

WITH THE SHAKSGAM SURVEY PARTY—1926.¹

BY THE LATE MAJOR H. D. MINCHINTON, M.C.

IN 1926 it was my good fortune to be attached to a party despatched to the E. Karakoram by the Survey of India. In that it was a survey expedition, climbing was a minor consideration, being only permitted by the survey officer in charge of the party when the objects of survey work made it necessary. This necessity lay in finding practicable ways over glaciers and snow passes for the party to further its explorations, and in ascents of minor summits in the search for routes.

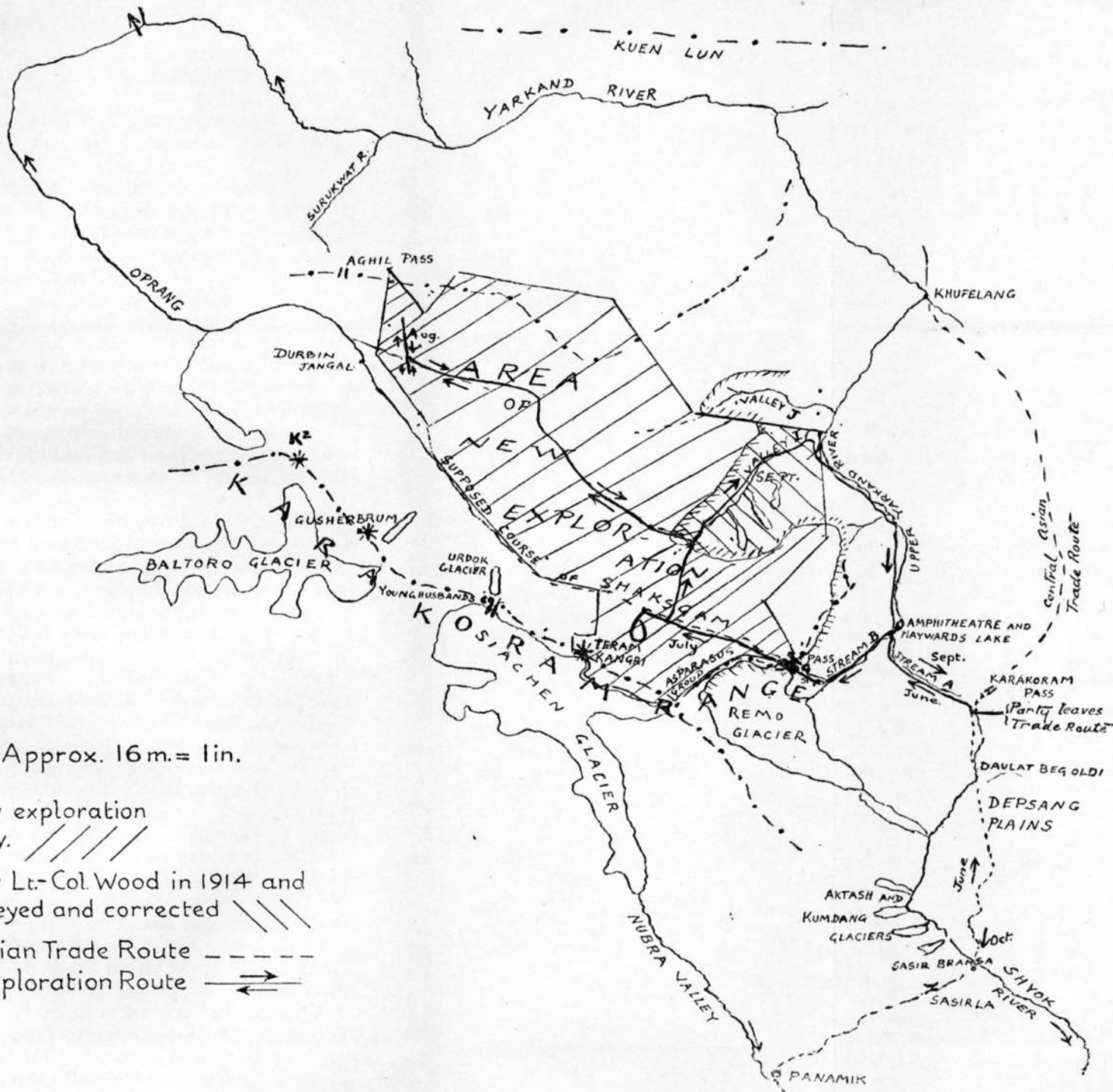
The region which the party explored is, however, of great interest, and the resulting map fills in some 1200 square miles of hitherto unexplored country. The region lies N. of the main chain of the Karakoram range, from K² in the W. to the Remo glacier in the E., with a line drawn somewhat S. of the Aghil pass due E. to the Yarkand river as the N. boundary, a line slightly W. from that pass to K² as the W. boundary, and the line of the Yarkand river as the E. boundary. A large portion of this area was surveyed, some more was sketched—*i.e.* roughly surveyed—and the small portion already surveyed in Valley 'I.' by Col. Wood, Survey of India, re-surveyed on a larger scale and certain unavoidable inaccuracies corrected.

There remain, however, certain portions which the party unfortunately failed to reach, the final exploration of which should prove highly interesting.

The exploration party was in charge of Major Kenneth Mason, M.C., R.E., Survey of India, and it is noteworthy that he has now been awarded the 'Founder's Medal' by the R.G.S. for this expedition.

The other survey officer was Khan Sahib Afraz Gul Khan, of whom it is impossible to speak too highly and without whom the results would have been decidedly less. His name is, of course, familiar to members. In 1925 he was attached to the Vissers' expedition in Hunza, and in both expeditions brought back fine plane table maps of the districts explored. His work with the transport and in camp proved not the least valuable of his varied activities.

¹ Major Minchinton suggested that this paper should be considerably curtailed. Under the circumstances, we prefer to publish it *in toto* as a slight memorial in this JOURNAL of a gallant soldier, mountaineer and explorer.—EDITOR.



Scale Approx. 16m. = 1in.

Area of new exploration and Survey.

Surveyed by Lt.-Col. Wood in 1914 and now resurveyed and corrected

Central Asian Trade Route

Mason's exploration Route

Attached to the expedition were Major R. C. Clifford, D.S.O., M.C., I.M.S., who, besides looking after the health of the expedition, helped with transport arrangements and specialised in botany and geology; Captain F. O. Cave, M.C., the Rifle Brigade, whose side lines were meteorology, ornithology, and the not unimportant matter of the feeding of the British officers' *personnel*.

My own work was such alpine work as was required, the feeding and clothing of the Indian and Ladaki *personnel*, with entomology as a side line, and also the military report on this new region. A Survey Havildar and three Gurkhas of my battalion completed the party.

In 1889 Sir Francis Younghusband, after crossing the Aghil Pass from the N., had looked up the Shaksgam valley and reported its head as full of glaciers.

In 1914 Col. Wood, then with Cav. F. de Filippi's expedition, looked down a valley, which he called 'H,' from his Pass 'G,' and which he believed to be the true source of the Shaksgam river. He reported that no glaciers were visible. From these two reports naturally arose considerable doubt as to whether these two valleys could be one and the same, and it was surmised that Col. Wood's Valley 'H' might possibly break N. through the Aghil range to the Yarkand river.

The main object of the expedition was to clear up this moot point, and it was originally intended to follow Valley 'H' right down and link up with Sir F. Younghusband's exploration. Certain difficulties, which were unexpected but which were really not insuperable, prevented the execution of this plan. After definitely fixing the source of the Shaksgam river, surveying the upper Shaksgam valley and confluents, and photographing the Middle Shaksgam with the new 'Wild' photo-theodolite, the Aghil range was crossed, and a large portion of this hitherto unknown range—or series of ranges—was successfully explored and surveyed. Attempts were made to get back to the Shaksgam lower down, but these all proved abortive—the rivers were now all in spate and the gorges proved inaccessible.

The party assembled in Kashmir on April 18, where three weeks were profitably spent in checking the stores and equipment from home, supplementing supplies by local purchase, and attending to the many necessary details, on the careful forethought of which the success of such an expedition must largely depend. Great credit is due to Mason for the thoroughness of the preparations. The R.G.S. was naturally very much

interested in the expedition and had generously supplied Whympers tents and sleeping bags, besides the 'Wild' photo-theodolite.

Unfortunately the spring weather was atrocious in the Himalayas in 1926, but thanks to weather reports telegraphed to Mason from Simla, we were able to slip over the Zoji La during a break by lantern light on the night of May 15, and reached Leh without incident on May 27.

Here we purchased 21 ponies which were to remain with us throughout—unfortunately 10 died before our return, mostly owing to lack of grass—and engaged 24 permanent Ladaki porters, who proved in every way splendid fellows. Here also we purchased the bulk of the food supplies for the porters, and also blankets and sheepskins for them and our other followers to supplement jerseys, gloves, etc., brought from India.

We were to follow the Central Asia trade route—the highest and most difficult in the world—as far as the Karakoram pass, and then strike off to the N.W.

Owing to the late snowfall no caravans had yet come through, and traders were waiting for our party to open the passes this year. The first pass, the Khardong La, 17,500 ft., caused us some delay. Clifford and I attempted to get the bulk of our transport—yaks—over the pass on June 7, but failed miserably. The yaks could only get to about 16,000 ft., so we made a dump of the loads and returned to Leh, after I had gone to the top of the pass to look at the state of the far side.

