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T H I B E T

SKETCH MAP

Shewing the **Glaciers** at the Source of the

# RATONG RIVER

to illustrate the Notes upon a trip undertaken by

## Major James Lind Sherwill, Rev. Surveyor.

to explore the Snowy regions of the

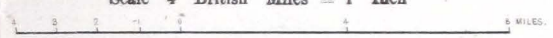
# GREAT KUNCHINJINGA GROUP

in the

# Himalayah Mountains.

## 1861.

Scale 4 British Miles = 1 Inch

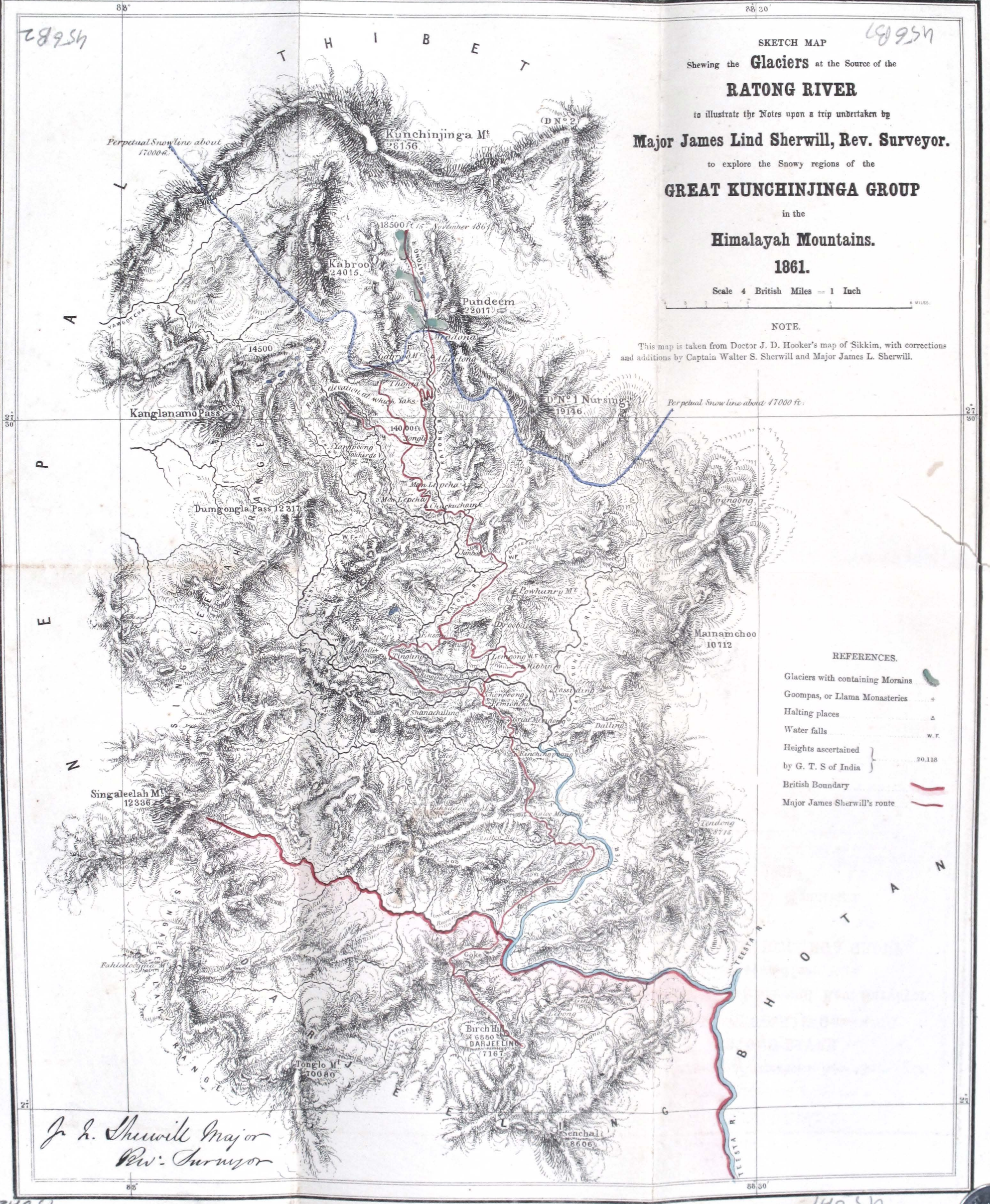


### NOTE.

This map is taken from Doctor J. D. Hooker's map of Sikkim, with corrections and additions by Captain Walter S. Sherwill and Major James L. Sherwill.

### REFERENCES.

- Glaciers with containing Morains
- Goompas, or Llama Monasteries
- Halting places
- Water falls w. f.
- Heights ascertained by G. T. S. of India 20,118
- British Boundary
- Major James Sherwill's route



*J. L. Sherwill Major  
Rev. Surveyor*

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# JOURNAL

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# ASIATIC SOCIETY.

No. V. 1862.

*Journal of a Trip undertaken to explore the Glaciers of the Kanchun-  
jingah Group in the Sikkim Himalaya, in November 1861.—By  
Major J. L. SHERWILL, Revenue Surveyor.*

The rains had been protracted to a later date than usual. On the 2nd November, 1861, after a week of fair weather, on the morning of one of those balmy days for which, at this season of the year, Darjeeling is so famous, our party, consisting of Dr. B. Simpson, Bengal Army, Captain E. Macpherson, 93rd Highlanders, W. Kemble, Bengal Civil Service, and myself, left "The Bright Spot" with the view, if practicable, of reaching and ascending any one of the perpetually snow-clad spurs of the great Kanchunjingah group of mountains, and examining the glaciers of this hitherto unexplored portion of the great Himalaya range. From Dr. Hooker's published map of Sikkim we were led to hope our object would have been attained by following the course of the Ratong river to its source. Accordingly we decided upon following this route, being strengthened in our resolution, by knowing that Captain W. S. Sherwill, in 1852, had failed in reaching *The Big Mountain* by continuing along the crest of the Singaleelah Range, his further progress having been stopped by a deep and precipitous valley.

Leaving Darjeeling at 7.45 A. M. on our hill ponies, we passed the Little Rungeet at 10 A. M. over a good bridge made of bamboos lashed together with slips of cane, forming an arch supporting a pendent roadway which was constructed in one night by Murray's sappers for the late Lady Canning. Reached the frontier outpost of Goke, at

10.30 A. M. It is situated on the summit of a narrow range which separates the Little Rungeet from the Rummàn, which river here forms the boundary between British and Independent Sikkim.

