

Diary of a Journey through Sikim to the Frontiers of Thibet.—By
Dr. A. CAMPBELL, Superintendent of Darjeeling—with a Map.
 (Communicated by SIR JAMES COLVILLE, KT.)

In 1848, I made a journey into Sikim ; a Journal of my trip was published in the Journal of the Asiatic Society for May 1849. The Map which accompanied that paper, although it contained a good deal of the Geography of Sikim previously unknown, was altogether inaccurate in the Northern districts, which I had not then visited. I now give the completion of a tour of Sikim with Geographical notices of the proximate parts of Thibet, and hope that it may be acceptable.

The journey here detailed was performed in September, October, and November, 1849, in company with Dr. J. D. Hooker, B. N., who was then on a Botanical Mission from the British Government to the East Indies. Dr. Hooker having obtained the permission of the Governor-General, Lord Dalhousie, to travel in Sikim, and the Rájá of that country having agreed to facilitate his journey to the passes which divide his territory from Thibet, left Darjeeling early in the month of May in the expectation of reaching the Northern Frontier of Sikim by the end of the same month, and returning before the setting in of the heavy rains in July. He had, however, not gone more than a few marches when the most vexatious obstructions were put in the way of his advance by the local officers along the route, encouraged thereto by the Singtam Soobah, the officer appointed by the Raja's Dewan to attend upon him to facilitate his journey and his researches !* His plant collectors were threatened and misdirected ; the people along his route were prohibited from furnishing him with supplies ; attempts were made to convince him that he had reached the Thibet frontier soon after he passed Choongtam when he was 30 miles from it, and he was repeatedly told that an attack by Thibetan Troops and a tramp to Peking would be the result of his further progress. In short, every effort that bullying and falsehood could devise was made to drive him from his purpose, but ineffectually ; for although he and his people were reduced to living on wild spinage and arum roots, the Sikimites

* This man was expressly selected by the Dewan for the purpose of defeating the object in view, and to the end was his zealous co-adjutor in preventing access to the Raja and the adoption of more friendly conduct.

could not starve them, and he had determined that starvation alone should force him to a retrograde movement. He, therefore, held on till he ascertained from me where the Northern boundary of Sikim really lay, of which I had no idea when he started, and in virtue of the Rájá's permission to visit it he determined to reach it. With indomitable perseverance supported by the courage and patient endurance of his followers, he succeeded in outstarving his tormentors, for the Soobah, who had endured similar self-imposed privations, and had eaten wild spinage, arum roots, and other garbage until he nearly died of the colic, knocked under, and at last admitted that the Kangra Lama Pass was on the frontier, that he had told lies innumerable on the subject, but would now take Dr. Hooker and his men onwards in the hope of their speedy return to Darjeeling. This he did, but not until the end of July, and from that time Dr. Hooker continued to explore and botanise in the Lachen and Lachoong vallies, and up to the passes, throughout the remainder of the rains, at the conclusion of which I joined him. I am not aware that any other European has ever travelled, and lived in a small tent in the Himalaya all through the monsoon, and it is certainly a very severe trial. He had his reward however in great collections of new plants made where no European had ever trod before, in making scientific observations of the confines of Thibet at very high elevations in an unusual season of the year, and in adding much to our Geographical knowledge in that unknown quarter. It was the necessity for ascertaining the real cause of the obstructions he had met with from the Rájá's Officers that led to my journey in that direction, and indeed I was little loath to undertake it when I read Hooker's accounts of the new regions he had visited, and of his views into Thibet from the passes both of which he had resolved to revisit after the cessation of the rains for botanical and other purposes. Having obtained the permission of the President of the Council of India, laid in, and suitably packed up, two months' supplies for my own party and Dr. Hooker's, I started at the worst season of the year for travelling in Sikim,—September 23rd,—to join him at Choongtam which is at the junction of the Lachen and Lachoong rivers, and with the hope of being allowed to travel through Thibet from the Kangra Lama Pass to the Doukia Pass, and thence down the Lachong valley to the starting point, Choongtam. We were very fortunate in effecting these objects in the

most amicable manner. A few days' residence in Thibet and the exploration of the Lachen and Lachoong vallies of Sikim amply repaid me for the difficulty and danger of the journey which was considerable, and my companion was equally satisfied with his success in the cause of science. From Choongtam we retraced our steps to Singtam, whence we proceeded to Tumloong, the residence of the Rájá, in the hope of procuring explanation from him in person. From Tumloong we were anxious to go by the Chola Pass into the valley of Choombi, which is Thibetan territory, and to return from that valley by the Yakla Pass to Darjeeling. We crossed the Chola Pass on the 7th of November, but the Thibetan officers here were not so accommodating as those we met at Kangra Lama, and we returned on the same day to Chumneko in Sikim, where the Singtam Soobah and other adherents of the Dewan brought matters to a crisis by personal violence on both of us, their force however being mainly expended on me. The accompanying map is a reduced one from Dr. Hooker's, and exhibits our whole route. All the elevations and Meteorological observations are his also. The climates of Lachen and Lachoong much drier than that of Darjeeling, and the noble scenery in and around those Northern vallies of a totally different character to the forests of the Southerly portions of Sikim, give them additional interest as promising places of resort to invalids from Bengal. Their proximity to Thibet with which country a route for unembarrassed commerce from Darjeeling and Bengal would be a great advantage, also gives them a more general importance. Of Thibet I can in no way say that it is a land of any promise. As far as I could see, it was mountainous and rugged, bare of vegetation and barren. The province of Dingcham, which we visited has probably a mean elevation of 16,000 feet. Bhamtoo is 18,000, the valley of the Geree to the North is, say 15,000, it is utterly bare of trees, and quite barren. Dingcham extends along the Northern face of Himalaya from the Tingu Maidon on the West to Tawang, on the East an extent of 360 miles. The intense cold of the climate in the winter does not admit of its being permanently habitable by man or beast.* It is occupied, however, by Nomadic Bhotias from May

* On the 17th of Oct. the Ther. fell to 5° of Faht. It was fortunately for our party quite calm. When it blows hard in Thibet in the cold weather it is almost certain death to be as little protected as we were.

till October, when it is very pleasant and the grazing is good. The habitable and culturable portions of Eastern Thibet are all to the North of Dingcham, and are confined to the narrow vallies of the streams and rivers; those portions are probably nowhere of greater elevation than 14,000 feet, and require irrigation from the rivers to produce crops. I infer 14,000 feet to be the upper limit of the culturable elevation in Eastern Thibet from the barrenness of Dingcham at elevations of 16,000 feet and under, and because there is a considerable descent from that elevation to the nearest cultivation to the North. I am afraid, however, to touch on these difficult and important points of enquiry with the little personal observation I have had in Thibet. At the time of my journey and since, I have collected information on various subjects connected with that country, which I may arrange at a future time, and I have a very curious Map of the country compiled by Natives who had travelled as Lamas and Merchants over the greater part of it. With this explanatory introduction I must leave the Diary to speak for itself, adding that the result of my local enquiries fully confirmed my previous suspicions, that all the obstructions to Dr. Hooker were instigated, and directed by the Rájá's Dewan, in opposition to the Raja's wishes. The same evil influence was set on foot to prevent my having access to the Rájá to procure explanation, and ended in violence to Dr. Hooker and myself with imprisonment and disgraceful usage. As on my former journey in 1848, I was everywhere received and treated with the utmost kindness and respect by all classes of the Sikim people, and even in our confinement I received numerous proofs of friendly feeling from old acquaintances who thereby risked the grave displeasure of the Dewan, who was dreaded and detested by all the Rájá's loyal subjects, and they are nine hundred and ninety-nine out of every thousand in Sikim.

DIARY.

Namgialachi, September 25th, 1849.

Having despatched my baggage and six weeks' supply of rice, &c. for my people to this place, 24 miles, 3 days in advance, I quitted Darjeeling this morning at $\frac{1}{2}$ past 5 A. M. It was a lovely morning. Ther. 62° in the house. As I reached the "Dell Corner," the view was as beautiful as it was novel to me although I have lived 10 years

within a few hundred yards of the spot. The sun, not yet above the horizon, tinged with deepest crimson long masses of clouds which hung over the lower hills of Bootan. The great spur of the Sinchal facing the Dell Corner to the South East, and lying between it and the emblazoned clouds, was cloudless itself, and of a sapphire-blue. In the valley of the Rungro reaching from the Saddle to the Great Rungeet, and just below me, lay a six-mile bed of the laziest and whitest clouds I ever saw. To the East the Peak of Tendong Arrarat stood out so boldly and looked so near, that in the coming daylight I did not at once recognise it; and to complete the scene Kunchinginga just then brushed off the clouds from its base to its summits, and appeared in all the majesty of its coldest morning white. I stood in great admiration until the sun arose, and then the whole scene changed with magical rapidity. The crimson clouds dissolved at once, and gave place to the clearest and brightest sky. The Bootan Hills came out in peaks, and ridges, and all else was restored to its usual aspect.

At $\frac{1}{4}$ past 8, having ridden all the way, I crossed the Great Rungeet by the Cane bridge. Thermometer in shade 85° , the heat stifling, the river excessively turbid and swollen,—I here mounted a fresh horse which had been ferried over the day before, and recommenced my journey. At 300 feet above the river I came on an open expanse of long yellow grass, in which a dwarf palm (*Cycas*) and a beautiful pale blue Iris abounded. This vegetation continued for at least a mile, the contrast of colours was very beautiful, the whole forming a variegated carpet under large trees of *Saul* and *Pinus longifolia*. Carried the *Sauls* and *Pines* with me to the ridge of *Meksurrso*, where they at once ceased, and *Oaks* began. Probable elevation 3,000 feet. This ascent was an hour's work. Thermometer at $\frac{1}{4}$ past 9, 76° ; took a light breakfast of cold tea with bread and butter, and moved on riding slowly till half past 11, when in a narrow part of the road a mile below *Silukfoke* the poney's hind foot slipped, I felt he was giving way, and immediately slid out of the Saddle against the inner bank which I had just touched when the poor beast capsized backwards, and then rolled like a round black ball with the speed of light down the precipice, the open umbrella which I had in my hand following about 100 yards in his wake.

The trees and underwood soon shut him from my sight, but for a minute and more I heard the horrid crashing sound as he bounded along to his untimely end. The men who were behind me soon came up and slid down in search of him. It was half an hour ere they returned. When they reached him he was stone dead, lying against a large rock the blood flowing from his nostrils, and his back broken;—poor Bhotia! Nine years long you were my steady and willing steed!

Walked the last 3 miles in a hot sun but reached this at 2 P. M. Found a good house prepared for me by the Cheeboo Lama, Vakeel of the Sikkim Raja who had preceded me, and met with due attention from the Raja's people. Thermometer 72° at 2 P. M., 68° at 6 P. M.

The forest around this place is now in full and varied foliage; very many trees are in flower, and the orange-blossomed *Erisina* makes a great shew. Just around my door are Oaks, Chesnuts in flower and fruiting, Wormwood, *Hypericum*, *Osbeckia*, Holly, *Magnolia* in flower, besides many handsome plants unknown to me by name.

Close below me there are fine crops of Tugmaar rice in full ear, but not ripe, and Murnea, Kodso, and Indian corn nearly ripe. The first crop of rice, the Zorug variety which is grown lower down, has been cut and stored.

Temi, 26th September.

Left Namgialachi at 7 A. M. and arrived here at 2 P. M. by which I reckon the distance to be 14 miles. Road very bad, and in many places ankle-deep in sticky clay, or black peaty earth. Tried a chair, which is a *tolerable* substitute for a good poney, and no more.

The Raja's people here are civil; a good house has been put at my disposal; small supplies and other assistance have been offered and accepted. The house is a Bhotia one; a notice of its style will suffice once for all on this journey. It consists of one large room 50 feet by 24, the floor raised 5 feet from the ground, well planked and supported on massive squared posts and beams. The walls are of close bamboo matting, the ceiling, of close laid straight bamboos an inch in diameter, looks very neat, it is laid on scanted cross beams 8 feet apart. The roof of bamboo thatch projects 7 feet, giving a verandah all round.

The Teesta at "Look Sampoo," is in sight from Temi the water of a very dirty greyish-green colour like soap suds. Badong, on the

opposite side, and the hills of Bootan lower down are bright with green woods, and ripening crops of rice, Indian corn and millet. This is a much better season than the cold weather, when I last travelled here in 1848, for lively and varied scenery. The Tondong Forest, stretching in one unbroken mass from its summit, an elevation of about 8000 feet above the river, to the Teesta, is a noble expanse of varied and majestic vegetation. Temi is embosomed in it, and stands about half way between the river and the summit.

Thermometer at 8 P. M. in the house 72°; elevation say 4000 feet.

Neh-Mendong, 27th.

Started from Temi at 6 A. M. and arrived here at 2 P. M. Distance most probably 15 miles. Heat intense and overpowering; in the Teesta valley through which the route runs, it was quite stifling from 9 to 11, and again from 1 to 2; yet there was a breeze occasionally blowing from the south, but it gave no relief. The eight Lepchas who carried my chair, in which I rode but seldom, were fairly overcome and had to bring up at the Rungoon river to refresh. The vegetation is superb all the way, and its shade frequently protected me from the scorching heat. This is the season to see these jungles in perfection although it is somewhat perilous. It is only in malarious places, and at times when malaria is rife that the mixed tropical and alpine character of the Sikkim forests can be seen in all its glory. Oaks and the Pandanus palm, Chesnuts and the Oopi palm, flourish side by side along Nainfok and Bram. Scitamineous plants of various kinds, and wormwood, each of 12 feet high and more, form a common under-wood in the clearer spaces, and all the other plants are of gigantic growth. There is a species of Chesnut hereabout which I never saw before. It has a broad and round leaf with wide spreading graceful branches. The clusters of unripe and light green fruit add to its beauty. It is a very handsome tree.*

The "Poosh Hemp," *Böhmeria nivea*, abounds along the road from the Rungpo to this place. The average elevation of the zone in which it flourishes is about 600 feet above the river. On the Rungeet I found the Poosh at 200 feet above the guard-house, i. e. at an ele-

* The other two varieties of Chesnut which I know, are 1st, the large-timbered Chesnut at Darjeeling with small thick hard leaves, and 2nd, one with a long sharp-pointed leaf now in flower at Namchi.

vation of 1800 feet. It has a most extensive range, and the supply might be rendered unlimited, if there was a demand for it in India or in Europe. Sir William Hooker has recently informed me that he has caused a trial of its qualities to be made in London, Dr. Hooker having sent him some of the prepared Hemp from Darjeeling. Sir William instances the successful cultivation of the Indian Jute as an incentive to further trials of the Poah.

The Jute was not many years ago unknown in England. Now £300,000 worth of it are imported annually !*

The Peepsas are very indefatigable here, and very numerous. I am encamped at the measuring stone (see Journal of 1848) ; there is no water within a mile, but my ground is, I hope, above the level of malaria.