On June 9 I went into residence at the foot of the pass and on the 10th Mason and I went to the top with some laden porters and unladen yaks to break the trail. Next day Cave and I went to the top, taking more porters and yaks. On the 12th, Mason, Clifford and the remainder of the party came up to the camp and a very large army of yaks.

We had a great day on the 13th, and managed to get nearly everything over the pass and down to a camp on the far side, but it was a very strenuous day for us all. I shall not forget the spectacle of a large yak, which, becoming alarmed just before the summit of the pass, turned and ran down the steep slope, with the result that it turned a complete somersault, and landed right way up again on its legs. Unfortunately we lost three yaks killed by falls on the northern slopes. Only half of our 21 ponies could be got as far as the top on the 13th, and that with great difficulty owing to the soft deep snow, into which they sank and out of which we had to lift and drag them for hours. They had to spend the night on the pass; the second

half had to be sent back from the worst patch and came over the following day.

Five days of easy going took us to Panamik, in the Nubra valley, the last village on the trade route. We halted two days here to collect the pony transport which was to take us to our base and leave us there: here also we laid in a stock of 'grim' (grain) for our ponies.

We now took on some 150 ponies—and a few yaks to aid in trail-breaking over the Saser La, a few days ahead. The ponies on this trade route lead a short and rather terrible existence, being worked for a few years and then generally perishing by the wayside. The whole trade route is well marked by hundreds of skeletons which bear pathetic witness to the lack of grass and arduous nature of this high-level route.

June 21 saw us really off with all traces of civilization left behind for many months. Two marches took us to Sangposhi, where we halted for the night in a sandstorm. Next day Mason and I started at 9 A.M. with unladen porters to see what the Saser La conditions were, and to break and cut passages through drifts and across slopes, where the winter snow still lay thick. During the afternoon I reached a point near the top of the pass, whence the remainder appeared simple. We met an unfortunate trader, coming from the Yarkand side, who had misjudged the date by which he had hoped we should have opened the pass. He had had to abandon his caravan on the far side and was now trying to descend on our side with a few ponies and men, who, like himself, were snowblind and all in a bad way. We were able to render timely aid and received many blessings.

Mason and I camped at the foot of the pass, and the former sent back orders for the expedition to get under way at 2 A.M. on the 24th, so that they could reach the foot at 5 A.M., which they did. I started shortly before their arrival and spent a strenuous two hours cutting a passage in ice from the last rocks to the flatter and snow-covered glacier surface—this being a glacier pass. We had some trouble with our temporary transport—the only time during the expedition—and had a good deal of manhandling of loads and snow-bogged ponies, but eventually everything reached Saser Brangsa on the far side by 9 P.M. Unfortunately we lost 2 or 3 ponies crossing the pass.

There had been some talk of part of the party taking the northern route with our porters from Saser Brangsa to Dualat Beg Öldi—the route via the Aktash and Komdong glaciers

(crossed by Dr. Longstaff and Oliver in 1909) which can only be used for caravans on the rare occasions when none of the glaciers, which advance and retreat rapidly, block the upper Shyok.

It was, however, decided to continue together on the out journey, leaving the alternative route to be visited by at least some of us during the return journey. Major Oliver, in Kashmir, was particularly keen for us to revisit this route. We crossed the Shyok river next morning, and winding up gorges for three days, camped on June 27 in the middle of the Depsang plain, at the stone where De Filippi had made his base camp in 1914. We were treated to a mild snowstorm during the ensuing night.

On the 28th we crossed the Chipchak river, passed Dualat Beg Öldi and camped a few miles short of the Karakoram pass. From Panamik to the Depsang we had passed through Alpine country—towering peaks and many glaciers—but now the country became more Tibetan—high rolling hills, some of them snow-capped.

The 29th saw an important stage of the journey reached. We left the Karakoram pass to the E., crossed an almost imperceptible col, about 17,800 ft., and struck down Wood's Valley 'A,' and at 4 p.m. reached the Yarkand river at what we thought must be Wood's 'Amphitheatre,' where we camped and got a little very scant grazing for the transport.

We rested here next day, discovering the real Amphitheatre together with Hayward's lake (which that early explorer had thought to be the source of the Yarkand river) a few miles down the river. We also shot a few Tibetan antelope and everyone had a feed of fresh meat. The wind here was bitterly cold.

On July 1 we started up Valley 'B,' passed close to the snout of a branch of the Remo glacier which gives birth to the Yarkand river, and struck up Valley 'F' in a blinding snowstorm, which was luckily of short duration. We made camp within easy distance of Pass 'G' which was to give us access to the unknown land and which lay invitingly at the head of easy slopes at the top of the valley.

I see a remark in my diary to the effect that 'the wind has caught our faces badly again.' It was pretty chilly about this period, and our beards had not yet become such useful and impervious doormats as they subsequently became.

Early next morning, July 2, we stood on Pass 'G' and looked down into 'the valley'—'the great unknown,' the goal

at which we had arrived, and into which our thoughts had been projected for many months—in Mason's case, for years.

At the summit—17,930 ft.—we spent 4 hrs. starting the survey work from the previously fixed points behind us. Mason set up the photo-theodolite and the Khan Sahib commenced on his plane table the map, the gradual growth of which we were to watch with so much interest through the succeeding $3\frac{1}{2}$ months.

As Wood had stated, we 'looked down a broad valley' into which no glaciers flowed. But what we also observed was that, after some 10 miles, the valley narrowed and became a gorge, and that at some 20 miles or more the valley appeared to hit at right angles against a line of snow peaks, and it was absolutely impossible to make out whether the valley then broke W. or E. If the former, it was probably the Shaksgam; if the latter, it must break through to the Yarkand, and we must look for the Shaksgam elsewhere.

Mason hoped that the line of snow peaks would prove some hitherto uncharted giants, but the result of calculations gave them a mere 23,000 ft. and less—so henceforward they were called the 'Tiddlers'—in point of fact they lay on the outer Aghil range—the Red wall. A snow pass through them was visible—our subsequent 'Marpo La.'

We camped a few miles down Valley 'H' at a spot where a little grass gave welcome feeding to the ponies, of which the conditions were taking sad toll. That evening we put 'The Entry of the Gladiators' on the little gramophone which I had brought—a fitting refrain which I had kept for our first night in 'the valley.'

On July 3 we got down, through the gorge we had seen, to 16,200 ft., and made our base camp. The gorge was, during its narrowest stretch of about a mile, barely wide enough for pack animals, and was probably quite impassable later on in the year.

The stream we were following, which we soon found definitely to be the Shaksgam, rises from the glacier which forms one flank of Pass 'G'—a branch of the Remo. The Yarkand and Shaksgam rivers therefore both rise from branches of the Remo, and within a few miles of each other, though flowing N. and N.W. respectively and not joining for over 100 miles. Though the Yarkand is regarded as the main stream the Shaksgam actually brings to their junction a far larger flow of water, tapping as it does the huge glaciers on the northern slopes of the Karakoram range—Alpine country—whereas the



Phot. H. D. Minchinton.

THE MARPO-LA, 18,500ft.



GROUP IN YARKAND VALLEY
With 'Expedition' Gurkhas.



FROM 'SHORT-CUT' COL, 19,500ft.

Left: Aghil Ridge, 23,000ft.

Right: K² and 'Staircase' Peak.



Phots. H. D. Minchinton.

VIEW W. FROM ABOVE COL.

N. face of 'Red Wall'; K² and Gasherbrum.

Yarkand runs through far more barren, sunless and Tibetanlike lands, tapping but small glaciers. The amount of water in some small streams, during the flood season, must be seen to be believed. These streams, and the gorges through which they run periodically, form the chief bar to progress in this region.

We had got an idea that we should descend into a land, if not of milk and honey, at least of good grass and some sort of shrubs and trees, perhaps, for fuel, with plenty of game for the pot. But we were badly mistaken. Grass was, except in one valley into which we later moved our base, almost entirely absent; our fuel consisted always of burtzi root, and even that apparently ubiquitous plant sometimes failed us, and the game was very rare owing to the absence of grass. We were soon to find out the error of entering a land of which nothing was known, relying partly on pony transport instead of wholly on porters. When discussing matters with Mason in 1925, I had asked what would happen should conditions prove unsuitable for ponies. Mason, however, relied on Wood's dictum—he being the only explorer who looked into Valley 'H'—that the country appeared suitable for ponies. One might naturally suppose that, if the upper reaches of a valley are ice-free and suitable for pack transport, the lower reaches will present even less difficulties.

But that again proves the impossibility of trying to forecast anything in this country, where streams perform 'S' turns and one never knows which way they will run next—any way except uphill and sometimes apparently that!—and where an open valley at 18,000 ft. may become an ice field at 16,000 ft. Such was our experience.

On July 4 we paid off our temporary transport, which started at once to Panamik, leaving us with our 18 ponies (3 having died out of our 21) and 24 porters—a good many of whom were required for the carriage of survey instruments.

The base camp was situated within a mile of where the valley hit the afore-mentioned line of peaks (the 'Tiddlers') and swung westwards and then N.W. Another valley from the E. joined valley 'H' shortly before camp. Clifford, who had ridden some miles down the valley, returned in the evening with the report that, five miles down stream, the valley appeared blocked by a large glacier, descending from the S., behind which a lake had formed. We were not amused, and began to unpack Alpine equipment and the collapsible boat—an old and leaky structure which the Joint Commissioner for Ladakh had lent us

On the 5th we all rode down the valley and reached the obstruction. As we rounded the last corner before the glacier we were met by a truly wonderful view. A mile of broad, stony valley led to a lake, about 2 miles in length and half a mile broad. At the far end of this was a wall of ice, some 200 ft. high—the flank of an immense glacier, the surface of which was a mass of towering séracs. In the distance—away down the Shaksgam—rose the massif peaks of the Gasherbrums.

