THE GEOGRAPHICAL JOURNAL

VOLUME XCII

JULY TO DECEMBER

1938

PUBLISHED UNDER THE AUTHORITY OF THE COUNCIL

EDITED BY THE SECRETARY

THE ROYAL GEOGRAPHICAL SOCIETY

KENSINGTON GORE LONDON S.W.7

EDWARD STANFORD LTD. 12 LONG ACRE W.C.2

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THE MOUNT EVEREST EXPEDITION OF 1938

H. W. TILMAN

Evening Meeting of the Society, 31 October 1938

THAT this year's expedition to Mount Everest was organized on a smaller scale than before is well known. For some time past a few have inveighed against the large expedition on more grounds than one—mobility, efficiency expediency, and economy—but it was probably the financial aspect that finally tipped the scale, especially after the experience of 1936 when, through no fault of those concerned, the party was unable to accomplish anything. It was felt that the time had come to give other methods a trial, if only for the reason that they were less expensive.

Permission to go this time was obtained through the persuasive powers of Mr. B. J. Gould, whose Mission visited Lhasa in the winter of 1936. The Committee having appointed a leader gave him a free hand, and, since the money was raised privately through the generosity of friends and members of the party, they were also spared financial responsibility. A satisfactory arrangement was made with *The Times*, but it is a matter for regret on our part that through an unfortunate incident the terms of the contract were not fulfilled by us. We budgeted for a cost of something less than a quarter of previous expeditions.

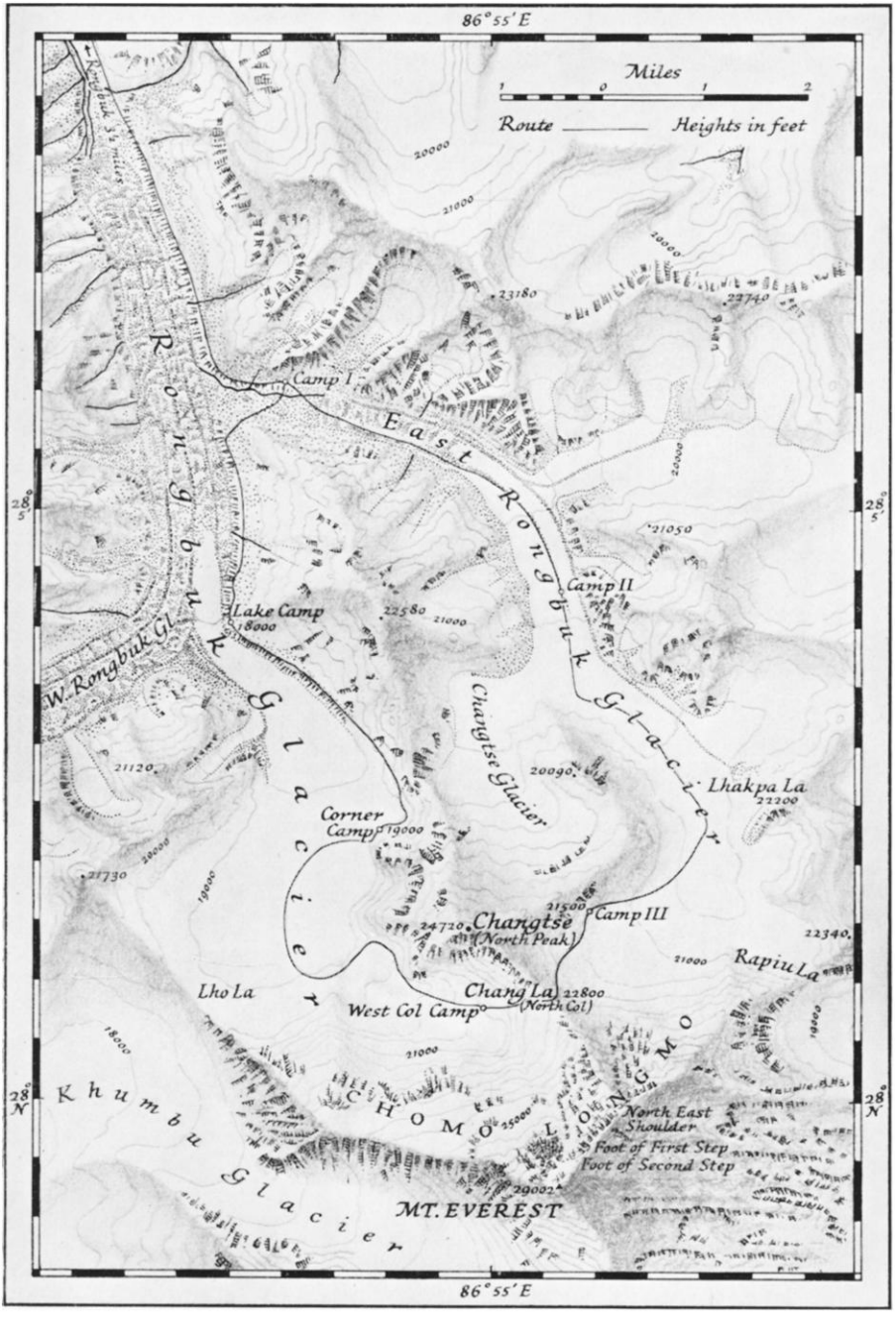
The party which assembled in India at the end of February consisted of seven, all of whom were climbers: H. W. Tilman, E. E. Shipton, F. S. Smythe, N. E. Odell, Dr. C. B. M. Warren, P. Lloyd, Captain P. R. Oliver. A dozen Sherpa porters were collected in Darjeeling, and the party left Gangtok on March 4 with sixty mules carrying the baggage. A week was spent at Tangu, where snow still lay deep, through which a track for the mules was cleared with the whole-hearted assistance of the Sikkim Road Engineer. The Sebu La was crossed on March 18 on a cold blustery day, but thereafter throughout the march across Tibet we enjoyed bright sunny days marred only by the wind which blew usually in the afternoons.

We reached Rongbuk on April 6, ten days earlier than the earliest of previous expeditions, having taken the precaution of being there in time to avoid a repetition of the 1936 experience. As will be related the weather did break

early, even earlier than in 1936, but until it broke the wind and cold made climbing impossible. The day after our arrival we were joined by forty-five Sherpas, who came over from Sola Khombu in accordance with arrangements, bringing with them 1300 lb. of food. They came by a 19,000-foot pass called the Nangpa La and the journey takes about a week. As women and children cross the pass later in the season, it must be easy; but we were told that no animal transport ever uses it because the guardian spirit of the pass takes the form of a horse, and any four-footed animal which presumes to cross is at once struck dead.

In spite of the mild conditions of the march, wind and dust had taken their usual toll: Oliver and Lloyd had colds, Odell a bad cough, Warren went to bed with what was called influenza, and Shipton with colic. After the usual ceremonies at the monastery, when the old Abbot blessed the whole party, Europeans and Sherpas, individually, we moved up to the original Base Camp. This was used only as a halting place; we took with us up the glacier everything we required and had no lines of communication to bother about. After making one carry to Camp I we reduced our porter strength from sixty-one to thirty-one, because we were in no great hurry to reach the mountain owing to the prevailing cold and wind. With this reduced porter strength four relays to each camp up the glacier were necessary, and it was not until April 18 that we occupied Camp 2. There I went down with influenza and after four days in bed went down to Rongbuk on the 22nd. Before I went we discussed plans, and decided that after the North Col slopes had been examined Shipton and Smythe should go over to the Kharta valley for a rest, leaving the others to carry on and make an attempt if conditions allowed. The reason for this was that Shipton and Smythe, who had had most experience and were our most likely pair, were of the opinion that the end of May was the most probable time for an attempt and were averse from making an earlier one.

