A WINTER EXPEDITION TO THE ZEMU GLACIER[1]

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This paper concerns a small expedition undertaken by C. R. Cooke of Calcutta with my wife and myself in the late autumn of 1937. It is as you see already stale news and a brief summary of our doings was published in the May 1938 number of the Alpine Journal.[2] My only excuse for presenting the subject again to the Club is (*a*) to show a few of the photographs taken by us, (*b*) to discuss the value of the post-monsoon period for climbing in the S.E. end of the Himalayan chain, in the light of our experiences. The original intention had been to attempt the ascent of a spur thrown out on its S. flank by the great E. ridge of Kangchenjunga, which we hoped might give access to Peak 1 (7775 m. = 25,503 ft.). At the last minute it was decided to change our plans and to make for the Zemu Glacier.

Our objects in visiting the Zemu were briefly :

i. To examine the North Col, as a possible alternative to the Bauer Spur for a future ascent of Kangchenjunga.

ii. To experience conditions in the late autumn from the climbing point of view, having in mind the fact that no attempt had yet been made to climb Everest at that time of year.

iii. To climb some of the peaks accessible from the Zemu Glacier.

We had about two months available for the purpose, and our scale of equipment and food was planned on very simple lines.

The departure from Darjeeling was preceded by a fortnight of atrocious weather—the tail end of a prolonged monsoon—and when the clouds at last lifted shortly before we left Darjeeling on October 9, we noticed fresh snow powdering the Sikkim highlands down to 13,000 ft.—an unpromising omen so early in the winter.

[1] For map of Zemu Glacier, see *A.J.* 44, following p. 175. Owing to paper control restrictions, it is unfortunately not possible to print illustrations for this article. The appropriate illustrations may be found in *H.J.* ix, 1937. See also sketch map printed in *A.J.* 50. 110.

[2] *A.J.* 50. 109 *sqq.*

No other expeditions were going out so late in the year, and we were able to collect a strong team of porters. Rinsing we made sirdar of the coolies for the outward journey ; he had made a name for himself on the 1935 reconnaissance and the 1936 expedition to Everest. Pasang Kikuli had been on Nanga Parbat with the Germans, on Nanda Devi in 1936, and earlier in 1937 on Chomolhari with Chapman. Pasang Sherpa had that summer reached the top of Chomolhari with Chapman, and had been on one of the Bauer expeditions to Kangchenjunga. Pasang Chakadi had accompanied the French expedition to the Baltoro, and was very well spoken of by them. And finally, my old friend Dawa Thondup, young and inexperienced when he had been with me in the Karakoram in 1935, had been with several expeditions since. He was one of the two survivors who came down during the blizzard from the Silver Saddle on Nanga Parbat in 1934. With the death of Kikuli, and with his considerable experience since 1937, he is probably the foremost of the now small band of active porters on the lists of the Himalayan Club. Palden, also one of our men in 1935, turned up and begged to be taken, but he had aged a lot, and was clearly unfit ; it was necessary to refuse him.

Our fifty coolies short-cut the journey to the Teesta valley by descending to the Great Rangit river and crossing the Kyosing-Namchi ridge, while we walked over and down to Teesta bridge, and travelled by the mail motor as far as Singtam. Two days later we all joined up at Maka, a quaint little village on a high terrace above the river, which gets a little more air than in the valley bed itself. The Teesta at this time of year is most unhealthy—the heat and humidity in this lowlying trough are great, and malaria is very prevalent, with a fairly high percentage of mortality among the inhabitants of villages along it. There is, in fact, a risk of infection from this or the more serious *kala azar*, particularly to one's porters, as we were to realise to our cost later on. But for my wife and myself this part of our journey was rendered of absorbing interest on account of the number and variety of the butterflies along the path. Being keen collectors, we had a great time during the first few days with our nets ; this season is second only to the early monsoon from the entomologist's point of view.

On the whole, however, it was a relief to make height, as we did from the village of Mangen onwards, to get a glimpse of the peaks we were to see later at close quarters, and to reach the grassy uplands of the Lachen Chu. We arrived in this delightfully situated village six days out from Darjeeling, and met there

a German party which had that moment returned from spending six weeks up the Zemu ; their leader was Ludwig Schmaderer, an outstanding mountaineer. They had made a second ascent of Siniolchu, but had experienced the bad weather already mentioned, and had been foiled by snow conditions on the Lower Twin and the Nepal Peak. We spent a pleasant evening with them in the dak bungalow, drinking quantities of *marwa* (fermented millet) ; they expressed great surprise at our arrival so late in the year.

