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Diary of an Excursion to the Shatool and Boorun Passes over the Himalaya, in September, 1845. By Captain MADDEN, Bengal Artillery.

The writer of the following notes has been induced to commit them to paper, in the hope of their proving interesting, from the fact that a portion of the route traversed is comparatively little known, and so far as published information is concerned, is nearly new ground in botany; though of ornithological and entomological tours, several have appeared from the pens of Captains Hay, Hutton, &c. The tract in question is scarcely ever quoted for plants in 'Royle's Illustrations,' and the writer is therefore induced to believe that the new habitats here given, may not be without their use to some of the many travellers, who now annually cross the Himalaya, from Simla to Kunawur. To those amongst them who are novices in the mountains, he would recommend attention to the following particulars, as tending considerably to remove the difficulties, and enhance the pleasures of the trip.

1st. Avoid forming a party of more than three, in consequence of the difficulty, increasing in a geometrical ratio, of obtaining supplies and porters for a greater number.

2nd. Change the latter daily; one may thus halt at pleasure without expense, when desirable; the rate of payment is only three annas per diem instead of four, as near Simla, and the difficulty, often a serious one near the snowy range, is obviated of procuring large supplies, and of adjusting the fair rate to be paid for them; a frequent source of angry

and interminable discussion. It is also advisable to secure the coolies from fraudulent deductions by paying or seeing them paid in person. A heavy bag of pice is useful in many villages, where the inhabitants cannot often produce change for a rupee.

3rd. Encumber yourself with the least possible number of servants; but let these be able-bodied, in sound health, and warmly clothed; their falling sick will cause much delay and inconvenience; and on no account start without a small tent for their use.

4th. Let this tent (and your own) be only of such a weight that one strong man can carry it well, even when soaked with rain; and to effect this the better, let each of the party have his own tent.

5th. As the heat in the low vallies is very great, take some light clothing, and a copious sola-feather hat. If inclined to hepatitis, a doubly-lined umbrella is indispensable; and a green gauze veil or pair of goggles to protect the eyes from the glare of the snow, especially in spring; many have been temporarily blinded from this 'cause defective.' The traveller should avoid the vallies as much as possible; many of them are infested by flies of which the bites are exceedingly poisonous, and when irritated, terminate in dangerous sores. A double wax-cloth, to keep one's bedding dry, is essential, and five times as many pairs of shoes as you would expend at Simla in an equal period. The country-made articles sold in the shops there, will not, particularly during wet weather, stand more than a hard day's work on the rugged paths of the interior; and in the end, the purchase of European shoes will be found to economize cash, space, and skin.

6th. Let your cups, jugs, plates and dishes be of metal; with these only may you defy fate and falls; and as for provender to adorn them, an ample supply of tea, sugar, Carr's biscuits, hermetically sealed soup and bouilli, fowls, aliced bread re-baked into everlasting rusks, with a liberal allowance of beer, wine, and brandy, the latter precious article insured against damage by being decanted into curaçoa or other stone bottles. Nor lastly, must a liberal proportion of tobacco be excluded from the category; be assured Molière was not far wrong when he said 'Quoique puisse dire Aristote et toute la Philosophie, il n'y a rien d'égal au tabac'—at all events when jaded by a severe walk, and all other creature-comforts out of sight. Amidst the fulness and listlessness of Simla, one may dispense very stoically with many of these things, but

after the hard exercise and keen air of the mountain tops, nature asserts her rights, and speaks through the stomach, in tones which can be neither mistaken nor denied. The direction of the journey being determined before-hand, much trouble and expense will be saved by the establishment of a *depôt* at some convenient spot on the return route.

7th and last. Some quarter of a century since, Stalker, Welsh, and other out-fitters used to furnish the innocent Cadet with certain pounds of tobacco to be given to the sailors "for doing little jobs;" such, as well as presents of coarse powder and small shot—will be found really serviceable in the Himalaya, where they are all scarce and bad. A judicious exhibition of these coveted articles will often secure a cheerful endurance of cold, wet, danger, and fatigue; the fumes of the tobacco stimulating the sensorium of the mountaineer, as those of loyalty and chivalry do, or did, that of the Frenchman. It is needless to add that the contrary method of abuse, blows, and violence, irrespective of its immorality in contravening the expressed will and orders of our honourable and honoured masters, is almost sure to defeat its intention, and to lead to the desertion of those subjected to it.

September 3rd.—Left Simla with Lieutenant Bouchier, of the Artillery, and walked to Fagoo, distant eleven or twelve miles, in four hours and forty minutes. The rocks at Simla are chiefly clay and mica slate, with quartzose sandstone towards the west, and a crystallized limestone at Jutog; the road lies along the northern face of Jaka mountain, which is here composed of a deep-blue clay slate, and not of limestone, as erroneously stated by Captain A. Gerard. The forest is here chiefly formed by the Ban oak (*Quercus incana*); and in the steep precipitous ravines to the right, grows abundantly the *Deutzia Brunoniana*, which bears a considerable resemblance to the common *Syringa*. Quitting this, the road gradually ascends the south or bare side of the ridge which connects Jaka with Muhasoo: the north side is covered with a forest of Mohroo oak (*Quercus dilatata*): and at 8 or 9 miles from Simla, the summit of Muhasoo is attained, upwards of 9,000 feet above the sea; the route is latterly through a fine forest of cedar, Rai (*Abies Smithiana*), and the Kreoo or Kurshoo oak (*Quercus semicarpifolia*), and descends to Fagoo, 700 feet below, through beautiful hanging woods of maple, pindrow, or Jhunera pine (*Picea pindrow*), horse chestnut (*Pavia*

indica), below the road, and a multitude of shrubs, *Viburnums*, *Leycesteria formosa*, *Limonia laureola*, black currant, &c., under which in May and June, the large pure white ladies' slipper (*Cypripedium cornigerum*) flowers in abundance. The *Putees* (*Aconitum heterophyllum*), *Circæa cordata*, and the blue-flowering *chereyata* (*Halenia elliptica*) are also both common on Muhasoo and at Fagoo. On the pleasant downs behind this latter, the *Primula denticulata*, the sundew (*Drosera muscipula*), *Viola cœspitosa*, and the pretty little eye-bright (*Euphrasia officinalis*), are all common, though less so than in the interior.

To the resident of Cawnpore or Ferozepoor, nothing can be more delicious than the freshness of the Fagoo woods in spring. The lofty stems of the pines are enveloped by the huge ivy and *Ampelopsis* climbers; and in the autumn, when the leaves of this last turn bright red and copper, the effect is very rich, and is said to resemble that produced in the North American woods by species of oak, maple, and sumach. All our oaks here are evergreens. The *Tree-Rhododendron* and *Andromeda*, which cover whole mountains of the outer ranges, become rare at Fagoo, and are seldom met with in the interior: so very limited in width is their favourite belt. They are however abundant on the Sutlej between Seran and Tiranda. The boiling point of water is 198° at Fagoo.

September 4th.—Detained for coolies; all those available being secured for Prince Waldemar and suite proceeding to Simla, and Colonel Fullarton and his party bound for the Roopin Pass.

September 5th.—To Puralee, ten miles, in four hours; the first seven miles, as far as Synj, are for the most part a steep and uninteresting descent to the Girree; the *Morina wallichiana*, which flowers in May and June, and the *Scutellaria angustifolia* are common. The glen of the Girree is so warm for most months of the year, that it is advisable, if practicable, to descend in the afternoon and merely pass the night in it; but fishermen will run all risks, and there is said to be good fishing ten miles lower down. Puralee is about two and a half miles up the valley from Synj on the same bank of the river, which, between these villages, forces its way through a deep rocky defile on the brink of which the road is carried for half a mile. There is a good breadth of arable land in this part of the valley, and the climate being very warm, the products are nearly those of the plains—barley, wheat, kodah

(*Eleansine coracana*), cheena (*Panicum miliaceum*), till (*Sesamum orientale*), and various species of *Phaseolus*. Puralee boasts a small bungalow of one room, which is cooler than a tent, but by no means so clean, being infested with almost all the insect plagues of Egypt.

September 6th.—To Kotkhaee, twelve miles, which we walked in five hours ten minutes. The road lies for three miles or so, up the right bank of the Girree, and then crosses by a good Sanga to the left bank, along which it continues for the rest of the route in a constant and rather wearisome series of ascents, descents, and sinuosities. Kotkhaee, "the Fort of the Fosse," is a picturesque spot at the junction of several streams from the east and north, which first here give the Girree the character of a small reach, about the same size as the Hosilla in Kemaon, and like it rising short of the snowy range. The thermometer boils here at 202°, which gives about 6,000 feet elevation, about 500 more than is generally allowed to Kotkhaee. An excellent bungalow of two rooms had just been finished by Mr. Brskine, 150 or 200 feet above the left bank of the river. Across the stream, on a precipitous rock at the angle formed by the Girree, and a stream from Huttoo, is "the palace" of the Kotgooroo chief; it is an emblem of his own mind, being a ruin, which only shines under the brush of the painter. Consequent on the imbecility of the chief, the district has long been under British management. A clump of cypress (*Cupressus torulosa*) grows in the vicinity of the palace; the other trees are chiefly Kail pine (*Pinus excelsa*.) On the route to-day I noticed in the corn fields abundance of the pretty *Hibiscus trionum*, for which Dr. Royle goes as far as China. A species of *Vicia*, resembling *V. cracca*, is common amongst the thickets. Considerable quantities of iron are smelted at and around Kotkhaee, and conveyed on mules to Simla and the plains.

September 7th.—To Deorah or Dehrah, about twelve miles, in five and three-quarter hours. Three miles from Kotkhaee the road crosses to the right bank of the Girree, and then leaves the glen to ascend the Shunkun Ghatee, over the high neck joining the Koopur mountain on the SE., with Toombroo and Huttoo on the left. The Pass is probably from 9,000 to 9,500 feet above the sea, and on the ascent occur *Abies smithiana*, *Picea pindrow*, and in considerable numbers, *Populus ciliata*: this I find, the natives of the plains invariably mistake for the peepul. If the word *populus* comes from peepul, it would go to prove that the separation of

the Latin nations from the Hindoos took place after the establishment of the latter in India; the peepul not being known in the high countries to the north, whence the Hindoos are supposed to have emigrated. The converse may indeed be true, that the northern tree is the original peepul. On the grassy summit of the Pass, the *Morina longifolia*, the *Sibbaldia procumbens*, &c. are in abundance. From this point the source of the Girree may be seen to the right, at about 10,000 feet elevation on the Koopur mountain, below which the stream penetrates by a deep rocky and wooded chasm, a spur from Koopur which would otherwise turn it down by Deorah to the Pabur. The locality is well worth a visit, especially following the Chumba range from Bulsun and Puthernulla. A little beyond Koopur, and connected with it by the Puthernullah Pass of the map, is the still loftier three-peaked range in the Tiroch territory, called Kunchooa; the Urrukta ridge of Royle and Fraser, an appellation apparently taken from a fort now dismantled, and scarcely known to the present inhabitants. From the presence of birch, silver-fir, *Anagyris barbata*, &c. the Kunchooa summits are probably little under 12,000 feet elevation; there is a difficult route over them from Deorah to Choupahl *via* the Puthernullah Pass of the map. The view is fine from the Shunkun Pass, including the Jumnotree peaks to the east, the Choor, Shallee, Huttoo, Fagoo, &c. The Koopur mountain is composed of gneiss rock, like Huttoo; but the Shunkun Pass is of a decomposing micaceous shale, down which the road, some times steep and rocky, proceeds for four or five miles to Deorah, which is seen directly beneath. Deorah, often called simply Durbar, is the residence of the Rana of Joobul. The last Chief, Poorun Chund, was drugged to imbecility by his Wuzeers, in order to ensure the management of the country remaining in their own hands; this policy failed, as our Government assumed and still retains the management; but the legitimate claimant, an intelligent boy of eight or ten, is promised the restoration of the Raj when he attains his majority. His palace is an extensive and lofty square pile, surmounted by turrets, slated in the concave Chinese style, not uncommon in the Himalaya; it is picturesque and has often furnished a subject for the tourist's sketch book; the best view is from the Saree road. It stands from 6,000 to 6,400 feet above the sea, the thermometer boiling at $201\frac{1}{2}^{\circ}$, and being surrounded by high mountains, is rather a warm spot. But the traveller has the advantage

of a small bungalow, the last on the route to the snowy range. Here commences the rice cultivation so general in the valley of the Pabur. Bathoo (*Amaranthus anardana*), kodah, cheena, and tobacco, are also cultivated. The country is fertile and populous; the neighbouring mountains, especially to the south, where a long and lofty spur from Koopur extends to the Pabur—are beautifully diversified with fields, thriving villages, and pine forests, chiefly of Kail, the only species at Deorah.

September 8th.—To Rooroo Kothee in four and three-quarter hours, called fourteen miles in the route book, but perhaps not above twelve. Soon after leaving Deorah, the road enters the domain of the Ranee of Syree, leading down over gneiss rock, along the left bank of the Beeskool river, which rises from the Koopur mountain. Its banks are regularly fringed with elder trees (*Alnus obtusifolia*) here called *Koonch*, the *New* of Kunawur. Saree is about half-way to Rooroo, and is the lair of an old Ranee, once famed for her beauty, and now for litigation with her neighbours, and oppression of her people. The old lady visited Calcutta about 1822, where I saw her on a visit to the late Sir Robert Stevenson. From near Saree, which is a poor hamlet, the Pabur river is first seen, with the Beeskool flowing into it, through some flat alluvial ground by Goonsa village. Across the Pabur, on a nearly isolated hill perhaps 500 feet above it, stands the fort or castellated mansion of Raecengudh or Raecengurh, once a Ghoorka, then a British post, and since ceded to the Rana of Kyoonthul in exchange for Simla. Far above the fort, from amidst a group of minor mountains of very picturesque outline, spring the richly wooded peaks of Boorhun and Godar Deotah, to the height of nearly 9,000 feet above sea level, a branch of the Changsheel—or as it is here softened, Chaheel range. The road descends by easy gradations to the level of the Pabur, and crossing the Nye, Noye, Pursrar or Dogra, a tributary from Thana Keeshain, continues along or near its right bank to Rooroo, a few hundred yards short of which, it crosses by a Sanga, or wooden bridge, a rocky narrow chasm, ninety-nine feet deep, through which flows the Shikree Nuddee. The Pabur is here a fine, strong, and perfectly clear river, occasionally forming formidable rapids. A species of trout is abundant in it and in the Shikree, but is said to be prevented by the snow water from ascending more than ten or twelve miles higher up. The cliff

section of the Shikree exhibits strata of a micaceous sandstone, but Rooroo, Chergaon, and several other villages on the Pabur, stand on elevated plateau of gravel and boulders, from 100 to 150 feet above the present level of the river. These are chiefly devoted to rice cultivation, for which this valley, here and upwards, known as Chooara, is celebrated; the fields are abundantly, and to the traveller often inconveniently, irrigated by rills skilfully led along artificial cuts from the Pabur, originating at a sufficient distance above to admit of the highest levels being watered.

