

wise.\* If the University of Oxford again sends an expedition to Spitsbergen this subject should be carefully watched, and every effort made to make sure that any accession of cold with sunshine is not due simply to a change in the air supply, or shift of wind to a colder quarter. On the other hand, since a surface of snow is such a rapid radiator of long-wave energy, and since it reflects such a large proportion of the incident solar energy, it may well be that there are certain atmospheric conditions, especially at any altitude where the air is thin, with the sun circling round the heavens at a low angle, when the snow will emit a good deal more heat than it absorbs. If this is really the case the fact is clearly a potential source of spells of cold weather, below the normal temperature, at midsummer in the neighbourhood of the North Pole, such as appear to occur in the Arctic Ocean now and then, otherwise difficult to account for in a basin surrounded by snow-free lands except Greenland. The point is thus of practical importance in forming an estimate as to what degree of summer cold—below the seasonal mean temperature, which is only slightly below freezing-point in July—an expedition to the North Pole would be likely to encounter. And as bearing vitally on this question, it is to be observed that upper-air observations, made on the *Maud* expedition, support theoretical expectation that a temperature inversion, that is a rise with height above the glacial surface, exists at all seasons over the polar sea; for an inversion would militate against the extent to which cold weather, locally engendered by radiation, could be transported by wind from one part of the polar basin to another, since in that case the air would be warmed by turbulent mixing. Hence another expedition to North-East Land, which appears to be an excellent experimental ground for problems in polar climate, should be well equipped for taking upper-air temperatures.

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## THE PROBLEM OF THE SHAKSGAM VALLEY

Colonel Sir Francis Younghusband, K.C.S.I., K.C.I.E.

*Read at the Meeting of the Society, 8 February 1926. Folding Map follows p. 288.*

THE title of my address this evening is "The Problem of the Shaksгам Valley"; but probably not a dozen persons here know where Shaksгам is. And little wonder; for it is a remote uninhabited valley at the back of the Karakoram Himalaya, and has been visited by only two Europeans, and by them thirty-seven years ago. It was discovered by me in 1887 on my journey from Peking to India; and it was again visited, first by me and then by the Russian (or rather Polish) traveller, Captain Grombchevski, in 1889.† Since then no European traveller,

\* The *Fram* results (1893-96) indicate a slight excess of mean daily temperature with clear sky in comparison with overcast sky in July and August, a deficit in May and June, and a very marked deficit in winter.

† The name of this distinguished Polish soldier in Russian service has suffered in successive transliterations. The Polish name, as we are informed by the Secretary of the Polish Legation in London, is GRABCZEWSKI. When turned into Russian it acquired an M before the B, as pronounced, and being thence re-transliterated under a French influence, becomes GROMBTCHEVSKY very commonly in geographical

as far as I know, has actually entered it, though some have looked into it from the Indian side.

When I reached Yarkand, in September 1887 I found a letter from Colonel Mark Bell (the head of the Intelligence Department in India), who had preceded me by a month on the way from Peking to India, recommending me to explore the direct route from Central Asia to India which led by the Mustagh Pass into Baltistan and Kashmir. This route was formerly used by the natives; but nothing was known about it. And it was while exploring this route that I discovered the Shaksgam Valley. I had to cross it on the way to the Mustagh Pass.

I described it briefly in my lecture to this Society in May 1888; and in my lecture to this Society in 1895 I described my second visit to it, when I explored its upper part and its course till the river joined the Yarkand River. But ardent travellers are again seeking to go there, and perhaps some additional observations about it may interest you.

What is chiefly remarkable about Shaksgam is that it is a deep trough running immediately under the wonderful castellation of peaks which group themselves round  $K_2$ , the second highest mountain in the world. On the far side of Mount Everest there is a high plateau running up to 16,000 feet, and a well-inhabited plateau. And this is the rule with the other great peaks. On the far side (from India) the country lies at a considerable elevation and the valleys are wide. But immediately under the  $K_2$  group of peaks there is this deep trough running down to only 12,000 feet above sea-level, quite uninhabited and devoid of vegetation except for a few patches of scrub, one of which is called Shaksgam and gives its name to the river which in its lower course is called Oprang by the Kirghiz.

