

THE KINCHINJINGA GROUP, SEEN FROM THE PLAINS.

(FROM A SKETCH BY CAPT. J. R. OLIVER.)

cursion I have described, told me it was a *miserable dumm-heit*, and not to be thought of. Moreover, the many satisfactory circumstances under which our ascent was made would rarely be found in combination. But this is certain, the Lyskamm can be ascended from Gressonay, and Gressonay is the most natural and easy place from which the ascent can be made.

I feel certain that even a second-rate mountaineer, starting from the Cour de Lys, would reach the summit easily in 8 hours; and our party was unanimous in the opinion that the upper basin of the Lys Glacier can be most readily attained by its western lateral moraine.

The ascent from Gressonay combines all the elements of variety, interest, and natural beauty; and I cannot doubt that it will in future form the leading object of ambition to the many tourists who now visit one of the most picturesque and lovely of Italian valleys.

Trips in the Himālayas. By J. R. Oliver, Captain Royal Artillery. (*With Plate.*)

On reading the interesting papers of Messrs. Cheetham and Clement Smith which lately appeared in the Alpine Journal, it occurred to me to supplement them by some account of my own experiences in the Himālayas, dwelling more particularly on points regarding which little information has been hitherto afforded in these pages, such as the natural history and physical geography of the country. As it has fallen to my lot to walk, in all, at different times, more than a thousand miles through these mountains, I will commence by giving a sketch of my travels, proceeding more to details afterwards.

Ever since a certain morning in the Mutiny campaigns, when, after a weary night's march, the sunrise disclosed, for the first time, a long line of icy pinnacles, rising above the horizon of the dead-level plain of the north of India, I had felt an insatiable longing for a closer acquaintance with those mysterious-looking peaks. The opportunity came at last. Eighteen months of almost incessant marching and countermarching, varied only by an occasional engagement, ended in sending me on sick leave to 'the Hills.' I had a tedious journey up country in the height of the hot weather, and a vexatious delay at Umbāla, owing to an informality in the way I had obtained leave. I succeeded, however, in getting

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clear off at last, and left Umbāla one morning towards the end of May 1859, with a friend in a cavalry regiment, also on sick leave, who had arranged to join me in my wanderings. Our intention was to push on to the 'interior' as rapidly as possible; both for the sake of escaping the approaching rains which fall heaviest on the southern zone of the mountains, and of having as much time as possible available for exploring the grand scenery of the higher ranges. We meant at the same time to take as much shooting as we could obtain *en passant*, provided always it did not entail loss of time.

Merely halting two days at Simla, where we were generally regarded as little better than lunatics for preferring to spend a five months' leave in roughing it among the mountains to enjoying the delights of a hill station, we pushed on to Kotgurh in the Sutlej valley, some 50 miles from Simla. By this time we had begun to have serious doubts as to whether the money we had brought with us would be sufficient to carry us through, the expenses of porters, &c., proving heavier than we had anticipated; and it was arranged that I should return to Simla for a fresh supply of rupees while my chum J. remained in camp at Kotgurh. This trip entailed more delay than we had reckoned on, and I did not rejoin for a fortnight, during which time I fear J. spent a miserably monotonous life, all alone as he was, and with nothing to do. However, the fortnight came to an end at last, and having effected a junction at a certain prearranged spot in a pine forest above Kotgurh, we fairly started on our wanderings.

Our retinue consisted of a couple of servants from the plains, one of whom acted as cook and the other as head servant in general, a hillman, whose special duty was to look after our dogs and clean the guns, and some eighteen porters, who were usually hired for the day at the villages near which we happened to halt, and whose rate of wages varied from threepence to sixpence, according to the length of the day's march. We carried with us a tolerable-sized cottage tent, a couple of 'charpoys,' or native bedsteads, bedding, washing, and cooking apparatus, some books, and a supply of ammunition. We had also a small quantity of preserved provisions to fall back upon in case of need, a few medicines, and a 'kilta' of potatoes; the kilta being (by the way) exactly similar to the conical basket used in Switzerland.

We followed the well-known route of the new Hindustan and Thibet road as far as it went at that time. This road, for about a hundred miles from Simla, is carried near the summit of a ridge at no great distance from the left bank of the Sutlej.

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It is in most parts nearly level, winding in and out round the different spurs and ravines in a most provoking manner. The following list of the heights above the sea of the first eight travellers' bungalows we come to after passing Simla, will show how carefully ascents and descents have been avoided in its construction, the bungalows being built at intervals of about 10 miles:—

Simla, 7,000; Mahāssoo, about 7,000; Theog, 7,192; Mattiāna, 7,700; Nār Kanda, 8,796, Bāghī, 8,591; Kundrāla, about 8,500; Soongrī, 8,356; Bowlī, 7,709. The road is very narrow and has no parapet. In many places it has been carried round the faces of precipices on wooden galleries; and several fatal accidents have occurred at different times, from horses shying and falling over the side with their riders, or from the galleries becoming rotten and giving way.

A few miles beyond the bungalow of Bowlī, the road makes a sudden descent of more than 3,000 ft. to the bottom of a savage rocky gorge through which rushes the Nogrī, a foaming torrent, and a tributary of the Sutlej. The rest-house is built by the side of the river, and the constant roar of the water, pent in as the gorge is by almost vertical walls of rock, made it a noisy sleeping place.