We ourselves took on twelve of the much spoilt Lachen men here, in replacement of some of our weaklings from Darjeeling, and started up the Zemu Chu on the 15th. Two days later we reached the glacier snout, and had a very trying time ploughing through deep new snow to the German base camp opposite Siniolchu. Normally the sides of the glacier are quite snowfree as far as the Twins Glacier entrance, and we had brought but few extra pairs of dark glasses or goggles ; the result was that some twenty coolies had to return from the German camp with severe snow blindness. This meant that a number of loads would have to be relayed up from here to our proposed base above Green Lake, and a possible delay in future plans. Among those who returned from here were four women coolies, who had shown themselves at least as tough as, and far more uncomplaining than the men ; we were sorry to see them go.

The journey onwards was a nightmare for whoever was making the track, and we were beginning to realise how great a handicap this fresh snowfall, too late in the year to melt away or properly to consolidate, would be to the initial marches of all expeditions starting from glacier level.

An excellent site was found for Base Camp in the glacier trough at the junction of the Green Lake Glacier with the Zemu ice stream. It was probably the site of Bauer's Camp 4, and is about 600 yards upstream of Green Lake. A very curious phenomenon noticed at that time was that this lake remained quite unfrozen among the surrounding world of snow and ice, and despite very low temperatures it was not until our departure at the end of November that it became lightly coated over ; I have not seen it mentioned elsewhere that Green Lake is fed by hot springs.

The first few days, while loads were being relayed up from the German base, were spent in making short reconnaissances in various directions. A track was made across the glacier towards the Simvu La at the expense of great labour, for we sank to all depths in the soft snow. We ascended Green Lake Glacier and

prospected the entrance to the Nepal Gap Glacier, as well as preparing a track towards the Twins ice stream. An unpleasant factor at this stage was the tremendous power of the sun. The weather thus far had been perfect, and we had met little wind. But despite the normal pigments our faces, hands and lips swelled up painfully, and the skin burst—so bad was this that we made ourselves face-masks. At Lachen we had laughed at the comparative pallor of our little porters against the German 'tigers'; now they in turn were blackened by the sun.

On the 23rd we moved up to the entrance of the Twins Glacier. At its head is the great wall of the 22,000-ft. North Col, which we proposed to inspect, and our immediate objective was the Sugarloaf, which we hoped to climb by way of acclimatising. Cooke, however, was by no means fit at this stage, and decided not to accompany my wife and myself, who, after a laborious time on the new snow, pitched our tent on the afternoon of the 24th at about 19,000 ft., below the S. face of the Sugarloaf; we were accompanied by two porters who returned to the lower camp (Boulder Camp) the same day.

On the 25th it was our turn to feel the height. We chose the W. ridge, and I foolishly decided to short-cut the way to its crest, climbing very steep slopes on the S. side on snow whose condition had deteriorated in the sun. We were wellnigh exhausted by the time we gained the ridge, and at about 20,400 ft., beneath a prominent gendarme, we decided to call it a day. The conditions were excellent, and had we been fit there would have been no excuse for not going on to the top, some 1200 ft. higher; such conditions did not, in fact, offer themselves at any future time during our stay. We returned to camp, and later in the day moved down to rejoin Cooke, who had been able to prospect part of the route up-glacier to the foot of the North Col.

Our return to Base Camp next day was the beginning of a period of misfortunes. The weather deteriorated, and we had snow accompanied by a high wind daily from down-valley—an unexpected quarter—for several days. More serious was the sudden illness of two porters. Rinsing, our best man, had almost collapsed on his way back from the Twins Glacier; Pasang Chakadi was taken ill in much the same way while Cooke and I were conducting a first carry of stores up the Nepal Gap Glacier preparatory to attempting the ascent of Nepal Peak and/or the Lower Twin. Both men were running temperatures of 104°–105°, and we had a most anxious time nursing them in the very trying conditions then prevailing at Base Camp, where we were surrounded by slush. We had of course to stay in

camp until they were out of danger, but mercifully they began to pull round towards the end of the month. The time was spent in remaking the track across the Zemu Glacier (which was completely snowed up), sorting stores, and working out a few short routes on a rock buttress near camp, curiously similar to Kern Knotts. There was work to do on the butterfly collection also, and a good deal of wild life was observed around camp. Burrhal were grazing within half a mile on the few uncovered slopes ; a raven was a daily visitor to the tents, as also was a lämmergeier, who doubtless had his eye on the carcase of a sheep brought up and slaughtered at Base Camp ; flocks of snow pigeons and snow finches, and a covey of snow partridges, were also seen. The only butterfly seen alive was a round-winged tortoiseshell.