The lake was partially frozen over still, giving it a white appearance, which earned for it the name of Kyagar Thso, 'the grey-white lake,' from our Ladakis. Such names as we gave tentatively throughout the exploration were those bestowed by the Ladakis according to some natural feature which struck their imagination. Mason hopes that these names will be officially adopted by the Survey of India. The glacier was named the Kyagar glacier.

The formation of the lake is a matter of some interest. It is evident that it has a small outflow at its W. end, forcing its way under the glacier where the latter abuts against the N. wall of the valley—the Outer Aghil wall—under the 'Tiddlers.' But during the flood season a vast quantity of water comes into the lake from the glaciers of the Upper Shaksgam. The lake rises and spreads backwards up the valley. In the winter it freezes, and with the spring thaw the surface ice remains in huge blocks perched up on the shale slopes. Some of these blocks were many feet in thickness; both sides of the lake and the shale slopes for some way back were covered with blocks. The height to which the lake rises each year is clearly shown in the shale slopes by ridges made by the ice, the slopes being covered by these ridges. It is evident that in some years the lake rises nearly to the height of the glacier and extends backwards for some 6 miles from the glacier. As water does not begin to flow into the lake until about June, the outflow has time to take off a large quantity of water before it commences to fill up again.

Leaving our ponies at the lake, we scrambled along the N. shore amidst the ice blocks until we reached the glacier. Actually to get up into this was none too simple. A huge sérac had fallen from the side of the glacier at the corner of the lake and formed a somewhat unstable bridge. However, I considered it my duty to see at once whether it would be possible to get porters across this part of the glacier, so crossed the bridge and scrambled up between séracs on to the surface of the ice. Never have I seen such a sight. From the surface

of the glacier rose tier after tier of immense séracs, one interminable chaos of huge towers, through which it would never be possible to construct a satisfactory line of communication for porters. So that was that.

The following day Mason commenced the survey of the side valleys leading into the Shaksgam, the Khan Sahib making a plane table station at about 18,000 ft. in the neighbourhood of the base camp, from which station most of the country could be seen.

Cave and I moved a light camp down to the lake in the morning and ascended a small hill, about 17,500 ft. to the S. of the lake, to get a view of the upper reaches of the Kyagar glacier. Shortly before reaching this hill, as we rounded a shoulder, we saw what I suppose was the finest spectacle which can be imagined. There burst upon our view the huge majesty of K², rising cloudless and peerless into the sky—40 miles down the valley. But this was not all, for in succession, closer to us, rose Broad Peak, all the Gasherbrums, and lastly the particularly beautiful and comparatively close summits of Teram Kangri. Southwards lay the Asparasas group, and from this group, first in many large ice streams and then in one immense frozen river, descended the Kyagar glacier.

We could not see the actual snout of the glacier, but far below us there emerged again the middle reaches of the Shaksgam valley, into which some ten miles further down another huge glacier could be seen protruding, and then yet another, below the Gasherbrums, probably the Urdok of Sir F. Younghusband.

The mystery of the valley now lay explained. Sir Francis, from the stream, looking up the valley, saw only glaciers. Possibly he saw the Kyagar, possibly only the next one down the valley from us. In any case it would have appeared to him that these glaciers formed the head of the valley and the source of the Shaksgam. He was not to know that the valley extended many miles E. of the furthest glacier he could see—an unnatural phenomenon. Similarly Wood, looking down from 'Pass G,' could only see 'an open valley.' He was not to know that it took a right-angle turn, and that round this turn these huge glaciers descend into and block the valley. We now had the ocular proof that the apparently different valleys of those two explorers were in reality one and the same. We took photographs, built cairns for survey points, and examined the glacier below us. This latter appeared to be some 2 miles broad, and for some 5 miles up from its snout was of the most chaotic nature imaginable. It was not crevassed, as ordinary

glaciers, but the weight and vast quantity of ice descending from its main three parent glaciers, when squeezed into the 2-mile trough, force the whole surface up into a chaos of huge towers. We did not notice their size until the following day. To the N. lay the long line of the Outer Aghil range, forming the N. wall of the Shaksgam valley—the 'Red wall.'

On July 7, a day Cave and I shall never forget, we left camp at 6 A.M. with some porters and Rifleman Telakbahadur. Passing our furthest point of the previous day (Shaly Col), and leaving the porters here to build more cairns and wait for our return with food for us, we ran down 1500 ft. of shale to the glacier, and put on crampons. This was Cave's first introduction to serious ice work. From our reconnaissance overnight, we had worked out a possible line across the glacier, but not until we were embarked on it did we realize the immensity of the towers of ice. Some were huge stable blocks, others pinnacles rising to the thinness of a needle point 200 ft. high. Direction was hard to keep, as one could see no landmarks against this labyrinth. The hoped-for passage was impracticable—we would work a few hundred feet through the labyrinth and then be forced southwards up the glacier for some distance. At length we were actually forced back towards the home shore, but then struck an open run of ice—a passage about 80 yds. broad, covered in débris, lying between the central portion of the glacier and another confluent of which we now caught sight, coming in from the S.E. Here—4 miles up from where we began—we stopped at 1.30 for a meal. The surroundings were wonderful, huge towering pinnacles of ice from which depended enormous icicles, blue caverns as large as Pullman cars, and bottomless pits into which thundered glacier streams—otherwise silence, now and then broken by the reverberation of some falling sérac.

Leaving Cave and Telakbahadur to follow, I pushed on up this hummocky passage for another mile. Here at least was a porter route. At 3 P.M., if we were to get back by dark, I decided it was time to turn. A final view from a neighbouring sérac gave me the impression that another half mile would end difficulties, that this passage would lead me to more open ice, whence a central promontory of rock—part of the Asparasas group—might be gained and from which the remainder of the glacier might be crossed above this chaos. Unfortunately we were never permitted to confirm this idea, though both Cave and I wished to do so. Retracing our steps we followed this passage down the glacier and were delighted

to find that it led us to the edge of the ice—5 P.M. We were now getting tired, so I sent Telakbahadur ahead, to go down the moraine and reach Shaly Col as quickly as possible, so as to prevent the porters returning to camp with our food.

Unfortunately there was neither a valley between moraine and hillside nor a proper moraine, and in one place we were forced out on the glacier again by a sudden perpendicular face of ice which abutted against a cliff. By 6 P.M. we were nearing the foot of the shale slope and took it diagonally. We could only manage a few feet of the slipping surface at a time and eventually arrived, nearly exhausted, at Shaly Col as the last rays of the sun were leaving the top of K². It was 8 P.M. and no sign of porters. We met these, however, a bit down on the camp side—had tea, and reached camp at 10.20 P.M.—16½ hrs. with hardly a rest.

Next day, a note from Mason arrived, in which he said that, in view of the difficulties of this glacier route, he thought an easier way might be found by crossing the Aghil range into Wood's 'I' valley, and thence working westwards to strike back in the middle Shaksgam below these glaciers. So Cave and I returned to the base. Meanwhile Clifford had found a way up on to a glacier—the Lungpa Marpo—which lay hidden in a side valley running into our valley from the N. not far below the base camp, and at the top of which there should be a pass into 'I' valley. On July 10 he and I started at 6 A.M. to reconnoitre this glacier. Mason and Cave moved down to the lake to complete the survey work there and to survey by photo-theodolite as much of the middle Shaksgam as could be seen.

Crossing the stream a mile below camp, we soon reached the side valley and the snout of the glacier in it. A passage between a large sérac and the rock wall, discovered by Clifford previously, led us to the right lateral moraine, and by 10.20 we were on nearly level snow-covered glacier at 18,500 ft. and stopped for a meal. To the N. lay an easy pass level with us, and to this Clifford, with Kunchuk (our head porter and shikari), now proceeded. To the W. lay a snow col at the head of the Lungpa Marpo river, which I hoped might lead over behind the 'Red Wall' to another valley, which might break S. again through the wall at a gap we had noted from the Kyagar glacier.

With Rifleman Tekhbadur and a porter I set off for this col, hoping to rejoin Clifford at the breakfast place by 4 P.M. Finding hidden, but small, crevasses, we roped and mounted

by slope and plateaux to the col, which we reached at 3.40 P.M. This was probably the *highest point* reached during the expedition, as the Khan Sahib later computed it to be 20,300 ft. We had left our coats at the breakfast place as the day had been hot, but here on the col a bitter wind swept over us, chilling us to the bone, but by crawling under a boulder photographs could be taken (though into the sun) and chocolate and tea partaken of. The view was most impressive. From our col dropped a fairly steep snow slope to a glacier below. Across this glacier rose the northern slopes of the Outer Aghil wall—peaks of 22,000 ft. here—and between the gaps in this ridge could be seen the long line of giants—K², Broad Peak, and the Gasherbrums. This was a unique view, and I much regret that neither Mason nor the Khan Sahib was able to visit the col for topographical purposes. We did speak of the Khan Sahib and myself coming up later, but, as so often with us, it was a case of 'man proposes,' etc., though I do not think that the Deity can be held responsible for abandonment of some of the plans made!