On the 26th I returned to Camp 3 where the others now were. They reported much ice on the North Col slopes and were not in favour of doing anything more yet on account of the extremely cold conditions. Temperatures of 46 and 47 degrees of frost at night were being recorded; moreover none of the party was fit: coughs, colds, and sore throats were the tale of our infirmities, and on Mount Everest the only cure for these complaints is a lower altitude. On the 27th therefore Shipton, Smythe, Oliver, and nine men crossed the Lhakpa La (22,000 feet) *en route* for the Kharta valley. The rest of us waited a couple of days and then followed them, the wind and cold showing no signs of abating. The alternatives to this move were to stay and carry on, or to go down to Rongbuk, which was nearer to the mountain but less beneficial to health. Before leaving England I had been strongly warned by Norton, who in 1924 had suffered in the same way, against committing the party too early with the probable result of putting some of us out of action with frostbite; and such were the conditions at this time that this was less of a probability than a certainty for any party above the North Col. Nor, as things turned out, would mere proximity to the mountain by our being at Rongbuk have helped us. Bitter weather continued until May 5, when snow fell heavily and fell daily for the next week. The mountain turned white and was never again in climbable condition.



The approach to Mount Everest

The courtyard of Rongbuk monastery

Our camp amongst grass and trees at the head of the Arun gorge was a change from the harsh conditions of the glacier camps. All enjoyed their stay there except myself, who went to bed on arrival with a recurrence of influenza and only left it to begin the march back on May 10. Shipton and Smythe stayed behind intending to return by the Lhakpa La in time to meet us at Camp 3 on May 20. We returned by the Doya La and reached Rongbuk again on the 14th, whence our first view of the mountain was not reassuring. It was covered with snow and the plume was now blowing off the summit from the reverse of the familiar north-west direction. On reaching Camp 3 on May 18 we found drastic evidence of changed conditions: a foot of snow now covered the bare ice of the glacier, and water lay about in pools whereas before water was only obtainable by melting ice.

Early on May 19 clouds poured up over the Rapiu La in ominous fashion bringing in their train intermittent falls of snow; but Odell and Oliver having examined the North Col slopes reported the snow in good condition. Lloyd was sickening for his turn of our common complaint, but on the 20th four of us and four Sherpas began making a route up to the Col. The line we took almost directly up the middle was undoubtedly well adapted to act as an avalanche shoot, but the snow was good and the climbing easy until within about 300 feet of the top, when the angle steepened considerably, forcing us out to the left on a long traverse before we were again able to climb straight up. Oliver, who had done most of the work in front with his two Sherpas, was suspicious of the snow on the traverse and waited until the rest of us had come up before embarking on it with his two men, carrying a light line for fixing. A short way out they got bunched and the snow avalanched. The leading man, a Sherpa, was clear of the cleavage, and the line we were paying out got mixed up in their climbing rope so that we easily held them. Part of the route having thus been made safe, Odell and I took over the job of cutting and stamping out a track in the steep, soft snow. It was so hot that a little of this work was enough to send us back to camp at 4 p.m., where we found Shipton and Smythe, who had recrossed the Lhakpa La early that morning. They had watched our performance with interest and anxiety and were glad to see us coming down. That evening it snowed steadily for several hours and the roar of the resulting avalanches continued far into the night.

This heavy fall of snow gave rise to discussion. The slopes would be unsafe for three or four days, while if the wind for which we prayed came the probable formation of windslab might make them dangerous for an indefinite period. Having in mind the queer behaviour of the snow here in previous years our thoughts began to turn to the route up the west side, which had been warmly recommended by the 1936 party who had looked at it but not gone up it. We decided that Shipton and Smythe, taking half the porters, should go round, and if they succeeded in reaching the Col should attempt the mountain. The contemplated division left both parties weak in porters, but it promised that one or other would reach the Col.

A cold windy night followed by a promise of colder weather made us drop the plan for the moment, and next day, having examined the slopes, their condition seemed good enough to warrant a start. On May 24, all the

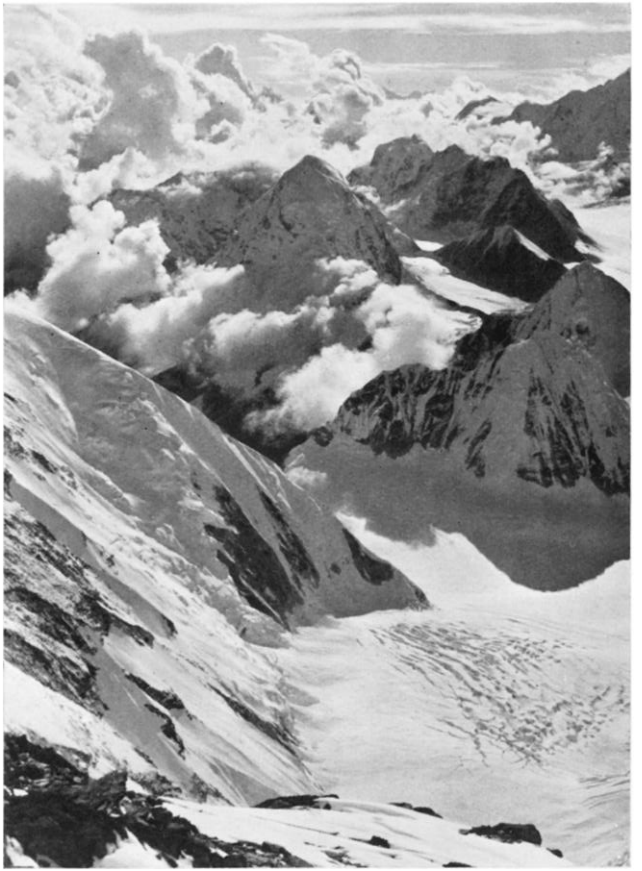
Europeans, less Lloyd who went down to recuperate, and twenty-five porters went up to the Col. The route to the top was soon finished, ropes fixed, and by midday all were up. Loads were dumped on the 1936 site where the apex of one of their Pyramid tents showed through the snow. Next day Smythe and I took fifteen more porters up; we left early, were on the top by 10 a.m., and back in camp by midday. The outlook from the Col was as depressing as from below. Clouds could be seen billowing up from both sides, the air was still, the mountain white, and the snow at our feet, deep and soft. More discussion followed, when it was decided that Shipton and Smythe should retire to Rongbuk, returning when the mountain was less white, and that we others should occupy the Col in order to examine the snow higher up. Uncertain whether the west side would be practicable, we were reluctant to commit ourselves to that yet; meanwhile it was no good keeping more men than needful at Camp 3. Nevertheless, when more snow fell the following day we reverted to the earlier plan, and on the 27th Shipton, Smythe, and half the porters went down, with the intention of returning by the west side when conditions improved.

On the 28th Odell, Oliver, Warren, myself, and thirteen porters, went up to Camp 4 on the Col. It was very hot, mist hung over the slopes, and the snow in places was rotting; we crossed the traverse one by one. Eight porters went down with orders to return next day with more loads if no snow fell, but a foot of snow fell that night, so nothing was done. There was more snow on the 29th, but on the 30th Oliver went off to examine from the end of a rope the snow on the western slopes and the rest of us toiled through knee-deep snow up the north ridge. Warren tried the closed type oxygen apparatus with unlooked for results. It seemed bent on suffocating him, and he did not wear it long. In addition to two of the closed type apparatus in which pure oxygen is breathed by means of a mask over mouth and nose, and which weighs 35 lb., we had two of the simpler open type with which one obtains oxygen by a tube in the mouth and also whatever air is available through the nose. Professor Finch was alone in recommending this type, the comparative success of which was instructive.

