



*Telephoto A. M. Kellas*

**MT. EVEREST AND THE RANGE TO THE NORTH**  
FROM A PEAK (17,400 FEET) TWO MILES N.W. OF THE KANG LA

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A SHORT SUMMARY OF MOUNTAINEERING IN THE HIMALAYA,  
WITH A NOTE ON THE APPROACHES TO EVEREST.

By J. N. COLLIE.

AT the present time, when an expedition is being sent to Mt. Everest, it is worth while to give a brief account of what has been accomplished by mountaineers amongst the giant peaks of the Himalaya, a range that stretches from Kafiristan to the western borders of China, nearly 2000 miles in length. Outside the Himalaya and the neighbouring ranges, the highest mountain is Aconcagua, 23,080 ft. In the Himalaya and the neighbouring ranges there are at least eighty peaks above 24,000 ft., seventeen above 26,000 ft., and six above 27,000 ft. At present the record ascent is that of the Duke of the Abruzzi, 24,583 ft. on Bride Peak in the Karakoram range, N. of Kashmir. The earliest account of a high ascent in the Himalaya is that of Captain Gerard, who ascended Leo Porgyul to a height of 19,400 ft. in 1818. He says: 'I have visited thirty-seven places at different times between 14,000 and 19,400 ft.'

Sir Joseph Hooker, during the years 1848-49-50, visited Sikkim; he went to the Donkia Pass, 18,500 ft., and reached 18,590 ft. at Bhomtso. He was particularly fortunate in obtaining leave to enter Eastern Nepal, which since then has been entirely closed to Europeans. On a snow pass beyond Wallanchoon he was nearer to Mt. Everest than any European has ever been, the mountain being about fifty miles away.

From 1854-1857 the brothers Schlagintweit wandered

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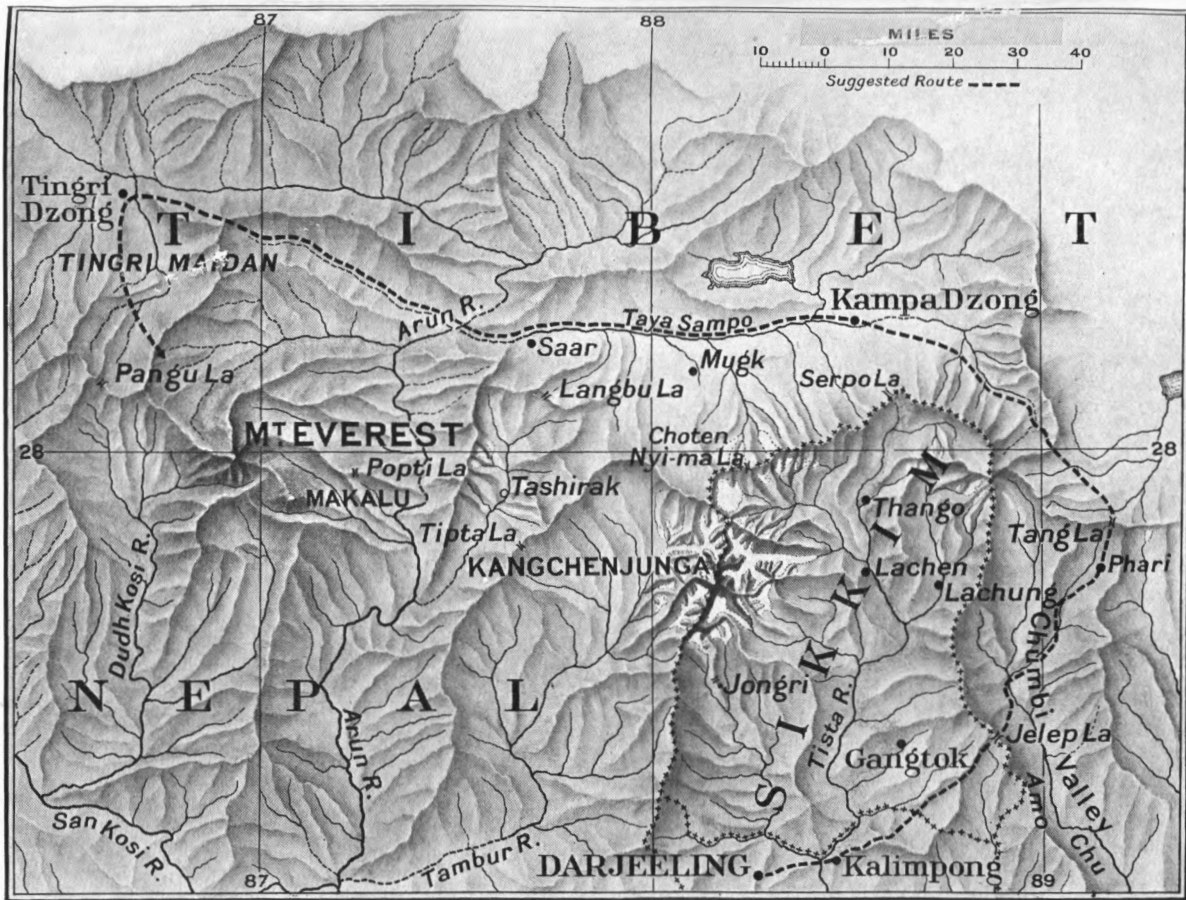
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through a large portion of the Himalaya. They were the first Himalayan climbers who had some knowledge of snow and ice, having climbed in the Alps. Their chief ascent was on Ibi Gamin, or Kamet, 25,447 ft., in August 1855. They estimated that they reached 22,259 ft. They made many glacier expeditions, and published many sketches of the high peaks in the Himalaya.

