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THE ALPS OF QUNGUR

C. P. Skrine, I.C.S.

*Read at the Meeting of the Society, 27 April 1925. Map follows
page 480.*

IN January 1922 I was fortunate enough to be appointed to the officiating charge of the British Consulate-General at Kashgar, and proceeded at once to make arrangements for the journey of my wife and myself to that ancient city by the Srinagar-Gilgit route. One of my first proceedings was to go to Delhi and consult Sir Aurel Stein as to whether there was anything I could do, in however small a way, to supplement his great explorations in Chinese Turkistan. Hearing I was going by the Gilgit-Tashqurghan route he at once suggested my trying to go down the Qaratash valley and examine the eastern face of the Qungur massif, which no one had as yet seen, and particularly its south-eastern offshoot, the Shiwakte Mountains. He himself, he told me, had in September 1913 been the first traveller to cross the Buramsal pass and follow the Qaratash river to its debouchure 36 miles due south of Kashgar; but owing to shortage of time, lack of supplies, and the extreme difficulty of the Qaratash gorges he had been unable to ascend any of the side valleys coming down from the Shiwakte and Qungur, and had had to confine himself to a plane-table traverse of the main Qaratash gorge. The latter is so deep and perpendicular-sided that he caught no glimpse from it of the main range to the west. This was quite enough to decide me to explore those side valleys of the Qaratash at all costs, and accordingly in April, before proceeding to Srinagar, I went to the headquarters of the Survey of India at Dehra Dun and invoked the aid of the Superintendent, Col. Cowie, and his assistant, Major Perry.

I may mention here that my sole qualification for survey work in unexplored mountain regions was having undergone nine years previously a short course of land records training in the United Provinces, during which another budding civilian and I had co-operated in a plane-table survey of a nine-hole golf-course near Cawnpore. None the less, the Survey officers were as kind and encouraging as could be, not only

lending me a complete plane-tabling outfit, but spending valuable time in coaching me for two days in the rudiments of field survey work. Col. Cowie agreed with Sir A. Stein that the blank patches in Survey of India Sheet 42 N (serial No. 2 of Stein's half-million-scale maps of Chinese Turkistan and Kansu), that is to say between the 75th and the 76th meridians and the 38th and 39th parallels of latitude, would be well worth my while trying to visit on the way to Kashgar.

The Drawing Office happened at the time of my visit to be engaged on the very sheet in question, an advance copy of which was specially heliozincographed on to cardboard for use on a plane-table. This map shows clearly the two great massifs of Qungur and Muz Tagh Ata, which are the twin culminating points of the meridional range, usually known as the Kashgar Range, which connects the westernmost Kunlun with the Tien Shan in the north and forms the eastern rim of the Pamir region.

For many years great uncertainty existed as to the height of the two massifs and even as to the identity of the northern one, which is visible (though only rarely) from Kashgar. This massif was fixed by Trotter in 1873-4 under the name "Tagharma." Sven Hedin and the Russian cartographers regarded Muz Tagh Ata as higher than its northern rival, Qungur, but do not appear to have given any height for the latter. Capt. Trotter's value for it was 25,350 feet. According to the Survey of India Triangulation Pamphlet on Sheet No. 42 N :

"Deasy, in 1899, measured a base of 6 miles at Kashgar, observed Kungur, and obtained a height of 23,350 feet for it, or 870 feet lower than Muztagh-ata (*Geographical Journal*, XVI., 1900, p. 521). In 1900-01 Stein obtained two values for Kungur, viz. 23,600 feet and 25,146 feet * ; the former value was at first adopted and is shown on his map of the expedition. Subsequently the agreement of his higher value, 25,146, with Trotter's value, led to the adoption by the Survey of India of this value, and Stein's map after his 1906-08 expedition shows two summits, 25,046 feet and 25,146 feet, in this neighbourhood. Great uncertainty therefore still exists as to the heights of the summits of this massif, and Kungur II. (25,046) previously accepted by the S. of I., has now been deleted."

The telepanoramas exhibited in the lecture show the two summits clearly, Qungur II. on the left and Qungur I. on the right. I am glad to say that one of the results of my amateur efforts has been to enable the Survey of India to fix with some exactitude the position of Qungur II. and to calculate its height provisionally as 25,200 feet, or slightly higher than Qungur I.†

* *I.e.* for Qungur II. and Qungur I. respectively.

† See Major K. Mason's 'Notes on the Compilation of Mr. C. P. Skrine's Topographical Material in the Neighbourhood of the Qungur Massif,' Appendix I., para. 7 *ad fin.*

In order to gain access to the eastern flanks of the Qungur massif and of the mysterious range to the south-east of it named by Stein (from the Pamirs side) the Shiwakte, it was necessary for us to penetrate the gorges of the Qaratash river mentioned above as having been traversed by Stein alone among previous travellers. The upper waters indeed of this river are comparatively accessible, for there is a route, used occasionally by Afghan opium smugglers, which goes from Qara Kōl over the Qaratash Pass (16,338 feet) into the valley of that name and out of it again by the Ghijaq Pass to Ighiz Yar and the plains. But this route only traverses a stretch of about 6 miles of the main valley, and that not an interesting one; the difficult part is lower down, from Chinghan Ayaki to Khan Terek. The first attempt to force these gorges was in 1906, when Stein detailed Ram Singh to try and reach Kashgar by this route.* Ram Singh crossed the Buramsal Pass † and descended the Qaratash as far as the main gorges, but was unable owing to the volume of water to go further and to cross the Ghijak Pass and rejoin the ordinary Kashgar road at Ighiz Yar.

It was not till Stein's third expedition, in September 1913, that the Qaratash valley was traversed throughout by Stein himself. He describes his journey as follows :

“ I myself set out for the same goal (Kāshgar) with Muhammad Yakub by a new route leading due northwards across the Merki pass and down the valley of the Qaratash or Beshkan river. Owing to special difficulties this important valley, in which most of the eastern drainage of the great glacier-clad range of Muz-tagh-ata finds its way into the plains between Yangi-hissar and Kāshgar, had never been explored in its whole length. During spring and summer the big floods from the melting snow and ice of the range render the extremely narrow gorges of the Karatash river in the north quite impassable. By the time the waters subside in the autumn, heavy snow on the Merki and Kara-tash passes closes the approach from the south. In the spring of 1906 I had sent Ram Singh to descend the valley, but the flooded river had obliged him to abandon the attempt. We were more fortunate this time. Exceptionally early snowfalls had stopped the melting of the glaciers just in time to allow of a passage while the Buramsal pass (14,940 feet), though under deep snow, could still be traversed with laden yaks. Nevertheless the descent through the extremely confined gorges of the river below Chinghan proved very difficult and in places risky. The constant crossings of the river tossing between precipitous rock walls could not have been effected without the help of hardy local camels secured from Kirghiz camps higher up the valley ” (‘ Memoir on Maps of Chinese Turkistan and Kansu,’ p. 25).

* ‘ Memoir on Maps of Chinese Turkistan and Kansu,’ p. 11.

† The pass crossed by Ram Singh on this occasion was probably the Buramsal, not the Merki pass, as stated in the Memoir.

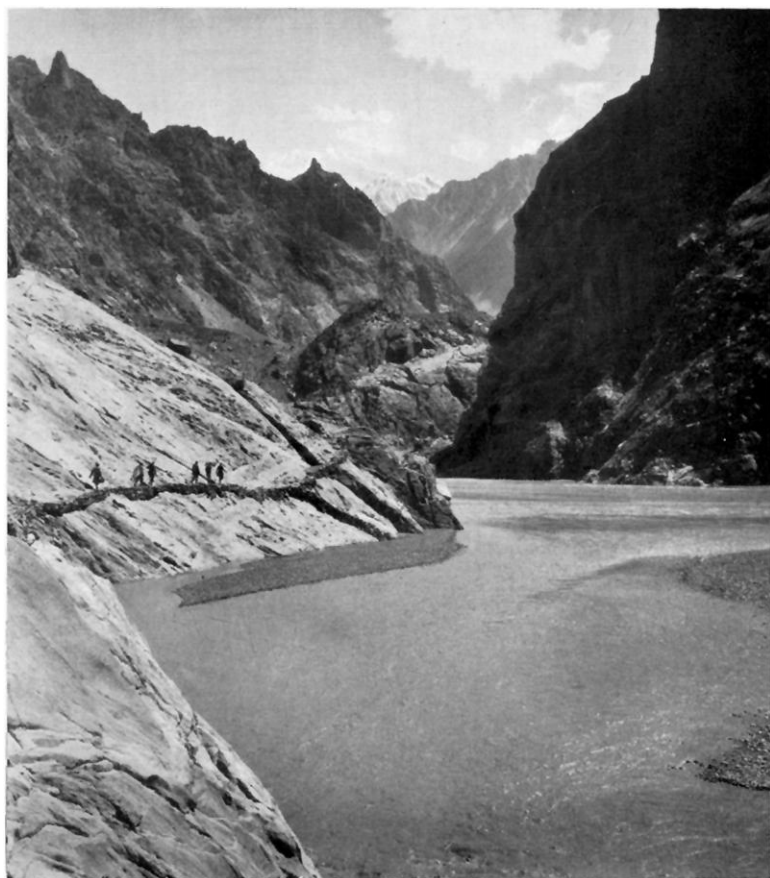
Leaving Srinagar on 3 June 1922, my wife and I and a friend, Mr. G. C. Price, travelled up *viâ* Gilgit and the Mintaka Pass to Tashqurghan, which we reached on July 6, and halted there a couple of days. Thence taking the ordinary summer route to Kashgar, we crossed the southernmost slopes of the Muz Tagh Ata massif and camped on the Chichiklik or "flowery" plateau at a height of about 15,000 feet. To the east of this, the route followed by Stein on both his journeys, and by most travellers on this road, goes straight down to Toile Bulung in the Pasrobat valley by the Tangitar gorge, in which the going is notoriously bad during the high-water season. In order to avoid it and also to strike less-known ground I decided to cross the Yangi Davan to the north of Chichiklik and go down the Yambulaq Jilgha. The pass (16,100 feet) proved easy, though the snow lay deep on the north side and it was necessary to lead the ponies down carefully. We were interested to find, lapped among the snowy peaks at the head of the Yambulaq Jilgha, 15,000 feet above the sea, a beautiful lake about $1\frac{1}{2}$ miles long by $\frac{1}{2}$ mile broad, still partly covered by the ice of winter. This lake is not marked in the Survey of India map, nor is it mentioned by any of the authorities I have read. We halted for a couple of nights at the hospitable camp of the Yambulaq Qirghiz about halfway down the valley, my object being to reconnoitre the Merki pass and see if it would be possible to take our caravan over into the upper Qaratash valley. I knew it would not be possible to go down through the gorges, but I thought of halting two or three days in the upper part of the valley, exploring the Chinghan Jilgha which promised easy access to the Shiwakte, and then rejoining the ordinary Kashgar road by the Ghijaq Pass route. Accordingly on July 12 Price and I started for the Merki Pass with five yaks and three sturdy Qirghiz. To cut a long story short, we found the "pass" not to be a real pass at all, nothing but a lofty ridge of rock at least 17,000 feet high, deep in snow even on the south side and defended also by an apparently perpendicular wall of ice. After five hours of scrambling up among enormous boulders and through soft snow in which the yaks often floundered helplessly, we left the animals and climbed on foot to the summit of a spur, 16,500 feet high, which commanded a good view of the "pass" above us to the north, and of a vast expanse of tumbled mountains to the south and west. Muz Tagh Ata and Qungur were unfortunately buried in clouds—as I was to find out later, it is useless to try to get a view of the giants after about ten o'clock—but the little-known peaks of the upper Yarkand River valley stood up grandly to the south. We were interested to observe two more lakes, one a small tarn immediately below us to the north-west, the other a large sheet of water on the opposite (south) side of the Yambulaq Jilgha, lying at an elevation of about 1000 feet above the valley-bottom. We thus found altogether three lakes in the catchment area of the Yambulaq Jilgha; there are two small tarns also on the Chichiklik plateau. The upper Yambulaq



CASTLE OF THE MIR OF HUNZA, BALTIT



NANGA PARBAT FROM BUNJI



IN THE HUNZA GORGES

valley, in fact, together with the Chichiklik Maidan and the rolling hills in the neighbourhood, constitutes a piece of typical Pamir country, lakes and all, on the east side of the meridional range ; the only such region to be found surviving, as it were, among the peripheral gorges south of the Gez Dara.

From our reconnaissance it was clear that the Merki "pass" was quite impracticable for loaded animals ; the Qirghiz indeed told us that it was hardly ever used, even by them. The only thing to do, therefore, if we wanted to reach the upper Qaratash Valley, was to go down to Toile Bulung and over the Buramsal Pass. This would have entailed three extra marches and trying ones at that, so, as time was short and the Qirghiz also frightened us with accounts of the volume of water in the upper Qaratash valley, I decided to abandon for the time being my attempt to reach Chimghan and the Shiwakte. Crossing the Tari Art (13,340 feet) and Kashka Su (12,900 feet) passes without difficulty, we at last, on July 18, emerged from the mountains at Ighiz Yar and reached Kashgar three days later. I shall never forget the view of the snows of the Kashgar range which we saw as we crossed the fertile plains of the Yangi Hissar and Kashgar districts ; all the great massifs with their lesser satellites were clearly visible for a hundred miles or more to the south and west. I did not know then how rare this beautiful spectacle is, and it was not till May 1923, ten months later, that I succeeded in obtaining a good telepanorama.

On 11 October 1922 we left Kashgar on a two-and-a-half-months' tour on Consular duty to Yarkand, Khotan, and Keriya. Instead of going straight to Yarkand, however, we turned off the main road at Yapchan and marched *viâ* Akhtur Bazar, a picturesque village with a large ruined fortress on the banks of the Qaratash river (here wide and shallow as it flowed over the plain) to Altunluk, at the debouchure of the same river from the foothills of the Kashgar range. We were accompanied by a member of the small colony of "White" Russians at Kashgar, Mr. Paul Nazaroff, a mining geologist well known at Tashkend before the Revolution. Our baggage and unmounted retinue went on seven shaggy two-humped "Bactrian" camels, for the hire of each of which we paid the princely sum of 2s. 4d. a day. The Chinese magistrate of Yangi Hissar, with whom we had made great friends on our way to Kashgar in July, gave us all the assistance in his power and sent with us the Beg of the valleys for which we were bound, an excellent old man who, unlike some others of his kind we have met, always did his best for us and gave us no trouble whatever.

The people of Altunluk, where we camped in a pleasant orchard gay with autumn tints, did all they could to dissuade us from venturing up the Qaratash Valley, but had to admit that the season was well advanced and the summer floods lessening. Whenever one leaves the beaten track the local people, usually backed up and sometimes in-

stigated by their Beg, invariably take this line, so that if anything untoward happens they can say, "We told you so." This is the more necessary from their point of view in that the Chinese always come down heavily on the Beg concerned if anything happens to a foreigner when travelling in the districts, and the Beg of course takes it out of the local people.

