

AN ACCOUNT OF A JOURNEY TO THE GANGOTRI GLACIER

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THE party started from Mussoorie on the 27th July, 1932. This was my second trip to Gangotri—the first having been undertaken in 1927. On both the occasions Jumnotri, the usually recognized source of the Jumna was also visited before going to the source of the Bhagirathi.

This year the party consisted of myself, my wife, my son Kedar Nath, Professor Mukand Lal of the Lahore Government College and his two sons.

From Mussoorie we followed the road to Tehri which is at a distance of 40 miles. The vegetation below the Kauria pass where the road descends towards Tehri is very luxuriant, Mosses, Liverworts and Ferns being particularly abundant. From Tehri we went up the Bhilang a feeder of the Bhagirathi and after spending a few days in that valley returned to Tehri and left for Gangotri on the 7th August. The rainy season was in full swing and we suffered some inconvenience from the rain but it was compensated for by the lowering of temperature which is very high earlier in the season when the weather is dry. Gangotri is 100 miles from Tehri. The road runs along the river bank at varying heights above the river all the way and is practically level throughout, there being very few slight ascents and descents. After two days we reached Dharamu—26 miles from Tehri—where the road bifurcates—the main road going to Gangotri and a branch to the left going up a side stream crosses the watershed between the Bhagirathi and the Jumna by the Ravi pass. This pass is about 16 miles from Dharam, and is quite low. The road for the last four miles to the pass ascends gently and passes through beautiful shady glades with many water courses at short intervals. Here we found on both sides of the pass the interesting telegraph plant, *Desmodium gyrans*, whose leaflets show such regular autonomous movements. This plant was particularly abundant on the Jumna side of the pass. About eight miles from the pass the Jumna is reached at Gangnani where there is a large spring bubbling up from the ground round which a beautiful small tank has been built. The local people believe that this water comes from the Ganges across the watershed. A few miles further is Jumna Chatti near Pujar village where the Jumna is crossed to the right bank and the valley becomes very narrow. The vegetation at the same time becomes gradually more luxuriant. There are numerous fine waterfalls on the way and the scenery increases in beauty and grandeur. A few miles beyond this bridge the Jumna is recrossed to the left bank by another wooden bridge. When we returned to this place a few days later this bridge had been washed away

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by heavy rains and the only way to reach the lower bridge under such circumstances is to go by a long and circuitous footpath. Luckily, however, by one of those rare coincidences with which nature loves to amuse herself a tree had fallen across the river a few yards below the position of the extinct bridge, spanning almost the whole of the river. After fording a little water we could just crawl over the trunk of the tree to the other side. The water of the Jumna is usually very clear, contrasting strongly with the turbid water of the Bhagirathi and the Alaknanda but after heavy rains, as was the case at this time, it becomes almost black and muddy. It was just before this bridge was reached that I found some very interesting fronds of *Pleopeltis simplex*. These showed dichotomy of various degrees from a small notch at the top to definite bifurcation into lobes once or twice. Other fronds on the same plant were simple as is usual in the species. These curious specimens should throw some light on the affinities of the genera with the Dipterideae.

We had brought our luggage on mules so far, but at Jumna Chatti we were told that the road beyond had been badly damaged and was impassable for mules. We, therefore, left the mules here to await our return and took thirteen porters with us, leaving much of our luggage also behind. At Rana where we camped for the night I found such Liverworts as *Fegatella conica*, *Dumortiera hirsuta* and *Pellia calycina* in a stream which supplies the village with water. The road beyond Rana had been washed away by rain in several places and there was very great difficulty and risk in negotiating it as the almost vertical rock had alone been left with the river underneath. Kharsali, the last village on this side, is six miles from here though one need not pass through the village as the road runs along the river leaving the village high up which is as well as one is spared the sight and contact of an unimaginable amount of filth on the way.