When I left the Yarkand River in 1887 to work my way up to the Mustagh Pass I imagined that I should simply follow up one of its southern tributaries. It had so far been thought that these southern tributaries must all flow straight down from the main watersheds. But on ascending one of them, the Surukwat stream, I found that this was not the case. I found that an intermediate range—the Aghil range—had to be crossed, and that I had to descend into a deep valley, the Shaksgam valley, and then ascend a tributary from *that*—and not a direct tributary from the Yarkand River—in order to reach the Mustagh Pass.

And similarly, when in 1889 I was sent in search of the Shimshal Pass into Hunza, I had to do the same thing. In each case I had to cross the intermediate Aghil Range, dip down into the Shaksgam valley, and then ascend one of its tributaries—in 1887 to the Mustagh Pass, and in 1889 to the Shimshal Pass. It was thus only in a casual way that I discovered this valley. My main object on both occasions was

literature. In the *Journal* we have been accustomed to spell the name GROMB-CHEVSKI, by direct transliteration from the Russian spelling, and it will be convenient to retain that spelling, at least for the present.—ED. G. F.

military—to explore the passes leading from the north towards India. But in this chance manner I did happen to discover one of the most remarkable regions in the whole Himalaya.

At this distance of time it is possible to gauge the chief impression it left upon me. What was it? No man can enter that region without enduring hardships. Was it these that made the most impression on me? Three weeks ago I had a chill. The doctor was called in. He applied his stethoscope. He issued his orders. I was not to think of getting up; there must be a fire in my bedroom; linseed poultices were to be applied; I was to inhale some infusion; I was to take certain medicines; I was to have hot soups, and so on. And taking advantage of this enforced rest I prepared this lecture. I looked up my old diaries, and in them I found recorded that on a certain day while I was exploring a glacier the ice on a glacier lake broke and I went through up to my waist, and then had to spend the night in my wet clothes sleeping on the floor of the tent, the floor being the glacier itself and the thermometer being nearly down to zero. As I now lay comfortably in bed with a fire near by and read this in my diary a shiver went through me. It was an experience which, I should have thought, I would have remembered all my life. As a matter of fact, I had completely forgotten it. Neither that nor any discomfort I may have had in my 1887 journey, when I slept in the open without any tent right up to and on the other side of the Mustagh Pass, has stuck in my memory.

The impression that *has* remained there and which has sunk deeper and deeper with the years is the impression of the sublimity and grandeur of the region. From the Aghil Range you look down into the deep trough of the Shaksgam River, and then across it to an array of peaks of unequalled mountain majesty. And on both occasions I saw them in dazzling sunshine showing sharp against a sky of purest azure. Here close together were peaks of 25,000, 26,000, 27,000 and in the supreme case 28,278 feet in height, rising above the valley in rugged cliffs and ridges, their summits mantled in glistening ice. It was a glorious sight, and I have often loved to dwell upon it.

And then, when one gets right in among the glaciers under the great peaks to a region where even rock is little seen—where nearly all is snow and ice, sparkling in the radiant sunshine, one has the sense of having reached a higher and a purer world raised far above the murky earth below. And this feeling of exaltation is the supreme impression left upon me by this region—the main impression which has remained with me for a lifetime and which, as experience has proved, has completely obliterated all those minor impressions so marked for the moment, but of such little real depth.

And perhaps contributing to this result were certain lesser causes. First there was the remoteness of this region. It is not particularly difficult to get at, but it is very far away. Enterprising inhabitants of

Chinese Turkestan might get at it fairly easily. But from either Russia or India it is very distant, and flooded rivers make it inaccessible except in the autumn, unless a way into it can be found from near its source.

Besides its remoteness its austerity also helps to produce the impress of exaltation. Not only are there no inhabitants, but there is scarcely a living thing. Here and there is some scrub in the valley bottom. But the flanks of the mountains are sheer rock. Austerity and purity are the characteristics of these mountains. And no one who is not himself at his fittest can win his way into them. They simply hurl from them all who are not fit to be among them.

On the other hand, to those who can stand their austerity and are not afraid to wrestle with them, they give this lifelong joy and exultation.

Such a region must obviously attract geographers. Grombchevski and I have made but a bare reconnaissance of it, and it must be examined more at leisure; for we had to explore it at a time when we were not only at rivalry with one another, but also when both of us had to beware of attack by raiders from Hunza. And I hope when it is thus explored the result will not be merely a map, but such a description of it as will enable that innumerable multitude who cannot go there to see and enjoy its incomparable beauty. All Grombchevski and I could do was to plod along the valley bottoms and ascend the passes. Future travellers should be able to clamber up the mountain-sides and climb the peaks and tell us of the glories that can be seen from them.

