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NANDA DEVI AND THE GANGES WATERSHED: *A paper read at the Evening Meeting of the Society on 4 February 1935, by*

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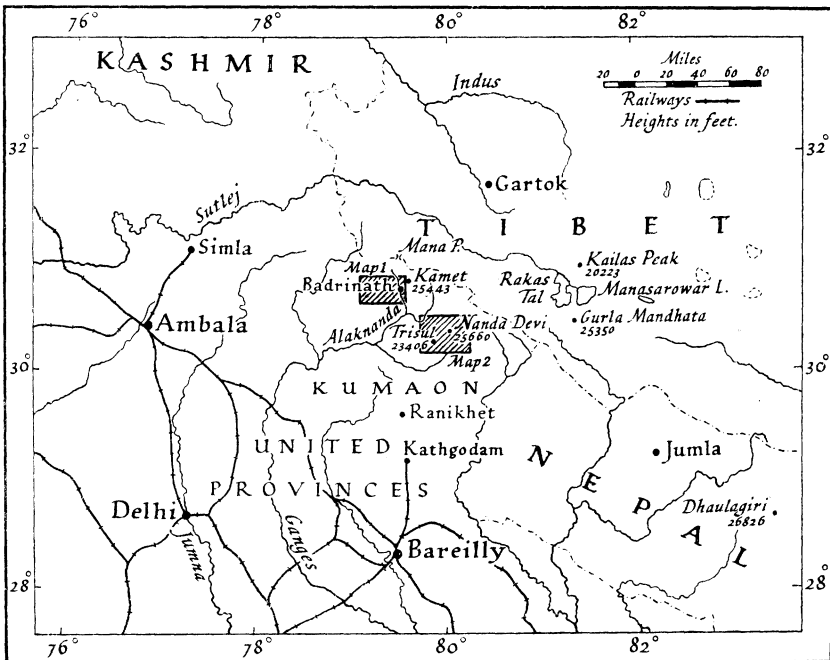
THE section of the Himalaya which gives birth to the river Ganges is perhaps the most visited portion of that vast range. A hundred thousand pilgrims throng each year to the sacred Hindu shrines of Badrinath, Kedarnath, and Gangotri, which are situated near the three main sources of the Holy River. A mass of fascinating legends and semi-mythical stories centre round these parts. Of these Hindu literature is full. This being so, it is curious that to this day the geography of the peaks, glaciers, and less accessible valleys of these parts is very little known, and vast tracts of country still remain unmapped and unexplored.

It is difficult to account fully for this fact. The country lies almost entirely in British territory, and no political difficulties have to be overcome before an expedition is allowed to visit it. Moreover the transport of supplies and equipment over the foot-hills to a suitable base is a simple matter, the organization of which does not require any previous knowledge of the country. There is only one obvious reason why there still remains so much minor exploration to be done in those parts, and that is the extraordinary character of the mountains and valleys themselves. These certainly present quite unusual difficulties of access. When I decided to take a small expedition to the Garhwal Himalaya this year I had plenty of choice and decided after due consideration to attempt to make a thorough exploration of the range which forms the watershed between the Badrinath, Kedarnath, and Gangotri valleys.

No one attempting mountain exploration in the Himalaya can afford to miss an opportunity of discussing his plans with Dr. Longstaff. When he gave me that opportunity therefore I accepted it with avidity. He was kind enough to give me two days of his time in spite of the fact that he was himself leaving for the Arctic in a short time. As a result of those two days, the Badri-Kedar watershed became a thing of secondary importance, and I had determined to make an attempt to force an entrance into the hitherto inviolate sanctuary of the Nanda Devi basin. I am glad that Dr. Longstaff is one of the very few who can fully appreciate the debt I owe him for this change of programme. I am

deeply indebted also to Mr. Hugh Rutledge for much valuable advice and encouragement.

Regarding Nanda Devi I need not say much. It is the highest mountain entirely in British territory, and yet, though several expeditions had tried to reach it, no one had so much as penetrated to the glaciers which rise at the feet of the great mountain. The main difficulty lay in the fact that the peak is encircled by a vast amphitheatre of mountains which, I believe, is unique. It is hard for any one who has not studied the phenomenon at close quarters to form an adequate conception of this gigantic rampart, in places over 22,000 feet high, enclosing a bit of country, itself not above the limits of dwarf trees,



*The Garhwal Himalaya, showing areas of Mr. Shipton's explorations*

out of whose centre there rises a stupendous peak, 25,600 feet. The interior of this circle had never been visited and the foot of Nanda Devi never reached.

The water rising from the glacier system of this basin flows to the west through a narrow gorge, the Rishi Nala, which forms the one break in the huge amphitheatre. One would naturally suppose that the best line of attack would lie here, but the extraordinary difficulties of the gorge are such that, since Dr. Longstaff visited it in 1907, all aspirants to reach the foot of Nanda Devi have attacked the mighty walls of the basin.

As early as 1883 that redoubtable Himalayan explorer, W. W. Graham, accompanied by two Alpine guides, Emile Boss and Ulrich Kauffmann, made two determined attempts to force a route up the Rishi Ganga. The first was frustrated at the very mouth of the gorge by sheer walls of rock. Later, he contrived to avoid the lower part of the gorge by making a big detour to the

north, and, after overcoming immense difficulties, he contrived to force a re-entrance into the valley higher up. Here he was deserted by his porters, local men who believed the valley to be the abode of demons. Undaunted, he and his guides struggled on alone, but were at last forced to admit defeat by the sheer difficulties of the gorge.

Others tried later with less success. But it was not until 1905 that Dr. Longstaff devoted his indefatigable energies to the problem of gaining access to the Nanda Devi basin. In that year he was accompanied by the two Brocherels of Courmayeur. They approached the mountain from the head of the Milam Valley, which bounds the Nanda Devi group on the east, and ascended the Panchu Glacier, crossing a new snow pass at its head. This brought them on to the Lwanl Glacier running parallel with the Panchu, and not into the Nanda Devi basin as their map had led them to expect. They descended to the main valley for supplies, and shortly afterwards re-ascended the Lwanl Glacier. After three days' climbing they gained the Kumaon-Garhwal water parting, which forms at this place a part of the rim of the Nanda Devi basin. From here for the first time in history they looked down on to the glaciers at the southern foot of the great mountain. A descent on the other side of the ridge was found to be impracticable.

Further exploration of the group was made in 1907 by Dr. Longstaff, General Bruce, Mr. A. L. Mumm, and three Alpine guides. Their first objective was the Rishi Valley. Examination of the lower gorge decided them to attempt Graham's route, the first part of which was known to the Tolma and Lata shepherds. But they were too early in the year and found too much snow to allow them to make a passage of the Durashi pass. The party moved round to the Bagini Glacier, and after several days of difficult mountaineering, crossed a 20,000-foot pass at its head. Again they were disappointed. They had hoped that the pass would lead them onto a glacier flowing down into the Nanda Devi basin; but on descending the glacier they found themselves in the Rishi Nala at a point below that which Graham had reached in 1883. It was soon after this that Dr. Longstaff made his famous ascent of Trisul.

Afterwards he visited the mouth of the upper gorge. I should like it to be understood that no serious attempt was made by the party to force a route up this upper gorge and that Dr. Longstaff did not have the time or food enough to do so. Several attempts to get into the basin were made since that date, notably those of Mr. Hugh Ruttledge, who, in 1932, tried with the guide Emile Rey to cross from Maiktoli, a gap at the head of the Sonadhunga valley on the south.

It is a mountaineering axiom that each successive attempt upon a problem makes that problem easier to solve. Few great mountains were climbed and few passes crossed at the first attempt. The man who eventually reaches the summit of Mount Everest will have done so, not by his own efforts alone, but over the shoulders of the pioneers—Mallory, Norton, Somervell—without whose hard-won experience he would have stood no chance. It should be clearly understood therefore that what measure of success we have had this year we owe primarily to those who had gone before us.

It was our plan to attempt once more to get up the Rishi Nala. Our first project was to get a month's provisions to the junction of the Rhamani stream

with the Rishi, which was about the farthest point previously reached in this direction. From here Dr. Longstaff advised us to attempt to force a way across the cliffs of the southern side of the gorge.

