Himalaya has to the north the elevated steppes of Central Asia, and to the south, the long low plains of Hindustan; Hinducush, on the other hand, has to the south the elevated plains of Cabul and Koh-i-damun, between five and six thousand feet above the level of the sea, while to the north stretch away the depressed, sunken, and swampy flats of Turkistan."

Against this long received opinion, that the snow lies deepest on the southern face, I shall merely oppose the few facts which fell under my limited observation during my journey into Tartary, and leave others of more experience to decide the point.

First, then, it must be observed that in the month of June, when I crossed the Roonung pass, the snow lay deepest and farthest down on the northern exposure.

On the southern face of the mountains it was first met with at about 12,500 feet of elevation, "lying in large fields or patches, and

uniting," at about 13,000 feet into one broad unbroken sheet, from whence to the summit of the Pass, or 1,500 feet more, it continued so, with the exception of fifty feet at the crest, when on the southern face there was none at all.

On the northern slope, on the contrary, it commenced at the very crest of the Pass, and continued in an unbroken sheet "to fully two miles and a half," while "beyond this, for half a mile more, it was broken and lying in detached masses."

The facts observable here therefore are greatly in favour of the northern face, for while the extent of snow is there estimated at three miles, that of the opposite exposure is but *two thousand feet*.

Again, on the Hungrung Pass the southern side had far less snow, both in respect to depth and extent, than the northern face down which it stretched nearly to the village of Hungo, or to a distance from the crest of the range of 3,600 feet in perpendicular descent, or between four and five miles from the Pass.

Again, in Spiti, above Leedung, while the southern exposure of the Pass was almost entirely free from snow, except immediately at the summit of the range, the whole northern face was buried deeply to some extent.

On my return to Hungrung in July, the northern side still held patches here and there, while the crests of the mountains were covered; but to the southward not a vestige of snow remained, except far down the glen, where from the falling of repeated avalanches from above, a hard and solid mass had become wedged into an arch or bridge across the brawling torrent that descended from the Pass.

Opposite to this, and merely divided by the narrow valley in which stands Soongnum, the northern aspect of Roonung still retained "a broad, and hardened belt of frozen snows" along its crest, while to the southward, not a trace of it remained.

To the right of Soongnum, towards Roopa, on the southern cliffs, no snow remained at all, while those with the northern aspect were in most parts still deeply buried, as was also the northerly face of Manerung, in Spiti.

From these few facts it will appear, that contrary to the usual belief, the snow is retained longer on the northern than on the southern exposure, exactly corresponding to the scientific observations, and re-

marks of Dr. Lord on the Hinducush;—and why indeed other than such a result should be expected, I am at a loss to divine. The aspects nearly the same, forming part and parcel of the same great range, surely the same phenomena in this respect might naturally be looked for.

From the crest of Roonung Pass, I bid a long farewell to Soongnum, which was seen in the depth of the glen below, and then dropping over the Pass, I descended gradually for about four miles to a stream of water, and a flattish piece of ground, where I sat down beneath a rock to await the arrival of my tent and baggage. Fatigued by the length of the toilsome ascent from Soongnum, and by the heat of the day, I soon fell fast asleep in my shady retreat, and on again opening my eyes, I found the tent pitched, and ready for my reception. It was now four o'clock *p. m.* and I found that I had enjoyed a sleep of as many hours, having arrived at the spot about midday.

We were here still at a height of 12,000 feet, and far below us in the distance was seen a part of the town of Khanum, while immediately beneath our encampment, at about two miles distant, was a broad piece of cultivation, with a few temporary huts called a *Dôgrée*, and belonging to Khanum and Leebrung. These patches of cultivation, far from villages, are often met with both in Kunawur and Hungrung. A few huts are erected on them, which serve to shelter those to whom the crops belong during the summer months, and which, when the harvest is gathered in, are abandoned during the winter. To these places the flocks and herds are also driven, where upon the surrounding hills, now free from snow, they find an abundant pasturage. In the language of Kunawur these temporary residences are termed *Dôgrées*, and in that of the Tartars "*Rezing*"; thus we find "*Rezing*" and "*Chang-rezing*", on the road to Spiti, to be patches of cultivation, and sheepfolds belonging to the inhabitants of the village of Chango.