The next day's march took us by a series of zigzags up a long steep hill, where we found both the black partridge (*Francolinus Vulgaris*) and the 'chuckore' (*Caccabis Chuckore*) tolerably plentiful, and managed to bag several. We had generally contrived so far to pick up sufficient game on the march to furnish our dinner, but this was the first place at which we had any really fair shooting. At the top of the zigzags we got into thick clouds and drizzling rain, and I have a very indefinite idea of the topography of the rest of our day's march (except that it was uphill all the way), the mist preventing our seeing anything. We reached the rest-house (Dharnī, 9,275) after five hours' walking, tired, wet, and out of humour. It was well that we had bagged some game on the way, as it turned out that the only provisions to be had at the bungalow were honey and flour; and on looking into the travellers' book, I found the following lines had been written by some unfortunate in the volume of 'Remarks':—

> 'The senses feed upon the prospect fair,
> The empty belly feeds on emptier air.'

The truth of the last line I could vouch for, but as for the 'prospect fair,' nothing was to be seen but thick fog and drizzling rain. However, towards evening it cleared up, when

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it appeared that the bungalow was built on the summit of a pass, and overlooked a deep valley, with a fine range of snow peaks immediately opposite.

The following day a steep descent through forest brought us to the bottom of the valley, the road then followed its right bank at a considerable height down to the village of Surāhan, where it joins the valley of the Sutlej. At Surāhan was the last of the bungalows, and a few miles beyond it, the new road at that time came to an end. As the real hard work of our trip began at this point, I may as well, before proceeding with it, endeavour to give an idea of the topography of the Himālayas and the general character of their scenery.

These mountains form a belt of some 150 to 200 miles in width, separating the plain of Northern India from the elevated table land of Thibet. On the south side they rise very abruptly. The usual elevation of the first range is 6,000 to 8,000 ft. On ascending it, if the weather be clear, the traveller finds before him a vast sea of mountain ridges and deep gorges, bounded in the extreme distance by a long serrated line of snowy peaks. Under favourable circumstances this panorama is always very fine, but the eye seeks in vain for some level spot to rest on. The bottoms of the valleys are almost invariably out of sight. This is owing to the fact that the hillsides become steeper and steeper as they descend, and the bottoms of the gorges lie between almost vertical walls of rock. As an illustration of this, I may mention that we followed the valley of the Sutlej for more than 100 miles, and only caught sight of the river three or four times, and this was usually when we had to cross it. The summits of the ridges too are very sharp, and I have many a time been compelled to prolong my day's march several miles farther than I had intended for want of a spot of ground sufficiently level to pitch my tent on; and eventually, perhaps, had to halt on the narrow crest of a ridge, where the wind blew *up* into the tent on one side and *down* out of it on the other.

The traveller who expects to find in the Himālayas the beauties of the Alps on a larger scale will be disappointed. In the first place we rarely, if ever, meet with the charming combinations of glittering glacier, sombre pine-forest, and emerald meadow, so common in Switzerland; and lake scenery is almost unknown. Again, it generally happens that the scenery bears much the same character for several marches in succession. Thus we may be for days wending amongst the valleys of the lower ranges where villages abound, and where the hillsides are terraced and covered with cultivation from

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base to summit. Or our march may lie for 50 miles at a time through gloomy pine-forests, dotting slopes whose angle of inclination is 45°. Or if we get among the higher ranges, we shall probably find ourselves in a region where nothing is seen for several days' march but rock, snow, and ice.

Another reason why the Himālayas impress us less in proportion to their size than the Alps is, that, in the case of the latter, we may place ourselves in the very heart of their fairest scenery within a few hours of leaving the level country; whereas, in the former, we have many a weary march to make through the lower ranges, the scenery all the while becoming gradually wilder and grander, before we are brought face to face with their full majesty. We thus become, as it were, accustomed to the feelings produced by wild mountain scenery, and it loses much of its proper effect on us. I remember well that on my first trip, parts that I had thought very fine when going seemed tame enough on returning.

To resume our journey. On July 4, we left Surāhan at 6 A.M., and commenced our march up the left bank of the valley of the Sutlej. This valley is a huge gorge, or, more properly speaking, chasm, which cuts right through the whole Himālayas chain, and whose sides rise to an elevation of from 10,000 to 22,000 ft. After two hours' walking we came to an end of the new road and soon felt the difference; the old track being in general nothing more than a sort of Titanic staircase, half natural, half artificial, carried across the different spurs formed by numerous lateral ravines that run down to the Sutlej. A day's march in this part of the country probably begins with a descent of some 2,000 or 3,000 ft. into one of these ravines. At the bottom the heat is sure to be stifling. Then comes a wearisome climb of about an equal height up the opposite side. A mile or two of comparatively level walking may possibly intervene before the next ravine is reached, when the same fatiguing process has to be repeated; and so on till the halting place is reached. On the present occasion we felt the unaccustomed fatigue of this sort of work so severely that we insisted on encamping four miles short of the village of Turanda, our proper halting place, much to the disgust of the porters, who did not at all relish sleeping out in the 'jungle.'

5th.—'Marched to Turanda—5 miles—road horrible—a mere succession of huge steps made of loose blocks of stone. Started at 5.15 and did not get in till 11.' (I have transcribed the above literally from my diary.) Turanda is a very pretty village on the crest of a spur, and we pitched our tent on a

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little open glade by the side of an old temple, in a grove of magnificent deodāras. The view up the valley from this spot was very fine.