The road to-day swarmed with leeches, the people's feet streaming with blood, and it was so slippery in the long descent from Temi that I could not walk with shoes on, and I was obliged to move between two Lepcha supporters, whose bare feet give them a great advantage. The air, and underwood teem with insect life ; innumerable butterflies of brilliant hues sport in the sunshine ; and thousands of other less attractive creatures are on the wing. The night is as busy a time as the day with the insect world. The roof of my tent is literally covered with the most beautiful little moths, and the air resounds with the discord proceeding from innumerable throats.

Thermometer at 8 P. M. 76°.

Padom, below Kedong, 28th.

Left Neh at 6 A. M. and arrived here at 3 P. M. I was anxious to reach Kedong as it is certainly beyond the limit of malaria, but I could not accomplish it ; I hope we are safe here ; it is, I reckon 5 or 600 feet above the Teesta and *said* to be healthy.

Thermometer at 5 P. M. 75°. I am pitched near a small stream of water among bamboos, high reed grass and Acacias ; there are some Oaks, however, lower down, and at the cane bridge over the Bumphup there are three large and handsome " Boreh " Palms. Pandani, Peepsas, mosquitoes, and a black venomous ant abound here. My feet are swollen and sore from leech and peepsa bites ; my face and hands equally so

* The Poah has been very favourably reported on for cordage, by Captain Thomson of Calcutta, see Proc. Agricultural Society for 1848.

from the mosquitoes and peepsas. This is a trying and fatiguing march at this season. The heat in the valley of the Teesta is quite overpowering and I never before experienced so much inconvenience from it. My head all day felt full to bursting, and my face and eyes were burning: but the skin was open at every pore, and I could walk along briskly. The Lepchas, who carried my empty chair, felt it even more than I did; they were quite exhausted, and rolled about as they walked along panting for breath. The tropical character of the route, as we approached Bamsang, was very striking. All the vegetation luxuriant, and every plant gigantic. The hum of insects was so loud as to rival the roaring of the river; both united were quite deafening.

The insect and vegetable kingdoms alone possess this region. Neither bird nor beast was to be seen. Thermometer at the Bamsang ghat in a house at 1 P. M. 87°, a fine breeze blowing; but this does not relieve the feeling of oppressive and choking heat, which I have experienced in the vallies since I started.

There are many beautiful plants in flower just now between Neh and Bamsang, which I never saw before. I found a "Sweet Pea," a climber, colour pale Rose, and two other Peas, one purple, a shrub, the size of the Spanish broom, the other blue, a small shrub with broad rounded leaves, also a lilac, terrestrial orchis 10 feet high called "Broong," a white one, and a blue one, each 6 feet high. There is also a handsome fig tree, with clusters of yellow fruit like Loquats, called "Suntote;" it is not edible however.

I heard from the Raja to-day in reply to my announced intention, of proceeding to his Northern frontier at Kongra Lama. He authorises Aden Cheeboo Lama to accompany me as I desired, and sends orders to his officers to clear the roads, and otherwise to assist me. The officers along the line I have come, paid no attention to the Cheeboo's previous requisition. The following is the administrative division of the country between Darjeeling and the Thibet frontier at Kongra Lama and Doukia.

1st. From the Rungeet to the Teesta, by the line of Atooknot and Temi, the country is under the Kaji who lives at Burmeok, the Meboo at Namgialachi and the Mahapun Kada, who resides near Temi.

2nd. From Temi to Neh is under the Lasso Kaji, who resides above Namfok.

3rd. From Neh to Goreh is under the Goreh Soobah, who resides at Goreh.

4th. From Goreh to Choongtam, the country is under the Singtam Soobah, who resides at Singtam.

The Choongtam Lama, and the Phipuns of the Lachen and Lachoong vallies, have respectively the local charge of their districts under the Singtam Soobah's surveillance, but the peculiar position of the two latter officers, the Phipuns, serving as they do the authorities of adjacent Thibet, as well as the Sikim Raja, will be better explained afterwards.

The Lachen man manages the country extending from Choongtam up to Kongra Lama; the Lachoong one, from the same point up to the Doukia Pass. Choongtam is at the junction of the Lachen and Lachoong rivers. Their united streams form the Teesta.

The Gereh district is at present assigned to the heir-apparent of the Rájá, the Singtam one to the Mohá Ráni.

We met many men to-day, travelling to the South; they had been 10 days on the road from Choombi. They were laden with salt. We passed others with loads of chopped Munjeet, going all the way to Phari.* How pitiful to see the trade of a people, in such bulky articles, carried on in this way, when a road for Ponies and Bullocks would make it so much more easy and profitable.

The road from Bamsong to Lachen and Lachoong† is so extremely bad, that it is not used in traffic with Thibet till the one by Chola to Choombi is snowed up. Lachen and Lachoong are nearer Bamsong than Choombi; and no snowy range intervenes, but there is no food to be had in this direction. From Lachen and Lachoong northwards the roads are good for cattle into Thibet, but a cattle road from the heart of Sikim to these places is required, to establish a proper trade with Thibet. The British Government could do this; the Sikim Raja never can have the means to do so.

Talking of the wretched system of trade in this direction, and of the people who dabbled in it, the Cheebo Lama said to me the other day, "The Bhotias are, however, very good Pedlars, (Biparies,) they eat so much less than Lepchas." "How do you mean," I asked.

* A frontier mart of Thibet.

† The principal places in the vallies of these names.

“They eat enormously at the expense of other people, but on their own charges they will fast to faintness rather than spend a penny, and it is the same with drink; a Bhotia, although so fond of it will rarely buy it; a Lepcha if he wants it will freely give any price for it.” So much for characteristic differences in these tribes.

Goreh 29th. Started from Padom at 6 A. M., reached Kedong where I encamped in 1848, at 9, and this place at $\frac{1}{4}$ past 12. A hard march it is; the road is so slippery in many places, that I found it impossible to walk alone with shoes on, and had recourse to the support of a barefooted Lepcha. No use to-day of the chair, which we had to take to pieces in order to carry it along the cliffs of Sungdum.* Near Goreh, to the West of the “Rungki” stream, there has been a great land slip by which the road has been quite obliterated for $\frac{1}{4}$ of a mile, and it was a difficult matter to get along the slip, as it is almost perpendicularly scarped on this side the Rungki; however, the road is worse even than over the land slip, or along the cliffs of Sungdum; at two places there is nothing to walk on but the stem of a tree with notches cut in it, standing erect against the face of the rocks; and above one of them was a dripping rock which rendered the notches as slippery as ice, and wetted us thoroughly as we climbed them.

Last night it rained heavily; the tent of Nipal blanketing in which I slept, leaked like a fine sieve.

The rain came down in large drops, but was spurted through the tent roof like the spray of a water fall. I got one umbrella over my head in bed, and another over as many of my things as it would cover, and got up this morning pretty dry, but little refreshed. We marched this morning in heavy rain, which lasted 4 hours.

There is a fine crop of Sunkoo Rice in ear on the shoulder of Sungdum, and near the Rhododendron Arboreum I noticed at this place in December last;—elevation say 4,500 feet. Rice at Goreh cut sometime ago;—elevation probably 1,000 feet less.

The whole country to the North and South is in heavy clouds. Nothing to be seen.

The Cheeboo Lama was my companion all the morning, and his sensible and fluent talk beguiled the hours. He is a student of “Mendooling,” a famous School or College in Thibet, and situated

* See Journal of 1848.

two horse jonnies east of Lassa. Here he informed me he had studied the Bhuddist religion for two years, but in saying so modestly added, "It takes 3 years of Mendooling to make a Pucka Lama," of his alma mater, he gave the following particulars, "There are upwards of 100 Lamas engaged in clerical duties, and in teaching Religion. Literature and the Sciences are deeply studied and extensively taught, and all the arts of life are also taught there, carpentry, stone masonry, painting, shoemaking, tailoring, &c. Pupils come from all parts of, what we call Eastern Thibet, the province of U, to learn there ;* one professor is always appointed to the principal College at Lassa from Mendooling, and when I was there he had the sons of all the grandees of the capital, as his pupils." I expect to hear much more of Mendooling before we have finished our travels together, for the Raja writes that my little friend is to take care of me to the Northwards.

I have got into a good house for the night, 4 P. M. ; heavy and continued rain. Thermometer 71°, elevation say 3,500 feet.

30th. Incessant pouring rain all night. The house leaked freely, but I got a dry spot for my bed. The rain continues, and we halt for the day. No wonder that Bengal is under water just now, every depression on the mountain sides has a snow-white foaming torrent in it, rushing furiously to the river, and they are countless in number. The noise they make, added to that of the Teesta itself which is just below me, say 2,000 feet, is like the coming of a furious storm. I felt very aguish last night, and dreaded jungle fever ; but the symptoms are gone to-day. Lepchas own this house, my portion of it is curtained off, but there is only one door for us all. They have indeed some dirty habits. The grandmama of two urchins was sitting in the door way, as the place for stronges^t light when I got up from breakfast. The brats were busily hunting lice in her back clothes and eating them, she herself being similarly employed with those in front !

There is a little tobacco grown here, but no care is taken of it. The leaves are small, it is allowed to go to seed, and is said to be of very inferior quality.

* All East of the Kamboola range is "U," all West of it "Chang" or tsang.

The wormwood* on the fallow ground here is 12 feet high; it grows up to, and all round the house and on both sides of all the pathways. I find, however, that the people have good reason for allowing this plant to monopolise all their fallow clearances. Its decayed leaves are considered to form the very best manure, it has a profuse foliage which falls and rots readily during the rains, and the plant itself is cut down after it seeds in October, and is also allowed to rot on the land.

As I did not in December last travel further than this place on the route to Thibet, I shall henceforward note more particularly the state of the road, the places along it, &c.; the foregoing memoranda being purposely of a more general nature, or designed only to shew the differences observable in the country during the rains, and in the dry season.

October 1st. Tugvia, east bank of the Teesta. Started at 6 A. M. and reached this at 2 P. M. very much fatigued; got into a good house just as it began to rain heavily. Thermometer at 6 P. M. 72°. Probable elevation above the Teesta 1,200 feet. There is a little garden attached to this house, the first I have seen in Sikim; it contains plantains, sugar-cane, capaicums, turnips, two kinds of creeping beans and marigolds.

The villagers have been turned out to clear the road all the way from Banson, and the little Lama with the Raja's orders to that effect under a Red Seal in his pocket, is exceedingly attentive and most useful.

The road descends steeply from the Goreh-mendong in a north-east direction to the Jett, a rapid torrent which pours over a precepice of whitish clay slate, and rushes to the Teesta; we crossed it over bamboos laid from rock to rock, and afterwards continued to descend in the same direction as before to the Num-moo, a larger feeder of the Teesta than the last, which we crossed at half past 3; a mile more along a flat terrace parallel to the Teesta brought us to the Bhalak ghaut of the Teesta, where at 9 o'clock we crossed to the East Bank by a rickety cane bridge suspended 30 feet above the water. The river is here confined in a narrow channel of rock and pours down like a sluice of dirty soap suds, so turbid is it from land slips in its upper course.

* Artemisia.

It does not appear to be more than half the size it is at Bansong : hence the Ryote which is the only affluent of note between this and Bansong must be a large one ; it drains the Chola portion of the eastern snowy range, and is formed by three streams, the Dik, Ryote, and Runjung. Thermometer at Bhalak in the shade 78°. Ascended steeply from the river to about 300 feet and came along the Phajigam* village and terrace thence to Akurthung, which we reached at noon, a flat terrace about a mile long, whence we descended by a precipitous and dangerous path to the Rungrung, running west, and crossed it a few yards above its junction with the Teesta.

This crossing is without doubt the worst place I have ever been over. From the top of an immense round rock up to which you climb on hands and knees, three bamboos are laid across the torrent at an acute ascending angle to the opposite precipice. This attained, at the imminent risk of falling into the torrent, you get to zigzag bamboos which are hung by slips of dry creepers against the face of the rock for you to walk on ; then there is a net work of knotted creepers spread over the face of the precipice by which you get to the top of a ledge or the first story of the ascent. From this there is an erect pole with notches cut in it, then a bamboo ladder, next another notched pole of 22 steps, which stands in a gully of the rock and over which a streamlet trickles, and lastly you have to crawl up the head of this dripping gully to reach the top. The whole ascent arranged in this singularly ingenious, but very dangerous manner, must be above 200 feet. It needs a steady head, and firm tread to manage it. The smallest slip would be fatal. The rivetting of the attention had, I found, quite exhausted me when I reached the top. We all got up in safety, an hour's march from this brought us to Tugvia. Our general direction has been north, road distance, say 15 miles.

On the west bank of the Teesta opposite this, and north of Goreh is the Mani, a feeder of the Teesta, then "Sidoor" a Lepcha village, next "Munkiang," and north of that the run, another western feeder of the Teesta which rises from the Kim mountain.

The mountains hereabouts are very precipitous and composed of clay schist ; land-slips are common. There is a recent one above

* Phajigam, or "Sandy plain," there is whitish clay slate debris doing duty for sand, but *the plain* is not perceptible.

“Sidoor” which is frightful to look at, even from this side of the river ; a few days ago a hill side came down bodily into the Teesta two marches above this, and two years ago a whole village Kemam was destroyed in this way, and all the people killed ; it occurred at night in a deluge of rain and in a storm.

I heard from Hooker yesterday ; he was on the 24th still at the Donkia pass, and had that day ascended the mountain close to it to 20,000 feet, and discovered another Lake the 4th of the Lachoong ones.

My Lepcha hostess of last night afforded me another trait of domestic habits. This morning, I was dressing by candlelight in my end of the house, while she was at her toilet at the other. Having got one of the boys to bring her a cup full of water in the tea-ladle, she commenced her ablutions. Wetting her hands she each time held them over the fire in the smoke, and then rubbed them over her face and arms. Then dried herself with the lousy chudder of yesterday ; rubbed her teeth twice with her fingers, and thus ended, “my lady’s toilet.”

Singtam, October 2nd.

Heavy rain all night, which ceased at daylight, but came on again at 6 o’clock.

Started at 7 in lighter rain, and reached this at noon. Thermometer at 8 P. M. in house 68° ; an easy march in the dry season as to distance, and no great ascents or descents, but just now it is very different ; general direction north-east, being the course of the Teesta. Crossed the Rung-lok, a small stream, a short distance from Tugvia, and then ascended to the Rungoon Spur along the west brow of which the road runs for two miles through an undulating and cleared country, bearing excellent crops of rice and murwa, now ripening. There is also a good deal of grass, and the cows are remarkably fine and numerous. It is well peopled, principally by Lepchas who have good houses, and is in the jurisdiction of the Singtam Soobah, who lives a little farther on at “Rufam,” from which we ascended steeply to “Shem,” a spur from the Enden mountain, and thence descended to Singtam. The road through the cultivation of Rungoon is ankle-deep in mud, and on the steep descent to this place it was impossible to move alone with

shoes on. With a stick in each hand and a Lepcha holding on by each arm, slipping was not to be avoided.