Some of the side valleys and glaciers I explored, but there are others, and especially the glaciers running down from the Gusherbrum Peaks, and K<sub>2</sub>, which remain to be explored. And most important of all is the question of the source of the Shaksgam River. I roughly mapped the course of the river from the Urdok Glacier to its junction with the Yarkand River. But I had no time to explore the source: I had to press on to the Shimshal Pass, which was the main objective. I could therefore only conjecture where the source lay, and from what I find recorded in my diary I should suppose it must be at about the point "G" which Major Wood reached in 1914, when in charge of the Survey of India Detachment with the De Filippi Scientific Expedition to Central Asia. For, writing in my diary on 13 September 1889 in my camp on the Urdok Glacier, I say, "The Oprang [Shaksgam] river valley beyond the glacier which I am ascending is again level and open, and has a direction 150°, while at about 15 miles another valley branches off to the east with a direction 120°, and this latter must probably run very nearly up to the Karakoram Pass."

This passage, through an oversight on my part, was not published in my report, and the map-makers had accordingly placed the conjectured source of the Shaksgam River further west than this passage would have justified them in doing. I therefore agree with what Major Wood says on p. 9 of his report, that the valley "H" which he was

looking down from the low pass "G" drains into the Oprang, and "is probably the source of that river."

I should imagine that the valley I was looking up in 1889 was the valley that Wood was looking down in 1914. I was looking up a valley in a direction 120°, that is, a little east of south-east. Wood looked down a valley which extended as far as he could see "north-west to west." If it were not that mountain valleys have a pernicious habit of doing precisely the opposite of what you would expect of them, I should say that it was a foregone conclusion that Wood's valley "H" and my Oprang or Shaksгам valley were the same, and that Wood in 1914 had discovered the source of the Shaksгам—or at any rate one source, for perhaps the other branch mentioned in the passage from my diary may have a greater volume of water.

The whereabouts of a mysterious Salto Pass leading into Baltistan was another problem left over from my explorations in 1889. I was only able to satisfy myself—and it was all that was required of me—that there was no pass in that region of any value for military purposes. But the lie of the land between the Gusherbrum Peaks and the Karakoram Pass was exceedingly perplexing, and it was not till Dr. Longstaff discovered the Siachen Glacier and till Dr. and Mrs. Bullock Workman surveyed its upper part that we could be certain that anyhow this pass did not lie as I had supposed at the head of the Urdok Glacier. And I agree with Mr. Hinks' suggestion that the col from which the Workmans looked down into the Urdok Glacier was not the col which I rashly attempted to climb in a snowstorm, but the col of a side valley on the southern side.

The surveys of the Duke of the Abruzzi's Expedition of 1919 also showed that the peak which I had seen from Durbin Jangal was not K<sub>2</sub>, as I had supposed. What that very prominent peak is remains then to be determined.

These, then, are some of the problems of the Shaksгам Valley. There is a field here for many years' intensive exploration. The exigencies of military service first brought it to our knowledge. The trained surveyor, the artist, and the climber can now take up the work.

But before concluding I would say a word about my rival but friend, Captain Grombchevski. After I had finished my exploration of the Shaksгам Valley and had discovered the Shimshal Pass I met him in another valley, a small tributary of the Yarkand River, on his way to Shaksгам. That meeting I have already described in 'The Heart of a Continent.' I also met him in 1890 in Yarkand, on my third journey—this time to the Pamirs. On both occasions he showed me the warmest cordiality. But I did not hear of him again—except that he was holding important posts in Manchuria—till last year, when he sent me a book he had written in Polish describing his journey, and from the Polish Legation I heard that he had had the saddest ending to a dis-