It was necessary to conduct the expedition with the strictest regard to economy. Careful accounts were kept of expenses both in England and India. The total cost worked out at £287. We were in the mountains for just under five months. On Dr. Longstaff's advice the party was a small one, and I was extremely lucky in having four ideal companions. They were H. W. Tilman, with whom I had climbed a good deal in East and Central Africa; Angtharkay, who was one of the two Sherpas on Mount Everest last year who sat through that three-day blizzard at Camp 5 and then volunteered to carry to Camp 6; Passang Bhotia was another Camp 6 man; and lastly Kusang Nangir, a man of extraordinary toughness and imperturbability.

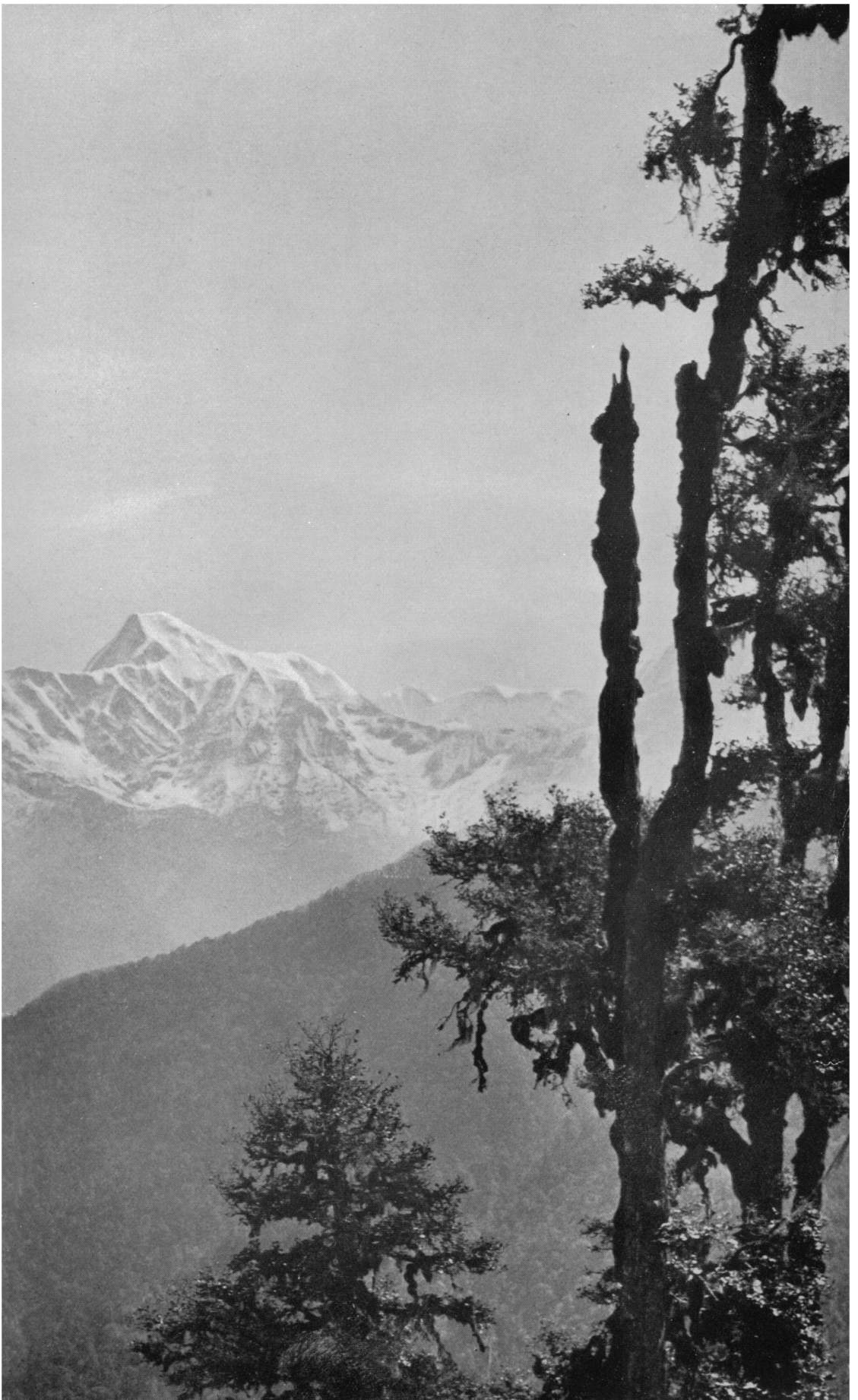
The party reached Ranikhet on May 9. We engaged twelve Dotial porters for the march across the Kuari pass and left Ranikhet early on the morning of the 11th, reaching Gwaldam the same night. For nine delightful days we wandered through the lovely foot-hills of the range, over passes clothed with pine, oak, and rhododendron woods. Here and there we obtained superb views of the peaks we were making for. An early morning view from the Kuari pass showed us that wonderful panorama in its most inspiring setting.

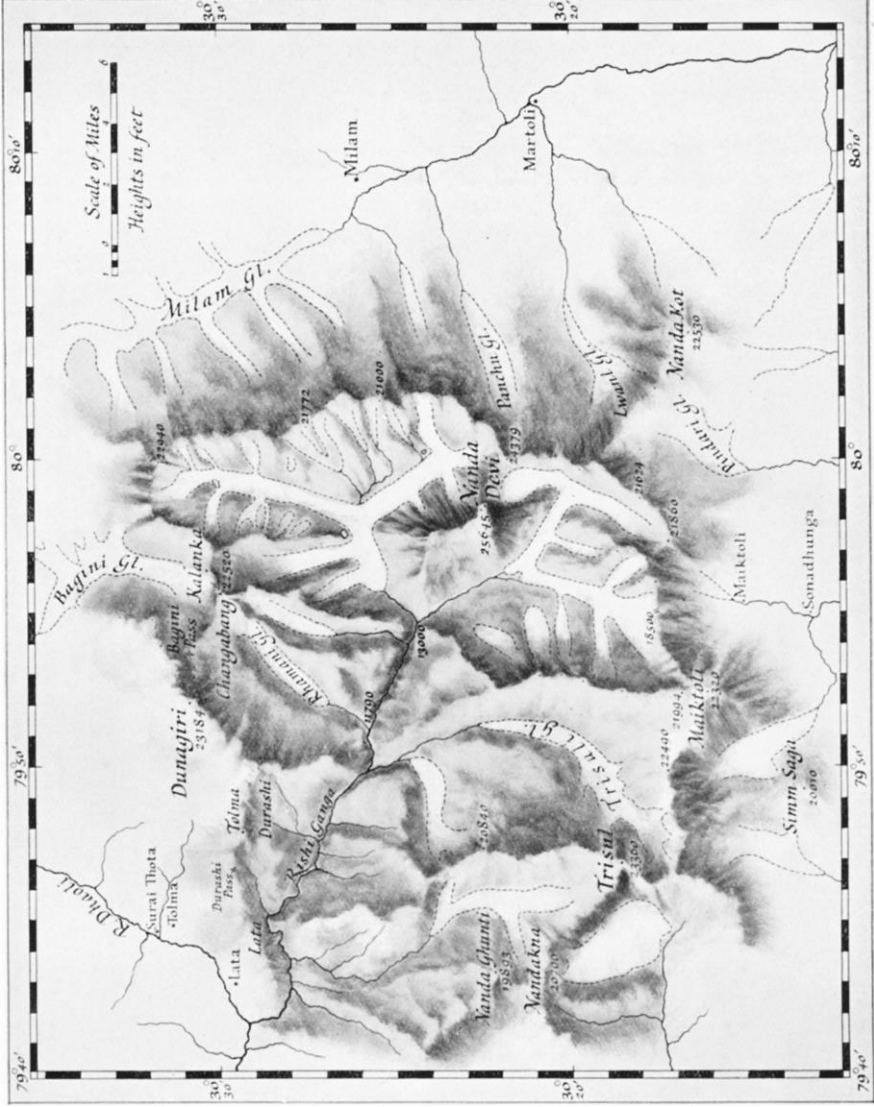
We reached Joshimath on the 19th and spent a busy day in the arrangement of our bandobast. Eleven of the Dotials requested to be allowed to remain with us as long as we required porters. With them we left Joshimath on May 21. On May 22 from Tapoban, in the Dhaoli valley, three of the party ascended the little Lata peak so as to get a view up the Rishi Ganga and to get started with our plane-table, descending that evening to Surai Tota.