Jumnotri is about four miles from Kharsali. The gorge of the river is very narrow and the road which runs at a high level above the river is rough. The forest, however, becomes more and more dense. *Hippophaë* forms small trees on the river bank below Kharsali, and some apricot trees have been cultivated at the neighbouring village of Bipa but the fruit was over at the time of our visit. Near Jumnotri itself the forest consists of *Quercus semecarpifolia* (kharsu), *Abies Webbiana* and *Taxus baccata* (yew). There was a species of *Salix* also. *Picea morinda* was not seen along the road. Many Compositae, species of *Polygonum*, *Impatiens*, *Geranium Wallichianum*, a rose with red edible hips, etc. formed the undergrowth. Among interesting Liverworts the following were noticed:—*Madotrocha macroloba*, *Lophocolea minor*, *Plagiochila* sp., *Stephensoniella brevipedunculata*, *Fimbriaria mussuriensis* and *Riccia pathankotensis*. There were many other Liverworts on the way throughout the journey but as they are common throughout Garhwal and Kumaon it is not necessary to mention their names. In the case of the last three species, however, the range has been greatly extended.

Jumnotri is famous for its hot springs and is ordinarily spoken of as the source of the Jumna though the snows which give rise to it are higher up which I



JUMNOTHI TEMPLE AND HOT SPRINGS. SMALL TENT IN THE FOREGROUND (1927).



THE GANGES AT HARSHIL (1927).



PINUS EXCELSA AT HARSHIL SHOWING EFFECT OF
UNILATERAL WIND (AUG., 1932).

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had visited in 1927. The valley above Jumnotri, however, is exceedingly narrow and the only way to go up is to climb the cliff somehow. There is a small temple here, a dharmasala and two or three other small huts for the pilgrims. A new temple was being built at the time of our visit. There is no place for pitching a tent, the only small flat space available being under water. There are several hot springs. Their temperatures as taken on 30th June, 1927 are given below. The hottest, Suraj Kund, had a temperature of 92°C., at the mouth of the hole through which the water comes out, a few others had 90°C., one 80°C., one 72°C., and one 69°C. The water is collected in two reservoirs for bathing and the temperature here was 48°C. The temperatures of the springs were quite constant morning and evening. The same constancy was observed by the writer in 1926 in the hot springs at Tirthapuri in Western Tibet. The height of Jumnotri above the sea-level is 9,900 ft.

In 1927 we had crossed the watershed from Hanuman Chatti, four miles below Kharsali, by the Ancha pass, to Gangotri, two miles above Uttarkashi, the distance from river to river being about 20 miles. This year we crossed it lower down from Gangnani (with its beautiful spring as described above) by the Fuachu pass coming out at Nakuri, six miles below Uttarkashi, a distance of about 13 miles from river to river. The former pass is higher and Rhododendron shrubs are met with on its top but there are no Rhododendrons on the top of the Fuachu pass though the road is beautiful and shady, especially on the Jumna side. It ascends gently but the descent on the other side is rather steep and rough. The Rari pass mentioned before is the lowest of the three. On the way to the Fuachu pass in the very beginning where there was a timber godown I found a large quantity of *Athalamia* (*Gollaniella*) *pusilla*. This pretty little Liverwort was again met with near the top and also at the end of the descent near Nakuri where the road meets the main Gangotri road. The most important find of the journey, however, was made close to the top of the pass when I came across a large patch of that most interesting Liverwort *Aitchisoniella himalayensis*. This monotypic genus was described by the writer in 1914 from Mussoorie but it has not been met with there since then. The only other places where it has so far been found in small quantities—and that also by the writer alone—are the Dulchi pass in Kulu and Simla. This was a most fortunate discovery as the material of this species available anywhere in the world is exceedingly small—little bits having been sent by the writer to England and Germany.

In upper Tehri-Garhwal the Ganges and the Jumna flow side by side separated by a long ridge extending from the source of the Jumna right to the plains. This ridge is crossed in many places and the distance from river to river by road is about 20 miles or less in most places though the road is very rough and difficult in the higher parts.