Accordingly, on October 14 we started up the right bank of the Qaratash, which here flows in a wide valley between low barren hills. Forging the river without difficulty 8 miles above Altunluk, we continued for 9 miles along the left bank among gradually rising but bare and much-eroded foothills. The river had then to be crossed and recrossed at a point where it breaks through a transverse ridge of red sandstone about 9000 feet high, forming narrows through which the water rushes with some force. The maximum depth at the fords above and below the narrows was 4 feet and the current about 5 miles per hour, while the stream was roughly 30 yards broad. A wide and almost straight reach of the Qaratash some 5 miles long was now entered, and a mile farther up we came to the first signs of occupation by the Qirghiz of the mountains at Saman. Here there were two tumbledown crofts and a few acres of land which had once been under the plough, now deserted, and here also we found a pleasant little grove of planes and desert poplars (*P. varifolia*). We camped here for the night and proceeded up the left bank next day. This morning for the first time the dust haze, which throughout the Tarim basin is the bane alike of the surveyor and of the landscape photographer, began to disappear, and we saw dimly, rising grandly above the river valley straight in front of us, a magnificent snow-peak which we afterwards found to be the outermost aiguille of the Shiwakte, Kök Döng, 16,800 feet high. A mile or two above Saman this peak was hidden by the nearer hills which rise steeply 3000-4000 feet above the valley bottom, here some 6000 feet above the sea. They consist of much-decayed grey limestone with, at one point, a well-defined belt of red sandstone, and are a continuation of the Zor Qir ridge which encloses the Yapchan valley on the north. The Qaratash makes a right-angled bend as it cuts through this ridge at the narrows of Achiq Aghzi. Another wide reach some 4 miles long, in which the river runs south-east to north-west, is here entered; there must have been a lake here before the river cut through the above-mentioned ridge, for three different "raised beaches," one above the other, are plainly visible on the hillsides above the right bank.

At the upper end of the narrows there is a Qirghiz bridge of primitive cantilever type leading to a plot of 40 or 50 acres on the right bank with two tiny farmsteads, all the irrigation of which is done from a wooden aqueduct carried high over the bridge. On the left bank is a pleasant little apricot orchard with a mud-brick farmstead attached, called Qurghan (fortress), from a small tower the remains of which can still be seen. The valley just above here is at its widest, and a comparatively large plot

of ground is cultivated with barley and lucerne ; the place is the winter headquarters of the Qirghiz of the Chopqana Jilgha, one or two of whose huts * are usually to be found here even in summer. At this our first visit the place was deserted ; as we afterwards found out, the Qirghiz, alarmed at the approach of a large cavalcade, had fled with their flocks and herds up to their highest fastnesses. On our return journey, however, and on each subsequent occasion that we passed this spot, the Chopqana Qirghiz always had a hut and some food ready for us, and some of them, men and women, were usually there to receive us.

A mile above Qurghan, we crossed once more to the right bank ; it was the last easy ford we were to have, for 5 miles further up the valley suddenly narrowed and we found ourselves entering the gloomy portals of the dreaded gorges which only Stein had penetrated before us and about which he had spoken so feelingly.

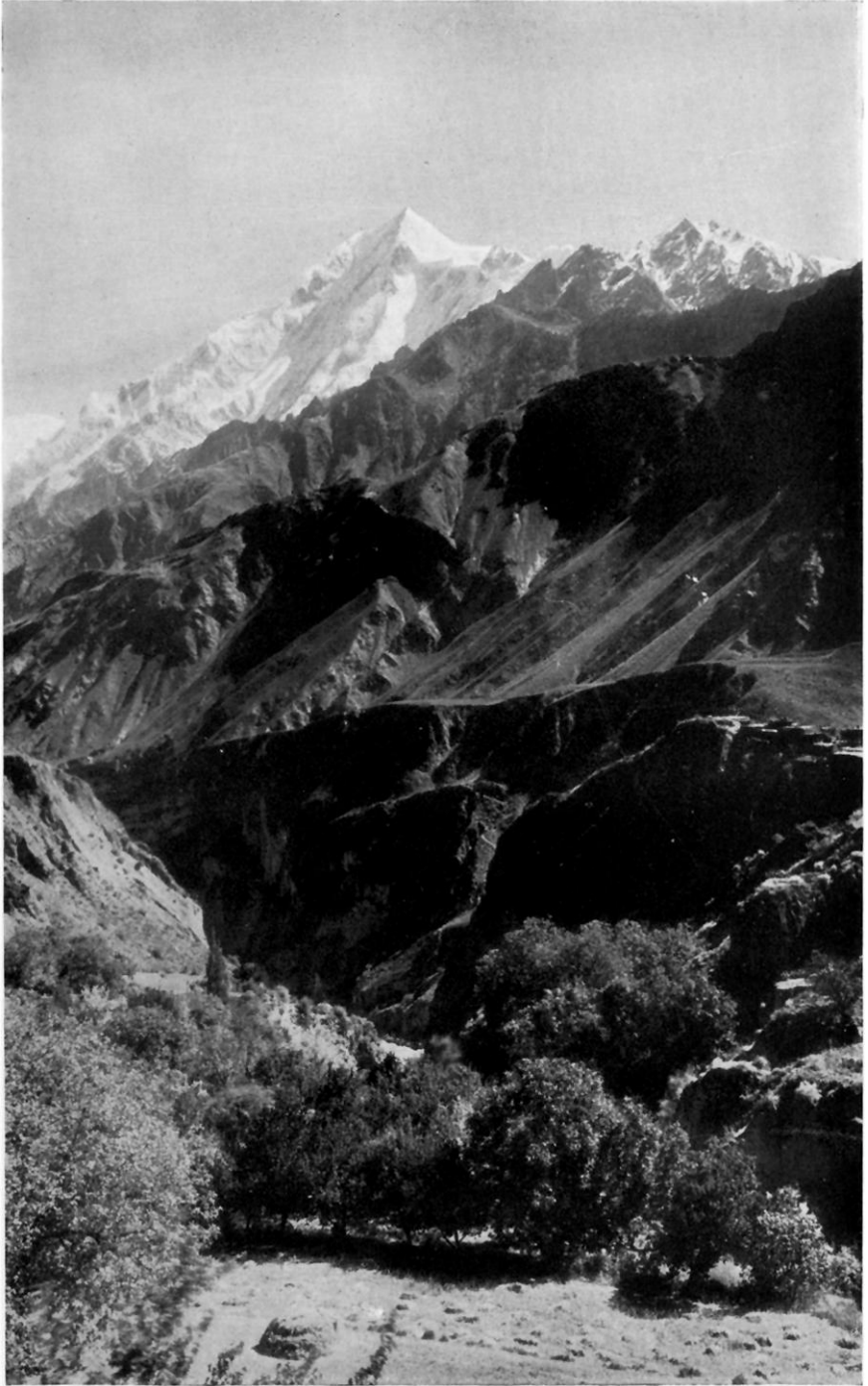
We had to cross the stream nine times in the next 3 miles, and although there were no rapids and the river-bed was in every case comparatively smooth, the fords were none of them easy to cross on horseback. Our baggage-camels had no difficulty, their extra length of leg giving them an advantage over the horses. Stein, it will be remembered, used local camels when he came down through the gorges three weeks earlier in the year ('Memoir,' p. 25). Even so most of our baggage got wet.

At Bash Kupruk ("Bridge-head"), where there used to be a bridge giving access in summer from upstream to the valleys on the right bank, the gorge widens somewhat, and we pitched our tents in a grove of tamarisk and willow which gave us welcome shelter from the icy wind. Firewood was plentiful, we had a week's supplies with us, and there was good grazing for the camels, so we decided to halt for a day or two and give the animals a rest. The gorge, we were told, was much narrower and the stream quite unfordable further on, and it seemed advisable to reconnoitre before attempting a further advance. A mile ahead I noticed a spur coming down from the west, the direction of Qungur, which seemed distinctly less unscalable than the rest. Sending one of our orderlies with a Qirghiz guide up the main gorge to report on the state of the water and the possibility of getting through to Chimghan, I myself set up the plane-table first at the mouth of the Kaying Jilgha, and then 2000 feet up the ridge to the south-west, at a point which I fixed from below and marked with a cairn (Stn. I.). From this point I obtained a tantalizing though still rather hazy view of snow-clad peaks not more than 7 or 8 miles away to the west, apparently enclosing the head of the Kaying Jilgha. Below me the Kaying stream rushed

* The Qirghiz nomad hut, known in Kashgaria as *aq-oi* or "white house" from the grey felts used, consists of a collapsible circular lattice framework of wood covered with large felt mats, with an aperture in the top which acts as chimney and window by day and can be covered with a mat by night to keep the warmth in. The word *yurt* used for these huts in Russian Central Asia means "village" in Kashgaria. The Tajiks of the Pamirs have copied the Qirghiz nomad hut, which they call *Khirga*.

through a rocky but by no means impassable gorge ; while right opposite me to the north-west rose a high double-peaked mass of dark grey limestone which I identified as " Kaying-beli," the last peak shown in this direction on Stein's map. Though exceedingly steep and even precipitous, I thought I could climb this peak, from which it appeared almost certain that I would obtain the longed-for view of the east face of Qungur and maybe of the mysterious Shiwakte (about which my guide could tell me nothing) ; so I fixed both the points of Kaying Beli carefully and decided to try and climb it next day from the same camp. I also drew rays to as many of the peaks of the Qaratumush and Pitlik Jilghas as I could ; the further course of the main Qaratash river was invisible, for the stream seemed to issue from under a great rocky wall about 10,000 feet high.

I was disappointed but not surprised when the orderly whom I had sent up the main gorge to reconnoitre reported late that evening that further up it became so narrow and the current so deep and strong that there was no hope of our getting through to the mouth of the Chinghan Jilgha with the whole of our caravan, if at all. I had no intention of risking the lives of members of our party or of our animals in the raging waters of the Qaratash, so once more I reluctantly decided to give up the attempt to approach the Shiwakte *via* the Chinghan Jilgha, and to explore instead the Kaying valley and see whether there was a pass at its head giving access to the eastern foot of Qungur. Accordingly, next day at 7 a.m. I started out with plane-table and camera to climb Kaying Beli, accompanied by a Qirghiz guide and the best cragsman among my orderlies, an excellent young Hunza man of splendid physique called Sangi Khan. Striking up the Kaying Jilgha a mile above camp we followed the stream for another 2 miles to the mouth of a steeply pitched ravine, 7800 feet above the sea, from which we climbed straight up in four hours to the top of the eastern summit of Kaying Beli, 12,750 feet high. The climb was arduous and in many places difficult, but so magnificent was the panorama that gradually unfolded itself as we ascended that I at any rate was much too excited to notice the fact. Unfortunately the higher peaks, which on the way up had been clear, had already begun to veil themselves in cloud and to a certain extent also in dust haze by midday, when I was ready with my plane-table perched on the topmost pinnacle of rock. Nevertheless I obtained a panorama good enough for surveying purposes, together with a complete set of plane-table rays and clinometer readings, of a large number of peaks right round from north-west to due east, including the following : Sargalang ; the Chakragil massif ; Qungur I. ; Qungur II. and the Shiwakte group approximately (they were mostly under cloud) ; the whole array of peaks enclosing the Tigarman Su, Kaying and Qaratumush Jilghas, and on the opposite side of the main Qaratash valley the beautiful snows of the Ghijaq and Pitlik ranges. It must be understood of course



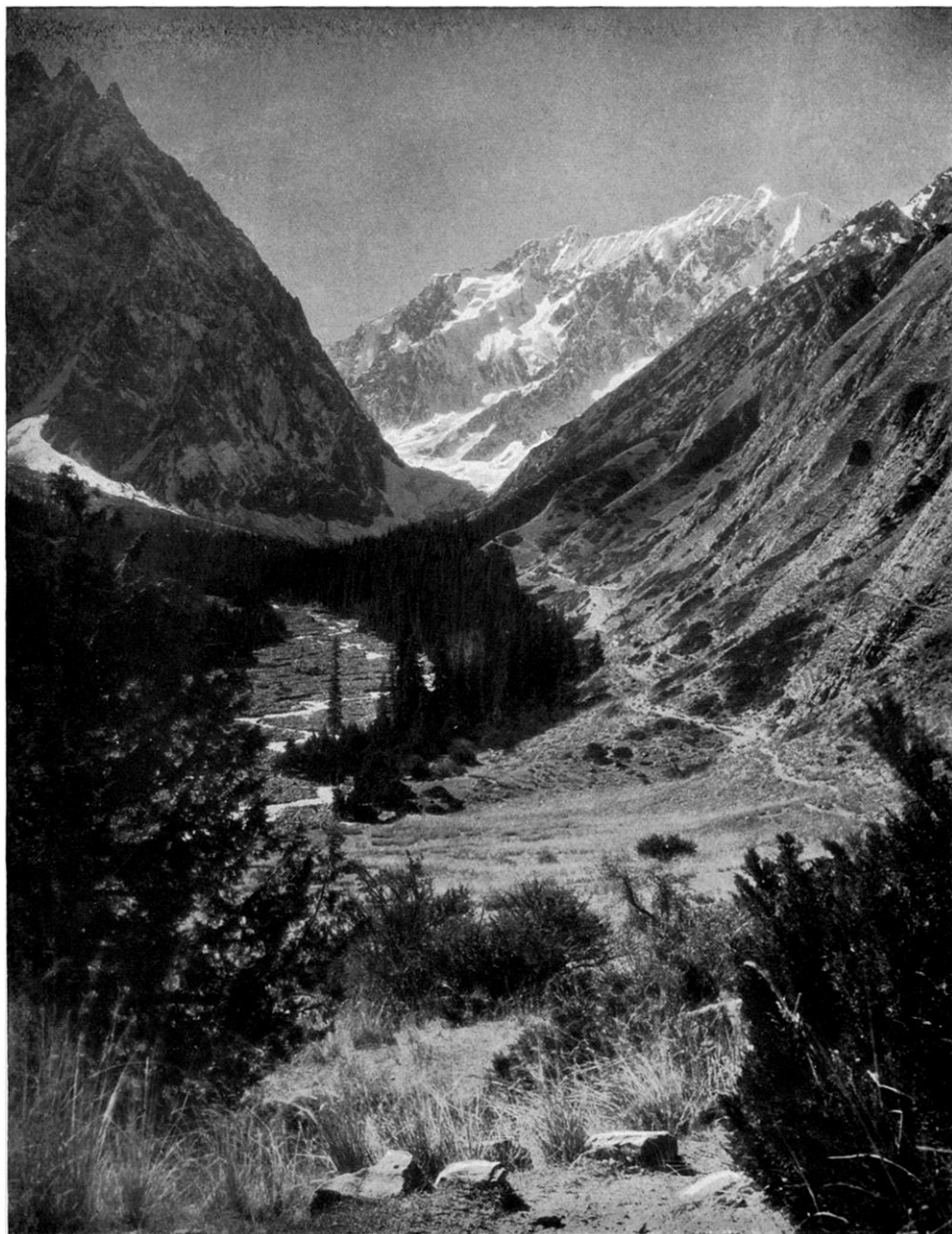
RAKAPOSHI FROM CHAPROT



CROSSING YAMBULAK DAVAN



UNMAPPED LAKE AT HEAD OF YAMBULAK JILGHA



KAYING JILGHA AND SHIWAKTE PEAK I.