I pushed on with a Sherpa to about 24,500 feet, but it was obviously no use trying to occupy Camp 5 yet, and when more snow fell that day we beat a retreat. A suggestion that two of us should go down by the west side was not accepted owing to Oliver's account of the snow. On June 1 we were at Camp 1, whence, next morning, Oliver and I walked up to Lake Camp to see Shipton, Smythe, and Lloyd, who were on their way to the western approach. The camp is a pleasant spot by a tarn on the right moraine of the main glacier some 2 miles above Camp 1. A change had come over the weather and for the last forty-eight hours a strong west wind had been driving low clouds before it. Through breaks in the flying scud we could see snow being whirled off the face of the mountain in a most encouraging manner, but while the wind might clear the snow off it might also form windslab on the east or lee side slopes; we therefore bowed to Smythe's reiterated warnings, and decided to concentrate on an approach from the west. I joined Shipton's party, which we reinforced to a strength of seventeen porters, and the others were told to follow as soon as some necessary loads had been brought down

Bridge above Tangu

West side of the North Col, showing the avalanche debris



Looking west from Camp V

from Camp 3. After making an intermediate camp on June 4 on the main glacier (Corner Camp), we marched up the short glacier lying between the north face of the mountain and the North Peak, leading to the foot of the west side of the Col. Mist caused some difficulty amongst the crevasses of the icefall, but by 2 p.m. we were in camp (West Side Camp) on the snow terrace at the foot of the slope. The height must be about the same as Camp 3 (21,500 feet). Snow was still blowing about on the Col and the Yellow Band looked fairly free from snow, but we were about to learn that appearances from below were deceptive.

Our way next morning led up the debris of a large avalanche which had apparently fallen recently. In consequence the first 500 feet of the slope was bare ice, and after cutting steps up this we had to cut steps across it in order to get on to snow which was still in place and which at that early hour might be expected to remain there. On the whole the parties who left this route alone in previous years seem to have had reason. We reached Camp 4 at 11 a.m. after a long plug up bad snow on which even the feeble sun there was had no good effect. The sky had a curious glassy look through which the sun peered wanly surrounded by a double halo.

Next morning, June 6, we started with fifteen porters for Camp 5. Lloyd was wearing the open type apparatus. The snow slope at the foot of the north ridge up which we had ploughed so heavily a week ago had now been swept hard by the wind. Approaching 25,000 feet two porters succumbed to altitude and most of the others were unhappy, while yet 300 feet below the Camp 5 site (25,800 feet) a sudden snowstorm further demoralized them and there was talk of dumping the loads and going down. In the end however better feelings prevailed, and by 4 p.m. everybody was up. Leaving Shipton, Smythe, and seven porters there, Lloyd and I took the rest down. Two of those seven actually went down several hundred feet that evening and brought up the two abandoned loads—a very fine piece of work.

Wind prevented the Camp 5 party doing anything next day, but on the 8th they moved up to Camp 6 (27,200 feet), finding it hard work making a track up fairly steep rocks which in many places were snow covered. The climb of 1400 feet took eight hours, and the seven porters, who stuck nobly to their task, only got back to Camp 5 very late and very tired. On the 9th Shipton and Smythe started, but, like Lloyd and I later, they were out too early and had to go back to the tent to warm up. Finally, after leaving the little patch of scree on which Camp 6 was pitched, they struck diagonally upwards, but almost at once got into deep powder snow. Realizing the futility of persevering under those conditions, they returned to the tent and thence down to the North Col.

Meantime Lloyd and I had a day off at Camp 4, took three sick men down by the west side, and then, on the day Shipton and Smythe were returning, he and I started up with six porters. As we were going up to Camp 5 we saw Odell, Warren, Oliver, and two porters coming up to Camp 4 from the west side camp. Farther up we passed the seven porters returning from Camp 5, and in that camp, which we reached at 3 p.m., we met Shipton and Smythe also on their way down. After hearing their report of conditions higher up, we agreed that the summit was out of the question and decided to reach if

possible the summit ridge and to work along it to the Second Step. Two of our porters were persuaded to stay, the rest went down.

A gale in the night made the double-skinned Pyramid tent flap so furiously that sleep was impossible. Leaving at 8 a.m. we reached Camp 6 soon after midday. Lloyd, wearing the oxygen, led and I followed, roped to the two porters. He got in some half an hour ahead of us evidently feeling more benefit from the oxygen as we got higher. For the short distance we went next day he also moved faster than I did, but perhaps under the circumstances that was no criterion. What I did expect was that the oxygen would give him sufficient extra "kick" to climb the rocks which so easily defeated us next day; but Lloyd's opinion is that less effort was required when moving and consequently he was merely less fatigued. We sent the men down, collected snow for cooking, and turned in, for the wind was already rising. We ate pemmican soup for supper. At night it blew hard and we slept little.

Starting at 8 a.m. on June 11 in a very gentle breeze we had not been going ten minutes before my hands were numb and Lloyd complained that his feet were in almost the same state. We returned to the tent and waited until 10.30 before trying again. As our first objective was the summit ridge immediately west of the north-east shoulder, we had to climb a steep rock wall some 50 feet high, just above the camp. Not liking the look of this from closer up we turned half-right towards an upwards sloping snow corridor, but there a few thigh-deep steps quickly drove us back to our first choice. There were three or four possible lines up the rock, all of which we tried with an equal lack of success. Each looked simple enough, but the smooth outward-sloping rock easily defeated our irresolute attacks. As I was inspecting the fourth and last possibility, Angtharkay and another man whom we had told to come up, were seen approaching the tent. Here was an excuse for going down, had we been in want of one, so down we went. If we had gained the summit ridge then some 200 feet above us we should have been a mile distant from the summit and 1500 feet below it, and 1200 yards from the Second Step. The ridge looked difficult and the Second Step would almost certainly have defeated us, but it will be a lasting regret that we were unable to try.

We descended to Camp 5 in a storm and reached Camp 4 that evening in calm weather. Only Odell, Oliver, and a few porters remained on the Col, the others having gone down by the old route that morning. Ongdi, one of our best men, had developed pneumonia, which obliged Warren to go down with him. Pasang, another Camp 6 man, was lying paralysed. Oliver was keen to go to Camp 6, but having a sick man on our hands, no hope of climbing the mountain, and some anxiety about the descent, the prudent course was to go down. The ice traverse put the western route out of court for getting a helpless man down, and on June 12 we descended by the old familiar way. Three men were kept back to look after Pasang, and after some difficulty we got him down to the glacier and thence to Camp 3.

Thus ended the 1938 attempt. We halted at Rongbuk until June 20, but in the interim the weather gave us no encouragement to stay. There was talk of returning in the autumn, but none of the party was available, and the chances of finding favourable conditions in October are, in my opinion, exceedingly remote. Assuming the unlikely fact that by then the wind has

cleared the snow away, the wind and cold are increasing instead of diminishing, the days getting shorter, and the north face receiving less and less sun.

To sum up, I think we have shown that a small party costing less than £2500 is as likely to reach the top as a large one costing £10,000. Two parties of two were in position at 27,200 feet, fit and ready to make a serious bid for the summit had conditions allowed. It would have been more convincing to have reached the top, but I believe enough was done to satisfy candid people that our methods are sound.

We learnt, as had already been learnt twice before, that it is impossible to climb the last 2000 feet if there is snow on the rocks. Siege tactics are impracticable at that height, but even if the labour of ploughing through powder snow was not insuperable there is the danger of the snow sliding off. Though wind seems capable of impacting snow up to about 25,000 feet it seems to have no such effect on snow above that.

The fact that we took no wireless equipment seems to have caused some surprise, but I do not see how even a small receiving set would have benefited us this year, and why a mountaineering party should wish to take a transmitting set is difficult to understand. This year we might have been told in the first days of May that a disturbance was approaching, but the news would not have caused us to alter our plan of making the attempt at the end of the month, because at the time no earlier attempt was possible. Even supposing some omniscient being had told us that from May 5 onwards monsoon conditions would prevail (as they did) we should certainly have been well informed but unable to do anything about it except, perhaps, pack up.

Something has been learnt about oxygen, but my own belief is that the mountain could and should be climbed without it. The opinion of a representative body of mountaineers has not been taken, but my feeling is that a successful oxygen attempt would merely inspire a wish to do it without. No finality would be reached, and the ultimate result would be another long-drawn series of attempts to climb the mountain in a normal way.

To conclude: the weather is all important, and for success conditions on the last 2000 feet must be perfect. In 1936 and 1938 there was great hope that the mountain would be climbed, and yet in neither year was a bid for the top ever possible. Whether with a system of attempts at haphazard intervals the dice are not too heavily loaded is a question that will have to be decided.