The snow slopes falling to the glacier below would not have been pleasant for the porters, nor was it possible to see what happened farther down, as the glacier wound out of sight some 2 miles westwards. But I should have liked to have been given the opportunity to explore it to ascertain whether we could break back through the outer wall. The foot of the glacier must have been in the neighbourhood of the gap seen from the S. side.

At 3.55 P.M. we commenced to return from the col, and there followed for me the eight worst hours of the expedition. The cause of my undoing was traced by Clifford to a bad tin of potted meat, of which he, Cave, and I had partaken overnight. Clifford felt ill in the morning, and being a doctor, was able to apply immediate remedies. Cave spent the next day in bed, and the poison chose this unfortunate hour to start reacting upon my digestion. I soon realized from unmistakable and violent symptoms that something was 'wrong with the works.' Added to this, the snow on the glacier had softened, and the 4 miles to the breakfast place was one series of sinking in, knee and waist deep, often with a leg through into a small crevasse, and having to be dragged out on the rope. At length we passed the breakfast place, where there was no sign of Clifford, and got off the ice on to the moraine at 7.30 P.M. Here Clifford had left two men with the tiffin basket, but an effort to drink and eat merely produced vomiting and increased

weakness. So down the moraine we hurried at such a pace as darkness would permit. After many falls and rests by the wayside, we reached a little cliff above the Shaksgam stream and by pure luck struck a slope down which we slid to the water—now in several channels and rushing knee-deep. With linked arms we crossed safely and wended our weary way to camp at 10.40. I found that Clifford had only been back an hour and was pretty done up. I spent two days in bed 'getting the works right again,' but didn't mind much as the weather was none too good for the next few days, causing Mason some delay over his photo-theodolite work.

On July 15 Mason, Cave, and I moved down to the lake again, the former to complete the survey work there and I to try a hopeless-looking gorge which came down into the N. of the lake from behind the 'Tiddlers.' I went a short way up it during the afternoon and got into difficulties at once with unpleasant rocks. Next morning we all left at 4.45 A.M. for our different jobs. I took Tekhbadur and a porter with me, but we were back in camp by 7.15. The gorge was hopeless for porters, and bad enough for a roped party. We only got up a few hundred feet. When Tekhbadur remarked 'If anyone falls here, we shall all be for it,' I thought it about time to recognize defeat—this not being a climbing expedition.

After a meal and a rest, we started off again at 10 A.M. with two additional porters, bedding, etc., retraced our steps to the Lungpa Marpo glacier, halted to collect burtzi roots, and finally made a bivouac by 4 P.M. well up the moraine, at about 17,800 ft. The object of this journey was to cross the col which Clifford had visited with Kunchuk during a reconnaissance on the 10th, and if possible descend it northwards into 'I' valley (Lungmo-Chhé). The porters afterwards named the col the 'Marpo La'—'Marpo' meaning 'red'—from an unmistakable red cliff near the summit. Starting next morning with Tekhbadur and a porter at 6.15, we crossed the pass at 7.45—height about 18,500 ft. and very easy going. At 8 A.M. we reached an outcrop of moraine on the N. side and left warm clothing there. Below us we could see a jumble of séracs, but by hugging the left bank of the glacier we soon got on to a comfortable moraine, and by 9 A.M. were parallel with the summit of the glacier. It appeared as if there would be no difficulty in descending into 'I' valley, and I spotted a likely camping place some 1000 ft. below and sent the porter to reconnoitre farther down 'I.' We could see two large glaciers, mentioned by Wood, coming down into the valley farther E.,

and above there appeared a green patch which must be grass. Here was a good spot to which to shift our base.

Tekhbahadur and I, keeping to the 18,000 ft. contour, traversed the shaly hillside, heading for rocky mounds from which I hoped to see up the main (N.W.) branch of the head of 'I' and to get a view of the glacier at the head, round the snout of which Wood had promised us an easy pass similar to 'G.' By 11 A.M. we reached our objective, close to a large glacier, which had every appearance of blocking this N.W. branch completely. The bottom part was a mass of séracs, but higher up, close to our mounds, was an easy way up on to the flat glacier above the séracs. This was all we had time to find out, and being now midday, we had to hasten back. We met the porter, who reported no difficulties below, and crossed the Marpo La in good time. By 3 P.M. we were making tea below our bivouac place, and 5.15 saw us back in camp, able to report an easy passage into 'I' valley for our porter transport.

It was now decided to abandon any attempt at a direct descent of the middle Shaksgam and to transfer our base to the head of 'F' valley. This was made the more imperative by the lack of grass for our ponies, who were daily getting weaker. Clifford and Cave were to take the ponies back over Pass 'G,' feed them on the grass of the Yarkand valley as they moved down to it, and then move up 'I,' as Wood had done in 1914. Meanwhile Mason and I were to cross the Marpo La with the porters and as much kit as could be carried and start a system of transport going to fetch over all necessary stores.

During the next two days most of our base camp stores were moved to the snout of the Marpo glacier where a dump was formed. On July 20 the move began. Clifford and Cave left at 8.30 with the 18 ponies, now so weak that they could only carry grain enough to see them round into 'I,' and were useless to help shift anything in the nature of real loads round to the new base.

Mason and I moved up to 'the green lake'—a little tarn amongst mounds near the dump, after building a wall round some foodstuffs and extra equipment which it became necessary to leave at the old base until they could be fetched in September.

On the 22nd some further survey work was done and the first lot of loads sent up to the edge of the ice—above my bivouac of the 16th—under Tekhbahadur, who knew where a safe place for a camp could be found there. On the same day we moved up to the camp and got up a lot of stuff. On the

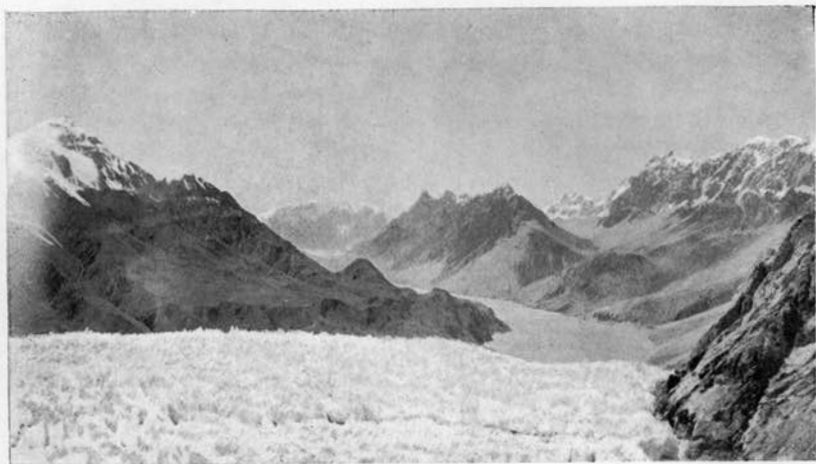


PONY IN CREVASSE at 19,000ft.



Phots. H. D. Minchinton.

AGHIL PEAKS, 23,00ft. RIDGE.



LOOKING DOWN KYAGAR GLACIER.
In background K², 'Broad' Peak and Gasherbrum.



Phots. H. D. Minchinton.

THE ACTUAL SOURCE OF THE SHAKSGAM RIVER.

23rd we crossed the Marpo La, and whilst the porters descended to the selected camp site at the head of 'I,' Mason and I and the Khan Sahib followed the same route as I had done on the 17th, and reached the first glacier at the head of the N.W. branch of 'I' at noon. We got up on to the ice and crossed some two-thirds of the glacier—flat going, snow a bit soft, and a few crevasses. From here we could see a second and parallel glacier, a mile ahead, which came in from the S.W. and joined the one we were on about a mile down from where we were. The two made below their junction a mighty sea of séracs, forcing themselves tight against the cliffs on the opposite side of the valley, and sending a snout down S.E. into 'I' and another N.W. into a valley, the trend of which lay N.W. as far as we could judge.

Coming back to dry land, we next reconnoitred the snout of the glacier, round which Wood had promised the 'easy way.' We were doomed to disappointment—there was no way for ponies past the snout, the terminal séracs of which merged into the opposite valley side. We followed the stream from the glacier down for some 2 miles and reached camp, which was pitched on an old lake bed, formed by the damming of the stream by a glacier which lay half a mile below camp, the snout of which was now well back from the valley floor.

This new base was at 17,200 ft. That day we despatched men back over the Marpo La, and the transfer of the remaining stores began—it took five weeks to complete! Mason and I made a trip some miles down the valley to see if a gorge just below camp, reported in 1914 impassable for ponies by Wood, would still prove so, and also to ascertain how far it was down to grass and burtzi. The gorge proved passable, and grass and fuel were located some 4 miles down—we spent a pleasant day taking things easily and collecting butterflies and fossils.

Then followed a reconnaissance over the Tuni glaciers, the Sa-Kang La (Pass of snow and mud) which we crossed, and looked down into the Sa Lungpa or 'Valley of Mud,' as the Ladakis named it. Neither of the glaciers presented much difficulty and we worked out a line for ponies and left Telakbahadur to cut a track up on to the first glacier. What intrigued me was the fact that this new valley appeared, some few miles down, to turn W. and cut right back towards Aghil wall—the central wall now—S.W. back towards the Shaksgam. It appeared to us as if there was a narrow gap in the 'Red Wall' but we could only hazard a guess as to whether it was our new valley cutting through, or another valley coming towards us

into this one. We made a different line back over the W. glacier, crossing amidst incipient séracs just above its junction with the E. glacier.