QIRGHIZ OF QARATASH VALLEY

that I had very little idea of the identity of all these points on this, the first time I ever succeeded in reaching a coign of vantage among the forest of peaks in this area.

As often happens, the descent of Kaying Beli was much worse than the ascent, especially as the guide lost his way in attempting, against my wishes, to take us down by a short cut. Sunset found us on the edge of a 60-foot drop into the ravine we had ascended in the morning, faced with the alternatives of climbing about halfway up the mountain again or going over the side. The former was out of the question, as it would have meant being benighted in intense cold among the waterless crags of Kaying Beli. Before attempting the descent we traversed an exceedingly unpleasant grass slope pitched at an angle of 40° in the hope of finding an easier descent round the corner, but without success. Finally we took our courage in both hands and went over the side, and thanks chiefly to the admirable steadiness of Sangi Khan we reached the bottom of the cliff without mishap. Even then our troubles were by no means over, for there were several "dry waterfalls" to descend before we reached the bottom, and it was quite dark when we found ourselves with much relief in the valley-bottom of the Kaying Jilgha.

My wife and Nazaroff, who in their natural anxiety had come out with a search party and met me a mile from camp, greeted me with the interesting news that they had spent the day in a reconnaissance up the Kaying Jilgha; that the gorge was practicable for our convoy; and that two hours' march up it the jilgha widened into a broad valley encircled by magnificent peaks, in which they had found two or three Qirghiz families with their huts pitched in a sunny corner. The latter were ready and anxious to provide us with huts to sleep in if we came up. Needless to say we decided to take them at their word, and next day, leaving the tents at Bash Küprük in order to lighten the loads, we moved up the Kaying Jilgha and camped in the Qirghiz huts. On the way up I measured a base-line 1350 yards long in the only straight stretch I found in the gorge, and from it fixed with greater accuracy the relative positions of Stn. I., Stn. II. on Kaying Beli, the mouth of the jilgha and several other minor points in the neighbourhood; this was all I had afterwards on which to build my map of the Kaying Jilgha and its mountain system, and to connect it with Stein's route traverse of the Qaratash gorges. In all this region the great difficulty is that the chief summits are hardly ever visible from the valley bottoms.

Our new camp was at an elevation of 9200 feet, and the thermometer at night went down to 10° or lower; the felts of our huts were full of holes (for our kind hosts were very poor), so that we had the full benefit of the night winds and were inclined to congratulate ourselves on not having exposed ourselves to the still greater elevations of the Chimghan Jilgha, the very mouth of which is over 10,000 feet above the sea. But the dust-haze had gone, the brilliantly clear weather of late autumn

in Central Asia had set in, and when we saw what the upper Kaying Valley had in store for us we soon forgot any minor discomforts we might have suffered. For next morning we all three, escorted by the Qirghiz, rode up the valley towards the magnificent peak afterwards designated as Shiwakte I. ; before we had gone a mile we found ourselves in a wood of big juniper trees, and, topping a rise, saw before us, nestling at the foot of black precipices 6000 feet high, a fine virgin forest of tall firs,* their deep shade contrasting perfectly with the brilliant snows of the Shiwakte behind. We were astonished and delighted, not only by the beauty of the scene but by the interest of our discovery, for it had not hitherto been known that fir forests of any size existed south of Bostan Arche, 50 miles away to the north-west under the snows of Ulugh Art, where Stein found conifers in 1915 at the end of his Third Expedition ('Memoir,' p. 40). The firs began to grow thickly, with individual trees 100 feet high or more, at an elevation of 10,000 feet and continued up to 12,000 feet. Yaks were waiting for us in a clearing of the forest, and mounted on these we reached by one o'clock a height of 13,100 feet on the lateral moraine of the Torbashi glacier, a tributary of the main Kaying glacier. Here we were surrounded by an array of precipitous snow-peaks from 17,000 to 19,000 feet high, their faces clothed with hanging glaciers ; far below us we could see the forest and the milk-white glacier-stream curving away behind tremendous black pinnacles towards the main gorge.

Next day, the last we could spare in the valley (for we were due on October 26 in far Yarkand and were already likely to be late), I climbed with Sangi Khan and two Qirghiz carrying my plane-table and cameras to a height of 13,430 feet on a splintered rock-ridge called Nichke Qir, immediately under the high chisel-shaped peak of Kök Döng, that same offshoot of the Shiwakte, 16,800 feet high, which we had seen from Saman. The climb, though exceedingly steep, was not so difficult as that of Kaying Beli, and the air was this time perfectly clear ; I was thus able to spend three hours at this station (No. III.) and take a panorama of, as well as rays to, most of the same peaks I had photographed from Stn. II. Qungur II. (which I then mistook for Stein's Qungur I.) was just visible over the top of the Kök Döng ridge, and with one of the very few slow plates I had with me I obtained an excellent telephotograph, the first ever taken of the east face of Qungur.

I was greatly helped in the identification of the peaks I had seen from Stn. II. by having with me the negatives of the panorama I had taken at the latter station, and had, as usual, developed in camp as soon as possible. In a region where you seldom see the higher mountains between stations, the great difficulty is identifying peaks seen from different points ; Stein had warned me of this, and it was for this reason

* Similar in appearance to, and probably identical with, *Picea Schrenkiana* of the Tien Shan.

that I always carried a developing outfit with me in camp. I could thus compare the view I was looking at with the negatives of photographs I had taken of the same mountains from other stations, and identification of salient points was comparatively easy.

I was thus able to plot in many of the peaks and glaciers I had seen from Kaying Beli. But I still could not see more than a small fraction of the east face of Qungur, and the configuration of the Shiwakte range was not at all clear to me, owing to the great ridge of Kōk Dōng and Sarigh Yon which partially concealed the view to the west and south-west. I saw that I must somehow or other, during my next visit, conquer the knife-edge ridges which completely enclose the upper part of the Kaying Jilgha.

On our return journey down the Qaratash we reached Qurghan by a short cut from the upper Kaying valley by crossing on yaks the steep but easy Chopqana pass (11,500 feet) immediately above our camp and descending the jilgha of the same name. This valley is about 8 miles long, and its stream, not being fed by any glacier, is small, but it boasts several patches of fir forest clinging to the north face of the Kaying Beli ridge, and, the grazing being good, several families of Kirghiz inhabit it. The stream joins the Qaratash a mile above Qurghan. There was quite a muster of Kirghiz at the latter place, and next morning when we struck camp they seemed genuinely sorry to bid us adieu and begged us warmly to come again next year.

Leaving Qurghan we sent the caravan to Saman only, as we intended to reconnoitre the Achiq Jilgha, at the top of which I had heard there was a pass leading over to the Gez River. The map shows the Achiq Jilgha as trending from west-south-west to east-north-east, and the watershed as being 6 miles west of the Qaratash valley; we found, however, that the glen was a short one, only about 3 miles long, and that its general trend was east to west. The watershed here is only $2\frac{1}{2}$ miles back, though farther down it is much more: the system of foothills in all this region is very complicated, consisting of a perfect labyrinth of defiles and rocky ridges. The track over the Achiq Pass to Kauruk Qaraul on the Gez was not difficult, I learnt, and was often used by our own Consular couriers when the Gez was in flood; one more pass after the Achiq Davan, the Kauruk Bel, has to be crossed. The former pass (9,800 feet) is steep for the last 1000 feet, but not difficult for loaded animals. I made a note of it as a possible alternative to the long and arduous "Nine Passes" route.

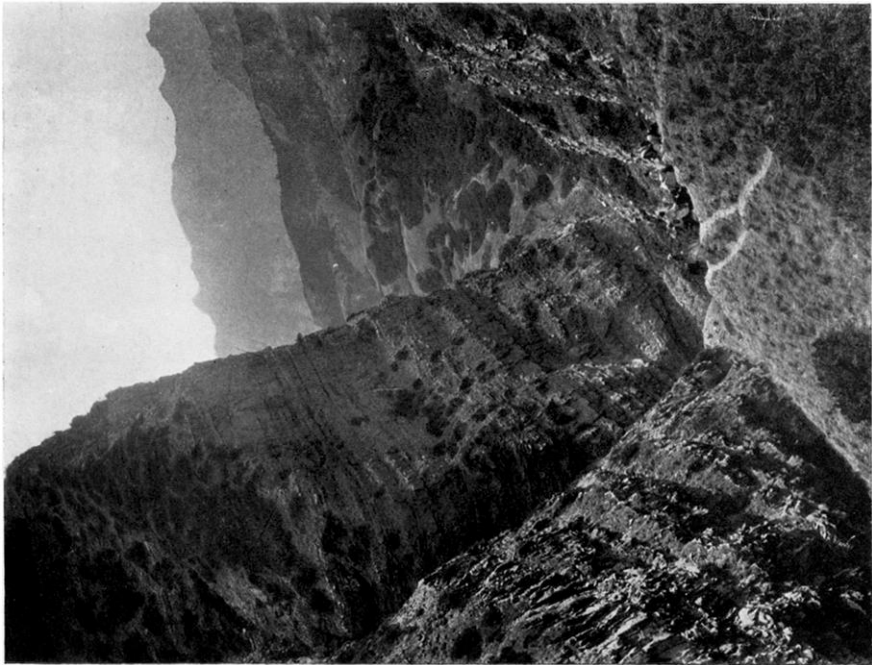
At the fords above and below the "Narrows" near Saman we found that the water had fallen very considerably during the ten days which had elapsed since we had passed this point on our journey up. The change from summer to winter level in these rivers is often surprisingly rapid, and seldom takes more than ten or fifteen days. Observation is complicated by the diurnal changes of level, which differ for different

streams and at different points on the same stream. At Kaying Bashi (10,400 feet) the rise in the river caused by the action of the morning sun on the glaciers took place between 4 and 5 p.m. in the summer months; at Altunluk the daily flood-water came down in the small hours and had subsided as a rule by 11 a.m.

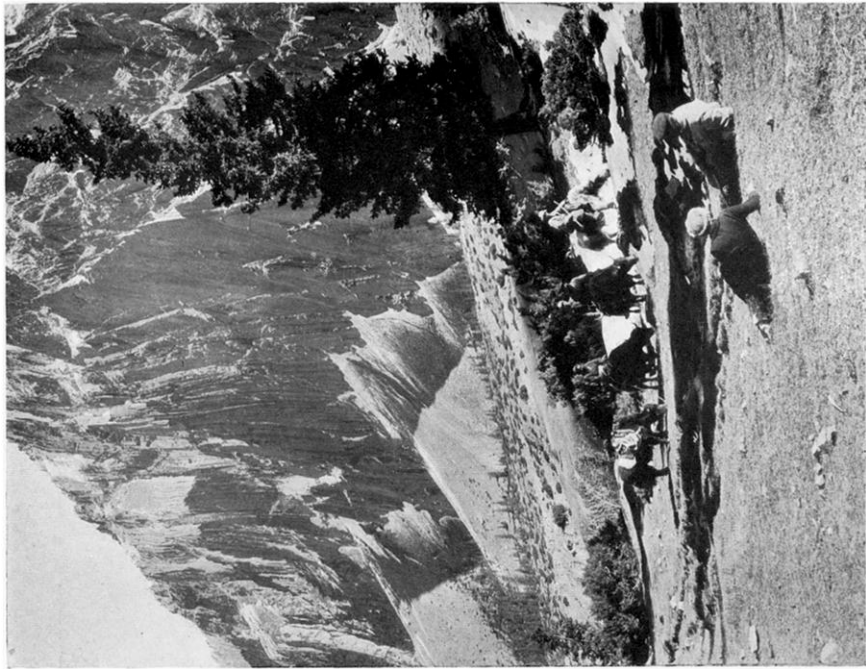
The next occasion on which we visited this region, though only hurriedly, was in the following April (1923), when we found ourselves at Yarkand in the course of a short spring tour with a fortnight to spare for the return journey to Kashgar. Leaving Yarkand on April 2 we marched up into and across the interesting Qizil Tagh (Red Mountain) region by tracks hitherto unused by European travellers. The peaks of the Qizil Tagh attain 16,000 feet and more, and there are small patches of fir forest at two or three points high up on their north faces. Even this, however, is not quite the extreme limit of conifers in this direction; I was told by Dr. Nyström, the head of the Swedish Mission at Yarkand, that in his search for a summer camp in 1922 he had found small fir woods at a place called Ai Bulung above Koserab on the west bank of the Yarkand River. It would be interesting to know whether any other traveller has found conifers in the Yarkand River valley; none are mentioned, so far as I remember, in any of the books I have read.

Crossing three passes of 10,000 feet or more in one day we descended into the Qinqol valley, which we crossed and camped a mile or two up the hitherto unexplored Chumbuz Jilgha. My object was to find out if there was any practicable pass, other than the Ghijaq, affording access to the Upper Qaratash valley from this side. For safety's sake we sent our caravan round by the Ghijaq Pass to wait for us at Chat, and ourselves pushed up the Chumbuz Jilgha with yaks and a minimum of baggage to a summer pasturage called Kizmak (12,500 feet). We slept the night in the hospitable huts of the local Qirghiz Beg (in this case a lady), and crossed the Kizmak pass (14,000 feet) next morning. We were surprised (and no doubt very lucky) to find no snow on the top, but the descent on the west side into the Qaratash valley was excessively steep and showed signs of earlier avalanches.