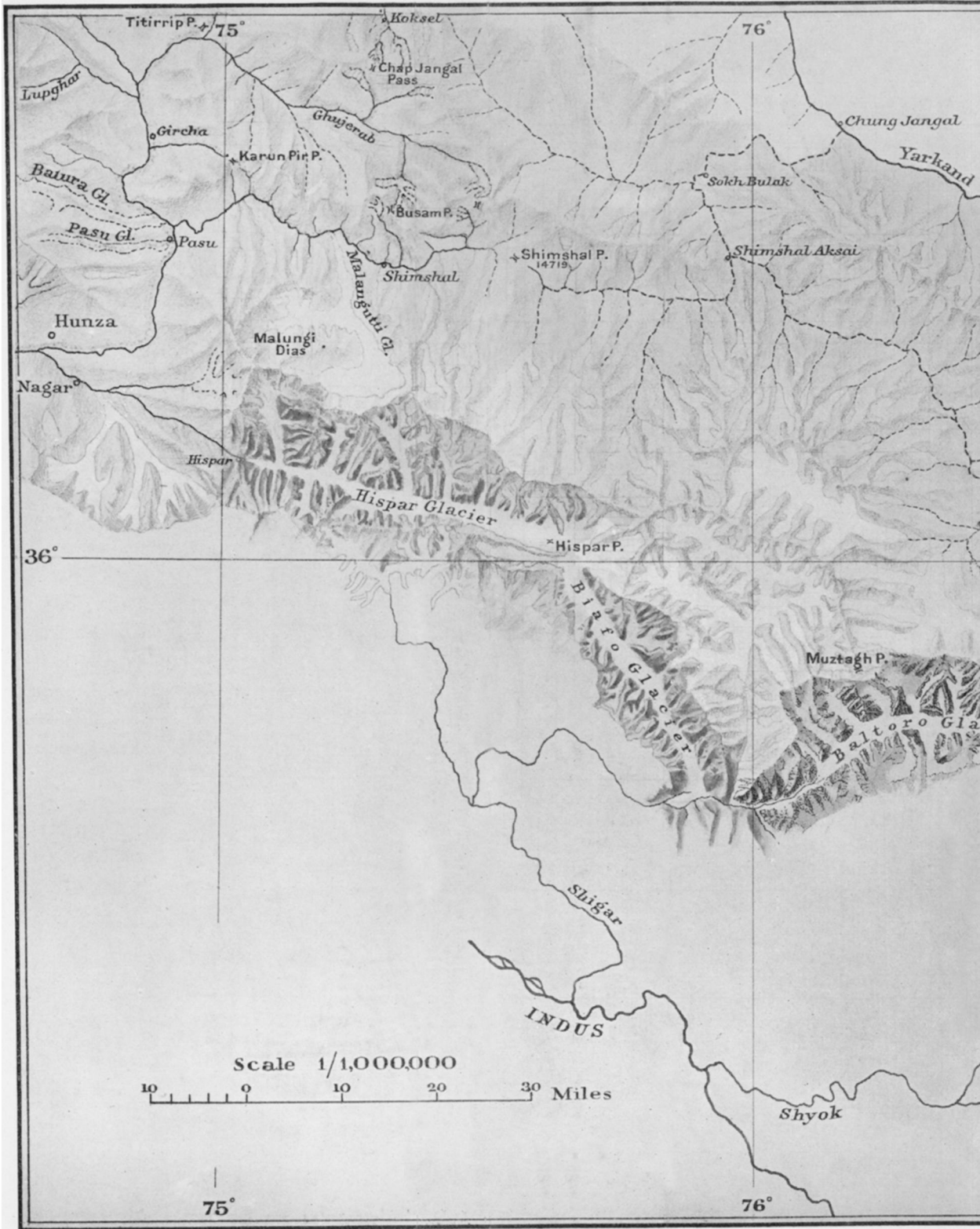
tinguished career. He had risen to high position in the Russian service, but in the revolution had been thrown into prison and robbed of all his goods. Through the assistance of the Japanese he had been able to get back to Warsaw. But he was completely broken down [and has since died]. I was at least able to assure him of the admiration we British had for him. For besides this journey to Shaksgam in 1889 he had made a much more important and daring journey to Hunza in 1888, to counteract the effects of which Colonel Durand was sent there from Gilgit in 1889, while I was sent to explore the passes into it from the north.

I would close my lecture with a tribute of admiration for the enterprise of this distinguished Pole.