APPENDIX I: THE GYANGKAR (NYONNO RI) RANGE

E. E. SHIPTON

The Gyangkar range is interesting geologically as being one of the few mountain chains of central Asia with a north–south axis. It is a feature very well known to members of the various Mount Everest expeditions, but although five of its main peaks were fixed on the 1921 reconnaissance map no part of it was examined closely by that expedition. In 1922 Mallory, Somervell, Finch, and Wakefield attempted from two directions to climb Sangkar Ri in the extreme north of the range. In 1933 Wager and I climbed a small peak on its eastern flanks, and Wager did some geological work.

In planning the 1935 reconnaissance a visit to the range had formed a part of our programme, and thanks to the friendliness of the local officials at Sar,

The Gyangkar range seen from 27,200 feet on Mount Everest

in the middle basin of the Yaru Chu, Spender was able to photograph the eastern flanks of the main range, the valleys of which are short. Tilman, Kempson, and Warren attempted to climb Nyonno Ri (22,142 feet), the highest peak in the range, and supplemented Spender's observations to the south-west. Wigram and I crossed a pass to the north and reached an isolated basin of pastureland lying to the west of Nyonno Ri and shut in on all sides by high peaks. We found that this country was grazed by large herds of yaks and sheep belonging to the people of the surrounding districts. We traversed the basin to the south and found our way back to Sar by way of a pass between the Nyonno Ri and Ama Drime groups. I hoped then to take the whole party across the range and to make a detailed exploration of those interesting and very beautiful western valleys. Unfortunately political considerations forced me to abandon this plan. I have always regretted this, and have looked for opportunities of renewing my acquaintance with the Gyangkar range and of extending our knowledge of it to the west.

This year I succeeded in spending a short time in the range on the way home. With two Sherpas, Kusang Namgir and Gyalgen, I left the main party at Trangso Chumbab on June 26. One pony carried all our food and equipment. The local knowledge of the owner of the pony enabled us to cross the Yaru Tsangpo, which is dangerous hereabouts owing to quicksand, at its junction with the Phung Chu, and so to reach Kochak on the first day. There I found that distribution of boiled sweets among the village children was an excellent way of breaking down the reserve among their elders.

I induced an old man to come, with two donkeys, to help us into the valleys to the south, and on June 27 we reached a monastery far up in the mountains. Beyond this our guide would not go, saying that there was no route and that we would only get lost if we went farther; though he must have known of the grazing country to the south. From the monastery we had to carry our baggage ourselves. We had to cross a series of high ridges which separated deep grassy valleys flowing west from the axis of the range. Each of these valleys is used as a grazing ground by the people of the Phung Chu. In one of them we met two men hunting for bharal. The men told us that these high valleys were mostly used in the winter for grazing. This surprised me for I had imagined that their slopes would be deeply covered in snow in the winter; but the Sherpas pointed out that similar valleys in Sola Khombu are used more in the winter than in the summer. Certainly these would be a pleasant resort from the bleak, wind-swept plains of Tibet.

The weather was very bad, and though we spent long hours at high stations I could not fix my position sufficiently well to sketch the northern valleys of the range. Moreover travelling in thick mist across numerous saddles was complicated. The glaciation of the mountains suggests that the weather in the whole range is influenced by the moist air coming through the Arun gorge. The vegetation too is entirely different from that of the mountains to the east and west of the range. When I was there the flowers were brilliant. Many varieties extended to over 18,000 feet.

When we reached the main basin the weather improved for a spell and I was able to do a lot of work with the small Watts theodolite. The camera attached to the instrument unfortunately broke down after the first few stations, and I had to take an enormous number of angles to minor features of the landscape which would normally have been fixed by intersection on the photographs. Panoramas of hand photographs supplemented the work.

The whole range seems to be composed of granite. The ridges are largely made up of bold rock spires, and the main peaks, where they are clear of ice, are

flanked by clean, sweeping rock faces of considerable steepness. Almost every side valley and cwm contains at least one lake. This is a remarkable feature of the country. Most of these lakes appear to be very deep indeed. Fuel was always plentiful; even where there was no scrub the ground was everywhere littered with yak-dung. This and the large number of encampments showed the extent to which these rich pastures are used. In July we met with very few herds, and obviously most of the grazing is done at another time of year, which supports the theory of a winter influx to these high valleys.

We found a tall *Meconopsis*, with a large red flower, growing in some profusion in one of the valleys. I have not seen it before, nor have I heard that it has been found before. Unfortunately there were no seeds available. I brought back some specimens of the flower which have been sent to Kew for identification.

I had hoped to explore some of the great gorges running south-east from Ama Drime to the Arun, but unfortunately by the time we reached that country our food was running short, nor had I enough money to be able to send for further supplies. This was most regrettable, for an exploration of these gorges would be extremely interesting from many points of view. As it was we were obliged to cross the same pass that Wigram and I had used in 1935. We camped by a lake about 3 miles long at the eastern foot of the pass, about 5 miles from the Nye La. The ground was strewn with gigantic granite blocks, and on top of one of these were the remains of an old fortification. These were very difficult to reach, but we managed to climb to them through a great fissure in the centre of the block, which demanded a good deal of rock-climbing skill. Later we learnt from some shepherds that the rock used to be inhabited by bandits, who for a long time preyed upon travellers crossing the Gyangkar range. At Sar we were hospitably received by our old friend the head man, who had been so kind to us in 1935.

APPENDIX II: NOTE ON THE BOTANICAL COLLECTION

C. E. C. Fischer

A small but interesting collection of dried botanical specimens and seeds was made, mainly by Mr. Peter Lloyd; the specimens numbered 117. Though it contained no new species there were two new varieties of *Gentiana*, and several others represented types found elsewhere within the last few years, thus extending the habitat.

Though it might be thought that a route now travelled and collected over several times would not offer much opportunity for the systematic botanist in a region not particularly rich in its flora, there is every chance of obtaining further information. Specimens are secured during different seasons, in different localities, and at different levels, and sometimes these supply stages in the growth of the plant that were not previously procured. There is also the possibility of the discovery of new species or varieties (as in the present and the 1933 collections), which were either overlooked on earlier occasions or were not then in flower owing, perhaps, to the unfavourable seasonal character of the particular year. This may account for the finding of two new varieties and two other plants not collected on any previous Mount Everest expedition (*Clematis Vernayi* C. E. C. Fisch. and *Androsace Cuttingii* C. E. C. Fisch., collected some three years ago in the direction of Lhasa). Further, the range of at least five of the plants collected this year has been raised by about 1500 feet.

It is obvious that an Everest expedition must not be hampered by cumbrous burdens; but as Mr. Lloyd and others before him have shown, it is quite

possible to do some very useful collecting without any hindrance to the more immediate purpose. It is to be hoped therefore that on future expeditions some effort will be made to complement the previous collections and to enlarge our botanical knowledge of a region still very little known.

The collection (excluding seeds which have been sown at Kew and whose identification must wait till they have produced recognizable plants) comprises 31 botanical families of flowering plants, 70 genera, and 110 species. Of these 26 families, 62 genera and 92 species belong to the dicotyledons and the rest are monocotyledons. There are no conifers or cryptogams, nor were any grasses forthcoming. The best represented family is the *Papilionaceae* with 5 genera and 12 species; but the *Ranunculaceae* with 8 species, the *Cruciferae* with 9, and the *Compositae* with 7 actually had a larger number of genera (7, 8, and 6 respectively).

The localities were mostly between 14,000 and 15,000 feet, but some were at only 10,500 feet and one specimen (*Ermania himalayensis* O. E. Schulz) was found at 18,500 feet. This plant was collected in 1933 by Mr. L. R. Wager at 19,000 feet.