The opposite bank of the Teesta is extraordinarily precipitous, and in many places the scarpd rocks for 1000 feet descend almost perpendicularly to the river. The course of the Teesta here is east and west, which it takes from the Saklang ghaut south of this, and at the foot of the Shem spur. It was by the Saklang ghaut that Hooker crossed in May last, having kept the west bank of the river that far from Goreh opposite Singtam. Bearing north is the Sufo mountain, lower down Likla, and west of that is "Sakiong."

The Kuloo mountain above last night's encampment is a favourite site for devotees, who retire for a time into the jungles to do penance and devote themselves to abstraction and religious contemplation. This feature of Hinduism is in considerable repute among the Buddhists in Sikim, females as well as males of the religious order adopting it. One of the present Raja's daughters is a Nun-Auni—and has in this way segregated herself from the world for 11 years. While thus engaged the individuals are objects of veneration, and perform religious exercises and incantations for all applicants.

There is a Goomba at Rungoon, the head Lama of which is a Lepcha. It commands a noble view of the eastern flank and spurs of Kunchia-jinga, but we were enveloped in thick clouds, and I saw nothing as we passed.

I found an Indian-rubber tree, called Yok-koong, close to the last ground at Tugvia. Caoutchouc is made in Sikim, but the only use it is applied to is for lining baskets to hold fermented murwa for making beer.

There is a crop grown here which I never met with before; it is called "Kundep," and is now in ear; it is grown like rice, and is something like it, but taller and stronger in the stem, and the grains are separate, on long pedicles, and twice the size of those of rice. It is said to be nutritious, and to taste like Indian-corn. When eaten it is boiled like rice and is previously husked in the same way. Three climbing edible plants are cultivated hereabouts, the Botanical names of which I do not know.

1st.—"Kucho-pote," a round brown thing like a potatoe in form and substance; it is formed on the stem of the plant which is a slender

climber, and is supported by long hop poles. It is eaten, boiled or roasted, and is a sort of above-ground yam.

2nd.—“Kusok,” a black round substance like the above in structure, but the size of a prune; it is similarly grown on hop poles, and eaten roasted or boiled. It is a handsome plant with large digitate leaves.

3rd.—“Tukoombi,” another climber. The edible part being black currant-like berries, which are roasted or boiled when eaten.

I have got into a Lama's house here and am dry and comfortable; but these people do not make the most of their houses which are really very good. They are all raised 4 to 8 feet from the ground, which at first sight would promise exemption from damp; the flooring, however, is of loose boards, with intervals between them, and as pigs, fowls, goats and calves live below you, and the ground is a perfect puddle, you have damp and noisome air incessantly about you. The cows too take shelter under the eaves and hang about the houses, so that dirt and slush surround you. This is the state of things during the rainy season, and different indeed it is from that which you find both at the house, and on the road during the cold weather, to which alone the English notices of the Himalaya generally refer.

Miangh, October 3rd.

Heavy rain all night. We started at 6 A. M. in a drizzle, which soon became a right down pour, and this continued until 11 when it brightened, and we reached this place at noon. The peculiarities of travelling in the rains were displayed in all their force and glory. Our route lay along the north-west side of Rungeelah, and above the Teesta south bank, with occasional descents to feeders of the river which we crossed, and ascents to their corresponding spurs, the general line being about the elevation of Singtain, until we made a long descent to this place which is about 500 feet above the river. The Koormi, Bungkiong, and Bungchi are the principal feeders on the route, they came dashing down their smooth narrow beds of quartz rock, occasionally impeded by immense round masses of rock through which they rush thick with mud and clay-slate debris, the foaming flood being the colour of dirty soap-suds. The crossings are very difficult;—the deepest places are passed over on rickety sticks or bamboos, the remainder by crawling on hands and knees from rock to rock and by wandering.

The road was very muddy all the way, and we had to toil through peaty slush in many places more than ankle-high. The leeches were most troublesome, half a dozen at a time fastening through the stockings, and it often sickened me to see the bloody water bubbling through my shoe laces as I toiled along. Peepsas and midges were all the time busy at my hands and face.

The course of the Teesta here is nearly east and west, and its bed is now gorge-like the mountains on the north side being almost perpendicular, and on this side but little less abrupt.

The Ramam is a large feeder from the north, and just below its junction with the Teesta there is a cane suspension bridge; above it is the great landslip already noted and which recently carried a whole village into the river.

We met some excellent cows to-day, and I would have bought some, but they could never get to Darjeeling, and until a road is made in this direction the cattle of Rungoon must continue to die in the land of their birth, for no cows could travel where we came along to-day. Another day and no views of Kunchinjinga; it cannot be helped, and I hope for better skies as we return. I had however a glimpse of Lemteng across the Teesta, it is a well cultivated mountain-side above the Rungjung river. The road to the Taloong Pass goes through it. This pass leads to Shanok in Thibet, a district of Digarchi. There is a little trade across it, but the difficulties of effecting a passage are very great, and the route is but rarely attempted.

Chakoong, October 4th.

Heavy rain again all last night, but it ceased by daylight, and at 6 o'clock we started; passed "Namgah" at 8, and reached this at noon. Thermometer at 8 P. M. 70°. Miangh is a place to be remembered albeit *not* memorable; my tent was soaking wet, there was no village near, and I therefore had a hut built of long grass and plantain leaves; it defended me pretty well from the rain although it fell in torrents; but I was a prey in the day to Peepsas and all night to fleas, bugs, musquitos and another creature more venomous than all of them, a sort of gnat, the bites of which are greatly inflamed and intolerably itchy. I am speckled purple all over from the industry of these creatures, and my feet and ankles are swollen and very painful from yesterday's leech bites. These animals, the leeches, I can, I

hope, defy for the future. The little Lama, seeing the plight I was in this morning, recommended me to roll moistened tobacco leaves round my feet. I did so, and with the most perfect success; I had not a leech bite all day, and when I took off my shoes a dozen were dead on the stockings under the tobacco leaves, not having done me any damage.

Miangh is a flattish terrace overgrown with a rank jungle of reed grass, wormwood, &c.; the soil, a rich black peaty loam saturated with moisture and covered here and there by small stagnant pools of water.

Although the place has apparently all the requisites of virulent malaria, it is said, and I hope truly said, to be quite healthy. Indeed the whole valley of the Teesta above Bansong is considered by all the people in this direction to be free from malaria; if it be so, the fact must, I think, be attributed entirely to the precipitous character of the mountains bounding the valley, which rise almost perpendicularly from the bed of the river to the height of 2000 feet.

They are however generally clothed with a dense forest; and although the action of the sun on decaying vegetable matter may doubtless be much limited by the near approach of both banks, the decay of vegetable matter must nevertheless be very great, and on the terraces such as that of Miangh the putrid smell covered by it was most offensive. If it shall really turn out that malaria is not rife and powerful here, an opinion which I have long held, that an expanded horizontal surface in the mountain valleys is essential to the generation of this mysterious and pestilent agency, will be confirmed. Rank vegetation, a retentive soil, and profuse moisture alone, will not produce it if it be not generated here. Our present encampment is a flat terrace similar to Miangh not 100 feet above the river; it is composed of sandy soil, and is occupied by fine alders and young birches; it is also considered quite healthy. Landslips appear in many places, and on both sides of the river. This is quite characteristic of the Teesta above Goreh. Last evening at 5 o'clock I was startled by what I believed to be a great explosion in the sky, followed by what seemed to be an increasing peal of thunder. It suddenly ceased, and not being followed by any thing similar, and there being no lightning afterwards, I was puzzled to account for the phenomenon. This morning, however, some of my people who were encamped a little lower down the valley, asked me if

I had heard the crash at that hour, and said it was caused by a great landslip on the opposite bank of the river.

To-day I have heard about a dozen of these crashes, and they are followed by a rumbling noise as the masses of rock are carried down by the current, which is a boiling flood throwing waves up in the narrow parts of the channel 20 feet high.

After leaving Miangh we descended to the feeder of that name, and crossed it by a rickety suspension bridge, the side rails of which, as well as the footing, were covered with a thick slime, and exceedingly slippery. It was a foaming cataract where we crossed. The bridge hung 40 feet above it, and many of the coolies clung to it in evident alarm, and were very dizzy. At 9 o'clock we reached the Rune, and crossed it also by a suspension bridge hung just below a fall of about 50 feet, and about 100 yards from its junction with the Teesta. It was a continuous bed of roaring foam for about 1000 feet above the bridge, and below it all the way to the river. I stopped midway to gaze at the extraordinary sight, and got soaking wet with the spray from the cataract. It was a noble sight; the rainy season only can give such sights in Sikim, where waterfalls and cataracts are very rare. Between the Rune and this place, Chakoong, three hour's walk, our road lay close to the Teesta, varying from 200 feet above it down to its level, and in that distance we had to cross 8 or 10 landslips of varying extent, some quite recent and extending from 1000 feet above us down into the river. They were all sufficiently difficult to cross, and none of them well free from danger; one in particular was very frightful. We crossed it 200 feet above the river; it was quite a new slip; foot traces had scarcely been formed along it to guide us; it was nearly perpendicular above us for 800 feet; equally so below us; the crest of the mountain whence it had separated above, was of rock, and projecting over it so far that it looked as if it was overhanging us, our footing was of loose rubble, and over lumps of rock, and water courses just cut in it came running down its sides.

While crossing this unsettled slip the Lama who was leading, and just ahead of me looked up to the top, and instantly quickened his pace; my eyes followed his to the overhanging summit, and my pace was quickened up to his, but not a word was spoken by any one, nor did any one delay a moment. When safe across I said, "That is a

bad bit of ground, my friend." He replied, "It is pretty safe to-day, there has been plenty of rain to take it down; but three days of sunshine will bring it all crumbling down into the Teesta!"

I believed him, and I am satisfied that to travel on the upper Teesta in the rains needs as steady a head and as much care as any mountain journeys whatever. I can now very adequately appreciate the intrepidity and zeal which has carried Hooker through five months of it without a companion.

Chongtam, October 5th.

Started at 6 A. M. a beautiful morning, no clouds, and a fresh cold weather feel in the air: a lofty Snow Peak of Kunchinjunga in sight to the south-west, and Peaks partially covered with snow are in sight up the Teesta valley to the east and north. Crossed the Chakoong, a feeder of the Teesta, two miles from camp by a suspension bridge, and at 8 o'clock crossed the Ryote by a similar bridge which hung 60 feet above the torrent. It was a bed of foam for 1000 feet above the bridge, and similarly furious in its course to the Teesta, which it joined 300 yards below. There is a cane-bridge across the Teesta, just above the junction of the Ryote. The road to-day has been exceedingly difficult and very dangerous. We had to cross more than a dozen landslips, some of them quite recent, and of very infirm footing, the river tearing past at the bottom of them with such speed and violence that nothing could resist its force. The noises from masses of rock rolling down with the current were incessant, and resembled distant volleys of musketry.

On nearing Chongtam the bed of the Teesta is considerably wider than it is lower down, a bank of loose mud and rubble is thrown up on the south side of it by the Ryote feeder, which dams up the river into a quiet lake-like expansion of half a mile long. The water was clear and green, and fringed with fine trees to the very edge. The effect was very striking and pleasing, being greatly heightened by the Chongtam hill rising at the back ground to 5000 feet, the upper portion of it 2000 feet from the summit being clothed with verdant grass. This is the first grassy land I have seen in Sikim; it is a pleasing foretaste of what I expect beyond on the plateau of Thibet. The Lachoong river coming down from the north-east is crossed by a cane-bridge close to Chongtam, at which there is a large flat terrace, 200 feet

above the river, covered with an irrigated rice crop. Above this flat is the Goomba and Lama's house, a fine airy situation, elevation 5000 feet. There was a delightful breeze from the south all day.*

About half way from Chakoong I met Hooker, who came down so far to welcome me. He is looking remarkably healthy and is quite robust, wears a large beard, and is sadly sun-burnt since his trip to the Passes.

Latong, October 6th.

Talked all night with Hooker about his visits to the Passes. Started at 8 A. M. and reached this at 3 P. M., our road all the way in the valley of the Lachen in a north-west direction, and on the left bank. We crossed the river below Chongtam by a suspension cane-bridge. At noon crossed the Urkang. Half way is Denga, a flat terrace, about a mile long and half a mile broad, and there is a succession of similar terraces all the way to Latoong, which is much the largest of the whole, and is perhaps a mile broad at the place we encamped.

These terraces or flats are covered with an upper stratum of black peaty soil, and their general formation is sandy gravel, and roundish masses of rock down to the river bed. The average elevation of them above the river is under 100 feet. There has been a marked change in the vegetation on this march. The most prominent plants not seen below Chongtam and seen here, are the Poplar, Willow, Crab-apple, and Anemone. We saw some of Hooker's newly discovered Rhododendrons, and the Dalhousie, growing not as an Epiphytic plant, but out of the ground;—elevation of Latong 7000 feet.

At the elevation of 2000 feet above the river, the mountains on both sides are clad with pines. Ther. at 6 P. M. 55°. The road all the way from Chongtam is most difficult; along the terraces it is ankle-deep in mud and black soil, and in the other parts it is across landslips, or violent torrents, or over immense rocks in the river's bed. Leeches very numerous. Insects infested the tent all night.

(To be continued.)

* Choongtam, and the whole country south of the Kungra Lama and Doukia passes, was occupied by the Thibetians for many years, and at length restored to Sikim by negotiation.

Diary of a Journey through Sikim to the Frontiers of Thibet.—By
Dr. A. CAMPBELL, Superintendent of Darjeeling—with a Map.
(Communicated by SIR JAMES COLVILLE, KT.)

(Continued from page 428.)

Chateng, October 7th.

Elevation 8,500 feet, started from Latong at 7 A. M. and did not reach our ground till 6 P. M. A mile from camp we crossed to the left bank of the Lachen by a rickety cane-bridge: the river a continuous sheet of foam; which is the character of it, and of the Teesta all the way from the junction of the Rumam; below that the water is heaved up in waves. The declension of the river's bed must be very uniform in each division of it, viz. in the way and in the foamy parts. The rate is very rapid; Dr. Hooker estimated it at 11 knots an hour. Close to the bridge there is a fine cascade of 100 feet or more from an affluent of which I could not learn the name. At $\frac{1}{2}$ past one we reached the "Takchoong" feeder which is a deep and furious one, and found the bridge at the proper crossing place had been swept away. Having ascended some way we found a crossing in progress of being formed. The operation presented a very animating scene. About 30 Lepchas having laid long Alder saplings from rock to rock in the torrents course, spread themselves across the roaring torrent, and by binding 3 or 4 of the saplings together for foot ways and running temporary rails, we all passed, the foam beating against the foot ways and wetting us all over. Keeping along the left bank for three hours we re-crossed to the right bank of the Lachen, and ascending a short distance came upon pines near the river's edge; all the way from Chongtam the mountain tops are clothed with them.* Our route now lay through an open forest of lofty Pines. At about 500 feet above the river and 2000 feet below the crests of the mountains, we crossed a recent landslide of great extent, and further on we crossed a roaring torrent running over a solid rocky bottom which terminated in a precipice 20 yards below the crossing, the water shooting in a cascade down to the river with a fall of 400 feet; one of our coolies slipped his footing at the crossing, and was saved from being instantly shot over with the torrent by a man who promptly seized him. From this crossing we

* *Pinus Brunoniana*, and *Pinus Khutrow*.

made a very steep ascent of 500 feet through a thick forest of Pines, at the top of which we suddenly issued on a wide and steep expanse of grass thickly studded with Anemones, asters, beautiful purple Primroses, and a profusion of blue and yellow flowers which all combined exhibited the gayest sheet of vegetation I had ever seen. For the first time I now realised the pleasure I had so often derived from reading accounts of the beauties of this sort to be met with, in the upper and inner regions of the Himalaya to the westward; and which are quite distinct from those which characterise the lower and outward ranges in both quarters of the chain.