Uttarkashi is a large place and the only Telegraph office and the last Post office on the Gangotri road. It is six miles from Nakuri, the place where the road from Jumna meets the main Tehri-Gangotri road. The valley is quite open here

and there are big grassy lawns, a school with its play-grounds, several Government offices, etc. It is a favourite place for sadhus and there are many pretty little huts with little plots containing ornamental plants in front for their use. We exchanged our mules here for porters as the road beyond was said to have been rendered impassable for mules in many places by the heavy rains. We heard from several independent sources that at one place two or three pilgrims had actually been carried away by a swollen stream. Uttarkashi is 42 miles from Tehri and 58 miles from Gangotri. The next important place is Bhatwari, 18 miles from Uttarkashi, where there is an office for the registration of porters employed by pilgrims. The pilgrim route to Kedar Nath branches off a little before reaching Bhatwari, up the Pilangna stream. For the next 18 miles or so up to Suki the valley is very narrow and the road is very difficult to maintain. There are big landslides here and there and the road has to be carried now on one side and then on the other. At Bhuki, six miles from Bhatwari, where the river is crossed by a bridge to the left bank, the current rushes furiously headlong under the bridge. The rush and the roar, the descent and splash against huge boulders hidden and projecting, the consequent reaction and rise, the fury and turbulence of the boiling water, all these make the scene most fascinating and one stands spellbound and awestruck at the wild grandeur. From Bhuki onwards during the next six miles the river is crossed no less than four times (including the Bhuki bridge) by suspension bridges owing to the impossibility of carrying on the road along one bank. The lower (cryptogamic) vegetation along the river bank during these miles is the most luxuriant in the whole journey from Tehri to Gangotri. From Bhatwari to Gangnani among the many Liverworts met with were species of *Frullania*, *Lejeunea*, *Madotheca*, *Radula*, *Fossombronia*, *Metzgeria*, *Plagiochasma similensis*, *Riccia pathakotensis* and a new *Fimbriaria*. There were many other species which are common throughout Garhwal.

At Gangnani, nine miles from Bhatwari there are some hot springs just above the road, but the temperature is not so high as at Jumnotri. On the 25th August, 1932 at 9 A.M. the temperature in the main spring which is inside a tiny temple and which is the hottest of the lot was 68°C. There are three small reservoirs for bathing in which the temperature varied from 41°C. to 47°C. Some blue-green algae were forming beautiful corrugated layers on the rock and were most abundant in water having a temperature of 41°-45°C., though some were growing even at 51°C. The water of the springs is quite clear. There are large deposits of lime along the course of the water.

The road some distance beyond Gangnani is very rough for a short distance passing over big sharp boulders and Mrs. Kashyap had a narrow escape. Her foot slipped and she fell down on the rough sharp stones several yards below. Luckily she escaped with a mere shaking and a few bruises. Perhaps the worst feature of this road was that it was thoroughly under flowing water for long stretches at a time and even where there was no flowing water the vegetation was so dense that in some places it was difficult to walk without getting wet from the plants. In



THE BHAGIRATHI RIVER BED WITH POLISHED ROCKS BELOW GANGOTRI
AT GAURIKUND (AUG., 1932).



BRIDGE ON THE JAHAVALI AND THE ROAD ALONG
THE VERTICAL ROCK (SEPT., 1932).



