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No. 3. September 1917.

No. 4. October 1917.

No. 5. November 1917.

No. 6. December 1917.

word "Hypergamy"—signifying the social custom, common in India, which obliges a father to marry his daughter in a superior social grade. This word was first used by the writer in a Census Report, written in India (for the Hoshiarpur District) in the year 1882, and, because a word was needed and it seemed to meet the requirements of the case, it has since been universally adopted.

It is perhaps not too much to hope that "Geoteresy" will become equally useful.

W. COLDSTREAM,
I.C.S., retired.

Photography in the Survey of India.

I much regret to see that my old friend in the Survey of India, the late Mr. W. H. Cole, has passed away; but in the obituary notice in the last number of the *Geographical Journal* there is a mistake which, in justice to his predecessor and colleague in the Great Trigonometrieal Survey Office at Dehra Dun, Mr. J. B. N. Hennessey, should not pass unnoticed.

The photographic department of the Dehra Dun G.T.S. Map-making Office was organized by Mr. J. B. N. Hennessey, and I learnt the process under him in July 1866, long before Mr. Cole joined. It had already been in use in the Surveyor-General's Office, Calcutta, at that time under two sappers from the Ordnance Survey Office, Southampton, and was in use when I took charge of the photographic work in Calcutta in December 1866.

I may further refer to Sir Clements Markham's 'Memoirs of the Indian Surveys,' 2nd edit., p. 143, in which the introduction of photozincography is attributed to Mr. Hennessey.

I am, yours faithfully,
J. WATERHOUSE,
7 July 1917. Major-General I.A., retired.

MEETINGS: ROYAL GEOGRAPHICAL SOCIETY: SESSION 1916–1917

Fifteenth Evening Meeting, 18 June 1917.—The President in the Chair.

ELECTIONS.—Col. the Lord Montague of Beaulieu, C.S.I.; Dr. M. Bennett; Mrs. George Black; Robert Hollister Chapman; Miss Ethel Esther Cohen; Capt. Alexander Crundall; J. Eskdale Fishburn; Mrs. Green-Thompson; Charles Lyell Harrison; T. Owen Jacobsen; E. J. Larby; Sidney Herbert Frederick Pulley; Capt. B. H. Spence; Major James Gordon Steese, U.S. Army; William Stone.

PAPER: The Zambezi-Congo Watershed. Major E. A. Steel, D.S.O., R.F.A.

GEOGRAPHICAL LITERATURE: ADDITIONS TO THE LIBRARY. Edward Heawood, Librarian, R.G.S.

For list of abbreviations see January number.

EUROPE

Austria and Italy—Trentino. **Battisti.**

Dott. Cesare Battisti. Il Trentino, cenni geografici, storici, economici, con un' appendice su l'Alto Adige. Seconda edizione. Novara: Istituto Geogr. de Agostini, 1917. Size 10 × 6½, pp. 62. *Maps. Price* 3*s.* 6*d. Presented.*

The Geographical Journal

Vol. L No. 6 December 1917

FROM INDIA TO RUSSIA IN 1914

Captain L. V. S. Blacker, Q.V.O. Corps of Guides

THIS is the record of a journey from Northern India *viâ* Central Asia to England. It traversed the same ground, to a great extent, as Dr. De Filippi's expedition, and I hope that these notes may be of interest in that they show things from a point of view different from his.

Leaving Srinagar on 14 June 1914, the first halt of my journey was at Leh, the capital of Ladakh, which was reached on the 26th, after a couple of days' delay due to a sprained ankle. This road is, of course, so well known as to need no further description. Having arrived at Leh, the business commenced of fitting out my modest caravan.

There was a great scarcity of men and ponies, as a result of Dr. De Filippi's expedition. I managed eventually to secure two passable ponies and three men. One of these was a youth named Karim, an Argoon, who proved most useful. Another was a Tibetan from Gyantse Dzong, named Puntsog, most uncivilized, but cheerful and willing; the third was a Turk named Sidiq. The latter was a disappointment; though he had served with Sven Hedin and received a Swedish silver medal from him, he possessed neither endurance, pluck, nor intelligence. I afterwards found that very few inhabitants of Central Asia had escaped becoming the recipients of this decoration.