The following morning we collected supplies of food at Surai Tota and engaged the services of eight more local people to help with the transport and to supply local knowledge for at least the first part of the route. We left the same morning (May 23). It was early in the season and there was a great deal of snow on the passes which constitute Graham's "back-door" entrance into the middle section of the Rishi Nala. These passes are used in summer by the Lata and Tolma shepherds of the Dhaoli valley, who take their sheep across them to a little alp known as Durashi.

The Surai Tota men deserted us after the first day. This produced a serious crisis which threatened to destroy at the very outset our plans for the exploration of the Rishi Ganga. For, in these parts, a very short time remains between the melting of the winter snows on the lower passes and the breaking of the monsoon. However the Dotials shouldered enormous loads and followed us with wonderful determination and loyalty.

Being now without the help of local knowledge we floundered for nearly two days through snow waist-deep before we could get across the passes to Durashi. Part of the route lies across some cliffs at an altitude of 14,700 feet. From here we could look down an 8000-foot precipice into what must be one of the most fantastic gorges in the world. It has never yet been penetrated by any human being and it is believed by the local people to be the abode of demons: a superstition we were quite ready to share. The river, only just visible in the depths below us, sent up a roar like that of Niagara.





*The Nanda Devi basin, from a plane-table survey by E. E. Shipton and H. W. Tilman*

In making our way along the northern flanks of the Rishi Valley we were again greatly handicapped by the lack of local knowledge, which the Surai Tota men would in all probability have provided. The flanks of the valley are steep and cut into innumerable ravine-like gulleys. We were constantly reaching some cut-off which could be avoided only by making a big detour. It was terribly hard work for the Dotials, who carried their huge loads with remarkable skill and courage. Also we kept them at it all day, as food was a vital consideration and each extra day we spent in getting to our base meant three days less for our work beyond.

We kept to the northern side of the valley until a mile or so beyond the junction of the Trisuli stream. Then we bridged the river and crossed to the southern bank. Late in the evening of May 28, in a heavy snowstorm, we reached the point where the Rhamani stream flows into the Rishi from the north. Here under the overhanging walls of the canyon we established our base. The Dotials were discharged and early on the following morning they started down the valley, leaving us to our own resources.

Our next task was to find a route through the unknown upper part of the Rishi Nala into the Nanda Devi basin, now barely 4 miles distant. Our base camp was on the southern shore of the river, at a point where the gorge forms one of its narrowest bottle-necks. We made our height 11,800 feet, which agreed well with Dr. Longstaff's reckoning. Dr. Longstaff had advised us to concentrate our search for a route mainly on the southern side. Indeed it was not long before we saw how utterly impregnable the cliffs of the northern side were. They rise straight out of the river-bed, seemingly without a break, and culminate in peaks of 20,000 odd feet.

We started at once upon our hunt for a route along the southern wall of the canyon. It was absorbing work and we spent our time being led alternately into a state, first of wild excitement, then of exasperation, as we traversed along some narrow ledge to some impassable cut-off. Looking at those grim, relentless cliffs, the chances of a continuous route along their precipitous sides seemed very slender indeed, and it was only due to a series of freak rock formations that, after an exhaustive search, we succeeded in effecting a passage along a series of delicate traverses over giddy drops to the river, 1000 feet below. Several sections of the route had to be roped up. Food and kit were then carried up in relays.

The last half-mile of the gorge looked so hopeless that we decided to try a route along the river-bed itself. When the river was low we actually succeeded in getting through that way, though we had to ford the stream six times to do so. We found it impossible however to get our loads up, and after some unpleasant adventures were obliged to abandon the route and search for another. Later we came to regard these river crossings as most serious obstacles. One's legs were numbed by the icy water and lashed and cut by innumerable stones swept down by the river. We found that when the water reached our waists it was impossible to resist the current. The usual procedure was for the first pair to cross holding hands for mutual support, then the others would follow hanging on to a rope stretched across the river.

Careful search revealed a continuation of our route 2000 feet above the river on the southern side, and on June 6, after nine days' work (from our base in

the Rishi Valley) we established an advance base (13,000 feet) in the Nanda Devi basin, with sufficient food to last our party of five for three weeks. We had left food dumps at intervals down the gorge.

The country we were now in is an extraordinary freak of nature, and is, to the best of my knowledge, unique. As I have said, it is enclosed by a gigantic rampart of scores of peaks between 20,000 and 23,000 feet in height. The only breach in this amphitheatre is the gorge we had just come up. In the centre of the basin rises one of the most colossal masses of rock in the world, the majestic peak of Nanda Devi, whose sides are so exceedingly steep that even the plastic Himalayan ice can find little room to cling. North and south of the peak flow two great glaciers, the streams issuing from which unite some miles below the snouts of their respective glaciers and form the Rishi Ganga, which later adds its water to the Ganges. A large number of subsidiary glaciers flow down from the peaks of the amphitheatre to the main glaciers.

With a bare three weeks at our disposal we decided to concentrate on the exploration of the northern section of the basin, and to return if possible after the monsoon to investigate the country to the south of Nanda Devi. The interior of the basin was very different from what we had expected. I had pictured deep, steep-sided valleys entirely filled with moraine-covered glacier. Actually we found the country to be wonderfully open. There were extensive areas of rich pasturage, gay with wild flowers, and lakes on whose deep blue and green surfaces were reflected the icy crests of the great peaks. We found too a considerable variety of birds, and large herds of tar and bharhal, which were so tame and regarded these strange new visitors into their country with such curiosity that I was very glad not to have brought a rifle with which to supply ourselves with food.

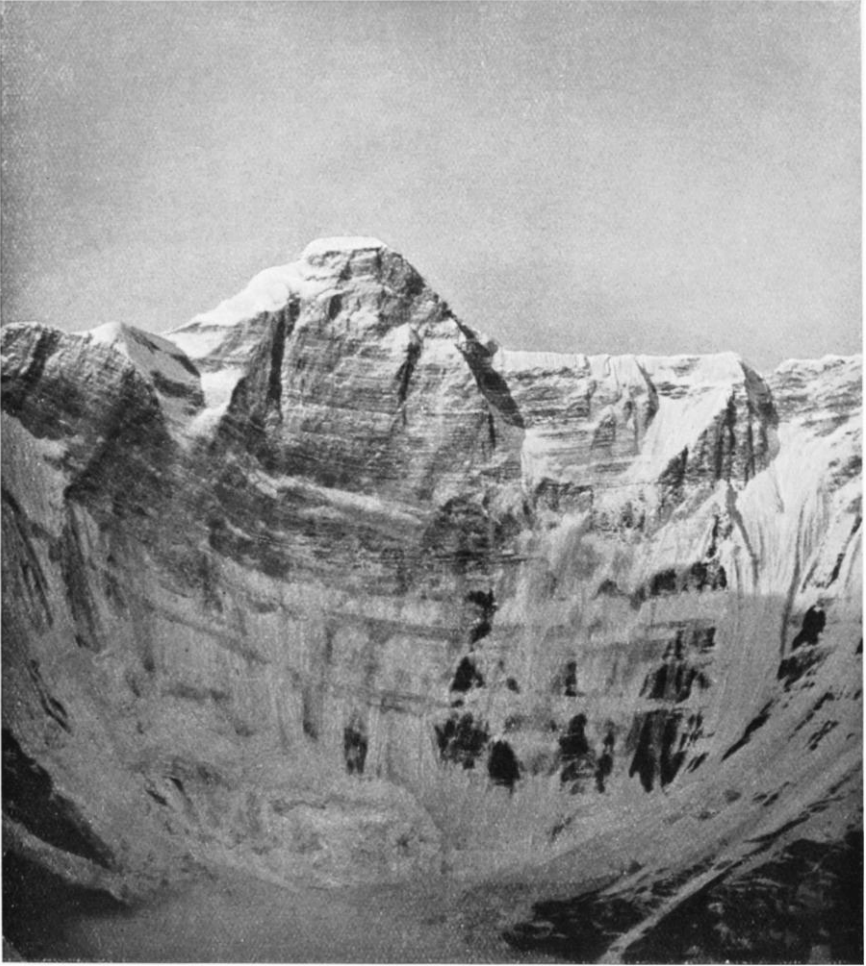
In consequence of the open country we found travel to be much easier than is usual in the glacier regions of the Himalaya. This was a welcome change after our recent experiences in the Rishi Nala. Nevertheless we had an exceedingly busy time and none to waste. The first two days in the basin were spent in ascending various points above the snout of the main north glacier, which commanded views suitable for our plane-tabling. We soon found how exceedingly difficult it was to identify any of the triangulated peaks on our graticule sheet with any degree of certainty. Over-confidence in this respect led us into a lot of trouble at first; and it was some time before we came to know which points we could trust, and to build from them a network of suitable fixed points inside the basin.