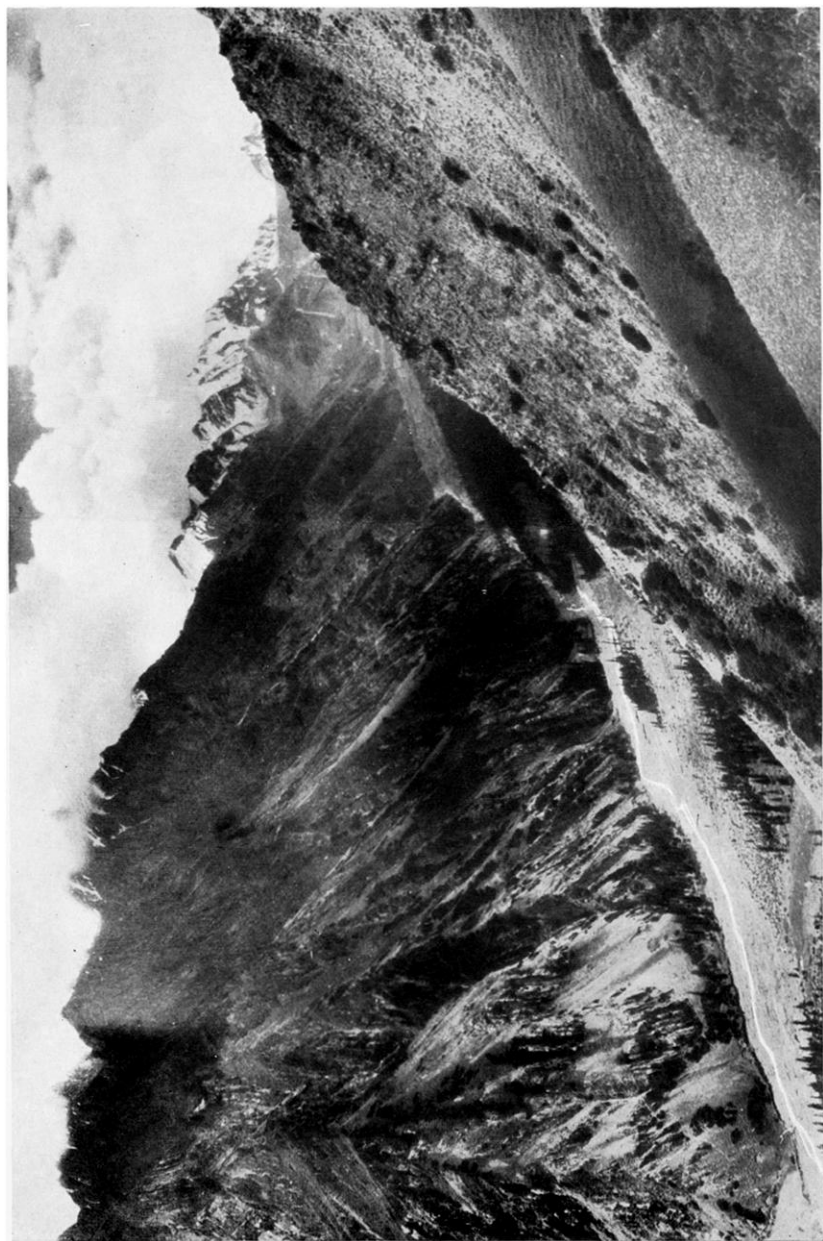
That night we camped at the small Qirghiz settlement of Chat (11,000 feet), just above the junction of the Ghijaq and Qaratash streams, where we found our caravan waiting for us and our tents pitched. Six inches of snow fell that night, but next day was glorious, and I was lucky to secure, from a point 1500 feet up the hillside to the east of Chat, a fine panorama not only of the whole Upper Qaratash valley basin, but of the huge ice-clad dome of Qungur II. and several of the Shiwakte peaks, to say nothing of the Chinghan range and the upper mouth of the main Qaratash gorges. My delight at securing a photograph and a set of rays of Qungur and the Shiwakte at *right angles* to those I had already got can be imagined; they have enabled Major Mason of the Survey of India, in his map based on my materials, to plot in a large part



BOZARGA GLEN, YAPCHAN JILGHA, ON ROUTE TO TIGAR-
MAN SU JILGHA



FOLDED LIMESTONE IN UPPER KAYING JILGHA



TIGARMAN SU JILGHA AND KÖK DÖNG

of the unexplored Upper Chimghan Jilgha and the tremendous peaks which enclose it.

Next day we dived into the great gorge. We would very much have liked to spend two or three days exploring the Upper Chimghan Jilgha, a fine wide valley with grand snowy ranges (the Tersöze to the south and the Chimghan to the north) rising 8000-10,000 feet on either side ; but in mid-April the summer floods may come down any day, and it was inadvisable to run the risk of being caught in the middle of the gorges.

As it was, the water in the river, which we had to cross twenty-eight times between Chat and Qurghan, was only just low enough at most of the fords for horses to cross with safety. The journey down through the gorges to the mouth of the Kaying Jilgha was a strange experience. The mountain sides towered up 10,000 feet on either side, with occasional hanging glaciers visible far above ; the river dashed backwards and forwards between its rocky walls, high up the face of which one could here and there make out the track, a few inches wide and carried from ledge to ledge on the trunks of young fir trees, which in summer forms the only communication between the inhabitants of some of the glens and the outer world. We had hoped to reach Bash Küprük, our old camping-place, by nightfall, but failed to do so owing to the frequency with which we had to unload and reload our ponies among the boulders of the Arasunde gorge ; we camped instead a mile below the outlet of the Qaratumush stream, in the dark, on a narrow spit of land boasting a few bushes and small trees but hardly any grazing for the animals. There was light enough as we passed the mouth of the steeply pitched Qaratumush Jilgha to see patches of fir forest away up under the glaciers. Three families of Qirghiz inhabit this wild glen, the only entrance to which, apart from the main gorge, is a razor-edge " pass " 15,000 feet high leading over from the Ghorumde side-glacier of the Kaying Jilgha. This " pass " is seldom open before August.

After that day's march the Tügene-tar gorge below Bash Küprük and the remainder of the Qaratash valley was plain sailing, and we marched the 48 miles to Akhtur Bazar in two days.

Two months later, towards the end of June, we left Kashgar for our long-anticipated summer holiday in the Kaying valley. We knew that the water in the Qaratash would be too high to permit of our following our former track all the way, but we were determined to get there somehow, even if it entailed following the toilsome " Nine Passes " trail up the Gez valley and then crossing into the Qaratash valley by the Achiq Pass. As it turned out, we managed to cross the river at its widest and shallowest point in the reach above Altunluk with the help of a dozen sturdy villagers. Thence we kept up the same side of the river all the way to the mouth of the Chopqana Jilgha ; the only place where the main river valley had to be left was at the narrows below Saman, which we successfully " turned " under the guidance of a delightful old Qirghiz

aristocrat called Samsaq Bai, whom we luckily met at this point. Samsaq took us 6 weary miles up dry and absolutely barren defiles to the west and across a short but terribly steep "pass" called the Aqsi Davan, over a lofty outcrop of red sandstone 9600 feet high. The last 200 feet of the "pass" consisted merely of a narrow passage pitched at an angle of 30° between perpendicular walls, leading up to a cleft in the rocky backbone. It took two hours to push and haul our animals, including my wife's unfortunate riding-camel Sulaiman, up this passage and to man-handle most of the loads over. On the further side dry nullahs similar to those we had ascended led down to the Qaratash valley, which was joined just below Saman. The whole *détour* occupied seven hours. After this the Chopqana Pass, which we crossed next day (thus avoiding the now impassable Tügene Tar), presented no difficulties.

Arrived at Kaying Bashi, we camped for three weeks on a sheltered Alpine meadow commanding magnificent views of forest and river, towering crag and pale green hanging glacier, wide flower-spangled pastures and thickets of juniper and barberry. The profusion of Alpine flowers was wonderful, and we did as much amateur botanizing as our total ignorance of botany permitted; in the course of our visits this and the following year, we pressed some thirty-seven varieties and obtained the seeds of seven or eight; my wife also painted most of the more striking kinds. This small collection has been examined by Mr. W. B. Turrill, of the Kew Herbarium; his comments will be found at the end of this paper (Note II.). To a layman, the striking thing about the flora of the Kaying and neighbouring valleys is that it is of a distinctly Central Asian rather than of a Himalayan type, although the valleys in question are only about 180 miles as the crow flies from similar regions of Northern Kashmir, the flora of which is, I believe, Himalayan. Of the thirty-seven varieties brought home by us, seventeen are confined to Central Asia, thirteen are found in the northern temperate regions of Europe and Asia, but not in the Himalayas, and only seven are common to the "Alps of Qungur" and the Himalayas. The flower that interested us most of those we found was a sweet-smelling kind of stock which only grew in small isolated patches among the loose stones of glacier moraines between 13,000 and 14,000 feet in elevation, near the highest limit of vegetation; this has been identified as *Parrya flabellata Regel*, previously found only in the Tien Shan. One of the specimens of *Astragalus* we found has proved to be a new species, allied to *A. Alpinus*, but with calyces longer. The conifers of the region are also those of the Tien Shan and not of the Himalayas; with the exception of the small patches of fir forest mentioned above as existing in the Qizil Tagh and at one or two places in the Yarkand River valley, they mark the extreme south-eastern limit of the Tien Shan firs. So far as I know, no fir forests exist in the whole of the Kunlun system.

We saw a great deal of our Qirghiz friends, not only the seven families

who lived in the Kaying Jilgha, encamped for the summer on another meadow about 1000 feet above ours, but those of neighbouring glens who came flocking to see us. My wife gave a tea-party for the ladies, to which women carrying babies came over dizzy passes and through roaring torrents ; but they swarmed round her even more eagerly for medicine, the appetite of the Qirghiz for which is insatiable. We also fed the men heavily on boiled sheep and their own indigestible barley bread and sour cream, and spent hours talking to them in their huts. I was thus able to note down a certain amount of information regarding their manners and customs, folklore, mode of life, and social organization. But my chief concern was always to find a way out of the valley to the east or south, which would enable me to map and photograph the eastern face of Qungur and the Shiwakte. The only pass of any kind that existed, I found, was one called the Kepek at the very head of the Kaying glacier to the south-east of Shiwakte I., leading over to a side valley of the Chinghan Jilgha called Aghalistan. The idea of getting by this route into the Chinghan Jilgha at last made me very anxious to cross the Aghilistan pass, but from personal reconnaissance and inquiries from the Qirghiz I found that it could not be crossed even by unencumbered climbers until August, when the worst of the ice and snow had melted off it. As our visit could not be prolonged after July 15, I was obliged to postpone any attempt to cross until the following summer. The daily clouding over of the sky in the afternoons and the frequency of rainstorms rendered regular survey operations at high altitudes almost impossible ; but I managed to climb to the top of the knife-edged ridges which enclose the valley at two points, each time after one or more preliminary failures. The first occasion on which I was successful was when, starting at 4 a.m. with Sangi Khan and two Qirghiz, I reached at noon Stn. IV. on the Sarigh Yon ridge 5200 feet immediately above our summer camp. From this point, where the thick snow cornice literally overhung the Tigarman Su valley on the further side, I obtained a magnificent view, which I photographed right round from north-east to north-west, only the northern quadrant of the horizon being hidden by the mass of Kök Döng above me. I also took a very useful set of rays to large numbers of peaks with which, thanks to the panoramas I had taken from Kaying Beli, Nichke Qir, and Chat, I was becoming familiar. I was greatly disappointed to find that the clear view of the whole eastern face of Qungur which I had confidently expected was still denied me ; all except the top of the long massif was hidden by the 17,000-foot ridge right opposite me on the west side of the Tigarman Su Jilgha. Part of the Shiwakte range, again, was hidden by the Sarigh Yon peak * quite close to me on the south and some 700 feet higher, but I got a most

* I would very much have liked to climb this, and would have got a far better view of Qungur and the Shiwakte from it, but the snow on the topmost arrête was by midday dangerous.

striking view, which I telephotographed, of three of the peaks afterwards identified as Shiwakte I. (19,400 feet), IIIa. and III. (20,400 feet) respectively. I was also interested to see, far below me in the depths of the trough-like Tigarman Su Jilgha, part of a considerable patch of fir forest.

The second occasion on which I attained a commanding position was after a 6000-foot climb (the first half of it with the help of yaks) to the top of the razor-like Zumurrat ridge. I first tried this climb from the west, *i.e.* from the main Kaying glacier, but was brought to a standstill by unscalable crags at 14,500 feet. I next ascended with yaks the very steep and trying icefall of the Zumurrat glacier, and then on foot struck up a 2000-foot couloir on the east side of the ridge; this time Sangi Khan and I (not the Qirghiz guides, who collapsed) climbed within 500 feet of the top, but were held up by dangerous snow in the couloir. A week later, the melting of the snow having progressed rapidly, we tried again with a couple of tougher Qirghiz. This time we reached the col, which carried a tremendous cornice of snow, at 1 p.m., and were rewarded by the finest mountain view I have ever seen. The whole of the Shiwakte group, glittering like colossal icebergs clothed with hanging glaciers thousands of feet high, stood right opposite me to the west from 4 to 6 miles away. Again Qungur was almost entirely hidden, this time by the Shiwakte, but enough of the top of Qungur II. was visible for me to get a most useful ray on to it. Far away to the south-west I saw a high snowy ridge which I afterwards found to be part of a range 22,000 feet high on the south side of the upper Chimghan Jilgha, opposite Qungur II. Between me and the Shiwakte group was the row of jagged ice-clad peaks at the head of the Kaying Glacier, which I named the Aghalistan Mountains from the name of the valley on the other side of them; of the two well-marked cols between the chief massifs only the right-hand one, the Kepek Pass, is possible.

Coming down I had a somewhat alarming experience: crossing a small branch of the main couloir filled with ice, my foothold gave way and I shot down like an arrow from a bow for about 40 feet, landing quite comfortably in the middle of the deep snow of the main couloir, but receiving some slight bruises on the way. I might, of course, have started an avalanche; this would have been serious the week before, but now there was not enough snow to make a dangerous avalanche; two came down the couloir later in the afternoon, but they were not very alarming affairs.

Besides these major climbs, my wife and I reconnoitred on yaks the Torbashi, Ghorumde, and main Kaying glaciers, mostly up the lateral moraines, the going on which was sometimes very bad. The Ghorumde glacier valley is typical of the region; you follow the stream up among scattered clumps of fir and find unexpectedly that more than half of it comes out of the ground from the midst of a fir coppice at the foot of

Qungur II.