Since no caravan had yet come through from Yarkand the ponies could not be hired but had to be purchased, and consequently all the details of fitting them out with saddlery, line gear, and grain had to be gone into at some length. My orderly, a Pathan named Ghulam Ali, proved exceedingly useful in the capacity of caravan Bashi. I was not able to start from Leh till July 6, but during my stay there received the utmost kindness and hospitality from every one.

The annual festival of the Tibetans, during which the celebrated devil dances take place in the monasteries, was then in progress. I was not able to go myself to the best known at Himis; but in Leh a minor "tamasha" took place, attended by the King of Ladakh, a British Commissioner, the missionaries, and all the notables of the district, including Subadar Nagdu, the Dogra officer then commanding the Maharajah of Kashmir's troops in the country. The Subadar as a Sepoy had gained

the Indian Order of Merit at the storming of Nilt Fort, during the brilliant little Hunza Nagar expedition of 1871, when he climbed the cliffs the night before the assault to reconnoitre the way up. He was one of those Dogra gentlemen whom it is always so pleasant to meet.

The proceedings commenced with a football match: the Army *versus* the rest of the World. The Army team consisted of Subadar Nagdu's Dogra and Punjabi gunners and myself. The other team was somewhat mixed, but included the Prime Minister as goal-keeper. As the field itself was heavy sand interspersed with boulders, and was 12,000 feet above the sea, the game was somewhat exhausting, but needless to say resulted in a victory, hands down, for the Army. The Prime Minister found it difficult to stop the excellent shooting of the Artillery Havildar playing for us. This was followed by a polo match of the true Central Asian type. The sides were Tibetans *versus* Mohammedans, and the game lacked nothing in dash; there were however no casualties.

The next day I set out and reached Ranbirpura, named after Maharajah Ranbir Sing. Instead of pursuing the usual caravan road for the Khardung or Laowchi La, I intended to trek up the Indus for two marches, and thence over the great Chang La, and along the left bank of the upper Shaiok. This track is to form a new caravan road from India to Central Asia. It was not so well known as the usual way by the Nubra River, but had recently been traversed by Dr. De Filippi's expedition.

In order to save the strength of the ponies, which I intended to take on into Turkestan, I had hired three or four additional local ponies which were to accompany me for the first six marches, that is as far as Shaiok village, the last human habitation, and were to return from there. I was very glad I had done this, as it led to my getting my ponies through without losing any, except one by drowning. This is most unusual; the caravans think nothing of the death of half their animals.

On the march up the Indus valley, which here is very wide, with great alluvial fans on both sides of the river, we passed several celebrated monasteries, notably those of Shay and Tikzay. The latter is in ordinary years a great storehouse of grain, and travellers can usually count on getting some thousands of pounds of barley (sattu). This year, however, Dr. De Filippi's expedition had rather strained its resources. These monasteries are all very well built of stone, and usually form the crown of prominent crags of rock.

The second stage was a village called Sukti, situated at the head of the side valley leading down towards Himis monastery, which forms the southern approach to the Chang La. I sent the baggage round by the ordinary road by the Indus, and myself went through the hills with Ghulam Ali and a Tibetan shikari in order to shoot some shapu. A great deal of the climbing proved fruitless, and crossing the Kilderma La we met the baggage as it was coming into Sukti. This is a small village of about twenty houses, with a grove of trees, in the middle of a somewhat

boggy valley strewn with great boulders. The hills on each side of the valley are of the usual precipitous Ladakh sandstone type. Here I met a Mohammedan merchant who had promised to supply me with the five pony-loads of barley that I needed to take my caravan through to Shahidulla; he was as good as his word, and courteous and helpful to boot.

Early next morning we pushed off up the valley, through a great mass of boulders, and struck a very decent path on the hillside. The valley-bottom held a surprising amount of grass, and even some barley. A steady pull took us up to a grazing-ground named Zingrul, where a side stream joined the main one. The altitude of this is some 17,000 feet above the sea, and progress from here onwards was beginning to become laborious. After a short halt the real ascent of Chang La began. This was by no means difficult, though the track lay among boulders, and the final part of the climb is by steep zigzags. It was a great relief to reach the summit, where there was remarkably little snow. I was under the impression that the Chang La was 19,600 feet in height; but I understand that Dr. De Filippi's survey has proved it to be somewhat less.