We parted with our ponies at Goke and proceeding on foot in an easterly direction, reached the Rummàn at noon, which river we crossed, not very far from its junction with the Great Rungeet, by a well constructed bridge of bamboos. The luxuriance of the vegetation along the northern slopes of the Goke spur is beyond all description beautiful. Near Goke are groups of stately saul trees, elegantly covered with clusters of ferns—one kind in particular encircles the saul, forming coronet-like bunches one above the other, the broad leaves of the fern resembling the feathers of a shuttlecock. On one tree we counted eleven of these coronets rising one above another. Towards the Rummàn, at a lower elevation, we passed through a grove of gigantic bamboos about a mile in extent. These bamboos are commonly used by the hill people for carrying water. Mica schist exists in considerable quantity along the spur, and the soil is rich and deep. Proceeding onwards and taking a northerly direction, we doubled round the Chakoong hill, and reached the Rut-<sub>400</sub> at 3 P. M. which we mistook for the Rishee. Crossing the Rut-<sub>400</sub> by a couple of stout saplings thrown across this wild and very pretty torrent, we commenced the ascent of the Rishee spur of the Hee mountain. Here one of our party became quite knocked up by the long and fatiguing walk, but after despatching the best part of a tin of marmalade, was sufficiently recovered to proceed and mount the remainder of the steep acclivity and descend the other side as far as the Rishee cultivation, where we arrived at 6 P. M. after a harassing march of twenty-seven miles, and encamped at an elevation of about 1000 feet above the bed of the river. We found all our things, which had been sent on ahead two days previously, were up and tent pitched. The road which was marked out last year by the sappers, during the temporary occupation of this part of Sikkim, was in pretty good order. It is called by the natives the lower and level road, to distinguish it from that *viâ* Siriong and upper Rishee, which has many long ascents and descents.

Early next morning the villagers brought us supplies and oranges from Mixidong, for which we paid. After an early breakfast, left Rishee at 8 A. M. and descended to the Rishee river, which was cross-

ed by a bridge made of saplings; hence we ascended the Rinchingpoong hill, the lower part of which is rocky and steep, but the upper portion is less so, and the road a made one and good. Passed a good deal of millet cultivation, and stopped with a view to procure some of the well known beverage made from the millet seed, called "Murwa," but the villagers all ran away. We reached Rinchingpoong about 12.45 P. M. and pitched our tent immediately above the site of the field entrenchment occupied last year by Dr. Campbell and Captain Murray's party of sappers. A few trenches, broken planks, pieces of posts strewed about, and the skull of a Bhootia pierced by a bullet, alone mark the spot, where our countrymen, the year previous, withstood the treacherous attack of twenty times their own number. If this portion of Sikkim should ever become British territory, this hill is deserving of particular attention, as possessing great capabilities for the formation of a winter sanitarium. The southern extremity of the hill is about 7000 feet, but the northern, where the village site exists, is not more than 5,600 feet, and the temperature is much milder than that of Darjeeling. The soil is deep and rich, mica schist entering largely into the composition of the hill. It has several good perennial streams, a large pool of water, and broad terraces on all sides. Carriage roads might easily be constructed. The distance from Darjeeling by the lower road is about thirty-five miles. Wheat, millet, rice, buck wheat, &c., are cultivated. Crabb apples, raspberries and cherry trees were observed, the latter in full blossom, whilst most of the other trees were shedding their leaves. The daphne or paper-tree also grows here, likewise oak, magnolia, birch, chesnut, walnut and many other forest trees.

There is a Goompa at this place well worth seeing, the Llama belonging to which died nine months ago.

The Llama's widow and relatives brought us a present of four bamboo tubes of hot "Murwa," and later in the evening eggs, rice, milk and fowls; and in the morning more rice for sale, also eggs, milk and millet seed. Our encampment, which was in the midst of very high wormwood, swarmed with hairy caterpillars, which crawled over our beds and up the sides of the tent, and were very troublesome.

The morning was very fine, and having breakfasted early, we were ready for a start, but delayed on account of the coolies who had no rice till this morning's supply arrived.

Left Rinchingpoong at 9 A. M. ; passed Soomtong at 9.30 ; and after two hours of steep descent reached the broad and rapid stream of the Kullait, close to where the Rongzong stream falls into it. Here we had a refreshing bathe and washed clothes. The Kullait is here divided into two streams. The first and smaller was crossed by a slender bridge made of bamboos, having a pendent roadway formed of a single bamboo. Across the second the fishermen have constructed a very ingenious weir of bamboos tied together with cane. During the night, when the fish descend the rapids, they are driven by the force of the water on to an open frame-work of bamboos where they are easily captured. The fishermen cooked some fish by baking or stewing them in a bamboo, a device which succeeded admirably and occupied only a few minutes. We boiled water and made murwa ; and having scrambled across the second stream by the aid of the fisherman's weir, by 1 P. M. were wending our way up the very steep Pemionchee hill on the north side of the valley, and at 3.45 P. M. reached Gazing, and the coolies an hour later. We put up in the house of a villager, and were shortly afterwards treated to murwa and plantains by a sturdy Llama with a peculiar drooping eyelid. All our beds were placed in a row, and dinner was served up on an extempore table formed of a plank taken from the flooring. In front was a flaring fire, surrounded by a dozen people of all ages and both sexes, principally the members of our host's family, besides some of our own coolies, including the cook and his deputy. All the members of the family had their heads shaved on account of the recent death of an old servant. After dinner we had singing, but it was not without some difficulty that we persuaded the Bhooteas to favour us. The Llama, who was in grief, sat apart in one corner of the spacious apartment constantly mumbling his prayers, but after partaking of two cups of tea and a cheroot, he was induced to join the social party round the fire. A Dowager Llama was very seriously engaged in her devotions with a praying cylinder the whole time. On breaking up festivities we went to bed, exposed to the gaze of all the fair inmates, who after seeing us comfortably settled for the night modestly retired. But I may as well mention that we had by this time relinquished the vulgar fashion of undressing before retiring to rest. Our slumbers were frequently disturbed by the barking of dogs, squeaking of pigs, and squalling of children. The latter we found in the

morning were without clothing, which may account for their restlessness.