On June 9 we reached a beautiful little lake, about 8 acres in extent, near the junction of the three biggest glaciers of the northern section. The main north glacier takes a sharp southward bend hereabouts, and is joined by a very large glacier coming in from the north. This came to be known as the Great North Glacier. Half a mile farther south another ice-stream comes in from the combe formed by the ridges of the two majestic peaks of the G.T.S. A.21: Changabang and Kalanka of Longstaff's map. Tilman suggested the name Changalanka for this glacier and seemed disappointed when I expressed my doubt if it would be accepted by the authorities. The difficulty however was overcome when we subsequently discovered another big ice-stream flowing from the north-east face of Kalanka. A camp on the farther side of the Great





*The north face of the main peak of Nanda Devi*



*North face of eastern peak of Nanda Devi, 8000 feet above the glacier*



*The twin peaks of Nanda Devi from the ice-plateau at the head of the Great North Glacier*

North Glacier served us as a main base for the rest of our stay in the northern section. For convenience we called it Junction Camp.

Our first task was to investigate the valleys coming in from the eastern rim of the basin. For the sake of convenience we numbered these, starting from the south. It was our plan to put light camps in each of the valleys in turn; these were to be occupied by Tilman and me, while the Sherpas worked between the lower camps and the higher. A remarkably broad strip of grassland ran outside the well-defined lateral moraine of the main glacier; this provided us with a high-road almost up to the head of the main valley.

From our camp in lateral valley No. 1 we were able to see to its fullest advantage the colossal northern face of the twin peaks of Nanda Devi. From the summit ridge it falls in one unbroken sweep to the glacier which lies at its foot. For hours on end, in every combination of light and shadow, we were able to gaze upon that cirque, but I never got tired of doing so or lost my early amazement at the sight.

Above this camp, at an altitude of about 18,000 feet, I came upon a bharhal. It was about 25 yards away and we stood and looked at one another for some minutes before the animal moved slowly away. Unfortunately I had not got my camera with me at the time. A taste for mountaineering seems to be the only explanation for these creatures visiting such altitudes.

We succeeded in reaching a 20,000-foot col on the eastern rim above Glacier No. 2, and from it climbed a peak of about 21,000 feet (June 11). From these points we got views to the east over an extraordinary tangle of peaks in the Milam district.

Within half an hour of returning to our high camp after climbing the peak I was stricken by a fever. It started by a violent attack of shivering and an acute pain in the top of the right leg. It lasted for about thirty-six hours, was accompanied by some mild delirium, and left me as suddenly as it had come. Nearly a week later Tilman was confined to his bed by a complaint exhibiting almost exactly similar symptoms.

We reached another point on the eastern rim above Glacier No. 3, also above 20,000 feet. We were anxious to find a practicable route out of the basin in this direction but from the points we reached we could see no way down on the other side. Throughout the whole season we struck vile snow conditions. This was one of the most serious obstacles we had to contend with.

On June 16 we started up the Great North Valley. Travel here was considerably more difficult. The glacier is a good deal longer than the main one above the junction and has a number of considerable tributaries coming in from the ridges of Kalanka and from the peaks of the "rim." It rises from an extensive snow-field between G.T.S. peaks 113 and 110. In bad weather we pushed a camp high up in this direction, and spent some days investigating the complexities of this great ice plateau. We reached a col of some 20,500 feet between the two peaks. From here we looked straight down on to the moraine-covered Bagini Glacier, a sheer drop of nearly 5000 feet. We also made two attempts (June 19/20) to climb peak 110, which is nearly 23,000 feet high. On both occasions we failed on account of dangerous snow conditions. We were anxious to get up it, primarily in order to get a more comprehensive

idea of the complex topography of the country to the north. Our time in this fascinating valley was all too short.

As we descended (June 22) the glacier once more we found that there was an alarming increase in the rate of melting of the ice. The surface streams were enormously swollen and from deep down in the bowels of the glacier there came an ominous roar. Before we could reach the southern bank of the Rishi we would have to ford both the northern and the southern streams and we were in some danger of being cut off.

On June 24 the monsoon broke. This surprised us as we had not expected it for at least another two weeks. On the 25th we began our retreat to the Rishi Ganga. Our fears regarding the state of the rivers were well founded and we had a very tough job to cross the one below the snout of the Main North Glacier. Lower down we found that the Rishi was in flood. We were forced to cross it by a natural rock bridge below our base camp and to climb for 2000 feet up the Rhamani gorge before we could find a possible line of traverse. Our dumps of food were small and we were delayed by weather and conditions so that we had to press on as fast as we could. Tilman, during our last few days in the basin, had developed a carbuncle on his foot and these forced marches must have caused him considerable pain; but he insisted on carrying his share of the loads and never murmured a word of complaint. Crossing the Durashi Col on July 1 we reached Joshimath in pouring rain on July 2. Here we spent a few days resting, eating, and making plans for our next move.

To the north-west of Joshimath lies the Badrinath range, which gives birth to the three sacred rivers, Bhagirathi, Mandakini, and Alaknanda, the three head streams of the Ganges. Though the birthplace of the Holy River of India is the goal of all devout Hindus, surprisingly little is known about the topography of the watershed itself. Our chief concern last year lay in the Nanda Devi basin, but it was decided to devote the monsoon period, when heavy rain and snow would make work so far south impossible, to an attempt to make a complete crossing of the range from Badrinath, first over to Gaumukh at the source of the Bhagirathi, and then over to the Kedarnath valley-system at the source of the Mandakini. In this way we hoped to connect up the sources of these three rivers. We hoped also to be able to trace the watershed as far as time and weather permitted, and to fill in roughly some portions of what might well have been left a blank space on the Survey of India Maps.

Several expeditions had visited various parts of the range. Before the War, Mr. C. F. Meade with the two Alpine guides, Pierre and Justin Blanc, went up the Alaknanda valley and, reaching a gap in the range, were able to look down on to the glaciers flowing to the north-west. In 1931 the Kamet Expedition spent two weeks exploring the head of the Arwa valley and discovered two passes, which if crossed completely would undoubtedly lead eventually to the Gangotri glacier; while in 1933 an expedition led by Mr. Marco Pallis visited and explored the lower reaches of that glacier, perhaps the longest in the Central Himalaya.

We reached Badrinath on July 11, and on our arrival we received a welcome visit from Master Ram Serikh Singh, former Professor of Philosophy at the University of Bhagalpur. The Professor has now retired and spends the

summer months in solitary contemplation in one or other of the beautiful alpine glens near Badrinath. The word professor perhaps conveys the wrong idea of the man, for he was a robust and imposing figure whose whole appearance harmonized with the magnificent mountain scenery amongst which he lived. He was kind enough to spend the whole evening with us, and gave us a fascinating discourse on the history and mythology of those parts, on which subject his knowledge appeared to be boundless. He has travelled extensively and has made, among other journeys, the pilgrimage round the holy peak of Kailas, in Tibet. From him we received a great deal of encouragement in our project.