From Sukti I had commenced a prismatic compass traverse. I found considerable difference between the relative positions of Zingrul and the Chang La from those shown on the Indian Atlas Sheet. I found the magnetic bearing from Zingrul to the pass to be 45°; on the Indian Atlas Sheet it appears nearer 85°.

On the summit of the pass is a large chorten and two stone walls built by the Tibetans to resist General Zorawar Singh in 1848. The latter was one of the finest leaders in history, and served the Dogra Maharajah Gulab Singh of Jammu, whose descendants rule Kashmir, Baltistan, and Ladakh. It is important not to confuse his troops with the Sikhs, as is so often done. Dogras, being true Rajputs, do not advertise, and so, though second to none as soldiers, are not much known outside the Indian Army.

Zorawar Singh's expedition into and conquest of Baltistan and Ladakh are among the most marvellous feats of leadership that have ever been performed, and are very good instances of what Dogra soldiers are capable. The record reads like that of Cortes in Mexico. The walls themselves are a record of that curious inconsistency in fighting shown by the Tibetans, such as we had examples of in the action of Guru and the defence of Gyantse fort. Having built the walls after an expenditure of stupendous labour, the Tibetans omitted to defend them, being probably guided by astrological rather than strategical considerations. There is no doubt that when the Tibetan feels inclined he can put up an excellent fight; but at times he will walk away without striking a blow.

I had seen at Leh the mound from which Zorawar Singh had dealt out his brand of justice to the Tibetans, which seemed to consist mostly of boiling them in butter. He looted all the monasteries in Ladakh with the exception of that at Himis, which, being hidden away in a narrow side-valley, escaped his notice.

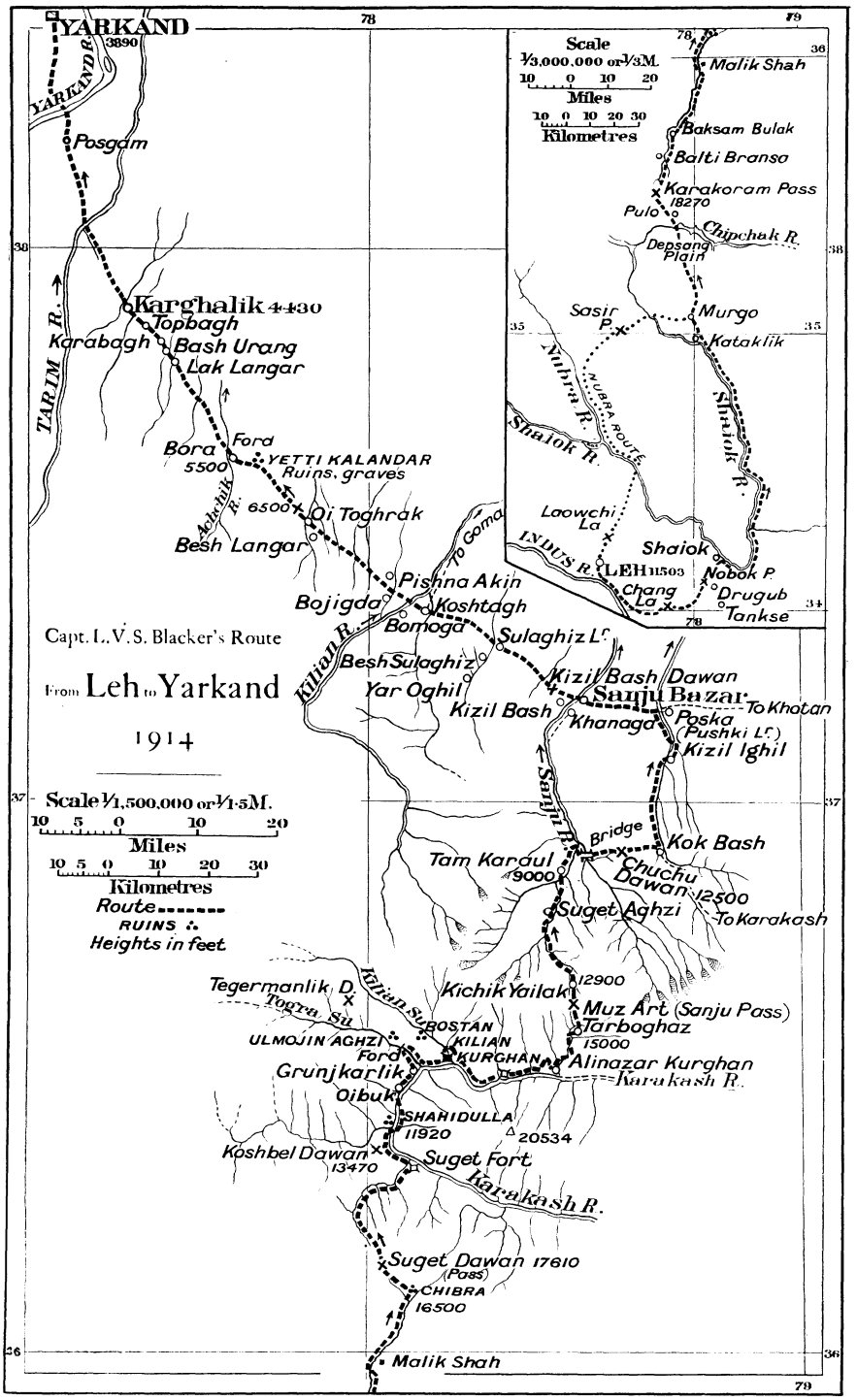
The descent from the summit of the Chang La to Tsul Tak took two hours, the first half-mile being over huge flat-topped boulders which caused me great anxiety about the ponies' legs. Tsul Tak is a sort of grassy Alp, with a lake some 300 yards long, and 100 yards broad in the centre of a wide valley. On the banks there was plenty of argl and burtse for fuel; the lake also held two geese; and they survived my efforts. I made the height of Tsul Tak to be 16,500 feet by aneroid. The march from Sukti occupied eight hours.