The ascent continued through this loveliness to the top, and then Chateng itself, which is a broad spur from the Takcham mountain, spread out before us in undulating terraces for more than a mile square. Clumps of Pines adorned it like a noble park, and overtopping it to the north-west the snow-clad summits of Takcham shot into the sky to the height of 17,000 feet.

The views from Chateng are as fine as itself is beautiful. To the south and east a long reach of the Lachen river foams along with numerous cascades dashing into it from either side. From the west a torrent and waterfall come pouring down for 2,000 feet through an avenue of noble Pines; and to the north is the valley of the Lachen apparently terminated by a snow-topped mountain 12,000 feet high, which divides the valley of the Lachen proper from that of its western feeder the Zemu. Chateng would be an incomparable place for a residence in the rainy season if it was even tolerably accessible from the south, which it is not at present. The climate is much drier than that of Darjeeling. Hooker found the fall of rain and humidity of the atmosphere much less in the country above Choongtam, than in the lower part of Sikim.

Yeunga, October 8th.

Started at 8 A. M.: descended from the lovely Chateng to a torrent flowing into the Lachen from the west which we crossed; ascended thence toward the village of Lachen through a forest of noble Pines, and along a good road, the under jungle of the forest becoming more and more scanty as we advanced, the soil dry and sandy. Suddenly round the end of a beautifully wooded spur we came in full view of the village of Lachen, also called Lamteng, an exceedingly pretty

place and picturesquely situated on a gently sloping terrace covered with grass, and having handsome clumps of Pines scattered over it. A streamlet of clear water runs over a pebbly bottom meandering through the village.* Lamteng consists of about 30 houses built of wood and raised on posts four feet from the ground, with lath and plaister walls neatly white-washed, or of a light blue colour. The roofs are shingled, with rows of stones to keep them down, and the lower story is generally walled in with stone, and used for goats, sheep and cattle. The only cultivation was some turnips near the houses, and a little buck-wheat higher up the hill. The inhabitants are all Bhotias, and are at present engaged in tending their flocks of yaks and cows higher up the valley. There was not a man, woman, or child left to look after the houses. The doors were locked and sealed, the latter a Thibetan custom. Lachen is the situation of a Phipun and of a Lapun, two officers who manage the joint interests of the Sikim and Thibet governments among the nomadic population of this valley. The Lachen Bhotias graze their flocks over a great extent of country in Thibet and Sikim, penetrating as far as Kambajong in Thibet to the north, and descending to Denga† in Sikim on the south. The valley of the Lachen forming the cis-Himalyan portion of their beat extends as far as Kongra Lama where the Sikim territory terminates; thence they go over the Thibetan wilds towards Geeree and Kambajong wherever grass is procurable. These nomadic people, occupying as they do both sides of this border, are equally subject to Thibet as to Sikim. During the time they are in Thibet, or about half the year, they pay for cattle grazing there, and the same while within the Sikim border. Their payments are in curds, ghee and kine to Sikim; to Thibet they pay in shingles, bamboos, dye stuffs, and also in dairy produce. The Thibetan influence is upon the whole much greater in the Lachen valley than that of Sikim, although the territorial limits are to the north of it, and not disputed now. The origin and continuance of this state of things between two contiguous states are curious enough. It appears that a very long time ago a Phipun of Lachen—in the service of Sikim—became indebted to the Lama of

* Elevation of Lachen 9000 feet. The Pine clad mountain forming its back ground is 1500 feet more.

† Denga is three miles above Choongtam.

Digarchi for a sum of money which he was unable to pay. The debt of the capital sum was expunged: but the interest, secured by a bond, was made payable to the Lama and his successors, with a proviso that the obligation should be transferred to the Phipun's official successors, all of whom on taking the office receive this bond from their predecessors and discharge its conditions. The interest is paid in shingles for roofing, a specified number of which are to be prepared annually in the Lachen valley and forwarded to Digarchi. The La Pun, or Deputy Phipun, is appointed by the Thibetan officers at Kambajong. The Phipun holds his appointment from the Sikim Raja. The Thibetan influence is further secured by the fact of all the holders of stock in Lachen being indebted for advances of money or goods to persons in Digarchi. The usual rate of interest paid on such advances is 25 to 40 per cent. per annum. I look for further particulars of the peculiarities of Lachen as we advance.

At noon we crossed the Zemu, a large affluent of the Lachen from the north-west by an excellent bridge, and ascended to our encamping ground. Elevation of Yeunga 10,000 feet. Thermometer fell during the night to 44°.

Tungu, October 9th.

Elevation 13,000 feet. Ther. at 4 P. M. 42°. Started from our last ground at 7 A. M., and reached this at 3 P. M.; road good all the way and the distance not above 12 miles. I rode the greater part of it, the Lachen Phipun having sent us down three good ponies from Tungu. Half a mile above Yeunga the Lachen valley opens out considerably; the stream runs in a quiet ripple, with the banks shelving to its edge, and there is a good deal of level ground on both sides. The mountains however are as precipitous on either side as they are lower down, but do not, as there, form the immediate banks of the river. At Pangri which we reached in an hour from Yeunga, the valley again narrows, and the river becomes rapid and foaming. This alternation of meanderings and rapid courses obtains all the way to "Tungu;" yet in no place is there any cataract, or even a sudden fall. At 10 o'clock we crossed the Lachen—to its left bank—at Talom Samdong by an excellent bridge. Here there is a flat terrace half a mile long and 20 feet above the river, with 20 houses belonging to the Lachen Bhotiahs, who occupy them in their migrations up and down the valley. These

houses are built of stone without any mud or mortar, are of one story roofed with shingles, and of one apartment only : some of them are plastered with mud, and all have a wooden door and shutter windows, which were tied up and *sealed*, as at Lamteng, the people being absent with the cattle, and not a soul left behind to watch the houses.

From Talom Samdong up the valley and bearing north-west, we had a fine view of the Chomiomo mountain : it is a magnificent mass of pure snow, the crest of a hog-backed shape with three sharp-pointed spikes, or small peaks rising out of it, and to the east up a deep gorge like valley the snowed peaks of "Milah" or "Minglah" came in sight. These peaks Hooker tells me are also seen from the Lachoung valley, and are to the south of "Momay Samdong."

The vegetation during this march has undergone a great change. Near the last camp we had fine pines, larches, tree junipers, large birch and willow trees, the large red and white rose, and many of Hooker's new species of trees, rhododendrons, mixed with 3 or 4 kinds of red fruited barberries—the barberry at Darjeeling is a damson blue—a very handsome thistle and gigantic hemlock extending to the river edge. The Tendook poison plant, *Aconitum palmatum* or *ferox*, is very common along this march.

After passing "Yatung" four miles below Tungu the trees become somewhat stunted, and here we came upon quantities of red currants—the first I have seen in Sikim—the Faloo and Tsuloo, dwarf rhododendron, mountain ashes, and dwarfed willows. The red currant—called kewdemah—is a beautiful large smooth-skinned berry in large bunches ; but bitter as well as very acid. The Faloo and Tsuloo rhododendrons are strongly and sickly scented plants, which cover large spaces of the mountain sides in this direction. The other species of rhododendrons are extensively diffused, covering whole mountain sides in many places principally in east and west exposures. The south wind in this valley at its upper part especially is strong and constant during the day. At night a piercing wind set down the valley from the north. The autumnal tints of the foliage are now becoming well marked, and the dark green of the junipers and webbiana pines contrasts vividly with the lighter green of some of the rhododendrons, and the yellow and scarlet tints of maples and barberries. No cultivation at Tungu. Herds of yaks are browsing on the steep grassy

declivities around it, while ponies with brood mares, and a few cows graze on the flatter ground of our encampment. The village consists of 20 wretched stone hovels with low pitched shingle roofs, over which a covering of pine bark is laid, the whole being held down by rows of stones two feet apart. The shingles and battens are made of the wood of the various kinds of pines, and are prepared all along the valley above Lachen—or Lamteng—for home use, and for export to the Thibetan stations of Geeree, Kambajong and the city of Digarchi. The favourite size for shingles is 4 feet by 1. The interior of the houses corresponds in wretchedness with their exterior. The people sleep all huddled together on planks laid on the ground, and have no furniture of any sort: the fire is lighted on the floor, with upright stones placed in triangles for the earthen cooking pots, and for the large earthen tea pot which is always on the hob. Dirt, smoke, tattered garments which are never changed, and faces which are never washed, are the invariable characteristics of the Lachen Bhotias. Men and women dress alike in loose woollen wrappers with very long sleeves, woollen caps and boots. The men carry a small brass tobacco pipe in the girdle which they are constantly smoking, and rarely carry arms of any kind. They are very dark in complexion, but it is more the darkness of colliers than of the tint of the skin, and is probably the result of sitting over smouldering sheep-dung fires, and of engrained dirt; for some of the children are almost rosy.

Tungu, October 10th.

Halt here to-day as the morning was cloudy with drizzling rain, and our intended visit to Phaloong and Kanchanjhow would have been useless in such weather. Having seen these places we purpose moving on to the Pass of Kangra Lama, which is about 12 miles up the valley, and at the head of it.

We have had some very good and clean made yak milk butter from the village, and we have replenished our larder by slaughtering a young yak, the condition of which is very promising.

The Bhotia who sent it came to beg for one of the feet with which to pacify the mother at milking time, and carried it away with him.

October 11th.

Drizzling rain all yesterday, last night and this morning; so that

we are weather-bound; our great object now is to see what we have so nearly reached. How I long to see that mountain Kanchanjhow from the plain of Phalooong, described to be such a glorious sight by Hooker! The character of the rain fall here is different from that farther south—at Darjeeling for instance. It is lighter and drizzling, accompanied by a thin grey mist, and this was equally the case in July when Hooker was here for 7 days.

There is no cultivation of any kind here at present, nor was there in July. The land about the village has the appearance of having been sometime ago terraced for cultivation, and wheat was grown here when the Thibetans held it. Turnips grow, I believe, but nothing else is tried by the present inhabitants, who are obstinately idle and lazy: a few beautiful purple primroses are still in flower in sheltered places, but the winter is setting in rapidly. Ther. at 11 A. M. 41° . During the night it fell to 39° . At noon 37° —heavier rain and sleet: at 4 P. M. 34° , and snow. Some of our servants have suddenly got dropsical swellings of the face and feet, which they attribute to the great cold. These swellings are not attended by any pain or fever, but merely with lassitude and want of appetite. What *will* become of these cold-stricken creatures if we get into Thibet? I have lost two goats since yesterday: the symptoms were those of poisoning, saliva running from the mouth and nostrils, swelling of the stomach and constant bleating. The Tendook aconite is abundant here, and the leaves of one of the rhododendrons are poisonous for cattle; it is named the "Kema Kechoong."* The smoke of its wood is very pungent and swells the eyelids. The juniper wood makes by far the pleasantest fire; it burns clearly and quickly, with a fragrant odour and with very little smoke or ashes. This is important when you have the fire as we have it, on the middle of the floor of a small hut without any chimney. The openings in the shingle roof however are numerous and serve for smoke vents, as well as for leaks and light holes. The Doongshing, Webbiana pine is the wood most used for shingles, being the easiest worked, and lasts 3 to 4 years. The juniper shingles last longer; but the wood is harder, and these people avoid labour to the utmost extent possible, every thing beyond looking after

* Rhodo. Cinnabarinun.—Hooker.

their yaks, and riding their ponies, being distasteful to them. The yak is a shorter lived animal than the cow of Sikim. After 7 or 8 calves the female is much aged; the cow will give 10, or 12, and even 14 calves. The period of gestation in the yak is said to be 9 months exactly, of the cow 10 or 20 days more. The flesh of the yak is, I think, the best meat that can be put on table; it is of delicate flavour, tender, juicy and eats quite short; the gravy is totally free from greasiness, and the meat of stringiness, which cannot be said of beef or mutton.

October 12th.

Still detained by bad weather. It snowed till midnight, and is raining this morning. The snow has not lain at our camp: but the mountains all round us are snowed from the top to within 500 feet of us. Ther. rose during the night to 35°; it was 34° at 4 P. M.

A string of 50 laden yaks has just arrived from Kambajong in Thibet with wool for the Phipun of this place. They came in two days. The average load is about 3 maunds, 240 lbs. The yak gear is very simple, a thick pack-saddle of blanketing, over which a saddle tree of a tough rhododendron wood is girthed with yak hair ropes, and secured by a crupper of the same material. The nose cartilage is pierced, and a hair rope in it is the only bridle. The ears are decorated with tufts of scarlet wool, which are very becoming. These pack animals are all geldings; they were in fine condition, the long hair on the belly reaching to the ground; the common colour of all we have seen is black all over, one in 15 or 20 is white-tailed and white-faced. Some are black and white mixed, and a few are dun. The yaks are kept in Thibet as bulls till 3 or 4 years old; they are the only animals used there in the plough, and for loads. The plough in use about Digarchi is the same as the Bengali one. The materials for it go from this valley and Lachoong; the oak and birch are the favourite woods. The people generally move downwards from this place in Noor, to Talom Samdong, then as the cold increases to Lachen (Lamteng), and downwards as far as Latong and Denga. The migration upwards is performed quite as gradually, beginning in April. All the rain and snow falling at Tungu come with southerly wind, scarcely any of either ever fall with north wind, which always indicates steady and clear weather in this part of the world.

October 13th.

6 A. M. light clouds coming up from the south ; to the north it is all clear. Ther. 40° , surrounding mountains snowed to 700 feet above our camp. A portion of Chomiomo mountain in perpetual snow is visible : bearing north-west.

The Bhotias of the village are already assembled on the green, sitting in a circle round the headman, all busily talking, and all smoking their brass pipes, which every man carries at all times stuck in his girdle. This mode of assembling is a daily practice, generally in the morning and evening, but often at other times. It is an idle gathering very often ; but at other times business matters are discussed and settled.

October 14th.