The following day we reached Nachār after a 6½ hours' march. The road for the first half of the way was a repetition of the day before, only worse if anything. In one place a steep rock had to be descended by a ladder consisting of a trunk of a pine-tree with notches cut in it. Just as we reached Nachār a thunderstorm with heavy rain came on, and continued for the rest of the day and all that night. Next morning the weather was no better, and we were compelled to halt. I don't know any circumstances in which time passes so slowly as in a wet day under canvas.

On the present occasion, however, the tent leaked so much as to give us a little occupation in dodging the dripping, and we had eventually to place our gun-cases under the beds, and lie on them with waterproof sheets over us. The thunderstorm continued till late in the afternoon. A heavy cloud seemed to have taken up its position right overhead, and there it remained, crashing away like the most furious cannonade, till it had quite spent itself in rain.

I may here mention that the mode of life which we found most convenient, and which we adhered to as far as possible, was to rise at daybreak, dress and drink a cup of tea while the tent was being struck, and then start off ahead of the porters. We generally contrived to pick up a few pheasants in the early morning, and after a few miles' walking used to look out for some shady spot near water to halt at for breakfast. A fire was then lighted, and on the arrival of the kiltas, breakfast cooked and eaten. The halt generally occupied about two hours, the porters meanwhile being sent on ahead. By this method we used generally to find our tent ready pitched by the time we arrived at the end of the day's march.

We occasionally availed ourselves of an invitation to sleep in the village temple; the Hillmen or Pahārries, as they are called, though normally Rājpoot Hindoos, being far less strict in their religion than their brethren of the plains. Their temples are built of wood and are very picturesque. If we happened to arrive late we generally made use of them, as by doing so we saved the delay of striking and packing the tent in the morning; and if one did not object to sleeping in the same room with a hideous grinning idol, they were not such bad quarters. But the dwelling houses we carefully avoided (after once trying them). The floors used to be literally black with fleas, to say nothing of other species of vermin. Nor is

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this to be wondered at considering the filthy habits of the Pahārries, who *never* wash, or even take off their clothes, except when the rottenness induced by age compels them to get a new suit. In fact, if you ask one of them his age he will tell you, not the number of years he has lived, but the number of suits he has worn out.

The only provisions we were able to procure at the villages were milk, ghee, coarse flour, and occasionally a tough sheep or goat. We generally trusted to our guns for our dinners, and if game happened to be scarce there was always plenty of wild pigeons to fall back upon. We had with us a good supply of brandy and tea, and these we found a great help in washing down coarse food. Wild apricots were very abundant, and the villagers occasionally brought us walnuts and other fruit. The hillsides, when cultivated, are invariably laid out in terraces. The villages are often very picturesque, the houses much resembling Swiss chalets, only that they are more lofty, and are built of blocks of gneiss or mica schist, and roofed with slabs of the same material.

The morning after our wet day in camp the weather had cleared up, and we started at 9. A descent of some two miles brought us to the Sutlej, which had to be crossed by a 'julah,' or rope bridge, the old wooden lever bridge having lately fallen to pieces. The river here is a very rapid torrent, rushing through a gorge between vertical walls of rock. The 'julah' consisted of half a dozen ropes hanging in a curve between the two masonry piers of the wooden bridge. Along these ropes ran a cylinder of wood carrying a sort of rope cradle. The person to be passed over sits in the cradle, holding on by the wooden cylinder. On being let go, his own weight takes him to the lowest point of the catenary, from which he is hauled in by a guy rope. The contrivance did not look particularly safe, as everything depended on a very flimsy ring of wood.

On our arrival a number of goats were being passed over, and we had to wait some time for our turn. The heat was very great, so we sat down in the shade of the pier, and amused ourselves by watching the proceedings. Among other things we saw a drove of large Thibet dogs—animals something like English mastiffs—being slung across. The method adopted was to tie them together by the fore legs in bunches of three, and then send them over. The dogs seemed to be quite accustomed to the proceeding, and to take it as a matter of course. On my turn arriving, I found the sensation of being swung across rather pleasant than otherwise. A little beyond the bridge we crossed a ravine, and then ascended by

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the usual rock staircase to the crest of a precipitous spur about 1,000 ft. above the river. The road then descended again nearly to its level, and lay close to it for some miles. The bottom of the valley was here a mere narrow gorge, the sides of which completely shut out all view of the snow ranges between which the Sutlej runs; but we had occasionally glimpses of fine snow peaks ahead. This was a very fatiguing day's march, both on account of the heat and of numerous collections of large boulders that we had to find our way over. Towards evening we arrived at the foot of a very long and precipitous ascent, which brought us by 6 o'clock to the village of Chirgāon, where we encamped close to a small waterfall.

Next morning a cooly from Simla overtook us with a bundle of letters and papers, so we made up our minds to take a half-holiday, and do a short march in the evening. Having written and despatched our letters and papers to Simla, we started again about 3. The road ascended for some distance along the side of a bare hill, then passed through a large oak wood, and finally crossed a very deep valley, high up the opposite side of which we took up our quarters for the night in a temple at the village of Meeroo.

Next morning (July 10th) we started after breakfast, and had a glorious day's march, to near the village of Rogī, the scenery every hour increasing in magnificence. Most of our road lay along green pastures with clumps of enormous deodāras, while at the other side of the Sutlej, the group of the Raldung peaks, 21,500 ft. high, formed a very fine background.

We passed to-day the entrance to the Buspa valley, a long straight gorge leading down to the left bank of the Sutlej, and celebrated for its burrel (wild sheep) shooting. We also met with a very acceptable novelty in the shape of a quantity of snow, evidently the remains of an avalanche, filling the bottom of a very hot gorge; we immediately called a halt and indulged in iced brandy and water. I may mention by the way that after entering the higher ranges an hour rarely passed without our hearing the thunder of an avalanche, though we were never fortunate enough to witness one.