In the years 1860-1865 a most enthusiastic mountaineer appeared, W. H. Johnson, a Government surveyor. One of his masonry survey platforms is said to be visible on the top of a peak (21,500 ft.) near Leh. He penetrated through the ranges, beyond even the Karakoram range, often being over 20,000 ft. At one point he, in order to return southwards, had to cross a range at 22,300 ft. and spent the night at 22,000 ft. The highest peak he climbed was on E61, 23,890 ft., but probably there is some error made in its height. In 1866 he tried to form a Himalayan club, but he received no support. The mountaineering he did was extraordinary for those days; he was also a marvellous mapper of mountains, but the Indian Government valued his services so low that they reprimanded him for being too zealous in his mountaineering, and he left the Service.

During the next ten or fifteen years but little mountaineering was done in the Himalaya. Captain Montgomerie and H. Godwin Austen pushed glacier exploration further than had been done before. The second highest peak in the world, K2, 28,278 ft., was discovered by Godwin Austen, and he visited the old Mustagh pass. Mr. Pocock (of the G.T.S.) set up a record plane table station, 22,040 ft., on Eastern Ibi Gamin in 1875. Sir Francis Younghusband also crossed a new Mustagh pass on his journey from China to India.

In 1883, W. W. Graham, first with Joseph Imboden, and then, on Imboden's departure, with Emil Boss and Ulrich Kaufmann of Grindelwald, visited Garhwal and Sikkim. In Garhwal he climbed Mt. Monal, 22,516 ft., and on another peak, Dunagiri, reached about the same height. In Sikkim he claimed to have climbed Kabru, 24,015, but it is much more probable that he ascended Forked Peak, which is lower. It was from the summit of this peak he saw two mountains which towered far above on a second and more distant range showing over the slope of Mt. Everest, one rock and the other snow. Boss thought they were higher than Mt. Everest. Most probably he was mistaken, but that there are high



--- THE APPROACH TO EVEREST



MT. EVEREST FROM KAMPA DZONG

peaks to the N. of Mt. Everest is a fact. Dr. Kellas's photograph taken last December, now reproduced, shows one is a snow peak and one a rock peak.

The next expedition to the Himalaya was Sir Martin Conway's, with C. G. Bruce, to the Karakoram mountains. From Hunza he ascended the Hispar Glacier; he then went down the Biafo Glacier to the foot of the Baltoro Glacier. Ascending this glacier he climbed to the summit of Pioneer Peak, 22,600 ft.

In 1895 A. F. Mummery, C. G. Bruce, G. Hastings and J. N. Collie went to Nanga Parbat, 26,620 ft. Only one determined attack was made on the mountain. Mummery and two Gurkhas, after sleeping at a camp about 18,000 ft., on the next day after very severe climbing reached about 21,000 ft.

In 1899 Dr. Workman and Mrs. F. Bullock Workman visited the Biafo Glacier. In later years they made seven more expeditions, to the Chogo Lungma Glacier, where they climbed a peak 22,567 ft., to the Nun Kun peaks, and to the upper part of the Siachen Glacier that had been discovered by Dr. Longstaff and Lieut. Slingsby. The books they published of their travels contain many interesting photographs, the study of which should be of value to anyone visiting the districts described.

In 1902 Dr. Jacot Guillarmod and Dr. Wessely reached a height of about 22,000 ft. on the N.E. arête of K2 after spending a month and establishing twelve camps on the Baltoro Glacier.