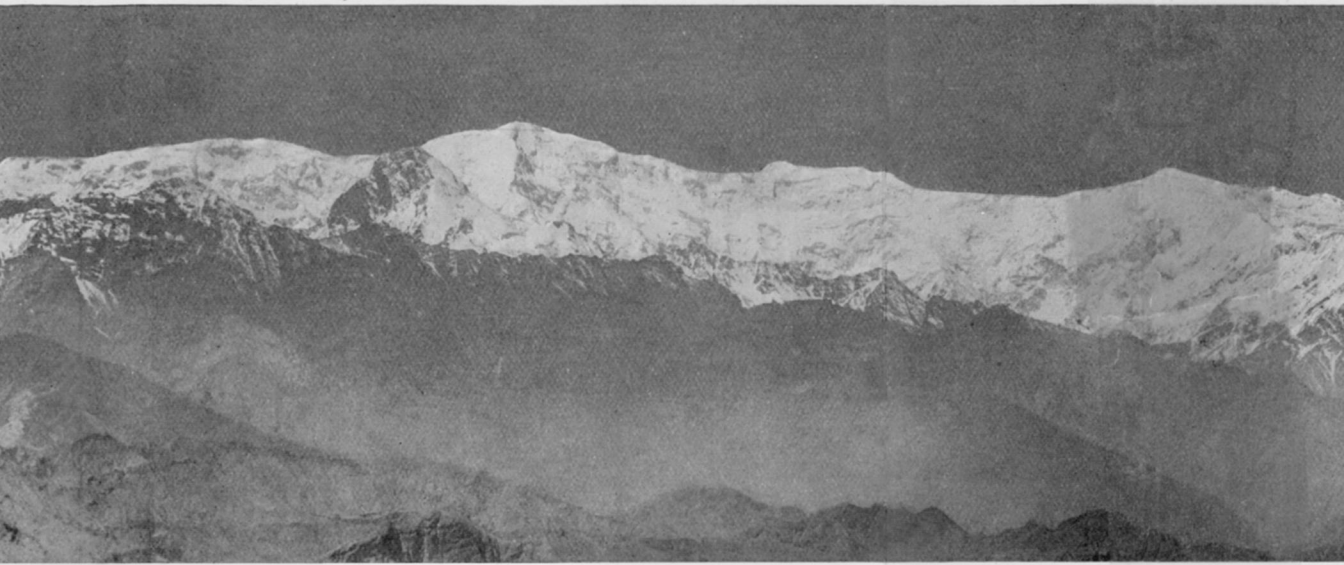
QUNGUR RANGE, LOOKING

Chimghan Jilgha.



SHIWAKTE GROUP, LOOKING SOUTH-WE

Qungur I.

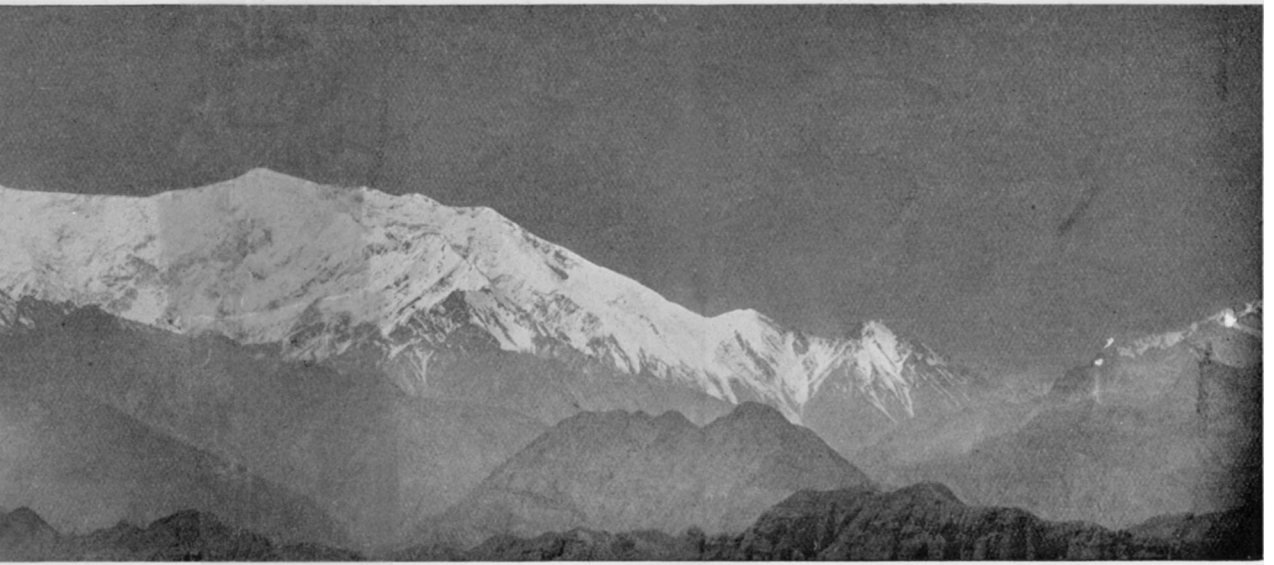


QUNGUR RANGE, LOOKING SOUTH-WEST FROM AQSAI DAVAN, 9400 FEET. $75^{\circ} 40' E.$, $35^{\circ} 53' N.$

Peak IIa.



HIWAKTE GROUP, LOOKING SOUTH-WEST FROM STATION V, 16,200 FEET, ON ZUMURRAT RIDGE. $75^{\circ} 31' E.$, $38^{\circ} 36' N.$



EET. $75^{\circ} 40' \text{ E.}, 35^{\circ} 53' \text{ N.}$

Peak IIa.

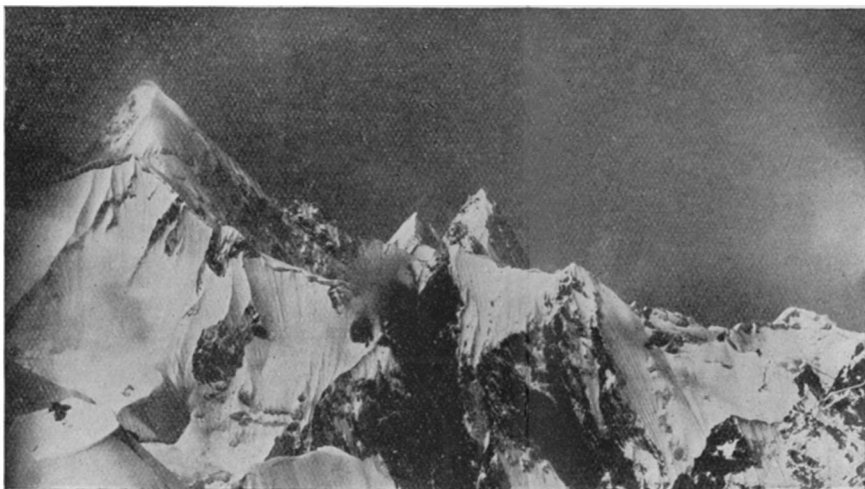
Peak II.

Peak III.



MURRAT RIDGE. $75^{\circ} 31' \text{ E.}, 38^{\circ} 36' \text{ N.}$

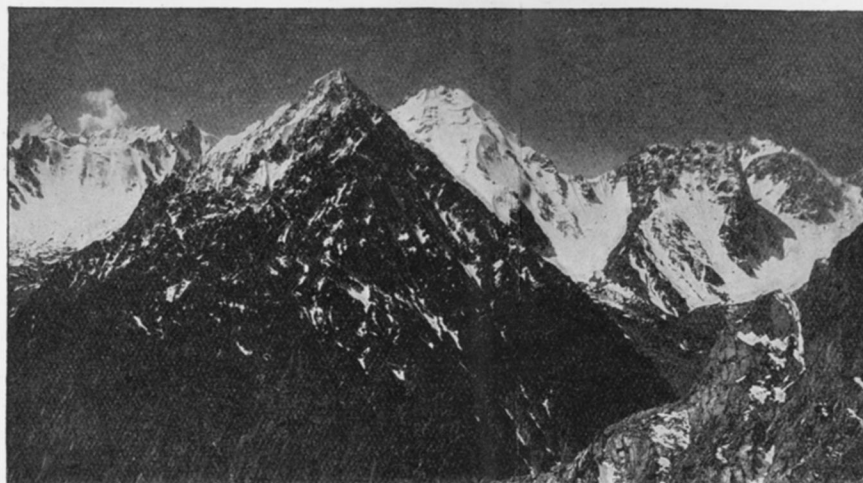
Kepek Pass.



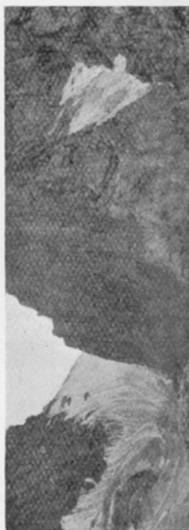
TELEPHOTOGRAPH OF SHIWAKTE GROUP FROM SARIGH YON



TELEPHOTOGRAPH OF ZUMURRAT GLACIER FROM SARIGH YON



CHIMGHAN I. AND ZUMURRAT FROM SARIGH YON





RIGH YON



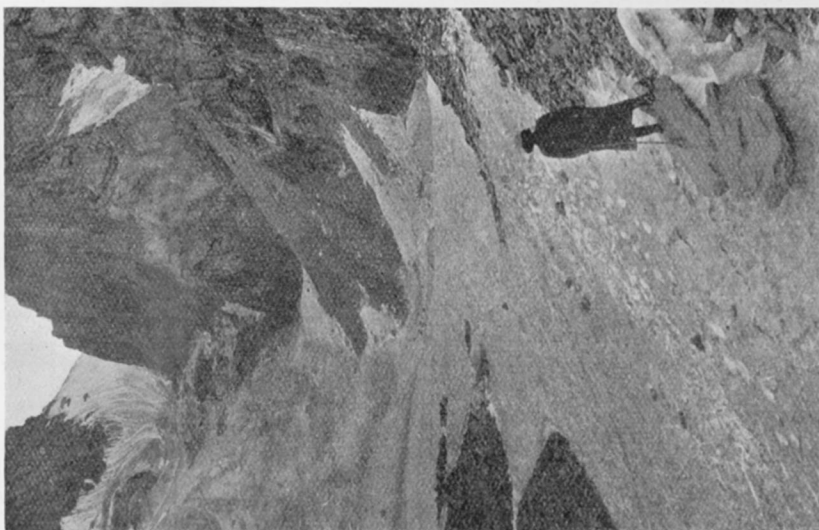
ARIGH YON



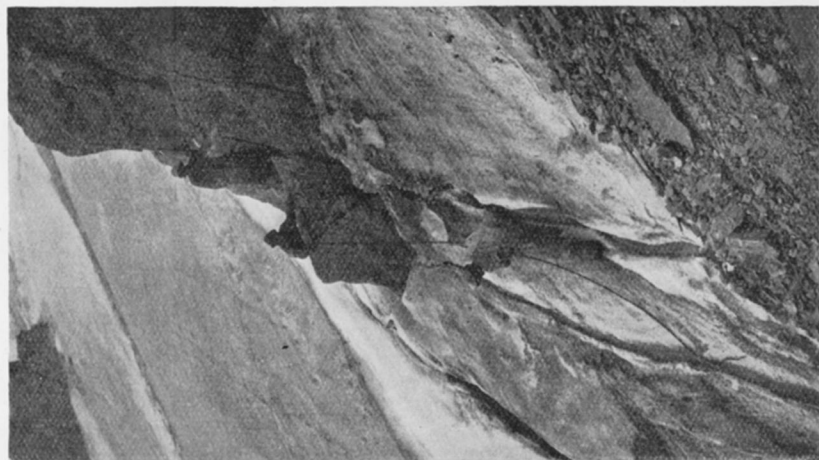
YON



KAYING GLACIER FROM TOP OF KEPEK PASS



HEAD OF KAYING GLACIER AND KEPEK PASS



CROSSING KEPEK PASS

the ancient terminal moraine, which rises steeply above for 1000 feet or more covered with Alpine flowers and juniper scrub. At the top of the rise are pastures with two or three Qirghiz huts, and away behind for miles stretches the glacier-filled valley up to the almost perpendicular ice-clad backbone of the Chinghan range.

A word here on the glaciology of the region. My researches on this subject are confined to a perusal of the appropriate section in that immortal work 'Hints to Travellers,' but the veriest beginner could say with some confidence that all the main glaciers I examined under the eastern flanks of Qungur and Chakragil are in full retreat. In most cases ancient terminal moraines could be clearly traced far below the present glacier-foot, and the "toes" of the glaciers themselves were generally shrunk to a remarkable extent. The most striking instance of this was in the case of the great Oi Tagh glacier among the Alps of Chakragil.

When we left Kaying Bashi this time we sent the caravan with our riding-horses straight to Saman, borrowed some yaks, and spent two nights as the guests of our friend Samsaq Bai, at his *aq-ois* pitched 12,000 feet up at Bozarga, on the southern slope of the Zor Qir ridge. The march to this place was an arduous but extremely interesting one. After crossing the Chopqana pass, instead of descending the glen of that name we kept round to the left and traversed for several miles the steep pine-clad northern face of Yelpakhtash, the three great crags of which, 13,000-14,000 feet high, towered above us on the left. In some places the trail crossed unpleasant rocky outcrops, in others the muddy tracks of recent landslides, where the whole mountain face, forests and all, seemed in a state of unstable equilibrium; elsewhere again the path, level and quite well engineered, led through pleasant forest glades for all the world as if we were among the Simla Hills. At the beautiful alp of Yapchan, of which we made a careful note for future camps, the path suddenly dived into the depths of a gorge and then crawled up an apparently impossible cleft in the great pine-crowned red sandstone cliffs of Bele Tök, 1500 feet high and very nearly perpendicular. We seemed at one point to be in a perfect *cul-de-sac* with cliffs literally overhanging us on three sides; but Samsaq led us up to a ledge, invisible from below, along which we traversed the cliffs to the left and found ourselves in a steep and narrow but comparatively straightforward gully. Further up we came to masses of wild rose and clematis with clumps of fir and a spring of clear water, until at last, 2000 feet above the bottom of the Yapchan gorge, we saw the huts of our old guide and his large family in front of us on a grassy knoll.

Hearing that there was an easy pass, the At Bel, quite close to us leading over Zor Qir into the Tigarman Su Jilgha, I resolved to reconnoitre it; but that night a wild storm of sleet and rain came on which continued for twenty-four hours and kept us close prisoners in our

hut the whole of the next day. The following morning, however, it was brilliantly fine, so before leaving for Saman we climbed to one of the summits of the Zor Qir ridge. From this point, 13,000 feet high, I obtained useful rays to the magnificent Chakragil massif, to Qungur II., and, no less important, straight down the lower reaches of the Qaratash to the Akhtur oasis; but I was disappointed once more in my expectations of a view of the eastern face of Qungur, for the snowy ridge dividing the Tigarman Su from the Qurghan Köl Jilgha hid all but the very top of Qungur II., while the vast mass of Kök Döng shut out the whole view from south-west to south-east.

Next day when we crossed the Aqsai Pass from Saman with our caravan (a much easier task from the south side than from the north) it was again brilliantly clear, and I obtained from the top of the ridge a very good telepanorama of the whole Qungur massif. The picture ought to include the Shiwakte group, which looked most impressive with its sheaf of needle peaks; but here the evil genius of the photographer stepped in, and I fogged the fourth and last plate of the telepanorama by failing to replace the dark slide of the plate-carrier firmly before removing the plate from the camera. This view of the Shiwakte would have been invaluable for survey purposes, and I regretted its loss more bitterly than that of any of the numerous pictures I lost through carelessness or ill luck.