DISCUSSION

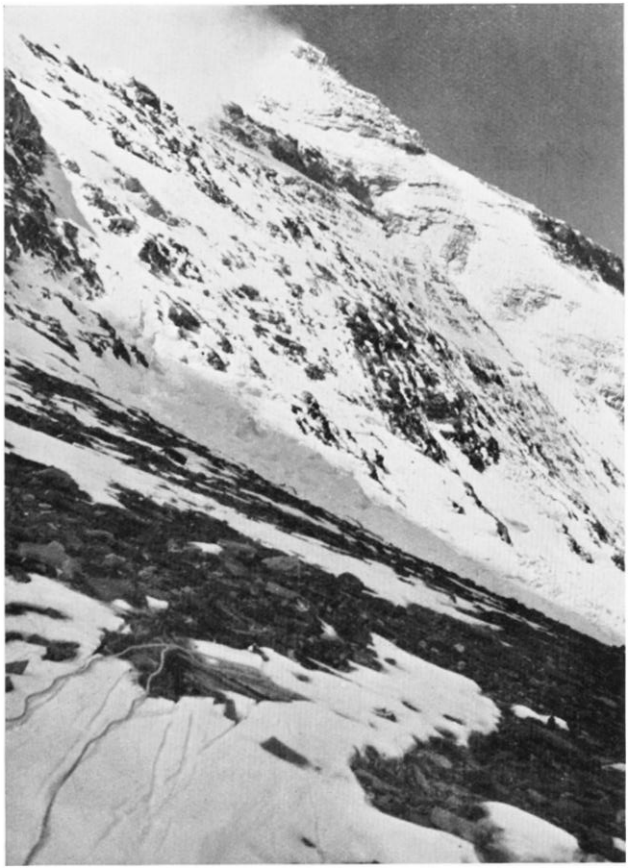
Before the paper the DEPUTY PRESIDENT (Professor KENNETH MASON) said: The President has charged me to express his great regret that public business abroad prevents him from attending here to-night, the first evening of our new session. I will straight away call upon Mr. Tilman to give his account of the Mount Everest expedition of 1938.

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

Mr. E. E. SHIPTON: I am very pleased to have this opportunity of congratulating Tilman on the way in which he ran the expedition, not at all an easy matter from various points of view. The great bugbear of an Everest expedition is that, whereas on an ordinary scientific exploratory expedition parties can be sent off into an unexplored area, each member having his own particular job, on Everest at least 75 per cent. of the time is spent in doing nothing. That fact is not generally realized. Members tend thus to become bored and to criticize unimportant things. It is difficult to organize the party so as to avoid this. The expedition this year was a pleasant one; we were all socially harmonious, and I think we all worked together well. But the question of doing nothing for long spells of time is a difficult one to get over. If I tell you that bed-sores, both physical and mental, are a greater hardship than altitude you will probably regard it as a joke; but there is quite a lot of truth in the statement.

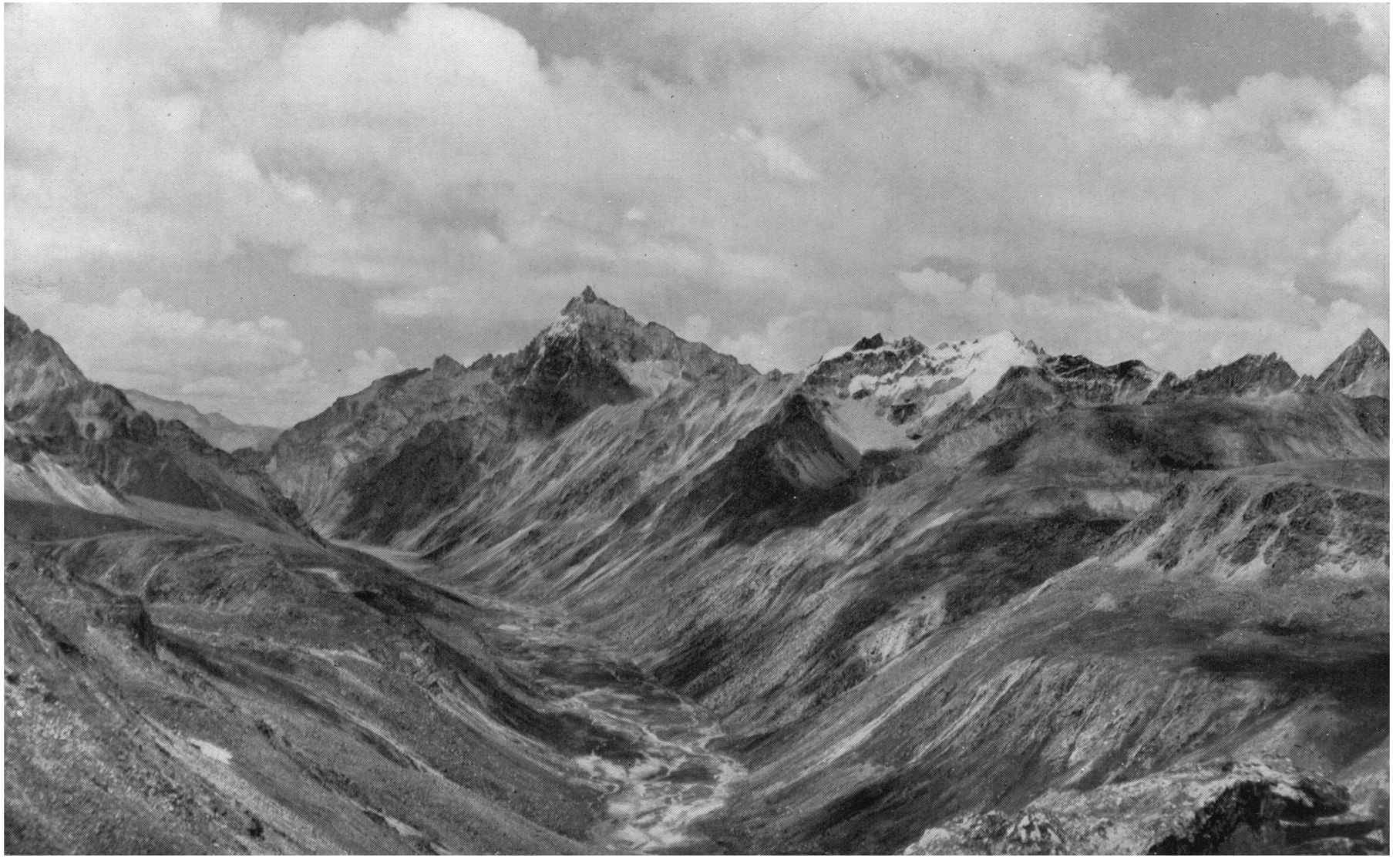
As regards the health of the expedition, I am convinced that the party kept far fitter than in 1933, when two members were confined to their beds with 'flu for a fortnight, one other was sent to Kharta with bronchitis, another was incapacitated for months with a gastric ulcer, and we all suffered more or less severely from laryngitis, colds, etc. No party has ever been at full strength on Everest.

Although on the expedition in 1935 we tried out, with success, the small expedition idea, there are still a number who regard it with grave suspicion, but the 1938 expedition has done much to prove the contentions of those who advocate the small expedition. I now feel that if I were to argue further in favour of the small party, I should be flogging a dead horse. I should however like to draw attention to the excellent American expedition to K^2. They cut their food and equipment down a great deal further than we did and I think they gained a greater measure of success on the second highest mountain in the