At the end of the month, feeling the need to start operations afresh, we took a tent up to the little glacier below the Keilberg, twin rock and snow summits of nearly 20,000 ft. above Green Lake. A reconnaissance of the couloir on its western side was made that afternoon, and next morning Cooke and I climbed the snow summit over its N. ridge, descending by the couloir prospected the previous day. It is very steep, and during its ascent the upper part had been measured by clinometer to be 58°. It was during this pleasant little expedition that we first made our acquaintance with that evil phenomenon, the N.W. wind. It fairly rocked our Meade tent with the three of us inside it, and almost turned us back at the foot of the ridge. I know of nothing more demoralising than that wind, which we came to dread as we got to know it better ; it simply knocks the bottom out of you. The rocks of the rock tower were ice-plastered, and we were unenterprising enough to leave them alone ; but we had enjoyed a grand day's climbing.

The invalids were now better and although of course we should have to lose them, we felt justified in starting on our plans for the Nepal Gap Glacier. My wife returned from our Camp 1, just above the icefall of the Nepal Gap Glacier, and later escorted the sick men back to Lachen on her own. Cooke and I had with us Dawa Thondup, Pasang Kikuli and Pasang Sherpa. We made our way to the head of the Nepal Gap Glacier on a vile surface of breakable windcrust, where we pitched Camp 2, and after a night of violent wind, searched in vain for a dump of stores left in this region by the Germans. We also climbed the 20,000-ft. Nepal Gap, pausing during gusts to anchor ourselves to the ice slope—on one occasion I was lifted bodily from my steps. What a relief it was to get down again into a hollow of the glacier, and mop our streaming eyes ! I have almost

forgotten to mention the remarkable view framed in this gap, but we could think of little else on that crest than shelter from the cruel blasts. I do remember having thought it worth while changing a Leica film on top, in order to take a picture of it !

It was decided to try Nepal Peak, the higher and more worthy of the two alternatives, and on November 6 we set out from Camp 2, climbing a well sheltered couloir leading from the glacier to the crest of the S.W. ridge at over 21,000 ft. The cornice was actually reached and cut through at about 21,400 ft. On the way up Dawa's load came adrift, spreading a trail of brown tsampa on the snow, and scattering tins etc., most of which were held up on a little terrace half way down the couloir. Some sleeping-bags, however, were not so obliging, and hurtled straight down 1000 ft. to the glacier. Dawa had the wretched job of going all the way down for them, which he did with his usual cheerfulness.

Meanwhile, I had cut through the cornice at the top of the steep couloir, and was confronted by a truly stupendous view—Everest and Makalu standing above a maze of summits in Nepal, and framed between Cross and Wedge Peaks, with the Kangchenjunga Glacier winding its way valleywards at a great depth below. Cooke had been busy hollowing out a cave beneath the cornice, and here we spent a comfortable night, in a remarkable situation facing right out to Siniolchu and Simvu, at the top of the couloir by which we had ascended. This was Camp 3.

The next day was gloriously fine, and we made good progress up the S.W. ridge, fairly sheltered still from the wind. Some difficulty was met with at one point, where the ridge rises in a series of vertical steps ; we had to outflank these on the S. side, which involved the ascent of an excessively steep ice runnel or gully in order to regain the ridge. Its measured angle was 62° and we left a line fixed for the descent. Camp 4 was pitched early—at 1 P.M.—for the going had been strenuous, and we had reached the foot of the final great snow slope below the summit ridge. The site was a broad terrace beneath the highest of a number of giant crevasses at about 22,300 ft., with a superb panorama from Chomolhari to Kangchenjunga. Incredibly far below us lay the Zemu Glacier, with Base Camp almost visible, if indeed tents could be distinguished from that height ; the evening was a perfect one. The porters left us early and descended to Camp 3. Both Cooke and I were feeling ill effects from the altitude—a sickening headache, and in my case also severe pain in one leg.

Next morning I was fully recovered, but Cooke was still quite

unwell, and not fit to make a bid for the summit. The disappointment of this for both of us was alleviated on account of the wind, now blowing at full force. I started out alone at 8 A.M., but so violent were the gusts that I could not raise myself on to the crest of the ridge, and so difficult was breathing that I had a feeling of suffocation.

At noon it was better, and we both started up the great slope. Cooke wished to go easy in the hope of being able to try for the summit the next day. So I went on alone, wearing crampons, and cutting steps up the last 150 ft. of steep ice, reached the S.W. summit (7145 m. = 23,500 ft.) in little more than one hour. The snow on this slope, which had been in windslab condition when the Germans reached it five weeks earlier, was now firm and safe, but a noticeable feature was a huge fissure running horizontally right across it. The view to the north was to me entirely new. Longridge and Jonsong Peaks were included in the panorama, and on the extreme right stretched the brown land of Tibet. For the first time I could see across part of the western side of Kangchenjunga, and Jannu, that intriguing summit, showed its N. face.