Before the paper the PRESIDENT (Dr. D. G. HOGARTH) said : It would be not only superfluous but, I think, rather impertinent for me to attempt to introduce to you the lecturer this evening. Sir Francis Younghusband's name is written across the whole history of Himalayan exploration for the last forty years. He is almost, if not quite, the *doyen* of all Himalayan explorers in this country. You will find his name, for example, up and down the encyclopædic works which a President of this Society, the late Lord Curzon, wrote about Asia. In the course of those explorations a very long time ago—in the year 1889—Sir Francis Younghusband, then Captain Younghusband, found himself in what we now call the Shaksgam Valley. Since 1889 neither he nor anybody else has been in that valley. The country to the south of it has been explored by more than one party. A list has been given to me of those who have actually been in the south : Sir Martin Conway, who is here to-night ; Dr. Longstaff, who is also present ; the Duke of the Abruzzi ; Dr. Hunter and Mrs. Bullock Workman. From the east it was seen by the expedition of Dr. De Filippi (I suppose in an English audience he ought to be given the full benefit of his K.C.I.E. and called Sir Filippo De Filippi), and Colonel Wood in 1913. But the actual Shaksgam Valley has not been visited again. It is about that that Sir Francis is going to speak to-night. I believe that what he saw in 1889 has been recorded, but practically shut away from the public ever since in official reports. I hope Sir Francis will be able to communicate some part of that to us in the course of the evening. He has very kindly undertaken to state the problems which still remain for solution in this very interesting country. There are a great many problems there of purely geographical interest ; no political question is involved. But this particular region is beginning to attract attention as a part of the Himalayas which ought to be better known, and in which it is desirable that exploration should at some time be undertaken. I will now call upon Sir Francis to speak.

*Sir Francis Younghusband then read the paper printed above, and a discussion followed.*

General Sir EDMUND BARROW : I have been asked by the Chairman to give you some idea of the explorations with which I was fortunate enough to be associated in 1886, two or three years before Captain Grombchevski visited Hunza. My acquaintance with that region is limited to the adventurous journey of the Hindu Kush Commission from Gilgit through Hunza to Wakhan in the spring of that year. Our chief difficulties on the road were not its natural obstacles, but those we encountered in the person of Ghazan Khan, then Mir



The main range and glaciers from the Surveys of Sir Martin Conway (1892), the Duke of the Abruzzi (1909), from the map of the Survey of India Detachment (Lt.-Col. H. Wood, R.E.) with the expedition of Dr. De F including the reconnaissances of Sir Francis Younghusband. The work of the Visser expedition in Hunza (19



Abruzzi (1909), Dr. T. G. Longstaff (1909), Dr. and Mrs. Workman (1910); the eastern and north-eastern areas of Dr. De Filippi (1913-14); the lighter imperfectly surveyed areas from the maps of the Survey of India, and the area in Hunza (1925) was not available when the drawing was made.



of Hunza. I do not think I ever met a greater ruffian than Ghazan Khan. He not only used every means short of force to obstruct our passage, such as preventing supplies reaching us, but threatened our liberty unless we handed over to him a fort called Chaprot, which of course we had no authority to do, Chaprot being in recognized Kashmir territory.

We were almost the first Europeans to travel right through his country, and when we reached Hunza—his capital and residence—we received a most inhospitable welcome from him. In fact, we were virtually his prisoners. He told us there were only three courses open to us: either to deliver Chaprot, or to go back to Gilgit, or to try to go on without his assistance. We naturally refused these alternatives, and insisted that he had got to help us, or at least to feed us. This annoyed him greatly, and he even considered whether it would not be simpler to kill us and report our death by avalanche. Eventually he let us go on, but gave us little help or supplies. However, by bribing his officials and buying direct from the villagers *en route* we successfully managed to make our way across the Hindu Kush by the Kilik Pass, which, though a snow pass over 15,000 feet, is not really difficult if crossed before sunrise while the snow is still fairly hard.

On the whole the Hunza route is not one to be recommended to ordinary tourists, but most young and active Englishmen feel an immense attraction to countries or places which have been little visited, and there is no greater satisfaction than that which they experience in the successful accomplishment of such explorations. I at least always look back on my visit to Hunza and Kanjut with the most lively pleasure.

Dr. T. G. LONGSTAFF: It has been a very great pleasure to me to hear Sir Francis Younghusband and Sir Edmund Barrow speaking of Hunza and of the Kanjuti raiders; the result of these first visits and of subsequent contact with other British officers has been to turn those raiders into some of the best frontier militia we have. I think the most interesting of all my visits to the Himalaya was that which fell to my lot, when I was being paid to do what I formerly had to pay to do, while I was serving with those same raiders of Hunza and Nagar in the Gilgit Frontier Militia during 1916 and 1917.