The next morning we left Badrinath and made our way along the northern bank of the Alaknanda. We had with us enough food for more than three weeks and eight local coolies to assist with the transport as far as the head of the valley. Friday the 13th lived up to its evil reputation for providing ill luck. We were confronted early in the morning by a stream of quite moderate dimensions, as compared with the ones we had encountered in the Rishi Nala. While fording it Passang lost his footing and was swept away load and all by the current. Fortunately for him his load broke loose and sailed down the stream, and he managed to save himself from having his head dashed against the rocks. He lost his ice-axe and in trying to rescue the load Tilman lost his. The load was stopped and brought in before it was swept into the Alaknanda, where it would have been irretrievably lost. Passang was badly shaken and later the loss of the ice-axes proved serious.

Three days' march from Badrinath took us to a point some 5 miles up the Bhagat Kharak Glacier (pronounced Bhagrathi by the natives). There the valley takes a gradual bend of some  $37^\circ$  to the north. Opposite us there rose a massive snow peak which we identified as the G.T.S. peak Kumaling, 23,420 feet high, the highest peak of the Badrinath Range. To its right lay the col visited by Mr. Meade. The route to it appeared to us to be in danger of being swept by ice avalanches. We took the local porters on for another day, carrying heavy loads of juniper firewood collected lower down the glacier, and camped right at the head of the moraine-covered part of the main glacier at an altitude of 16,200 feet. From here we discharged them and were left again to our own resources. On the following day (July 16) Tilman and I climbed a peak which commanded a superb view of the cirque of mountains which encloses the head of the Bhagat Kharak. The cliffs of this cirque are some of the most precipitous I have seen.

After making a rough exploration of the lateral glaciers of the cirque we started northwards. We were carrying enormous loads and our progress was rather slow. The weather too, which had been fair up till this time, became bad. The snow conditions were abominable, and however early in the morning we started we never found a surface crust to prevent us from sinking in up to our knees and even to our waists. In all my mountain experience I have never struck such continuously bad snow conditions. Things had been very different when we were in the Arwa valleys about the same time of year in 1931.

During the next week we crossed a series of passes to the north, each between 17,000 and 20,000 feet high. This landed us in the Arwa glacier system, and we were thus able to connect up the lateral valleys of this part of

the watershed. We climbed (July 22) another peak of 21,000 feet which provided us with excellent mountaineering but no view.

As we got farther north the mountains took on a more rounded appearance, which suggested that we were approaching the border of the Tibetan plateau. We passed several of those curious glaciers which are such a typically Tibetan feature and which appear to have no névé. Having reached the glaciers of the Arwa system we turned west and crossed the main watershed on July 25 by a col of 19,400 feet, probably one of those visited by Captain Birnie in 1931. From now on we left dumps of food and fuel against our return. This lightened our loads and we were able to press forward at a good speed.

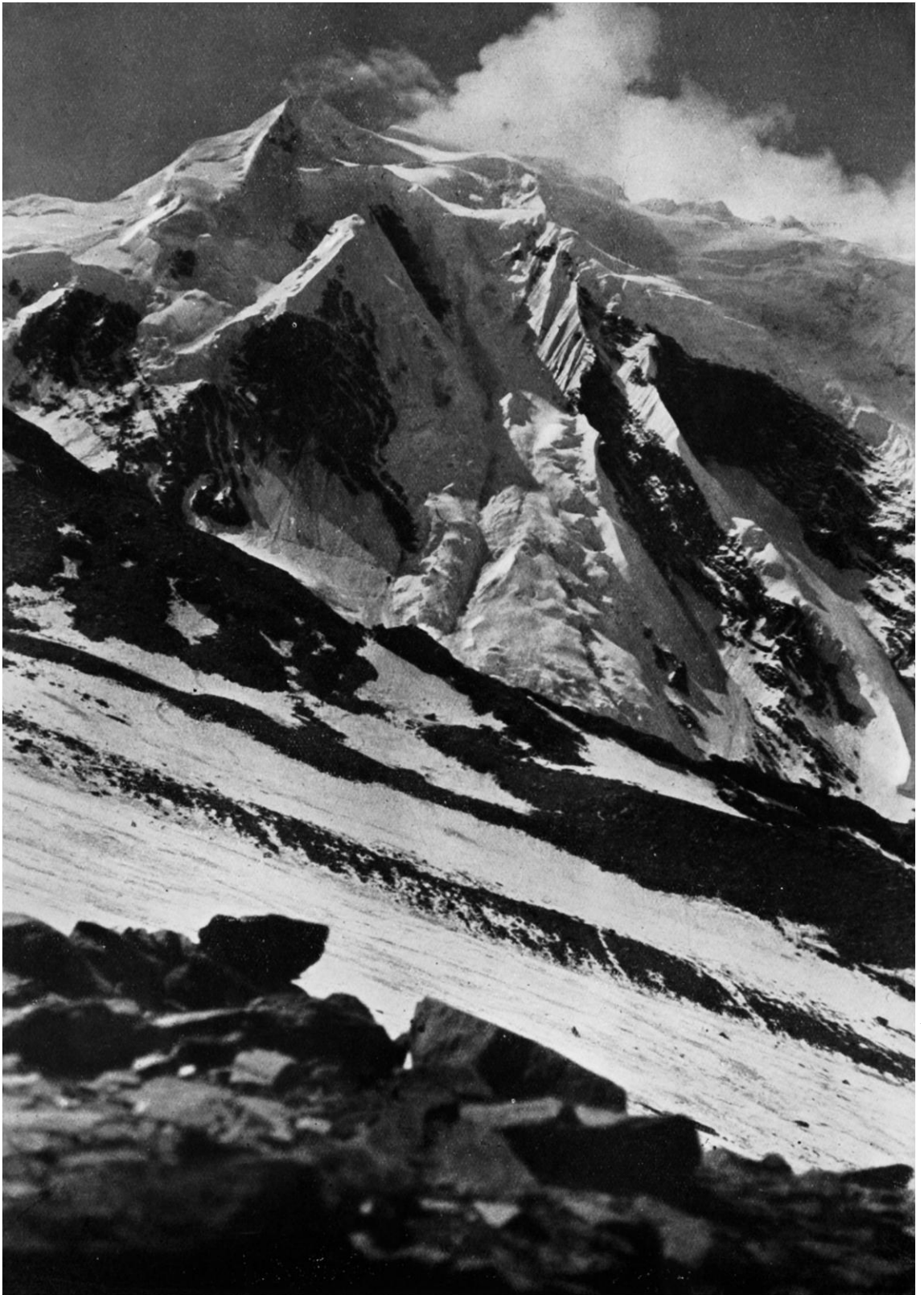
When we reached the Gangotri glacier two days later we were surprised to find that we were only about 2½ miles above its snout. We camped here in a little garden of wild flowers, which provided us with a welcome contrast after so long amid the harsh colourlessness of the glacier regions. The following day (July 28) we went down to Gaumukh, chief of the sacred sources of the Ganges. Thus for the first time had a route been made across the range between the headwaters of the Bhagirathi and the Alaknanda rivers.

Half a mile above the snout of the Gangotri glacier another large valley comes in from the north-east. How this fits into the puzzle of the northern part of the range I cannot say. A whole season devoted to the exploration of this fascinating section of the range by a competent party interested primarily in the unravelling of topographical problems should produce interesting results.

We would have given much to have been able to make a push for the untrodden upper reaches of the Gangotri glacier, and if we had had four days' food to spare I think we would have been able to reach its head. But our food was exhausted and we had to make all possible speed back by the way we had come. Our return journey was a lot easier for having no food to carry, as each evening we picked up one of the dumps we had left. From the head pass we made our way down the Arwa valley in bad weather and so reached Badrinath on August 2.

Of the many legends of these parts believed to have been founded on fact is a story that, many hundred years ago, there was no high priest of the Kedarnath Temple, and that the high priest of Badrinath used to hold services in the temples of both places on the same day. The shortest known route between the two temples was well over 100 miles, and over a high mountain pass at that. Tradition has it that a quick way across the watershed was known to the priests of those days. But though the natives believe that the two places are only 2½ miles apart, in actual fact the distance is some 24 miles as the crow flies.

Our observations from the Bhagat Kharak had suggested to us that if a pass could be forced from the head of the Satopanth, it would lead us into the Kedarnath valley system. If this proved to be the case we should stand very little chance of getting down on the other side owing to the immense depths of the valleys there. However a view from the crest of the ridge would solve for us many interesting problems. We had intended to return to the Rishi Ganga about August 10, and August had already come round. But by now we were thoroughly absorbed in the manifold problems of the watershed, and to have to come away without investigating the head of the Satopanth glacier would have left our task only half finished.