To my lasting regret, I had finished my Leica film on the slope below, and had no spare roll to take advantage of this unique opportunity. Just below me, at over 23,000 ft., a large bird, probably a lämmergeier, was circling round the S. face of my peak.

I had the greatest trouble in remaining upright on the ridge owing to the wind, which however had slightly moderated since the morning ; any movement was liable to result in overbalancing, and a few steps along the narrow crest towards the summit, only 100 ft. or so higher, convinced me that, roped or not, there was a real danger of being blown from one's steps. I descended some way to the S.W., then returned to the summit and went carefully down in my steps on the sheltered S. side.

On the morning of the 8th Cooke's condition had not improved, and it was necessary for him to get off the mountain. When the porters came up as prearranged, we started down and paused only for a drink of tea at the cave camp, before descending the couloir to the glacier. Here we found the Burns tent collapsed and its aluminium poles broken by the wind—an indication of what we had experienced higher up. A sleepless night was spent at Camp 2, with the tent walls cracking like a whip. Nepal Gap is better named Wind Gap.

Nepal Peak had been only a partial success, and a great disappointment to Cooke ; although he was clearly not fit for going

high at present, he was much better down here, and I suggested that we might try to reach the Twins Glacier over the Twins-Sugarloaf Ridge, returning to Base Camp that way—it would make a new crossing, and might show us a better approach for the ascent of the Lower Twin.

We took with us only Kikuli, with 200 ft. of line and a Burns tent. It proved to be a grand day's mountaineering, not the least entertainment being the descent of the icefall of the nicknamed Lower Twin Glacier ; it falls precipitously to the Twins ice stream, and apart from this, our view was obscured by a thick mist rising from the lower glacier. When the glacier became altogether too broken up, we took to the trough on the left, and a way out of this was presented just when most needed in the shape of a horizontal traverse across the buttress separating us from the Sugarloaf Glacier. At the end of this, a gully full of loose rock was descended blindly, and it solved our difficulties, for a few minutes later we glimpsed, to our great relief, the dim outline of the Twins Glacier through the mist. The tent was pitched at once, and a warm and comfortable night was spent with the three of us in the little Burns.

We reached Base Camp on the 10th, almost at the same moment as my wife, who had come up from Lachen ; she had brought with her a young boy, Kitar, in part replacement of the two sick men. He was completely new to the business, but proved very willing and cheerful. I regret very much to say that he and Kikuli were both lost, quite unjustifiably, on the second American Expedition to K_2 in 1939.[3] Kikuli was the best porter I have known, and a splendid climber.

The next phase was to be a simultaneous attempt on the North Col by Cooke, and the Sugarloaf by my wife and me ; this was in order to make the best use of our time. It was also decided to reconnoitre the Zemu La, as we hoped to cross it and return to Darjeeling that way, which to our knowledge had so far not been done. We again moved up to Boulder Camp on November 13, and next day Cooke left with the two best men—Kikuli and Dawa—for his reconnaissance and attempt on the North Col, while my wife and I with Pasang and a camp coolie Hawang (for we were short of trained men), ascended the icefall of the Sugarloaf Glacier. During a pause on our way up, we saw a tremendous avalanche, started by séracs, fall from beneath the E. ridge of Kangchenjunga. So colossal is the scale of this 11,000-ft. face that, despite its steepness, the mass of snow and ice appeared almost to crawl down the wall, until it disappeared

[3] *H.J.* xii. 123–7, 134–5.

from view behind the intervening Bauer Spur. After an interval, a cloud of snow vapour rose above the crest of the spur, filling the deep Bauer hollow, and hanging around for about ten minutes ; it was a dramatic and awesome spectacle, reminiscent of one of the great avalanches which used to sweep our line of communications across the Peak 36 col, during the Karakoram expedition of 1935. We would have camped this time immediately beneath the foot of the W. ridge, but for poor Hawang, who found great difficulty on the steeper slopes ; his load had finally to be divided between Pasang and me, and we had to camp only a few hundred feet above the previous site.

My idea was to traverse the peak from west to east, *i.e.* ascending by the rock ridge attempted last time, and coming down the snow arête which terminated just above our camp. As it turned out this was foolish, for not only is the E. ridge probably more straightforward, but it would have been very sheltered from the terrific wind to which the W. ridge was exposed from the direction of the Nepal Gap ; we had a terrible time of it next day in these conditions. The ridge was gained at a lower level than last time, and we had a lucky escape when traversing along the lower snow section of it. The whole slope up which I had kicked steps only a few minutes before, suddenly peeled off beneath our feet, and thundered down to the glacier ; curiously enough, it had not felt like windslab when we were ascending it, and I was surprised to meet a windslab after a long period of fine weather —it was of course composed entirely of blown snow.

