

It will be seen that the glacier-filled depression which we traversed on our journey has its main direction at right angles to the general direction of Novaya Zemlya in that latitude, and at right angles to the direction of the strata. We have here one of the many instances of the predominance on the north island of Novaya Zemlya of transverse and not longitudinal valleys. This condition is of course already indicated by the numerous and sometimes long fjords in the southern half of north island. In the northern half the relief of the solid rock is hidden by huge masses of inland ice. Therefore, in reality, the narrow Matochkin Strait, which cuts transversely through the land-mass, can (as has been pointed out by Chernyshev) not be regarded as the isolated cleft in the country which it appears to be when seen on the map of Novaya Zemlya, and which naturally gives rise to the thought that there exists there a fault fissure, a zone of dislocation, which is not the case. In reality there are a number of similar cuttings, only the others do not extend quite so deeply, or else they are covered by a glacial mass.

From a purely geographical point of view it may be of interest that the crossing from Mashigin to Zivolka fjord has been made, for hitherto the north island had only been crossed at two places. One of these was between Krestovii fjord and Rosmyslov fjord (which is the shortest possible passage across Novaya Zemlya); the other is far north, from Pankratyev peninsula (slightly north of 76°) and across the country towards the south-east. The crossing at the former place was made by the Russian Arctic explorer Russanov and the Italian Candiotti in the summer of 1908, and at the latter by the Russians Pavlov and Wiese in the winter of 1912-13, during the wintering of the Sedov Expedition at Pankratyev peninsula.

THE EXPLORATION OF THE UPPER YARKAND VALLEY IN 1914 BY THE DE FILIPPI EXPEDITION

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IN the paper read before the Royal Geographical Society by Sir Filippo De Filippi, K.C.I.E., in June 1915 (*Geog. Journ.*, 46, pp. 85 *et seq.*), the general results of the work of this expedition were dealt with; this note is intended to amplify in some particulars the account of the survey and exploration of the Upper Yarkand valley by one of the parties of that expedition.

Previous to 1914, our knowledge of this neighbourhood was based on the sketches and reports of Johnson of the Survey of India in 1864-65, and of the explorer Hayward in 1868. But even so far back as 1876 Shaw had expressed doubts as to the accuracy of the mapping of this region, and Dr. Longstaff in 1910 had independently come to the same conclusions about it.

In July 1914 one of the survey parties of the De Filippi expedition proceeded to the Daulat-beg-öldi or Pulo stream, which leads from the Depsang plateau to the Karakoram pass, and crossing the col at its head, a little north-west of the pass, entered the valley to the north. About 12 miles further down the stream, which trended in a north-westerly direction, they reached a large amphitheatre or basin, into which several streams flowed. This amphitheatre is at the place where, on Atlas sheet No. 44A, the stream is shown making a sharp bend to the west, eventually to join the Shyok river. This valley runs N.E.—S.W., and the stream, instead of flowing from east to west, actually flows in the reverse direction.