Breakfast over, and after attempting to eat some hard cakes made of crushed Indian corn, cemented with some farinaceous matter, we left for Pemionchee at 8 A. M. ; and after a steep ascent reached the Rajah of Sikkim's unfinished durbar at 9 A. M. This durbar was only begun last year, and during the troubles in Sikkim remained untouched, and is now in abeyance until the Pemionchee Monastery is renovated. At present only two stories have been built. As far as it goes, it is a very substantially constructed mansion, 36 × 46 feet. The walls are 5 feet in thickness and of solid masonry, and the floor of the upper story is supported on massive beams and upright posts. It will be a fine building, when completed.

A further steep ascent of half an hour brought us to the Goompa at Pemionchee. This once extensive monastery is now a mass of ruins. It was accidentally burnt in October last year. The full complement of Llamas is 108. Of this number only twelve were present. The remainder were absent in all parts of the country, collecting money and materials for the rebuilding of their temple. Some of the latter, such as pigments and brushes for the painting of the figures of their gods and embellishment of the walls, are to come from China, the artists from Thibet, and other materials from Calcutta. We saw the villagers bringing in half wrought logs of wood from the surrounding forests.

It will take two years to rebuild, and probably as many more to embellish. The Llamas are very anxious to get it completed, as in its present state their occupation is gone. They complained that nobody visited them, a state of things very detrimental to their finances. Formerly they received a subsidy of Rs. 3000 annually from the Rajah of Sikkim, but since the Terai lands and the Darjeeling hills were annexed to British territory, this bounty has been discontinued. The Llamas are consequently poor, but like the monks of old are a fat and jovial race, their sleek faces indicating any thing but a poor larder. We put up in a house belonging to one of the absent Llamas. The head Llama, who is a perfect type of his holy order, treated us to murwa which was very refreshing. He and several other Llamas were sociable and talkative. They informed us that they had two days previously received instructions from the Dewan

at Darjeeling to lay in a supply of rice for us, but had not been able to do so, as very little rice had been cultivated, in consequence of the flight across the Rungeet of the majority of the cultivators during the recent disturbances. They could only supply one maund of rice, and three or four of Indian corn. But I soon found out that this was not the case, and that plenty of rice was forthcoming on making money advances for it, which I accordingly did, and had it sent after us, some as far as Jongli, and some placed in Caches at intermediate stations.

From Pemionchee, which is 7000 feet high, a fine view of the snow is obtained, also of the valley of the Ratong. The monastery of Chanacheeling is perched upon a high peak of the Pemionchee range to the westward, and at present is made the repository of all the books and other relics saved when the Pemionchee Goompa was burnt. Sinchul and Darjeeling are visible over the Kulloo Mendong twenty miles in direct distance.

This morning the weather was again very fine; the thermometer at sunrise stood 48°. Dr. Simpson photographed the snow, the Goompa and one of the Llama's houses. Left Pemionchee at 8.45 A. M.; and after a steep descent and rapid walk of 45 minutes reached the village of Chonpoong, consisting of about fifteen well built houses very pleasantly situated at the foot of a tree forest, on a rather flat terrace on a spur of the Pemionchee hill. It commands good views on three sides to the north. Eksum is seen in the foreground, looking very flat and having a quantity of cultivation round it. The deep and thickly wooded valley of the Ratong is conspicuous winding to the west, across which are plainly visible the fine waterfalls of Lemgong, dashing headlong down perpendicular walls of gneiss rock, over which a near view of the Nursing and Junnoo mountains is obtained, but Kanchungingah is depressed behind the Baraborony hill. To the east a high mountain in Sikkim is striking, and the monasteries of Raking and Tassiding, the latter perched upon a conical hill standing apart from all others. To the west, the distant view of the Singaleelah range, seen across the valley of the Ringbi, is very grand. Altogether the view from Chonpoong is striking and beautiful, but that of the snow is limited, and far less grand than that obtained from Darjeeling.

It was our intention to proceed direct to Eksum, which is the shortest road by several miles; but understanding from the villagers

that the bridges across the Ringbi and Ratong were broken, we were compelled to proceed by the long route viâ Tingling. So after partaking of murwa presented to us by the mundul or headman, and having made purchases of rice, fowls, eggs and butter, at 10.30 A. M. we resumed our march in a westerly direction. Having crossed through the Liebong cultivation and clearance, and making a rapid and very steep descent, we crossed the Ringbi by a bamboo bridge thrown across a deep narrow gorge, through which the whole body of the stream rushed with impetuosity, rolling and boiling over large blocks of gneiss rock. The Ringbi at this spot is very narrow, confined between steep rocky sides, the bed of which is full of deep pools of clear water. The ridge was not more than twenty feet in length, and the view of the river from it very wild. After a steep ascent and a slight descent we reached the Ringbi, here we bathed, washed clothes and had tiffin. Air 70° ; water 56°.

Left the river at  $\frac{1}{4}$  to 2 P. M. and after a steep ascent of 40 minutes reached our halting-place at Tingling, altogether a distance of about eight miles. We put up in the house of the headman of the village, who very politely offered us his apartment on the floor of which our dinner was cooked. We turned in early, but what with the coughing and loud talking of our host's family, some of us did not get to sleep until near morning. There was an ill-natured cur at this place, who several times snarled and snapped at our heels.

We had not been in bed very long before a rumbling noise, not unlike the devotional murmurings of a Llama, was heard, which shortly increased in earnestness and became louder and louder. At last it was indistinctly heard to say, "that beast of a dog has got hold of my hand and won't let go, he has bitten my hand right through now;" and then the same voice was very distinctly heard to say, "I'll eat no more dinner, I was in a mortal funk, and could get no one to take the beast off, though I tried hard to do so." This was our friend Kemble who had evidently partaken freely of dinner, and was labouring under the effects of nightmare.

The Molee Goompa is immediately above Tingling on the summit of the Molee mountain. The Chanacheeling, Pemionchee, Tassiding, Rubolong, Gyratong, Doobdee and Kaichoopenee Goompas are all visible from this place.



After having purchased some fowls and partaken of an early breakfast, we started at 8.30 A. M. and after fifteen minutes' steep descent passed the small village of Kasuppyah, consisting of two houses and some clearance for cultivation. The headman was waiting for us with presents of sugar-cane, murwa, eggs, plantains and milk.

Another quarter of an hour of steep descent brought us to Linchoogong, a small village of three houses. At 9.30, after a very steep, stony and difficult descent, we arrived at the Ratong, which is here a wild, foaming and boiling torrent, dashing over large blocks of gneiss rock. We halted till 11.30 bathed and washed clothes. The temperature of the water was 48°.