The following summer (1924), though we expected to be leaving Kashgar for good early in September, we managed to work in a last fortnight among our beloved "Alps of Qungur" in July-August. This time we decided to make first for the Yapchan Jilgha before going to Kaying, as I was anxious to reconnoitre from it the Tigarman Su Jilgha and possibly beyond. Two days were delightfully spent among the pines and amazing riot of flowers of the beautiful Yapchan alp, opposite the magnificent red cliffs of Bozarga and Bele Tök.

Then with an irreducible minimum of retinue and baggage carried on yaks we climbed once more the secret track to Bozarga and crossed the At Bel pass (12,000 feet) behind it. Descending grassy slopes for 2000 feet we found ourselves at the prosperous-looking encampment of Oi, the summer headquarters of the "Nasir Beg,"* of the Tigarman Su Jilgha. Here, to our surprise, we were told that we were no longer in the Yangi Hissar district but under the jurisdiction of the magistrate of the Chinese Pamirs at Tashqurghan, eight marches away. The Beg did his best to make us stay the night with him and go back next day without venturing down into the wild Tigarman Su Jilgha, the path to which he described as very difficult; but finding that we were determined, he did his best for us and lent us six fresh yaks for the onward journey in place of our tired ones. The track proved narrow and up-and-down but not dangerous, and two hours later we topped the last

* A kind of minor headman subordinate to the Beg of the region and responsible to him for the revenue of one *jilgha* (valley).

col and looked right up the deep trough-like valley of the Tigarman Su Jilgha (so called from an old mill (*tigarman*), near which is a shrine). A mile further we came to fields of meadowsweet and the first tall firs, and were met by the old headman of the tiny Kirghiz community (three families) whose tents were pitched in a clearing in the thick forest beyond.

We stayed here three nights, but were unable to do much as it rained nearly the whole time. One of my objects had been to climb the Dilbagh "pass," a 13,000-foot col leading over to the Qurghan Kōl Jilgha, another large unexplored glacier valley of Qungur; from this col I hoped at last to see the inner arcana of the great range. But when we tried it the first morning, down came the clouds and we had to turn back half-way. As for the peaks at the head of the Tigarman Su Jilgha, of which I had hoped to obtain a close view, they never cleared of cloud at all. However, the valley bottom and glacier foot which we explored were well worth close examination, and the Qirghiz were an exceptionally friendly and interesting community. A striking feature of the valley was a flood of shell-pink water which gushed out of "caverns measureless to man" at the foot of the forest-clad terminal moraine of what must have been a vast glacier filling the Tigarman Su valley in ancient times. We found the source of the pink colour 2 miles higher up, where at the foot of the existing glacier we discovered beds of red clay over which a strong stream flowed from the glacier for 100 yards before disappearing into the earth.

Another feature of the jilgha is the abundant evidence of the presence of copper. I was told, indeed, that a rich vein of copper ore used once to be worked in a terrifying and barely accessible cleft high up on the north-west face of Kōk Dōng, but that the working had been discontinued twenty years ago for fear of the military authorities hearing of it; this would have meant the mine being taken over and the Qirghiz forced to work in it for the benefit of the military authorities, who in Kashgaria regard all mineral rights as their monopoly.

There is absolutely no exit from the upper part of the Tigarman Su Jilgha, nor can it be reached in summer from the Gez defile, as the lower course of the stream lies through a deep and narrow gorge impassable in the high-water season. The only access to the valley is by the way we came, that is to say, up the Chopqana Jilgha, across the upper Yapchan J. (the lower gorge of which is also impassable) and over the At Bel Pass; and that is not possible for loaded ponies, only for yaks. Nor would it be possible for a stranger to find the way up to the At Bel without the guidance of the Qirghiz.

On our return to the Yapchan alp, where we had left our tents, we went out of our way to visit Samsaq Bai and his clan, who were encamped this year just behind the fir-clad crest of one of the great red precipices of Zor Qir. A grassy ridge dotted with neat clumps of fir and juniper, very much like a well-laid-out park, jutted out over the Yapchan valley,

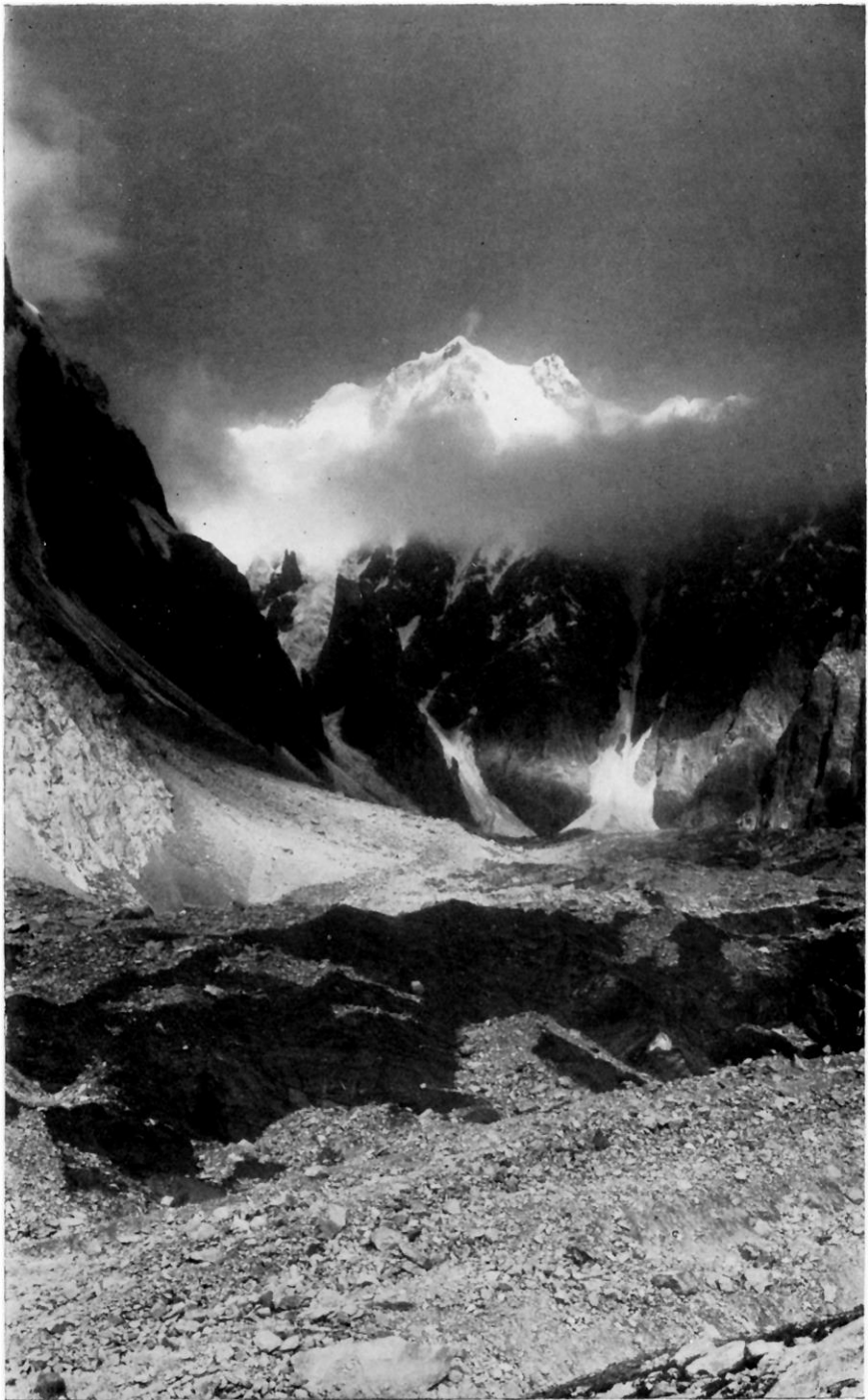
and on this the huts were pitched ; the grazing all round was excellent, but the place had one drawback in that the unfortunate ladies (who do all the hard work in a Qirghiz camp) had to descend 600 feet to the spring in the Bozarga glen for their water.

After this trip we had only eight days to spare for Kaying Bashi, where we camped once more at the lovely alp below the forest. Only four of our eight days were fine. On one of these I climbed *viâ* the Tor Bashi glacier to the top of the knife-edge ridge at the head of the Tigarman Su glacier. Here, at 16,100 feet on a south face, there was still a great deal of soft snow, and with only a Qirghiz boy to help me I had great difficulty in reaching the top of the cornice. I was armed only with a prismatic compass and my film camera on this occasion. With the compass I obtained some very useful angles on to some of the mountains on the other side of the Chimghan Jilgha, which appeared above the peaks of the Aghalistan range, also down the Tigarman Su Jilgha. The latter enabled me to fit my plane-table sketch of Tigarman Su on to the rest of my map. With the camera I secured a fine picture of the ice-clad peak of Shiwakte I. (19,400 feet) piercing the clouds right opposite me.

The only important piece of work I managed to do during this all-too-short visit was the crossing of the Kepek Pass into the basin of the Chimghan Jilgha. Only now, in the first week of August, did the Qirghiz pronounce the pass to be sufficiently clear of snow for a crossing to be attempted. Even so, the col was so steep for the last 1000 feet and so filled with glacier ice that there was no question of yaks going up it. Accompanied only by Sangi Khan and three Qirghiz hunters, I left my wife in camp for a night by herself and started at 5 a.m. with a supply of cold food and Bovril, my two cameras, a sleeping-bag with a blanket, pillow, etc., in it and my plane-table and instruments (including clinometer and hypsometer) tied up in a sack. This made two light cooly-loads. We did the first 4000 feet on yaks, and then left them to graze on the highest pastures of the Kaying glacier while we attacked the col. On our left ice-slopes at angles varying from 45° to 60° (measured roughly with a protractor) came down from the precipices of Aghalistan Pk. 1 to the very foot of the lower cliffs of Shiwakte I., along which we had to crawl the whole way up. In several places steps had to be cut across tongues of ice running up into clefts in the cliff, and the loads had often to be sent up from hand to hand over difficult bits. Shortly after ten we at last reached the col, and saw away to the left an array of peaks which I afterwards found to be those to the south of the Chimghan Jilgha and its tributary the Tersöze. The Shiwakte peaks were hidden by a jagged black ridge like a row of teeth coming down from Shiwakte I. I spent two hours on the flat top of a boulder taking a complete set of rays and some pictures, and also boiled the hypsometer, which gave a height of 15,230 feet. During this time it unfortunately clouded up,



SHIWAKTE PEAK I, FROM COL ABOVE TIGARMAN SU GLACIER



SHIWAKTE PEAK III. FROM AGHALISTAN

and the Shiwakte group was completely hidden when we descended a small glacier on the south side of the pass and joined, at 13,000 feet, the huge Aq Tash glacier. This took some time, as I made a careful plane-table sketch of all I could see as I went along. Further down we were met by some Qirghiz, who were astonished to see us, but led us hospitably to their two huts and sent word to their headman, Sayat Beg, at his encampment in the main Chinghan Jilgha. This man was very helpful when he came up and gave me a lot of information. Among other things he told me that the Chinghan Jilgha and its branches are rated for revenue purposes at sixty households *; that there are no fir trees in any of them; that the only possible outlet to the Pamirs is over an exceedingly difficult pass, worse even than the Aghalistan, at the head of the Tersöze Jilgha; and that the name "Shiwakte" is used by the Qirghiz of the Chinghan J. for something—whether mountains, pastures, or what I could not quite make out—at the head of their valley.

Owing to the rain and a bad headache I did nothing more that day, and went to sleep at nine on the floor of one of the huts. I was up again at four, and started back for Kaying Bashi at six. I was rather anxious about the weather and afraid of being cut off on the wrong side of the pass, perhaps for weeks, by bad weather and heavy snow. Luckily it had cleared up in the early morning, and though it clouded over again afterwards I was able before it did so to complete my plane-table sketch and secure some fine pictures of the magnificent Shiwakte group, the peaks of which stood round the upper Aghalistan valley in a semi-circle. Never shall I forget the steepness of their sides nor the terrific hanging glaciers that depended from them like vast frozen waterfalls thousands of feet high. The latter feed the Aq Tash (white rock) glacier, so called by the Qirghiz from its remarkable serac, which is visible from a great distance.

Our descent of the pass on the return journey was somewhat exciting. It was warmer than the day before, evidently banking up for heavy rain, and the ice was very soft. The steps we had made the day before had melted, and it was difficult to cut new ones; rocks loosened from the cliffs above came down frequently and had to be dodged; nor was it

* The other divisions of the Qaratash Valley are as follows:

Qaratash, i.e. the main valley above Chinghan Ayaki, 60 households.

Khan Terek, i.e. the main valley and its branches below the big gorge, including Kaying, Chopkana, Yapchan, etc., 30 households.

Terek Kichik (among the mountains on the east side of the Karatash), 100 households.

The revenue paid by the Chinghan Jilgha with its (nominal) 60 households is as follows:

Four *saghins* of cheese, i.e. the output of four yak cows in a year; this can be commuted for four *charaks* (1 charak = 20 lbs.) of barley flour.

Forty ropes of camel-hair.

A hundred *charaks* of flour.

Ten yaks or ponies to be lent for transport whenever required.

safe to avoid them by going out on to the steeply pitched glacier, because the thin coating of flat stones and frozen snow over the crevasses might now be insufficient to bear one's weight. As it was, Sayat Beg, who at my request came over with us to investigate some complaint of the Khan Terek Qirghiz, had a narrow escape ; he was just in front of me as we filed across an arm of the glacier, when he suddenly disappeared up to his armpits. The *débris* of flat stones which lay on top of the ice formed a support which prevented him sinking further, and we soon fished him out ; but, peering down into the hole he had made, I noticed with a slight shudder that Sayat's legs had been dangling over a crevasse at least 20 or 30 feet deep. Near the bottom of the steep part we had to jump off the edge of the glacier on to a steep slope of loose stones, and in doing so started a stone-slide which plunged *under* the snowfield we had just left and went on roaring away underneath for a long time. However, we soon found ourselves safely on the flowery moraine of the main Kaying glacier, where by arrangement a Qirghiz lad was waiting for us with the yaks.

This was the last of my attempts to map the " Alps of Qungur " from the side of the Qaratash Valley. On the way down from Kashgar to India, however, I made an effort to secure a valuable cross-view of Qungur and the peaks at the head of the Tigarman Su and Qurghan Kōl Jilghas from the north. On the top of Zor Qir in July 1923 Samsaq Bai had pointed out to me a pass, on the north side of the Gez between the Chakragil massif and Sargalang, called the Arpa Bel. He told me it was regularly used by the local people, and led over from the Gez river near Gez Qaraul to the Oitagh Jilgha, which he said was a very fine valley with fir woods and rich pastures and many inhabitants. As the pass was free from snow and promised the above-mentioned cross-view of Qungur and the Shiwakte, and as no European so far as I knew had visited the forests of the Upper Oitagh valley, I decided to explore it on the way down to India.