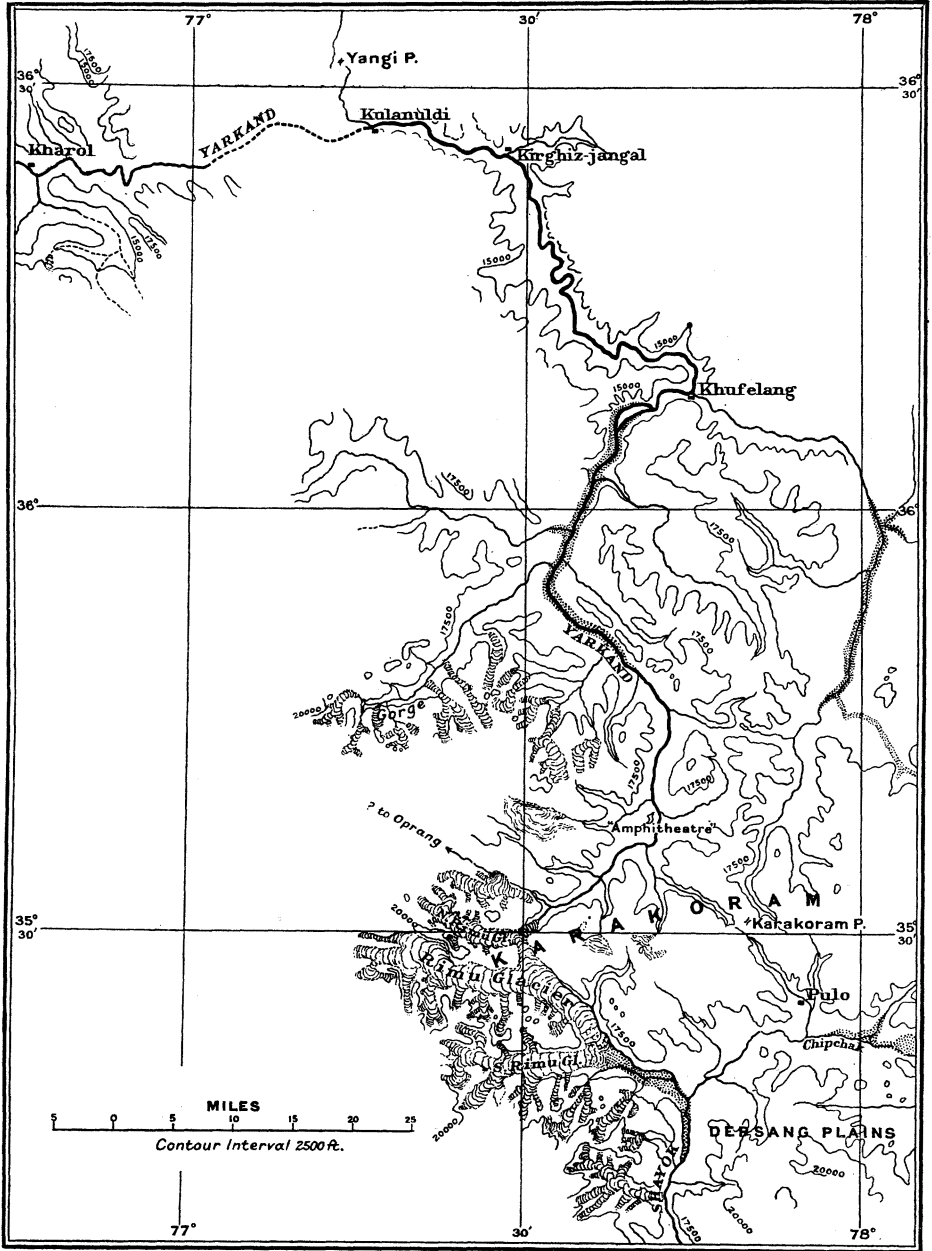
It was surveyed to its source. Investigation showed that this was the snout of a large glacier, an arm of the Remo, and led to the interesting discovery that the Shyok and Yarkand rivers have a joint origin in one glacier. About half a mile below the source of this stream a tributary joins from the west; this also rises from a glacier, resting, like its neighbour the Remo, on a pass and thrusting branches into opposite valleys. Its north-western snout is probably one, and possibly the most distant, of the sources of the Oprang river.

At the northern end of the amphitheatre before mentioned another tributary joins the Yarkand river from the west, presumably explored by Hayward, and considered by him the source of the river. He reached this place in December, when the whole country was deep in snow, and his description therefore is somewhat misleading in places. No glaciers extend into the basin, nor are there any on the adjoining slopes. His visit was very hasty, and it is certain that he could not have seen the large western valley at the south end of the amphitheatre, for he was a careful and accurate recorder of everything that he saw. Nor is the basin a lake, as he surmised, though a small tarn, entirely disconnected from the river system, actually exists in it.

Below the amphitheatre no large stream joins the river for about 30 miles, but here two tributaries, both carrying a considerable flow of water, effect a junction on the left bank within 3 miles of each other. It is the northern of these two streams which Hayward mentions in his narrative as being two marches from Khufelang, and leading to a pass across the Karakoram range to Nuba and Chorbut. Both were explored in September 1914, when the flow of water down them had decreased, and permitted an easier passage than was feasible in July, when their outlets were first reached.

The valley of the southern stream is open, contains a fair amount of grass, and has a general trend to the south-west. About 15 miles from its junction with the Yarkand river, two long but comparatively narrow glaciers, parallel to each other but about 3 miles apart, descend from the snow-covered range to the east which separates the valley from the river. Both reach the stream bed and block it, but the western slopes of the

valley being gentle, an easy passage exists past their snouts. Some 5



The Upper Yarkand Valley, from the Surveys of the De Filippi Expedition.

miles further on the stream issues from a narrow gorge, cut through the moraine of an old but now non-existent glacier ; beyond, the upper course

bends almost due west. It has a double source on the northern slopes of a snow-covered mass, apparently part of the range before mentioned. This mountain group lies about 15 miles to the north of the Karakoram and appears to be entirely disconnected from it. The glaciers giving rise to both sources of the stream, like many others in this region, project their snouts into two river systems. In this case the south-western outlets probably drain into the Oprang.