Two days later Clifford and Cave brought in the ponies. We had begun to get anxious, as they were two days over the anticipated time, but the necessity of giving the ponies grass when found had delayed the arrival, and even so, 3 more ponies had died *en route*. The remaining 15 were now much fitter, and we left them at grass below the gorge, together with our 6 remaining sheep. The party brought a welcome addition to the larder—2 antelope and 2 burrhel, which soon vanished amongst our 40-odd persons in camp. Mason now decided to push on over the 'Tuni glacier' and down to Sa Lungpa. He was optimistic about getting back to the Shaksgam by this route, but decided that, owing to lack of porters and the quantity of stuff still to be brought over the Marpo La, Clifford and Cave must remain at the new base in support. He hoped that we should be back in ten days, and that the base party would be able to join us earlier. Actually our 'advance party' was away five weeks from the base, which proved the most arduous time both for us and for those in support. On July 29 we sent off 12 porters during the afternoon to sleep at the edge of the southern Tuni glacier, following ourselves at 4 A.M. on the 30th with the 4 strongest ponies. By 5.45 A.M. we had the ponies up on to the flat glacier, loaded them up and crossed it in $1\frac{1}{2}$ hrs. with only a little difficulty getting off, where a passage had to be cut in the ice. The second glacier, reached in another hour, took twice as long to cross, as the sun was softening the snow, and in one patch of some 300 yds. the ponies went in up to the withers, necessitating manhandling their loads and digging them out continuously. A few small crevasses had to be probed for before we got the ponies and porters safely off the second glacier at 10.15 and halted for a meal.

Then commenced the descent down a stony and steep ravine to the Sa Lungpa valley. This small valley must surely be the most desolate spot in Asia. Some 5 miles long, flanked on both sides by steep rock and ice-clad peaks, the valley bottom itself and lower slopes seem composed of dried grey mud, and during the ten days we spent in that little valley the sole vestiges of life seen were 2 snowcock and 1 fly—the latter was found inside my tent and had probably come over from the base camp in the rolled-up tent. Nor was there a sign of vegetation—no burtzi, although we were down to 16,000 ft.

Our march down the valley brought us to what we named 'the pony camp,' being the farthest point the ponies could reach. Poor beasts—the Sa-Kang La was really too much for them, and they only just got back to the base alive—we had taken them, loaded, over two glaciers of nearly 19,000 ft., on starvation rations, and they did wonderfully well.

On arrival at the 'Pony Camp' Mason immediately set off to explore 'the gap' at the entrance of which we were now camped. Our Sa Lungpa certainly broke through the Outer Aghil wall here, and we hoped to follow it through, with the further hope that it similarly broke through the Outer wall back to the Shaksgam. Mason's exploration was short-lived, as he found that the going became impossible within $1\frac{1}{2}$ miles of camp, where the stream dashed through a gorge. What he could not see was that the gorge, at the entrance of which he stopped and which he thought ran only for a short distance, in reality extended for several miles. This melancholy fact disclosed itself to me from a hill, 1500 ft. above camp, to which Tekhbadhur and I repaired when Mason set off down stream. On this hill we built 'Tekh's cairn' which served as a good survey station later. From the cairn the view down the gorge was most impressive. The stream, after cutting through the central wall and its ramifications, appeared to strike against the back (N. slopes) of the outer wall and turn left-handed—north-westwards. Beyond the outer wall we could see the Gasherbrums towering loftily. I am of the opinion that it does not break through, but again swings N., and is the self-same river that we were to meet three weeks later, vastly increased by streams from many glaciers. The streams in this region think nothing of boxing the compass on frequent occasions, during a few miles' course.

To the N. of our hill lay another valley, which joined the Sa Lungpa about $\frac{1}{2}$ mile below us, and the view in this direction led me to believe that we should have some prospect of success in pushing up in that direction. On August 1 Tekhbadhur made further survey cairns on a col of hard grey mud above camp, while Mason worked out latitudes and other problems. The following day Telakbadhur and I discovered an interesting fact whilst following the left side of the N. valley at a high level. We crossed the grey mud col, dropped down to the gorge below, hoping to find a way up it, but could not actually get into the gorge, being stopped by a waterfall. Ascending to the col again, we kept along the 17,500 ft. contour over shale slopes to a yellow mud col over a spur, dropped 500 ft. and rose

the same to another grey mud col. On a spur near this we built a small cairn and found several fossils of small shells. It was wonderful to think that these fossils, now 17,500 ft. above sea level, had once lain on the sea-bed. From this cairn we got a good view up the remainder of this valley. We could see that the gorge ended below us and that the stream did then become a practical route; that we could get down the shale slopes ahead to the stream without difficulty and that, some 2 miles farther up, the stream divided. The N.W. branch was a violent torrent, red in colour, flowing from a glacier the snout of which was covered in red-coloured moraine. The glacier appeared to be about 5 miles long, and at its top lay a high but apparently easily reached snow col. But it was the stream coming down the N. branch which really intrigued us. Whereas the N.W. stream was turbulent and red, the N. one flowed placidly and was blue! This to my mind could only mean that the N. branch did not flow from a glacier but from some other purer source. This small stream appeared into view from round a corner, so we could see nothing more than the first 200 yds. of it, which was tantalizing. We got back to camp at 4.15 p.m. with 15 fossils and a route in our pockets.

The next day was an anxious one. For two days we had had next to no fuel—cold meats, except for tea. We used our invaluable 'Meta' to keep the camp going with hot tea, except for which the men were able to cook nothing. During the afternoon 8 porters with burtzi arrived, so we were able to arrange to push on instead of retreating. Most nights lately a little snow had fallen, but the days were mostly wonderful, and some good survey photos were taken. The Khan Sahib, of course, was out every day working from some hill-top with his plane table—he was never idle.

On August 4 he started with a minimum of porters up the N. valley to the junction of the red and blue streams now established 'Clean and Dirty Water Camp'—'Dirty-Clean' for short. Thanks to Tekhbahadur, an easier way over the second Sa-Kang La glacier had been found and 5 ponies arrived with loads of burtzi and rations for the men. We were not travelling by any means 'light,' not nearly as light as we might have done, considering the paucity of porters and that we were engaged in a 'push.' It became necessary to take two days over each move from now onwards, there being insufficient porters to carry everything on our journey.

On the 5th Mason and I started at 7.45, and reached 'Dirty-

Clean' at 1 P.M. Whilst waiting for porters to arrive I went a short way up the 'Clean' branch and saw no difficulty for the first $\frac{3}{4}$ mile at all events. The Khan Sahib was busy surveying on a hill immediately N. of the junction and made his station at about 18,500 ft.—2500 ft. above camp. Close to our tents was the first small patch of grass we had seen for days, and a few flowers, amidst which a 'Bee Hawk Moth' and a few butterflies flitted gaily—a cheering spectacle which seemed to announce the proximity of greater verdure—even possibly 'Durbin Jangal' not far distant as the crow flies—which reminds me that some choughs accompanied us from camp to camp throughout the five weeks. We christened them 'George' and 'Mary'; occasionally they brought along a friend or two as well. The Khan Sahib returned at 3 P.M. and confirmed what I had conjectured, that the 'Clean' branch is the N. branch, the 'Dirty' is the Westerly.

On the 6th Mason and I started at 5.45 A.M., he to explore the 'Clean' branch, and I to try to reach the same col at the head of the 'Dirty' branch. Taking to the shaly hill N. of camp, I passed the Khan Sahib's station at 7.15 and mounted by an easy ridge and patch of névé to a snow-capped peak—about 19,500 ft.—which I reached, with Telakbahadur, at 8.15 A.M. The view was wonderful. To the S.W. and S. lay the walls of the Aghil ranges in serried rows—glacier-covered summits and bold spires running up to 23,000 ft. Almost due S. could be seen Teram Kangri and the Asparasas group. But the most extraordinary prospect lay to the N.E. Instead of further serried rows of peaks lay a totally unexpected barren plateau of some 30 square miles extent—a replica of the Depsang (so that we later naturally called it the Aghil Depsang). Evidently once a vast ice cap, the glacier has retreated from its centre, leaving huge snouts projecting miles out into the plateau, like the bodies of gigantic dragons descending from the surrounding peaks.

There is a legend that an army of Kalmuk Tartars once invaded Ladak from Chinese Turkestan, finding a way from Khufelang through this region, and then over some pass in the vicinity of the Urdok glacier. One of our objects was to search for any trace of this ancient route, and it seemed to us that any such army must have crossed this plateau.

At the same time as I was regarding this new phenomenon from on high, Mason was crossing the snowless col at the head of his 'Clean' branch and setting foot—perhaps the first human foot—on the plateau. Far to the N. lay a vast range—

probably the Kun Lun. Our col lay still a long way off, so we could not stay long on this hill top. A long run down névé and shale took us to the edge of the glacier, from which the 'Dirty' stream emanated. We struck it about 2 miles below the col, and were soon plodding carefully up the snow-covered surface, roped, as there were several visible, and invisible, crevasses. At 11.30 we halted at an outcrop of rock for a meal, then headed for the left bank and kept up this towards the col. Before reaching the latter we struck right-handed up a farther snow slope which took us to a snow summit to the N. of the col—about 19,800 ft. The view from this summit was even finer than from the previous one, as K² now appeared through a gap in the Aghil wall, some 20 miles away, soaring upwards into the sky. Below, westwards, lay a glacier, winding out of sight, but which did not appear to have great difficulties for porters. N.W. lay a deep barren trough, at the end of which lay a broad, barren valley in which a river flowed. It was hard at this distance to determine which way the water in it ran, but it appeared to me to run northwards. The 'trough' ran up N. of our summit to a gap in the walls surrounding the Aghil Depsang, and I felt sure a way could be found from the Aghil Depsang over the gap and down in the 'trough' or narrow valley. Having reached this summit at 12.50 p.m., we commenced the return journey at 1.5 p.m. in softening snow, but were off the glacier at 2.30, and, after cutting over a rocky spur, kept down the left bank of the glacier to camp, which we reached at 4.45—a good day's work rewarded with some unsurpassed views.