Dr. Simpson took two photographs of this wild spot, which unfortunately were afterwards destroyed. We crossed the torrent by a temporary bridge constructed by the inhabitants of the village of Labeong, who also brought us presents of rice, murwa and eggs. After a steep scramble of a quarter of an hour, we met the inhabitants of the village of Paranting, who brought us hot murwa, and had prepared a place to sit down. They were particularly polite; the women were highly decorated with coral, amber and silver ornaments; both sexes wore flowers of a pretty blue hydrangea in their ears. Three of the women had jackets made of European long-cloth, dyed blue, but the children, as usual, were quite naked. After a further steep ascent we reached our halting-place at Eksum at 1 P. M. This is the frontier village, prettily situated on a broad plateau surrounded by high commanding mountains, most of which have their summits capped with fir trees, and their slopes richly clothed with deep verdure and stately forest trees. A few hundred feet above the village, to the east, the monastery of Doobdee is seen perched on the summit and at the extremity of a separate spur, in a very picturesque position. It is probably of very ancient origin, built by the first Buddhist priests who settled in Sikkim. Eksum derives its name from Ek or Yeuk which means a "labourer" or "workman," and "soom" three, from the first three Bhuddhist ministers who came into Sikkim from Thibet, having commenced their spiritual labours at this place.

We put up for the night in the house of a villager, the female members of which, on their return from the toils of the field, seemed not at all pleased at finding their house in the possession of strang-

ers, however, they soon became reconciled and appeared to take considerable interest in our culinary operations.

Our host had been a cripple for twenty-two years from the effects of a hatchet cut, but this did not deter him from soliciting medicine to cure him. The females all left before we turned in for the night, but mine host remained and drank whiskey toddy which made him very restless all night. We had most of us become very bad sleepers, and very little disturbed us, so what with mine host passing in and out and the fighting and incessant squeaking of young pigs under the floor, we got very little sleep.

As this is the last village towards the snow, the coolies wanted a halt which was not conceded. Before starting we purchased three maunds of rice, four fowls and some eggs, and distributed some glass beads and buttons amongst the members of our host's family, and presented a metallic snuff box to the Doobdee Llama, from whom we bought a yak for 12 Rupees. We left Eksum at 9.30. The first part of the road was good, but it soon became very bad. It lay along the side of an almost precipitous hill, where a false step would often have precipitated the traveller many feet headlong down the kudd towards the Ratong, the roaring of whose waters below was very audible. At 11 A. M., we passed the beautiful water-falls of Barabarong, dashing headlong down a precipice over immense blocks of gneiss in situ. The water was clear as crystal.

The ascent on the opposite side was very difficult: we were sometimes obliged to scramble upon all fours, at others to mount by steps cut in upright posts, or along saplings slung over precipitous parts. In a few places the yak herdsmen have cut foot-steps in the solid rock for the convenience of travellers, who would often find it difficult to proceed without such assistance. The hills are very precipitous, as is the case in all the back ranges near the snow in Sikkim. The range on which we were, was thickly covered with forest trees and underwood, it was only occasionally we obtained a peep at the noble capped mountain across the Ratong. We encamped in a very jungly place in the midst of forest, at a spot called Joaboo, near a small mountain torrent. We wished to go on a little further to Neebee, but were prevented, for want of water at that place. Although the whole distance was not more than seven miles, the march was a fatiguing one for the baggage coolies who arrived late in the evening. We all

assisted in cooking dinner. Cooking has become quite a pastime with us. We are now at an elevation for that troublesome and loathsome parasite, the Himalaya tick, which we have found rather abundant.

Started at 8.46; and after going over five or six miles of difficult road, reached the Ratong which is here the same foaming, boiling torrent. We crossed immediately above a water-fall, over three very primitive constructions which served for bridges. The bed of the river at this spot has an elevation of 7,790 feet, and we found the temperature of the water to be 42°, too cold for bathing. After a very steep and fatiguing ascent of four or five miles, we reached our halting-place at Chockachaine at  $\frac{1}{2}$  before 2 P. M. There is a pool of indifferent water here, and a hut erected by the yàk herdsmen who often reside here during winter. The height of the encampment, as ascertained by boiling water, was 10,300 feet. The hill sides were perfectly covered with forest trees and tangled underwood, the same as yesterday. As we ascended, the changes in the flora were very remarkable. We were now in the region of rhododendrons, of which we observed several kinds; also of oaks, whose acorns were scattered along our path in great profusion, holly; walnut, chesnut, long and short-leaved scarlet barberry; many beautiful varieties of ferns; mosses pendent from trees, besides other kinds, including the stag moss so well known at Darjeeling; creepers of all kinds and sizes, epiphytical and parasitical plants of various kinds; and towards the end of our day's journey we were well amongst tall firs. We saw a few leeches, but found the ticks most abundant and voracious.

Thermometer at sunrise 28°, but not so cold to the feeling. We ascertained that all the yàks had left Jongli and were in the vicinity of Chockachaine. We sent a man to drive the yàks to our camp for inspection, but we quitted before his return. Left at 8 o'clock and after a steep ascent reached Mon Lepcha at 11.15 A. M. and Jongli at 1 P. M. From Mon Lepcha the road is easy, but we found the first part of the road very trying, all of us suffering more or less from shortness of breath and headache. There are no huts at Mon Lepcha: it is the name given to the locality, which is a feeding ground for yaks at an elevation of about 14,000 feet. Dr. Simpson took some photographic views of the snow which is very imposing from the spot. Between this and Jongli we passed several frozen rivulets.