This is not the place to describe the remarkable Alpine region we found right under the 14,000-foot precipices of Chakragil—different from but quite as fine as the Alps of Qungur—nor the new alternative route we discovered connecting Tashmalik with the bridge at Gez Qaraul ; suffice it to say that we were denied the view of Qungur we had hoped for from the Arpa Bel, for throughout the ten days we were in the Oitagh region the atmosphere remained persistently thick with the fatal dust-haze of Kashgaria.

Marching up the Gez Dara we emerged on September 15 from its terrific gorges, and two days later were camping on the shores of Little Qara Kōl in perfect weather. We spent four days in this neighbourhood, during which I visited several of Stein's chief survey stations and took rays from them to the salient points of Qungur and Shiwakte, as well as a number of photographs. My object was to

identify from the opposite side the peaks and ridges I had surveyed from the north-east. I had no difficulty as regards Qungur, but was somewhat at sea as regards the Shiwakte group. None the less, the materials I obtained from this side turned out afterwards exceedingly useful.

On arrival in India at the beginning of November I at once got in touch with the Survey of India authorities, who asked me to take my maps and other material to their Drawing Office at Simla. Here the officer in charge was Major Kenneth Mason, R.E., who has made the cartography of the Pamir region his own. He took the greatest interest in my amateur efforts, which he treated much more seriously than I had expected, spending four whole days on taking over every scrap of my material, plane-table sketches, panoramas, sets of rays and all, and discussing the whole region and the problems connected with it at great length. The amount of work he put into it then and afterwards will be seen from the map and memorandum he has produced specially for this meeting of the Society, and I am more than grateful to him.

NOTES ON THE COMPILATION OF MR. C. P. SKRINE'S TOPOGRAPHICAL MATERIAL IN THE NEIGHBOUR- HOOD OF THE QUNGUR MASSIF

Major Kenneth Mason, R.E., Survey of India

The material available for the compilation of Mr. Skrine's map consisted of (a) Plane-table rays drawn from various points; (b) Rough plane-table sketches; (c) Enlargements of photographs; (d) Clinometer readings to various points; (e) Route reports; (f) Verbal descriptions. Of these, the greatest use has been made of (a), (b), and (c).

The whole of the area falls in sheet 42 N. In this sheet are only two class A points (fixed by the Pamir Boundary Commission), and no rays were available to these. Of the class B triangulation, that of Deasy observed from the south, and that of Stein based on this work are the most reliable (see *Memoir on maps of Chinese Turkistan and Kansu*, by Sir A. Stein). The first basis of the map is therefore the positions of Little Qara K l, Subashi, and Shamalda in the neighbourhood of Little Qara K l lake, and of the peak Qungur I., 25,146 feet, fixed by Stein.

In panoramas IXa., IXb. of *Mountain Panoramas from the Pamirs and Kunlun*, Stein shows the whole south-western face of the Qungur Massif. (These panoramas are reproduced as 3 A and 3 B in the Memoir quoted above.) Comparing the outline of this with the telepanorama taken by Skrine from Kashgar (and with another from Aqsai Davan), almost exactly from the opposite direction, it is possible to identify in both pictures the following points; PK 2/42 N, PK 3/42 N (Chakragil, 22,070, and 21,480); the Gez defile; the whole of the Qungur ridge from this defile to some 6 miles east-south-east of Qungur I. Beyond this point however the outline of the distant mountains from the two positions is no longer the same. The mountain I have shown as Qungur II. is half hidden in Stein's panorama by a great spur sent out in a S.E. direction from Qungur I.; while in Skrine's panorama the highest point is almost, if not quite, hidden by the great dome-shaped massif of Qungur II. itself.

From Little Qara K l, Qungur II. looks insignificant beside Qungur I.: from Kashgar, Qungur I. looks insignificant beside Qungur II.

It is now possible to examine the observations made from Kashgar to what must have appeared the highest point. Deasy's PK 12/42 N and Trotter's PK 15/42 N are, I am convinced, both attempts to fix the highest point of this great dome.

Deasy's position is $38^{\circ} 39' 26''$, $75^{\circ} 21' 37''$;
Trotter's " $38^{\circ} 35' 15''$, $75^{\circ} 22' 47''$.

The former assigns to it an altitude of 23,530 feet, the latter, 25,350 feet. Both observers fixed it from approximately the same point, some 70 miles away. From a subsequent examination of Skrine's photographs, I am convinced, Qungur II. presents a dome over 23,000 feet, 6 miles long from N.N.W. to S.S.E., and 4 miles long from N. to S. Not only did Deasy not observe the same point as Trotter, but I do not believe that either observed the same point at each end of their base. With an enormous ill-defined dome such as this, such a mistake is easily possible.

In view of these considerations PK 12/42 N and PK 15/42 N. have been rejected.

Skrine handed me over a most useful set of plane-table rays to peaks from Toquz Aq Bazar, which place he fixed from Kashgar, and another valuable set from Altunluk, of which the position assigned by Stein has been accepted. The rays from these two points combined with those already drawn from the Little Qara K l stations—all being set on Qungur I.—gave a series of intersections to peaks, shown on the map as the Shiwakte group, and Aghalistan. From these positions it was possible, by means of other rays, to resect the approximate positions of station 4 and station 5, and to make further intersections. The principle was to draw the rays, ignoring Skrine's identifications; then to compare from photographs and see whether the peaks could exist in those positions. In general, Skrine's identifications, in spite of the difficult nature of the ground, worked out extremely well.

Having obtained positions for peaks, these were identified as far as possible with peaks shown on Skrine's plane-table sketches of the ground, which were then adjusted to these positions, and amplified by close examination of the photographs. The detail is fullest on the south side of and at the head of the Kaying Jilgha, and at the head of the Tigarman Su glacier.

A useful panorama from near Chat gave material for the south-western flanks of Shiwakte II. and IIa., and a telephotograph from the same point seems to indicate a wide basin at the head of the Chimghan Jilgha, probably filled by a glacier, and enclosed by the precipitous face of the southern spur of Qungur II. The Qaratumush valley was filled in from photographs taken near its mouth, and from stations II. and IV. The mouth and head of Pitlik Jilgha, the precipitous spurs and ridges bordering it and the Qaratash, were also drawn in from these latter stations, intersections having been obtained to points on the crest from them and from Altunluk. The ground by Yapchan Jilgha and Chopqana Jilgha is mainly from Skrine's sketches, slightly adjusted to new positions.

The north faces of Qungur II. and Qungur I. are from more distant photographs, taken in conjunction with Stein's work. The Oitagh Jilgha, Arpa Bel, Chakragil area is from a small sketch, a rough verbal description, and from route reports.

The ground in the neighbourhood of the Aqsai Davan is based on Stein, altered to Skrine's notes.

The heights throughout are rough. They are based on aneroid, boiling-point, and clinometer readings.

Qungur I. is the only peak that can be said to be fixed for height.

The height of Qungur II. is based on the following considerations. Deasy's rays to his Pk. 12, if produced to the newly assigned position of Qungur II., give 25,100; Trotter's position is almost the same range from Kashgar as the new position; his height is 25,350: the average of clinometer readings of Skrine from three different points gives 25,200; the height obtained from Sir Aurel Stein's panorama from Qara K l lake makes it 25,050.

I have assigned 25,200, believing it to be slightly higher than Qungur I.

The remaining heights of Skrine are to the nearest 100 feet, and may be taken to have a probable error of 300-400 feet.

The following alterations have been made in the map of Stein:

- (a) Oitagh Aghzi at the mouth of Oitagh Jilgha is moved 3 miles south.
- (b) Langar is moved 3 miles south.
- (c) Crow-fly distance between Langar and Achiq Jilgha mouth is shortened by 3 miles.
- (d) Crow-fly distance between Achiq Jilgha mouth and Altunluk is lengthened by 4 miles.
- (e) Adjustments to position of Chakragil peaks and Sargalang, to fit in with Skrine's plane-table rays. I am convinced these fixings of Deasy from Kashgar, being very acute, admit this adjustment.
- (f) Insertion of Qungur II. massif.
- (g) Insertions of Qurghan and Tigarman Su glaciers and corrections of detail.
- (h) Insertion of detail of Yapchan, Chopqana, Kaying, and Qaratumush Jilghas with their glaciers and peaks.
- (i) Extension of Terek Kichik and Pitlik Jilghas and the insertion of detail to the south of the latter.
- (j) Corrections of the direction of the Chimghan Jilgha with the branch Ters ze Jilgha.
- (k) Chimghan-ayaki is $1\frac{1}{2}$ miles south and 4 miles west of the position given it by Stein.

Skrine's explorations fill in several important blanks in our knowledge of the eastern flanks of the Qungur massif. They give a very good picture of the "peripheral gorges of the Pamir plateau," and while emphasizing the difficulties of the ground, reveal a certain amount of vegetation and habitation of which we previously had no knowledge whatever. Separate communities living in the different jilghas can only communicate with each other by difficult passes, and frequently such intercourse is interrupted altogether.

One of the outstanding features of the exploration is the further evidence of the existence of Qungur II. Its great featureless dome has been the cause of uncertainty for years. Its height is not yet settled, but we know now that it competes with Qungur I. for the post of the highest point of the Pamirs.

NOTE ON THE PLANTS COLLECTED BY MR. SKRINE

W. B. Turrill, M.Sc., F.R.S., The Herbarium, Kew

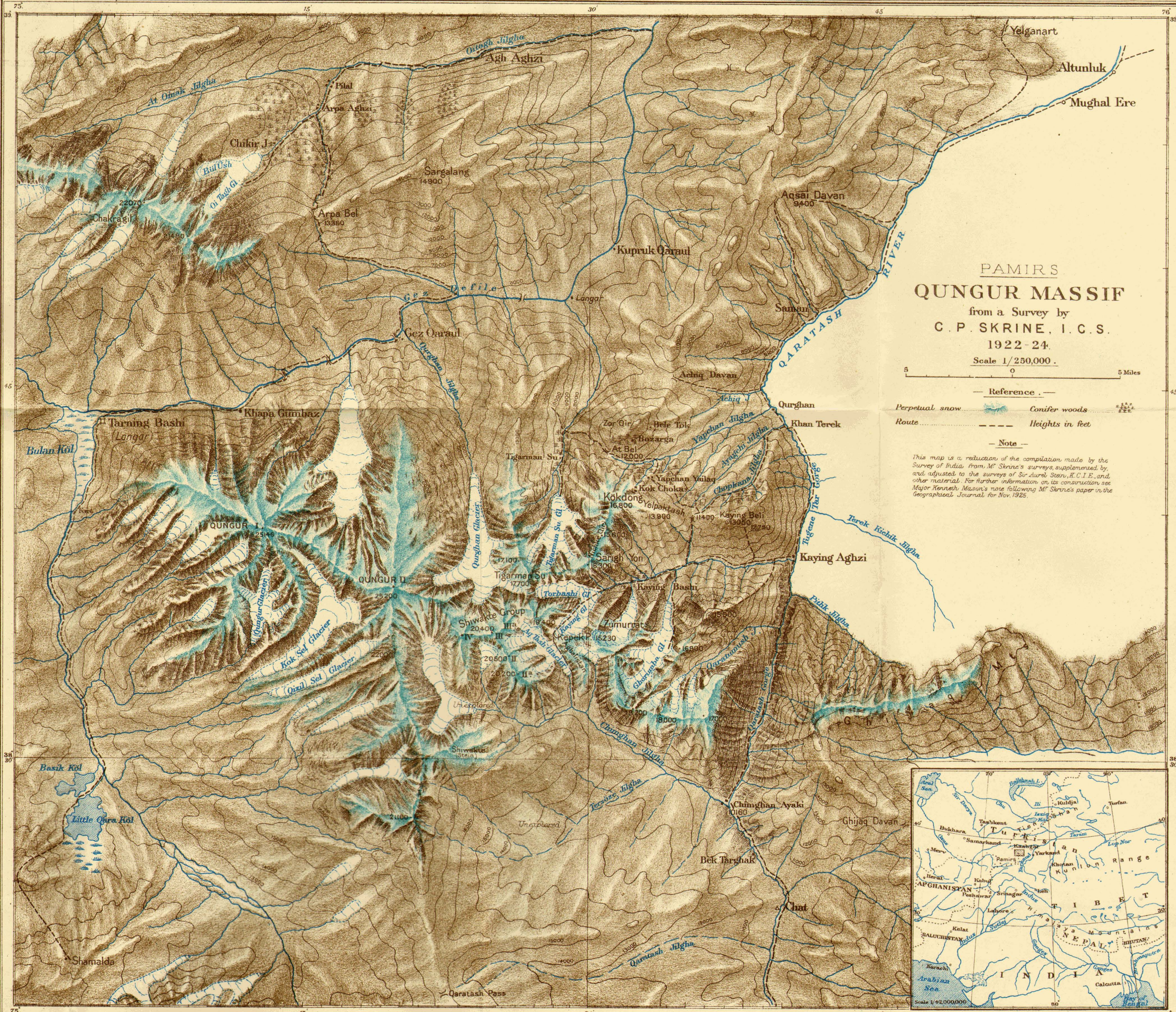
The collection, though small, indicates that the flora, taken as a whole, is distinct from that of the Himalayas and belongs, indeed, to the Central Asian Region. The most striking feature is the number of plants limited either to

Turkistan or to this country and the immediately surrounding districts. These Central Asian endemics give the flora a facies of its own, and, since they are often very distinct species, suggest a long period of uninterrupted floristic development. On the other hand, it is interesting to note the occurrence of several species which have a very wide distribution over the whole of the North Temperate Regions. It is impossible to suggest the locality of origin of these from a study of their present distribution alone.

Before the paper the PRESIDENT (the Earl of Ronaldshay) said: Our lecturer this evening, Mr. Skrine, in the course of his official duties as a member of the Indian Political Service, has been fortunate enough to obtain opportunities of visiting an absolutely unknown piece of Central Asia. Mr. Skrine, when the war broke out, found himself a member of the Indian Civil Service, and, being active, enterprising, and patriotic, he made strenuous endeavours to join His Majesty's forces. Circumstances preventing him from doing that, he did what seemed to him to be the next best thing with a view to getting to the scene of action, that is to say, he joined the Indian Political Department, and in that capacity he first went to Eastern Persia, where he had many chances of studying that part of the country during the war. Subsequently he was sent as our representative to Kashgar, and being anxious to do what he could to further the cause of geography he obtained permission to visit the mountains of Qungur, the meridional chain which lies from north to south between the main systems of the Himalayan Mountains and the Tian Shan; and it is this hitherto unvisited range that Mr. Skrine is going to describe to-night. I might add that he has a long tradition of Indian service behind him, for he is the son of an eminent member of the Indian Civil Service who, as I happen to know from personal knowledge, is still remembered with feelings of affection by the people of Bengal. Our lecturer this evening is also an extraordinarily competent photographer, and he will be able to show us views of these unknown mountains and valleys in the heart of Central Asia which have been described to me by those who have already seen them as some of the finest photographs of mountain scenery which it is possible to see. We look forward, therefore, with feelings of most pleasurable anticipation to Mr. Skrine's lecture, and I now have pleasure in asking him to proceed with his narrative.