The following day we moved camp a 3½ hrs. march on to the Aghil Depsang, sending back the porters in the afternoon for the remainder of our things, as we were now always forced to do. Owing to the shortage of fuel we had been unable to have hot water for a bath since leaving the base, and in a mistaken desire for cleanliness I had, two days before, bathed in a glacier stream, with the result that I was somewhat unwell for the next few days. Even the short march to the Aghil Depsang was trying, and after tea I had perforce to do a 2-mile walk after some antelope, as we were in sad need of fresh meat. I was rewarded with a bag of two stray females—the porters had to eat their share practically raw, as we again failed to find any burtzi here.

Mason ran into two coveys of sandgrouse, amidst which he did great execution, and put our minds at rest regarding the fresh food problem for some few days. The trouble was to

cook anything. We managed to dry moss, and add a little antelope dung, which made some sort of a fire. The 'Meta' was kept in reserve as long as possible. The grass on this large plateau was so scarce that it barely supported half a dozen antelope, and after taking toll the first day, the remainder became very wild and unapproachable. On the 9th the Khan Sahib took a light camp to the E. end of the plateau and surveyed a large portion of country. The plateau is evidently the real head of Wood's valley 'J.' He placed the head much farther E., having no idea of the existence of this plateau phenomenon.

On the 10th we moved up a ravine towards the gap I had seen on the 6th as leading westwards over into the trough. We made camp at 17,700 ft. at the foot of a small glacier leading to the gap. This was a bitterly cold camp, bounded on one side by a névé edge fringed with icicles and on the other by a small stream, the water of which would freeze when taken out for the morning ablutions in a tin basin—so the ablutions became somewhat sketchy.

On the 11th we reached the gap in an hour over easy glacier. The gap was at about 18,700 ft. and Mason made a station 200 ft. above it. He thought it probable that, had the Tartar army come in this direction, they must have passed over this gap. The ravine we had come up was therefore christened the Tartar Lungpa, and the gap was the Tartar La, descending from which was the deep trough or Kalmuk Lungpa, into which a steep line of descent down some slopes was evident. We spent 5 hrs. at the station and noticed for the first time the Central Asian haze—the 'Loess' haze—which began to obscure our fine view of K^2 and other peaks. We found, close to camp, several apparent traces of gold amongst the stones, and powdered the latter to carry back. The weather was rather troublesome, and from that cause and lack of supplies we were forced to remain idle in camp for some days. We ran out of tobacco and tried Ladaki coolie tobacco, which our porters had, and moss—not a very pleasant mixture!

On the 13th Tekhbadur and I visited another gap more to the N., proving it to be an alternative route to descend into the Kalmuk Lungpa. From this gap we traversed a small peak of about 19,500 ft. and descended to the Tartar La to join Mason and the Khan Sahib surveying there. Two porters were despatched down on to the Kalmuk Lungpa to look for burtzi and anything else they could find, and great was our joy next day when they returned with burtzi, twigs of bushes,

and flowers. Were we really going to descend to vegetation, and might it not possibly be to Durbin Jangal?

Our porters were now strung out all along the L. of C., fetching burtzi which had been sent to the 'Pony Camp,' and going back to the base with letters of instruction for more supplies. Clifford and Cave were having an arduous time at the base. They had been left with 12 porters to get the stores over the Marpo La, but the constant necessity to use most of them to send us up burtzi and food in response to piteous appeals much interfered with their work, and a few men were also unfit to work now and again, further curtailing their few remaining porters.

Whilst waiting to collect our full 12 men again we began sending loads over the Tartar La, and it was not till the 18th that we had sufficient men and supplies to push on. On the 19th we crossed the Tartar La, descended 3000 ft. by steep slopes to a little stream, and at 1 P.M. reached a little patch of grass in which grew flowers which our 'scouts' had brought back—rather like the Dove and the Ark. Mason was keen to get right down to the junction of this stream with the main valley which I had seen on the 6th—another 3 miles or so, so we set off again at 2 P.M. Shortly after this I spotted a herd of burrhel high up a side nullah, and set out on a long stalk as we badly needed meat. After a 2000-ft. climb I got my 'meat' and decided to cut across country to where the camp should now be pitched. After dropping another 3500 ft. and walking 2 miles along the stony valley bottom I arrived at the junction of the valleys at dusk—to find no camp! A weary tramp up stream again—cheered by a beacon lighted on a mound to guide me—brought me, at 8.15, very tired and hungry, to where camp really was. Mason had found the porters too tired to go on, and camp had been pitched within a mile of where I had left them at 1 P.M. Anyhow, 'meat' for some days lay on the hill above and was fetched in next morning, after which we moved down to 'Junction Camp.'

The next day the chief event was hot baths—our first for five weeks! We also explored a mile up stream, but the going got too bad and we had to return. The stream we had now found was really no stream, but a roaring river. In the mornings it would be 200 ft. broad, running in channels, towards evening it would fill the whole 800 ft. breadth of its bed, and we could hear huge boulders being carried down. It must have been very deep by the evenings and quite impassable at any time of the day in its present swollen condition. We



Phot. H. D. Minchinton.

FROM 19,800ft. ABOVE 'DIRTY' GLACIER.
K² and 'Staircase' Peak.



AT POINT 19,500ft. LOOKING S.



Phot. F. Cave.

GASHERBRUM 'BROAD' PEAK AND K2.



Phot. H. D. Minchinton.

LOOKING UP KYAGAR GLACIER.
Asparagus Group, 23,000ft.

had left our boat at the Upper Shaksgam, but it would not have availed us and would have been dashed to pieces. Mason was at first convinced that this was the Shaksgam again, and that we were camped at Durbin Jangal and that a few miles up stream would take us to the Gasherbrum glacier. I was always sceptical and in my diary of 22nd have given my reasons against it being the Shaksgam. My reasons were :

(a) That although there is a lot of water, there is not as much as I should expect to find in the middle Shaksgam in August, after it has received the large streams which must flow from the Urdok and other vast glaciers.

(b) If it is the Shaksgam, then the Aghil pass must lie where we could see the river turning W. some 6 miles farther down, and it would be impossible from such a position (the supposed Aghil pass) to see the snout of the Gasherbrum glacier (which Sir F. Younghusband saw from the Aghil pass), owing to the bend of our river a few miles up stream ; our height, at the junction, was still over 14,000 ft., where Sir Francis gives Durbin Jangal 12,300 ft.—too great a discrepancy for permissible error.

Unfortunately this was correct, and we had to content ourselves with the discovery of a large tributary to the Shaksgam, into which it must run some twelve miles farther W.

On this day we moved camp 6 miles down the river, nearly to the point at which it swung due W. Unfortunately, we could not see round the bend, but everything pointed to our being within a few miles of the true Durbin Jangal. After two nights here, during which the river suddenly rose an extra 5 ft. the first night and fell 10 ft. the second, we decided to return to the base in Valley 'I.' We had shot our bolt. The strain was telling appreciably on some members of the party, the porters were showing signs of exhaustion, and our L. of C. now lay through 60 miles over three passes. Neither Clifford nor Cave having had previous experience of snow-work, bad weather on the Sa-Kang La might have meant a complete cessation of supplies from the base, with disastrous results.

On the 24th we went back to Junction Camp, whence the Khan Sahib went a day's march up the river until unable to proceed by an impassable gorge, and definitely proved that it was not the true but the 'Zug (false) Shaksgam.' Although the few days here at 14,000 ft. had been comparatively hot, it snowed that night, and we saw autumn conditions commence.

On the 26th I took a light camp back to the grassy patch—'Green Camp'—to look for fresh meat, but saw no game.

Mason joined me on the 27th, and on the 28th we moved the whole camp to the top of the Tartar La. Here we camped for the night at 18,700 ft.—our highest camp—with the object of seeing sunset and sunrise on K², and a cold night was well rewarded. We were awake an hour before dawn lest we should miss one second of the wonderful spectacle. Whilst the Gasherbrums were still clothed in blackness, the summit of K² became first white, then pink, and lastly golden, looking as if it belonged to another world. From the Tartar La, I took a high level route over a little snow col of about 19,400 ft. by which I reached the Aghil Depsang an hour before the remainder of the party, and was able to obtain a last view of K²—I hope not for ever.

The next day we did a double march—to 'Dirty-Clean' in the morning, and thence to the 'Pony Camp,' which we reached after dark. We had hoped to find the water in the Sa Lungpa much less by now, but to our disgust it was higher than when we left it three weeks ago. The Khan Sahib had told us that in Hunza the year before the rivers had begun to fall by mid-August, so we had entertained ideas of making another attempt to force the gorge below the 'Pony Camp.' I think the late spring snowfall may have kept the rivers at flood level to a later date this year. As this attempt could not be made, and as it looked stormy, we hastened up the Sa Lungpa next day and camped below the W. glacier. On September 1, using Tekhbadur's route over this glacier—a great improvement on the previous route—we were able to get off the ice of the E. glacier by 2 P.M. With less surface snow the glaciers were much easier than five weeks previously.