The summit from Camp VI

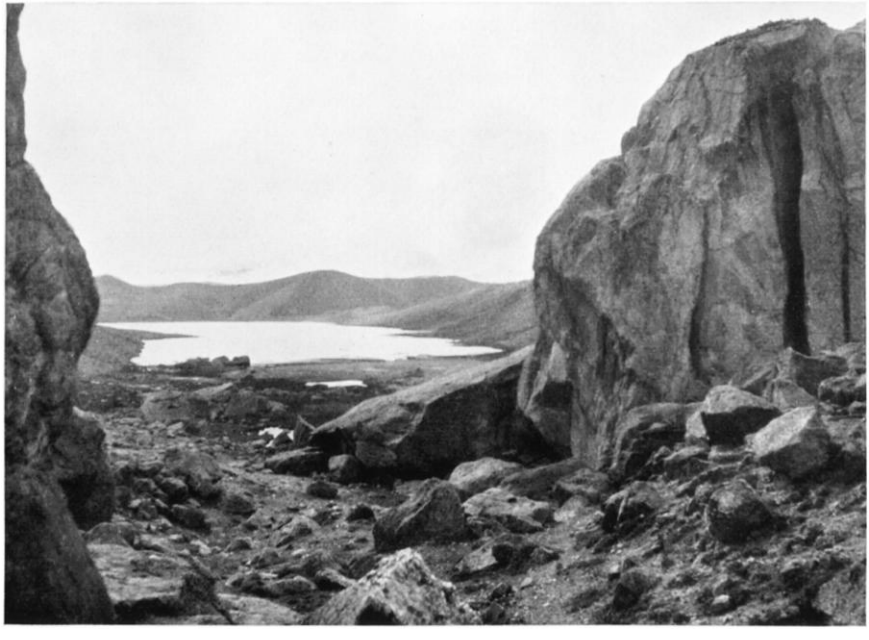
Smythe at the foot of the Yellow Band



Valley in the central basin of the Gyangkar range

The country south-west of Ama Drime

Nyonno Ri from the west



A lake near Nye La; with rock fortress on the right

world; a mountain which had looked so difficult that the Duke of the Abruzzi had, thirty years previously, given it up without making a serious attempt to climb it. Until the American party went there in 1938 no other serious attempt had been made. That expedition reached an altitude on an almost completely unknown and extremely formidable mountain of about 26,000 feet: a very remarkable feat.

I do not think there can be any doubt that Mount Everest will be climbed one day, but there must be perfect weather and perfect conditions otherwise, a combination which is not nearly so common as earlier expeditions appear to have thought.

I think Tilman has told you everything there is to be told, and beyond congratulating him again on the splendid way in which he ran the expedition and the excellent manner in which he has presented it to you, there is nothing more for me to say.

Mr. F. S. SMYTHE: I should like to associate myself with everything Tilman has said with regard both to the small expedition and to the oxygen. There is a point which has impressed me very much. As you know, oxygen is supposed to be, and is, the best possible treatment of frost-bite, and yet apparently Lloyd, who was carrying oxygen, suffered from the cold just as much as did Tilman.

Another interesting point which perhaps has not been stressed is that of the cold at high altitudes. A difficulty both parties experienced was the cold in the shadow on the north face of the mountain, and I will go so far as to say that I am quite sure as a result of my own experience that the mountain cannot be climbed in shadow. I remember watching the upper part of the north face from Camp 2 in April, and as far as my memory goes the sun did not get on to it until about eight to nine in the morning. That is too late to start from Camp 6 for an attempt on the summit. Any suggestion therefore as to a post-monsoon attempt must be defeated by that one fact alone, and therefore the possibility of climbing Everest is definitely limited to that period, which we did not get, just before the monsoon.

Then as to the question of the food: Tilman alluded to the impossibility of eating anything above Camp 4, but in the next breath he said that he and Lloyd ate pemmican at Camp 6, and to any one who has eaten pemmican, I would almost say at any altitude, that is a remarkable circumstance. The usual procedure is to plan out some food for high-altitude camps, and when one gets to Camp 3 one lumps as much as one can remember of it into a rucksack and takes it up. The question of high-altitude food should be a matter for experts and for all the members of the expedition. It should be documented at the start and taken up in small boxes, each box being labelled for its particular camp. In that way the climbers might conceivably get something they had not eaten before, and that would help to get them to the top.

Dr. C. B. M. WARREN: You may have gathered from what Tilman has told you that he has a supreme distrust of scientists and doctors. I never quite knew whether to be flattered at being asked to go on the Everest expedition because I spent my spare time mountaineering, or whether to be insulted because Tilman asked me to go as a doctor. In spite however of Tilman's views about doctors in general, I shall dare to talk to you about the medical aspects of the expedition.

To begin with, we had the usual crop of sore throats, and I think Tilman is quite right when he says there is nothing very much that we can do about these once they have developed. We tried throat sprays and painting the throat, and I tried wearing the Matthews respirator, with which I think I had a certain

Western peaks of the Gyangkar range

amount of success. But the suggestion that I put forward, perhaps for future occasions, is that the leader only or a competent transport officer should lay the camps up the East Rongbuk glacier as far as Camp 3 when the weather is still very cold, and the rest of the party should be kept down in the Kharta valley at reasonable levels where they will keep fit and can practise mountaineering. Thus they would not be upset by the high altitude and the dry atmosphere until they were ready to make the actual attempt on the mountain.

In spite of the fact that a doctor on the expedition has been decried as unnecessary, we had at least one very serious medical casualty this year in our porter Pasang, who after going up to Camp 6 became completely paralysed down one side; he could not walk at all, and had to be carried and lowered the whole way down the slope of the North Col. This was most unexpected in a young man, and the question was whether the paralysis had anything to do with the altitude or whether it was just fortuitous. I cannot help feeling that there was probably some connection between the two. Certain accidents which occurred on past expeditions, when reviewed in the light of Pasang's illness, might perhaps have had a similar cause. When people go to high altitudes alterations occur in the blood as a result of acclimatization. It is not at all certain that these alterations are entirely beneficial. It may be that after a certain time there is clotting in the vessels of the brain because the blood has become more viscous, and this would cause serious accidents such as this case of paralysis.

I would like to support Smythe's remarks as to the diet. I think it is most important on Everest, from the medical point of view at any rate and because we want to keep people from getting what we call intercurrent infections, that they should be well nourished. Not only should they have their vitamins, which is easily managed nowadays, but they should have an adequate diet. As it is almost impossible for members of the expedition to eat a proper diet at high altitudes above Camp 3 I think it is all the more important that they should have a very carefully worked out diet at the lower levels. When we went over to the Kharta valley this year we had to travel light because we were going over a high pass; but the idea of going there was to recuperate. And yet we seemed to spend most of our time feeling hungry on the way down there and feeling hungry when we had reached the valley of plenty. I suggest that in future a dietician should always be consulted before an expedition goes out. After all, he has spent most of his life carefully studying diets, and even though you do not accept what he says you would at any rate get expert advice.

I have been asked to say a word or two about oxygen, but Lloyd will give you more indication as to whether it was successful on the mountain or not. We had two kinds of oxygen apparatus with us. In one type the wearer breathed pure oxygen and all the external air was excluded; in the other type he breathed oxygen which was diluted with air. Both types of apparatus had been tried out at home, but I made special tests with the newer closed type, in which only oxygen is breathed. In 1937 I took it out to the Alps and climbed the Matterhorn in it, the Wellenkuppe, and one or two other mountains, to see whether one could really climb steep rocks. Mechanically the apparatus worked extremely well. The only drawback was that those mountains were not high enough to enable one to decide whether there were any beneficial effects from the use of the gas. So we took out both types of apparatus this year. When I went on the North Col the first time I tried the closed apparatus, and what Tilman has said about my reactions is more or less accurate. When wearing the apparatus I was completely free of fatigue in going uphill, but there was a feeling of suffocation of which it is hard to localize the cause, unless it lay in the

fact that the design had been altered slightly at the last moment. I do not think that one can entirely rule out of court the closed type of apparatus on that account; I think it should be given further trials. The other type of apparatus I was not able to try myself because I had to go down off the Col, but Lloyd will tell you how he climbed above Camp 6 in it, and give you his reactions.

Mr. PETER LLOYD: We have heard a lot of hard words this evening about oxygen, not only from Tilman but also from Smythe. I have a lot of sympathy with the sentimental objection to its use, and would far rather see the mountain climbed without it than with; but on the other hand I would rather see the mountain climbed with it than not at all. Climbing Everest is not, after all, like a game of cricket, for which you can make rules as to what is fair and what is not. It is a big enough proposition to demand all the forces that we can bring to bear against it.

Warren has told you of, and Tilman also mentioned, the two types of apparatus that we had with us this year. It was a distinct disadvantage in many ways having to take both types with us, but having them both there it was obviously desirable that we should try to test them under the actual conditions above the North Col. That is the only test that is of any value.