Jongli is the name given to an extensive tract of yàk pasture land, situated at the foot of Gubroo, on the southernmost spur of that mountain, including all the land to the south of Gubroo, contained between the Ratong and Chuckchurong rivers, of which Mon Lepcha is an integral part. The elevation of the pasture land averages from 12,000 to 16,000 feet, the latter being the greatest height at which yàks are grazed during the summer months. The spur is broad and undulating like a swelling table-land devoid of forest. It is richly covered with good grass, intermixed with a low and scrubby rhododendron and the dwarf and an aromatic kind. It is the grazing ground of about eighty yàks belonging to parties in Nepal and Sikkim, and is capable of affording pasturage to many hundreds more. The yàk herdsman have erected three substantial huts of stone with shingle roofs. They reside at Jongli during the summer and rains, but when the cold sets in in November, they descend to winter quarters in lower and warmer elevations. The entire pasture ground is well watered by numerous perennial streams, most of which were frozen up at night during our stay at Jongli. It is situated above the region of tree rhododendrons and firs. During our ascent we passed through all the flora met with at Sinchul and Tonglo. At 12,000 feet we lost the ferns. Having passed through firs, birch, rhododendrons, junipers and a kind of heather, dwarf and aromatic rhododendrons, barberry, primrose, &c., we entered the undulating and grassy flats of Jongli. On the road, not far from our last halting place, we met a wild looking man of the woods, whom our servants introduced to us as the Llama of Jongli. He stated himself to be eighty years of age. He looked more like a Gorilla than a human being. A more comical weather-beaten and hale old gentleman I have never seen. He had a very hoarse voice and a large goitre to boot. He had just left Jongli for his winter quarters, which he had taken up under an over-hanging piece of gneiss rock in a fir forest.

After tiffin at 2.30 p. m., MacPherson and I set off for the summit of what we considered to be the highest of the Jongli mountains. After two hours of very fatiguing climbing and suffering from shortness of breath, headache and nausea, we reached the top and found it to be 15,120 feet.\* Thick clouds setting in, we were disap-

\* This hill affords capital pasture for the yàks, being covered with good grass and juniper bushes. The latter all assume the same inclination as the slope

pointed in the principal object of our trip, which was to endeavour to trace a practicable route by which to reach the snow peaks in that direction. The surrounding hills were totally obscured, and in commencing our descent, the guide wanted to take us down the wrong side of the hill; but preferring to trust to our compass we were not misled.

With splitting headache and quite knocked up, we reached our hut at 5 P. M.

The night was very cold, but being well provided with warm clothing, we were all right; but the coolies, although well-housed, suffered a good deal.

The thermometer at sunrise stood at  $18^{\circ}$ . The small streams were all frozen. At this early hour the snow appeared so close that it seemed to tower above us. The sky was cloudless and the cold very keen. After breakfast we went on a reconnoitring expedition to the summit of Thonja, a hill immediately to our front, at the foot of Gubroo, in the direction of Kanchunjingah. It is a fine grassy mountain affording excellent pasturage, about 14,500 feet high. Dr. Simpson took some beautiful photographs of this wild region.

When on the crest of the hill, which is precipitous to the north side, we witnessed a very beautiful and perfect sun bow. It was seen in a mist a few feet down the precipice and remained visible for a long time. We reached our hut at 2 P. M., some of us feeling very queer from the rarified state of the atmosphere, having headache and nausea. On our return we flushed two covies of birds at from 12,000 to 13,000 feet, closely resembling Ptamagan, probably the "*Tetragallus Himalayensis*" of which I have since seen some specimens in the Society's Museum. I shot one with a bullet which immediately concealed itself under the rocks, and occupied us a long time getting it out. In the evening the men who had been sent down in the morning to bring up the yak purchased from the Doobdee Llama returned, bringing a fine black animal with an uncommonly bushy tail, about the size of a Highland bull.

The morning was very fine, but the night had been intensely cold. Shortly after sunrise the thermometer stood at  $17^{\circ}$ . The first object

of the hill side caused apparently by the strong blasts of wind which constantly blow up the hill.

that attracted my attention was our black friend the yàk, who had turned white during the night, his long shaggy flanks being entirely covered with a coating of ice.

After taking an early cup of cocoa, some of the party started on another exploring expedition.

After proceeding about three miles, sometimes along yak tracks, and at others along the grassy slopes of the mountains and over dwarf rhododendron, we found ourselves on the verge of a deep precipice which entirely cut us off from a snow spur which we desired to reach on the other side of the gorge. It would have taken us hours to reach the bottom of this valley and the remainder of the day to ascend the opposite side; so we relinquished the object we had in view at starting, and decided upon ascending the perpetual snow clad peak of Gubroo instead. After partaking of breakfast near the Gubroo lake, a fine clear and deep sheet of water 130 paces square, situated in a picturesque spot at the foot of the mountain to the south-east, we commenced the ascent of Gubroo which we found very trying from its steepness, and the great elevation causing shortness of breath, nausea, and violent headache. We reached about 16,500 feet, when I found it impossible to proceed any further, in consequence of an oppression in the head and a feeling like that of seasickness. The Gubroo range, as seen from Darjeeling, presents a black, rocky and precipitous foreground to Kanchunjingah. It is formed of a finely laminated dark colored gneiss and hornblende, which exist in immense angular masses, rising in steps with perpendicular walls. The snow lies very thick on the summit of these flat masses and in the cavities, though scarcely visible at a distance.

The snow was very bright and dazzling; our attendants being unable to stand the glare and cold, remained behind. We commenced the descent at 1 P. M., and reached camp at 3.30 P. M. The droppings of deer were everywhere visible, but we only sighted one musk deer which rose close to us in scrubby rhododendron forest. A fine covey of *Tetragallus* and two solitary snipes were also seen, but we were disappointed at the absence of game along the eastern slopes of the Jongli plateau which is well watered by numerous small streams, some of which spreading out with marshes and small lakes afford excellent cover for pheasants and jungle fowl. During our absence our headman had shot the yàk and prepared a savoury

stew of yàk's heart and kidneys which we discussed with a hunter's keen appetite.

Another superb morning : the night was intensely cold, and the thermometer a little after sunrise stood at  $11\frac{1}{2}^{\circ}$ . Having made all the necessary arrangements for an absence of four days, and leaving all heavy baggage behind, at 10.30 A. M. we started for a place situated near the base of the Pundeem mountain, on the left bank of the Ratong river, several miles further up the valley, called Aluhtong, where there is a yàk-grazing post. After proceeding about three miles along yàk tracks over grass and low rhododendrons, we commenced a steep descent through rhododendron forest, and afterwards through firs, and reached the banks of the Ratong about noon. The river here is broad and rapid, but as we ascended the valley, it became less rapid and of smaller dimensions. It was not without difficulty that we found our way along the broad valley, over masses of loose stone and broken ground, by following the course indicated by small piles of stones erected by the yak herdsmen. We increased the number and size of these useful guides for the benefit of our friends in the rear, and after two or three times losing our way, reached our destination at 2.30 P. M., and some of the party an hour later ; and the baggage coolies late in the evening, looking half frozen. We brought on a tent for the latter ; and before turning into our own hovel, we satisfied ourselves that these were well supplied with fuel, yàk's flesh, and rice for their evening's repast. The grandeur of the surrounding snow-clad mountains, and the wildness of the scenery of the valley of the Ratong, surpasses any thing of the kind I have elsewhere witnessed in the Himalayas. On looking directly north up the valley, Kanchunjingah rose majestically above everything else. Between us and it, thrown completely across the valley, and only two miles distant, was seen a stupendous morain a thousand feet in height, which forms the conspicuous object seen from Darjeeling. Immediately on our right, out of a long range of perpetually snow-clad mountains running parallel with the valley, rose the formidable peak of Pundeem, 22,015 feet in height, at the base of which rests the glacier above alluded to, and many other masses of debris washed down from above in wild confusion. To our rear, winding its course down the broad valley, the hills on either side being covered with dense fir forest often down to