Rooroo Kothee is 5,200 feet above the sea, and is rather a hot place. The barley ripens in the latter half of May, the wheat in the first half of June; the heat is then excessive. It is not a very large village, and has a kind of square in the centre, which, were it a little cleaner, would remind one of a substantial farm-yard in England. The Mahunt or Chief Gooroo of Busehur resides here, and has large endowments in land. Owing to the neglect of the smooth-tongued Mookheea of Deorah, who promised everything and performed nothing, our baggage did not arrive till sunset, so that our breakfast and dinner merged into one, at $\frac{1}{2}$ past 7 P. M., thirteen hours after leaving Deorah; a place which economizes cash better than temper. During the day, a general assembly of the mountaineers took place under the Gooroo's auspices, for the purpose of dancing round the gods. These, however well-gilt, appear to be aired and ventilated but once a year, and were deposited in litters beneath the trysting tree in the village square, round which the people formed themselves, men and women apart, into seven squares, single rank of eight or ten each, holding each other's hands, extended behind their backs: then by a curious and by no means inelegant step, or set of steps, in excellent time, they gradually completed the circuit, the movement being combined with others to the front and rear, with repeated bowings in concert to the deities; this continued the best part of the day to the music of pipe and drum, the performers being occasionally relieved from the surrounding crowd, all seeming equally adepts. Considerable practice must have preceded so creditable an execution of this dance, and once or twice the gods even joined in the fun, which then grew more fast and furious than ever; and from the exceeding elasticity of the ash-poles on which they were carried, "their worshippers" got such a shaking as gods in the plains can never hope to enjoy.

The mountaineers of the Himalaya, like those of Gilead, invariably convert the letter *s* into *sh*: so that the Shibboleth test must be reversed to detect a Paharee; they have also retained in common use a great number of Hindooee words, which are seldom heard in the plains.

Rooroo Kothee is situated about 150 feet above the right bank of the Pabur, which, at this season is fordable here with difficulty. In common with similar valley sites in the mountains, the village is infested with a small species of fly, which, without giving any notice, inflicts a bite that is frequently attended with much irritation. The higher mountains have also in the spring, their pest, in the shape of a large gad-fly, a pitiless enemy of man and beast.

The low glen of the Pabur, while it boasts abundance of the *Rosa brunonis*, *Indigofera dosua*, *Hypericum cernuum*, *Deutzia staminea*, and other flowering shrubs, possesses few or none of the beautiful herbaceous plants of the Alpine rocks and pastures. The *Marvel of Peru* (*Mirabilis jalapa*) however, grows in the greatest abundance and luxuriance about Rooroo and several other villages, as well as about Kothaee on the Girree, and on the outer range about Barh and Kalka; the climate of the Himalaya between 4,000 and 7,000 feet elevation, brings it to such perfection that in all these places it is so completely naturalized as to appear wild. Another American plant, the *Martynia diandra*, is equally abundant near villages in the Turae of Kemaon towards Bhumouree. The *Hypericum perforatum* is a common shrub in the cornfields of the Pabur and Girree vallies; and on the rocks near Rooroo and Deorah, I noticed the *Linaria incana*, resembling in habit the *L. cymbalaria* of Europe. *Desmodium tomentosum* is also a common shrub on the rocks in the Pabur valley hereabouts, and on the Sutluj above Wangtoo bridge, preferring the warmest exposures.

There is an interesting route of three marches, from Rooroo Kothee *vid* the Shikree Nuddee, and over the Moraul ka Dunda, to Rampore on the Sutluj, halting at Samurkot and Neura (or Neheree.) The country is well peopled, and beautifully varied with forest and cultivation. In May and June nothing can exceed the beauty of the wild roses, (*R. Brunonis*) climbing up the dark pines and alders, and falling down in splendid festoons of the most fragrant blossoms. Snow will be found early in June on this route, when the heat at Rampore, immediately below is almost intolerable.

September 9th.—To Chergaon, an easy stage of ten miles up the right bank of the Pabur, which we walked in three and a half hours. The current of the river becomes more and more furious as we approach its source in the Boorhun Ghatee; and in several places, dashes along with the greatest noise and violence amongst the granitic and other boulders, which lie in its bed.

“Vexed Scylla and the sea that parts
Calabria from the hoarse Trinacrian shore,”

are smooth water compared with it even in poetry; for it must be acknowledged that in reality these classic rapids are wonderfully calm and gentle. After a few miles, the road passes under a high range of slaty mountains of a curious formation, presenting an appearance more like a series of gigantic pine-apples or cheeses, than any thing else I know of. This is owing to the inclination and interruption of the strata, which on one side present steep faces of shattered rock, while the reverse side of the hummocks, though steep, is covered with grass. There are no trees on these mountains, exposed as they are to the withering influence of the southern sun; the *Desmodium tomentosum* is, however, abundant, and the *Capparis nepalensis* creeps in patches along the face of the sunny cliffs. About eight miles from Rooroo, we passed the village of Mundlee, held in free gift by Brahmans, but also inhabited by a colony of Moosulmans, whose ancestors emigrated here from Jounpoor, three or four generations ago. They still possess the true faith and a supply of fowls and eggs. This is properly the first village of Chooara. The land is here almost wholly devoted to rice, which will be ripe in October: till, koolthee, mash, &c. are still sown, but not in any quantity; and in spring, the poppy is rather largely cultivated. Across the river on a spur from the mountains stands the romantic fort of Butolee, near a large village called Musoola; above these rise the densely wooded flanks of the Changsheel range, facing the north, and in full contrast to the mountains on the right bank, covered with forests of pine (*Pinus excelsa*, *Abies smithiana*,) &c. Should the traveller prefer it, he may, if bound from Simla to the Roopin Pass, strike up from the glen of the Pabur at Raecengurh, and follow the summit of the Changsheel range to Doodoo. This route is much cooler and more interesting than that by Rooroo; but there are no villages, and two or three days supplies, a good map, pocket compass, and guides from

Mandil village, are indispensable. A little above Butalee, the Pabur receives on the right bank the Mutretee river, from the Moral ke Dhar, consisting of lofty, broken, glacia-like ridges, the strata lying over towards the Sutluj, and probably rising to 13,000 feet. It is the continuation of the Shatool range, and divides Chooara from Dusao. By fording the Mutretee at a mill in the line of the Pabur, a considerable detour to the bridge up to its glen and a subsequent ascent of several hundred feet may be avoided; the short cut keeps close to the Pabur, but it requires a steady head to pass in safety some narrow ledges of rock, against which when the water is high, the current sets strongly, and none should then attempt it, who cannot depend on their nerves. On our return, the Pabur had fallen considerably, and we effected the passage without further inconvenience than what arose from the chilly waters of the Mutretee, which must be forded. About two miles on is Chergaon, a small and poor hamlet, about 6,000 feet above the sea, in the angle formed by the junction of the Undretee or Indravutee river with the Pabur. This impetuous torrent which is about equal in size to the Pabur, pours down south from the Shatool Pass; the bridge having been carried away, we were forced to cross its angry waters by a single tree, which my companion did unaided, while I was glad to accept the assistance of a neighbouring miller. Al-sirat itself could scarce be more narrow, or destruction more certain in the event of a slip. Chergaon is well supplied with apricot and other fruit trees, and the brink of the Pabur is shaded by alder, &c. The Toombroo peak, north of the Shunkun Ghatee, erroneously written Toongroo in the maps, is a conspicuous point from Chergaon down the glen of the Pabur.

September 10th.—To Moojwar village in Rol, twelve miles, a fatiguing march, during which we accompanied our coolies, who halted liberally to rest and smoke, so that we were eight hours on the road. For three miles the path lies through rice cultivation and brush-wood, up the left bank of the Undretee; then crosses and ascends about 500 feet to Dugol, a Brahman village of eight or ten families on the right bank, but in the map erroneously placed on the left. It is reckoned 6,800 feet above the sea, but the warm clothing of the inhabitants indicates a much colder climate than would be due to such an elevation nearer the plains. The holy fathers are small, well made, well clad men, but being afflicted with the itch, accompanied us to Rol for medi-

cine, of which, by the way, every traveller should carry a small supply to meet the demands, which will be almost daily made by patients suffering from liver, spleen, dysentery, and in short all the ills that flesh is heir to, save blue cholera; and if unflinching faith in the skill of the physician be conducive to a cure, the practitioner here should be successful indeed, for not *Æsculapius* himself was invested by the Greeks with more certain healing powers than is every European—however modest his pretensions in this department—by the mountaineers. From Dugol, the path again descends to the river, and for two or three miles keeps near its bank through beautiful English-like woods of elm, poplar, alder, cornel, (*Cornus macrophylla*) and birch (*Betula cylindrostachya*), with *Abies smithiana* on the heights. A little beyond Dugol, I found by a stream a species of *Eupatorium* in flower, much resembling *E. cannabinum*. We next recrossed to the left bank and followed it for several miles by a path often bad and rocky, and impracticable to ponies; the scenery is very wild and beautiful, the Undretee forming here, and indeed throughout the march, a series of foaming rapids: it is quite unfordable. We now once more recrossed to the right bank, and in a mile or two reached the junction of the two streams which form the Undretee—viz., the Byansoo from the left, the Sheear from the right, both flowing down from bare russet-coloured ridges, far above the region of forest, and evidently buried in snow for three-fourths of the year. The Byansoo, I believe, originates in the Jalsoo Pass, about 13,000 feet high, which affords a passage to Seran on the Sutluj. We finally gained the left bank of the Byansoo by a fallen spruce, and ascended the fork between the streams by a long and steep ascent to Cheechwar, one of the Rol group of villages, 8,600 feet above the sea, a pretty large and well-built place, one and a half or two miles above which, by an easy acclivity, we reached Moojwar. A blue aster, quite similar to the Swiss *A. alpina*; a large and handsome *Inula* by rivulets, (*I. royleana*?) the *Parochetus oxalidifolia*, the large-leaved elm (*Ulmus crosa*?) much like the Wych elm, here called Mored and Paboona, affording much fodder to the cattle, with the walnut, peach, and oak, (*Q. semicarpifolia*), are common in this district. Across the Sheear to the east, the mountains present a lofty precipitous front to the west, clothed with spruce and cedar. Across the Byansoo to the west are more bare, brown, and very rugged mountains. On the north, the Shatool is con-

cealed by rising land, but so far as one can see, the great range here is deficient in the magnificent cliffs and crags of the Roopin and other Passes to the eastward, but one is not yet high enough to judge fairly. Moojwar is about 9,000 feet above the sea; the houses large, of two stories, very substantially constructed of stone and timber. The cultivation is chiefly Bathoo (*Amaranthus anerdana*.) and Phaphur or Buck-wheat, with a little tobacco. The climate is severe and capricious, and the people seem to consider the passage of the Shatool by no means a trifle, and, as we afterwards found, endeavoured to intimidate our people by the threat that not one of them would ever return; nor was a storm of rain and thunder in the afternoon, much calculated to encourage them. The villagers have, however, agreed to accompany us, and promised to have supplies for three days all ready in the morning. They are said to have been recently implicated in a foray on their neighbours beyond the next ridge whose sheep to the number of 1,500 they carried off after the manner of Rob Roy and his Caterans. There is *no king* in the land, and every man does that which is right in his own eyes.

September 11th.—To Kala Koondar, ten or eleven miles, which took us eight hours, being much delayed by the constant halts of the coolies, by my own rests and search for plants, and, after quitting the forest, by a very difficult path. The distances indeed are but approximations, and are perhaps exaggerated; experience has shown that to the direct map-distance about one-third must be added for the road-distance, instead of one-seventh as in the plains; but Kala Koondar, and the next two stages, being "*vox et præterea nihil*" are not inserted on the maps. Soon after leaving Moojwar, we passed the hamlet Jutwar, the last and highest (9,200 feet,) on the route. Brush-wood and meadows succeed, the first formed by *Rosa sericea* (a 4-petalled white species,) *Berberis brachybotrys* (with bright red fruit,) and abundance of the beautiful yellow *Potentilla dubia*; while the pastures abound with the sessile flowered *Iris kemaonensis*; all these plants are equally characteristic of the corresponding sites above Junglig and Jaka near the Boorun and Roopin Passes. The late Dr. Hoffmeister shewed me specimens of the above *Potentilla*, if they were not varieties of *P. atrosanguinea*, gathered at and above Chitkool on the Buspa, in which some of the petals were yellow and some carmine. On quitting the

meadows, the route enters and ascends steeply through a forest of *Abies smithiana*, *Pinus excelsa*, *Picea pindrow* and *P. webbiana*, *Quercus semicarpifolia*, *Taxus baccata*, *Ribes acuminatum* (red currant) the lemon-scented *Laurustinus* (*Viburnum nervosa*), *Rosa sericea*, &c., none of the trees remarkable for size. The *Picea pindrow* and *P. webbiana* are here and at Jaka, confounded under the name of Kulrai, perhaps the Chilrow of Royle, and these unconscious disciples of Lamarck insist, that the difference in the size and colour of their leaves is solely owing to the inclemency of the wind and weather, on the exposed sites where the Webbian species is found. We emerged from the forest at a spot called Bhoojkal, 11,700 feet above the sea, and about three miles from Moojwar; the rest of the day's journey lies along the east or SE. exposure of the mountains, destitute of trees, but covered with a new and rich series of Alpine plants. A little beyond Bhoojkal and on the same level, Reoonce, sometimes used as a halting place but a very bad one, occurs; and hereabouts much ground is lost by several steep descents to torrents by rather dangerous paths. Above, to the left, the mountains exhibit bare, but not precipitous shelves of gneiss rock, inclined from the route; to the right are deep glens, woods, torrents, and a few beds of snow, all wild, lonely, and sublime. Kala Koondar is an open but steep spot in a grassy, flowery glen, facing south, about 300 feet above the forest, and 12,000 above the sea, on a level with the Choor summit, which is visible to SSW. We encamped amidst heavy rain and hail from the north, which rendered the grass very cold and wet for our people and ourselves too, having been compelled for want of hands, to leave our charpaees on the road to-day. In these difficult tracts a good tarpaulin under one's bedding is much more conveniently carried than a bedstead, and excludes the damp almost equally well; where both are absent, a very excellent substitute is a thick layer of pine or yew branches.

The creeping juniper, here called Theloo but in Upper Kunawur Pama (*Juniperus squamosa*), commences from 800 to 1,000 feet below Kala Koondar. The open pastures are covered with a profusion of alpine flowers among which are the *Cyananthus lobata* (called Kheeree), the *Dolomicea macrocephala* (Dhoop or Googul), *Saxifraga parnassiaefolia* (or a species very like it, also found on the Choor), and (on rocks) *Saxifraga mucronulata*, *Sieversia elata*, *Swertia cœrulea* and several other species, (one, a large plant with pale blue blossoms is probably

Royle's *S. perfoliata*), the *Sphelia latifolia* of Don, *Polygonum molle* (or *polystachyum*), *brunonis*, and *vacciniifolium*, (the last on rocks, a beautiful species), *Lonicera obovata*, *Senecio nigricans*, *Achillea millifolia*, a yellow *Tanacetum*, *Oxyria elatior*, *Sibbaldia procumbens*, *Spiroea kamschatkika*, (very like meadow-sweet), several *Sedums*; *Morina longifolia*, *Caltha himalensis*, *Delphinium vestitum*, *Aconitum heterophyllum*, *Phlomis bracteosa*, *Corydalis govaniensis*, *Geranium wallichianum*, *Picrorhiza kurrooa*, and many more. *Rhododendron campanulatum*, is common in the region of birch, and is called Chumreesh, Simreesh, Simrat, Simbur, &c.; and above it is the much smaller *Rhododendron lepidotum* or *anthopogon* with aromatic leaves, smelling when bruised like those of walnut; it is called Talsur. The capsules are in dense terminal clusters, and the flowers are said to be red. *Gualtheria trichophylla* with its beautiful azure fleshy calyx abounds on the sunny banks. The above are so general in all the region above the forest on the Snowy range, that it will be needless to specify them on every occasion. The *Cyananthus lobata* covers extensive tracts with its blue (occasionally white) periwinkle-like flowers; at and above Nooroo Bassa on the north side of the Roopin Pass, I found the seed ripe on the 20th of September, while lower down, the plant was still in full bloom. In the same way, on the Changsheel Range, *Morina longifolia* was all ripe on the 25th September, while on the 30th, it was still in full flower on Huttoo. *Rhododendron arboreum* flowers in February and March at 7,000 feet, and is not ripe till Christmas; but *R. campanulatum* and *anthopogon* (*Talsur*) which flower in May, June, and July, at 12,000 feet, are ripe by the end of October. A strange alchymy of nature this, to ripen her products first in the colder sites, but perhaps necessary to the existence of plants in these elevated spots, where but for this provision, the early winter would prevent their ever coming to maturity. "Il est démontré (says the brilliant Frenchman,) que les choses ne peuvent être autrement: car, tout étant fait pour une fin, tout est nécessairement pour la meilleure fin. Remarquez bien que les nez ont été faits pour porter des lunettes, aussi avons nous des lunettes. Les jambes sont visiblement instituées pour être chaussées, et nous avons des chaussures. Les pierres ont été formées pour être taillées, et pour en faire des châteaux, aussi monseigneur a un très-beau château; et les cochons étant faits pour être mangés, nous mangeons du porc toute l'année."