In 1905 Dr. Longstaff, with Alexis and Henri Brocherel, went to Gurla Mandhata, 25,850 ft., where he showed that even under extraordinary conditions climbing can be done at heights well over 20,000 ft. They started up the western ridge of the mountain, and camped at 20,000 ft. Next day they reached about 23,000 ft. on the ridge. In attempting to reach some rocks for a bivouac, they started an avalanche and were swept down 1000 ft. Spending the night on some rocks, they started again next day up a glacier for the top of the mountain, finally digging a hole in the snow, where they spent the third night at 23,000 ft. Next morning they again started for the summit, but two of the party were soon exhausted, a fact not to be wondered at; the third, Henri, however, was not only willing to go on but very much disappointed with the other two members of the party, urging 'You will be very sorry if you turn back now; you will regret it very much when you get down into the valley.'

In 1907 there were two expeditions to the Himalaya—one to Kanchenjunga, 28,225 ft., by C. W. Rubenson and Monrad Aas, and the other to Garhwal by Dr. Longstaff, C. G. Bruce and A. L. Mumm.

Rubenson's party did not do anything on Kanchenjunga itself, but attacked Kabru, 24,015 ft. In connection with their expedition there are some facts that are of considerable interest connected with climbing in the Himalaya at high altitudes. They camped on the mountains for about twelve days at 20,000 ft. and higher. Their highest camp was 22,600 ft. Their experience of a Himalayan ice-fall is worth recording: it took them five days to cut up it from 19,500 ft. to about 21,000 ft. The cold also was intense, 29° below zero in their tents. They finally ascended the mountain, but did not arrive on the summit, 24,015 ft., until six o'clock in the evening as the sun was setting.

Dr. Longstaff's party attacked Trisul, 23,360 ft. This mountain was successfully ascended by Dr. Longstaff. He camped at 20,050 ft., but was frozen out by cold and wind, and had to return to a lower camp at 17,450 ft. Starting again from this lower camp at 5.30 A.M., he reached the summit at 4 o'clock in the afternoon. He describes the *tourmentes* of wind and snow as paralysing in their intensity.

The next Himalayan expedition was that of the Duke of the Abruzzi in 1909, during June and July, to the Baltoro Glacier. They explored all the glaciers round K2, 28,278 ft., but came to the conclusion that it was impossible to climb the peak. An easier and less lofty mountain at the head of the Baltoro Glacier was selected, Bride Peak, 25,110 ft. Camps were pushed up a difficult ice-fall to the Chogolisa saddle, 20,778 ft., between Bride Peak and the Golden Throne. They spent nine days at this and higher camps in an incessant struggle with the weather, finally reaching an altitude of 24,583 ft. Their final rate of ascent was as follows: from 23,000–23,500 ft., 360 ft. per hour; from 23,500–24,300 ft., 270 ft. per hour; and from 24,300–24,583 ft., 160 ft. per hour. The weather was mild and the snow in a very dangerous condition.

Dr. Longstaff and Lieut. M. Slingsby in 1910 went in search of a long lost pass leading over the Karakoram range from Baltistan to Yarkand. This pass, the Saltoro Pass, Vigne had tried to find in 1835. Sir Francis Younghusband probably was near the N. side of the final pass over the watershed during his journey in 1889. A pass was found at the head of

the Salto River, and crossed, but 'what gave rise to no little surprise' was, they had not crossed the watershed of the Karakoram range but had discovered the largest glacier they had ever seen. Eventually it turned out to be the upper part of the Siachen Glacier that feeds the Nubra River, and certainly one of the largest in the Himalaya. It is surrounded by some very lofty peaks, and is the next great glacier E. of the Baltoro. At its head lies the pass over the watershed to the Yarkand River.

In the meantime Dr. Kellas had visited Kanchenjunga and the mountains that lie to the north of it. In 1911 he climbed Chomomo, 22,430 ft., Pawhunri, 23,186 ft., and later Kanchenjha, 22,700 ft., on his fourth visit to Sikkim. He also visited Nanga Parbat, and has been more than once to Kamet, 25,447 ft., where last summer he climbed with Major Morshead to 23,600 ft.

In 1910, 1912, and 1913 Mr. C. F. Meade made expeditions to Kamet, and in 1913 he succeeded in taking coolies and a camp to 23,500 ft. on Kamet. He stayed there the night, and experienced a temperature of  $-20^{\circ}\text{F.}$  in his tent. Whilst Meade was on one side of Kamet, Lieut. M. Slingsby was on another; he climbed to 23,350 ft. He does not say how many degrees of cold there were, but remarks: 'That night, ugh! I have never known such cold.'