Mr. Skrine then read the paper printed above.

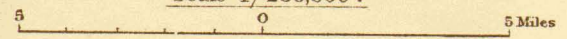
The PRESIDENT: Is there anyone present who has been in the neighbourhood of the country we have seen to-night? If so, I would be glad if any volunteer would say a few words. . . . It appears that there is no one present who has any personal knowledge of the neighbourhood. The thing that struck me about the photographs, a point which Mr. Skrine himself emphasized, was the extraordinary similarity between the valleys of this hitherto unvisited meridional range and the valleys of the Tian Shan Mountains which lie very much farther north. The part of the Tian Shan which I know lies in the neighbourhood of Kuldja on the Chinese frontier, which must be some 200 or 300 miles north-east of the actual mountains of which Mr. Skrine has shown pictures this evening, and the pictures which he showed us, both from the contours of the mountain, the flora, and even from the people themselves, might have been taken in the Tian Shan round about Kuldja. The mountains there are inhabited in the same way by those wandering Kirghiz tribes, and throughout the valleys which I know there are the same trees which Mr. Skrine



PAMIRS
QUNGUR MASSIF

from a Survey by
C. P. SKRINE, I. C. S.
 1922-24.

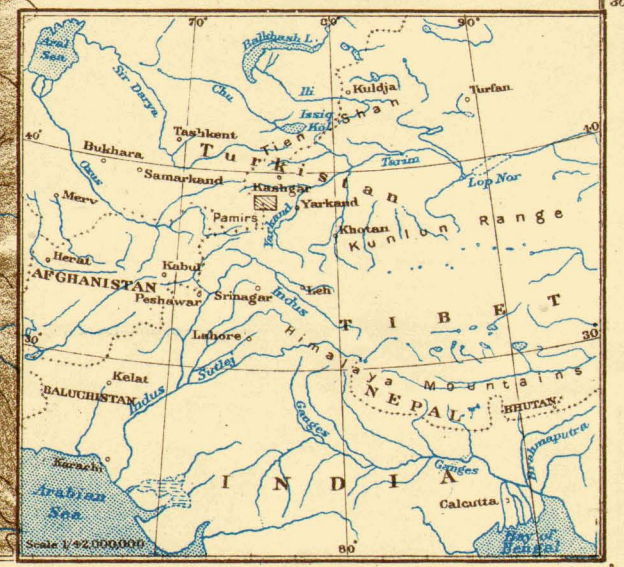
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- Reference
- Perpetual snow
 - Conifer woods
 - Route
 - Heights in feet

Note

This map is a reduction of the compilation made by the Survey of India from Mr Skrine's surveys, supplemented by, and adjusted to the surveys of Sir Aurel Stein, R.C.I.E., and other material. For further information on its construction see Major Kenneth Mason's note following Mr Skrine's paper in the Geographical Journal for Nov. 1925.





At Onak Jilgha

Ontagh Jilgha
Agh Aghzi

Chikir J.

Bil Ush
Qi Tagh Gl.

Chakragil
22070

Islal

Arpa Aghzi

Sangalang
14900

Arpa Bel
13350

Gez Defile

Gez Qaraul

Qureshan Jilgha

Bulan Kól

Tarung Bashi
(Langar)

Khapa Gumbaz

QUNGUR I
25146

QUNGUR II
25200

Tigarman

Tigarman Su
17700

Qureshan Glacier

Qungur Glacier

Kok Sel Glacier

Qizil Sel Glacier

Shiwakte Group
20400 IV
20500 III
20200 II

Uterstared

Shiwakte
(Stein)

Basik Kól



Qungur Jilgha

Agh Aghzi

Filal

Arpa Aghzi

Sargalang
14,900

Arpa Bel
13,350

Aqsai Dayan
9,400

Kupruk Qaraul

Gez Defile

Langar

Samon

QARATASH

Gez Qaraul

Qungur Jilgha

Achiq Dayan

Achiq J

Qurghan

Khan Terek

Zor Qir

Bele Ibi

Bozarga

At Bel
12,000

Yapchan Jilgha

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Tugene Tar Gorge

Terek K...

Kaying Aghzi

QUNGUR II
25,200

Tigarman Su
17,700

Torbashi Gl

Kaying Gl

Kaying Gl

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Sarigh'on
16,300

Kaying Bashu

Zumurrat

Kepek P
16,230

Aghistan

Ghorumbas Gl

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Qarantumush J

Fidik Jilgha

Chugchan Jilgha

Chugchan Jilgha

Sel Glacier

Sel Glacier

Shiwakte Group
20,400

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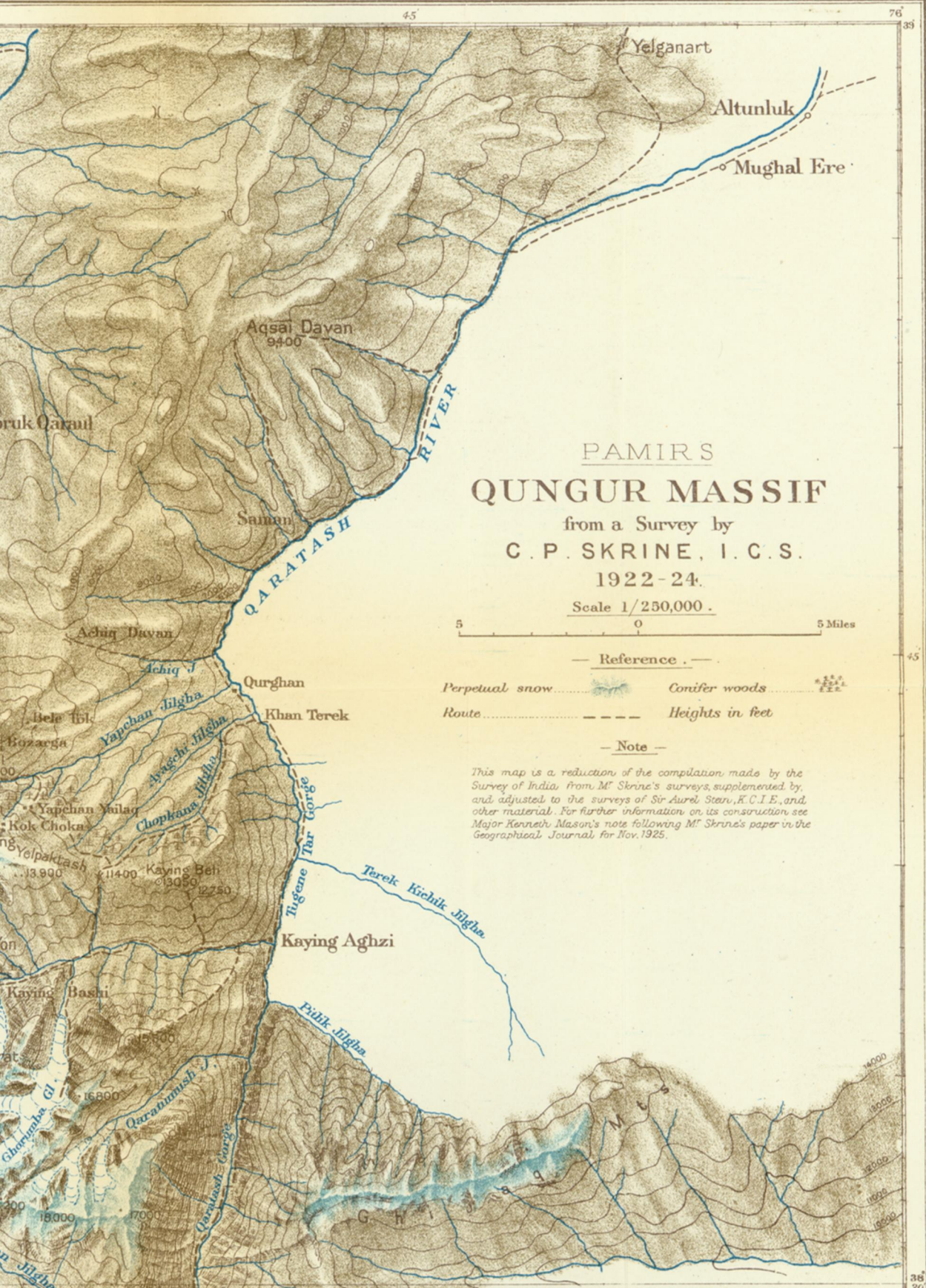
Shiwakte Group
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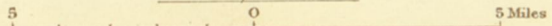
Shiwakte Group
20,400



PAMIRS QUNGUR MASSIF

from a Survey by
C. P. SKRINE, I. C. S.
1922-24.

Scale 1/250,000.



— Reference —

- Perpetual snow 
- Conifer woods 
- Route 
- Heights in feet 

— Note —

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PAMIRS QUNGUR MASSIF

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C. P. SKRINE, I. C. S.

1922-24.

Scale 1/250,000.

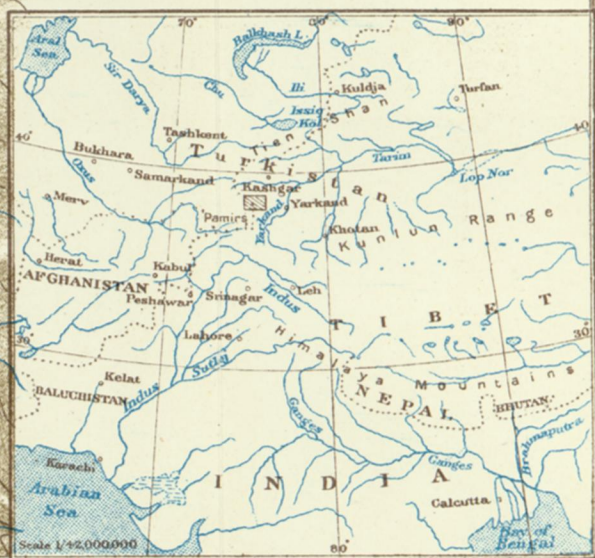
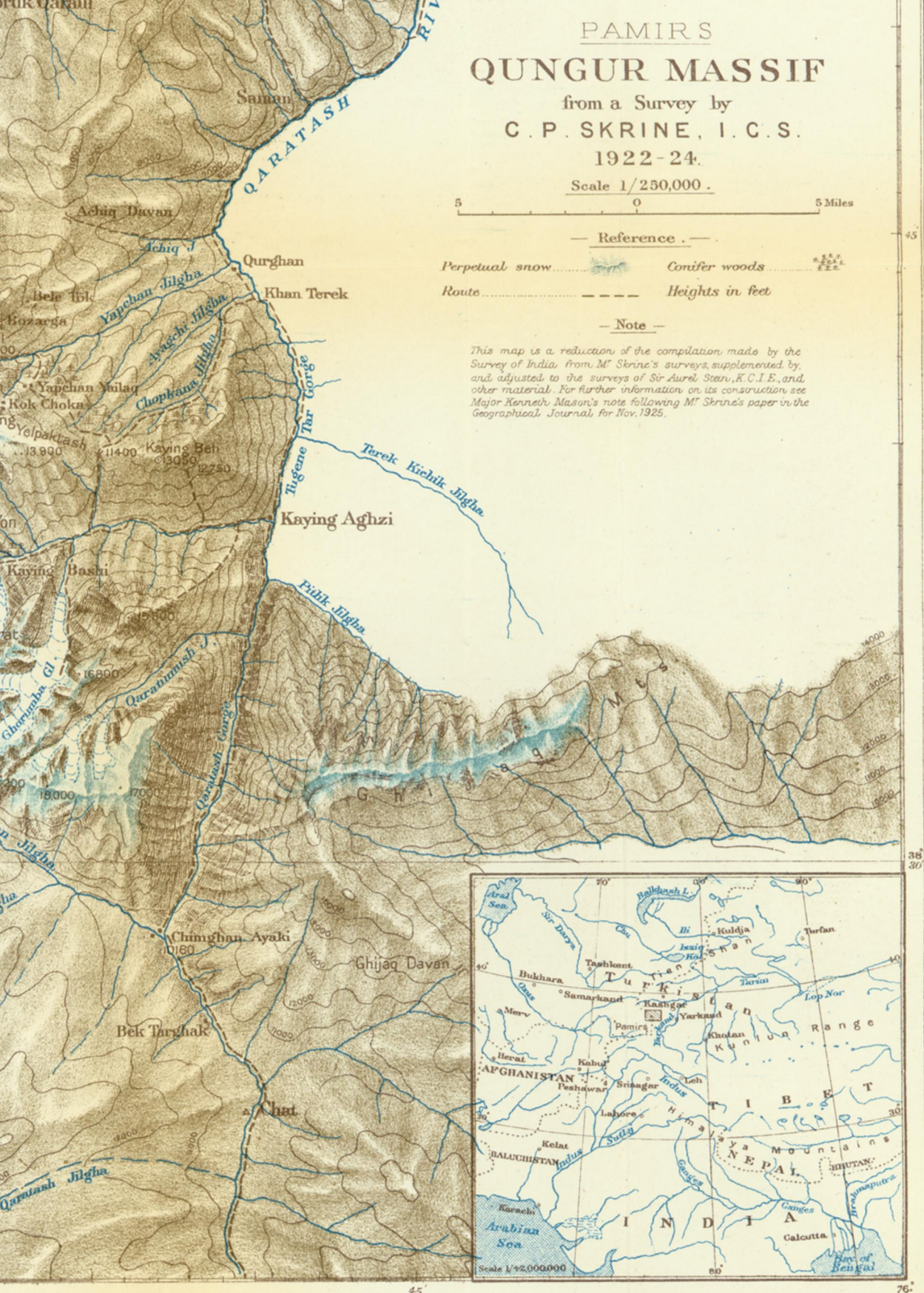
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— Reference —

Perpetual snow
Route
Conifer woods
Heights in feet

— Note —

This map is a reduction of the compilation made by the Survey of India, from Mr Skrine's surveys, supplemented by, and adjusted to the surveys of Sir Aurel Stein, K.C.I.E., and other material. For further information on its construction see Major Kenneth Mason's note following Mr Skrine's paper in the Geographical Journal for Nov. 1925.



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