At 7 A. M. yesterday it suddenly cleared, and we started on ponies for Phaloong to get a view of Kanchanjhow, Chomiomo and the Choongoo Kang mountains of perpetual snow, which respectively lie to the north, north-west and east of Tungu, and the Lachen valley. Our route lay east by north, and along the right bank of the Tonguchoo, a stream which falls into the Lachen, below the village of Tungu. Ascending about 1,000 feet, we came to a dozen of black yak hair tents, in shape like those of the Israelites, occupied by as many families of the Lachen Bhootias tending their yaks ; they had come down the previous day from Phaloong in consequence of the fall of snow, and told us that the Thibetans from Geeree and Kambajong, who had been with them at Phaloong since July, had from the same cause retired with all their yaks and sheep across the Kangra Lama Pass into Thibet. The Lachen men will gradually descend their own valley as the winter season advances to Deenga, grazing their cattle on the way at Tungu, Talom, Samdong, Lachen or Lamtong, Latong. The Thibetans have retired to Zeumchoo, and will do so to Geeree and Kambajong, where they rely principally on straw and hay for carrying their cattle through the winter.*

A mile beyond the black tents I got a glimpse of Kanchanjhow with a few light clouds scouring over its summit. I was leading our party ; the bridle path was good and I pushed on in a high state of

* Geeree and Kambajong, although further in the interior of Thibet than Zeumtro, are at a lower elevation and warmer.

excitement for an hour, when I reached a turning that brought the mountain in full front of me, and here I had 20 minutes of great delight before any one came up, and before the envious clouds had greatly marred the prospect. I did not however get a full view at any one time of this noble mountain, which rises within 3 or 4 miles distance to 5 or 6,000 feet above where I stood at 15,000 feet; masses of fleeting clouds obscured large portions of its sides, and occasionally flew with the rapidity of lightning over its crest, leaving its sides and base only in full view, which was very tantalising.

It is a table-topped mountain, the outline of which describes a very flat arch; the dip to the west is sudden, to the east it is perpendicular, and the south face is equally so. The summit is an enormous bank of snow, at least a mile long, of the purest whiteness, and unbroken anywhere by protending rocks. The cliffs in front were sprinkled with newly fallen snow, and from their base to the foot of the mountain lay a mass of sloping snow of 2,000 feet or so in breadth.

Advancing further, we ascended gradually by a sloping spur to Phaloong, which is an open expanse of undulating ground, or a succession of downs extending for 3 miles or more in a North East direction to the base of Kanchanjhow, and of nearly equal breadth, being bounded on the east by the valley of the Ihachoo, and on the west, by a mountain range of easy slope and grassy surface, which divides Phaloong from the valley of the Lachen. The whole of Phaloong is quite bare of trees or shrubs, but affords excellent pasturage in grass sedges and numerous herbs. The mean elevation of the downs is 16,000 feet, the bounding range to the west being about 500 feet higher, with similar pasturage to its summit on the south-east exposure; and nothing but bare rock and loose stones on the north-western one.*

The ridge which divides Phaloong from the Lachen valley was thinly snowed over at noon. Phaloong was so at 8 A. M.; but it all disappeared by 10 o'clock under the rays of a very hot sun, which

* This is the character of the Lachen valley also all the way from Tongu to Kangra Lama, when a red-coloured rocky spur from Chomiomo comes down in an easterly direction, its flank facing you as you look to the north, and appearing to shut up the head of the valley completely.

warmed the atmosphere immediately it appeared, and gave a delightful feeling of elasticity to the air while it remained unclouded.

At 2 P. M. on the mean level of Phaloong where Hooker took Barometrical observations, and the boiling point of Thermometer, the Temp. was 45° ; the sky was cloudy, and a light snow drizzle falling.

Phaloong is about 7 miles from Tungu. About half way the Tungu stream is joined from the north by the Zhachoo, which rising from the western base of Kanchanjhow, sweeps round and bounds Phaloong to the east. For a distance of three miles the Zhachoo runs quite sluggishly and very tortuously through a flat swampy valley, which has all the appearance of a lake bed. After emerging from this swamp the stream is precipitated by a sudden fall over a collection of rocks and stones at the southern extremity, whence its course is rapid, and its bed very rocky. From the upper or north-east extremity of this flat portion of the valley of the Zhachoo, there is a road to Momay Samdong at the head of the Tachoong valley; it goes over the Pass of Seeboolah, which is just now heavily snowed, and is probably 18,000 feet high.

As this route to Lachoong is in the Sikkim territory, we have been urged to take it: but I have the greatest desire to go through Thibet to the Cholamoo Lake, and get into the Lachoong valley from the north by the Donkiah Pass, and I hope to accomplish this without offence to any one. During the ascent to 16,500 feet at Phaloong, my breathing was but slightly affected; there was a feeling of faintness with a constant desire to take full inspirations, and nothing more. When standing still my respiration was not the least incommoded. After descending 1,000 feet, however, a racking headache came on, and by the time I reached Camp at Tungu, 6 P. M. it was so bad I could not sit up at all. A feeling of tightness round the occiput, as if a cord was being hard pulled on it, was very distressing, and violent vomiting ensued, which continued at intervals till daylight. The Lama and five servants who accompanied me were similarly affected sooner than I was, and their headaches also have continued till to-day. Neither Hooker nor his servants were the least affected by the ascent of yesterday; but they have been at this sort of work for three months past, and are well used to high elevations. I felt no inconvenience at elevations below 15,000 feet.

The contrast between the climate of this elevated region, and that of the central portion of Sikim is most remarkable at this season. Here the rain never falls heavily, the air is dry and bracing, and the sun's rays have an immediate effect in melting the recently fallen snow, and drying the ground. The pasture ground is very peculiar, and altogether different from what I had anticipated. I looked for undulating tracts of rich and luxuriant grass extending along the base of the perpetual snow, but with the exception of Phaloong, the grazing grounds are almost precipitously steep. They are every where covered with numerous herbs, many small, grass-like sedges, and only a few tufts of grass; this sort of vegetation, interspersed with the strong-scented dwarf rhododendrons, which at 16,000 feet and upwards cover the ground like heather, and vary from a foot to four inches in height, with bushes of dwarf juniper, barberry, rose, and rhododendron shrubs, characterises the picturesque haunts of the fearless and steady-footed yaks, goats and sheep of these regions. The yak delights in the steepest places, and when seen on the mountain side at 1,000 feet or more above you, they seem to the unpractised eye of a novice like myself to be in constant danger of tumbling down. I have often checked myself since our stay at Tungu from calling out to the Bhotias to remove the yaks from the dangerous-looking places in which they graze. Aconites, dandelion, cowslips, a beautiful blue gentian, astragali, primroses, potentillas, and a large-leaved sage, are some of the numerous herbs which form the rich pasture in this direction, and all—except the aconites, which are carefully avoided by all native animals,—are eaten by the cattle, the condition of which is excellent, and the milk of the richest and purest quality.

October 15th.

A beautiful morning, and we at once decided on moving upwards, the Lama and the Lachen Phipun being appointed to take the Camp close up to the Kangra Lama Pass, while we were to spend the day at Phaloong, and see all the mountains which were but partially visible on the 13th, and join them in the evening. For this purpose, we started at 7 A. M. by the route already described, and soon reaching Phaloong, came upon such a scene as I never even imagined, and never saw anything to equal.

First of all, to the north there was the beautiful Kanchanjhow

mountain in all the splendour of unclouded brightness, a monster mass of brilliant snow; to the north-east and east, the Donkiah Lah 23,000 feet; the Seeboo Lah Pass 18,000 feet, and the Changoo Kang mountain 22,000 feet, were in equal glory; to the west, no less lofty and brilliant, the peak of Chomiomo was full in sight; while down the valley of Lachen to the south-west, innumerable snowy peaks of minor note closed the view behind us. Ascending the ridge which divides Phaloong from Lachen—to about 17,000 feet—our prospect was still more extended and beautiful. Here we had Kunchinjinga to the W. S. W., Kanchanjhow, E. N. E., and not 2 miles off, with the intervening downs of Phaloong as a foreground at our feet. To the north and west a fine rounded red and yellow coloured spur from Chomiomo, extending across the head of the Lachen valley to Kangra Lama, and standing in bold relief against the clearest azure sky, gave me a delightful foretaste of Thibetan scenery. The whole was such a round of novel glories, such a vast picture of splendid objects on a great scale, that I was overcome with the deepest emotion. I could not realise a landscape of this gigantic nature, distinctly and in detail, far less can I describe it. Never however shall I forget that scene; then it was that I first found out the real depth and intensity of the hold these mountains have always had on my mind and feelings, nor did I then wonder, nor do I now, at their being objects of veneration and worship to the human beings who dwell among them.

From the ridge above Phaloong a very large glacier on the east face of Chomiomo is visible; it discharges itself by the Chomiochoo, which falls into the Lachen five miles above Tungu. The south-east exposure of the Phaloong ridge has soil and pasture up to 17,000 feet. The north-west exposure is quite barren and rocky at that elevation; but at 16,000 feet it is covered with a diminutive heather-like *Rhododendron*—*R. Setosum* of Hooker—lower down, the pasture is composed of small rushes, grass, and numerous herbs. The whole of Phaloong is covered with a knobby peaty soil, on which the vegetation is now browning fast under the approach of winter.

We had a fine breeze from the south all day, the air was light and bracing, sky clear and cloudless. Temp. at 2 P. M. on the flat of Phaloong 51°. Wet bulb Ther. 44°. No snow at 17,000 feet.

We saw a flock of forty wild sheep; it is called *Náá* by the Bhotias,

and is the *Ovis ammonoides* of zoologists, I believe. They were basking in the sun on a hill side at 16,000 feet. The younger ones were of a bluish grey, the old ones whitish. I also fell in with a large covey—sixty or eighty—of chakoor-like birds, their flight and size that of chakoor, but they had no black bars on the wing, nor red legs. Crossed the Phalooing ridge into Lachen valley, which we ascended to our camp at "Sitong;" elevation 16,000 feet. Temp. at 6 P. M. 38°. No fire-wood. We are four miles below the Kangra Lama Pass. Some wood was brought from Tungu, eight miles. The coolies are all suffering much from headache and the cold.

Yeumchoo or Yeumtso, Thibet, 16th October.

The Ther. fell at Sitong during the night to 21°; at 7 A. M. it was 32°; a cold north wind blew down the Pass all night; at daylight the cold was intense; but as soon as the sun appeared, the north wind ceased and the temperature was delightful. We were pitched in the dry bed of a stream coming from the north-west, which rises to the north of Chomiomo. The Lachen was not a foot deep here. Kan-chanjhow towered over our heads due east of us. We heard last night that a Chinese guard was posted on the frontier at Kangra Lama to arrest our progress. We sent to see, and found it true, for they told my messenger we should not pass into Thibet, as their necks would be the forfeit if we did. This did not disturb our rest, and although hardly pressed by the Lama not to move the camp to the Pass until we had previously seen the guard, and arranged for a passage through Thibet, I resolved to move up to the frontier in the morning, and trust to what might happen there on meeting the Thibetans for the accomplishment of our wishes. The bright sun, highly rarified atmosphere, and gazing at the dazzling snow all day yesterday, have made my eyes sore and weak. I have a veil; but it blinds me to wear it. The skin of my face is inflamed, and very painful: but I have escaped all headache and discomfort from the high elevations. Hooker has not however done so, with all his practice. He feels sick and head-achy like every body else in camp, but he takes violent exercise all day on foot, whereas I have ridden whenever I could, and was able to do so almost all day yesterday.

At 8 A. M. this morning having with much difficulty started our benumbed coolies, we left "Sitong," and marched up to the pass of

Kangra Lama ; our route lay all the way along the Lachen, Kunchinjhow on our right, Chomiomo on our left. The valley of the Lachen opened out into flat terraces, and contracted by turns into rocky gorges, until at four miles from Sitong, gradually rising on a sloping plateau, you leave the Lachen to the left, turn the shoulder of Kanchanjhow on the right, and find yourself without any effort of ascent on this side, or any descent on the other, on the Thibetan territory, and beyond the Himalayan chain. Where this transit takes place it is a grassy open down, sloping if at all to the south, and about a mile broad from the Lachen on the west, to a swampy flat at the foot of Kunchinjhow on the east, from which swamp a dribbling stream joins the Lachen a little way below. On this flat ground the boundary marks of Sikim and Thibet are conspicuous. They are small cairns of stones, in one of which a written certificate is annually placed by the Thibetans, that the boundary has been examined and found correct. This is the Kangra Lama Pass so to speak, but no Pass at all in the sense taken of the term in the Himalaya generally.

It is probably the easiest passage in the world through a mountain range ;* the elevation at the frontier pillars is 16,500 feet.

A mile below the boundary two Thibetans, who had been watching our progress up the valley, joined us. They were not armed, but I suspected their purpose of stopping us, and had them questioned. They admitted they were Thibetans : and asserted that the ground we were then on was Thibetan. I told them that we were in Sikim, which was the case ; and as I had found them in Sikim, and ignorant of the proper boundary line, I should regard them as Sikimites for the rest of the day. They walked ahead quietly until I passed the cairn ; then they commenced calling out to their comrades who were encamped close by, and objected to our progress, but offered no actual obstruction to it.

Feeling that this mode of proceeding would not answer, and at the earnest desire of the Lama who was becoming alarmed at being implicated in a trespass on Thibet, I stopped close to the cairn, and asked to see the officer commanding the Thibetan guard, to whom I wished to communicate my reasons for desiring a passage through

* More correctly speaking the easiest termination to a passage, for the real passage through the chain is the Lachen which arises beyond it.

Thibet to the Donkiah Pass. After some delay, the Dingpun commanding the party with the Deputy of the Soobah of Kambajong, and fifteen sepoya, came up. I told the Dingpun that I had come up the Lachen valley to his frontier on business, and to see the country, that I had also to go to the Lachoong valley and the Donkiah Pass, and that there were three ways of doing this. One was to march back to Choongtam and up the Lachoong; this would take me ten days. The second was to cross the Seeboolah Pass from the head of the Lachen to Samdong in the Lachoong valley; but that route was deeply snowed and dangerous. The third, the most obvious, and the easiest, was to go round the northern base of Kanchanjhow, and come out by the Donkiah Pass, and I wished to encamp that night at Yeuntso, going on to the Pass by Cholamoo without delay. I said I knew that the route proposed was not inhabited, that therefore no one could be alarmed or inconvenienced by our passage, and as it would greatly convenience us, it was not I thought worth their while to make us go back so far, or to endanger our lives by braving the Seeboolah Pass after the recent heavy fall of snow. There was much more talk between the Thibetan party and my friend the Lama about the propriety of my waiting for instructions from Kambajong, which the Dingpun suggested he would ask for, the unprecedented nature of my request, and how all their throats might be cut by orders from Lassa, if a passage was effected by our party. The talking might have lasted a week without any result; at all events I thought so, and time was precious: to cut it short therefore, and be no longer standing idle at the Rubicon, I told the Dingpun I would with his leave move on, and I did so accordingly on foot, and unopposed by word or deed from any one; leaving the Lama and all our people to arrange with the Dingpun about our followers and baggage to follow me at his leisure. Hooker rode straight on into Thibet when I stopped to parley with the Dingpun, and I saw no more of him that day till we met at Yamchoo in the afternoon, after he had been all the way to the Chalamoo Lake, and whence he was then returning towards Kangra Lama in search of me, not being aware that I had followed him.