*A peak on the eastern rim of the Nanda Devi basin*





A dense mantle of cloud still hung over the peaks as we left Badrinath and plodded once more up the valley towards Mana on August 5. We had brought with us provisions for only twelve days, and four local men to assist with the load-carrying up the lower part of the Satopanth glacier. Remembering our little contretemps with the Bhasudhara stream a few weeks before, this time we kept to the southern bank of the Alaknanda. When we reached the junction of the glacier we bore to our left and followed a lateral moraine of the Satopanth glacier. We found that this branch was the more frequently visited of the two, and that the grazing extended far up the side of the glacier. Some tiny shrines and quantities of prayer flags suggested that this part of the country was as sacred as Bhasudhara itself. The going was easy, and in three days we were able to pitch camp (August 7) near the head of the Satopanth glacier. From here we discharged the local men.

Early in the morning of August 8, carrying heavy loads, we started towards an obvious gap below the tremendous southerly walls of Kumaling. Throughout the day we worked slowly up the ice-fall which forms the head of the Satopanth glacier. But at length, when only 1000 feet from the col, we were brought up by a huge crevasse which, running from one side of the glacier to the other without a break, formed an impassable barrier. We were forced to camp where we were in heavily falling snow. Throughout the night the gulleys and hanging glaciers of Kumaling kept up a continuous bombardment of ice avalanches from which however we were protected by the crevasses about us.

The following day, in thick mist and falling snow, we managed to find our way off the glacier on to some rocks to our left, and by the middle of the afternoon we reached a level expanse of snow which forms the crest of the col. We hunted about to try and get some idea of our surroundings, but visibility was restricted to a few yards, and at length we decided to remain where we were lest we should blunder into some avalanche-swept area. For the next eighteen hours the heavy mist enveloped us. It was extremely tantalizing, as we were far from sure where the gap was leading us to. I had an idea that we should find ourselves at the head of the Gangotri glacier.

At 7.30 the next morning (August 10) Tilman and I set off to reconnoitre. The snow had stopped falling and our tracks provided sufficient safeguard against the possibility of losing ourselves. We worked down for twenty minutes before we were brought up on the brink of an ice-cliff. We were looking for a way out of this difficulty when all of a sudden the fog rolled away from us and we found ourselves looking down a glacier of tremendous steepness into a narrow ravine-like valley some 6000 feet below. It was now obvious that we were not on the Gangotri ice-stream, and we concluded that we must be looking down into the Kedarnath valley system. The glacier we were on descended in a series of three exceedingly steep ice-falls, separated from each other by small ice plateaux.

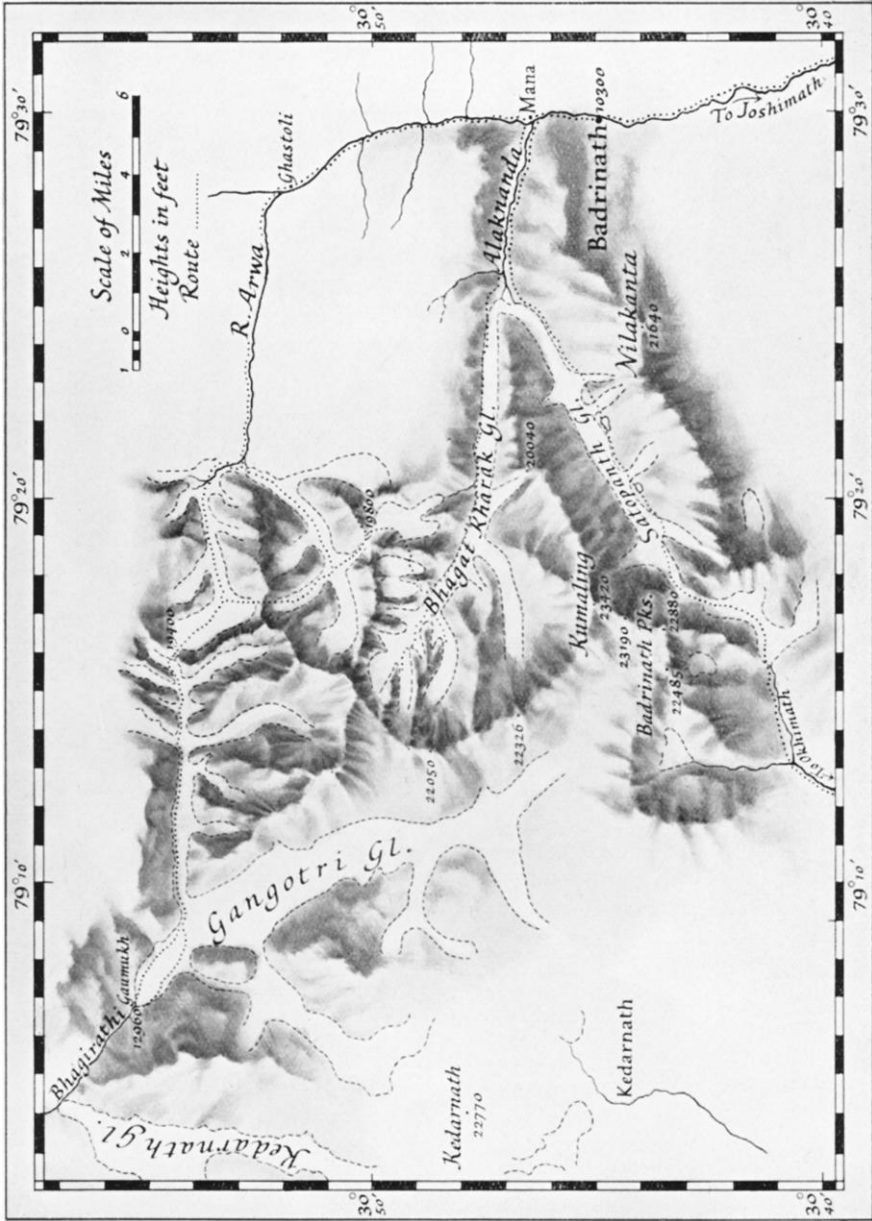
We returned to find that the Sherpas had already struck camp and were waiting for our return. We shouldered our loads and hurriedly started the descent. All through the day we worried our way down the intricate tangle of ice, halting only once for a meal. The mist hindered us a good deal, and several times we were forced to retrace our steps for a considerable distance before we could find a way through the maze of crevasses and séracs.

Late in the evening we reached the brink of the glacier's final downward plunge. We were now working on dry ice and much step-cutting was required. The angle of the glacier was becoming so steep that we began to think that we were on a hanging glacier. Indeed the prospect of getting down the last bit appeared so hopeless that Tilman and I would have decided to abandon the attempt had it not been for the extraordinary enthusiasm of the Sherpas, who insisted upon investigating every conceivable possibility. Here was another striking example of the loyalty of these men. What we were doing must surely have seemed very pointless to them; and yet, because we had shown our desire to get down to this valley below us, they were willing not merely to follow us, but to undergo any amount of labour, to face any danger in order that we might fulfil our purpose. At dawn the next day (August 11) we resumed our task and eventually succeeded in lowering our loads and ourselves into a steep rock gully at the side of the ice-fall, by means of our 180 feet of climbing rope. We were able to climb down the gully and so to reach the level glacier which lay at the foot of the great ice-fall.

At sunrise that morning we had had a fine view of the country to which we were descending. Beyond the glacier we had seen what we took to be a pleasant grassy valley; beyond this dark vegetation stretched away as far as the eye could see. This we took to be pine forest. Two days' marching at the most, we thought, would take us through this agreeable-looking country to some habitation. Also it seemed reasonable to suppose that we should strike some path and be able to cover, if necessary, some 12 miles a day. We knew that it could be no very great distance from the snout of the glacier to the Kedarnath pilgrim route. We were soon disillusioned. Immediately on leaving the glacier we found ourselves in dense undergrowth. We now struck really bad weather. Rain fell in torrents most of the day and night. All our kit got waterlogged, which made the loads very heavy, and the task of hacking a way a tedious one.