It is difficult to make adequate tests under those conditions, and I am fully conscious that the work we did was not as complete and as satisfactory as it might have been; but we did at least give both types of apparatus a fair trial, and both Warren and I were, if anything, prejudiced in favour of the closed apparatus. Warren has told you what happened when he tried the closed type above the North Col when he was first there. I had not seen him when I got out on the Col with Tilman, Smythe, and Shipton later on, but I heard what happened, and when the opportunity came of going up to Camp 5 I tried the open type first and got surprisingly satisfactory results with it more or less from the word " Go." I found no difficulty in acquiring the breathing technique that it demands, and though it did not send me uphill at the speed one might have climbed at in the Alps, it did at least improve my performance as compared with the previous day coming up to the Col. In particular, I noticed a tremendous sense of ease in climbing, in that it took away the great strain that one is apt to feel otherwise. The following day when I made the short test on the closed apparatus I obtained entirely unsatisfactory results, exactly comparable with what Warren had experienced.

The comparison of these two alternative units is a technical matter which I need not bore you with here, but I would submit that the agreed success of the open type of apparatus and its inherent simplicity, which is an enormous advantage under those conditions, and one which those who have never been there cannot appreciate, are very important arguments in favour of it.

If oxygen is to be used successfully on Everest, the design of the apparatus will have to be improved as far as possible—and there is still room for improvement, because the bulk of the weight one carries is not oxygen at all, but metal. Everything possible will have to be done in advance to develop and practise the technique. It is no good taking oxygen as a last resort in case the attempt without it fails.

In appreciation of Tilman's leadership I would like to say that if ever I go to Everest again I very much hope it will be under his leadership.

Mr. N. E. ODELL: During the course of an expedition one sometimes falls to wondering what sort of a report will be demanded on one's return home. Lying in my sleeping-bag at Camp 1 towards the end of the expedition I composed a speech befitting, as I thought, such an occasion as this. That particular one was

largely forgotten, and I found myself composing another walking in the drenching monsoon rain down the Lachen valley on the way back to Kalimpong. A good deal of the speech so composed was severely critical, for I felt that there was so much that was not as it should be in the running of these Everest expeditions. A swing-over from the large, expensive expedition to the smaller, economical one had by no means been all to the good. True the compacter, smaller party had been a success as a party, and much of our equipment had been reasonably sufficient, but in other respects the cult for lightness and mobility had been carried unnecessarily far. It should be quite evident that the Everest expeditions are, by reason of the position of the mountain and its approach, in quite a different category from those smaller summer undertakings on the southern slopes of other Himalayan peaks. An Everest expedition operates for anything up to six months, from a period of real winter in Tibet to relatively genial summer conditions. Therefore the extreme cutting down of spare clothing and other articles of equipment, as practised on this year's expedition, is not only undesirable but highly risky. I have myself travelled too far in the Arctic and elsewhere not to appreciate what the fortuitous loss of an important garment, for instance, may mean. At the same time in other respects improvisation is often a desirable necessity, but even that has its limits.

But it is mainly in respect of the provisioning that I would criticize this year's expedition. Frankly we did what we did on the mountain not because of our meagre rationing but in spite of it. And we could have done more at times than we did, and returned, some of us, in better condition, if our rationing had been ampler and more suitable. I am no believer in the necessity for truffled quails or champagne (though practically all of us regretted the refusal of a generous gift of a case of the latter), but for a sustained sojourn at really high altitudes a carefully selected and varied diet is essential; and some alcohol has its uses after a particularly exhausting day. As most people know, one's palate and appetite become very fickle at high altitudes, and it is no good thinking that badly cooked porridge, or an inferior brand of pemmican, or a single rasher of bacon for breakfast, is going to keep together the body and soul of even the most devoted Everest climber. Valuable advice in this respect can and should be expected from the medical officer. Moreover, the Shipton-Tilman doctrine of living off the country is definitely inapplicable to, and highly undesirable to try to practise in, Tibet. For one thing, local supplies of food are non-existent or hard to come by, and where purchase is possible from the peasants there is inevitable shortage and likely famine during the succeeding winter. It seems often to be forgotten that one of the great objections of the Lhasa authorities to these expeditions is their tendency to upset the internal economy of the country.

Nor am I at all satisfied that dispensing with a transport officer, as we did this year, has as much advantage as disadvantage. He can become an actual member of the climbing party if necessary, when his duties of transport to the foot of the mountain are completed, as several earlier expeditions have arranged. Certainly the rôle of interpreter and transport officer should be kept distinct, as was not done this year.

Briefly, in my opinion a future expedition to Mount Everest will be best advised to adopt a compromise between the lavishness of some earlier expeditions and the frugality of this year's enterprise. I still consider that the conduct of the expedition of 1924 was a model for all time, for if the cost of the unsatisfactory oxygen equipment of that year be deducted the total expenditure was by no means excessive.

I was more than glad of the opportunity of continuing my geological observa-

tions which were commenced in 1924 and furthered by Wager in 1933. This work was always carried out as heretofore with strict regard to the susceptibilities of the Tibetans, and most of it was purely observational. As to the stratigraphy of the Everest Series and its actual age, in 1924 I indicated the possibility of its being a southern outlier of Heron's Permo-Trias Series, which outcrops along the southern border of the Tibetan plateau proper. Without further question Wager adopted this suggestion, and from fossil evidence and relationships in northern Sikkim added the very plausible one that the Everest Limestone Series might be considered Permo-Carboniferous or Carboniferous, and not Permo-Trias, in age. If his distant correlation is valid, then by actual local field correlation I was able to determine that the age of the Everest Series is definitely not younger than Permo-Carboniferous. Moreover from those superb view-points of the Lhakpa La and the Rapiu La fresh evidence was obtained as to the actual structure of the Everest and Makalu massif. From Makalu a great thrust-plane runs beneath Lhotse and into Everest itself. In consequence of movement along this thrust-plane the Everest block has been tilted, and the rocks of the mountain given their well-known, and, from the climbers' point of view, unfortunate, northerly dip. Moreover it could be seen that the top of Makalu is composed of a portion of a great sill of light granite whose injection probably accompanied the above movement.

Amongst glaciological observations one's earlier surmises were confirmed, and the Mount Everest glaciers found to be frozen throughout their mass and to have other High Polar characteristics. The Ahlmann glacier-drill was brought into use, but owing to the extreme hardness of the ice little headway could be made with the drilling bits available. The structure of the trough of the East Rongbuk glacier was re-examined, and while my ideas of 1924, as to its being a special zone of compression and shear, were confirmed, it would appear that the blue banding of the ice, then attributed to foliation, is in reality largely due to the intersection of upturned bedding planes of coalescing tributary ice-streams. This intersection, together with the contained moraine and its heat-absorbing qualities, appear to be the main factors in the formation of the East Rongbuk trough, as well probably as in other similar features.

I regretted not being allowed to return *via* the Kharta valley, for I was particularly anxious to measure some of the remarkable river-terraces of the Chiblung Chu, as suggested by L. R. Wager after his visit in 1933, for that might have tested the idea that the Himalaya may hereabouts have been upwarped since Pleistocene times.

Some meteorological observations were made, particularly determinations of relative humidity with an Assmann psychrometer, kindly lent by the Meteorological Office of the Air Ministry. We had hoped to use a special high-speed anemometer and so obtain for the first time measures of the wind velocity across the face of Everest. But the early arrival of the monsoon, before we had actually reached the North Col, prevented this being done.

I wish here to acknowledge my gratitude for other instruments lent me by the Society for use on the expedition.

The amount of research which can with profit be pursued by members of a Mount Everest expedition should quite eliminate the danger of bed-sores, which one of our party this year claims to be the chief menace of such expeditions.

[*This contribution is expanded from the report of what was said at the Meeting.—Ed., G.J.*]

The DEPUTY PRESIDENT: I feel we should have the opinion of members of previous expeditions. I will first ask Dr. Raymond Greene to add a word or two.

Dr. RAYMOND GREENE: Most of the remarks I could have made have already

been made by previous speakers, but there are one or two points I would like to underline.