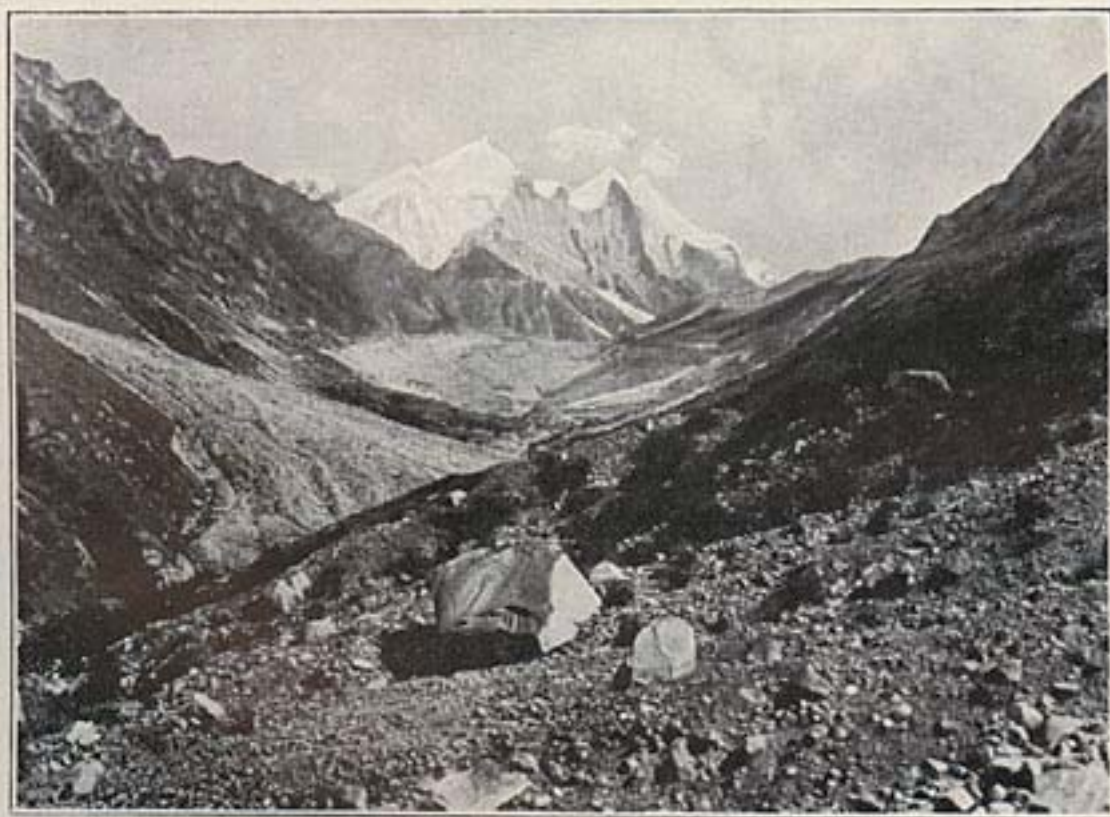
GANGOTRI FROM THE OPPOSITE BANK (1927).



GANGOTRI FROM THE OPPOSITE BANK (AUG., 1932).



INTERIOR OF THE TEMPLE AT GANGOTRI (1927).



THE END OF THE GANGOTRI GLACIER FROM ABOVE THE KEDAR NATH
GLACIER STREAM, ABOUT THREE MILES FROM GAUMUKH
(AUG., 1932).



GAUMUKH (AUG., 1932).

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many places the road had subsided owing to the rain and in other places there were big fissures on the ground where the road would fall down in a big landslide with a little more absorption of water.

From Suki onwards we are out of the range of the monsoon. From the day we reached this place till the day we came back to it—12 days in all—we had not a single shower anywhere. We were told there had been no rain above Suki that year so far. It had been raining almost every day below this. From Suki onwards for about five miles the valley opens out till it culminates in the wide expanse of Harshil inhabited by domiciled Tibetans and others. It is a market place also and a fair is held every year a little before the Dusehra festival when Tibetan wool and other products are brought from Tibet and sold there. There is a large wooden Forest bungalow here. On our return we witnessed a fair at this place when people indulged in drink and dancing and a man was 'possessed' by the Devata. He pierced his cheeks with a long and thick iron pin without any signs of bleeding or pain. We camped here in a fine open place under the cedar trees. Other common trees were *Pinus excelsa*, *Populus ciliata*, and *Hippophae salicifolia*. An *Artemisia* (*A. maritima*) was very common. Apples and apricots are cultivated here, the former were not quite ripe yet and the latter were over. The cedars are mostly truncated owing to the cold winds and some of the trees had branches developed only on one side owing to the effect of winds blowing from one side only.

A road from here leads to the Sangla Valley in Bashahr over the Nela pass. We had intended to return by that road but owing to the harvest time and other causes it was not possible to arrange for transport.