Leaving Kangra Lama at 11 A. M. stick in hand, and with a cloth cloak carried over my shoulder to insure some covering for the night, and followed by one chapprassey—Seetaram,—who had not the good

sense to bring on the pony when I left the Dingpun, I ascended a gentle grassy slope in a north-easterly direction for less than a mile, when I came upon a flat expanse of three miles broad, bounded on the right—south—by Kanchanjhow, on the left—north—by a fine red spur of Chomiomo; the Lachen flowing very slowly and in a trifling stream nearly in the centre of the flat expanse. There were about 100 yaks feeding on this expanse. They were tended by a dozen robust Thibetans, who stared at me in dumb amazement; their black hair cloth tents were pitched close by, each with a huge black and tame watch dog at the entrance, and some rosy-cheeked children playing around. The pasture was short, quite scorched by the frost and sun, and crumbled under my feet like snuff. The sun was bright and very hot, the air dry and elastic, the sky blue and quite cloudless, not a tree, shrub, or herbaceous plant to be seen. I waited a little to wonder at this change, so great, from the moist forests, and cloudy skies of Sikim, and then moved on without any guide, keeping close by the base of Kanchanjhow, its nobly expanded sides, and rounded summit of unbroken snow towering over my head to the south of me. Hugging the base of Kanchanjhow, and at an elevation of about 400 feet above the Lachen, I kept on due east till 2 p. m., when I reached a rocky spur from the mountain, from which I saw the Yeumtso Lake to the north and east of me. Halted here for Seetaram, who lagged behind, having been attacked with fever since we started in the morning. I had a good deal of oppressed breathing, although I walked slowly, and my pulse had been 108 all the way. The prospect at this point is very fine. To the south, there is an immense saddle of snow, probably two miles broad, lying between two peaks of Kanchanjhow; below me to the north is the valley of the Lachen, flat, with the river winding through a whitish expanse of sandy like deposit—Carb. of soda. To the east and trending north a fine red mountain—a spur from Kanchanjhow, which divides the Yeumtso and the Cholamoo Lakes. To the north-east the view is closed by a table-land, bare and scorched, which stretching from Donkiah bounds the Lachen valley in that direction, and is lost in the undulating downs to the north, which seem to extend for ten miles at least in that direction and towards Geree. To the north—and over a rocky range of red and white quartz which bounds the Lachen valley to the north—and about forty.

miles off as far as I can guess, is seen a long range of sapphire blue hills running east and west, the west end peaks north of Kambajong tipped with snow. To the west, and closing the Lachen valley, the great peak of Chomiomo rises to 22,000 feet, a splendid mass of perpetual snow north-west, and very distant, 60 or 70 miles perhaps, are seen three lofty snowy mountains. They must, I consider, be quite as far north as Digarchi, but to the west of it, and from the extent of snow on them in a position where the snow line may be taken at 20,000 feet, their elevation is probably 24,000 feet or more.

From this spur I descended in a northerly direction over rocks and stones to the outlet of the Yeumtso Lake, which I reached at 3 P. M. very tired indeed and foot sore. I carried Hooker's barometer for the last two miles, as the chupprassie was quite ill and scarcely able to walk. Here I made up my mind to pass the night, a dreary prospect enough, without shelter, food or clothing, at an elevation of 17,000 feet. I saw nothing else for it; I could not walk back to Kangra Lama, nor did I know whether I should find my people there if I did, and my companion—the chappressie—was quite unable to do so. He had a blanket cloak only, and I mine, to cover us; a bit of ginger-bread, and an old ship biscuit, was all we had to depend on for food: I saw no signs of any one following us, and was quite ignorant of Hooker's whereabouts, as we parted without any understanding about meeting. He had a horse, but no attendant. I had no horse but had a companion, and in this plight were we wandering during our first day in Thibet. From the outlet of the Lake to which I descended, and where I intended to bivouac for the night, the scene was very striking, and was thus noted by me at the time, "I now sit in a position from which all is superb; it is at the outlet of the Yeumtso Lake at its north-east angle. The water is of a pale green colour, and a southerly breeze, descending from an extensive glacier which feeds the Lake, is carrying a swelling ripple to my feet. The form of the Lake is irregular, longer from north to south than from east to west and about three miles round. It stretches before me to the base of an immense bed of glacial snow, which runs far back—south—into the masses of Kanchanjhow, and which is raised about 100 feet at its lowest part above the Lake, into which is discharged a trickling stream now frozen over. To the south-west is the enormous

saddle of snow noted before, and dividing two peaks of Kanchanjhow, a feeder from this saddle running easterly also supplies the Lake at the south-west extremity.

Further to the west is the great rounded summit of Kanchanjhow, of towering height and dazzling brightness.

To the north east, a fine red and yellow spur from Kanchanjhow, which divides the Lake from the Cholamoo one, and to the west the rocky and bare spur from which I have just descended.

The eastern bank of the Lake is grassy, and now scorched, along the water's edge, but high and rocky beyond. On the west it is abrupt and rocky. The outlet is thirty paces across: but the stream is not a foot deep, nor more than 5 feet wide. The air is excessively dry, parching up my lips and cracking the skin of my face; the sun is hot, but the wind is bitterly cold, and sudden blasts from the mountain raise whirlwinds of dust. The base of the mountain is not half a mile from the Lake; it rises quite abruptly. Snow is lying deep in the hollow places to within 200 feet of its base, and is sprinkled to the same line on the steepest places, which are of solid rock.*

Not a plant is to be seen in the Lake, nor on its stony margin. Not a fish, or shell, in its waters; nor any saline deposit near it, but its water is sweet: the sky is clear, brilliant and blue, and all around is new and most imposing. Oh that I could paint or draw! and how delightful it would be to sail, or row, on the green rippling waters of this little Lake now for the first time spied by European eyes!

As I had done inspecting and admiring the Lake, the Lama came up much fatigued and breathing very hard; his presence relieved me of all apprehension about being out all night, as he told me our tents and baggage were coming up. Hooker says it would have killed us at the present temperature of the night to have lain in the open air; and I dare say he is right. The Lama told me that after I had started from Kangra Lama, the Thibetan guard had agreed to allow our people to follow me, and that Hooker was at Yeumtso close by, where we were to pitch for the night. This was good news; I descended a short way, and found him there quite knocked up, and with a violent headache, the effect of great exertion at this elevation, 16,800 feet. We

* The snow line on the northern face of Kanchanjhow in October may be taken at 18,000 feet.

were both glad to lie on the ground, cold as it was, till 6 o'clock, when the tents came up.

As we lay shivering, the Thibetan guard, which had accompanied our baggage from Kangra Lama, came marching in. It consisted of an officer and fifteen men, dressed in ragged blue cloth cloaks bound round the waist with yellow girdles, cloth boots of various colours—red, green and blue, and black felt caps; each man carried a load of clothes and a matchlock strapped across his back, from which projected a forked rest, like antelope's horns; a bow and some arrows with an old cartridge pouch completed their equipment.

The Dingpun, or officer in command on the part of the Chinese government at Lassa—and the Lt. of the Kambajong Soobah—a civil officer—brought up the rear, mounted on yaks with high saddles over which, and under, a quantity of bedding, warm clothes and other articles were stowed in the bunchiest and least military fashion possible. These officers did not carry any arms. The Dingpun was dressed in green with a large orange-coloured cap, in the crown of which was a round brass button, the sign of his rank. He was not five feet high; he was sixty years of age, very fat, dark-complexioned, smiling and very greasy; his countenance was a picture of indecision and imbecility, and he did not belie it in any way. I shall however say no more to his discredit. I wish him most heartily a long life and great promotion in the ragmuffin band to which he belongs, with the happiest reminiscences for gratifying us as he has done on this occasion. The guard is to accompany us to the Donkiah Pass, and see us fairly out of Thibet, so that we may now expect to part very good friends, and I hope we shall do so.

We are pitched inside the kraals, or square enclosures of loose stone used by the migrating yak herds of Thibet for pitching their black tents in, and our people are crowded round large fires of yak dung, the only fuel this country affords. These fires give a great deal of heat, but are attended with interminable and intolerable smoke, and are not at all suited for cooking. The flavour of all roasted, toasted and grilled articles is disagreeable, and it is very difficult to get any thing fully cooked where the boiling point of water is so low.

This may be one reason for the Thibetans always eating their animal food dried and raw, instead of cooked as we do. I am very headachy

after my long and elevated work ; all my servants and coolies worse off from the same cause, and the extreme cold, some of them being very ill indeed and unable to move. They have come over Kangra Lama, 16,000 feet, and have ascended 6 or 800 feet more in coming here, swollen faces and inflamed eyes are numerous among them. My own face and eyes are quite red and much inflamed. The glare from Kanchanjhow was excessive, but I could not keep my eyes off, so attractive was the novelty of being all day along the base of its perpetual snow. Thermometer at 6 P. M. 34° ; a light breeze from the south ; calm at 9 P. M. with a sky of the clearest blue. Temp. at 10 P. M. 26°.

October 17th.

Halt at Yeumtso to see about us, and for Hooker's meteorological observations, &c. Thermometer at 6 A. M. 10°. Wet bulb do. 9½ ; minimum temperature during the night 5°. A black bulb thermometer placed in a radiating metallic bowl fell to 3°. Ther. in our small tent at 6 A. M. 14°. The sun rose with us at 6 hours 40 minutes. Heavy hoar frost on the grass, and the marshy pools along the Lachen and close to us are frozen over since last evening.

It is a brilliant morning with a light air from the north-east, and I am enchanted with this near sight of Kanchanjhow.

9 A. M. Ther. 32°, brilliant sunshine ; all my people and the Lama's people also are very ill with head-ache and vomiting ; some of the coolies have dropsical swellings of the face and feet, and none of them can eat ; they lie on their faces and knees in the sun, pressing their heads with their hands, and are quite as wretched as any sea-sick people I ever saw. Hooker's fellows are well and lively.

The Dingpun and his men have paid us a friendly visit in our tent. We have regaled them all with snuff and rum and water. The few English articles we have with us, have been much admired by them, especially a detonating gun, pistols, telescope, and our broad-cloth coats. I presented the Commandant with a Tartan shawl and some rupees for a dinner to his men, which made them all vastly well pleased. The Dingpun despatched a report of our progress to his superior officers at Kambajong while in our tent. Went to the Yeumtso Lake with Hooker, collected some minerals, found ice half an inch thick along its margin at 11 A. M. ; reckon it to be three miles round or more, and

found it 10 feet deep at 20 feet from the shore. Small pieces of blue slate numerous on the east bank only, and a white tasteless substance on the grassy banks—Pen. or Carb. of soda. There were large flocks of the Brahminy duck, with a few grey geese, and widgeon on the water. Not an insect to be seen: but large flocks of grey “stone chats” flew about the rocky places. Holes of the “goomchen,” or tailless rat, were very numerous about our tent at Yeumtso, as well as burrows of the marmot called Kadiapen.*

Thermometer at noon 52° , wet bulb do. 37° , a fine breeze with a delightful feeling of elasticity and dryness in the air. The brightness of the sun is incomparable, the sky is of the clearest blue. The great mountain ranges of Kambajong, and far to the northward and westward, of brown and reddish hue tipped with sapphire blue, and with perpetual snow, with the intervening plateaux of Cholamoo and Gerec in yellow grass and fading herbage, all united make this country to my taste a most attractive one at this season, notwithstanding the excessive cold, its utter barrenness, and total want of population.

In the afternoon we crossed the valley of the Lachen from Yeumtso due north; it is a bed of white and bare sand, a mile and a half wide, the stream running tortuously, very slowly, and not a foot deep towards the west. Ascended the rocky range immediately bounding the valley to the north; it is 500 to 800 feet above the river, and composed chiefly of a close white and pink quartz,† with large rounded masses of gneiss and gneiss rubble. Crossing this ridge, but without

* During our short stay in Thibet we fell in with the Goa antelope, another antelope larger than it, but smaller than the Chiru, a very handsome large fox, reddish brown with a bushy grey tail, a hare or rabbit frequenting rocky places, light grey, with white scut and a patch of dark bluish grey over the croup. This animal was abundant; it always ran with its ears erect, and lastly, we saw the Kiang, or wild ass, on the open downs between Yeumtso and Gerec. The country about Chamulal is always indicated as the favourite ground of the Kiang, and I was told that it did not visit this part of Thibet except at the warmer seasons. In November it would be too cold for it hereabouts. The long ears, scanty mane, scanty and short tail, give this creature an entirely asinine appearance, and not at all the appearance of a horse. Dr. Hooker and I have forwarded complete skins of the male, female, and young colt to the Museum of the Asiatic Society, Calcutta, through Dr. O'Shaughnessy.

† Hares very abundant here.

any descent, we came upon a grassy plateau two miles long, the east end of which slopes to the south and drains into the Lachen, but it bore no marks of water-ways.

In the centre was a small Lake, the edges of which were then frozen, and this was the depository of all the remaining waters of the plateau, for there was no slope or outlet to the west. An examination of this small plateau gave me the first satisfactory explanation of the constant assertion of the Thibetans, that in travelling over the more level portions of their country "*there are no streams of water.*" The annual fall of rain and snow is represented as being exceedingly small in the aggregate, and never to be at all heavy, while the evaporation is very rapid.* This with a sandy soil, and the existence of numerous depressions forming shallow Lakes, will account for the disposal of much of the Thibetan waters, and for the extreme difficulty of ascertaining the situation of streams, but except in the mountains, in which the valleys are said to be very narrow and to contain permanent water-courses, I believe there are no constantly running streams at all in Thibet. I can speak in this respect to the plateau extending north-west from the smaller one noted above, to the Kambajong range of hills, and which is certainly ten miles square. There is not a drop of running water in the whole of it. There is a water-course with a general north-west direction, which I went along from its origin for six miles; but it was perfectly dry, and the slope was quite trivial. The drainage from this plateau is to the north-west, and goes, I believe, into a feeder of the Arun—a Nipal river. This plateau of Cholamoo and Geree is bounded on the east by a broad flat spur from Donkiah, which terminates the Lachen valley to the east, to the north and north-east by the Kambajong range of mountains, and to the south by the hill of Bhomtso, and the smaller plateaux lying to the north of the rocky range which bounds the valley of the Lachen. Probable elevation of the plateau 17,500 feet; it is composed of yellowish sand and stone, pasture very scanty indeed. Antelopes and Kiang seen on it, and I fell in with a flock of four hundred very fine large sheep. They were hornless, generally black, or brown faced, and were tended by one man only without a dog. He walked slowly in the middle, keeping up a sort of grunting noise to the flock which

* The Wet Bulb Ther. stood 22° degrees below the temperature of the air.

grazed and moved onwards whichever way he did. There was one remarkably fine ram among them; his fleece reached the ground, his back was painted bright red. The wool of these sheep is of a superior sort. The flesh we ate was flavourless, but short in the grain and tender. The flock belonged to Geree; I believe I never saw any one look so much surprised as the shepherd did when I rode up to him.