the water's edge, was seen the noisy, foaming Ratong. On our left a dark range of bare, bold and craggy mountains 16,000 or 17,000 feet high, capped with snow, having the appearance of basaltic formation, but formed of gneiss mixed with hornblende and syenite, rose abruptly. We were the first European travellers to gaze upon this truly grand scene. Any one desirous of witnessing grandeur of scenery should visit Alutong. However toilsome and comparatively uninteresting he may find the intermediate travelling as far as Jongli, he will be well repaid by the wild scenery of this locality.

Another cold night, and clear, crisp morning; thermometer at sunrise  $5\frac{1}{2}^{\circ}$ ; and at sunset, the valley having been in the shade since 4 P. M., it stood at  $21^{\circ}$ . At 10 o'clock we all started to explore the morains. We proceeded at times along the bed and banks of the river, at others over rough, stony ground, deeply intersected by small running streams coming from the snow. The main stream flows gently over a gravel bed of moderate incline. The valley is nearly a mile broad, and covered with dwarf rhododendron and grass wherever soil occurs.

A little before reaching the morain we passed a series of Mendongs, having numerous slabs of well carved prayers and images of the gods in the side walls, extending the entire length. These slabs of chlorite slate are carved by Llamas from the Sikkim monasteries who periodically visit this place on pilgrimage during the rains.

Having ascended the immense mass of debris forming the morain, probably to an elevation of 15,000 feet, we found ourselves, to our great surprise, standing on the top of a stupendous glacier. This huge mass of ice and debris descending from the Pundeem mountain extends nearly across the valley, where it is met by, and abuts upon another glacier, equally vast in its dimensions, and formed at the base of the snow-clad mountains on the other, or western side of the valley, the two together forming a complete barrier across the valley and choking it up to the height of a thousand feet or more. The morain forms the retaining wall to this mass of moving ice and debris, and is composed of rounded and angular blocks of *highly contorted gneiss*, intermixed with pieces of syenite, micaceous schist, coarse granite, quartz with tourmaline crystals, white and pink quartz, often containing veins of crystalized felspar and coarse gravel and debris. Towards the summit the fragments were all



angular, and free from gravel. The loose manner in which these were massed together, rendered walking both difficult and dangerous, particularly to parties in the rear, from the tendency of the stones to roll down the steep sides. Proceeding onwards, the glacier presented a perfect wilderness of blocks of ice invariably covered with the stones and debris brought down from the mountain above by avalanches, with deep crevasses through which the sound of running water was heard, the whole presenting a stony and undulating mass about one and a half miles long and a half to one quarter of a mile broad. In order to ascertain as nearly as possible what might be the thickness of the glacier, we ascended by a separate spur of Pundeem to a level with the top of the glacier, and measuring the height by boiling water found it to be 16,060 feet, and again measuring the height at the foot found it 13,760 feet, thus giving a difference between the summit and the base of 2,300 feet. I was able to make a rapid sketch of a vertical section of a precipice on the western shoulder of Pundeem, shewing its formation to be of gneiss, similar to that found on the glacier of which I brought away some good specimens. Although the surrounding hills were literally covered with glaciers of sizes, and the valleys overhung with masses of ice and snow, we observed only one avalanche, but frequent loud cracking of the ice during the hottest part of the day.

A little way up the valley, beyond where the glaciers meet, we observed a small lake. Only one small stream falls into it, and this must be considered the source of the Ratong during the winter months. Dr. Simpson here took some interesting photographic views. We returned to our hut late in the evening. To-day our Lepcha cook whom we brought from Darjeeling failing to give satisfaction was removed from office. Thus the cooking operations devolved upon ourselves; but this was not felt to be irksome, as we had from the beginning taken turn about to look after the messing for the day, knead the flour for making chupattees, or unleavened cakes, assist in cooking, &c., our *ci-devant* cook knowing nothing of the mysteries of his profession beyond lighting a fire, boiling water, washing plates and so forth. In fact he was an impostor.

Another cloudless morning after an intensely cold night. Thermometer at sunrise  $11^{\circ}$ . The coolies having laid in a good store of wood over night, next day we were enabled to cook an early breakfast

and resume our explorations in the direction of Kanchunjingah. Mounting over the two glaciers of yesterday, and proceeding by the lake, which we found to be about 500 yards long by 100 broad, we ascended another immense morain which confined a third glacier on the west side of the valley. This one appeared to begin nearly on a level with the top of the mountain range, at probably 20,000 feet, then descending by the mountain side came sweeping along the valley in a curve about a mile in length, the more elevated portion being formed of masses of ice covered with snow, rising in steppes one above the other, and the lower portion presenting a sea of broken masses of ice, covered with snow and debris. A more stupendous mass of ice and snow it is scarcely possible to conceive. Dr. S. took a photograph of it. On our right at the foot of Pundeem we saw another lake partially frozen, and a little further on a third one. Descending from the glacier we proceeded for a mile, occasionally along the dry, smooth bed of the Ratong, and over frozen snow, when we arrived at the fourth and last glacier, equal in extent to the others. With great difficulty we scrambled up the steep sides of its retaining morain, over frozen snow. When near to top, Kemble was nearly precipitated to the bottom by his foot giving way and only saved by rapidly digging his alpine stick into the snow, which pulled him up.