The river makes a sharp bend here to the east and the valley again becomes gradually narrowed, till at Jangla where the river is crossed by a small bridge this channel is very narrow indeed. From Jangla to about half a mile below Gangotri, the gorge is exceedingly narrow and just below Gangotri at the place called Gaurikund the rocks forming the narrow channel actually meet in the middle forming a natural bridge, though on account of the steep walls above the bridge the latter cannot be used for crossing the river. The water comes down in a leap into the gorge and can hardly be seen as it passes out in a snake-like manner. The rocks above this fall are broad and flat and are beautifully polished by the action of water. The river can be crossed here by a small wooden bridge to the left bank but the road to Gangotri goes along the right bank. The road from Harshil to Jangla along the left bank is very pleasant, shady and level.

About nine miles from Harshil the Jahnavi coming from Tibet meets the Bhagirathi on the left and the latter makes another bend to the south and then again to the east. The Jahnavi was formerly crossed by a wooden bridge very high above the river but the bridge was damaged sometime ago and is no longer being used. The stream is now crossed by a cantilever bridge and the road beyond the bridge is carried on planks placed on horizontal bars struck into the vertical rocks.

At Gangotri we again came to an open valley. The right bank is occupied by the large fine temple built about twelve years ago and a number of other small

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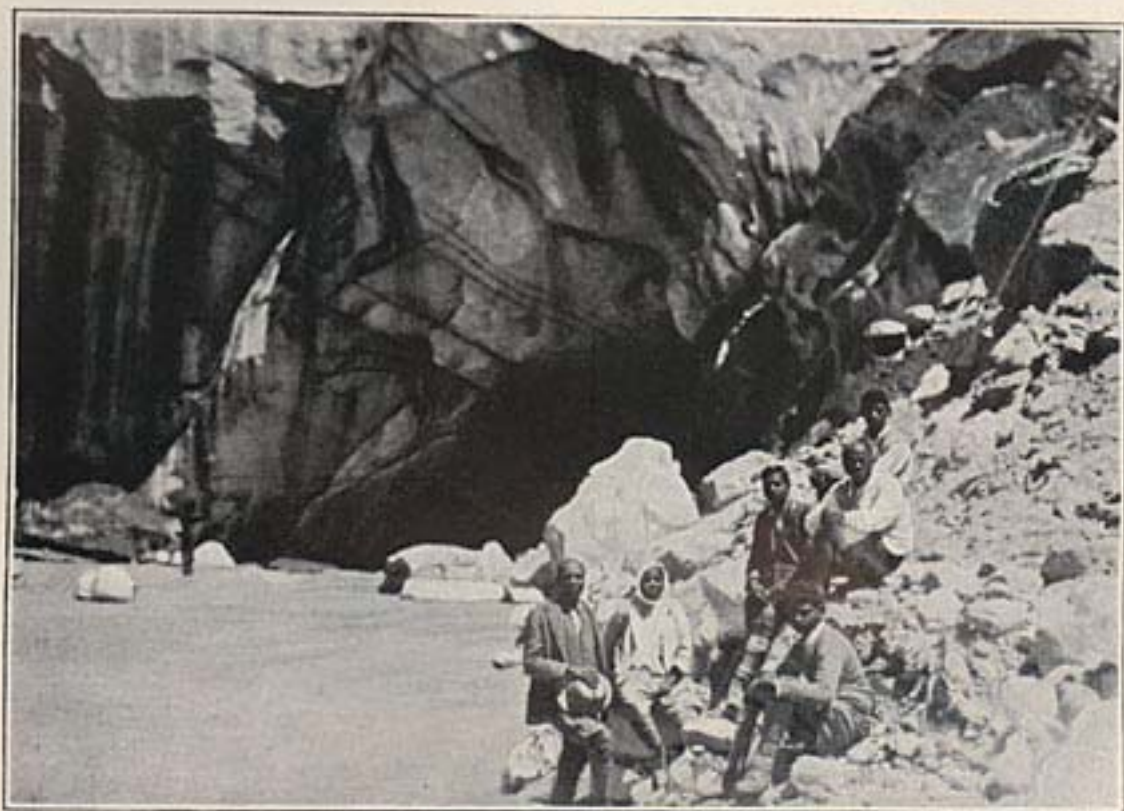
buildings—dharmshalas, etc. On the right bank is a wide open ground very suitable for camping. The river was crossed here by a large wooden cantilever bridge but owing to a flood caused about 3 weeks before our visit by a blockade in a feeder higher up due to a landslide the bridge was damaged and can no longer be used with safety. A large part of the camping ground has also been washed away and it is now much smaller than it was when I camped here in 1927. Several houses have also been carried away and the temple barely escaped destruction.