Ther. at Yeumtso, 6 P. M. 36°, at 8 P. M. 29°, radiating do. 20°.

October 18th.

6 A. M. Yeumtso. The Ther. fell during the night to 5°, radiating do. to 2°. Water in vessels on the tent table frozen to a mass of ice. Ther. at sunrise 15°. We move our camp to-day to the Cholamoo Lake, where we shall join it in the evening, going in the mean time to Bhomtso mountain five miles north of this, and 1,400 feet higher, total elevation about 18,000 feet. Hooker wishes to amend his geography by a careful round of bearings, and especially to see the position of Chumulari. Reached Bhomtso or Bhomcha—elevation 18,500 feet—at 10 A. M. followed by a detachment of the Thibetan guard, who were very anxious for us to go direct to our camp. They felt the cold excessively, and finding us unwilling to accompany them set off themselves, leaving us to our own devices. Ther. at 11 A. M. 44°, Wet Bulb 22°, and strong breeze from the north-west cuttingly cold. No sickness or head-ache to-day, but walking brings on laborious breathing. We remained on Bhomtso till the afternoon, Hooker taking bearings with the Theodolite, and observations with the Barometer, the boiling point, the Wet Bulb, &c. &c. and had indeed a rare day of it. A great extent of Thibet was laid out before us without a cloud to obscure the view, and it was equally fine to the south. In the far south-west forty miles off we had a view of Kanchanjinga still the king of all the Sikim mountains, its north-east aspect being no less grand from Thibet than its southern one is from Darjeeling, although from the former it appears hemmed in by numerous lateral peaks and mountains of perpetual snow. Immediately south-west-south and south-east of us was a noble line of mountains formed by Chomiomo, Kanchanjhow and Donkiah, all 23,000 feet or more,* and not more than six miles lineal distance. To the east and in line with the above, we saw a great range of perpetual snow mountains indicated

* Donkiah misnamed "Powhunry," by Col. Waugh is measured 23,000.

as Chomulari by the Thibetan soldiers, and, as far as Hooker could calculate then, they occupied the position assigned to that celebrated mountain by Captain Turner.

What could exceed in grandeur such a galaxy of immense mountains as we had in view from Bhomtso to the south and east? Nothing that I know of. But the view to the north, north-west and north-east stretching into Thibet was quite as striking. After descending from Bhomtso, Hooker botanised the bed of the Lachen, and we found a bed of blue slate on the south side of the Lachen valley, which would be valuable for roofing if more accessible.

Before reaching our tents at Cholamoo it got quite dark, we had no guide to our camp, and instead of going to the eastern bank of the Lake where it was pitched, we kept the west side, going towards the Donkia mountain till we came upon snow. Here we found out our mistake by shouts from the opposite side, and had to retrace our steps to the outlet to enable us to cross over two miles of rocky and swampy ground in pitchy darkness; but we got in by 8 o'clock, all right, and very tired.

(To be continued.)



Influence of the Moon on the Weather.—By J. W. BEALE, Esq.,
Agra College.

At the desire of Mr. Middleton, the Principal of the Agra College, I have, during the past year, followed up the observations made by him in 1850 and printed in Journal CCXX. of the Society, with the view to determine whether the prejudice so universally received in India, especially by the Christian community, of the moon's influence in producing a change of weather, be correctly founded or otherwise.

The observations were made generally twice in a day, and sometimes oftener, when any change in the state of the weather seemed to require it. The reductions from the larger tables have been made exactly in the same way as in the former year, each lunation being divided into New-Moon, Full-Moon, second and last periods; each

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*Diary of a Journey through Sikim to the Frontiers of Thibet.—By
Dr. A. CAMPBELL, Superintendent of Darjeeling—with a Map.
(Communicated by SIR JAMES COLVILLE, KT.)*

(Continued from page 501.)

19th October, Cholamoo Lake, North-East Bank.

Thermometer fell during the night to 14°, radiating do. to 9°; a calm night; south-easterly squalls: this morning, bright sunshine, and the clearest of blue skies. All my people are ill with head-ache and vomiting, and quite knocked up from the continued effects of this elevated atmosphere. Elevation of this place 17,500 feet, which is the highest encampment we have had. My eyes are inflamed, and the skin is peeling off my face from the excessively sharp wind and brilliant sun of yesterday; my nose bled profusely this morning; but I have escaped head-ache and other painful symptoms, although we were all day yesterday at elevations of 18,000 feet, and higher. The direction of the Cholamoo Lake is north-east and south-west; it is about two miles long and half a mile broad; sloping banks with occasional rocky belts and swamps characterise the west side. The east side is flat, dry, rocky and barren; a rusty red-coloured rocky-terraced spur from the east end of Kanchanjhow bounds the lake to the west, and divides it from the Yeumtso lake. The most easterly source of the Lachen runs from the east of the Cholamoo Lake; it rises in a

glacier of Donkiah. At present it is a mere rivulet, and never carries much water; it is joined by the stream from this lake a quarter of a mile below the exit, where the stream is not more than a foot deep, and ten yards across. The Lake has two affluents. The principal one to the westward is from a glacier of Kanchanjhow. The other carries the draining of the Donkiah Pass, which is first collected at its foot in a small, circular deep lake, the outlet of which at present is some feet above the level of the water. Probably it does not overflow in this arid and rapidly evaporating region, except during the height of the rainy season.

We found a bed of grey limestone with traces of small organic remains, in the bed of the eastern source of the Lachen.

I started from camp at 10 A. M. to cross the Donkiah Pass into Sikim, and march to Momay Samdong in the Lachoong valley. It was a delightful day, and it was with great regret I bent my steps to the south. Thibet is no doubt a barren land, and the severity of its climate is adverse to the real enjoyment of life; but from sunrise till sunset it is indeed a pleasing and happy land to wander over, and although my reason taught me to regard it as little better than a desert, I could never look on its red hills shading off into sapphire blue and perpetual snow, and its yellow downs of scanty grass and scorched herbs lighted up to a dazzling pitch by an unclouded sun and lying under the bluest sky, without declaring that it was highly attractive and almost beautiful.

Hooker is less excited by the novelty of Thibetan scenery than I am; he is going to ascend a peak of Donkiah near the Pass, and about 20,000 feet, to try and get other sights of Chumulári.

The Donkiah Pass between Sikim and Thibet is over a saddle in a sharp rocky ridge which connects the great Donkiah mountain—misnamed Powhunry by Col. Waugh—with Kanchanjhow; the direction of this ridge is east and west, and it is thrown off from a great spur of the Donkiah. Elevation of the crest of Pass 18,500 feet. Elevation of the highest peak of Donkiah 23,176 feet. The ascent from our encampment on the Cholamoo Lake was gradual, for about two miles, the ground rocky and almost devoid of vegetation; another mile of steeper ascent brought me to the foot of the Pass—where vegetation ceased—18,000 feet.

From this point the ascent was exceedingly steep, and the track lay over and among loose stones and rocks of gneiss and quartz. It took me just an hour from the point at which vegetation ceased to get to the summit on an indifferent pony, which I rode almost all the way. My breathing was a good deal affected, and my pulse above 100.

The Thibetan guard lent us six of their yaks to take some of our baggage up the Pass to the Sikkim frontier; this is on the crest of the Pass, and marked by cairns of stones; here they deposited the loads, and the drivers could not be prevailed on to take them a step farther, although our coolies were so ill as to be unable to carry the loads. The yaks ascended easily and quickly compared with the men and ponies; but even they appeared to be a good deal affected in their respiration at this elevation. They were eating the snow which lay in patches near the path, as they went back. It was calm and warm, as I ascended the north face, but on the crest a cutting wind from the south made it very cold indeed. There was no snow on the road as I ascended the north face, nor, as I descended, on the south side: but it lay in patches among the rocks all the way on both sides. On the mountain to the west of the Pass, snow lay deep in hollow places to within 300 feet of the smaller lake. These snowed places may have had glacial ice in them, but the surface of the snow was then smooth, and was probably quite recent. There was no vegetation for 500 feet on either side of the crest of the Pass, i. e. north or south faces. The line of vegetation may be estimated at 18,000 feet on both sides.

I reached the top of the Pass at 1 P. M.; all the coolies were up at the same time, but much oppressed in breathing, and suffering excessively from severe head-aches. I had a fine view of the main peak and massive part of Donkiah Lah which lies to the south-south-east of the Pass. Five small lakes, which flow into the Lachoong, and lie about 6 or 800 feet below the top of the Pass, were also in sight. I left Hooker's Barometer for him in a niche of one of the cairns on the top of the Pass, took a last look at Thibet with real regret, and facing a bitter south wind descended into the valley of the Lachoong river along which I travelled to Momay Samdong, reaching it at 5 P. M. The coolies left Cholamoo at 8 A. M., crossed the Pass at 1 P. M., and reached Samdong at 6 P. M. The distance is not more than thirteen miles.

The descent from the Pass on the Sikim side is steep and rocky like the north side. The top of the Pass is 800 or 1000 feet above Cholamoo Lake, something less perhaps above the Lachoong lake. On descending into Sikim—800 feet or so—the change from Thibet is already apparent. Instead of the red colour and friable structure of the Thibet hills, and the sandy soil of its downs tinged yellow with scorched grass and a few herbs, we find grey gneiss with a black peaty soil, and vegetation still alive, although now browned with winter tints. Instead of a clear sky, bright sun and dry atmosphere, we had, a couple of miles down the valley, a thick mist and heavy clouds upon the mountains;—vegetation increased gradually as we came along; first it was composed of grass and sedges only, then the dwarf rhododendrons appeared, and increased as we came down until it quite covered the hills about Samdong road—good enough for ponies—from the Lachoong Lake. There is one hut built of stone partially roofed with boards at Samdong, and no other habitation or shelter. We pitched a tent for ourselves, leaving the hut for our people.

October 20th.

Momay Samdong, elevation 16,000 feet. We halt here to-day, to allow our people to recover from their head-aches and the other distressing symptoms produced by travelling at our late high elevations, and by the great cold they have been exposed to. Nurkoo, a Lepcha of mine, was so ill yesterday at Cholamoo that I feared for his life. He had the worst symptoms of apoplexy without a thumping pulse, and could with difficulty be roused to consciousness. I was afraid to bleed him, but a large dose of jalap helped to do him good, I think, for although he was carried over the Pass, thereby ascending 800 feet more, he was lively when he reached this; but still he had an excruciating head-ache. As I came down the Pass I had to rouse up four coolies who lay on their knees and faces in great pain with head-aches, and to force them to move. This position was much preferred to any other by all the sufferers, who were so listless and sick that if left alone they would not, I believe, have ever moved from where they lay. Although I am subject to severe head-aches under ordinary circumstances, I have escaped them wonderfully here. Rapidity of breathing in all positions and oppression under exercise is all I have felt since leaving Tungu; but I have ridden wherever I could, and this

makes a great difference. The inflammation of the eyes, swelling and peeling of the face, with breaking out of the lips from which I am suffering, are no doubt attributable to the extreme dryness of the air, the cutting wind and the glare of the snow. In Thibet we did not see any snow below 20,000 feet. Bhomtso—18 or 18,500 feet, on the top of which we passed the forenoon of the 18th—had not a particle on it. In the Lachung valley—Sikkim—snow is now lying at about 15,000 feet. South of the Himalaya, the quantity of snow that falls is very much greater than in Thibet, and from the greater moisture of the air and cloudiness of the sky, it is not carried off with the rapidity of evaporation which obtains in Thibet, where you do not find a rill even of water from the melting snow. Besides, in Thibet the snow falls in light feathery skiffs and not in flakes. I believe that the lowest snow-line we saw on the mountains to the north of us in Thibet, must have been upwards of 22,000 feet. On the Kambajong range, which, comparing them with Bhomtso, must be 20,000 feet at least, there was not a particle of snow. In Thibet the difference between the wet bulb and the Thermometers in air, was as much as 20 degrees. In Sikkim and in this dry part of it—Samdong—the difference to-day is only 6°. We had heavy hoar-frost nightly in Thibet, an hour after sun-rise it was gone, and not a trace of moisture was left on the ground. Ther. to-day at noon 46°, wet bulb 40°; southerly wind. At Yeumtso, at noon on the 17th, Ther. in air 52°, wet bulb 32°, minimum here at night in the open air 22°, minimum at Yeumtso 5°. In a radiating metallic bowl it fell to 2°. It commenced snowing at 1 P. M. to-day and continued to fall till 7 P. M., when it lay 3 or 4 inches thick. Ther. at 5 P. M. 32°: south wind. Elevation of Samdong; 16,000 feet, of Donkiah Pass, say 19,000 feet; yet it was free of snow on the 19th.

October 21st.

We march to Yeumtang. The Ther. fell last night to 22°. The mountains down the valley are heavily snowed. Yesterday we went up the bed of a stream north-east of Samdong, to examine a succession of glacial flats or lake-beds, which Hooker had visited in the rains, and was anxious to shew to me. Went to two only, when the snow came on. This stream falls into the Lachoong at Samdong; above the junction there is another flat lake-bed; on leaving our tents at 8 A. M. we went to examine a glacier of Kanchanjhow, which lies to

the north-west of Samdong, and about 2 miles off. The Moraine or rocky bed below the field of ice is about 3 miles long, and 300 to 400 feet high. It is composed of rocks and stones of all sizes loosely huddled together, on the west side of this, and at the foot of the Seeboolah Pass, which leads to the Lachen Valley, is a deep lake, the drainage from which passes through the Moraine above noted, and issues at the east side of it as a large stream. There is a hot spring close by, which throws up air-bubbles from the bottom. Temp. 104° at noon; water quite clear; it has a slightly sulphurous smell; no deposit outside; Temp. of the glacial steam 41°.

A little lower down there is another hot spring; Temp. 116°; a good water-cress growing round it. Some crystals of sulphur at exit of spring from the rock—and silver dipped in the spring is turned brown by the sulphuretted hydrogen. Both waters are in repute as hot baths. A Lepcha of Hooker's—Chitoong—who lost a Thermometer near the spring, was sent back from Yeumtang to search for it. He found it not far off at dark, but could not return to us that night, and the cold would have probably killed him, if he had lain down to sleep in the open air. He stripped and lay comfortably in the hot bath all night.