The *Dolomicea macrocephala* is a very common plant in all the upper Himalaya: Royle's plate, perhaps for want of space, represents the leaves erect, which are naturally quite procumbent; the root is highly valued as incense, and as such, is presented to gods and rajas. The *Picrorhiza kurrooa* grows abundantly on dry rubble from Kala Koondar to a great height on each side of the Shatool Pass, but I did not notice it elsewhere; the root is excessively bitter, and is sold under the name of Kurrooa in the Simla Bazar; it is the Kutkee of Kemaon.

September 12th.—To Doodach, eight or nine miles, which our coolies performed in four and a half hours. The route is much better and more easy than yesterday's, gradually rising over slopes, for the most part gentle, and crossing many rivulets from the left, some of them chalybeate. The banks of these exhibit in some places great walls of gneiss rock. The forest is now entirely lost sight of, and fuel must be brought in from Kala Koondar. Doodach is an open and level spot, well adapted for an encampment; it must be fully 13,000 feet above the sea, and is probably identical with the Kuneejan, of Gerard. We had hard frost at night. The Undretee, a mere rivulet, rises in a bed of snow, a little higher up, and flows about 200 feet below us. Immediately above it, the opposite bank rises to a very great height, in a magnificent façade of bare gneiss cliffs, the ledges supporting deep beds of snow, and terminating to the north in a steep conical peak, called the Dhuneer ka Thood. From these crags several avalanches of rock fell down at night, with the noise of thunder. Between our camp and the base of the Pass (about a mile,) the rock is quartz, in immense *coulées* of shapeless masses, heaped together without order and very difficult to climb over. They have fallen from a huge and very curious rectangular mass, which forms the western side of the Pass. Several interesting plants abound here; the *Saussurea* or *Aplotaxis gossypina*, clothed in dense wool, raises its conical form every where on the rocky rubble to the top of the Pass, resembling a vegetable spectre. It is called Kusbul, Munna Kuswal, and Bhoot-peah, and is offered to the gods, who have evinced their care and favour by clothing it so warmly, exactly as they have protected the yak and alpine goat with a thick *waistcoat* of *pushmeena*: Another *Aplotaxis* is defended by a different contrivance; the leaves are gradually converted into large yellowish transparent bracts, enclosing the colts-foot-like blossoms as

if in a head of cabbage. This plant is common amongst the large rocks from Doodach nearly to the summit of the Pass, and is also sacred. It is called "Birm (or Brem) Kounl (or Kouwul)," i. e. "Brahma's Lotus;" a similar species on the high mountains behind Cheenee, has a strong odour of musk.

Fraser found the "Birmah Counla" on the Bumsooroo Pass, between Sookhee and Jumnotree, and describes it thus—Stalk covered with large and long leaves, somewhat like those of a primrose, ending in a cup like that of a tulip, appearing merely the continuation of these leaves, closing and forming the petals of a very noble flower, in the centre of which the stamina and pistil are seen. Petals greenish towards the base, but the middle and higher parts are black and yellow, as is the centre of the cup, but more vivid. The latter part of the description appears derived from a *Fritillaria*, and very possibly from the same plant which, "Pilgrim" (pp. 66, 67) says is so beautiful at Kadarnath in April: and though growing on the hard ground and out of the melting snow, is called "Lotus." In Kemaon, the *Iris nepalensis* is known as the Neela Kumul, or blue Lotus; and is a favourite plant with fukeers, &c.

Amongst the other plants found at Doodach and on to-day's route were two species of *Aconitum*. One, which seems to be known as *A. dissectum* (*Hamiltonii* or *Speciosum*) abounds at this elevation, and has the leaves cut into five segments, with light blue blossoms. It is called here Doodhiya Moura, but in Kunawur, Tilia Kachung. The other species, *Aconitum ferox*, is called Moura-bikh, or simply "Mora" (from mri, to die,) and is reckoned extremely poisonous. It only occurred in one spot, a mile or two above Kala Koondar, growing in an extensive patch, the stems from four to six feet high, with long dense racemes of splendid deep blue flowers: the follicles three. The mountaineers were shocked when I told them that an equally deadly species was a favourite flower in our English cottage gardens, where they concluded it could only be planted in the view of occasionally getting rid of a superfluous boy or girl. The handsome *Ligularia arnicoides* (figured by Royle,) was in full bloom every where about and above Doodach, and in similar situations all over the Snowy and Changsheel ranges. On the south side of the Roopin Pass there is another species, with reniform leaves. By the rivulets on the route, and high upon the Pass, the *Primula stuartii* and *P. purpurea* are abundant, and now with ripe seed. They are both

called "Jy-be-Jy" or "Jyan," and are very ornamental in May, June, and July. With these occurs a very handsome species of *Dracocephalum* or *Lanium*, called Gurounta, with a strong camomile odour when bruised. On bare rocky ground from 12,800 feet upwards is found the *Centaurea* (*Aplotaxis*) *taraxicifolia*, the "Dhoopree," with heads of purple blossom and a delicious fragrance like that of the sweet colt's foot. The showy musk-scented *Delphinium* (*brunonianum*?) grows near the foot of the Pass, and is called "Soopaloo," "Ruskur," "Ruskachung:" it is, I believe, the "Liokpo," of Upper Kunawur, and is a curious illustration of the association in these lofty regions of musk in the vegetable as well as the animal kingdom. The *Hymenolæna* *Govaniana*, and several similar *Umbelliferae*, with bracts greatly developed and beautifully fringed with white, are common, some of them attaining the crest of the Pass; among those lower down is one with decomposed leaves, of a strong aromatic parsley-like fragrance, here called Nesir, and mentioned by Fraser as occurring near Jumnotree, under the name of Mahee. All this lofty region (from 12,000 to 13,000 feet) abounds with the *Kanda*, a species of prickly *Meconopsis*, probably *M. nepalensis*, in form like Royle's *M. aculeata* (which in his plate seems too deeply coloured,) except that the flowers are of the most lovely azure. Amongst the Doodach rocks grows the *Sedum himalensis*, very like the *Rhodiola rosea* of England, and amongst the rocks and snow at the source of the Undrettee I found the *Saxifraga granulata* of England, and a *Ranunculus* (*choorensis*?) much like the *R. glacialis* of Switzerland. Such are a few of the plants which "blush unseen" on these desolate wilds; a more leisurely examination would easily double the number. Nature, where she cannot be useful, seems determined to be ornamental, and converts these tracts where grain will not ripen, into pastures and flower gardens, where thousands of butterflies and insects enjoy their brief existence. The utility of nature must not indeed be limited to man, for there is scarcely one of these plants, the seeds of which do not support myriads of insects as well as many birds; and the highly successful experiment at Muhasoo is a sufficient proof that many of the forest tracts at least, and perhaps even the pasture lands above them might, by a moderate expenditure of industry and enterprise, be rendered available for the production of excellent potatoes, and thus enable the Himalaya to support

double or treble its actual population. Judging by the produce of the flocks and herds which now partly graze on these pastures, the soil and grass must be faultless; every traveller is struck with the quality of the milk—as rich as cream—at Rol, Jangleeg, and Jaka, placed at the lower limit of the belt where cultivation now ceases.

September 13th.—From Doodach over the Shatool Pass to Ateeng Wodar, twelve to fourteen miles, in somewhat under seven hours. An experienced native of Rol had earnestly advised us not to attempt the Pass unless the day were fine, and we were so far fortunate as to have a cloudless morning, and reached the summit, perhaps four miles, in three hours, mounting at a very easy pace; the ascent, indeed, is less fatiguing than that of the Choor from Seran; and on its completion we experienced none of those feelings of headache, giddiness, distress in breathing, &c., described by many travellers, and very sensibly felt by myself on a former occasion on the Roopin Pass. The route lies up over the frozen snow bed of the Undretee, and then up one steep continuous tract of broken, angular, masses of gneiss rock, of which there is a steep escarpment to the right, capped by a thick bed of the purest snow. The *col*, or semicircular summit of the Pass, is in its whole extent furnished with numerous piles of stones called Shoogars or Thooas—the “Ebenezers” of grateful and successful passengers; in number and height far exceeding those on the Roopin and Booran Ghatees; the pillars being apparently in a direct ratio to the piety and the fear of the passengers, and the difficulty and danger overcome. Our men had provided themselves with stores of flowers, chiefly the Kounl and Munna-kuswal saussurea, and the musk larkspur, which they tied in long garlands, and with which they decorated, first the pillars, and then, on the Hindoo principle of “Pürmeshwür-hai,” ourselves. They clearly fancy their gods to be as fond of musk as they are. On so cold a site, a few faggots of wood would be a more rational offering; but as their evil genii and demons are lodged in eternal fire, it is quite logical to locate the gods in eternal cold and snow, and it is remarkable that he who was prophet at Medina, and impostor at Mecca, also patronized this notion, for he affirmed that, when touched by the hand of Allah, the sensation was that of intense cold. On our return by the Roopin Pass, the garland ceremony was dispensed with, each man merely tearing a small portion of his clothes, and suspending it on the pillars, a custom

universal in these mountains, where we observe a bush or tree on each more eminent pass, ornamented with votive rags of all colours, precisely similar to those about holy wells, &c., in Ireland. With respect to vegetation, the *Primula purpurea* and *Sibbaldia purpurea* grow very high upon the south side of the Pass; the two *Saussureas*, a large *Sedum* (probably *S. asiaticum*), a *Rumex*, and a pretty pink *Corydalis* (either *hamiltonii* or *meifolia*) reach the crest; and *above* that of the Roopin, I found patches of *Potentilla inglesii*; so far are these elevated ridges from being entirely forsaken by Flora!

The right or eastern portal of the Shatool Pass is formed by the pinnacle of rock, 1,500 feet high, and 17,000 above the sea, visible from Doodach; it is called Dhuneer ka Thooa (the Dunerko of Gerard,) from the Mookheea of Rol, who bribed a bold adventurer with a hundred rupees to scale it, and erect a pile of stones in honour of the Deotahs and himself. Moore tells us, that the schoolmen used to debate how many angels could dance on the point of a needle without jostling each other; and some of these Himalayan needles are so sharp, that the same question naturally suggests itself with respect to the thirty million of gods which the Hindoo Mythology has peopled them with. The Dhuneer ka Thooa sends down to the north a broken serrated spur, which falls to the west in a lofty and most superb escarpment of naked rock, which lay on our right as we descended. Looking down to the north, through the long vista of the glen, we had a glorious though somewhat limited view of the lofty peaks of the snowy range beyond the Sutluj, separating the Busehur district of Wangpo, north of the Wangtoo bridge, from the districts of Manes and Dunkur, in Speetee, and crossed by the Taree Pass, 16,400 feet above the sea. In some of our maps this range, or its outliers behind Kanum and Cheenee, is called the Damak Shoo, probably from the prevalence of the *Damak*, or various species of *Astragalus*, *Caragana*, &c. which grow there, and which our travellers in Upper Kunawur call Furze.

The Shatool Pass is 15,550 feet above the sea level, nearly 100 feet below the top of Mont Blanc; and was first crossed in June 1816 by General Hodgson. It is distinctly visible about E. 24° north from the top of Jaka at Simla, a degree or two to the left of Colonel Chadwick's house on the Muhasoo ridge, lying between two of those conspicuous inclined peaks of which the rocky planes slope down to the east and

ESE. at angles of from 10° to 20° , considerably to the right of the three-grouped and similarly inclined peaks, often but erroneously pointed out as the Boorun Pass. It is owing to this conformation of the strata that the routes up the vallies near this portion of the Snowy range invariably keep to their western and SW. sides; on the opposite ones, the strata "crop out" in inaccessible crags.

Beautiful are the "balancings of the clouds" at this and the past season in the Himalaya, and the endless variety of light and shade, which they cause on mountain, forest, field, rock, and meadow. No sooner has a shower fallen, and the sun shone out, than the process of evaporation commences in the heated vallies; the rising vapours are condensed at a given elevation into clouds, which, with a snail-like movement, creep up the mountain sides, and invest the summit or languidly tumble over the ridge into the next valley; "even in their very motion there is rest." Occasionally an entire valley or large tract of the mountain is covered with one fleecy mass, on which the spectator looks down as on a sea, a lofty peak here and there jutting up like an island. It must be confessed, however, that they are best at a distance and in poetry. Disagreeable at Simla, they are dangerous on the Shatool, where we had not been above half an hour, on the narrow crest, when from the south, clouds

"Rose curling fast beneath us, white and sulphury,
Like foam from the roused ocean of deep hell,
Whose every wave breaks on a living shore,
Heaped with the damned like pebbles!!!"

The wind also being very keen, and our only seat the snow, we effected a speedy retreat down the great northern snow-bed, of which we only reached the termination in an hour and three-quarters. The upper portion had been covered to the depth of two or three inches by a recent fall. To this succeeded a wearisome and, in many places, very steep and difficult *moraine* composed of enormous sharp, shapeless, fragments of gneiss piled on each other in wild confusion, the lowest ones resting on frozen snow. These would indeed prove "destruction's splinters" to the unfortunate, overtaken here by a snow storm, which would paralyse his hands and feet, and blind his eyes—all most essential accessories now; and accordingly this was the scene where Dr. Gerard in September 1820, had two of his people frozen to death at midday, and escaped

himself with great difficulty and the loss of all his baggage. In no month is the passage perfectly secure. It is effected with least difficulty early in spring, as the snow then covers all the rocks which so much impede one's progress; but I am not aware that the natives ever attempt the Shatool till the rains have set in; and even on the other Passes clear and perfectly *calm* weather is indispensable to safety.

The scenery on the northern declivity is wild and savage indeed: to the right are the magnificent black cliffs before mentioned, which, from the summit, slope back gently in great fields of snow, of the most dazzling whiteness; deep beds also lie at their base. To the left the mountains are more bluff and rounded but still greatly shivered. The Moraine ends to the north in a steep escarpment, and latterly our route over it, lay on the ridge of a very curious *bund* of snow, rubble, and rocks, about sixty feet high, and very steep on both sides, and apparently artificial as any railway embankment. Except that frozen snow is substituted for ice, the whole scene greatly resembles the Mer de Glace, and other glaciers of Savoy and Switzerland. A turbid stream issues from the base of the great snow-bed, and is joined by several torrents from the left; the combined stream a little below flows placidly for a while over a nearly level dale. During the day time the powerful rays of the sun melt the whole surface of the snow beds, and these torrents become unfordable: but at night, when all is re-frozen, they are dwindled to mere rivulets, only supplied from the bottom of the snow-beds being melted by the heat of the earth, and hence they are easily crossed in the morning. Below the moraine, the mountains rise steeply on each side, covered, especially on the left, with grass and herbage, now of a rich raw-sienna tint forming a strong contrast with the great beds of white-quartz masses, which on this side extend down to the valley, reflecting a most intolerable glare. The path, a very narrow and bad one, finally keeps close to the left bank of the stream, and so continues to Ateeng Wodar, a summer station for shepherds, equivalent to the *chalets* of the Alps, except that the Himalayan mountaineer is generally content with the shelter of a cave in the rocks, sometimes a little improved by a rude wall in front. Ateeng is nearly in the latitude of Rampoor, a short distance above the birch forest, about 12,000 feet above the sea, and perhaps nine miles from the crest of the Pass. The valley is narrow, and destitute of the savage features it possesses above.

but across the torrent to the east, the mountains are still very steep, bold and lofty, with many deep ravines filled with snow.