The next day's march took nine and a half hours for the ponies, but only six hours' ordinary walking. At first the descent was gradual, down a stream between granite hills, on the banks of which was a surprising amount of grass. The stream was everywhere fordable and the average descent 4° to 5°. After an hour and a half we climbed 500 feet up the right bank, on the flat top of a spur running north, mapped as Chigar Station. Here the river gets into an impassable cañon and grass disappears. Two hours from Tsul Tak the descent led down a steep rocky watercourse, and thence, skirting sandy salients, where the going began to be heavy, to the bridge of Drugub, shown as Durgu on the map, at altitude 13,400 feet. The bridge consisted of five 5-inch baulks, and was 20 feet long by 5 feet wide. The stream was, however, fordable.

From here we commenced a heavy ascent of 15°, deep in sand, the track winding along the hillside at 500 feet above the combined streams of Tankse and Drugub. The cliffs on the opposite side were vertical, but at their foot a track could be seen running down in the river-bed from Drugub village to a patch of barley about 200 yards by 50 yards, some 2 miles down from the junction. From Drugub bridge a goat track leads up westwards to the Nobok La. Two hours more of laborious travelling took us along a track which zigzagged up and down the cliffs, from level with the river to 1200 feet above it, in the gorge of the Tankse River where the heat was considerable. On both sides of the river the hills are impracticable, on the right bank being vertical cliffs.

Shaiok village (near the junction with the river of the same name) is the last human habitation till one has crossed the great ranges into China, ten weary marches further on. Here there were about two square miles of cultivation, mainly thin Tibetan "grim," and about twenty stone-built huts. There is also a new sardai for caravans. The camp overlooked the flat stony bed of the Shaiok river, more than a mile wide, with thickets of brushwood on both banks, affording an almost unlimited supply of fuel.

Next day the journey really began, in that we left all cultivation and human habitation behind us; from here, too, I sent back the ponies I had hired at Leh. The details of the caravan may be of interest. I had two riding-ponies, one for myself and one for Naik Ghulam Ali, both of which carried a good part of our kits. A spare pony carried my own 40-lb. tent, a second the food supplies for myself, together with a considerable quantity of tinsel and ornamental printed cotton fabrics and scarves, and also some