Our tents were pitched under the cedars, and firs (*Picea morinda*). There is no *Abies Webbiana* here. The ground was covered with tiny plants of *Chenopodium album*, *Polygonum plebium* and *P. cognatum*.

A road has recently been built along the right bank of the river also from Harshil to Jangla via Mukhba, the village of the Pandas, and we followed this road on the way back. The only redeeming feature of this road is that a fine view of Srikanta peak (20,120 ft. above the sea) can be obtained from the village and it is not visible from any part of the other road on the left bank, otherwise the latter is far superior.

Gangotri is 10,020 ft. above sea-level. It is a very sacred place of pilgrimage for the Hindus but owing to the lack of bridges, rough roads, inadequacy of accommodation, difficulty in getting proper provisions, and recurring epidemics of cholera owing to absence of all sanitary arrangements, it is visited by a far smaller number of people than Badrinath. Gaumukh, the actual source of Bhagirathi at the end of the Gangotri glacier, is visited by hardly a dozen people every year and they are generally sadhus. We left for Gaumukh—about 12 miles beyond—on the 29th August. There was no road, not even a footpath. Whatever there was in the form of a footpath had been carried away for the first few miles by the flood. Later on a semblance of a footpath was occasionally seen but it did not last for more than a few yards at a time. We had to go somehow, hopping over stones, crawling up or down some particularly steep rock, wading through water, jumping over the branches of the trees or bending under them, and occasionally clearing the wood by breaking or cutting the branches. In some places the whole rock consists of loose debris and it is positively dangerous to pass over it or under it especially if it is touched for support as the whole mass comes down crumbling. In other places the route runs across a stream of steep slippery gravel which is constantly falling down into the river. About two miles from Gangotri is the Deva Garh, meeting the Bhagirathi on its right bank, and it was this insignificant looking stream which brought about all the havoc at Gangotri. At its confluence with the Bhagirathi the debris brought by it forms a large wide platform which extends even above the confluence for a short distance owing to the temporary blockade of the Bhagirathi.

Earlier in the season the road runs along the right bank after some distance as there are snow bridges at various places, but at the time of our visit the snow bridges had disappeared and we had to go along the left bank



PARTY AT GAUMUKH (AUG., 1932).



SWARGAROHAN FROM ABOVE GAUMUKH (AUG., 1932).

PLATE VIII.



PARTY BELOW UDAIGIRI ABOVE GAUMUKH (AUG., 1932).



GANGOTRI GLACIER FROM ABOVE GAUMUKH (AUG., 1932).

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all the time having crossed the Bhagirathi at the Gaurikund bridge below Gangotri.

We had started rather late and camped in a very rough and uncomfortable place after a few miles. The space available was very small and steep. Next day on the 30th August we had done only about 4 miles when we were held up by the stream coming on the right from the Kedar Nath glacier. Owing to the melting of the snow during the day the water had risen and the stream was unfordable. We tried to bridge it by rolling big boulders into it from the top of the ridge and by bringing some large logs from the neighbouring wood. It was, however, too late to continue our journey before the logs could be placed in position. We stopped for the night on the bank of the stream and forded it early in the morning, leaving the porters behind to complete the temporary bridge for the return. Gaumukh is only about three miles from here and the going is comparatively easy.

On the way from Gangotri the route passes through a wood consisting mainly of blue pine, the cedar, and some birch trees (*Betula utilis*). There are many shrubs, chief among them being three species of *Lonicera* and a rose. There were also trees of *Populus ciliata* and *Picea morinda*. Among other shrubs and herbs the following were met with:—*Ribes* sp., *Juniperus* sp., *Ephedra vulgaris*, *Salix* sp., a little *Myricaria* sp., *Impatiens* spp., *Polygonum affine* and two other species, *Oxyria digyna*, *Potentilla argyrophylla*, *P. eriocarpa*, three or four species of *Sedum*, an *Astragalus*, *Cassiope fastigiata*, some *Saxifraga*, two *Arenarias* (*A. musciformis* and *A. feutucoides*) *Artemisia* sp., an *Umbellifer*, *Androsace* sp., *Rheum* sp., *Lactuca* sp., *Geranium Wallichianum*, etc. Tree limit is reached a few miles below Gaumukh, the last trees being the 'Bhuj' (*Betula utilis*, Bhoj patra) a little above 12,000 ft. above sea-level.