On reaching the northern extremity of this glacier, at the head of the Ratong valley, we found ourselves standing on the water shed between Kanchunjingah, and the Pundeem, Kubra, and Junnoo ranges to the south and west. We were at an elevation of about 18,500 feet, and had we proceeded further, we should have had to descend into what appeared to us a perpetually snow covered valley. Although we were unable to look down into the bottom of the valley, we could see the clouds rise out of it from the east and west and ascend the sides of Kanchunjingah, of which we obtained a near and good view through a narrow gorge which terminates the Ratong valley. Kanchunjingah stood apart, unconnected with any of the high mountain ranges to the south. The nearest spot not covered with snow in its southernmost spur was probably not more than a mile and a half or two miles distant, the stratification of which was clearly visible. Its formation is probably of gneiss, not of a contorted type, and which has a dip of 20 to 25° to the east. Others may determine the interesting point of its geological structure, but this

important fact was elicited, namely, that Kanchunjingah is detached from the other mountains forming the Kanchunjingah group, and that none of its waters find their way into the Great Rungeet, either by the Ratong or any other tributary.

Our half frozen coolies, unable to proceed so far over the snow, dropped to the rear unobserved by us, but we picked them up on our return, and Dr. S. managed to get three good photographs, one of which was "*Pundeem from the north.*" It being too late in the day to attempt any further exploration, we commenced our return at 2 P. M., and after several stoppages and very brisk walking we reached Aluhtong by moonlight, at about 6.45 P. M., having undergone a very laborious and fatiguing day's work, during nine and a half hours. We found a Bhooteah lad had prepared us some yak soup and chupattees which we fell upon with ravenous appetites.

We all rose with heated and sore eyes, and scorched faces, the effects of the cold wind, the sun and the glare from off the snow. Thermometer at sunrise 11°. At 9.30 A. M. we quitted our hut and very reluctantly turned our backs upon the wild scenery of the upper Ratong and our faces homewards. Arrived at Jongli at 2.30, but not so our coolies, who had suffered so much from the cold at night, and from the cold blasts of wind during the day, which incessantly blew up the valley during our stay at Aluhtong. We retraced our steps, guided by the heaps of stones, and after going about four miles commenced to ascend by the steep pathway through the firs and rhododendrons. The road was rendered very difficult and slippery by the recent fall of dead leaves. Passing under Gubroo, and near the lake, we reached our old quarters at Jongli at 2.30 P. M., and the coolies two hours later.

Rose early, packed up for a start homewards. Left our homestead at Jongli at 8.30 A. M. with twenty-four coolies, four of whom carried guns, four bedding, two minerals, two photographic apparatus, one the tent, ten stores, cooking utensils, &c., and two were sick. The coolies were badly clothed, some had sore legs and chapped hands and feet, and all looked more than half frozen and incapable of carrying loads at this early hour of the morning, but not a murmur escaped them; they left with heavy loads, but light hearts, our cook boy remaining a few minutes behind to blow a parting blast upon a horn or Llama's thigh bone, or some such harmonious instrument. We had

seen Jongli to disadvantage clothed in its autumnal garb, and totally deserted, being too cold and bleak at this season of the year for a residence; but in the spring and summer months it is no doubt a bright and cheerful spot. During our descent through the firs, we saw our Gorilla Llama engaged in cutting timber near his winter dwelling, and we turned aside to salute him. The largest fir met with by the road side measured 21 feet in girth, and may have been 80 or 90 feet high. Reached Chuckachaine at 1 P. M. and found a small herd of twelve yàk bulls, cows and calves, on the feeding ground at this place. Their colours were black, black and white, and slate coloured. We purchased yàk milk, and drank it mixed with brandy. After half an hour's rest we resumed our march, and descending very rapidly, re-crossed the foaming Ratong by the three crazy bridges, and arrived at Jongoo 2.30 P. M., a distance of about fifteen miles. During the short interval since our upward passage the dead leaves of the rhododendrons and other forest trees had fallen in such abundance as to render the steep descent very slippery and difficult. Having descended nearly 5000 feet, we found the change in the atmosphere most agreeable. and the ticks as numerous and loathsome as before. Mon Lepcha spur is composed of fine gneiss, intermixed with beautiful white quartz and mica schist. From Mon Lepeha I made a series of magnetic observations to fixed points, which enabled me to fix its exact position.

Left Jongoo at 8.30 A. M. and after an hour's brisk walk crossed the Barabarong by a very frail bridge formed by throwing a sapling across the main stream between two large boulders. The bed is full of large angular blocks of gneiss, the same as exists in situ. When within a mile of Eksum, we met Mr. Long and Lieut. Bartley, of the Queen's Bays, proceeding to Jongli on a similar visit. They were scarcely prepared for the extreme cold they were about to encounter. We assisted them with some spare rice and clothing. We have since heard that they experienced very severe weather and were compelled to return. Reached Eksum at noon and proceeded to the house of our former host, who at our request made us baked cakes of the flour of millet seed and buck wheat mixed. The flour is quite white, but harsh to the touch. The cake is baked on a heated slab of stone, and when cooked becomes quite black, but is not disagreeable to the taste. It must, however, become very unsavoury when eaten as the sole

article of food, as is the practice with the hospitable inhabitants of this wild and sequestered spot. After purchasing fowls, murwa, eggs and milk, and presenting the members of the family with some articles of warm clothing, we resumed our journey at 2.30 P. M., much against the wishes of our coolies, some of whose families reside here, and all of whom wanted to remain for the night. After a long descent along the Eksum stream, at 3.30 P. M. we passed the Parmarong stream a little below the water-falls, where some of the party had a refreshing bathe in its crystal-like waters amidst blocks of beautifully stratified gneiss. Continuing our course without either much ascent or descent, at 4.30 P. M. we reached Ribbing or Bootong, a small clearance consisting of one Limboo and one Lepcha family, the members of which appeared very poor and destitute of clothing. We put up in the hut of the former, and our Bhooteea cook boy professed not to understand a word of their language, and made signs for any thing he required.

Thermometer at 7 A. M. 50 . Left Ribbing at 9.30, and after a steep and rugged descent reached the Ratong and crossed by an old bridge constructed of bamboos and trees, which had just been repaired for our use ; about a mile further on, we crossed the Ringbi by a very dilapidated suspension bridge made of bamboos. The jungle creepers forming the suspenders of the roadway were all rotten, and the whole fabric bore the appearance of great insecurity. The scenery here and also at the Ratong is very wild and picturesque, and it was matter of regret that "our artist" was not prepared for taking photographs. Observed mica schist in large quantities in situ, and in the beds of both the rivers. From the Ringbi we made a steep ascent to Chongpoong, passing through tree forest and ferns. Our Chongpoong friends did not come out to meet us on this occasion, so we sent to the headman, and purchased some murwa, fowls and eggs, and after an hour's rest started again at 1 P. M., and passing through the umbrageous tree forest below Pemionchee, we reached the Goompa at 2.10 P. M.