In 1914 Dr. F. De Filippi explored the eastern end of the Karakoram range. He joined the gravimetric survey of India with that of Russian Turkistan. A glacier of unexpected size and importance, the Remo Glacier, was discovered. It is the source of the Shyok River and also of the Yarkand River.

H. D. Minchinton also in 1914 made an expedition to the Himalaya in Lahoul with some Gurkhas. They climbed several peaks of 19,000 to 20,000 ft.

Dr. Neve of Srinagar has also done much climbing and exploration in Kashmir and the neighbouring ranges, especially in the Nun Kun group.

But of all climbers in the Himalaya none have done so much as General C. G. Bruce. From far Chitral on the W. to Sikkim, 1200 miles away to the E., General Bruce has visited all the more important centres that are open to Europeans. Gilgit, Hunza, Nanga Parbat, K2 and the Baltoro Glacier, Nun Kun, and Kaghan, Chamba, Kulu, Lahoul, Spiti, Garhwal, and Kumaon—in all these districts he has climbed, and his knowledge of the Himalaya is unique.

It will be seen from the foregoing ascents in the Himalaya

that mountaineering at heights above 20,000 ft. is attended with difficulties that at lower altitudes give far less trouble. The difficulties are twofold, the physical and the physiological. We know more about the first than the second, at least as far as avoiding them; for such physical difficulties as steep rocks, steep ice-slopes, stretches of soft or powdery snow, if they occur to any great extent at high altitudes, would be prohibitive from the point of view of time alone. These we can almost always determine beforehand, by examining photographs. Such peaks as Kanchenjunga, K2, Nanga Parbat, and Nanda Devi, present very great physical difficulties for many thousand feet below their summits. They should certainly for the present be left unattempted by the mountaineer.

But of all the high mountains in the Himalaya Mt. Everest gives most promise of being free from physical difficulties near its summit. Also it is probable that the snowfall on the northern side of Mt. Everest is considerably less than on mountains further S. The monsoon weather that affects the southern faces of the Himalaya hardly comes so far as the country N. of Mt. Everest. For Mt. Everest is sheltered behind the great massif of Kanchenjunga on the S.E., and Makalu and other mountains on the S. Also the snow-line on the N. of the Himalaya is some thousands of feet higher than on the S. side.

It is the physiological difficulties, however, that play far the largest prohibitive part in high ascents. We yet have much to learn about them. The lack of oxygen and the effect of intense cold are the two chief difficulties to be conquered. The lack of oxygen at high altitudes is of course due to the rarefied air. During respiration the body gets its oxygen through the ultimate ramifications of the lungs—the alveoli; and it is through them that the blood becomes oxygenated before it returns to the heart, ultimately to do its work of oxidation of the tissues of the body. Should there be a deficiency of oxygen, the natural processes of the body are at once interfered with. If one takes an engine, and in one hour burns in it a hundredweight of coal, we get a certain amount of energy produced. But if for one hour we cut off the supply of air so that only one-third of the coal is burnt, we naturally only get one-third of the energy.

On the summit of Mr. Everest one is supplied with only one-third of the usual amount of oxygen. The question is, Can the human engine do much work with this limited supply?

Fortunately the body can acclimatise itself to a considerable extent to changed conditions. For instance, people who ascend Pike's Peak, 14,109 ft., in the United States by railway suffer from faintness, sickness, and blueness of the lips and cheeks, breathlessness and general lassitude. Their blood is unacclimatised to the deficiency of oxygen. Yet on the Pamirs at 15,000 ft. and above, people live their lives comfortably and do hard work; they are acclimatised. The chief effort of the body to counteract the deficiency of oxygen is to increase rapidly the number of blood corpuscles. These corpuscles are the carriers of oxygen from the air to the interior of the body. Double the number of these little carriers in one drop of blood, and that drop will carry twice as much oxygen to the tissues for available energy and life.

The number of such corpuscles in a cubic millimetre of the blood of a person at sea-level is usually less than five million. The average count of a native of the Pamirs is over eight million. On the Pamirs there is only about half as much oxygen in a cubic foot of air as at sea-level. People who make rapid ascents to high altitudes in balloons and aeroplanes are unacclimatised. Tissandier in a balloon ascent fainted at 26,500 ft., and on regaining consciousness found both his companions dead. Yet on the other hand the Duke of the Abruzzi at 24,583 ft., and Rubenson and Monrad Aas at 24,015 ft., were not only capable of living but doing work as well. They were acclimatised by living for some time at the reduced pressure. Another factor that favours the trained mountaineer is that a trained man needs much less oxygen during work than an untrained man. He is an engine working with the maximum economy.