Sir Francis Younghusband has raised a very intriguing problem in connection with the Shaksgam, and there are one or two points that I think should be put on record at such a meeting as this, which is a sort of official *résumé* of our knowledge of that particular bit of country, and to which I feel that he has not quite done full justice—needless to say, to himself!

Sir Francis is the only European who has been in the upper part of the Shaksgam Valley, but the problem of the Saltoro Pass is by no means a new one. There is an obscure reference to it in the 'Tarikh-i-Rashidi' of Mirza Muhammad Haidar, written in the sixteenth century, and I think there is also a reference to it by Mir Izzet Ullah. Those references however are not illuminating, and it is to that accomplished and rather neglected traveller, G. T. Vigne, that we owe our first definite information. In 1835 he approached the problem from the south side, while in 1889 Sir Francis attacked it from the north. You will see from the old Survey of India map that before Sir Francis went to that region the country to the north of the Karakoram range was unsurveyed—it is just left as a white blank space; and the main axis of the range is projected southwards in a great angular bastion which projects down to below Vigne's Saltoro Pass at the head of the Bilafond glacier. When Sir Francis' work came to be plotted it was brought down to fill up that great blank wedge beyond the (hypothetical) water-parting. But in 1909, before

I started off to follow Vigne's footsteps, I spent a most delightful week with Sir Francis in the Residency at Srinagar, when he was kind enough to get out his maps and notebooks of 1889 and go through them with me. According to his route-book it was impossible to be certain of the longitudes, for these depended on the correctness of his identification of  $K_2$  from the north, but as regards his latitudes there was no earthly reason for doubt, and yet on the official map his route had been stretched far down to the south of his observed position to fill up that awkward gap. Now I want to show you a slide: Sir Francis will no doubt recognize his own handwriting. You will see on the sketch the dotted line which represents the outline of the main axis of the Karakoram as laid down on the Indian Atlas sheet. Sir Francis drew this on the day when we had really come to grips with the problem, finally saying in effect, "I was right and it is the map which is wrong; the main axis of the Karakoram is not that shown on the maps, it is here." The man who had been there himself was right: if his original notes and maps had been accepted the mistake that was made of extending the Karakoram axis so far to the south would never have been made, and I should never have had the credit for the little discovery I made in 1909.

Following up Vigne's route, with the late Arthur Neve of Srinagar and with Captain Morris Slingsby of the Frontier Force, who so gallantly laid down his life in 1916, we crossed the pass at the head of the Saltoro Valley, which Vigne had been to the foot of, now called the Bilafond La, and saw the remains of stone shelters used by former native travellers on this route; after another day's march we got out on the north side on to a great glacier which nobody knew anything about. The lower part of that glacier was not unknown, for Colonel Henry Strachey ascended its foot in 1848, but no one imagined that it was 45 miles in length. We followed it up just far enough to see the end of it, and at its head saw a gap in the ridge, which I called "Younghusband's Saddle" on my sketch-map because it corresponded in latitude with his observed position. In Khapalu Rajah Shir Ali Khan had told me that there were two routes through the Saltoro Valley, one to Yarkand and one to Nubra: the same tale was told to Vigne in 1835. The finding by the Workmans in 1912 of an old bivouac farther on beside the main Siachen glacier convinces me that the tradition is correct, and that the main range was formerly crossed just about here. I want you to appreciate the accuracy of Sir Francis' original work and to realize that our chief discovery in 1909 was that the water-parting was just where he said it was! There on his sketch is  $K_2$ ; here is Broad Peak and the Gusherbrums; here is the latitude of the Urdok glacier; then the axis runs east through Teram Kangri and on into the Rimu peaks explored by Sir F. De Filippi in 1914, and thus on nearly due east to the Karakoram Pass, all just as the lecturer predicted. There is one omission: for though the Aghil range, which he alone has crossed, is correctly shown articulating with the Karakoram axis on the north, yet at the actual junction there is an easy pass, which you saw in the last photograph which Sir Francis exhibited. This is the pass discovered by Major Wood\* and Mr. Spranger, which you will realize is really beyond and to the north of the main Karakoram range, and which must lead directly to the headwaters of the Shaksгам River, into