The Llamas were not so civil as on our first visit, and on this occasion the head Llama did not make his appearance. On being questioned as to our despatches and stores, they informed us that none had arrived from Darjeeling. This we knew to be false. On closely questioning one of them, he indicated the place where I could find

them. Dr. S. had inadvertently left behind a portion of his photographic apparatus, this had been picked up by one of the monks who declined to restore it, unless he received a remuneration of 2 Rs. Under the circumstances this demand was refused, and the man of holy orders peremptorily ordered to give it up, which he did, and never shewed his face again. This avariciousness was probably caused by seeing us pay liberally for every thing we required, a policy we strictly adopted from the commencement, and which secured us a ready and ample supply of every thing. The prices paid were—rice 12 seers per rupee, fowls 8 annas each, milk 4 annas per bottle, eggs 2 for an anna.

Pemionchee is about 7000 feet high. The thermometer at sunrise stood at 45°. The weather was close and cloudy. Left at 9.30 A. M. and after a very rapid descent passed Gazing at 10.15, stopping a short time to photograph "the Great Mendong" at that place. Reached the Kullait river at noon. After a long, rapid and fatiguing descent, we found the villagers and fishermen had erected a substantial bridge of bamboos about a mile below the weir since our former visit. Here we enjoyed a refreshing bath in the clear cold waters of the Kullait, and washed clothes, and at 1 P. M. continued our journey up the northern spur of the Rinchingpoong hill, which has a much milder gradient than we had been accustomed to for some time past. At 2.15. halted for a quarter of an hour for luncheon at Soomtong, and reached Rinchingpoong at 4 P. M. ; but the coolies did not arrive until after dark, the march being fifteen or sixteen miles, and very fatiguing—the descent from Pemionchee to the Kullait being not less than 5,000 feet, and the ascent to Rinchingpoong about 3,600 feet. We put up in the Llama's house on the ridge of the hill, situated in the midst of barley cultivation. The dwelling consists of one spacious room, in which was a miscellaneous family of men, women, maidens and children, none of whom were at all put out by our presence, but sat round a large fire drinking tea, &c. Some sugar given to a man was handed round the family circle for each to taste, and some hot brandy and water given to another man in the palm of his hand was in like manner handed round to each member to take a sip, after they had retired to rest. The hill tribes are particularly liberal and friendly towards each other, always sharing with their friends anything they may become possessed of.

Simpson and Macpherson left long before daybreak with the intention of walking into Darjeeling, a distance of about thirty-six miles, which they duly accomplished, stopping only to bathe in the Rumman.

Mine host the Llama was very early engaged in his matutinal devotions, but stopped short in the midst of his prayers and ringing of bells to drink a cup of cocoa, which he seemed to relish with great gusto. A young mother, with an infant at the breast and a deficiency of milk, came in the morning to the Llama, who by a prolonged blowing of short puffs of breath on the naked breasts, was supposed to have administered an effectual remedy. Such is the deception practised on the minds of these simple people by their spiritual guides.

Kemble and I, not being in a hurry, left Rinchingpoong at 8.30 A. M., crossed the Rishee at 10 A. M., and the Rishee cultivation where our first camp was at 10.45 A. M., and at 2 P. M. put up in a hut by the road side near a very small stream about 1000 feet above the Ruttoo. At Rishee we observed a very large flock of Hornbills.

23rd November, 1861.—Left our hut at 7 A. M. and reached the Rumman at 9.30, crossing by a good substantial bridge just completed by the sappers. Reached Goke Guard house at 10.30, halted 15 minutes. Reached Little Rungeet river at noon, where we found our ponies in waiting. Reached Darjeeling at 2.30 P. M. Observed many clearances being made for the cultivation of tea along Tugoor spur, &c.

The coolies who accompanied us consisted of two Lepchas, two Limboos and twenty-one Sikkim Bhooteas, almost all of whom, as well as their Sirdar named Tinley, were inhabitants of that portion of Sikkim to the west of the Great Rungeet traversed by us. No men could behave better than they did, the words "burra dikh" and "tukleef," so common in the mouths of Hindustanis and Bengalis never escaped theirs, neither did complaints of any kind. Even in sickness, or when suffering from extreme cold, or sore legs, or chapped hands and feet, there was no grumbling. They were always ready to perform their work with a cheerfulness and light-heartedness quite refreshing to witness, after being accustomed to deal with the unmanly and discontented inhabitants of the plains, particularly of Bengal. They all readily and gladly partook of any remnants of food we were able to spare them, as did all the villagers in whose houses we put up.

In the valleys, where Lepidoptera exist in countless myriads during the rains, very few were seen by us, and no Coleoptera at all. *Pyra-meis Callirhoe* was common at great elevations. I observed it on the snow, and on the glaciers at 13,000 to 16,000 feet, but it was *the sole inhabitant* of these cold and dreary regions. It is difficult to understand how an insect so delicately formed as a butterfly, could exist at an elevation where the thermometer must have stood at zero at night time. We saw a few small birds resembling larks at Aluh-tong, and an occasional eagle, but the absence of all wild animals and game was remarkable. None of the lakes or pools of water, as far as we could ascertain, contained any fish, or any living creature.

From the time we left Darjeeling to the date of our return, a period of twenty-two days, we experienced delightful weather. When in the vicinity of Jongli, the clouds would generally ascend the valleys from the plains between 2 or 3 in the afternoon and obscure the snow peaks for a time, but after an hour or two they would disappear and leave us to enjoy cloudless evenings and nights, and the rare, but truly magnificent spectacle presented by the moonlit snowy masses around us. The great enjoyment and advantages of fine weather, the absence of leeches, pipsas, sand-flies, musquitoes and other such like torments experienced by former Sikkim Himalayan travellers, also the absence of extreme heat, deadly miasma in the valleys, and fear of contracting jungli fever, all point to *November* as the most desirable month of the year for travelling in these still unexplored regions. The third day after our return, the weather suddenly became raw and cold. At Darjeeling we had rain and hail, and the military stations of Jellapahar and Sinchul were covered with hail and snow. At the latter place the fall was  $3\frac{1}{4}$  inches thick, and remained for several days on the ground.

*Camp ; March, 1862.*

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