There is some good yak grazing at Samdong. The tsalor, faloo, and other dwarf rhododendrons abound round it, and there is a plant very like heather, abundant near the great glacier—an andromeda. The descent of the valley for 3 miles is gradual—both sides are barren and rocky, with scarcely anything on them, except dwarf rhododendrons. This is succeeded for a short distance by some of the shrubby rhododendrons, and some dwarf junipers; when quite suddenly at about 5 miles down, at the turning of a corner, a full mass of fine and varied vegetation is displayed in trees, shrubs and herbs, affording a very fine prospect. Among these are the *Pinus Webbiana*, large and smaller junipers, willows, birches, barbereys, mountain-ash, roses, thistle, honey-suckle, primroses, asters, gentians, the chuka rhubarb, &c.; and this is the character of the valley all the way down to Yeumtang. Distance from Samdong 10 miles. A good riding road all the way along the west bank for 5 miles, when we crossed by a wooden bridge, then our road lay over 3 or 4 spurs abutting on the river, and at 2 miles from Yeumtang it came on a flat expanse—old lake-bed—2 miles broad or so, which continued all the way to the village where the

Lachoong running smoothly is re-crossed to the west bank by a good wooden bridge. The village of Yeumtang has 25 houses built of wooden walls with shingle roofs. They belong to the Bhotias of Lachoong, who are now at that place with their cattle, this being too cold at this season. They migrate up and down the valley from Yeunkta—5 miles above Samdong—to some miles below Lachoong. We reached Yeumtang at 5 P. M. Ther. at 8 P. M. 40°, fell during the night to 34°. There is some good grazing here, and it is rather a fine place, the valley being nearly two miles broad, with pine forests rising 1,500 or 2,000 feet up the mountains which, above the line of pines, exhibit fine masses of rock topped with snow.

Yeumtang, 22nd October.

Halt here to-day. There are some hot springs a mile down the valley, to which our coolies are gone to bathe their swollen faces and sore eyes. Temp. of these springs 5° lower than the Samdong ones, when Hooker visited them in September. There are some very bold rocky peaks on the left bank of this valley above the village, which rise probably 5,000 feet above the river.

The pine forest extends to 1,500 or 2,000 feet. Excellent ponies in this valley. The Phipun or manager trades a good deal with Thibet, and into Sikim as low as Singtam only, whence he brings rice for export to Thibet. The other exports are munjeet-madder, a leaf yielding a yellow dye or symplocos, bamboos, rattans and planks for flooring and shingle.

The imports from Thibet are tea, salt, blankets, and some very good pottery. Ther. at 8 P. M. 38°. Drizzling rain all the evening.

October 23rd.

March to Lachoong. A good deal of snow fell last night on the neighbouring hills, and those to the south. "Black Rock" bears 159° S. S. E., Singikamoo Mountain, P. S. just over head bears E. N. E., Singikama-loong P. S. N. E., Latoong Kamboo P. S. S. W. A very fine bright day; start at 9 A. M. by a good road for ponies through a forest of the largest and handsomest trees of *Pinus Webbiana* I have yet seen, with numerous species of rhododendron tree and shrub-roses, birches, maple, &c. Descent gradual. At 3 miles down, found the larch and willows along with *Pinus Webbiana*; old lake-beds frequent, the Lachoong running quietly through them and in rapids by turns.

At 4 miles or so the valley spreads out into a flat grassy space two miles long, and about the same breadth, the Lachoong meandering through it, and its banks studded with clumps of trees and bushes. On the east bank, and about the centre of this flat portion there is a fine cascade tumbling down the face of a precipitous rock from a height of 400 feet. On the west bank and above the flattest part of the valley is a waterfall, which on reaching the level space, runs in a clear and placid stream along its margin, and joins the river some way below. On the south and west of the flat, a stupendous pyramidal mass of dark brown rock rises abruptly to 1,500 feet or more from the green flat.

It is the finest and boldest rocky mass I have ever seen, and if it cannot be strictly called a precipice, it is, to say the least, *very precipitous*.* Larches in yellow leaf, the *Pinus Webbiana* of darkest green, rhododendrons, willows, maples, with other trees and plants in various tints flourish round its base, and close its sloping flanks. Far up the valley are seen the perpetual snow-peaks of Changookang, and down it—to the east side—the massive mountain of Tunkala of 17,000 feet; on the south east of which there is a pass which leads into Thibet and Choombi. At 4 P. M. we reached Lachoong, which is, I think, altogether the finest place in Sikim.

There is a considerable descent for the last 4 miles.

October 24th.

Lachoong. Halt here to-day. Elevation 9,000 feet—a bright day with a fine breeze from the south. Temp. at noon 60°; Min. Temp. during the night 42°. The Phipun has presented us with a sheep, a blanket and some butter. The villagers conjointly have presented a large yak, which has been slaughtered, and distributed among our people. In return I gave 20 Rs. which is more than its value.

It is difficult to describe Lachoong; its beauties are so numerous and striking. We are pitched on the west bank of the river on the opposite side from the town or village, which is connected with this by a substantial wooden bridge. The village consists of 40 or 50 good houses, all well and neatly built, the lower story of stone, the upper of posts with lath and plaister walls, the roof of shingles 6 feet long, with a batten laid along at 2 feet apart, and held down by rows of stones.

* Hecker objects to its being called a precipice.

It stands on a terrace about 50 feet above the river. The terrace slopes gently to the north and also to the south. The greater part of the village is on the northern slope, and has a very picturesque appearance as it is approached from the north, as also from this side of the river. The houses are placed at convenient distances, and have trees and shrubs about them. Poplars, magnolia-willows, peaches and barberry are the most conspicuous. Behind the village to the north-east rises a sloping grassy hill, to which clumps of junipers and pines, with numerous yaks grazing on it, give a park-like appearance of great extent and beauty. This open slope ascends to 1,000 feet or so, where it is surmounted by a thick dark green forest of pines, contrasting most pleasingly with the yellow autumnal tints of the pasturage, which is rich and almost rank. Overhanging the village and rising out of the larger grassy slope is a conical grassy knoll, the summit of which is decorated with poles, and large flags, which are printed with texts and prayers from the Buddhist Scriptures. A small monastery stands at its base in a very lovely situation. I visited it. There are only 10 or 15 Monks attached to it, and its library does not exceed 20 volumes. My reception was civil and cordial, as it always has been in the Goombas of Sikkim. I was seated on a cushioned bench in the body of the centre room opposite the images and the library-cabinet, and served with hot tea by an old Nun; as soon as I sat down one of the monks squatted cross-legged on the floor, counted his beads and muttered prayers as long as I remained. The same thing was done when I visited the Phipun's house, when tea was served to me in the chapel-part of his house, a priest—his domestic chaplain, officiated. He has 100 volumes of books. The monastery of Lachoong is connected with one at Digarchi, and has no assignment of land in Sikkim. The Monks live by alms, and by largesses distributed by the Bhotias of the valley during sicknesses and after deaths. The Phipun's father died here a short time ago. It was said that property to the value of Rs. 1,000 was distributed to the Lamas on the occasion. The greater part by far of this money went to Digarchi; the rest to the local Monks. The total however is greatly exaggerated, I believe.

The cultivation here consists of Buckwheat, which is cut in October, wheat sown in November and cut in May, turnips which are now in season, and a few peas which come in, in the rains. Buckwheat bread

when hot has rather a tempting flavour; but it is bitter to the taste; it is greenish coloured and spongy. Peaches grow, but do not ripen; they are pulled now and partially dried.

The people of this valley live principally on the milk, curd and flesh of their herds of yaks and a few cows which they graze up and down it according to the season, as in the Lachen valley already noticed, and by a small trade with Thibet. There are about 1,000 yaks among them. All the trade with the north is in planks, beams, rattans, bamboos, butter, endicloth, munjeet, rice and some dye-stuffs. They bring down salt, tea, blankets, some skins, and yaks occasionally. Yaks range in Thibet from 8 to 12 a head.

The yaks calve once in two years. They go nine months with young. The Raja of Sikim has 100 in this valley, about the same number in Lachen, 150 in Shanok—a valley west of the Lachen, some in the Byote valley leading to the Chola Pass, and in the Rungbo valley, which leads to the Yakla Pass. At Jongri also—north west of Darjeeling—he has a herd.

They are quartered on the inhabitants, who tend them and manage the dairy, receiving a small allowance per annum for the labour.

The office of Phipun has been hereditary here for seven generations. The family is of Thibetan origin. No money-revenue is paid to the Raja of Sikim. The payments are in kind only, comprising, ponies, yaks, blankets and salt, in quantities and proportions I could not determine, nor are they fixed, I believe, by any specific agreement; added to this they furnish porters for the use of the Raja without hire, whenever they are called upon. From this valley, as from Lachen, the annual contributions in the shape of revenue are delivered at Chongtam, and are taken thence to the Durbar from village to village by the unpaid people. When the Raja is at Choombi and that place is their destination, the people of both valleys take them to Geree in Thibet. The people of Dobta, a small tract in Thibet held by the Sikim Raja, come to Geree in two journeys, and carry them thence to Choombi in six journeys.

From Lachoong to Geree is four journeys for loaded men, viz. Yeumtang, Momay Samdong, Cholamoo crossing the Donkiah Pass, Geree. From Geree to Choombi 5 or 6 ditto, viz.

1. Nachomo.
2. Linki.

3. Phari.
4. Galling.
5. Choombi.

From Geree to Dobta 2 ditto, viz. Tagha, Dobta; the route all the way is over a bare plain, i. e. a Thibetan plain, which is very far from being a level one: two streams are crossed, the waters of which run to the west and into the Arun, I believe.

From Kambajong to Phari three journeys, i. e. you leave Geree to the right and go by Nachamo and Linki as to Choombi.

From Kambajong to Giangtchi 5 ditto, viz.

1. Tahtcha, a horse journey, say 20 miles.
2. Wussoh, ditto ditto ditto.
3. Kallah, ditto ditto ditto.
4. Kamah, ditto ditto ditto.
5. Giangtchi, ditto ditto ditto.

This route crosses 5 streams which run to the north, feeders of the Painom, I believe, and is occasionally mountainous and level.

From Kambajong to Digarchi 3 ditto, say 60 miles, viz.

1. Hoomah.
2. Rhe.
3. Digarchi.

Direction northerly; all are long horse-journeys; cross 3 streams on the way running north; occasional hills and plains.

Lachoong 25th. Halt this day for Hooker to collect seeds for the Kew-gardens, and I also wanted to send Seedlings of pines, junipers and rhododendrons to Darjeeling. We made an excursion towards the Tunkala Pass; it was a beautiful day and the scenery was very fine; a short way above the village we crossed a fine brook on which two shingle huts stood. They covered 4 large manes or praying drums which were turned by the stream. The plan was simple.

The drums, 4 feet long and a foot and half in diameter, revolved vertically from left to right, the lower end of the spindles turned in stones which lay on the ground, the upper in holes cut in a plank which ran along the centre of the hut.

Wooden floats were attached to the spindles a foot above the stone in which they revolved, and the water was turned upon them by bamboo shoots. The plank-flooring of the huts was a foot below the drums.

“Mani Padma Hum,” in large letters, was printed on the drums, and all visitors repeat this universal prayer, while they remain at the mane.

There was a well-cut image on stone of Gorakn ath in one of the huts. From these manes we ascended the open grassy spur on which the monastery stands, and proceeded along a narrow ridge for a mile; then along the north-west bank of the Tunkala stream, and 1,000 feet, above it, through open pasture land varied by clumps of Rhododendrons and larch; a profusion of ornamental plants occupied the open spaces,—prim-roses, asters, lily of the valley, euphorbia, hypericum, &c. &c. The bottom of the valley on both sides of the Tunkala was a dense and noble forest of larch, *Pinus Webbiana*, *Pinus Brunoniana* and *Pinus Kuthrow*. Passing through the pasture-land and still ascending, we came upon the forest which was formed here of numerous species of the tree rhododendrons, *Webbiana*-pine, maple, birch, mountain-ash, rose, hawthorn, barberry, the small Chinese bamboo, &c. The *Webbiana* and *Brunoniana* pines were the finest I have ever seen. Some of the former measured 25 feet in girth, with a clear stem of 60 feet. Its handsome leaves of a damson-blue colour strewed the ground; a purple dye is made from them, which is said to be fast.

About 4 P. M. it became cloudy and we returned; our coolies laden with seeds and seedlings.

We purchased three good skins of the kiang of Thibet to-day, a male, female, and young one, and sent them to Doctor O’Shaughnessy at Darjeeling for the Asiatic Society’s Museum. The men who sold them were Thibetan hunters. People who live by hunting in Thibet are called “Hurpo;” they are very numerous; they eat the kiang, and all other animals, use the gun, make their own powder, and are good marksmen: they cultivate and graze sheep occasionally; but live mostly by the chase.

October 26th.

Marched to *Kedoom*. Started at 10 A. M. and arrived at 3 P. M. Road runs on west bank of Lachoong river, and is good for ponies, half the distance it lies at first over open grassy spurs, and through intervening hollows in which pines, junipers and larches are disappearing, and oaks, tree rhododendrons, magnolias and laurels are increasing rapidly. At Teemoo—a grassy slope 2 miles long and half way—the pines cease along the road, but the sides of the valley for

1,000 feet above, are still covered with them. Considerable descent this far; insects now numerous, and it is getting warm. Cross the Lachoong to east bank by a wooden bridge, ascend and cross a thickly wooded spur, whence descend to a torrent from the east, cross and ascend to Kedoom, the elevation of which is 7,000 feet. Ther. at 6 p. m. 60°, fell at night to 50°—a village of six or eight houses inhabited by Bhotias, who were very civil and cheerful: a good deal of cultivation. The maize, kodu, kowni and amaranthus not yet ripe. The muwwa has been cut. Plantains not good; peaches do not ripen, but are pulled and stored. They are soft and shrivelled.

October 27th.

Chongtam. Reached this to-day at noon, in three hours from Kedoom, which terminates our exploration of the Lachen and Lachoong rivers which unite here. We have followed the former to its sources in Thibet, and taking up the latter at its origin on the Sikim side of the Donkiah Pass have come along it downwards. This has occupied twenty-two days. Rode our ponies for 2 miles after leaving Kedoom, and sent them back to Lachoong as the road was quite impracticable. At 4 miles crossed to west bank of the Lachoong by a cane suspension-bridge, and kept this side the remainder of the way. Total distance about 7 miles. Two fine cascades fall into the Lachoong at the bridge—W. bank. Heavy forest of birch, alder, oaks, hydrangea, *Bucklandia*, &c., with under jungle of small bamboo all the way, one *Bucklandia* measured twenty-one feet in circumference. The mountains above Chongtam are grassy to their summits—say to 8,000 feet. The ghoral and thar antelopes with the wild goat—jharal—are numerous. Elevation of Chongtam 5,000 feet. Temp. at noon 74°.

The Lachoong Phipun, a very good natured Bhotia, but rather eccentric, took great care of me all the way to-day, helping me over every bad place, and exclaiming at each: "I have but the size of my thumb to do for the Sahib now. Thank God we are near the end of the journey; if any thing should happen him in my district, I would cut my throat:" and then he would give me half dried unripe peaches out of the breast of his greasy Bukoo-Cloak, and expected me to eat them. His district extends from Choongtam to Donkiah, comprising the whole of the Lachoong valley. He rarely leaves Lachoong except to go to Thibet. He felt the heat very much; I enjoyed the genial warmth after our recent freezing.

(To be continued.)