\* May I here record my belief that Major Wood is quite correct ('Survey of India Report on the De Filippi Expedition, 1914' (Dehra Dun, 1922), p. 5) in concluding that the plate opposite p. 640 of my paper in the *Geographical Journal* for June 1910 is *not* Teram Kangri but De Filippi's 7391-7388-metre group at the head of the southern branch of the Rimu glacier.—T. G. L.

which the Urdok glacier drains. Incidentally Major Wood found another pass over the tail of the Aghil range a few miles farther to the north-west, with traces of recent travellers. As yet we do not know exactly where these trails crossed the main range: but soon the riddle will be solved, and when it is, then I am willing to bet that the rough sketch which Sir Francis Younghusband drew on a bit of paper in the Residency at Srinagar in 1909 will correspond very well with the reality as revealed by the most modern theodolite in 1926.

The PRESIDENT: The hour is late. I do not know whether Sir Francis would like to say anything in reply to what has been said. You will agree with me that he, Sir Edmund Barrow, and Dr. Longstaff have succeeded in showing that there is still a very considerable deal to do in the Shaksgam country. There lies a problem of extraordinary perplexity and interest which awaits any future explorer fortunate enough to be able to get into that particular part of the Himalaya. You will, I am sure, join with me in giving cordial thanks not only to Sir Francis Younghusband (though chiefly to him) but also to those who have followed him.

NOTE BY THE SECRETARY ON THE POSITION OF THE URDOK GLACIER

Some years ago Sir Francis Younghusband presented to the Society his original field book containing all his astronomical observations made on the journey in 1889 when he crossed the Aghil Pass into the Shaksgam Valley and ascended the Urdok glacier, but was unable to reach the col at its head. His observations include pairs for latitude by north and south stars, altitudes for local time, and an observation for azimuth on a peak which he took to be K<sub>2</sub>. His orderly kept a compass traverse. All these observations were turned over to the Survey of India at Dehra Dun, and were worked up by a computer in the Survey.

When the Duke of the Abruzzi was preparing his expedition to the Karakorum the Survey of India plotted for him a diagram showing the route of Sir Francis in the Shaksgam as deduced from his observations, placed with reference to the outline copied from the map of Dr. J. Jacot Guillarmod in 'Six mois dans l'Himalaya.' The following are the latitudes and heights from the observations of Sir Francis:

	Lat.	Height	
Kulan Jilga .. ..	36° 7' 22"	—	
Durbin Jangal .. ..	36° 2' 0"	12329 feet.	
Gusherbrum Jilga .. ..	35° 56' 5"	12962 "	
Urdok glacier, Camp II. .. ..	35° 48' 5"	13880 "	
"    "    III. .. ..	35° 45' 45"	14144 "	
"    "    IV. .. ..	35° 41' 20"	15355 "	

The computer at Dehra Dun seems to have concluded that nothing could be made of the observations for azimuth and longitude.

The Duke of the Abruzzi's mapping showed that the Guillarmod map was seriously wrong in the position of Staircase Peak in relation to K<sub>2</sub>: it was placed too far east: and this affected the plotted position of the Shaksgam-Urdok route in longitude. But the latitudes seemed entitled to every confidence: they showed that the col above the head of the Urdok glacier must be close to latitude 35° 40'.

When therefore Mrs. Bullock Workman's surveyor Mr. Peterkin deter-

mined the latitude of what she called the Turkestan La as  $35^{\circ} 40'$ , she wrote a passage which has often been taken to mean that she believed the Turkestan La was the head of the Urdok glacier. I was under this impression myself when I remarked to Sir Francis about the time of the Meeting reported above, that it seemed clear from the Workman photographs that the glacier they looked down from the Turkestan La was not the main Urdok but a western affluent.

A recent re-reading of Mrs. Bullock Workman's passage seems to me to show that we had misinterpreted it. The passage is as follows:

"The col we stood on forms a semicircle and ends in the bergschrund-festooned wall visible in the foreground. Directly below the col a sharp drop occurs, say of 2000 feet (it is difficult to estimate height from above a wall). Below, this wall shades off into a short crevassed glacier, which, as an affluent, joins a wide trunk-glacier flowing north-west towards its tongue. We saw well only the upper part rising south-east towards its source behind the group of peaks above mentioned. From the edge of the col the end of the triangular mountain-mass discovered from the Indira col was seen, and the main glacier appeared to take its downward direction along the base of these mountains.