The vegetation consists here of *Delphinium vestitum*, *Dolomicea macrocephala*, *Cyananthus lobata*, *Onosma bracteata*, aromatic rhododendron, and *Cassiope fastigiata* ("Talsiree") the "heather" of Fraser; with it grew a shrub with all the appearance of a *Vaccinium*, but with neither flowers nor *fraochans* to enable one to decide. Between Ateeng and the moraine, the *Salix lindleyana* creeps abundantly on the ground, and Royle's *Arenaria festucoides* is not uncommon; on the moraine itself was a plant very like his *Saxifraga imbricata*, abundance of *Ranunculus choorensis*, and one or two *Gentians*, in flower. These mountains no where exhibit the carpet of blue *Gentians* and *Campanulas* so lovely in the Alps. On the gravel beds and banks of the stream, the *Epilobium speciosum*, perhaps the finest species of the genus, grows in abundance.

The chief reasons for the Shatool Pass being so much dreaded are first—the intrinsic difficulty of the northern moraine, as well as the descent from Ateeng to Panwee, where the path is so narrow that even laden sheep pass with some risk: and secondly, the remoteness of supplies, fuel, and places of refuge. The Roopin and Boorun Ghatees have each a village within one stage of their southern base, and on the north, the valley of the Buspa is easily gained in one day by tolerable paths. Laden men cannot reach the Shatool from Rol in less than two days; and at Ateeng Woodar, on its north side, they are still distant a very hard day's journey, by an execrable path, from the valley of the Sutluj.

September 14th.—From Ateeng Wodar to Panwee, near the Sutluj above Wangtoo bridge, a distance which we estimated to be sixteen or seventeen miles, with a descent of 6,000 feet; a very fatiguing march, which we walked in eight hours, inclusive of several halts. In the contrary direction, it would indeed be a tremendous journey, and should be divided by all who travel for pleasure or profit. The route, by a bad pathway, gradually rises along the Alpine pastures, occasionally traversing a dense coppice of *Rhododendron campanulatum*, *R. anthopogon* (or *lepidotum*, the aromatic species) and mountain ash (*Pyrus foliolosa* or *ursina*), the latter in full fruit, the berries occasionally of a beautiful waxy white, a variety probably of the usual red-fruited species,

which I have also received from the Harung Pass above Sungla. It forms a favourite food of the bears which are numerous hereabouts. Mingled with and below the Rhododendron and mountain ash to the right, are extensive shaggy woods of large white-barked birch (*Betula Bhojpatra*,) recalling many a romantic spot in the Trosachs, Glengariff, and Capel Carrig. The bark consists of as many as twenty layers, and is much employed in Kunawur in the flat roofs of the houses, where it is laid under a stratum of clay. Supposing the Himalaya to have emerged gradually from the ocean, this "tree of knowledge" may be held the last best gift of heaven to man in the vegetable way, for it could not exist till the mountain had attained an elevation of 9,000 or 10,000 feet; the silver fir, (*Picea webbiana*) must be nearly of the same age, and thus we may form a comparative chronology of the dates at which the various trees were successively produced. Quitting the birch braes, we encountered a steep ascent under fine gneiss crags and pinnacles, with tremendous declivities on the right hand, which brought us to the crest of the Ootulmai Ghatee, (called Gongrunch or Shaling by Alex. Gerard,) where the path turns to the left, and leaves the Shatool glen. Hence to Panwee is one almost uninterrupted and generally extremely steep descent for a few hundred feet, over loose rugged rocks, covered with the large and now scarlet leaves of *Saxifraga ligulata*, and then through a superb forest of *Picea webbiana* and *Quercus semicarpifolia*, both streaming with long white lichens, also birch, and a dense underwood of mountain ash, *Rhododendron campanulatum*, *Rosa webbiana*, *Syringa emodi* (Lilac,) black and red currants, yew, &c. At the bottom of this glen, perhaps a mile down, we reached a small romantic dell, through which flows the Skooling or Shaling stream, and here the scenery is of a Titanic grandeur and wildness. On all sides, feathered with the dark silver fir, vast precipices spring up perpendicularly, and seem utterly to preclude further progress; it seems as if one had reached the gates of Hades. On the brink of the stream the Greek Valerian (*Polemonium cæruleum*,) and the lovely azure blue hound's tongue (*Cynoglossum uncinatum*,) were flowering in abundance. God might have made a more beautiful flower than this last, but he never *did*, as some one has justly observed of the strawberry as a fruit. Exit from this spot seems as impracticable as from the happy valley of Rasselas, and is only obtained by a short

sharp clamber, which introduces the wayfarer to the Panwee Dhunka, a distance of three miles, the most dangerous I ever traversed ; the path so called, being excessively narrow, and carried along vast ledges of rock, inclined at a high angle to a bottomless pit on the right, from which they rise at an equally steep angle on the opposite side. I cannot recollect such enormous shelves of rock elsewhere, nor, except the Via Mala on the Splügen road, and the gorge of Gondo on the Simplon Pass, an abyss more profound. Neither of these, however, can compare with the Panwee ka Dhunka in the extent and luxuriance of forest, which here clothes the mountains above and below, to the right and to the left. The Skooling falls in a fine cascade down to the right at such a depth, that one can scarce bear to glance at it, save from such "coigne of vantage" as a tree growing from the cliffs. "The least obliquity is fatal here," and no one should attempt the passage who is not well assured of his nerves, or weary of his life. Bossuet has a passage so eloquent, and so apt to such a situation, that my readers, if any, will be pleased at its insertion here.

"La vie humaine est semblable à un chemin dont l'issue est un précipice affreux. On nous en avertit dès le premier pas : mais la loi est portée, il faut avancer toujours. Je voudrais retourner en arrière : Marche ! marche ! un poids invincible, une force irrésistible nous entraînent ; il faut sans cesse avancer vers le précipice. Mille traverses, mille peines nous fatiguent et nous inquiètent dans la route. Encore si je pouvais éviter ce précipice affreux ! Non, non ; il faut marcher, il faut courir ; telle est la rapidité des années. On se console pourtant, parce que de temps en temps on rencontre des objets qui nous divertissent, des eaux courantes, des fleurs qui passent ! On voudrait s'arrêter : Marche ! marche ! Et cependant on voit tomber derrière soi tout ce qu'on avait passé : fracas effroyable ! inévitable ruine ! On se console, parce qu'on emporte quelques fleurs cueillies en passant, qu'on voit se faner entre ses mains du matin au soir, et quelques fruits, qu'on perd en les goûtant : enchantement ! illusion ! Toujours entraîné, tu approches du gouffre affreux : déjà tout commence à s'effacer, les jardins moins fleuris, les fleurs moins brillantes, leurs couleurs moins vives, les prairies moins riantes, les eaux moins claires ; tout se ternit, tout s'efface. L'ombre de la mort se présente ; on commence à sentir l'approche du gouffre fatal. Mais il faut aller sur le bord. Encore un pas : déjà

l'horreur trouble les sens, la tête tourne, les yeux s'égarerent. Il faut marcher : on voudrait retourner en arrière ; plus de moyens : tout est tombé, tout est évanoui, tout est échappé!" and it was our fate to escape these very literal precipices by an abrupt descent to Panwee, all through a dense and lofty forest, excepting the last 500 feet, which lead to the village through terraced cultivation. The forest trees occur in the following descending order—*Picea webbiana*, first alone, and then mixed with *P. pindrow* and *Quercus semicarpifolia*; then *Abies smithiana* and *Pinus excelsa*, many of the latter fully 150 feet high. Lastly, the cedar feathers all the bold crags about the village, which across the Skooling torrent to the east rise precipitously into a lofty peak, arguing no easy marches ahead.

We encamped by a temple where our people found excellent shelter from the brisk showers which fell in the afternoon. A thick bush of sacred juniper grows in the enclosure, and the vicinity is well shaded by horse chestnut (*Pavia indica*), elm, peach, apricot, walnut, and mulberry trees. Panwee is a middling-sized village, above the left bank of the Skooling river, two or three miles from Wangtoo bridge, and from 1,300 to 1,500 feet above it. From several points above the village, the Sutluj, with the road to Chegaon, is visible; as well as the wild glen of the Wungur, which joins at the bridge in one succession of cataracts. By visiting Panwee, we have enjoyed some of the sublimest scenery in the world, at the expense of a stage on our way to Sungla, for the direct route follows the Shatool stream to Melum, but our guides were, or pretended to be, unacquainted with it, and on enquiry here, we found that it is really impracticable to men with loads; and have every reason to believe it must be extremely difficult without that encumbrance.

September 15th.—To Melum or Ramné (the Melung of the map), about ten miles in seven hours, by a difficult route, the path being for the most part as rocky, and in some places as dangerous as any we have traversed. At one almost impassable ledge, one of our dogs fell and had a narrow escape. (By the bye, dogs should not be brought into these parts—being perpetually in the way, to the risk of their own and their master's necks.) In several places jutting crags are only passed by the aid of the ladders, scaffoldings, and steps, so familiar to the traveller in Kunawur. On leaving Panwee, there is a steep declivity to

the torrent, which here forms a pretty cascade, as does that under Melum, about a mile short of the village. The vegetation here consists of rank grass, reeds, &c. Hence there is a considerable ascent to a point affording an interesting view of the Sutluj, and its picturesque rocky gorge where spanned by the Wangtoo bridge. Our path then led us down to the left bank of that river, now rolling along an impetuous torrent of milky water. A long ascent succeeds, with the river from 300 to 1,500 feet right below; and above us to the right hand long craggy façades, bristling with cedar which abounds hereabout. The road to Cheenee lies down on the opposite bank of the river. From the brow of the last ascent our path turned to the right up the glen of Melum, and met the Shatool Pass torrent in about two miles, where it has deposited an immense accumulation of drift timber, the spoils of the forests above. The trees on its banks here are chiefly *Alnus obtusifolia*, *Rhus buckiamela*, and *Spiræa lindleyana*. A gentle ascent of about a mile and a half brought us to Melum, also called Ramné, a small but well built village, about 7,000 feet above the sea, standing on a plateau, closely backed by steep woody mountains. By avoiding the last steep ascent to-day, and keeping direct on to the mouth of the Melum river, we might perhaps have reached Keelba; but the gentlemen and ladies who carried our baggage assured us, we should repent if we tried the very bad ascent from that stream.

September 16th.—To Keelba, about nine miles, which from the excessive ruggedness and difficulty of the worst path in the world, and its manifold steep dips and rises, we only accomplished in five and a half hours. First we descended to, and crossed a torrent below Melum, and then mounted by Yana or Janee village, till we came abreast of Chegaon or Toling, and on a level with it, 7,225 feet above the sea. It consists of a group of villages, with several large temples and extensive cultivation. On the crags at this point, I noticed the *Incarvillea diffusa* of Royle, an elegant plant which is also found on the Wangtoo rocks. Hence the path falls to the Sutluj, and leaving Poonung above to the right, continues along its brink for a few miles over boulders, gravel, and sand, overrun by a shrubby, silvery, and very aromatic *Artemisia*; the river is fringed by the "Wee," a species of olive, probably *Olea ferruginea*. The toom or ash, *Fraxinus xanthoxyloides*, is common, but of no great size. It is frequently met with in the higher parts of

Kunawur, and is known about Rampoor, as the Gaha or Ungah. The very jaw-breaking specific name is very justly applied. The *Daphne mucronata* of Royle here becomes a common shrub, called jeekoo; and near Yana, I first met a species of *Celtis*, called koo, of which the drupe, now ripening, of the size of a small cherry, is sweet and edible. There are two species or varieties; one a large tree called Ro-koo, with black or dark purple fruit; the other, Cho-koo, smaller, has yellow or orange fruit. This, and not *Elæagnus*, as surmised by Royle, I take to be the "red and mawkishly sweet berry," produced on a shrub in Hungrung, as mentioned by Herbert (*Asiatic Researches*, XV. 392.): as his "yellow and acid berry about the size of a currant," is no doubt the fruit of the Soorch (*Hippophæ salicifolia*). The Koo is pretty common nearly up to Brooang, at Meeroo, &c. It has been mentioned to me by a friend as occurring under the name "Kaksi" near Jungee, where, however, a subsequent enquirer could hear nothing of it: in all likelihood because the first had been misinformed as to the name; "Kagshee" being the *Cornus macrophylla*, which has a leaf like the *Celtis*. Both the *Celtis* and the *Zizyphus* have been identified with the famous lotus of the Lotophagi; but assuredly one may devour any quantity of Koos or Bers, without risk of forgetting one's home and friends. A little below Panwee, and generally up the left banks of the Sutluj and Buspa to Brooang, at an average of 6,000 feet, there is abundance of a species of oak, which I have not met elsewhere, though it seems to be the *Quercus cassura*, of Don's *Prodromus*. The leaves are exceedingly waved and spinous, tomentose below (as are the cups of the acorns, which are produced by six to eight) or solitary, on spikes or peduncles of five or six inches. They are now nearly ripe. The tree is called "Bré," but this seems to denote the genus only. *Pinus gerardiana* is pretty common, but not very large on the crags, during this day's journey:—and in the coppice, *Abelia triflora* occurs abundantly, here called "Spung:" the "Takla" of Bulsun and Bhujee.

From the river-bank, the path now ascends for two miles or so, to a few hundred feet above its level: another rainy season will, to all appearance, render it impassable, and it is now as dangerous as can well be imagined, crossing a vast landslip with a most precarious footing on loose sand and rocks, highly inclined, where each step receives and requires more deliberation than an act of Parliament.

What has been done once may be done again, but no reasonable man would attempt this a second time. The reward consists in the view of the river, here not above ten yards over, "a hell of waters" rushing on, like Pyriphlegethon, in perfect cataract, boiling, foaming, and tossed up vertically in one continuous mass of spray in its ungovernable career, amidst immense boulders, and under the tremendous precipices of the right bank, which it seems bent on undermining. What an anti-thesis between its recent quiescent state and gentle fall as ice and snow, and this unruly turbulence, and then its almost stagnant course onward to the ocean, where it enters on its final probation as vapor, realizing the hell imagined by Shakespeare :—

" To reside
In thrilling regions of thick-ribbed ice;
To be imprisoned in the viewless winds,
And blown with restless violence about
The pendent world."

Above this, the river receives an affluent from Meeroo, and on an isolated rock, just above the junction, stands the Raja's Castle of Gholing, the Chalgee of the map : still higher up, the Channel widens, and the river flows with a strong uniform current, bounded by a broad bed of shingle on its right bank. The Sutluj may here be said to effect its passage through the great range, and, generally, the traveller cannot fail to be surprised at the manner, almost resembling instinct, in which the river finds its way through such a labyrinth of mountains. It has here indeed followed the natural line of a vast echellon formed by the Shatool ranges to the south, and those of Speetee and Koolloo to the north : and from the Thibet frontier at Shipkee to Rampoor has an average fall of sixty feet per mile. The absence of lakes, and the existence of so general and efficient a system of natural drainage seems to argue the vast antiquity of the Himalaya, and may also serve to establish Lyell's theory of a gradual upheavement of mountain chains, which afforded time for the water to adjust their levels ; and to fill up the basins with those deep deposits of gravel and boulders, through which they are so often found to excavate their beds. The planes are indeed still far from uniformity ; and the roar of the torrent and the cascade, the sound of many waters, is rarely out of our ears as we approach the higher mountains.