The prominent gendarme was circumvented on the S. side of the ridge, which we regained by some difficult climbing—fortunately sheltered—up a face of loose rock. The contrast between this shelter and the conditions which met us on the ridge is indescribable. We struggled up perhaps another 50 ft., but there was more rock to negotiate — and consequently further work for the fingers—before we reached the final snow arête, and progress was really tricky. When my wife's fingers began to lose sensation we decided to retreat, very disappointed at this second failure. We were probably still 400–500 ft. short of the top.

The wind literally hounded us down the glacier, and we lay in our tent to recover from it before packing up and descending to Boulder Camp. The whole scene was one of wild turmoil, with Kangchenjunga surrounded by swirling clouds.

Hawang had had enough ; he proclaimed himself unwell and demanded to be sent back to Base Camp. We could not let him go alone, and it was reluctantly decided for my wife to go

back with him, so as to enable the Zemu La reconnaissance to go forward ; it was a thankless task for her. Pasang and I spent two exhausting days ploughing our way up the centre of the Zemu Glacier, before we reached the foot of the gap, sinking sometimes shoulder deep between hidden boulders on the medial moraine, in the incoherent floury snow—it was still not consolidated since the heavy fall preceding our arrival. We reached the col on the morning of the 18th, and had a wonderful view across the Talung Glacier to Pandim and further to the Darjeeling hills. This, my first real introduction to Pandim, aroused a curiosity which prompted my wife and myself to examine closer at hand the possibilities of climbing this fine mountain in 1938 ; and with Cooke we were camped at its foot last year and about to tackle it, when I was recalled.

It is indicative of the labour we had in trackmaking, that on the day of the ascent to the col we returned down glacier to Boulder Camp in the well frozen furrow, in the space of only three and a half hours—it had taken two and a half days in the reverse direction.

I may mention here a curious fact. On the final slope below the col were clearly marked windraised tracks. We had noticed those of the Germans on Nepal Peak, and also on the ascent to the Twins-Sugarloaf ridge (for they had attempted the Lower Twin). I naturally concluded that they had forestalled us here also, and felt some disappointment, not knowing that the 19,500-ft. gap had already been reached from this side. Furthermore, there were what appeared to be distinct steps cut in the ice on the S. side as far as the point where it falls away in a cliff. It was only some time later that I discovered in correspondence with them that the Germans had not visited the Zemu Gap ; nor as far as I can ascertain was any party other than ours and theirs in this region during that year. To me the matter remains a mystery, attributable only to the dreaded snow men themselves —this at any rate is Pasang's explanation.

Cooke reached Base Camp only two hours after me on the 19th. He had made a most creditable attempt to reach the North Col, in spite of continual exposure to falling ice and stones from the Higher Twin. At a point judged to be less than 1000 ft. below the crest, and some way to the right, he considered the venture unjustifiable and turned back. Some very difficult climbing with heavy loads had been done by himself and the porters.

Our time was now short. We decided to give up the Zemu Gap route for want of porters ; only three men were fit for the job, and of them Pasang was shaky on steep slopes. So Cooke

was to take the three porters and try to cross the Simvu La, descending the Passanram Glacier and going up the Talung to the Guicha La. The crossing had been made by Wien's party the year previous.[4] My wife and I were to escort the loads back by the Teesta. We would dearly have liked to accompany him, but there was simply not the carrying power for what was certain to be a long journey entirely void of local supplies.

I helped Cooke carry and make the track up to the Simvu La on November 21, and spent a night up there before returning to Base Camp; for its view alone this visit to the 18,500-ft. saddle was well worth while.

The wind, on which I fear I have laid much stress, had its final fling that night. The whole glacier, as I recrossed it, was discoloured with dust from Tibet, and the track was entirely obliterated; tents at Base Camp had collapsed owing to the wind on top of the coolies who had come up to carry the loads back to Lachen.

It only remains to say that we had a very pleasant journey back. We visited Gangtok, and saw some devil dancing at the Maharajah's invitation, and crossed over the Namchi ridge from the Teesta to the Rangit, and so up to Pemionche, in the half hope of meeting Cooke on his way down from the Guicha La. We lived entirely on the country, ate quantities of oranges, and met crowds of Tibetans on their way down to British India with merchandise, leaving their plateau on account of the devastating wind which sweeps it at this time of year. Our companion on this journey was the cheerful little Kitar.

Cooke reached Darjeeling a day later than us, on December 6. He had succeeded in descending the Passanram in spite of very bad weather, but had been forced to descend the Talung Chu into the Teesta. A dead pig, which had conveniently fallen in the very track by which they were groping their way through the dense jungle of the gorge, came as a welcome addition to the nearly depleted stores.