The effects of intense cold on the human system is to lower the vitality, and there is no doubt that the cold at altitudes above 20,000 ft., with a wind, becomes almost paralysing. Longstaff, Meade, Rubenson, all suffered from it. Yet Henri Brocherel after three nights out, the third spent in a hole in the snow at 23,000 ft., was able and anxious to continue climbing. There is little doubt that with acclimatised climbers in first-rate training a greater height will be reached than 25,000 ft. But it only will be done under the most favourable conditions.

Probably the greatest difficulty will be getting the camps up to the high altitudes. The record at present is that of Mr. Meade's coolies, 23,600 ft. on Kamet. Given another 1700 ft., and a camp 4000 ft. from the summit of Mt. Everest

could be made. If the climbers in this camp were properly warmed and properly fed a push for the summit might be made. Dr. Longstaff 'rushed' Trisul, climbing almost 6000 ft. from his camp, and several other climbers have ascended many thousand feet in one day at very high altitudes. We more or less know that the physical difficulties on the summit of Mt. Everest are not prohibitive, and there is every reason to hope that the physiological ones will also not be great enough to stop a really determined attempt made on the mountain under favourable conditions.

The expedition to Mt. Everest has been made possible by the energy of Sir Francis Younghusband. Early last year he approached the Government in England, and through them the Indian Government, to induce them to ask permission from the Tibetan authorities to enter Tibet. Last summer, however, the Indian Government, owing to political reasons, intimated that for the present at any rate it was unadvisable to move further in the matter. Lt.-Col. Howard-Bury, however, went out to India and was successful in overcoming all difficulties. Just before the New Year a telegram was received saying the Dalai Lama had consented to an expedition entering Tibet to approach Mt. Everest.

The mountain can therefore be arrived at from its northern side, which is in Tibet. The southern slopes of Mt. Everest are in Nepal, a country entirely shut to Europeans.

The route followed by the expedition will be from Darjiling to Phari in the Chumbi valley, from there over a pass in the Himalaya into Tibet, thence to Kampa Dzong. This route has a much better road than the shorter route up the Teesta Valley. From Kampa Dzong to Tingri Dzong, that lies to the N.W. of Mt. Everest, there should be no difficulties. It ought to take not more than seven days. Tingri, and in fact most of the route from Kampa Dzong, lies very high, over 13,000 ft. The means of transport in Tibet is with ponies and yaks. At high altitudes yaks will be the chief means of transport; they are able to live on the very scanty herbage which grows between the stones, are very surefooted, and can be used over the roughest country up to 20,000 ft.

From Tingri the exploration of the valleys approaching Mt. Everest will be made. The chief object of the expedition next summer will be to make a thorough reconnaissance of the mountain, but should opportunity offer an attempt will

be made to climb as high up Mt. Everest as possible. The difficulties of thoroughly exploring and finding an easy route to the foot of such a giant as Mt. Everest will be great, for there must be several valleys coming down from the mountain in which probably will be long glaciers. It will take much time getting up to the head of these glaciers, and still longer to get from one valley into the next, as the ridges separating the valleys will almost certainly be far too high to admit of any camp being taken across them. Also probably the heads of the glaciers on the N. side of Mt. Everest will be at least 20,000 ft. This will be an advantage from the point of view of climbing Mt. Everest. If there are no steep glaciers and ice-falls between 20,000 ft. and 24,000 ft., the access to the upper snow-fields on the mountain will be not too difficult for the coolies. One must not forget Rubenson's experience on Kabru, when he took five days to cut up less than 2000 ft. of glacier. However, it is to be hoped that on the northern slopes of Mt. Everest the glaciers will be easier to climb. There is no doubt that the northern slopes of the Himalaya, on Pawhunri and Chomiomo, for instance, are far easier than the southern slopes, and the snow-line also is much higher.

General Bruce's paper on Mt. Everest in the *Geog. Journal*, January 1921, and Lt.-Col. Howard-Bury's 'Some Observations on the Approaches to Mount Everest,' in the *Geog. Journal*, February 1921, contain much valuable information.

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THE RANGES NORTH OF MT. EVEREST AS SEEN FROM NEAR  
THE KANG LA.

BY J. N. COLLIE.

ON February 5 I received a letter from Dr. Kellas, who is at Darjiling, in which he sent a tele-photograph (frontispiece), of much interest at the present time. Both Makalu and Everest are shown, but what is of exceptional importance is that the ranges to the N. of Everest have been photographed for the first time. It is taken from a peak 17,400 ft. N.W. of the Kang La.

After leaving the Kamet district he went to Darjiling, in Sikkim. At the end of November he started along the water-