The following morning a walk of an hour and a half brought us to the village of Chenee, which is built on a level space of a few acres at a height of 3,000 ft. above the river, and directly opposite the Raldung peaks. Here we took up our quarters in a large ruinous bungalow, which had been built, I believe, by Lord Dalhousie, but not kept up afterwards. The first two miles of the road from Rogī would have been worth walking 150 miles to see. It had been carried by wooden

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galleries around the face of a precipice almost overhanging the Sutlej, which runs many thousand feet below. The slopes at the opposite side as far up as the snow line were clothed with dense forest, except in one place, where a stream of water fell in a single leap over a vertical wall of rock some 1,500 ft. high. The peaks were well covered with snow, but only one glacier, and that a very small one, was in sight.

After a day's halt at Chenee we followed the route described by Mr. Clement Smith as far as the Werang Pass (13,200), where we turned off the main road to the village of Āsrung high up the Leepee Valley. We were, however, more fortunate than he was, as we had a clear view from the summit of the Pass. The ridge it crosses may be considered as the limit of the rich vegetation of the Indian side of the Himālaya. Beyond it hardly a trace of green was visible. We saw ridge behind ridge of bare steep rocky mountains, slightly sprinkled with snow. Rain rarely falls in Thibet, and from the specimen we saw it did not seem an interesting country to travel in.

On the ascent to the Pass the change in vegetation was well marked, a number of species we had not hitherto seen—azalias, junipers, potentillas, saxifrages, asters, making their appearance. At the summit the rock (mica schist) had been very much disintegrated, leaving a thick deposit of gravel, consisting entirely of large crystals of kyanite. The descent to Asrung lay for some distance over masses of large boulders, probably an ancient moraine.

The Asrung Valley is celebrated for ibex, and we had hoped to meet with some; but on questioning the villagers, we were told that at that time of year they were all high up the mountains where it was almost impossible to follow them, and that, in any case, several days would be required for the expedition. This settled the business. We were now 200 miles from Simla, and private affairs necessitated my being there again by the beginning of August. My friend J.'s leave, too, was drawing to a close; so we had nothing for it but to give up the ibex and make the best of our way back, taking, however, a different route, so as to see as much as possible within the time. Accordingly, after a day's halt, we crossed back into the Sutlej Valley by another high pass, and reached Chenee in two days, having noticed on the way several new species of Papaveraceæ, Geraniaceæ, and Primulaceæ. Some of these, I fancy, have never yet been described, and I regret much to say that the few specimens I collected were subsequently lost.

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The route we proposed to take on our way home was as follows:—To cross the Sutlej at Pooaree below Chenee, follow it to its junction with the Buspa, and thence cross the great range that lies to the south of the Buspa and Sutlej by the Boorung Pass (15,500). But our servants, on hearing what we had settled, broke out into such dismal lamentations, describing so piteously the fearful hardships they would have to undergo on the pass, that we thought it better to make a compromise and cross the Roopung instead, an equally lofty but easier pass. To reach this we should have to cross a shoulder of the Raldung and drop down to Sungla, a village some distance up the Buspa Valley. Our route thus having been decided on, we left the bungalow at Cheenee at 6 A. M. on the 18th, and, after a descent of 3,000 ft. by a footpath with terraced vineyards on each side, reached the Sutlej at a point about 6,100 ft. above the sea. Here we found a very insecure-looking julah, and halted for breakfast while the ferrymen were being hunted up. The river at this point was about eighty yards wide and very rapid. The ropes of which the julah was made looked so old that I did not like to trust myself to them without first testing their strength, which I did by sending my bedstead across. It had hardly started when the ropes broke, one after another, and the charpoy was with difficulty hauled back by the guy. Having to rig up fresh ropes caused a long delay, and it was noon before everything was safely across. I nearly lost a favourite dog here. On my being slung over he plunged into the water, and was at once carried down by the stream. He managed, however, to reach the opposite bank several hundred yards lower down, and was dragged out in a very exhausted condition.

Our way now lay for three miles along the river bank, and then took us by a long steep climb to the village of Bhārung, which is situated in the forests high up in the mountain sides, where we encamped for the night.

The whole of this part of the Sutlej Valley is called Kunāwur, and is celebrated for its grapes. Vines will not thrive on the inner side of the Himālayas, but here the climate suits them well enough. The vineyards are in terraces, and the vines are trained on horizontal platforms raised a few feet above the ground.

The next day's march was about the longest of our whole trip. We started early and followed a footpath which gradually ascended through forests, at first of pine and deodāra, and afterwards of birch. In one place we had to cross a large

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sloping snow-bed. Above the forest we came out into an open alp, which led us to the shoulder of the Raldung range, when we left the Sutlej Valley, and commenced the descent into that of the Buspa. The height of the point we crossed must have been about 12,000 ft., and the pass had the usual groups of stone cairns ornamented with bits of rag.

The descent was very long and steep. In one place the path crossed a sloping piece of rock at the very edge of a vertical precipice 2,000 ft. high, where considerable caution had to be used to avoid slipping over. We did not reach the village of Sungla till late in the afternoon, having had a march of ten hours' good steady walking.

The Buspa Valley runs in nearly a straight line for fifty miles, but is very picturesque. About Sungla it has a flat meadow tract, which appears at one time to have been the bed of a lake, the remains of a rocky barrier appearing lower down. The village is built on a rising ground close to the river, and the valley there is something like that of the Rhone between Leuk and Visp, only much more beautiful.