From the rapids of the Sutluj an abrupt ascent of several hundred feet leads to the cultivation, chiefly buck wheat, and finally under vineyards, to the romantic village of Keelba, situated immediately above the river, surrounded by great numbers of fine peach, apricot, walnut and elm trees; while some superb weeping willows flourish by the beautifully clear rivulets which gush down on every hand from the lofty mountains to the south. These are densely wooded, and shew a front of splendid precipices to the north or north-west, ending in a high bluff of rock, which seems the "Yana Bul" of the map. Seen from near Meeroo across the river, the appearance is as if a great tract of ground had here subsided, having a high wall of rock on one side, reaching up to the Snowy range near the Boorun Ghatee. Meeroo itself is hidden from Keelba, but the neighbouring village and cultivated slopes of Oorinee, 400 to 500 feet above us, are visible to the north-west; and to the east, the snowy peaks of the Ruldung just come into view. The grapes here and at Brooang, &c. have totally failed this year, probably from the prevalence of unseasonable rain, which fell in drizzling showers to-day and yesterday, but cleared up this afternoon. At Melum, a good room was placed at our disposal, with a second for our people: and we have the same advantage at Keelba.

September 17th.—To Brooang, Booroo, or Brood, eight or nine miles. We marched at 20 minutes to 8 A. M. and descended to the Sutluj, which here flows in a broad and comparatively calm stream: the path generally bad, lying up and down the crags, which are finally wooded with ash, olive, and neoza pine (*P. gerardiana*.) At half past nine we reached the confluence of the Buspa, which flows into the Sutluj like a mill-race, and is equally muddy, marking its source in a granitic tract. "Pilgrim" attributes the turbid waters of the Neelung to its source amongst mountains of slate clay (p. 33.) but on inspection of the Ruldung cluster, which may be called the cradle of the Buspa, with its great scars and flaws of whitish granite, induces me to conclude that the discoloration is due to the decomposition of this rock: it is exactly the same with the Arveron at Chamouni. The bluff crags and cliffs, feathered with cedar, and the twisted neoza, are very grand where the rivers unite: the Sutluj comes down through a narrow rocky gorge, a little above the point of confluence; a good Sanga, 5,968 feet above the

sea, is thrown across the Buspa, for the Poocaree and Cheena road; but our route lay up the rough, stony path on the left bank—the river a perfect torrent, in a very deep confined gully, where the channel is choked by huge boulders. At the fifth or sixth mile, we should have quitted the gorge, and ascended to Brooung: but we had loitered behind the coolies, and proceeding to the Brooung stream, were in full route to Sungla, when we fortunately met its Mookheea on his way to Ralee, who shewed us our mistake, and directed us back up a steep ascent of about 800 feet, where we lost our way again in a wilderness of fruit trees, and got at least 500 feet above the village, which, after two hours' wandering in complete uncertainty, we at length hit on quite accidentally. It is a poor scattered place, just above the left bank of the stream from the Boorun Ghatee, the snows and peaks of which are seen above: the inhabitants are a meagre, sickly race. It seems to be the place called Soorung, in the trigonometrical map—one of its manifold errors in typography. The elevation is generally given 7,411 feet, but in a German map, published at Berlin, it is stated to be 8,820 feet, (Paris) or 9,400 English, which is certainly too much.

On rivulets flowing into the Buspa, I noticed to-day a species of *Tussilago* (colts-foot) with the habit of *T. petasites*; it is said in May and June to produce fragrant yellowish flowers. With it grew the *Polygonum runcinatum* of Don's *Prodromus*.

September 18th.—From Brooung to Sungla, about twelve miles, in seven hours. For half this distance the path rises and falls along the left bank of the Buspa through beautiful scenery, the precipitous rocks feathered with the neoza pine, here generally called Shungtee and Ree. The course by the river then becomes impracticable; and a steep ascent of 2,000 feet succeeds nearly up to Chansoo, with a line of stupendous precipices to the right, the pents and ledges of which are clothed with splendid cedar and kail (*Pinus excelsa*), many of the latter not under 150 feet in height. To the left, the Buspa rages in a series of cataracts through a tremendous abyss, which succeeds its comparatively level course over the Sungla valley. Boisterous indeed is the career of this aquatic Richard: its average fall being 250 feet per mile. The brink and face of the steep on this side is fringed with many superb old tabular-headed cedars, their gigantic boughs thrown about in wild disorder, like Lear, with outstretched arms, appealing in vain to the unpitying heavens.

The tree constantly prefers the steepest acclivities, a peculiarity which must be respected by those now trying to naturalize it at home: it will infallibly perish if planted in any ground approaching a swamp, a condition unknown to the Himalaya. Near the foot of this ascent there is a *dogra* or hamlet, belonging to Chansoo, with orchards of apricot, walnut, and peach trees, of which last the very abundant fruit was sweet and juicy. The people and the bears divide the prize; the former securing their share by day, which is dried in the sun for winter consumption. The bears, who are said to be very numerous, devour their portion by night. Chansoo is 9,174 feet above the sea, and is a most lovely and picturesque spot; the continuation of the cliffs before mentioned, extending behind it in a lofty amphitheatre, the brow of which is clothed with birch, now falling into the sere and yellow leaf of winter. The fields of Chansoo are shaded by very large walnut and cedar trees: we measured an elm twenty-nine feet round, at five from the ground. From Chansoo there is a route via Soang or Sheong, (9,000 feet), over the Sheoo Ghatee, (13,350 feet), to Panemor and the Boorun Ghatee. It is very interesting from its carrying the traveller amongst the most splendid cliff-scenery: and from the summit of the Sheoo Ghatee several shadowy ranges, covered with snow, are seen to occupy the horizon from north to north-east—the far away mountains of Ladakh and Thibet.

Our descent towards Sungla was amongst huge detached masses of gneiss, and at about one-third the height ascended, we again reached the Buspa, no longer roving like a maniac in a strait waistcoat, but flowing rapidly, and frequently in three or four streams, along the open valley of Sungla: Kumroo, the old capital of Busehur, is seen across the river, and elevated several hundred feet above it: it is about a mile from Sungla; the intervening tract being a high plateau, a forest of fruit trees. The rajas found themselves Tartar up here, and determining to become Hindoo, removed to Rampoor, as—*parvis componere magnis*—Peter the Great left Asia and Moscow for Europe and Petersburg. The banks of the Buspa are here fringed with the willow and “*Soorch*,” (*Hippophæ salicifolia*); and in three or four miles from Chansoo, we crossed to the right bank by a good Sanga, immediately under the village of Sungla, close to which we encamped, by a temple adorned as usual in these parts, with many heads and horns of wild sheep, deer, &c. Some of them belonging to an animal called kin, skin, or sikeeng, are of

monstrous dimensions. The very general practice of decorating the temples (not of the men but) of the gods, with horns, which prevails even amongst the Mohammedans of the Hindoo Koosh, reminds us of the expression—"horns of the altar"—among the Jews, as well as of the altar of Apollo at Delos, which is reported to have been wholly formed of them. There is perhaps a reference to the rays of the sun, which are denoted in Hebrew by the word Kiran, which also expresses horns; hence, when it is said "Moses' face shone," the Vulgate chooses to render it—"was horned;" and the Italian painters have ever since represented the prophet with horns just as Alexander the Great ("Dhul," Karnein) wears them in right of his father Jupiter Ammon. The sun would naturally play a prominent rôle in the primeval worship of the Himalaya, and I remember once at Paikha, on the upper Pabur, when marking out a short vocabulary, having "Purmeshwur" given me as the name for the sun: a significant commentary on the Gayatri!

Sungla is rather a large village, built on a slope facing the south-east, about 150 feet above the Buspa, and 8,600 above the sea. There seems no medium in the looks of the inhabitants, who are either very handsome or very ugly. Of the extreme beauty of the valley there can be but one opinion: the river flows swiftly down the centre over gravel and stones; above this, on plateau of various levels, is an abundant terraced cultivation of cheena, bathoo, tobacco, kodah, and the beautiful buckwheat, diversified by occasional woods of cedar, poplar, and the usual fruit trees, irrigated *ad libitum* without labour; the difficulty in the hills being to level the ground, and in the plains to water it. To the south the base of the outer Himalaya is sloping and verdant, with woods of cedar and koil firs: and immediately above the valley to the north-east, rise the enormous bare, grey, rocky scarps and pinnacles of the Ruldung group, with considerable snow beds wherever the slope allows, and still resisting the force of the southern sun. This magnificent group extends far up the Buspa towards and beyond Rukchum, above which a single pyramid of rock springs up nearly to the height of the loftiest peaks behind Sungla, 21,500 feet: but to see the valley and its setting in all its perfection of pinnacle, crag, and fields of the purest snow, one must mount to the highest hamlet towards the Roopin Pass. The scene strongly recalled Chamouni to my mind: the Buspa enacts the Arve well, and in each situation the mountains actually rise

about 13,000 feet right above the spectator. Seen laterally from Cheenee at only seven miles distance, the Ruldung presents the additional feature of dark and extensive forests, and the sharp needles are there mingled with long dome-shaped ridges, all invested in perpetual snow, from which, in June and July, is heard the frequent crash of the avalanche. "Ruldung" is the Kunawuree name for Muhadeo, who resides here, as Jove

' On the snowy top
Of cold Olympus ruled the middle air,
His highest heaven.'

The legend is, that Ruldung is a chip of the true Rylas near Mansorowur, brought here at the desire of an ancient king and penitent: and it is considered meritorious to perambulate the mountain, keeping it always to the right hand, exactly as the cairns, &c., are circled in Scotland and Ireland, and for the same reason, i. e. because the sun goes round the earth in this direction.* Amidst all this superstition, the sublimity and immaculate purity of the Ch'hota Kylas render it no mean emblem of "the high and holy one that inhabiteth eternity;" and we may quote with admiration, if we do not adopt with conviction, the lines of the poet, written under the inspiration of similar scenery—

' Mighty Mont Blanc! thou wert to me
That moment with thy brow in heaven,
As sure a sign of Deity
As ere to mortal gaze was given, &c.'

There does, indeed, appear to be both benevolence and design in the existence of these great mountain chains, and we may consider the Himalaya as nature's vast reservoir for the irrigation of empires; opened every spring by Phœbus Apollo, when like Amram's son, he ascends from the south and causes the waters to gush from the flinty rock. It is probable, that a portion of the Hindoo veneration for the range is owing to its containing the springs of so many of the rivers which fertilize their country.

When at Sungla, the traveller should not fail to ascend the Harung Ghatee, over a brown sterile spur of the Ruldung, on the route to Me-

* I have seen a Sikh soldier go through exactly the same ceremony at a shrine near Makhawal Anundpoor. From how much superstition would a knowledge of the solar system have rescued the world!

bur and Cheenee, for the view of the snowy range and Passes to the south. The scenery on the Buspa at Rukchum is said to be of the finest description: want of time prevented our seeing them. At Sungla is first met the petit shrine called *Chasiun* by the Buddhists; in one of the four sides a small cylinder revolves on an axis, which the passenger puts in motion. Such a cylinder on a great scale may be seen in the temple at Soongnum, inscribed all over with 'om mane pudme hom,' which Klaproth interprets 'oh! the Jewel is in the lotus:' of which the esoteric meaning is very deep. The prayer is considered as good as said by each revolution; an idea which could never have originated but in the mechanical and material mind of the Mongolian race.

This day, the 18th, was cloudy, and snow fell on the Passes to the southward, but the afternoon was fine. We halted on the 19th.

September 20th.—From Sungla to Nooroo Bassa, about ten miles, in six hours, generally up an easy ascent by a path which is perfection, compared with any between this and the Shatool: traversing first some woods of cedar and koil, and then over the cultivated slopes of one or two small hamlets, where the wheat and barley were being cut, and sent down to Sungla. Above this, the path lies over grassy mountains, with wooded crags across the torrent to the left-hand; the whole somewhat tame after what we have seen, but for the Ruldung. The Chough abounds amidst the cliffs in all this and the upper portion of Kunawur. On the way to-day, we met a herd of the Yak, which supplies the *Chownree*. In Thibet, or the neighbouring districts of Toorkistan, we have the origin of the Pashas of one, two, three, or many tails, who once carried terror over Europe. About 1,000 feet below Nooroo, the path turns to the right, the glen of the Nulgoon Pass being straight ahead. About here large beds of *Ligularia arnicoides* were in seed fully ripe, while on the south side of the range, it is still in full blossom: 700 feet higher, the declivities are covered with *Anagyris barbata*; the seed nearly ripe, but much injured by grubs. The roots are much branched, and extend several feet under ground. The plant is here called *Bhaloo ka buroot*; it flowers in May and June, and resembles a lupine of the deepest purple. Nooroo Bassa is an extensive open piece of grassy land, 12,985 feet above the sea, and a few hundred feet above the highest birches, which afford abundance of fuel. A stream flows about 100 feet below to the south amongst beds of

snow; its right bank is rugged and craggy; the left sloping and covered with *Cyananthus*, &c., the general prospect limited and rather uninteresting. A bitterly cold storm of sleet came down from the Pass, just as our tents arrived, and we had hard frost all night, fully a month before it is thought of at Simla.

September 21st.—Over the Roopin Pass to Rasur or Rasrung, called also Surra Peechoo, distance eleven or twelve miles. We left Nooroo at twenty minute past six A. M., and by an easy ascent reached the crest of the Pass at a quarter past nine, including, as elsewhere, several stoppages to collect seeds, &c. Heavy and suspicious masses of clouds accelerated our departure, but the sun soon dispelled them, and revealed the gigantic forms which surrounded us—the embodied frost—giants of the Edda, and very *unlike* the guardian angels seen by Gehazi to encompass the prophet. The northern declivity of the Pass is quite a trifle in comparison with that of the Shatool. On the 20th of September 1833, it was an unbroken and extensive sheet of snow, but to-day we only met two beds of it near the summit; nor is there any Moraine, so terrible at the Shatool from its chaos of sharp gneiss masses. Here the rock is chiefly flat micaceous slate, sometimes approaching to sandstone, and therefore of easy passage, though not macadamized. The grand cliffs of the Shatool are also wanting here, but on the left or east, there are some fine shivered pinnacles of rock, plentifully strewed with snow-beds and sufficiently high

‘To shew,
That earth may reach to heaven,
Yet leave vain man below.’

And nowhere does he appear vainer and more insignificant than here, if we regard only his physical strength and size; at the same time, the mind of a Shakspeare or a Newton is more truly wonderful and sublime than all the Ossas heaped on all the Pelions in the world. The glory of the Roopin Pass consists in the cascades on its south side, in its lovely valley, and in the views of the Buspa Dell and the Ruldung pinnacles, which from this point are seen from NE. to E. rising from great fields of the purest snow, untrodden by man, and probably by any living thing. On the 21st September 1833, the thermometer boiled on the summit of the Roopin at 186°; the elevation is reckoned to be 15,460 feet: and on that day about noon it stood in the shade at 49°,

and in the sun at 68° . It is the Pass marked Goonas in the map, which is another error, the Goonas being more to the west. "Pilgrim" refuses to all this range the honour of being the veritable Himalaya, and Captain Herbert considered, that the true continuation of this latter was in the Ruldung group, penetrated by the Sutluj near Murung: it is however merely a question of more or less; and there is, at all events, no denying that from the Shatool Pass eastward, there is a snowy range, inasmuch as even on its south exposure, the snow never disappears; nor can the fact of its gradually declining below the zone of perpetual snow in the Moral ka Kanda, between the Sutluj and the Pabur, detract from its claim; though it must be allowed, that the mountains and Passes are inferior in altitude to those of Kemaon; nor can the north-western mountains, any more than the whole world, furnish the prospect of overwhelming sublimity which the spectator enjoys from the Gagur, Binsur, and many more points near Almorah. Still the easternmost Pass into Kemaon from Thibet, the Byans, is under 16,000 feet elevation, and of so gentle ascent, that it is crossed on horse-back: and the Chinese invasion of Nepal proves that, still more to the east, the Passes can scarcely be so difficult as the Shatool.