During our absence the base camp had been moved 4 miles down Valley 'I,' where an excellent place had been formed. We reached this at 4.30 P.M.—completely surprising the other two, who did not know that we were on the way back.

We learnt, then, something of the difficulties which the supporting party had experienced in keeping us supplied. Not only were they always short of porters to get the stores over the Marpo La owing to having to keep men going and coming over the Sa-Kang La to the Pony Camp, but the large sérac at the far end of the Marpo glacier, just above the dump between which and the rock wall lay the somewhat precarious passage, collapsed early in August and made the transport of stores even more difficult. But in spite of all difficulties, and of short rations themselves, they kept us well supplied—though sometimes the supplies arrived, through no fault of theirs—

at the very last moment, when another day without must have meant turning back.

The next day was spent in resting, bathing and darning. The Khan Sahib was impatient to be at work again, however, so on September 3 Cave, he and I with 2 porters started at 8 A.M. for a certain col N. of the camp, and marked on Wood's map at over 19,500 ft.—about 3000 ft. above camp. We reached it at 11.30 by a torrent bed, shale slope and finally 1000 ft. of steep frozen watercourse, in which we had one *mauvais pas*. From the col a névé stretched northwards, interrupting the view which the Khan Sahib required to fill in a blank space between 'I' and 'J.' So we tackled a little rock and snow peak E. of the pass, the summit of which we reached at 1.30 P.M., finding by the Khan Sahib's calculations, and much to his and Cave's joy, that we were at over 20,000 ft.—though Mason, upon our return to camp, thought the Khan Sahib might be over-estimating it. A wonderful 2 hours were spent here—the highest survey station of the expedition,—and then we descended to the col. At one point we had to descend steep rotten rocks very carefully—moving one at a time. This little difficulty took some time for the five of us to negotiate, but 4.45 P.M. saw us back at the col for tea, which was followed by a 1200 ft. slide and run down scree. We were back in camp at 6 P.M.

Two days later we all rode up 'Two Lake Valley' S. of camp. This valley had been previously mapped by Wood, who showed a rock wall at its far end, blocking a possible easy route into the Upper Shaksgam. Clifford and Cave, from the new base, had explored this (as well as in other directions)—[if the word 'exploration' is allowed, as Survey tenets apparently lay down that nothing counts as 'exploration' unless a reliable map is brought back]—and reported that no such wall existed, but that a glacier blocked the descent on the S. side. This error was now corrected, the 'wall' removed from the map and the glacier put in, which certainly formed an efficient barrier for ponies at least to cross by that route. From a hill near by Clifford and Cave had a good view down the Upper Shaksgam to the Kyagar glacier again, and reported that the lake had greatly increased in size and now stretched a good 4 miles up the valley. In this little valley are two small tarns—one of which is a beautiful azure blue, the other grey—hence its name of 'Two Lake Valley.'

Between 'I' and the Upper Shaksgam lay a blank space on Wood's map, which he had hoped Mason would be able to fill

in. This area might have been reached by going up one of the long glaciers coming into 'I' from the S.E. for a few days. The Khan Sahib, Cave and I would have liked to explore these glaciers and fill in the 'blank' during the remaining two weeks to be spent in 'I,' but the opportunity was not given us, and the space still, unfortunately, remains blank.

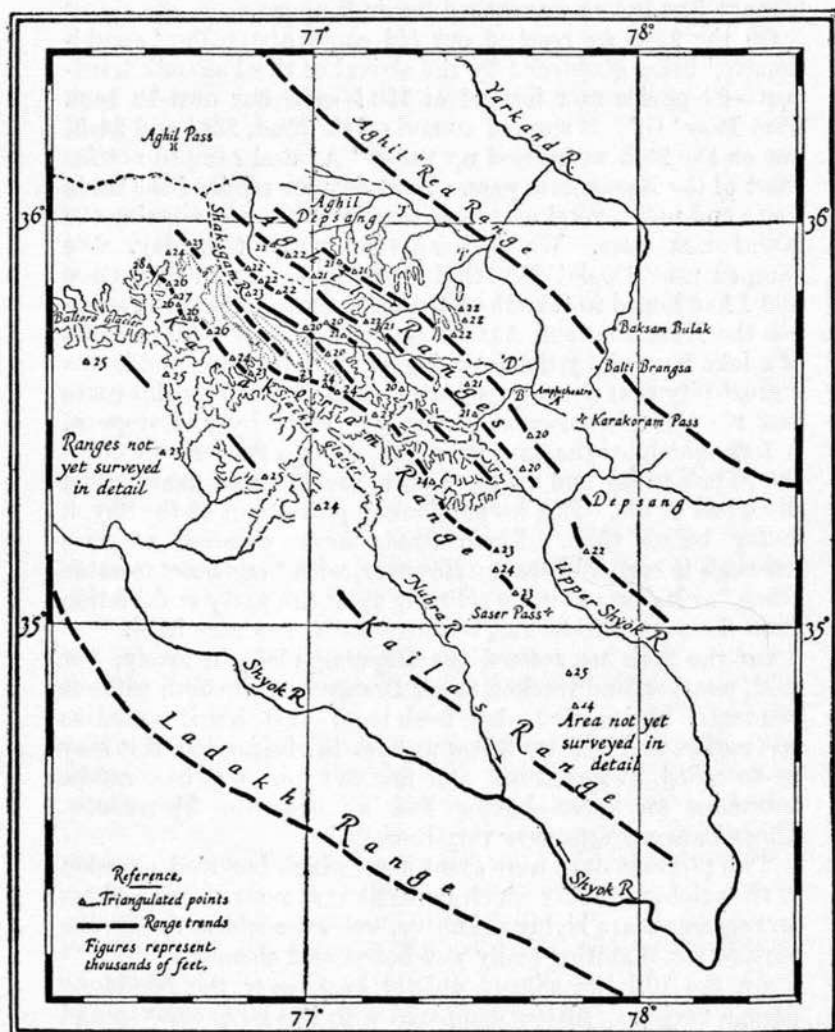
Days of visiting easy cols (mostly rideable to within close distance of their summits) alternated with days of ease or shooting. On the 6th Mason, Cave and I moved a march down the valley to camp at the foot of these cols, which lay on the N. side of the valley. Clifford and Cave had crossed one during August and descended into 'J,' and the topography of the locality required some rectification. Cave and I also ascended a small valley on the right bank—looking for burrhel—and 'removed' another rock wall shown at its head [finding the glacier also different from what the previous map had led us to expect].

Clifford joined us on the 10th. His pleasure did not lie so much in visiting high—or low—cols, but in collecting botanical and geological specimens, and I understand that his collections have furnished valuable information and are well worth the labour he put into the collecting of them. Similarly with Cave's birds, of which he obtained at least one specimen of every bird seen, a great achievement. He often won my admiration by sitting in his cold Whymper tent at the end of the day, with gloveless, freezing hands, skinning specimens, whilst the rest of us were sitting well-begloved round a lamp in our mess tent.

On the 13th the move 'home' began. The remaining 15 ponies went off back via the Yarkand and Pass 'G' to the Upper Shaksgam to fetch the foodstuffs which we had dumped there. We made a short march with the porters towards the Yarkand river. Two days were spent here whilst the porters carried down the rest of our kit, which procedure had to be followed as we moved gradually up the Yarkand river towards Wood's 'Amphitheatre,' where transport from Panamik was to meet us on the 25th. These days were distinguished by very cold winds and some snow at night, the beginning of winter in these inhospitable regions. Our own ponies were caught near Pass 'G' by a bad snowstorm, which we only felt lightly in 'I,' and 3 more died—leaving only 12 of the original 21.

On the 22nd we had our only serious accident. We had collected some specimens of copper ore from a little outcrop

of rotten rock close to camp. It looked very like gold, and in the evening Telakbahadur climbed up to get some for himself.



The rocks above gave way and fell on top of him—resulting in a fractured skull and other less serious injuries. We did not think he would survive the night, but thanks to Clifford's skill, and his own thick Gurkha skull, he did so. This

complicated transport arrangements, as he had to be carried for several days on an improvised blanket stretcher, often in bitter weather, before he was fit to ride a pony, which he could manage just before we reached Sassir Brangsa.

On the 23rd we reached our old camp above the 'amphitheatre,' being gladdened by the arrival of the Panamik transport—29 ponies now instead of 150!—and our own 12 back from Pass 'G.' It snowed on and off all 22nd, 23rd and 24th, but on the 25th we started up valley 'A' and camped not far short of the Karakoram pass. Next day we rejoined the trade route and met several caravans, mostly of camels, crossing the Karakoram pass. We lost another pony this day. We camped near Dualat Beg Öldi that night. From here Cave and I had hoped to take the alternative route to Sassir Brangsa via the Kumdung and Aktash glaciers. There were rumours of a lake forming by the damming of the river here, and it was a great pity that none of us were permitted to go by this route and see this phenomenon, never yet seen by a European. A fortnight later the dam burst and a huge flood swept down the Shyok valley and up the Nubra, causing vast damage and some loss of life. But we had luckily passed out of the Shyok valley before then. These floods have occurred at long intervals in earlier history. However, with 'our noses towards home,' as Mason put it, no splitting up of the party or deviation from the most direct—and tedious—route was permitted.