On the one side the mountains were covered from base to summit with pine-forest, while on the other rose tier above tier of stupendous precipices, culminating in the snow-crowned peaks of the Raldung chain, 21,000 ft. high, but apparently so directly overhead, that as the thunder of their avalanches broke the stillness of the summer air we half expected to see a torrent of snow and ice rush down into the valley and overwhelm the village. It was one of the grandest views conceivable. We looked up at the opposite side of the Raldung to that seen from Chenee. The Roopung chain, which we were about to cross, was invisible, being shut out by pine-covered slopes.

At Sungla it was necessary to hire porters for three days, that being the number of marches to the first village at the other side of the pass. Having laid in a supply of provisions for the natives, we started at 8 o'clock on the following morning, and commenced the ascent by a footpath leading up a ravine opposite the village. The first day's march was rather uninteresting. After climbing for some distance through pine-forests the path emerged on open pastures, up which we trudged steadily, still keeping parallel to the ravine. Patches of snow soon became numerous, and at 4 P.M. we halted and encamped at about the lower limit of perpetual snow, here some 14,000 ft. above the sea. It was decidedly cold, but, in spite of this, my Hindoo bearer from the plains insisted on sticking to the customs of his religion, and sat for two hours

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in the open air, cooking his food, with nothing on but the 'dhotee,' or cloth round his loins. Our tent was pitched close to an overhanging rock, which served as a shelter for the natives.

After an early breakfast next morning we struck camp, and at once got on to the snow. The weather was lovely, and, after turning a corner round some rocks, the whole of our route to the Pass lay before us. We had to ascend a sort of large irregular basin filled with snow. Right and left nothing was to be seen but snow slopes and black precipices. The summit of the Pass was at a slight depression in a serrated ridge of rocks. It was a wild desolate-looking scene. But I had not time to think much about it, for I soon found that I had quite enough to do in keeping myself going, the rarefaction of the air beginning to tell upon me. I felt a painful shortness of breath, and before long had to rest every two or three steps. The snow, too, was soft, and this made walking still more fatiguing. However, the top of the Pass began to look very near, and I pushed on alone, J. and the porters being by this time far in the rear. I reached at last the foot of the final slope, consisting of a bank of snow some 50 ft. high and very steep. But by this time I was so thoroughly done up that I felt almost incapable of climbing it without assistance. However, after a short halt, I made a desperate effort, the snow falling away from under me at every step, and, somehow or other, in a few minutes reached the summit, when I threw myself down on the ground, fairly pumped out.

I fear that after this account I shall be looked upon as a very poor walker; but it must be remembered that the Roopung Pass is very nearly, if not quite, as high as the top of Mont Blanc; and that at the time I crossed it I had been very much pulled down by long campaigning in a country where the temperature varied from 80° to 120°, while, through all the previous hot weather, we had generally turned out seven nights in the week at 1 A.M., and marched till 9 or 10 o'clock, after which hour the heat used to be so great as to render going to sleep, if not impossible, highly dangerous—those who indulged in a nap during the daytime running a considerable risk of never awaking again.

I had hoped for a fine view from the top of the Pass, but on reaching it found a mass of clouds rolling up from the Indian side. It was as wild a scene as I ever beheld, and I enjoyed it all the more from being perfectly alone. Not a trace of any living thing was to be seen. Black precipices, masses of snow and rolling clouds, filled up the landscape. I could not make

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out anything at all resembling a glacier, the snow appearing to lie, wherever the ground was not too steep, in enormous compact masses. At either side of the Pass the peaks rose to a height of about 18,000 ft.

The passes over the 'Snowy Range' are practicable about four months in the year, and are for that time much used by the Tartar traders, who carry borax and wool to the Indian markets. They suffer much, however, from the rarefaction of the air, and attribute the symptoms to a fabulous poisonous plant, which they believe to grow at great heights. They are also liable to bad attacks of colic in the passes; and knowing this, I had taken the precaution to carry a bottle of laudanum in my pocket. On the porters coming up, I found my shikaree had been already attacked, and he lay in the snow at the top, groaning, and expressing his belief that he was dying. I made him take thirty drops of the laudanum, which relieved him at once. About noon, or two hours after I had reached the top, we commenced the descent down a very steep chimney lined with large loose stones. The fog prevented our seeing far into it. I was leading with one of the porters when down came a perfect avalanche of large stones that had been dislodged by some one above, and we had barely time to jump behind a projecting piece of rock before they swept the place where we had been standing. Not at all relishing this sort of cannonade, I climbed down to the foot of the couloir as fast as I could. Here I found myself at the top of a snow slope of 45°. I hesitated about getting into it, the fog preventing my seeing what was below, but the porter saying it was all right, I climbed down by digging my heels well in at each step. After descending about 200 ft. I found myself in a sort of basin, and waited to see the rest of our party come down. One or two of the porters, attempting to descend with their packs on, lost their footing, and rolled from top to bottom of the slope. The rest unslung their loads and let them come down by the run, following themselves by a glissade on their backs, feet foremost. J. attempted to do the same, but steered badly, and rolled to the bottom in a heap, narrowly escaping cannoning against some sharp rocks that projected through the snow.