Like Dean Swift, the mountains die at top first, and except a small white *Helichrysum* and the fragrant *Centaurea*, the vegetation on and near the Pass is now being rapidly burnt up by the frost: two or three *Gentians*, the *Aconitum dissectum*, and the *Delphinium vestitum*, seem alone to defy its power: but few flowers remain of *Saxifraga parnassiaefolia* (*orglandulosa*?), *Sieversia elata*, *Ligularia arnicoides*, the yellow *Tanacetum*, common *Senecio*, and a *Polygonum* like the bistort of the Alps. On the crest of the Pass grow the *Aplotaxis gossypina*, *Potentilla inglesii*, *Hymenolœna govaniana*, *Corydalis meifolia*, and *Saxifraga imbricata*; the last two in flower.

We quitted the crest at quarter past 10 A. M., the wind being bitterly cold, and descended 800 feet or so, over loose stones and frozen snow, by a steep rocky *kloof* to a kind of oval basin, extending in length from NNW. to SSE. from six to eight miles, by two or three across, enclosed by a barrier of black broken crags, debris, and snow beds; the surface covered with snow and mica slabs, thrown about in great confusion; a scene of utter silence and desolation. Here and there, there is a pool of water, and a multitude of tiny rills trickled under the stones, the

sources of the Roopin river, of which the glen below this valley, is found, after a long and steep descent, to be completely blocked across by a precipitous wall of black rock, from 250 to 300 feet high. Over this the accumulated streams leap down by two falls, which, to the best of my memory, surpass in beauty the finest in Switzerland: the water perfectly clear, and reduced to white mist like the Staubbach, falls in the softest wreaths over successive tiers of ledges, and about a mile lower down, where the two falls are brought into one line, the effect is exceedingly fine. The path has hitherto kept on the right bank of the stream, but crosses between the falls, where in 1833, a deep snow-bed supplied a bridge; but this year, it is much melted here, though at the base of the lower fall, the river passes under an enormous mass of it. Here the path improves, following the narrow glen alongside the river, now flowing gently for a few miles as if to rest after its great leap. The mountain-cataract, which, having leaped from its more dazzling height,

‘ Even in the foaming strength of its abyss,
 (Which casts up misty columns that become
 Clouds raining from the re-ascended skies,)
 Lies low but mighty still.’

The lateral cliffs all down to Rasrung are continuous on each side of the valley, and so whitened with cascades, that the scene considerably resembles Lauterbrunnen, in the Canton Bern, and fully deserves that name—“nothing but springs.” There is here indeed no wood, the whole being quite above the region of forest; but the grassy or rocky talus at the base of the crags, as well as the small levels by the water, are richly enamelled with flowers:—such as *Primula stuartii*, *purpurea*, and *glabra*: *Sieversia elata*, *Aconitum dissectum*, *Ligularia arnicoides* and another, *Polemonium cæruleum*, *Scrophularia urticæfolia*, the blue *Meconopsis*, and a host of *Compositæ* and *Labiatae*, especially near the falls; the Greek valerian is very common, and in full bloom, as is a very pretty species of *Forget-me-not*; these, and the *Lotus corniculatus* are amongst the many examples which in these mountains frequently replace us for a moment or two in our native land:

‘ And, as in forts to which beleaguers win
 Unhoped-for entrance through some friend within,
 One clear idea wakened in the breast,
 By Memory’s magic, lets in all the rest.’

Many of our Himalayan tourists, especially the earlier ones, have allowed their imaginations to run away with their judgments, and have dressed up their descriptions more in the style of Macpherson or of Harris than of sober prose: but it must be admitted in extenuation, that the reality of the scenery, and the champagne atmosphere, able to drive all sadness but despair, have an inevitable tendency to exalt the spirit to the ethereal regions, which there, Chamæleon-like, naturally assumes the tint of their deep native *blue*. Even in the physical department of the man, a greatly diminished dose of alcohol will suffice to produce intoxication. The daily repetition, however, of the sublime and beautiful, is very apt to create a revulsion of feeling, till at length, to get rid of the perilous stuff which preys upon the heart, we take refuge in apathy, and perhaps fall so low as to adopt the Frenchman's panegyric, "Grande, magnifique, superbe—pretty well!" or at least to swear with Akenside—

'Mind, mind alone, bear witness heaven and earth,
The proper fountains in itself contains
Of beauteous and sublime.'

After many delays from seed and plant-collecting, and a heavy storm of rain and hail at the falls, we reached Rasrung at half-past 3 p. m.; a small sloping plot, covered with grass and flowers, just below the highest birches on the right bank of the Roopin, which is here crossed by a natural bridge of snow, still from twenty to twenty-five feet thick. The usual encampment is a little lower down and on the opposite (or left) side of the river, under a high cliff called Jeyral, where water boils at 194°, which gives an elevation of 10,800 feet. Rasrung is about 11,000. The sward here, and at Seetes, is much cut up by an animal like "a rat without a tail," which is figured in Royle's Illustrations, and is also found on the choor. It takes two hours to reach the upper water-fall from Jeyral, and four, the crest of the Pass. We had frost all night at Rasrung.

September 22nd.—To Jaka, ten miles, in six and a quarter hours. A cloudless morning, but we only reached our tents at 2 p. m. in time to escape a heavy rain, which fell in snow on the Passes. The climate up here is as "perfidious" as that of England: a sky without a speck at six a. m. is overcast by noon: at 2 or 3 p. m. we have a storm, and all is blue again: often however—and the phenomenon seems hitherto unex-

plained—no rain falls, but heavy clouds rest on all the mountains, which, notwithstanding the increase of cold, altogether disappear during the night. In Kemaon, when all else is perfectly serene, a fine thin wreath of cloud may be seen to issue from the summits of Nanda Devee (No. XIV. of the great map) and the Panch Choola (No. XIX.) which has led Europeans to the conclusion that a volcano exists there: while the natives solve the appearance by the supposition that culinary operations are going on amongst the immortals.

The route to-day was by a very rocky and often tree-encumbered path, but never difficult to a footman, following for some miles the right bank of the river, which is then crossed by a snow-bridge. It continues for a greater distance on the opposite bank, and finally returns to the right side by another snow bed, which must be permanent, being entered in the Trigonometrical Survey map, made about twenty-five years ago. For the first half or better, the glen, about 200 yards wide, is bounded on each side by noble-bastioned crags, in several places rising vertically from the river full 1,500 feet, and terminating in picturesque shattered pinnacles. The vegetation though luxuriant is still herbaceous, only consisting of *Aplotaxis aurita*, *Polygonum molle*, *Aconitum heterophyllum*, *Cynoglossum uncinatum*, *Sedum purpureum*, *Spirœa kamtschatica* (Meadow-sweet), *Polemonium œruleum*, *Geranium wallichianum*, *Potentilla atrosanguinea*, *Corydalis govaniana*, *Scabiosa candolleana*, *Achillea millefolia*, a straggling *Cerastium* with flowers like *Stellaria holosteum*, called Gundeeal, and used as a vegetable. But the birch soon clothes the cliffs, and then fine clumps of the dark silver fir (*Picea webbiana*) like so many gigantic cypresses, appear and become the predominant tree, with maple, and a rich underwood of lilac or "Shapree" (*Syringa Emodi*), the lemon-scented *Laurustinus*, "Tealain" or "Thelain" (*Viburnum nervosum* of Royle), *Rhododendron campanulatum*, *Lonicera obovata* and *bracteata*, *Rosa sericea*, *Ribes glaciale* and *acuminata*, several *Salices*, &c. Amongst the shady rocks here and on the eastern side of the Changsheel, &c. grows a large tall composite plant of the *Corymbiferae*, with a very strong smell of raw carrots; and on the cliffs of the right bank I found large tufts of a very elegant *Dianthus*, in full bloom, of a pink colour.

The levels on the river banks are delightfully wooded with birch, pine, maple, &c.: the scenery is so exquisitely beautiful, combined with

the grandeur of the rocks, that one is tempted to reverse the Persian proverb and ask what was the purpose of creating heaven while this valley existed? The Roopin, occasionally bridged and banked by snow-beds, and clear as crystal, dashes on from rock to rock, augmented every half mile by rivulets from the lateral cliffs and glens. These are generally constituted of mica-slate, but at the lowest snow-bed, the rock alters to quartzose strata, with a corresponding change in the scenery. Crossing to the right bank, the path ascends a steep of 800 to 1,000 feet, and the silver fir gives place to a dense and lofty forest of koil and pindrow pines, yew, hazel, *Rosa webbiana*, &c. The glen narrows to a gorge, the left bank presenting a wall of magnificent cliffs, perhaps 2,000 feet high, facing WSW., the brow splendidly wooded with pine. These cliffs soften down opposite Jaka into steep declivities, covered with forest and spacious grassy glades. The river raves below, and is no more approached in this stage. On leaving the forest, we reached Jaka by about a mile of more open country, interspersed with thickets of *Rosa sericea*, *Berberis brachybotrys*, &c. The pasture is covered with *Iris kemaonensis*, *Inula royleana*, the scarlet and orange varieties of *Potentilla atrosanguinea*, &c. Jaka is but a small village, overhanging some huge crags, and surrounded by great horse-chesnuts, walnuts, peaches, &c. under which we pitched, but found their shade much too chilly. Water boiled at 198, which gives under 8,000 feet: but the place is probably higher. We found the people very civil; a frank, rough, good-humoured set, the Mookheea especially, being a pattern of these excellent adjectives, and like Democritus, meeting every difficulty with a laugh or a loud whistle, the Lillibullero of the Himalaya. The people are of small stature and dark complexion, negroes almost compared with the fair faces of the vallies below Simla, which proves, if proof be wanted, that the colour is not entirely dependent on climate.

September 23rd.—To Kooar, nine miles, in four and a quarter hours, an easy stage in this direction. For about a mile and a half the path is execrably bad, rocky, and steep, descending about 1,500 feet to the river, and reaching its bed by a short but rather difficult ledge of rock, known as the Tunkoor Ghat, which reminded us in a small way of the Panwee ka Dhunka. The Roopin seems here to have several names, Sheelwanee, Gosung, Tous, &c. We soon quitted its bed, and re-ascend-

ed some 800 or 1,000 feet, through forests of pindrow, large hazel trees (*Corylus lacera*), *Grewia* (or *Celtis*), *Rhus buckiamela*, *Millingtonia dillenifolia*, *Staphylea emodi* (*nagdown*, the snake-subduer), *Symplocos paniculata*, *Betula cylindrostachya*, elm, and maple; the vegetation of Nagkunda. The opposite bank is one series of huge crags and cliffs, falling sheer down to the river, with a "boundless continuity" of pine above. A large tributary here joins the Roopin from the wild shattered glen of the Nulgoon Pass. Open, grassy, and rather warm mountains succeeded, on which the path gradually declines to the river, where we reached the left bank by the sanga—called in the map, Wodar—from an impending rock, used as a sheep-fold. From this an easy ascent of two miles, shaded by elm, Horn-beam (*Carpinus viminea*), horse-chesnut, *Cornus macrophylla*, rhus, Alder birch, maple, and Mohroo oak—brought us to Poojalee, a very well-built village, one of the group of four or five collectively, called Kooar, situated on the sunny slope of the mountains, amidst a profusion of the usual fruit trees, and with a spacious tract of terraced cultivation, now one rich glow of the splendid carmine, orange, and yellow hues of the Bathoo, and the more delicate pink of the Phuphur or Buck-wheat. A fine stream rattles past the village from the mountains above, which extend from NE. to SE. covered with forest, and reaching the region of birch. They slope up easily, but from N. to NE. several bold peaks and bluff rocky promontories stand out in all the "wild pomp of mountain majesty."

Though now uncommonly low, the Roopin is here quite unfordable; its general temperature from Rasrung down to Kooar, is in the day-time from 46° to 50° at this season; from the clearness of its water and the beauty of its banks is most likely derived its name, which I think signifies "beautiful," as "Pabur" means "clear"—Tous (or Tamasa) "dark blue," &c. All the advantages indeed, of this valley, Paradise are counterbalanced by some serious drawbacks, one of which, the goitre, deforms rather than afflicts almost every inhabitant of Kooar; for while it shortens the breath, it does not, they say, shorten life or cause pain. In so far as it disables its subject from climbing the mountains, nature may seem to fail in adapting man's organization to his circumstances: but I could not learn that with his breath she takes away his mind too, as in those shocking samples of humanity, the cretins of the Valais, &c.

Water boils here at 198, which would give about 8,000 feet elevation. The villagers are of dark complexion. They keep numerous bee-hives, as usual located in the walls of the houses, which are very substantial, of stone and timber, roofed with thick slabs of mica-slate,

September 24th.—To Kala Panee, ten miles or perhaps more, in five hours and fifty minutes, of which the minutes were spent at Doodoo. The path falls in about 600 feet to the Roopin, passes it by a sanga, and continues for about a mile on the right bank through grass; then crosses a torrent from the Changsheel Pass, and finally quits the Roopin river and glen by an ascent of 1,200 feet up the steep grassy mountain to Doodoo or Doodrah, a considerable village, reckoned 8,732 feet above the sea, and the chief place of the district called Ruwain in NW. Gurhwal; the locality of which, Prinsep in his account of the Ghoorka war declared himself unable to assign. The *Iris nepalensis* is plentiful here on the damp shady ground, as *Iris decora* is on the sunny meadows below. The Mohroo oak (*Quercus dilatata*) grows at Doodoo in great beauty and perfection: one specimen by the wayside measured nineteen feet round at five from the ground, and possesses so superb and verdant a head, that it would have been deified in the time of the Druids. It does not appear that any superstition attaches in these mountains to the oak similar to those which made the Greeks people it with dryads and oracular demons, and the Celts to regard it as the habitation of Darnaway, their Jupiter Tonans, as apostrophized in masonic strains by one Vettius Valens Antiochenus;

‘ By the bright circle of the golden sun,
By the bright courses of the errant moon,
By the dread potency of every star,
In the mysterious Zodiac’s burning girth—
By each and all of these supernal signs,
We do adjure thee, with this trusty blade,
To guard yon central oak, whose holy stem
Involves the spirit of high Taranis :—
Be this thy charge.’

Our mountaineers are too much accustomed to lop oak branches and leaves for their cattle to believe there can be any thing very sacred about it.

At Doodoo, the path turns to the right, and after rising for a mile or more through an open cultivated country, enters the forest, in which it

continues generally ascending, for three miles more to Kala Panee, which is a very damp confined spot, so closely hemmed in by the trees as scarcely to afford space for a tent. This forest, covering the north side of a spur from the Changsheel, is very dense and chilly, consisting for the most part of tall pindrow firs, yew, maple, hazel, cherry (*Cerasus cornuta*), white-beam (*Pyrus lanata*), with a very rank undergrowth of *Nepeta govaniana* (a very aromatic plant), *Adenostemma*, and a tall shrubby species of *Strobilanthes*, which also abounds on Huttoo and Muhasoo, and which the hillmen fancifully assert to flower only on the year of the Muha-koomb at Hurdwar. The truth is, that the plant is greedily eaten by sheep, and that perhaps not one in a myriad escapes being browsed too low to admit its flowering, which this season occurred from August till October.