On the evening of the first day (the 11th) we reached the brink of a sheer drop of 1000 feet in the floor of the valley. For a short distance above this the river disappears underground and spurts out of the side of the cliff in an impressive waterfall. In camp above this precipice we took stock of our position. Our food supply was beginning to run short and what remained of the *satu* and *ata* was soaking wet and was rapidly going bad. A discussion of the problem as to whether we should go on or turn back lasted late into the night. It was a difficult decision to make, but the prospect of retracing our steps and committing ourselves once more to the icy slopes we had just left did not appeal to us, and eventually we agreed to go on down.

The precipice provided us with more rock climbing than we were then inclined for, but by roping down the worst sections we reached the forest at its foot. Here, under the spread of giant trees, the undergrowth was not so thick, and we made good progress until we reached the upper limit of bamboo at about 10,500 feet. The bamboo shoots were ripe for eating, a fact which undoubtedly saved us from a very serious predicament. We were also able to collect a small supply of forest-mushrooms, which, though they did not last long, gave us one or two square meals. The forest was full of bear-tracks, which greatly alarmed the Sherpas, so that they sang and shouted all day long



The Badrinath Group, from a compass sketch



*Porters from Mana smoking the ceremonial pipe*



*Glacier table in the southern section of the Nanda Devi basin*

in order to frighten the animals away. This they did so effectively that we only got one close view of a bear during our sojourn in the forest. He was of the black variety.

Late in the evening of the 12th we reached a narrow gorge containing a formidable torrent coming in from the north. During the whole of the 13th, in a perfect deluge of rain, which made the visibility extremely bad, we searched for a way across this obstacle without success. On the following morning however we managed to bridge the stream near its mouth. Here further trouble befell us. Passang had a small bone in his foot broken by a boulder falling on to it. This put him out of action for any work, and the task of keeping up with us over the precipitous country which followed must have caused him frightful pain.

Beyond the gorge the going became very bad indeed. The side of the valley was exceedingly steep and we had to hang on to the undergrowth to prevent ourselves from sliding down, while we hacked our way through the dense thorn-scrub. At times it took us as much as an hour to cover 25 yards, and we were hard put to it to go more than a mile a day. We used to halt each evening at 5.30. This gave us just time before dark to build a bamboo shelter under which we could protect a fire from the pouring rain, and so cook a meal of bamboo shoot and tea. Dead bamboo, however sodden it might be, makes most excellent kindling, and without it and a fair supply of paraffin we should have had to have foregone the luxury of a fire. Thus this excellent plant provided us with shelter, fire, and food. Without it our plight would have been a sorry one.

We made our way through this type of country for five days after crossing the gorge before we reached (August 18) the tiny hamlet of Gaundar in the Madmaheswar valley. This was nine days after reaching the col, an air distance of 6 miles. The few inhabitants were very poor, and though they gladly gave us shelter we had the greatest difficulty in extracting from them a few handfuls of flour and a cucumber. For these we paid lavishly, but quite willingly.

We now got onto a good path, and on August 20 in the still torrential rain we reached the temple of Okhimath<sup>1</sup> where we were received with a hospitality whose warmth will live amongst my most cherished memories.

But the high priest, who made a practice of holding services at Badrinath and Kedarnath on the same day, was surely a little overworked.

Time was getting short and we could not afford to halt anywhere. In bad weather we crossed a beautiful pass to Chamoli and so reached Joshimath in six marches from Okhimath.

On August 27 we began our hurried preparations for our second Nanda Devi expedition. Early that morning Angharkay started off with instructions to recruit fifteen men from the Mana valley and return with them as soon as possible. Meanwhile we were busy working out ration lists, collecting food, packing up, and planning our last little campaign. Late on the night of the 29th Angharkay arrived with as tough a squad of men as we could have

<sup>1</sup> This is the spelling employed by the temple authorities. It is spelled Ukimath on the Survey of India map and pronounced locally more like Weekimāt.

wished. He brought also kind messages of congratulation from His Holiness the Rawal and other of our friends in Badrinath. We were particularly gratified to get a message from Master Ram Serikh Singh who, on hearing of Angharkay's arrival, had rushed down from his camp in the lovely valley below Nilkanta to hear our news. From him we learnt that while we had been on the Satopanth pass, Badrinath had experienced some of the worst weather on record, and that there had been a belief that we were lost.

We left Joshinath on August 30 and camped that night at Tapoban. The weather was still bad and we were somewhat worried about our food getting wet. We reached Durashi this time in four marches *via* the Lata Kharak. When we got into the Rishi Nala we found that a great many landslips had occurred in our absence. The rains must have been terrific. Some small, steep side *nalas*, normally dry and with very little collecting capacity, showed signs of having had as much as 7 feet of water coming down them. We were now able to appreciate the tremendous advantage of local knowledge when traversing difficult country. Across places which had previously cost us hours of anxious toil we were now able to lead our party safely in half the time. We used the high-level route and crossed the Rhamani 1500 feet above its junction with the Rishi.

I should like here to pay a tribute to the skill and willingness of the Mana men. They had not, of course, to undergo the hardships which the Dotials had suffered on our first journey, but before very long I came to have considerable respect for them as cragsmen, while their ever-ready wit and care-free laughter will remain as one of my pleasantest memories. They and the Sherpas came to be the very best of friends and I think there was a measure of genuine regret when the Mana men had to take their departure.

We reached our old base-camp in the Rishi Nala on September 5. From here on we knew every inch of the route and were able to take ten of the Mana men with us. It was by a lucky chance that none of the vital points of the traverse had been seriously altered by the landslips. On September 8 we reached the basin and discharged the Mana men. We established a base near the snout of the southern glacier (about 14,000 feet) which we were surprised to find is over 3 miles above the junction of the two streams. The weather now (September 9) became fine and we were able to work without interruption. We found the southern section to be a great deal less complicated than the northern.

There are two main ice-streams which cover the floors of the upper valleys. The larger of the two rises in the great snow-fields which form the northern face of the highest peak on the southern rim of the inner basin, which is called by the Survey of India East Trisul, but for which I would suggest the name Maiktoli Peak, from the local name Maiktoli of the grazing ground to the south-east; or perhaps better, Maiktoli for both peak and grazing ground, if there is no objection to the same name, as in Dunagiri. It flows in a northerly direction and ends abruptly 100 yards from the snout of its rival. The smaller glacier rises partly under the grim precipices which form the south-east rim of the basin and partly from vast ice-fall which extends a long way up the southern face of the Nanda Devi East. The tributaries of these glaciers are few and of no great consequence.

We were extremely anxious to force a route either across the ridge which connects Nanda Devi East with the southern rim (which Dr. Longstaff had reached in 1905 from the Milam side), or towards the south across the col by which Mr. Ruttledge and the guide Emile Rey had attempted to get into the basin in 1932. I am afraid that our activities in the southern section were governed largely by this ambition.

On September 11 we set out to climb Maiktoli. We put a camp at about 20,000 feet on the glacier face referred to above. Tilman became unwell on the way up and unselfishly went down with Passang in order that Kusang and Anghtharkay should be able to occupy the camp with me in his place. The next day we climbed the peak (22,320 feet) in bad conditions. We encountered a severe wind which was almost up to Everest standard. All the way up and from the summit we saw views of surpassing grandeur. Even the great southern faces of Nanda Devi seemed to be dwarfed by the mere extent of the panorama. West and north, Badrinath, Nilkanta, Kamet, Ghori Parbat, Dunagiri, and their numberless satellites merely served as a foil the better to display those extraordinary ranges towards the borders of Nepal. To the south, at our feet, lay the little Simm Saga range, beyond this was a cloud sea stretching as far as the eye could reach.

On September 15 from a camp far up on the left bank of the eastern glacier we climbed to about 20,500 feet on a south-eastern ridge of Nanda Devi in order to get a comprehensive view of the southern section of the basin. On September 17, having completed to our own satisfaction the reconnaissance of the southern section we set out to attempt the crossing of the col on the southern rim. We were carrying food sufficient for twelve days, which we had found was the maximum we could manage without having to make double journeys. The climbing on the northern side was easy but on the southern side we became involved in very difficult work which kept us hard at it for two long days before, late in the evening of September 20, we reached the little grazing ground of Maiktoli. Although this gap provided us with a means of escape from the basin it would probably be too severe a task to tackle it in the reverse direction, particularly if heavy loads were carried; and I fully endorse Mr. Ruttledge's judgment in abandoning his attempt of 1932.