A sleety rain had by this time begun to fall, and it was very cold, so taking a porter as guide I walked on ahead, leaving the rest to follow. For some time the fog prevented my seeing anything but the snow slopes we were descending When the clouds lifted I found myself in the most extraordinary-looking place imaginable. We were standing at the head of a huge horseshoe amphitheatre walled in by vertical precipices. Im-

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mediately below us the cliff was in three immense tiers. At the top of the uppermost of these a good-sized river emerged from beneath a mass of snow, and fell over it into a deep circular well in the snow at its foot, to emerge again and fall over the next step, and again in like manner over a third, at the foot of which it disappeared under a mass of snow that filled up the bottom of the amphitheatre. There were thus three fine waterfalls, one over the other. The snow beds between them lay at an angle of 45°, and we had to cross the stream by one of these slopes. We afterwards descended by another long slope to the bottom of the amphitheatre. A mile farther down the valley a little vegetation appeared, and we halted and encamped for the night. The river we had struck proved to be a feeder of the Tonse, one of the affluents of the Jumna.

The next day's march was an easy one. A little below our halting place we entered a glen, the sides of which were covered with birch-wood; the path lying over the snow that filled up the bottom of the gorge, and beneath which the river flowed in a tunnel. Farther on the glen widened, and the birch-woods gave place to rhododendrons and pines; lower down still the sides of the valley consisted of vertical precipices of enormous height, so close together as to leave but a narrow chasm between, something like parts of the Via Mala. Soon after passing this part we emerged from the pine-forest into cultivated slopes, and reached a snug little village called Zāké early in the afternoon.

I must hurry over the rest of our journey to Simla. After following the valley for one march more we turned to the right, and spent a whole day in ascending through pine-forests, finishing by having to pass the night under a shelving rock just below the crest of a pass 13,200 ft. high, that leads over a spur of the great range we had just crossed. We had a thunderstorm that night to add to the pleasures of our bivouac, but the next morning was fine, we had a glorious view of the Jumnootree Peaks, and just over the Pass I fired at (and missed) the only woodcock I have ever seen in India. My shikaree tried to console me for the miss by telling me that that sort of bird was not fit to eat!!! From the Pass we descended into a deep valley leading down from the Boorung. After following this for two more marches, a long ascent took us to the Kundrāla Bungalow on the new road, and on the ninth day after leaving Zāké we reached Simla. Our trip had been a most prosperous one. In the course of forty days we had walked more than 400 miles, the greater part of which was by the roughest of mountain paths, without meeting with

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a single *contretemps* (two wet days excepted), and by the time we reached Simla again both J. and I were thoroughly restored to health.

The great mass of the Himālayan chain is, as far as I have been able to ascertain, composed of metamorphic rocks, principally gneiss. On entering the hills at Kussowlee we found a highly inclined sandstone, which gives place to clay slate as we approach Simla. A few marches beyond this place the clay slate merges into mica schist, and this again into gneiss, with a few trifling alternations of chloritic and other schists. I have met with one or two bosses of granite, but they were of very limited extent, and I believe all the higher ranges to consist chiefly of gneiss. The gradual increase of the metamorphic character of the rocks as we approach the axis of the chain forms a very interesting study for a geologist. In connection with the geology of the Himālayas I may mention the apparent scarcity of glaciers. The climate and conformation of these mountains are less favourable than those of the Alps to the production of glaciers, which, when they do occur, are generally found filling the bottoms of long trough-like valleys for many miles, and at first sight appear to be mere masses of snow. It is worthy of remark that the Hindee word 'barf,' pronounced 'burruf,' 'snow,' is also used to signify ice, the natives having but one word for both, and not seeming to recognise any difference between the two.

Of the certain *sounds* peculiar to Himālayan forests the most remarkable is one said to be the note of a tree-frog. It is only heard at night, and sounds like two strokes upon some ringing sonorous substance. In the still night air it may be heard a long way off, and is repeated at intervals all through the night. Go where you will in these mountains you arê certain to hear this melancholy note, and many and many a time, when encamped in the depths of the forest, have I lain awake listening to it.

The animal most often seen in these woods is a very large species of grey baboon, with a black face, called the 'lungoor,' which goes about in troops of from twenty to thirty. Bears, hyænas, and leopards are common. The last, though seldom seen, are very destructive to dogs. In fact one's dogs are sure to be carried off by them sooner or later unless protected by collars with good stout steel spikes. The leopard invariably seizes the dog by the neck, and if he finds he has hold of a mouthful of spikes, he lets him go again and slinks back into the jungle.

Many species both of deer and wild goats are common in

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most districts; but as so much has been already written by others on the subject of Himālayan shooting, I will merely observe that during the whole of my first trip the only four-footed game I came across was one wild pig and one or two barking deer. The latter a pretty little animal somewhat resembling a roebuck, whose deep hoarse bark may often be heard in the woods. The fact is that no large game shooting is to be obtained in these mountains without going off the beaten tracks. The route we followed, although in many places a barely perceptible sheep-track a few inches wide, was still trodden by human beings sufficiently often to scare away all wild animals; and time did not admit of our going out of our way to look for game.

Pheasants and partridges of different species we found plenty of. The hoarse croak of the black partridge was heard on every hillside, as also the 'chuck-a-chuck' of the 'chuckore,' or red-legged partridge; and we once or twice met with the beautiful little wood partridge (*Arboricola oli-vacea*). The 'snow partridge' (*Lerva nivicola*) and the 'snow pheasant' (*Tetraogallus Himalayanus*) are only found about the lower snow line, and we never had a chance of shooting them, though we occasionally heard their call. The different species of the pheasant family found in the Himalāyas are well known, and we met with all of them at different times, one species alone excepted; this was the so-called 'Argus' or *Satyra melanocephala.*

Before leaving the subject of natural history, I may mention that the only really pretty native women I ever saw in India were in the villages of Kunāwur; and that polyandry is customary throughout the hills, the usual plan being for the brothers of a family to club together and marry a wife.