On the 26th we crossed the Depsang plain in lovely, but cold, weather, and reached Sassir Brangsa on the 30th without incident. The Sassir La had fresh snow on it, but it caused us no trouble, and October 3 saw us back in civilization, if it may be so called, at Panamik. Our first act here was to consume enormous omelettes—having had no eggs for 3½ months. Those Panamik eggs were very luscious!

Two pleasant days were spent here, which included a session in the sulphur bath for which Panamik is famous. The bathing arrangements are highly primitive, but we could not resist the temptation of getting really well boiled and cleaned.

On the 10th we slipped quietly back over the Khardong pass, a very easy matter compared with the large caravan and trying snow conditions four months ago. That afternoon we reached Leh and real civilization in the form of rooms in the 'rest house' and tin baths. We received several kindnesses from the people at the Moravian Mission here. A week at Leh was spent in winding up accounts, paying off our splendid porters and pony men, selling off our remaining ponies, loafing

round the interesting bazaars with their quaint folk, and feeling rather at a loose end and bored!

Cave and I had cherished a plan to relieve part of the monotony of the two weeks' march back to Srinagar by a diversion through Seru, but found it better to let the plan drop. On October 17 we left Leh, and taking the normal stages, reached Dras on the 26th, after some very cold marches. From here Cave and I double-marched ahead, as I was expecting my wife to come up the Sind valley to meet me. Leaving Dras on the 27th, we reached Matzoi that night, crossed the Zoji La early next day and camped below Sonamerg at dusk, which enabled us to reach Kangan, where my wife was awaiting us, on October 29. Here we had a delightful two days' rest.

The party reunited again in Srinagar on November 1, where a further short period was spent in writing reports, disposing of surplus and worn out equipment, and the thousand and one matters pertaining to the winding up of an expedition. On November 12 the party broke up, Mason leaving for Dehra Dun and England, Clifford for Lucknow and England likewise, and Cave and myself returning to our respective regiments.

The whole expedition from Srinagar and back had occupied us a few days under six months.

During this period we had covered in distance something like 1800 miles, mostly on foot.

An area of over 1000 square miles of fairly difficult and previously unexplored mountain country had been mapped and a bit more 'sketched' (*i.e.* mapped fairly accurately). The source of the Shaksgam has at least been definitely placed and the Upper Shaksgam and its branches explored and surveyed. Further, the not inconsiderable masses of the greater portion of the Aghil ranges had been explored and surveyed.

One very interesting point suggested itself—namely, that the Karakoram pass does not lie over any portion of the so-called Karakoram range, but rather over a prolongation of the Aghil range. The Karakoram range proper would appear, both geologically and geographically, to turn S.E. in the neighbourhood of the Sassir La. The mistake, if such it is, may easily be accounted for. Early travellers first crossed the Karakoram pass, to which the name, signifying 'black earth,' was correctly given. The name then became applied in the natural course of events to the huge snow-covered masses extending thence N.W. in the direction of K², so that this range became known as the Karakoram range, though actually the ridge over which the pass crosses has no claim to be

connected with the range of giant peaks culminating in K². The *Geographical Journal* for April 1927 throws much light on this subject.

It was to my mind a great pity that we did not carry out the original intention of descending the Shaksgam as far as the Urdok glacier, thus joining up on the ground with Sir F. Younghusband's route. Owing to the presence of ponies and the lack of grass for them, and to the corresponding small number of porters, this plan would have had certain difficulties, but I have not the slightest doubt that two of us could have carried it out and returned to the base before the waters rose considerably. Knowledge of the great glaciers flowing into the middle Shaksgam, of which we could only see the snouts, would also have been gained.

Mason, however, claims to have done what was required in surveying the middle Shaksgam by the 'Wild' photo-theodolite method, so that the forcing of the Kyagar glacier and the linking up on the ground with Sir F. Younghusband's route would possibly have had more sentimental than practical value, and the plan was therefore abandoned. But I continue to regret it.

I am of the opinion also that to avoid running into difficulties and getting held up by not knowing what lay ahead, longer reconnaissances would have been valuable, involving some days' absence in advance of the 'main body' by certain members of the party, whilst the survey party would have followed up in rear carrying out its work. This might well have proved a saving of time, enabling better preparations to be made to combat what would then have been known difficulties, and thus enabled more ground to have been covered.

This again was made difficult by the shortage of porters, who were all required to shift the main camps and to carry survey apparatus. It was difficult to find any available for an absence of more than a single night, as the ground ahead was rarely known; consequently with the physical difficulties and resulting 'arrangements' troubles had to be dealt with as they were met, resulting in delay at times.

That no small value is attributed by the R.G.S. to the result of the expedition is evidenced by the award of the 'Founder's Medal' to Mason, to whom the greatest praise is due for the preparation of the expedition, on the care and thoroughness of which the ultimate success must so largely depend.

I understand that all the collections made are proving of value, connecting up what is already known of flora and fauna in other districts.

I should like again to pay tribute to Khan Sahib Afraz Gul. If the success of the exploration was in large measure due to Mason's preparations, the palm for hard work 'in the field' must certainly be given to the Khan Sahib, without whom we should have had a far more difficult time on the march, and but for whose hours of labour, on hillside and ridge, the plane table map would have suffered very considerably.

No better 'followers' could have been found than our Ladaki porters, who worked splendidly, and last, but not least, praise is due to our two Kashmiri cooks, who never seemed too tired nor too cold to get us a hot meal whatever the length of march or weather conditions.

On the whole the weather was kind to us; a few snowstorms, of little intensity, interfered with survey work on occasions, but never really embarrassed our comfort. Of course it was cold—that was to be expected—but the physical discomfort never approached what I had anticipated it might be. Accidents were rare, and excepting the serious one to Telakbahadur, were confined to a few bruised limbs and falls into streams. Health remained excellent, and we returned to Srinagar in excellent physical condition—merely without any surplus adipose tissue!

I do not think the effect of $3\frac{1}{2}$ months at over 16,000 ft. had much appreciable mental effect on us, except the occasional 'growse' of some of us that we seemed to be served with as much physical work as we were capable of performing. Certainly, some of the jolly days and evenings we had in Srinagar after the party broke up, during the few extra days some of us spent there before returning to our regimental labours, must have dispelled the idea of any altitude depression, or other effects.

We undoubtedly became acclimatised to exertion at a fairly high altitude, and increased in powers of going up hill. Cave's improvement was particularly noticeable, and our day on September 3, at the end of our fourth month, 'in the field,' to over 20,000 ft. and back, caused but little distress to any of that party.

Within ten days of the breaking up of the expedition we were all back at our normal duties again.

A word as to the fauna may be interesting. The game was not nearly so varied nor so plentiful as we had hoped with regard to the larder. In many valleys we were astonished at the quantity of game tracks, though we saw comparatively little game. This is accounted for by the paucity of grass, which causes the animals to be always on the move searching

for fresh grass and making numbers of tracks. Tracks were particularly plentiful in Valley 'I' and in the 'Zug-Shaksgam.' In the winter it would appear that Valley 'I' is a sanctuary for all sorts of game—being open, catching the sun and containing more grass than all the other valleys put together. This valley appears to be a wintering place for burrhel, wolves and probably wild yak. Two small herds of kiang were seen, but from the tracks there must be a large number of the animals earlier. There were apparent tracks of these in the 'Zug-Shaksgam' also, though, in spite of the large number of tracks of all sorts, the only game seen there was one large herd of burrhel. Burrhel was the animal most frequently and most widely met with, and afforded welcome meat for those of us who liked it.

The Tibetan antelope appears to range much farther west than previously recorded. They evidently come into the Upper Yarkand valley very early and breed there, as when we reached it at the end of June the kids appeared to be 6 to 8 weeks old. The males were found mostly apart from the females. We found a small herd of females, some with kids, as far W. as the Aghil Depsang.

When we next came into the Yarkand valley at the end of September, the migration eastward had begun again, and we were only in time to catch the tail end of the trek. The males, unlike the females, do not appear to travel W. of the Yarkand river. Antelope makes most excellent eating.

We found hares in most valleys—up to 18,000 ft.—beautiful creatures with long grey hair. More than one was caught by hand when sheltering under boulders. Small mouse-hares were also found. Once we saw tracks of a few wolves (in the Yarkand valley) and traces of a lynx or snow leopard close by.

As I have stated, Cave made a most valuable and comprehensive collection of birds, as did Clifford of flora and minerals. I understand that my small collection of butterflies is of interest on account of the height at which some specimens were found.

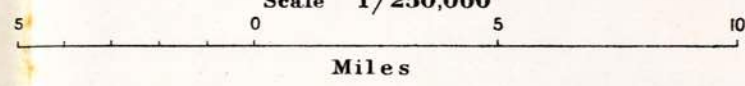
Small black spiders, in large quantities, were about the only insect of this kind met with.

[We are indebted to the Council of the R.G.S. and to Major Kenneth Mason for permission to reproduce the map accompanying this paper, prepared by the members of the expedition, which will be found at the end of this Volume.—EDITOR.]



KARAKORAM HIMALAYA
Preliminary Map of the
SHAKSGAM VALLEY & AGHIL RANGE

1926
Scale 1/250,000



This map has been drawn from the half inch Surveys of
Khan Sahib Afraz Gul Khan, Survey of India. For further
information see Major Mason's note at the end of his paper.
Approximate contours are at 500 ft. vertical interval.

△ Triangulation Stations
WΔ Wild Camera