As to the results of the expedition:

(i) Cooke had shown that the North Col is probably climbable, and a worth-while objective in itself; he had also, I think, indicated the best route to the summit of the Higher Twin, except possibly from the Nepal side. But to reach a height of only 22,000 ft. of Kangchenjunga, under such difficulties and objective danger, must prove that this is no route to the summit.

[4] *H.J.* ix. 72.

The wall below the col could be made neither safe nor simple for regular use by porters.

(ii) Conditions as they affected climbing have left us with mixed feelings. The heavy new snow on the glacier may have been exceptional; this was certainly a handicap to our higher work, but it would not be wise to draw conclusions for the future on this factor.

The wind, so the porters assured us, is a regular feature of the season, which is perhaps supported by the normal migration of Tibetans southwards at this time of year. If so, I feel that on any but very sheltered faces or ridges it is a strong factor militating against success. Apart from the cold and danger of frostbite and its effect on morale, which can be offset to some extent by adequate equipment, there is a real physical difficulty in making headway against such a wind, and in breathing in the face of it. On a ridge it is quite strong enough to lift you off your feet.

I cannot speak of avalanches. Windslab is certainly to be met with in the Himalaya at all times of the year, and wet or dry snow avalanches, which were not observed, would probably be unusual at this season owing to the normally clear weather and lack of snowfall. Indeed, the strongest point in favour of the autumn is the steady and reliable fine weather.

Taken all round, I still feel that it is unwise to generalise as a result of this experience, and that it is most desirable to visit Everest in the post-monsoon period. The Himalayan Club, at the initiative of C. R. Cooke, was planning to do this shortly before the war, and I greatly hope that the project will be taken up again as soon as it is all over.

In the discussion which followed Major Hunt's paper, Mr. Smythe and Captain Odell were among those who took part. At the request of the Editor they have kindly set out in writing their views on post-monsoon conditions in the Eastern Himalaya.

The experiences of Major Hunt's party, the experiences of others, and available meteorological data go to prove that high winds and snowfalls together with low temperatures must be expected in the eastern Himalaya in the post-monsoon season. Such experiences and meteorological data are, however, confined for the most part to the Sikkim Himalaya, and less information exists as to conditions in the Mount Everest region. However, both regions possess similar weather characteristics; they are subject to the Bengal monsoon; they have cutting into them deep valleys (the Arun in the region of Everest, and the Teesta in Sikkim), so that convection air currents

similar to those that prevail before the monsoon must be expected when the monsoon abates its warm air current and a wider range of temperature between the upper and lower air strata is re-established. In many respects, therefore, the post-monsoon period resembles the pre-monsoon period, except that available evidence seems to show that high winds and low temperatures follow quickly upon the cessation of the monsoon current, and that the comparatively quiet period immediately prior to the monsoon, which mountaineers anticipate for the ascent of Everest, does not find its counterpart after the monsoon, or if it does the period is seldom anything but of short duration. In other words, it would appear that the monsoon ends in the Eastern Himalaya more abruptly than it begins, though it is of course unwise to dogmatise, and there may be seasons when the reverse applies. It should, perhaps, be explained that the comparatively quiet period before the monsoon already mentioned is due to the gradual building up of the monsoon current against the strong N.W. winds. There comes a time when the winds cancel themselves out as it were. This, at least, is the popular explanation, and it should be noted that the experiences of Everest expeditions show that even during this period severe gales may be expected.

If there is an inter-monsoon period when reasonably quiescent conditions can be expected, it is in midwinter when the general temperature at all altitudes is low, and conditions are not so favourable for convection air currents. These currents must always be expected before and after the monsoon, when the difference in air temperature between high and low altitudes is greater, and hot moist air, rising from the low southern valleys, is replaced by a downrush of chilled air from the high snows and the plateau of Tibet.

It would appear therefore that apart from minor local factors there is little to choose between Kangchenjunga and Everest in the matter of weather, and that the experiences of Major Hunt's party may be taken as an indication of what may be expected on Everest in the post-monsoon season. It has been said that Kangchenjunga is not subject to high winds as is Everest, but this is very likely due to the fact that most parties climbing on that mountain or in Sikkim have been on the lee side. The international expedition which attempted Kangchenjunga from the north-west in 1930 experienced winds every bit as bad, altitude for altitude, as those experienced by Everest expeditions.

As regards post-monsoon conditions on Everest, we have the experience of the 1921 reconnaissance expedition. Mallory's party reached the North Col on September 24, but were met by a high wind. As Mallory wrote: 'The powdery fresh snow on the great face of Everest was being swept along in unbroken spindrift, and the very ridge where our route lay was marked out to receive its unmitigated fury.'