I will conclude this paper with a short account of what I saw of the Eastern Himālayas, the war in Bhotan in 1865 having afforded me an opportunity of visiting that part of the country.

Starting from Caragola, on the north bank of the Ganges, a fortnight's marching over swampy plains, which in the rainy season become a vast morass, brought us to the little frontier station of Julpai-goree, where the light column of the force destined to invade Bhotan was being assembled. For the whole march the peaks of Gaurisankur (Mount Everest) and Kinchinjinga, the first and third in height in the world, had been conspicuous objects in our front, and we were now within full view of the lower ranges. On the 1st of December, 1864, the column marched from Julpai-goree, and

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two days afterwards entered the deadly belt of forest known as the 'Terrai,' which skirts the foot of the mountains. On the night of the 4th the troops encamped by the side of a stream at the commencement of the ascent of the first range, here from 7,000 ft. to 8,000 ft. high, and everywhere covered with the densest tropical forest. The Fort of Dalimkote, the first object of the campaign, was perched on a spur some 2,500 ft. above our camp. We attacked it on the morning of the 6th, and after a long day's fighting, in the course of which our troops were several times repulsed, it was carried just before nightfall. Our loss on this occasion was severe, and we had to mourn the death of three out of the six artillery officers present with the force, by an accidental explosion of a powder barrel. The fort was built on a sort of tower of rock rising from the crest of a knife-like spur. It was only accessible by one narrow pathway, and the walls were thick and high. In fact, it would have been a difficult place to get into, even if unoccupied. No wonder then that all the attempts of our Sepoys to effect an entrance in the face of a determined resistance on the part of the garrison were in vain. As it was we did not get possession of the place till a lucky 'carcass' had set fire to it and driven out the defenders. The loss we sustained was the more lamentable, inasmuch as it might easily have been avoided. Two eight-inch mortars had been, with great labour and at considerable expense, carried along with the column, and had they been employed to shell the fort, the defenders could not have remained half an hour in the place; but the artillery were not allowed to fire them. It is but due, however, to the Brigadier-General who commanded the column to state that the order forbidding their use did not emanate from him, nor was he, I believe, aware of its having been given.

A few days afterwards a small fort, called Dumsong, situated on the northern slope of the first range, was given up to a detachment of native sappers. As this was the only chance I was likely to obtain of getting a near view of the higher ranges, I applied for a few days' leave, and started for this place along with a small party of Sepoys under an officer destined to form its garrison.

The Eastern Himālayas differ in many respects from the Western. The amount of their annual rain-fall is much greater, and the vegetation, in consequence, different in character and more luxuriant. The ranges nearest the plains are covered from base to summit with a dense growth of different tropical species of trees and underwood. No sign of villages

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or cultivation is to be seen, and it is possible to travel for many days through the mountains without meeting with a single break in the forest. Of course, in a country like this, large game of different kinds is very abundant, although the density of the cover makes shooting difficult.

Leaving our camp at Dalimkote at 9.30 A.M., we commenced our march by descending to the bottom of a very beautiful glen. After crossing this, the path—a very narrow one—rapidly ascended, and soon gained the crest of one of the spurs of the first range. Before long a slight opening in the trees showed us the Fort of Dalimkote far below, and we soon began to have a fair notion of the topography of this part of the range. Its crest seemed to run in an irregular serrated line about east and west, throwing out numerous prominent spurs, which descended rapidly towards the plains, and enclosed between them very deep precipitous ravines. Every inch of the mountain side was covered with forest. As we ascended, the vegetation became rather less tropical in its character, the tree ferns and other remarkable species disappearing, and magnolias, together with a gigantic oak, taking their place. After about six hours' walking, we found we had attained the crest of the first ridge, but the thick masses of foliage still prevented our having any view of the higher ranges. The path now kept near the summit of the ridge, and some three miles of tolerably hard walking brought us to the spot where we were to pass the night. It was a little open glade in the forest, known by the name of 'Lābah,' and situated on the watershed of the ridge. Its elevation must be somewhere about 7,500 ft. above the sea. Here we found the Sappers had constructed a sort of hut with boughs of trees, and very glad we were to obtain such shelter, the thermometer having fallen to 47°.

Ever since arriving at Julpai-goree I had been worried by repeated sharp attacks of malaria fever, and by the time we reached Lābah a more than usually violent fit had come on. All night long I lay shivering in that hut, my bones feeling as if they were being smashed by heavy crowbars. Towards morning, however, the fever beginning to abate, I obtained a little sleep, and by breakfast time I was well again for the time being. We were not able, however, to resume our march, as the elephants that were bringing up provisions for the detachment had not yet arrived. About noon we heard that they were within a few miles of Lābah, so, not wishing to be delayed longer than necessary, we took a dozen Sepoys as an escort, and a native who was supposed to know the way, and started

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at 2 P.M. As we knew Dumsong to be only some 12 miles distant, we expected to arrive there before dark. The path was plain enough at first, and followed the crest of the ridge. In many places it was only about 12 inches wide, with a precipitous descent on either hand, and yet, so thick were the trees, that we never once had a glimpse of the mountains beyond. It would seem almost incredible that we could make nearly two good days' march along the very crest of a narrow mountain ridge, without ever seeing anything beyond the trees in our immediate neighbourhood; and yet such was the case.