Water boils here at 197° , and the elevation is probably about 9,000 feet. There is no village nearer than Doodoo, from which supplies must be brought on. Heavy storms of rain, hail, and thunder all the afternoon from 2 P. M. made this uncomfortable spot doubly wretched.

September 25th.—Over the Changsheel Pass to Looloot or Lourrot, about eleven or twelve miles, which took us eight hours, including many stops and a long rest on the Pass: the march may be easily performed in six hours. The route continues up the forest, which abounds in streams; path rather rocky, and blocked up by fallen trees. The black bear is common and dangerous: we saw a man at Doodoo who had been terribly torn by one without any provocation; the white or yellow species is also said to abound, but frequents the crags on the heights above the forest. Emerging at length from its chilling shade, we reached an alpine glade, like all the higher parts of the Changsheel, a perfect carpet of flowers of all forms and colours; the Botanic Garden of Asia. Amongst them were conspicuous the *Anagyris barbata*, *Morina longifolia*, and *Codonopsis rotundifolia*; and now the *Picea webbiana*, *Rosa webbiana*, lilac, currant, &c., appear, followed, as we rose, by *Dolomiaea macrocephala*, *Cassiope fastigiata*, *Ligularia arnicoides*, sweet *Centaurea*, *Polygonum vacciniifolium*, tansy, and other plants of the snowy range. On the western side, the *Caltha govaniana* (or *Himalensis*), the marsh marigold of England, the azure *Meconopsis*, and a large *Cynoglossum* (*grandiflorum*) resembling the common English hounds-tongue, are abundant, as the *Cyananthus lobata* is on both sides. The crest

of the Pass, 12,871 feet above the sea line, is attained after a considerable ascent in the region above the forest, with lofty grey crags and spires of gneiss and mica slate above on the right hand; and is considered high enough to be worthy of the stone cairns which mark the fear and the gratitude of the mountaineer. Being fortunate in a cloudless day, we rested a considerable time on the summit to inoculate our minds with the most extensive and magnificent panorama around us. The snowy range, that embodied eternity, "shining like truth" or rather considerably more brilliant, is seen to perfection, and not looking the worse for a good sprinkling of snow yesterday; the Changsheel itself is perceived in this direction emanating from the parent mass in a ridge of shattered crags and pinnacles, on which summer may be fancied to have been just impaled by the frost-giants; and the range from the Boorum to the Shatool Pass, with its lofty, shelving, and now russetting continuation towards Rampoor and Huttoo. It is interesting to observe how regularly the forest all round ceases at a regular level, or at best creeps beyond the line of demarcation a little in the ravines, to be succeeded by the zone of grass and flowers. Kooar is seen below to the east, and on the west the view reaches down the vale of the Pabur to Chergaon and Rooroo. To the SW. is a great reach of the Changsheel, the rounded and almost tabular summits rising considerably above the luxuriant forest which clothes their lower declivities, and presenting a gently sloping surface of the finest yellow autumnal tints; a most inviting though rather remote site for a settlement. The supply of wood for fuel and timber is inexhaustible; and the rice of Chooara would supply abundance of one important element of food:—at all events, it would furnish a most eligible spot for the head-quarters of a summer party from Simla. The circle of vision is completed on the south by a dreamy, mystic, "multitudinous sea," with the snowy range for the bounding surf, the swelling outlines melting into each other, and the whole seeming as if it reposed to all eternity after the enormous efforts by which it was upheaved. The Himalaya is seen to the best advantage, not at noon, but a little before sun-set, when, especially in the cold season, its whole extent is at once, and most gloriously lit up to a rose or copper colour, "one living sheet of burnished gold." Gradually the "sober livery of grey twilight" creeps up towards the loftiest peaks, extinguishes all their "bright lights" and replaces them with the deadly

pale hue of a corpse; the soul of the mountains has departed; and if the spectator be contemplating the ranges north of Simla, he says or sings its requiem with the pun—"Sic transit gloria *Mundi*!

The descent from the Changsheel Pass to Looloot is by the south side of a great spur of the mountain, and is so gradual and winding that the forest is not reached for above two miles; the first trees met are the birch, the horned cherry, the mountain ash, the Kurshoo oak, the silver fir, and most abundant coppice of *Rhododendron campanulatum* and *Rosa webbiana*. The oak and fir soon predominate; lower down the forest is almost exclusively pindrow, with koil, rai, cedar and the sweet *Viburnum*: and lastly, the usual thickets of *Rosa sericea*, *Berberis*, and *Indigofera*, lead to the arable tracts. Except in the pindrow forest, where it is steep and slippery, the path is generally very good this stage. Water boils here at 198°, indicating an elevation of from 8,000 to 8,500 feet: but the thermometer had not been verified, nor the water distilled, both very necessary to the accuracy of the process. Looloot is an insignificant place, and the inhabitants seem a poor, filthy and rather ill-looking race. They have had however, the spirit to introduce the cultivation of the potato, of which we obtained a small but welcome supply. This is the only site beyond Muhasoo where we observed any. A stream flows towards the Pabur below Looloot; the opposite side of the glen, to the SW., is thickly peopled, and beautifully cultivated, the Bathoo as usual in the greatest proportion. With all its brilliancy, the bread made from its flour seems bitter and unwholesome.

September 26th.—To Chergaon, eight or nine miles, in three hours: the first part of the route is a descent of from 1,500 to 2,000 feet down grassy mountains to the Pabur, which we crossed by a sanga of two spars opposite Tikree. The path then keeps the right bank to Chergaon, and is good, except in one place where it passes for a few hundred yards on a narrow rocky ledge, about 200 feet above the river. Here, in 1833, a friend of mine lost his ghoont by the fall of a small bridge, and in general, it is not advisable to take ponies beyond Chergaon. In May and June, when the glen of the Pabur is excessively warm, the traveller to the Shatool and Boorun Passes may avoid it by keeping the heights above the right bank by a route from Huttoo, given by Captain Hutton, in one of the volumes of the Journal of the Asiatic Society of Bengal. Even at this season we found the temperature

disagreeably warm, till the sunny forenoon was succeeded by a cool cloudy day. On the 27th we walked to Rooroo Kothee in two and a half hours.

September 28th.—To Thana Kushain, ten and a half miles, in four hours and forty minutes: the road is good, chiefly through cultivation; quits the valley of the Pabur about three miles below Rooroo, and in two more, by an ascent of 1,000 feet, reaches Krassa, an exceedingly well-built and comfortable looking village; the Kunaits, or descendants of the Rajpoots and aborigines occupying one department, and the Kholees, or Helots, a separate one. These poor outcasts are held in great contempt, and are never allowed to mix in society with their liege lords, the Kunaits. In a pine-wood here, the downward traveller should breakfast and pass the heat of the day. Hence the road undulates up the left bank of the alder-fringed Pursrar or Dogra Nuddee, formed by two branches which unite below Kusain. We ascended the fork for 600 or 800 feet, and encamped a little above the village in a very airy spot, shaded by some fine cedars, with the twin-village Thana a little below to the west. The elevation is probably 7,000 or 7,200 feet, which ensures a delicious climate after Rooroo. About 500 feet higher, and a mile distant on the ridge above to NW., is the small but rather inaccessible fort of Tikhur, formed by two square-roofed bastions, connected by curtains, all of good masonry, and held by a garrison of one man, who refused to surrender till my companion climbed over the wall and opened the gate. The walls command an interesting view of spacious and well-cultured mountain slopes, with several large villages, above which the koil pine abounds, crowned by the lofty Chumba ridge and Suraroo Pass. This is the Nawur District, rich in iron ore, which is found disseminated in grains like iron-filings in a grey, friable micaceous sandstone, which is quarried from mines a little below the village, pulverized, and then washed in running water, which carries off the earthy matter; the ore is then smelted, and as much as a thousand maunds are said to be made in favourable years: most of which is carried on mules to Simla and the plains. The shafts or mines dip at all angles, and are very like the dens of wild beasts; they are more or less inundated during the rains, and the work can consequently only be carried on during the cold and dry seasons. Some of the ore is sent to Shyl to be smelted, probably to economize wood. The usual

rock here is a silvery grey mica slate, containing a very large proportion of quartz. There is also a blue clayslate, with which the houses are roofed in the concave style.

September 29th.—To Shyl or Hurrela, ten miles, in six hours; we had considerable difficulty in getting coolies; Kushain brought up its quota punctually, but on applying to Thana, we found that the Mookheea, having forgotten or disregarded, if he had ever heard, the precept of the Temperance Societies—

“There's not a joy this world can give like that it takes away,
When the glow of slight excitement yields to drunkenness the sway,”

lay gloriously or hopelessly drunk—‘o'er all the ills of life victorious;’—so that we were compelled to assume his official functions, and use a little gentle coercion. The route lies up the mountain a little to the left of Tikhur, and on reaching the crest of the Chumbee range, continues along it to the right, gradually ascending. The mountain, hitherto smooth and grassy, with a mica slate basis here changes to gneiss, which occurs in a labyrinth of great blocks and crags, with a coppice of Kurshoo oak, *Viburnum nervosum*, cotoneaster, &c. The more common plants are *Nepeta govaniensis*, *Impatiens (glandulosa?)*, *Potentilla atrosanguinea*, *Polygonum molle*, *Delphinium vestitum*, several *umbelliferæ*, and the *Anemone discolor*, “Kukra,” which in May covers the mountains with its white and blue. The acrid leaves are used by the mountaineers to raise blisters; but they are said to produce bad sores, leaving a permanent scar. The “Chitra” or *Drosera muscipula*—“Sundew”—a curious little plant which abounds between Kotgurh and Simla is applied in the same way. The elevation of the Suraroo Pass is 9,875 feet, commanding a glorious and extensive view, which includes the Koopur and Kunchooa ranges, the Moral and Changsheel up to the snows, with a long segment of the great range itself, in which the positions of the Shatool and Boorun Passes are well fixed by their pyramids. On the other side the huge wooded and grassy range of Huttoo is the most prominent object, its base watered by the Chugountee Nuddee, the opposite or western bank of which presents one of the most beautiful and extensive sheets of cultivation in these mountains. Chumba, Chumbee, or Chamee is a term very generally used in the Himalaya to express a mountain range. The road to the summit of this Chumbee is good, and we reached it in three hours very quiet walking; but the descent to Shyl is the

very reverse, the path being very steep, bad, and rocky, over a most dazzling decomposing micaceous shale near the top, and with some awkward steps near the bottom, where several streams are passed—the head waters of the Chugountee, one of the main feeders of the Girree. Shyl is a considerable village, or rather group of villages between two of these, and possesses a good share of arable land. It belongs to Busehur, and is about 8,000 feet above the sea. Passing the villages we descended by a rough flight of stone steps to a stream, and then re-ascended the opposite or Huttoo side, till about 100 feet above Shyl, where we pitched our tents by a Bowlee amidst woods of young cedar. Supplies are got with difficulty from Rutnaree, a village about one mile south, which shares alternately with Shyl, the charge of hospitality, and which would apparently transfer to it willingly the whole honor and merit of entertaining strangers, perhaps from having hitherto been so unlucky as to chance on few or no angels amongst them.

September 30th.—To Nagkunda, eight or nine miles, over Huttoo mountain, of which we reached the summit, 10,670 feet, (water boiling at 190°) in 1 h. 50 m. by the Pugdundee route, which keeps to the left of and below the made road, and, which from precipitous rocks, is impracticable for ponies. The made road passes under a ruined fort called Kurena, and then over the north shoulder of Huttoo, within 400 feet of the summit, on which we passed some hours. Huttoo or Whartoo, may be called the Righi of the Himalaya; but it must be confessed, that we are here totally deficient in three main constituents to the attractions of the Alps: first, their exquisite lakes; second, their equally exquisite hotels and markets; and third, their historical or legendary associations, such as those of William Tell, and the confederates of Grütli. In Hindooism the gods interpose so constantly, that man is nothing. But so far as natural scenery is concerned, I do not know a more delightful walk than that along the rounded swelling knolls of the Huttoo range, with its edging of “castled crags” of gneiss rock to the north-west, its alternate coppices of Kurahoo oak, and meadows enamelled with flowers, and its spacious views. Those of the snowy range are inferior to few, extending from (probably) the Peer Punjal of Kashmeer by the Chumba, Koolloo, and Shatool ranges, to and beyond Jumnootree, which rises over the high slopes of the Changsheel like a double-poled tent. Choor, Koopur, Kunchooa, Moral, are all conspicuous features; Huttoo itself being protract-

ed towards the last in the darkly wooded summit of Kot, below which to the right is Nowagurh, once a garrison of the Ghoorkas, who had also several posts, now dilapidated, on Huttoo, and who indeed, Kenite-like, made their nests on the rocks of every commanding height in these provinces. Half way between the Choor and Kunchooa range in Tiroch (the Ootroj of the map,) appears an isolated summit, probably Deobun, on the Mussooree road, between the Tons and the Jumna. On the W. and SW. are the Shallee and Muhasoo mountains, and on a clear day the houses of Simla may be discovered on the distant and hummock-like Jaka, which, after the grander features of the interior, looks small indeed. All around is the same ocean of summits and ranges which render the Himalaya rather one vast mountain of 1,500 or 2,000 miles in length, than a series of mountains; for no where do we find the comparatively broad vallies of other systems, and this character may be best expressed by a different reading of one of Campbell's lines, "its peaks are a thousand, their bases are one." In the absence of lakes it is apparently parallel to the Andes. Including the charming walk from the summit of Huttoo down to Kotgurh, and the ascent thence to Nagkunda, the botanist will enjoy a rich treat on Huttoo and its great buttresses. The summit pastures are alive with *Fritillaria verticillata*, *Morina longifolia*, *Aster alpina*, *Anemone discolor*, *Corydalis govaniiana*, *Potentilla atrosanguinea*, *Viola reniformis*, *Hemiphragma heterophylla*, *Veronica*, &c. &c.; and the crags with *Lloydia Himalensis*, *Saxifraga ligulata* and *parnasiaefolia*, the shrubby *Potentilla rigida* or *arbuscula*, *Anemone villosa* (which is very common on the rocky banks of rivulets above the forest belt of the great range), two species of *Lonicera*, one of which greatly resembles *L. alpigena*, *Ribes acuminata*, *Pyrus foliolosa* and *lanata*, and a few very stunted specimens of *Rhododendron lepidotum*. The *Roscoea alpina* is found up to 9,500 feet. The declivities of the mountain are clothed by a magnificent forest of *Abies smithiana*, *Picea pin-drow*, *Quercus semicarpifolia*, maple, yew, and towards Nagkunda, sweet scented *Viburnum* (Thelain), *Kadsura grandiflora*, *Deutzia corymbosa*, *Philadelphus tomentosa*, *Symplocos paniculata* (Lodh, Loj—a sheet of white bloom in May), the scanitent *Hydrangea*, (*H. altissima*), *Rhus buckiamela*, *Jasminum revolutum*, and many species of *Desmodium*, *Indigofera*, *Berberis*, *Clematis*, &c. form a dense brushwood or coppice; while the mossy rocks and shady banks are covered with *Wulfenia am-*

herstiana, *Primula denticulata*, *Pedicularis megalantha*, *Gypsophila ceras-tioides*, "Bhatlee," several beautiful species of *Impatiens*; and in the deepest recesses of the woods *Actæa acuminata*, *Aconitum palmatum*, *Angelica glauca*, *Adenostemma*, *Strobilanthes*, *Lilium giganteum*, called "Book," and *Arum speciosum*, "Gangsh or Jungoosh," a curious plant, the spathe of which beautifully striated with green, and ending in a long thread, bears an alarming resemblance to the hood of the cobra di capello. In autumn the bushes towards Kotgurh are matted with the leafless and sweet-scented Dodder (*Cuscuta grandiflora*), which, having no root, the natives may safely promise boundless wealth to the lucky man who finds it. The Akash-bel, or heavenly twiner of the plains, *Cuscuta reflexa*, may be considered the Mistletoe of the Brahmans.