These last two days provided a fitting climax to our little season of supreme happiness. There followed the marches back over the wooded foot-hills, whose ravishing beauty must leave an indelible memory with all those who have travelled amongst them. Behind us, floating in the upper air, were the giants whose presence we had just left. So ended at Ranikhet five crowded months, amongst some of the most glorious mountains of the world.

## DISCUSSION

Before the paper the PRESIDENT (Major-General Sir PERCY COX) said: We are going to hear to-night an account of an exploration of the Nanda Devi basin and the Ganges watershed. Those of you who have been in India will probably remember Ranikhet and Almora in the district of Kumaun, a very beautiful bit of country for a starting-point. We are going to hear of the task, a very difficult one, of penetrating into the basin surrounding the great mountain of Nanda Devi, the highest peak in British India, 25,600 feet, and a very beautiful peak,

too. Mr. Shipton and his companion, Mr. Tilman, own properties in Kenya. Mr. Shipton, it will be remembered, came to England when he heard of the plans for the last assault on Mount Everest in the hope of being able to join that expedition. When that was over he thought he would make another journey in the Himalaya before returning to East Africa, and Mr. Tilman, with whom he had climbed a good deal in East Africa, came and joined him in his Nanda Devi project. They were a very small party, themselves and six porters, but they accomplished a very fine piece of work which Mr. Shipton is now going to describe. Without more ado, I ask him to read his paper.

*Mr. Shipton then read the paper printed above, and a discussion followed.*

The PRESIDENT: Mr. Tilman has promised to add a few words. I now call on him.

Mr. H. W. TILMAN: I have never previously faced an audience, and I beg to be excused more than a word or two. Really, there is nothing for me to add to what the lecturer has said. He has made clear every aspect except, of course, what he himself did. I should like to say that these small successes of ours were not quite fortuitous but mainly the result of very careful planning on the part of the leader. He expressed appreciation of the work of the Sherpas, but it must be remembered that those men will only give of their best under such leadership as we enjoyed. He also observed that we climbed on the shoulders of our predecessors, so I venture to hope that means will be found to build upon our work, in the near future.

The PRESIDENT: As you know from what the lecturer said early in his paper, he owed to Dr. Longstaff the idea of undertaking this particular piece of work. I hope Dr. Longstaff will come and address us.

Dr. T. G. LONGSTAFF: I am familiar with the mountains of Garhwal; I think they are the most beautiful part of the Himalaya. I also know a good deal about all the expeditions which have been there, and I do not know of any which has done more or better work than that of which we have heard to-night. The success achieved by Shipton and Tilman is a shining example of concentration on the tactical objective through every stage of the expedition. They have solved the problem of the Rishi gorge—so difficult that they took nine days to cover the last untrodden 4 miles. I did not get through; therefore I am very glad they took nine days over it because no one can say it was very easy. They thus had the tremendous excitement of being the first human beings—because no natives have ever been there—to enter the inner sanctuary of Nanda Devi. Incidentally, the double peak of Ushba, the most celebrated peak in the Caucasus, is very like Nanda Devi except that the latter mountain happens to be twice as high. Their base camp at the immediate foot of Nanda Devi was at 13,000 feet, and the top of Nanda Devi was 12,600 feet above that. Is there any steeper scarp in all the Himalaya?

After all this excitement they solemnly concentrated on exploring the northern basin, and throughout the whole of the trip they were plane-tabling: they have brought back a survey of the ground they have covered, which is a vast improvement on the old maps. When caught by the monsoon they went off and completely connected up the Badrinath-Gangotri and the Badrinath-Kedarnath glacier systems, perhaps the most arduous work of all in view of that appallingly steep ice-fall. This time they managed to do 6 miles in nine days, 2 more miles than they had done in getting up the gorge of the Rishi. That extra 2 miles entailed living on bamboo shoots and fungi, which the lecturer politely called mushrooms. After the monsoon they returned to the south basin of Nanda Devi and actually climbed up Nanda Devi itself to 20,500 feet. We saw a fine



picture of their descent of the great ice-falls above Maiktoli, a feat demanding the highest sort of mountaineering competence.

There are many remarks I could add with regard to this piece of work, the finest that has ever been done in the district. It is surely a striking proof of what all experienced travellers know: that individual competence and the personal qualifications of the traveller are far more important to his success than the size of his bank balance. These two men, both, I am glad to say, fellow-members of the Alpine Club, and of course skilled mountaineers who have climbed many difficult heights, did their work accompanied by only three Sherpas. They carried loads themselves: they did their own work and yet, at the same time, they continually used the plane-table and, as I have said, brought back a survey of the ground they traversed. They spent five months in the Himalaya, using cargo boats out and home—seven months in all—at a total cost of £287: £143 10s. apiece. It is certain that lack of funds always entails extra hardships, but if their resources had been multiplied tenfold, could these two men have done more than they have done? Personally I do not think anybody could have done more. In this respect, as in many others, they have set up a standard hard to follow.

Brigadier E. F. NORTON: You have called upon me quite unexpectedly, Mr. President, and I have to hurry to catch a train. Nevertheless, I am glad to have this opportunity of expressing my admiration for the expedition about which we have heard. I regard it as the ideal type of expedition—a type of which we have seen all too few in the Himalaya since Dr. Longstaff first set the fashion. Since the Mount Everest Expedition everybody has, of course, been aware of Mr. Shipton's reputation, but not so many know Mr. Tilman. I had the privilege of working with him nearly twenty years ago during the Great War. From what I knew of him then I am not at all surprised to hear that he was so able a seconder of so fine a leader. I must now catch my train, but I should like once more to congratulate the lecturer not only on his lecture and his beautiful pictures but on the modesty with which he told his story.

The PRESIDENT: We have with us the President of the Alpine Club, and I hope he will give us some comment from the point of view of the alpinist.

Colonel E. L. STRUTT: I feel, like Brigadier Norton, that I ought to run off to catch a train, but as I have been called upon, as President of the Alpine Club, to comment on this most remarkable expedition I can say, honestly, that I have not been within 1200 miles of the district. Therefore I am hardly an authority on it. I do however know something of the ground that Dr. Longstaff and Mr. Graham traversed, and I can endorse Dr. Longstaff's remark that we have heard described one of the finest bits of exploration that has ever been carried out.

As has been said, we all know Mr. Shipton's record. Mr. Hugh Ruttledge told of his exploits on Mount Everest. Some of us are not quite so much up to date with Mr. Tilman's record. All I know of Mr. Tilman, beyond the personal acquaintance of which I am very proud, is that he last year crossed Africa from east to west on a push bicycle. During that period he spent, I think I am right in saying, six days in making a solitary ascent, that is without a companion of any kind, of Kibo, the highest peak on Kilimanjaro. That proves him a pretty tough specimen.

The PRESIDENT: You have heard such eloquent tribute paid to the travellers' performance that there is little more that I need say. They have undoubtedly carried out a most wonderful piece of work, and the ridiculously small sum for which they managed to do all they did was indeed a triumph of economy. We heard from them what they did during daylight and how they camped for the night and at 7.30 a.m. they proceeded onwards and so on, but they told us nothing of their night experiences on the mountain. In fact it was difficult to realize

while Mr. Shipton was lecturing in the simple way in which he told his story the extraordinary endurance their exploration entailed. They have both referred in grateful terms to the behaviour of the Sherpas, and we know how much we owe to them in connection with climbs in the Himalaya and Karakoram, especially the assaults on Mount Everest; thoroughly reliable and brave men that they are.

Mr. Shipton is, I am glad to understand, planning another expedition. It seems that he and his comrade cannot tear themselves away from the mountains. Let us hope that Mr. Shipton will be able to carry out another expedition this summer, if funds permit, and that we shall hear from him again next winter. I ask you to join me in congratulating him once more on his splendid achievement, and thanking him for the interesting evening he has given us. Mr. Shipton, I am sure you will realize from this very hearty applause how much we have appreciated your lecture.