So far we had had no difficulty in finding our way, there being but one path through the jungle. But about 5 in the afternoon we came to a spot where it branched off right and left. Our guide, without any hesitation, took the turn to the left; but before we had gone far my suspicions were aroused by our meeting an armed Bhotea, who, on seeing us, bolted off like a deer into the forest. About a mile farther on, the path began to descend rapidly; so, knowing that Dumsong was situated on an elevated ridge, I cross-questioned our guide, who thereupon admitted that he did not know whereabouts we were. We at once began to retrace our steps, feeling convinced that we were on the wrong track; but it was nearly dark when we regained the place where we had first turned off. We followed the other path as well as we could, but were before long warned of the danger of pushing on in the dark by one of the natives suddenly falling down the hillside. On lighting some dry sticks, we found that the man had rolled about 60 ft. down a very steep slope, and been then stopped by the dense underwood. Fortunately, he was unhurt; but we found that we must remain where we were till the moon rose, the path being very narrow and the slopes very steep. It was nearly 9 o'clock before the moon gave sufficient light to enable us to proceed.

Soon after starting afresh, we came to another spot where the path divided in two. It was quite a toss-up which to take, and, as it happened, we chose the wrong one. We soon found ourselves rapidly descending, the track meanwhile becoming almost impassable. We had now fairly lost our way, and our situation was by no means an enviable one. A small party, without provisions of any kind, buried in dense forests in the heart of an enemy's country. For aught we knew we might, for the last three hours' walking, have been moving farther and farther from Dumsong. We were worn out with long fasting. In fact, few of the Sepoys had tasted food since leaving Dalimkote thirty-six hours before. If we waited till

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morning, we should be no wiser than before. If we retraced our steps to Lābah, we should probably find nobody left there. Only one course was open to us. This was to try and reach some Bhotea village. We could hear dogs barking low down in a valley on our right, and determined to follow the sound. We felt that we were running rather a risk, since we were in an enemy's country, where all the inhabitants had arms, and the people of a large village could easily overpower and murder us all, should they be so disposed. However, after a short consultation, our empty stomachs decided us on making for the nearest human dwelling.

We followed the path down the valley, and before long found ourselves suddenly clear of the forest, at the upper end of some green pastures that sloped down towards a village. It was a great relief getting at last from under the trees; and a combination of meadow, forest, and blue mountain, all sleeping in the soft moonlight, formed as fair and peaceful a scene as man could wish to gaze on. But it was no time for enjoying scenery, when a few minutes more would decide whether or not we should have to fight for our lives. One of the natives with us, who knew a little Bhotea, very pluckily volunteered to go to the village and open negotiations. When he had left us, we withdrew the Sepoys just within the forest, and having made them quietly load their muskets, awaited the result in silence. After an anxious interval, our messenger returned, accompanied by three armed Bhoteas, one of whom turned out to be the head man of the village. This individual seemed, on the whole, amicably disposed. He could speak a little broken Hindostāni, and pointed out a footpath which he said would lead us to Dumsong. However, we had had enough of wandering about, and insisted on his going with us to prevent any more mistakes. This he agreed to after some demur. We trudged off again in high spirits, keeping our new friend well surrounded by the Sepoys to prevent his giving us the slip. After half an hour's very steep climbing up a forest-clad hillside, we suddenly found ourselves on the top of a bare grassy spur, and the fort of Dumsong about two hundred yards in our front, while in the distance beyond it the whole magnificent range of the Kinchinjinga Peaks lay glittering in the moonlight. Dismissing the Bhotea with a handsome present of rupees, we joyfully ran on to the fort, and found our servants had arrived some hours before, and had a capital supper ready for us; and very thankful we were for it, for we had breakfasted early in the morning, and it was now past midnight. The

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Sepoys, too, had a good feed; and well they deserved it, for I had not heard them utter a single complaint.

Judging from what we saw by moonlight, I had reckoned on having a magnificent view of the snowy ridges next morning; but by the time I awoke the clouds had settled low down on all the hills, and I had to content myself with sketching the fort—a small, strongly-built stone structure, which could have defied mountain artillery, and which, had it been defended, would have formed a formidable obstacle to our troops, as it had but one narrow entrance, and was bristling with loopholes.

I only spent two nights there, and had to return to Dalimkote without seeing Kinchinjinga by daylight. It was a great disappointment to me; for this glorious mass of mountains and glaciers must be a splendid object from such a comparatively near point of view. Before leaving the subject of the mountains, I may mention that the only species of rock I noticed in Bhotan, with the exception of a little mica schist and chlorite schist near Dumsong, was the same eternal gneiss that the Himālayas appear to be mainly composed of.

The rest of the Bhotan campaign is matter of history. After the capture of the stockade of Chamoorchi, which happened shortly afterwards, the work of the light column was finished; and jungle fever having by this time nearly finished *me*, I said good-bye to the Himālayas, and left, on sick certificate, for England.

The accompanying sketch is an exact copy of one I made on the spot in January 1865, and represents the Sikkim and Bhotān Himālayas as seen from near Julpai-goree. The distance in a direct line to the foot of the first range was about 35 miles. The snow mountains are the Kinchinjinga group. Their highest peak is about 28,100 ft. above the sea, and was till lately believed to be the second highest in the world, It has been found, however, that a peak in the Kara Korām range, north of Kashmir, overtops it by a few feet. As seen from the plains Kinchinjinga is, in my opinion, the most beautiful of all the Himālayan mountains.

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