Huttoo only requires a deep lake and a slide of Alpnach to be a mine of wealth in its timber; at present it lives, dies, and rots uselessly. In several places large tracts of pine have been killed, perhaps by lightning, and remind us of Milton:—

"As when heaven's fire
Hath scathed the forest oaks or mountain pines,
With singed top, their stately growth, though bare,
Stands on the blasted heath."

The Berbery at Nagkunda, &c. is a distinct species, which is now covered with the most profuse crop of fruit, of a fine blue, with a bloom of a pink or lilac colour. It makes excellent jam, and I have had the pleasure of seeing young plants raised in Dublin from seeds which had undergone that fiery ordeal unscathed.

The descent to Nagkunda occupied us one hour and twenty-five minutes; there is a good bungalow, and two or three buneecas. As is frequently the case in this direction, the waters flow on one side to the Bay of Bengal, and on the other to the Arabian sea. The elevation of the bungalow is 9,000 feet. In one of the shady glens to the north, and about 1,000 feet below, there is a most copious chalybeate spring; known as the Lal-panees.

The *Polygonum molle* or *polystachyum* is very luxuriant about Nagkunda.

October 1st.—From Nagkunda to Muteeana, by the Pugdundee route, over the back of the Kumuloree or Sheerkot mountain, about ten miles, which we walked in three and three-quarter hours. The path rises

through brushwood immediately behind the bungalow for about 4,000 feet, or 10,000 above the sea, and in about two miles enters the forest of pindrow, yew, maple, white-beam, *Cerasus cornuta*, *Cotoneaster affinis* (Rous) and *acuminata*, with occasional glades covered with the richest beds of flowers, *Potentilla atrosanguinea*, *Anemone discolor*, *Geranium wallichianum*, *Aplotaxis aurita*, *Spiræa kamtschatica*, *Campanula latifolia*, *Ranunculus*, &c. In the forest we find *Erysimum alliaria*, *Strobilanthes wallichii*, *Nepeta govaniensis*, *Aconitum palmatum*, *Callimeris flexuosa*, and a species of *Diplopappus* resembling it, *Senecio canescens*, and a very elegant species, perhaps *asplenifolius*, also common on the north side of Huttoo: on the rocks, *Mulgedium macrorhiza*, *Saxifraga ligulata*, *mucronulata*, and another: and under the shadiest crags, the may-apple of N. America, *Podophyllum emodi*, and the enchanter's night-shade, *Circæa intermedia*, whose only connection with the black art seems to be the fact of its loving the absence of the sun. The views of the Chumba and Koolloo snowy ranges are magnificent, seen over and through the primeval forest, with the great range of Mundee to the right or north, the base covered with villages and cultivation, and the crest reaching up to about 11,000 feet, reported to afford cedar of the first dimensions. Huttoo lies on the left hand, and, latterly, Shallee, Muhasoo, and Simla, in front. At an abrupt turn, a path strikes down to the right towards the Sutluj and Koolloo, which must be carefully avoided, as well as another a little further on to the left, which will equally, though not so fatally, mislead the wayfarer, and beguile him of his summum-bonum, which, under present circumstances, is probably his breakfast. A convenient and most romantic spot for this is on some crags about half way, where there is a small spring just below the path to the north. So far the difficulties of this route have consisted mainly in the fallen trees; but beyond this, both in and out of the forest, it becomes so rocky in several places, as to be totally inaccessible to ponies, and very difficult to jumpans. On leaving the forest, there is a rapid descent of about 600 feet to some crags, under which a multitude of sheep are tended, and on which will be found a very pretty white *Sedum* or *Sempervivum*, and the shrubby *Polygonum graminifolium*: after this four miles of pleasant walking along and down the southern and grassy face of the mountains, latterly through cultivation, lead to Muteeana bungalow, 7,900 feet, which

having neither doors nor window-frames, offers but a cold welcome, with a roof, too, resembling the sieve of the Danaides: they manage these things better in the plains and in Kemaon; but a decree has I believe gone forth for the erection of a new bungalow in a more convenient site than the present, which is more suited to the herald Mercury than to the mortal, weary, and thirsty traveller. It was the full intention of the late Major Broadfoot, C. B., to open the Pugdundee route, so greatly superior in scenery and shade to the made road, which, besides being nearly two miles longer, dips deeply into the hot glen below Muteeana, and is uninteresting till within a few miles of Nagkunda. It will always, nevertheless, be necessary as the winter medium of communication with Kotgurh, when the northern exposure of the mountain is buried in snow. In this warm glen, and in that of the Girree, grows the shirsha, a species of *Acacia*, perhaps *A. smithiana*, with flowers in May of the size of *A. speciosa* or *Lebekh*, the *Siris* of the plains, except that its long tassels of stamens are rose-coloured, and that it has not the delightful lemon fragrance of the latter. The shirsha greatly resembles *A. julibrissia* (i. e. *gul-i-reshm* or silk-flower), a Persian species, which is naturalized about Como. In the same glen will be found the pretty little *Parochetus oxalidifolia* or *communis*, the *Cedrela serrata*, *Populus ciliata*; and in the cornfields on the way side, the Nepal wall-flower (*Erysimum robustum*), *Silene inflata*, *Carduus nutans* (the fine purple thistle), &c.

October 2nd.—To Fagoo, fifteen miles in five hours: the road rises to the Punta Ghatee, 8,500 feet, 100 feet above which to the right, stands a ruined post of the Ghoorkalees, who near this inflicted a decisive defeat on the mountaineers. Hence it descends and makes a great circuit to, and up the Kunag Ghatee, 8,400 feet, with the Teeba, 300 feet higher to the right; it then passes a little under Theog, and reaches Fagoo by a long but gentle ascent. Except some koil and oak woods below Theog, and the forest of Mohroo oak on the Kunag mountain, there is but little wood in this stage; the Mohroo oak (*Quercus dilatata*) considerably resembles the beautiful evergreen oak of Nynee Tal, and the Binsur and Gagur ranges in Kemaon, where it is known as the Tilonj, Kilonj, or Timsha: it is the *Quercus kamroopii* of Don's prodromus: this botanist was afterwards inclined to identify the two trees, but they differ considerably in several particulars. A few specimens

of *Quercus kamroopii* may be seen on a south aspect at Simla on the lower bazar road, near Lord Combermere's bridge : and far down in the vallies grows the "Banee," (the Funiyat of Kemaon), or *Quercus annulata*, which Don calls *Quercus phullata*. The handsome globe-thistle, the *Echinops cornigera*, is very abundant on the sunny rocks of the Punta and Kunag ghats, and *Morina longifolia* flourishes on the Kunag Teeba : neither of these plants occurs nearer Simla, though Muhasoo would at first sight promise them : but the neighbourhood of the plains seems inimical to many Himalayan plants : just as thyme is plentiful at Almorah, but unknown at Nynee Tal and the Gagur, with a much more favourable elevation. The *Iris decora* is common on the grassy slopes of the Kunag mountain, and towards Fagoo, the *Spiræa cuneifolia*, "Takoo," in May and June, whitens as the roadside-like hawthorn. The red *Potentilla* (*P. nepalensis*) and the deep-blue *Cynoglossum furcatura* abound at Theog, and tufts of the delicate little *Androsace sarmentosa* hung, as at Simla, from the sunny rocks.

This stage is generally decried as the most uninteresting near Simla, and it is assuredly rather bare : yet the views are fine ; the bold bare precipitous peak and ridge of Shallee, like a lion couchant, are no where seen to such advantage, and are novel features in the more usual scenery of Simla. On the left hand are the snowy range, Jum-mootree, and the Choor ; and latterly in the same direction the great northern spur of this last "cloud compeller" with its seamed and scarped flanks, pleasant meadows, and beautiful woods, reminds the traveller towards Mussooree, of one of the most picturesque excursions short of the snows ; and the botanist, of *Trillium govianum*, *Actæa acuminata*, *Paris polyphyllum*, *Podophyllum emodi*, and several *Polygonatums* and *Smilacinas*, which Fraser, by a pardonable deviation from botanical orthodoxy, calls the lily of the valley. The mountaineers commonly distinguish the Choor as the "Choor-chandnee" or "crest of silver," the original having no reference to any abstraction of silver spoons, as some, impelled thereto by Indian experience, have supposed. The summit exhibits the only granite hitherto discovered amongst the outer ranges of the NW. mountains, and is apparently a continuation of the line of granitic out-breaks traced by Mr. Batten in Kemaon, inside of the Gagur, which, in all likelihood, owes its superior altitude to the vicinity of this great natural lever. The granite of the Choor is,

however, somewhat different from that of Kemaon and the snowy range; and it is a remarkable fact, that this last (I speak from specimens of the vast precipices of Sookhee, near Gungootree) is identical in its abundance of felspar and black schorl crystals, with the granite of the Ajmeer hills; where, by the way, is an example never yet, I think, published, fully as conclusive on the igneous origin of this rock as the more celebrated Glentilt in Perthshire. The exact locality is three or four miles west of Nusseerabad, on the way to Rajgurh, where the granite is seen penetrating the stratified rocks in a complete and very extensive network of veins, and in several places imbedding large masses of them, in a manner that must satisfy the most sceptical, it was once in a state of fusion. The Choor also, which like another Briareus, with a hundred arms, domineers over the outer Himalaya, is the nearest point to Simla, where we meet with the silver fir; and separated as it is by comparatively low ridges from the great ranges which form the natural habitat of the tree, the fact necessarily gives rise to speculations on its origin, and as in the similar case of the Alpaca and Llama of the isolated Cordilleras of the Andes, and its own Lagomys or tailless rat, induces the question whether nature does not necessarily and independently give birth "automate" to like forms of organization under similar circumstances. Every traveller in the colder tracts of the Himalaya must remark the resemblance of the genera to those of Europe: while, with very few exceptions, the species are different; so much so, that as Mr. Batten observes, though our oaks have acorns all right, the absence of the sinuous leaf of the English tree is enough almost to excommunicate our spinous brethren. The only exception to the above rule appears to be in New Holland, as compared with a like soil and climate in South Africa, where her productions, animal and vegetable, are so dissimilar in plan from those of all the world besides.

The homeward route from Muteeana to Simla may be agreeably varied by a diversion to the Shallee mountain. From Muteeana to Bhogra, 1,500 to 2,000 feet below its summit, is a walk of six or seven hours by a path scarcely practicable for ponies. Back to Fagoo, via Kiarree, is about the same distance, including a long and tiresome ascent from the Nawul Khud: or one may return to Simla direct by Deotee in the Kotar state. Bhogra is the most southern of the cluster of five villages visible from Fagoo, on the east face of Shallee, the property of

the Thakoor of Kiaree Mudhan. Though very steep and rocky, there is no difficulty in the ascent to the summit, (9,623 feet above sea level,) where Bheema Kalee or Devee 'towers in her pride of place', in a small octagonal temple, and as nature personified, enjoys, when she pleases to look out, an exceedingly extensive and impressive view of her own works and votaries. Her character and attributes seem as severe as those of the Taurian Diana; and the mountaineers, who scarcely acknowledge any other god or goddess, hold her in such awe, that I have known one of them positively refuse to approach nearer than 300 or 400 yards to her fane, though it was our only shelter from a cutting blast. Hence, no doubt, she is said in Hindoo mythology to be the daughter of Himalaya. The entire northern face of Shallee is covered with dense forest, amongst which the *Cupressus torulosa* is found in considerable quantity, being the only site in these Provinces where it appears to be truly indigenous. The day-lily, *Hemerocallis disticha*, is common by the water-courses, as is the *Abelia triflora* on the warmer exposures. On the summit grow *Ephedra saxatilis*—"syr"—and a silvery *Artemisia*, very like the *A. rupestris* of the Rhine.

"All things are full of error" said one of the ancients; and it is at best but a quixotic procedure to wander out of one's way to refute it, at the imminent risk of encountering controversial wind-mills, Biscayans, or Crowderos; and truth when found, may, like *Mademoiselle Cunégonde*, prove less attractive than had been anticipated. All that can be done discreetly is to knock an error on the head when met privately; and it may be accomplished with the less scruple on this occasion, as the present is, so far as I know, the only one into which the late Captain Herbert has fallen. I allude to his Geological Map of our Himalayan Provinces, where Shallee is included in the micaceous slate district; whereas it is in fact, one great mass of very compact, splintery, light-blue limestone, apparently very pure, with the exception of a small proportion of magnesia. Several plants will be found, which are, I think, peculiar to limestone, as *Cytisus flaccidus*. The mountain is very deficient in springs, and in the warm season is dependent for water on the pits called "Jors," which is of so vile a quality, that all Hudor-men-ariston men should carry up a supply from the Nawul stream.

October 3rd.—To Simla. The distant view of the hospitable homes of our countrymen identifies our feelings with those of the Mesopo-

tamian soothsayer, and we adopt afar off his exclamation—'How goodly are thy tents, O Jacob, &c.' but the nearer and beatific vision of the bazaar and its brimful stores, exalts our enthusiasm to the pitch of the wizard of the north, and we end our pilgrimage by a gastronomic application of his famous lines.—'Breathes there the man, &c.' Those heaps of flour and Shajehanpoor sugar are worth more than the purest cones of snow in the frosty Caucasus; those gram-fed fleeces than its shaggiest woods; those cases of aqua-vitæ, more soul-satisfying than its loudest water-falls. Rapt into future dinners, the Deotahs of the unfriendly rocks and snows of Emaus descend to insipid nonentities in comparison of Messrs. Barrett and Company, who are confessed the true dispensers of the good things of this life to all who can pay for them and to some who cannot.

Rough Notes on the Zoology of Candahar and the neighbouring Districts.

By Captain THOMAS HUTTON, of the Invalids, Mussoori; with Notes by ED. BLYTH, Curator of the Asiatic Society's Museum.

(Continued from Vol. XIV, p. 354.)

No. 20. The Wild Hog. These are plentiful among the high rushes at the lower extremity of the Bolan Pass, where they conceal themselves during the day, but issuing forth at night, they proceed to ravage the cultivation around Dadur. They are also numerous in similar covers on the Helmund and in Seistan around the lake.

They are hunted but not eaten. They do not appear to differ from the common wild hog of the Upper Provinces of India.²²

22. In Mr. Gray's catalogue of the specimens of mammalia in the British Museum, the "Indian wild boar" is styled *Sus indicus*: and Mr. Elliot had previously pointed out the following differences between it and the European one. "The Indian wild hog," remarks the latter naturalist, "differs considerably from the German. The head of the former is longer and more pointed, and the plane of the forehead straight, while it is concave in the European. The ears of the former are small and pointed, in the latter large, and not so erect. The Indian is altogether a more active-looking animal; the German has a stronger heavier appearance. The same differences are perceptible in the domesticated individuals of the two countries." (*Madr. Journ.* No. XXV, 219.) Vide Cuvier's 'Ossemens Fossiles', pl. lxi, for figures of the skull of the European boar, but which would seem to have been taken from a domestic individual.

In the Society's Museum are two very different forms of Indian wild boar skulls, especially characterized apart by the contour of the vertex and occiput. In a particu-