Blue-flowered plants were more numerous than the others but yellow and white were more conspicuous. A species of *Anaphalis* (*A. cuneifolia*) with its white heads was most prominent. It is curious that no *Leontopodium alpinum* (Edelweiss) was seen.

There were, however, nowhere any large beds of flowers like the ones we saw in the Alaknanda valley at the same altitude last year. It may be said in general that of the many valleys running side by side visited by me from the west to the east—Bhaga Valley, Chandra Valley, Sutlej Valley, Jumna Valley, Bhagirathi Valley, Mandakini Valley, Alaknanda Valley, and the Vishnu Ganga Valley—between the altitudes of 10,000 ft. and 17,000 ft., the Alaknanda Valley has the most conspicuous flower beds, sometimes extending over furlongs at a time consisting of one or a few species, and is in this respect the most beautiful. Jumna Valley is fairly rich in vegetation. The Bhagirathi Valley would come next and the other valleys are dry with much less vegetation and fewer flowers. This applies mainly to the state of things in the months of July, August, and September.

About a mile above Gangotri there is a large hut on the right bank of

the river, formerly occupied by a sadhu but now deserted owing to the damage done by the last flood and the consequent future risk. A mile and a half below Gaumukh there is another smaller hut which was said to have been occupied recently for some years throughout the year by another sadhu whom we met on our way back. He was absolutely naked and is under a vow of silence. A third small hut is again met with about half a mile below Gaumukh built under and partly into an overhanging stone.

Close to the mouth of the glacier there is a small pond of perfectly clear warm water. Probably it has a hot spring somewhere near it.

The mouth of the glacier is a huge dark cavern from which the water rushes out in a large quantity. The glacier is so long—it is said to be more than twenty miles long—and there are so many other lateral glaciers meeting it that the volume of water coming out of it is already large enough to deserve the appellation of a river. Huge rocks of ice are constantly falling down the walls and the roof of the cavern into the stream and the water is naturally ice cold. A very well-informed local Panda told us that the glacier had receded for about half a mile during the last forty years. It used to end formerly near the small hut mentioned above. The whole party, including even the porters, had a bath and after taking a little refreshment started on the return journey. Some members of the party, however, went up a steep cliff to the right (on the left bank) for a distance of about 3 miles to have a good look at the glacier from an eminence, and we were amply rewarded by the glorious sight that we saw. Gaumukh is 13,000 ft. above the sea and the party must have gone up to 15,000 ft. Even during the ascent we had a fine view of a most dazzling snow peak to the east (E.N.E.) locally known as Swargarohan where the Pandavas are said to have perished in ancient times. The glacier coming from this peak joined the Gangotri glacier on the right side a little above Gaumukh. Ascending still further we came to the foot of a conical snow peak called by our guide Udaigiri and from here we had a most magnificent view of the whole Gangotri glacier and the snows which give rise to it. To the right (W.S.W.) was the small conical peak, Udaigiri, at the foot of which we were sitting. To the south-east there was some snowy peak known locally as Baijanti. To the left we had a still more extended view of the Swargarohan peak. But the most magnificent view lay in front (south). The glacier lay in the valley like a huge python 'dragging its slow length along', and far in the distance rose the lofty snow peaks which gave rise to it towering to a height of more than 23,000 feet above the sea. Last year we had seen these very snows from the other side (north) about this very time of the year standing on the Shatopanth glacier but then we were not high enough to get a full view. As it was getting late we tore ourselves reluctantly from the view and reached the camp after dark. The next day we continued our return journey and ultimately reached Mussoorie on the 17th September. We had been away for one month and twenty-two days.