The valley of the northern stream is the exact antithesis of its southern neighbour. It flows throughout its entire length in a deep narrow gorge, the upper slopes of which are entirely bare of all vegetation. Its course is almost from due west, and its source is on the northern slopes of a snow-covered range, believed to be a continuation or part of the same snowy mass at the head of the southern stream. Exceptionally severe weather prevented the actual source of this stream being reached, but the range from which it rose was only a few miles from the point to which the survey was carried.

A route to Nubra was supposed to follow this stream, and during its exploration a sharp look-out was kept for relics of previous travellers. A few miles from its junction with the river we found the abandoned baggage of an Indian, containing some books and letters. From these it would appear that the traveller was returning from Mecca to Yarkand about 1904. Attempts to trace the owner, made by the British Consul-General's staff at Kashgar, were fruitless. This find certainly points to the correctness of the rumour mentioned by Hayward and other travellers; but the valley is exceptionally difficult to traverse, and the route, if such existed, can have been very seldom used.

Between these two streams and Kulanuldi, at the entrance to the valley leading to the Yangi-dawan, no stream of any size joins on the left bank, so most of the drainage from the hills on this side must flow towards the Oprang. The Yarkand river, from its source to Khufelang, flows in a wide and fairly open valley, with moderate slopes on either bank; between Khufelang and Kirghiz-jangal the hills begin to close in and the valley becomes more confined, these features being more accentuated between the latter place and Kulanuldi. Still lower down and below Kharol, opposite the entrance to the valley leading to the Aghil pass, gorges are very frequent and the enclosing walls precipitous.

From south of the Depsang plateau to Kirghiz-jangal in the north the only formations are limestone, in which fossils are numerous, and sandstone. Granite rocks were found in the river-bed north of Kirghiz-jangal, but the crest of the K'un-lun at the Yangi-dawan is limestone. Granite boulders were also noticed, embedded in a fine clay, in the tongue of land between the junctions of the two large streams, which were explored in September; this tongue appeared to be the remains of an ancient and large glacial moraine.

The Oprang valley was not explored, but its source is probably some

30 or 40 miles further east than Sir Francis Younghusband suspected, when he travelled in these regions in 1889.

A detailed account of all the work of the expedition will be published in Italy in due course, with an abridged English edition; a narrative report of the explorations of the Survey of India detachment, which formed part of the expedition, will also be published in the Annual Report of the Survey of India for 1921-22 (Record volume).

Note: The topographical results of the work which Colonel Wood thus briefly describes have been shown on a special sheet (scale 1/500,000) prepared by the Survey of India, which is however rather difficult to follow in detail, since the drawing is not quite up to standard: it was done during the war, with little or no supervision. The same results have been incorporated in sheets 51 and 52 of the 1/M series of India and Adjacent Countries, published in 1916 and 1917: but here the draughtsman has made the grave fault of representing as lakes what are really broad gravel beds of rivers, nearly dry, and has failed to realize the size and importance of the Yarkand. These sheets require revision.

A much more elaborate representation of the same material has been drawn at the Istituto Geografico Militare on the scale 1/250,000 for inclusion in Cav. De Filippi's volumes of scientific results. This sheet is in well-executed hachures, and the glaciers are carefully sketched: but there are no contours.

The sketch-map to illustrate this note by Colonel Ward has been made by reduction of detail from the Italian map, with a few contours reduced and adjusted from the Survey of India sheet.

Cav. De Filippi very kindly offered to arrange for printing an edition of his map for the *Journal* from the plates at Florence: but the need for strict economy has limited us to the simple sketch-map, which will however serve—perhaps as well as the more elaborate—to illustrate the most striking of his important geographical results. The names on the Italian map look strange, because the cartographers (against the inclination of their chief) insist on spelling Indian frontier names phonetically in Italian. The British long ago resolved to adopt the system of "vowels as in Italian." May we hope that some day the Italians will return the compliment with "consonants as in English"? We cannot admire the spelling Sciaiok, which is not even phonetically correct if Dr. De Filippi is right in preferring Shayok to the Survey of India's Shyok, that ought to be pronounced as one syllable. (But is the real name Sha-yok or Shai-ok?) In two names, Shayok and Rimu, for Shyok and Remo, we have in the sketch-map ventured to disagree with the Survey of India and to agree with Dr. De Filippi.

THE MOUNT EVEREST EXPEDITION

ON the recommendation of Colonel Howard-Bury it was decided by the Mount Everest Committee last October that this year's expedition should leave Darjeeling by the end of March, expecting the grand assault on the mountain at the end of May or in the first half of June. In accordance with this plan General Bruce took the road with the first detachment of the main party on March 26, and a telegram from