According to local information, Everest 'smokes' for weeks after the monsoon until the enormous accumulations of monsoon snow are blown from the mountain. One thing is certain: no party with or without oxygen will ever traverse Norton's Traverse and

the slabs of the Great Couloir when the rocks are continuously snow-covered. The question then arises regarding the date by which the mountain is denuded of monsoon snow. This may well be as late as December in some seasons and as early as October in others; there is little or no information available. Even supposing it is as early as the beginning of October, the days are perilously short, whilst high winds must be expected even if no snowfalls occur. Snow-covered rocks, wind or cold, any one of these three is enough to turn back an Everest party. It has been proved by the 1938 expedition that it is possible to reach the foot of the slabs of Norton's Traverse (Yellow Band) during the monsoon season, and this may well prove possible in the early post-monsoon season. But of what value is such an ascent? If the uppermost part of the mountain is snow-covered it is mere waste of time for a party to make an attempt on the summit. Nothing further need be said about a high wind above 27,000 ft. except that no party can withstand it. The last, and in many ways the most serious factor in any post-monsoon assault is the cold. No one who has not climbed above 27,000 ft. can have any conception of what cold means at the highest altitudes. Two things alone can counteract it, the sun and oxygen. As regards the first, two parties were forced to return to Camp Six in 1938 because they started when the sun was low or had not risen over the N.E. shoulder, and this was during the monsoon season. In October the sun is much lower. It would be interesting if someone would work out the hour at which it would strike the N. side of the mountain in the neighbourhood of Norton's Traverse and the Great Couloir in October and succeeding months. Of one thing I am certain: no party will ever reach the summit of Everest without the sun to keep them warm unless they breathe oxygen equal to that breathed at sea level, and whether oxygen is of itself sufficient to counteract this deadly shadow, which prevails for so many hours of an October or November day on the N. side of the mountain, is very doubtful.

In conclusion, it would seem that Major Hunt's experiences are merely so many nails in the coffin of a post-monsoon attempt on Everest, and that all the available evidence suggests that the next attempt should be made, like the others, before the monsoon. But if having made their attempt they fail, let the party stay on in Tibet to examine the weather and snow conditions prevailing on the mountain and if possible attempt it after the monsoon.

F. S. SMYTHE.

The Editor has asked me to set down in writing and to amplify, if possible, my brief contribution to the discussion of Major Hunt's paper. Very pressing military duties on the eve of my departure for India will prevent my doing any real justice to a subject of such interest and importance as the question of a post-monsoon attempt on Mt. Everest.

It has long been held by a not inconsiderable number of the

Himalayan Club that, in view of so many pre-monsoon essays on Everest having ended in failure, a post-monsoon attempt is well warranted and has in fact as much, if not more, chance of success. Major Hunt is one who has held this view, and he has in fact sought evidence for its justification from his own expeditions to the eastern Himalaya.

In *Everest 1933* (Ruttledge) were recorded the fullest accounts which have yet appeared on Everest weather and Himalayan meteorology from the pens of L. R. Wager, and S. N. Sen and N. P. Chatterjee respectively. These accounts and the data therein discussed are well worthy of careful perusal. Wager succinctly states (p. 337) that 'the whole timing of a Mount Everest expedition depends on what is known, and what is surmised, of the date at which the monsoon will begin.' Dr. Sen in his analysis emphasises the considerable number of factors, and their interactions, which bear intimately on the time of arrival of the monsoon. He claims that there are three chief characteristics during the course of a year which should be ideal from the point of view of an expedition to the eastern Himalaya. (1) The frequency of western disturbances should be below normal in the months of April, May and June, i.e. less than one disturbance per week should appear on the N.W. frontier. (2) There should be no depressions in the Bay of Bengal in June. This may happen, on the average, once in six years. (3) The westerly drifts at great heights over the Himalaya should be comparatively weak. He concludes that it is not known whether there is any year of which the summer months will satisfy all these specifications. Moreover, he is of the opinion that in years of early retreat of the monsoon there may be brief spells of good weather over the eastern Himalaya in the autumn when the mountain slopes are free of fresh snow. In this season the vast Indian plains cool down, and storms usually originate far away from the Himalaya in the south of the Bay of Bengal. 'It would therefore be interesting,' he concludes, 'to undertake an Everest expedition in this season.' So much for the views *ex cathedra* of an acknowledged expert on Indian and Himalayan meteorological conditions.

In a later important paper [5] Dr. Sen has demonstrated, from an analysis of the monsoon 'front,' that even with such information as is at present available, it should be possible by February to foresee any exceptional acceleration or retardation of the normal advance of the rains of the same year.

Sir Gilbert Walker, formerly Director of the Indian Meteorological Service, has more recently worked out a number of numerical correlation coefficients between certain weather elements in different parts of the world, and he claims to have discovered three principal oscillations, one of which shows a marked tendency for high pressure in the

[5] 'Long Range forecasting of the South-West Monsoon and Everest Expeditions,' *Science and Culture*, Calcutta, June 1937; also review in *G.J.* xcii, 1938, p. 564.