First, the question of diet. In spite of what Mr. Shipton has said, it is clear that actually there was more minor illness in the 1938 expedition than in the 1933, of which I was a member. I think part of that increase in illness may well be due to the fact that in 1933 we consulted a dietician, and although the food we took was not palatable it was an adequate, well-balanced diet containing the necessary accessory food factors and necessary proportions of the essential food factors. I am quite certain that if Everest expeditions are to remain as fit as possible in the hard conditions in which they live, it is essential that the food should be very carefully considered.

I should like to say as to oxygen that I entirely agree with Mr. Tilman that the business of getting up Everest will not be finally settled until somebody has got up without oxygen, and the sooner somebody gets up without oxygen and allows the climbers to go back to climbing for pleasure, the better. Because I have made a special study of oxygen and oxygen apparatus it has fallen to my lot to do a certain amount of work on the subject. Prior to the setting out of the expedition I was asked by the Mount Everest Committee to undertake a certain number of inquiries into the matter of oxygen apparatus. These inquiries were begun months before the expedition started but, as usual, owing to obstructions here and there, the oxygen apparatus, as finally taken, was not properly tested before it went. The reason why the closed circuit apparatus did not work was that it was not quite good enough. If one could design a perfect closed circuit apparatus there is no doubt whatever that climbers could walk up the last part of Everest as easily as they could at sea-level. I have always been in favour of the open type of apparatus, and the one taken in 1938 differed only in minor details from that which I designed for the 1933 Everest expedition. I am not at all surprised, and certainly very pleased, to hear it gave more satisfaction than the closed apparatus.

Lastly I want to support with all the force at my command what Mr. Odell has said as to the scientific aspect of Everest. I think a lot too much has been said in the past about the spiritual and mystical significance of climbing Everest and about its possible effects on British prestige. However true that may be, the fact remains that we go to Everest not for those reasons at all, but either simply because it is fun or in order to satisfy some purely personal and selfish psychological urge.

I do not think we are any longer justified in spending large sums of public money in satisfying these private urges. If it is argued against me that the last expedition did not spend public money and that there is no reason why public money should be spent, my answer is that I do not think even private expeditions are justified in losing the outstanding opportunities which they have for making valuable scientific researches. Not only is it interesting and useful to carry out researches such as those suggested by Mr. Odell, but in an age which is becoming increasingly air-minded opportunities should be taken of investigating much more carefully than has hitherto been done the physiology of high altitudes and also the meteorology of the upper atmosphere. I think that future expeditions to Mount Everest should be planned primarily on a scientific basis. I am sure that the necessary funds would be available. The expedition should go out primarily as a scientific expedition accompanied by a small climbing party which, if opportunity arises, will undoubtedly reach the top.

Supposing we go on sending out expeditions which return one after the other but get no nearer the summit than the last, and possibly not quite so far towards

the summit, people will get rather tired of Everest expeditions and ask what is the interest of these continued failures. Everybody will know, of course, that they are gallant failures in the sense that no one could have done more than Tilman and his party did to reach the top, but the fact remains that one party after another fails to reach the top. How much more satisfactory it would be if they could come back and say: We did not get to the top, but at any rate we have important scientific achievements to our credit.

I think therefore that we should start straight away to plan a scientific expedition. I do not think we need fear particular opposition from the Tibetans. The scientist the Tibetans object to is a geologist, and there has been a geologist on almost every Mount Everest expedition. A scientific committee to plan the research on Everest should, I am sure, be formed now in order that if and when permission for another expedition comes, that expedition can go out to Everest as a scientific and not as a purely sporting expedition.

Mr. H. W. TILMAN: I am in entire agreement with Dr. Raymond Greene's suggestion with regard to the sending out of scientific expeditions, except that they should not be sent to Everest. There are plenty of other high mountains which are far more accessible, and in British territory, in which scientific expeditions could do all they want in the way of investigation.

As to Dr. Warren's suggestion that only the leader should go on to the glacier and get a sore throat, three out of seven of us this year had colds, sore throats, and coughs long before the glacier was reached, simply through the journey across the country leading to it. While I am open to correction, I think such complaints are far more likely to be the result of over-feeding than under-feeding. At any rate, it is, I believe, generally recognized now in England that coughs, colds, and sore throats are the result of too much to eat.

I must confess I was surprised to hear any criticism of the food, except from Odell, who has not yet finished criticizing the food we ate on Nanda Devi in 1936 and who, in spite of his semi-starved condition, succeeded in getting to the top.

I am sure that Dr. Warren as well as Dr. Raymond Greene will be interested to hear that we consulted a dietician in 1935, and though Raymond Greene was not there Warren was, and he will bear me out that the food we then had was much more Spartan than that which we had on the 1938 Everest expedition. As you know, dieticians have little sympathy with human nature. No two people agree about food, not even husband and wife. But the whole art of travel is to adapt oneself to circumstances. The Everest expedition involves more travelling than actual climbing and, as you have already heard, the difficulty on the mountain is that one does not want to eat any food whatever. In the opinion of at least two of those on the mountain we lived like Sybarites, but I am aware that there are degrees of sybaritism, if one may use the word. Up at Camp 3 we certainly lived very well; above that the choice of food is not particularly vital because of the fact that one does not want to eat at all.

I have already told you what we had to eat, and we found at Rongbuk at least forty boxes of 1936 stores, which some of the party were pleased to see. They contained nutritious things like pickles and liver extracts. I remember as we were about to leave Gangtok the Maharajah gave us a farewell dinner, and very excellent it was. Noticing how wistfully my comrades were regarding the last course of the five-course dinner and having to make a speech in reply to the Maharajah, I suggested that they had all the appearance of men who had undergone a long fast, or were about to undergo one. And I ventured to remind them of a saying by Thoreau, the great apostle of the simple life who lived alone in the American woods and wrote a book about it, that most of the luxuries and

nearly all the so-called comforts of life are not only not indispensable but positively a hindrance to the elevation of mankind.

Dr. T. G. LONGSTAFF: In moving a vote of thanks to the lecturer this evening I should like, first, to say how much I sympathize with Mr. Tilman's views. The large expedition whose objective has been mountaineering has never had any real success in the Himalaya. All the successful Himalayan ascents have been made by comparatively small parties such as Shipton, Tilman, and Smythe are celebrated for. Lord Conway's pioneer expedition was also a small one.

The idea of sending a scientific expedition to Everest is really deplorable; there could be no worse mixture of objectives. It is a district in which all forms of scientific investigation are particularly abhorrent to the Tibetans. If it is desired to send scientific expeditions to deal with terrestrial magnetism and that sort of thing, follow the lead of De Filippi, our lamented member who died a few weeks ago, or Dainelli, or Stoliczka, or any of the eminent scientists who have worked in the Himalaya, and choose a region suitable for the particular work required. Another point to remember is that on Everest expeditions there have always been scientific members. The reason that little really effective work is done by scientists on these expeditions is either due to failure of the individual scientist or to the accuracy of my statement that an Everest expedition cannot properly combine climbing and science.

With regard to oxygen I should like to see it more frankly admitted that little advance has been made on Professor Finch's achievement with Geoffrey Bruce in 1922. He used a similar apparatus to that employed—on his recommendation—this year. If since that date collaboration with Messrs. Siebe Gorman, the great oxygen experts, had been continuous, instead of invariably spasmodic and at the last moment, a type of apparatus suitable for mountaineers might by now have been evolved. Dr. Warren deserves great credit for breaking down custom and trying out apparatus in the Alps last summer.

So, in moving a vote of thanks to Mr. Tilman, I say that I think he has proved that a small party has as good a chance as any other of climbing Everest. He did not make it clear that he took two climbing parties of two men to 27,000 feet in the monsoon, in powder snow, and got everybody away without frostbite. A very fine performance indeed, really as fine a performance as that of Houston's party on K^2 this year, though that was at a lower altitude.

I beg to offer our thanks to Mr. Tilman for the account which he has given of the 1938 Everest expedition.

The DEPUTY PRESIDENT: We have had an extremely interesting evening, and it only remains for me to ask you to accord the lecturer and those who have discussed his paper a most hearty vote of thanks.