"It is probable that this large glacier flowing north-west joins the Gusherbrum stream seen from the Indira col beyond the triangular mountain-range, or that both end in the same valley near together. The latitude,  $35^{\circ} 41' 20''$ , of the point reached by Sir Francis Younghusband on the Urdok glacier would about correspond to that of this col. After consultation with him there appears to be but one conclusion possible—that this is the glacier he ascended in 1889 when in search of the Saltoro pass, and named the Urdok. The col he saw culminating the Urdok is probably a ridge of the mountain-group seen by us from the east Siachen col [Turkestan La]."\*

The ambiguous words are in the middle of the second paragraph: ". . . that of this col." The reference cannot be to the Indira: it has been taken as to the Turkestan La: the last sentence makes it probable that "this col" does not refer to either of the cols visited by Mrs. Bullock Workman; and that her interpretation of the photographs was really the same as ours, but that she had obscured the argument by quoting the latitudes unnecessarily.

Some months ago, with the permission of Sir Francis, I tried to see if I could deduce anything from his observations for longitude, which had been rejected by the Survey of India; and as a preliminary I re-computed the latitudes, mostly meridian altitudes of Altair south, and extra-meridian altitudes of Polaris north. The latter required of course the sidereal time, to be derived from the altitudes of the Sun, and a deduced rate for the one watch which had survived to that date. At Shahidulla Sir Francis had recorded that the index error of his sextant was zero. It soon became apparent that in the Shaxsgam it was about  $3'$ . There was a discordance of  $5'$  or  $6'$  between the latitudes from north and south stars, pretty constant; and the means of the pairs agreed within a few seconds with those derived by the Survey of India. The agreement was as close as could be expected, considering the uncertainty of the sidereal time.

A recomputation of the local times with the deduced index-error did little,

\* *Two Summers in the Ice-wilds of Eastern Karakoram*, by Fanny Bullock Workman, pp. 186 *et seq.*

however, to improve the concluded rates of the watch; the Sun-observations for time were all in the morning; the index-error was uncertain; and I was compelled to agree with the computer of the Survey of India, that no differences of longitude could be deduced with any advantage. But the observations for latitude seem unassailable, and it will be surprising if they are not confirmed some day by precise survey.

The Survey of India plotting shows the snout of the Urdok glacier a little away from the Shaksgam river, as described by Sir Francis. But it makes the route up the glacier run south-westerly to Camp II., thence a little south of south-easterly to Camp IV., and thence south. The authority for this curve in the glacier must be the compass-traverse of the orderly, which cannot now be found in the records of the Survey of India or in the Intelligence Department. The triangulation chart compiled by the Survey of India in 1922 gives a different outline of the glacier, which is evidently influenced by the misinterpretation of the Bullock-Workman narrative mentioned above.

A. R. H.

## 'AIDHAB

### G. W. Murray, Survey of Egypt

THE hackneyed comparison of desert life with seafaring still holds good—long periods of monotony are broken by events as surprising as a shipwreck or a fire at sea. Last December on the Red Sea coast of the Sudan, I came across the jetsam of a great catastrophe of this sort. On a flat and waterless mound, in wet weather almost an island, separated by 10 miles of flat desert from the majestic wooded peaks of Jebel Erba, lie the ruins of 'Aidhab, a mediæval city of some importance.

It is perhaps mentioned by the tenth-century geographer, Ibn Haukal,\* who says that the produce of the gold-mines in the Wadi 'Alaqi was carried to a certain castle on the sea-coast called "Assab," or "Assat." (The reading is corrupt.)

Certainly during the period of the Crusades the land route to Mecca through Sinai and Northern Arabia became unsafe for pilgrims from Spain and North Africa, and they preferred to ascend the Nile as far as Sus or Aswan, from both of which places roads could be followed through the desert to 'Aidhab, a port on the African coast of the Red Sea opposite Jidda. Makrizi indeed says † that for 215 years from A.H. 450 (A.D. 1058) the Mecca caravans followed this route, and that "it counted formerly among the most important ports of the world, because the ships of India and Yemen disembarked their merchandise there."

The Mecca pilgrims were not, however, safe even at 'Aidhab, for in 1182 Renaud de Chatillon, amongst other piratical exploits, sacked the town, massacred an entire caravan, and destroyed sixteen ships

\* Ouseley's translation, p. 13.

† Ed. Bouriant, pp. 588-9.