South Pacific to be accompanied by low pressure in the Indian Ocean and *vice versa*. While this is considered by experts to have great possibilities for long-range weather forecasting, and to be applicable to that of the monsoon, apart from other weather regimes, it is not felt that Walker's predictions of seasonal rainfall in India from Himalayan snowfall are sufficiently reliable to be of any real value.[6]

Dr. Sen has also emphasised the paucity of the data upon which estimates and forecasts can be based, in view of the almost complete absence of observatories in the actual Himalayan region. His later ideas have been developed as the result of observations in the upper air over the Indian plains, corresponding with that zone into which the Himalaya project. It is these observations considered in terms of the modern 'front' theory, affecting the advance and interaction of moving bodies of air, which have enabled Dr. Sen to feel more confident of long-range forecasting of the monsoon. But it is clear that a more extended programme of upper-air observations would enable the problem to be examined to much greater advantage both to science and to Himalayan mountaineers. In the Everest district, and in spite of seven expeditions to the mountain, the period covered by observations of seasonal conditions on the peak itself is all too short. Wager has voiced the opinion of many of us that it is deplorable that no expedition to Everest has left a rear party to observe actual monsoon and post-monsoon conditions and weather effects, which might be a guide to the chances of a later attempt on the mountain.

Mr. Smythe in his note has cited the concrete factors, favourable and adverse, which bear upon the problem; that of the strength of wind, and its ability to clear fresh snowfalls, being perhaps a principal one. If we did nothing else during the unfavourable Everest expedition of 1938, we demonstrated that the monsoon falls of snow, in the absence of high wind, make the mountain quite unclimbable.

It is of interest that Dr. Sen has observed that the upper winds over the Himalaya in the months November to February are almost invariably strong, often rising to gale force and sometimes to hurricane force. Wind speeds of 100 miles per hour should not be infrequent on the summit of Everest. Some falling off of the speed, he states, usually takes place in the months of March, April and May, but even in these months the wind often blows with gale force in 9 or 10 kilometre levels. With the setting in of the monsoon a conspicuous fall in wind speed is noticeable, and this condition persists until the approach of the winter. In this connexion it should not be forgotten that the actual pressure of the wind for any given velocity will be less than at sea-level, owing to the corresponding decrease in density of the air with increased elevation.

In 1938, incidentally, I had hoped to obtain some data on the range of wind velocities on the mountain by means of a high-speed anemometer, but circumstances unfortunately prevented these observations being carried out.

[6] *Monthly Weather Review*, Supplement No. 39 (Washington), 1940.

It would appear, therefore, that as far as wind-clearance is concerned, the immediate post-monsoon period, with its lighter or perhaps negligible snowfalls and moderately increasing air velocities, might be a distinctly favourable season. Moreover, during late September and early October, general air temperatures should not be appreciably lower, nor would the hours of daylight be seriously diminished.

Consequently, whether Major Hunt's experiences in the Kangchenjunga district can or cannot in themselves be deemed to bear favourably upon the problem, I am entirely in support of the view that another Everest expedition should not merely attempt the ascent, as heretofore, before the monsoon, but be prepared to stay on and seize the possible opportunity which conditions immediately following its final stages may afford.

But before world conditions allow of further expeditions setting forth, let us hope that the researches of Dr. Sen and others of the Indian Meteorological Department may have so advanced the means of foretelling the weather prospects that the climbing party can order its operations accordingly.

N. E. ODELL.

THE ALPHUBEL IN 1906

BY G. A. SOLLY

THIS paper has been written[1] in response to the appeal by our Editor to old members of the Club for records of expeditions which, though not new, were undertaken in unusual conditions or were likely to be otherwise of interest. My companions during the season of 1906 had fluctuated a good deal, and at the end of July there were with me at Saas Fee, besides my wife and her sister, only J. A. Parker and J. A. Hargreaves of Birkenhead. The latter, though not a member of the Club, had done a good deal of guideless climbing and was a steady and reliable companion. The party had had several rock climbs lately, so wished to have a big glacier expedition, and fixed upon the Alphubel, hoping to traverse it from the Mischabeljoch to the Alphubeljoch. A great attraction was that none of the party had ever been on the Mischabeljoch or the Alphubel, and that as there was very little snow on the rocks that summer we were more likely to have the route to ourselves. We had an early breakfast and left the hotel on July 30 as the clock on the village church was striking 2.0 A.M., the two ladies having been told that if they looked out about 9.0 A.M. they

[1] It is with great regret that we report the death of the author, a distinguished and well loved figure in mountaineering circles. We hope to publish an *In Memoriam* notice in our next number.—EDITOR.