YARKAND
3890
YARKAND R.
Posgam
Karghalik 4430
Topbagh
Karabagh
Bash Urang
Lak Langar
TARIM R.
Bora
5500
Ford
YETTI KALANDAR
Ruins, graves
6500
Qi Toghrak
Besh Langar
To Goma
Pishna Akin
Bojigda
Koshtagh
Bomoga
Sulaghiz Lr.
Kizil Bash Dawan
Sanju Bazar
To Khotan
Poska
(Pushki Lr.)
Kizil Ighil
Kizil Bash
Khanaga
Besh Sulaghiz
Yar Oghil
Kilian R.
Sanju R.
Bridge
Kok Bash
Tam Karaul
9000
Chuchu Dawan
12500
Suget Aghzi
To Karakash
12900
Kichik Yailak
Muz Art (Sanju Pass)
Tarboghaz
15000
Alinazar Kurghan
Karakash R.
Tegermanlik D.
Togra Su
Kilian Su
BOSTAN KILIAN KURGHAN
ULMOJIN AGHZI
Ford
Grunjkarlik
Oibuk
SHAHIDULLA
11920
20534
Koshbel Dawan
13470
Suget Fort
Karakash R.
Suget Dawan 17610
(Pass)
CHIBRA
16500
Malik Shah
Capt. L. V. S. Blacker's Route
From Leh to Yarkand
1914
Scale 1/1,500,000 or 1/1·5M.
10 5 0 10 20
Miles
10 5 0 10 20 30
Kilometres
Route
RUINS
Heights in feet
Scale
1/3,000,000 or 1/3M.
10 0 10 20
Miles
10 0 10 20 30
Kilometres
Malik Shah
Baksam Bulak
Balti Branso
Karakoram Pass
18270
Pulo
Chipchak R.
Depsang Plain
Sasir P.
Murgo
Kataklik
Nubra R.
NUBRA ROUTE
Shaiok R.
Laowchi La
INDUS R.
Shaiok
LEH 11503
Nobok P.
Chang La
Drugub
Tankse
78
79
36
35
38
37

toys, gaudy buttons, and knives destined as presents to the Kirghiz. These proved well worth taking, as the Kirghiz appreciated them tremendously; they were especially fond of mouth organs. The third pony carried rations and bedding for the men; the remaining five carried 1080 lbs. of barley that I had bought at Sukti. I calculated on having to carry barley at the rate of 6 pounds per pony for twenty days; this I hoped would give me a little in hand when I reached Shahidulla, where I hoped to be able to obtain more. The train was very modest for financial reasons; but I think if I were repeating the journey I should cut down everything still further.

The Lambardar of Tankse disappointed me, as he promised to provide sheep, and arrived on the morning of departure without the sheep but full of polite and plausible explanations. As a result of my reproaches he said he would come up the valley with me and show me a herd of shapu; accordingly he and I climbed about a great deal of hillside together, but the shapu were not forthcoming.

That day's march was a short one, taking five and a half hours for the transport. A stony descent at 8° led down from Shaiok in twenty minutes to a bridge over the Drugub River, immediately above where it meets the Shaiok River. The bridge was 30 feet long by 5 feet wide, constructed in the local semi-cantilever fashion supporting five 4-inch road bearers. The stream beneath it was constricted and torrential, and quite unfordable. The path approached the bridge in a sharp turn, but the exit was straight. From here we went through brushwood 5 or 6 feet high where there was some grazing. The hills to the south are only 200 or 300 feet above the river-bed, and less than 500 yards from the river.

After three-quarters of an hour from the village we passed a cairn of nine single stones, piled vertically, and climbed about 500 feet over spurs. The hillsides become very steep, especially on the north bank. Sirshak, the place where the men of Shaiok and Tankse graze their herds, is at the bend of the river, two and a half hours from Shaiok, from where the bearing to it is 185°. There is a small abandoned stone hut here, surrounded by ample grazing and fuel. A very difficult path leads hence over the hills to Tankse.

Half an hour later the track drops into the river-bed, and goes under 100-feet mud cliffs. After four hours one climbs by built-up zigzags up granite cliffs, the summit of which runs up to 1000 feet above the river. A little further on, on the opposite north bank, a huge mass of gigantic tumbled rocks comes down from the hills and forces the river round its foot into a sharp bend. Five very steep zigzags lead down to the river level to a camping-ground called Chang Jangal, meaning Big Forest. Here there is almost unlimited grazing and fuel for a small party, and good water from side streams, but the main river is very murky and unfit to drink; it is 100 yards wide here, and much too swift to be fordable. The hillsides are generally almost perpendicular and quite

impassable, and the altitude of the river is 12,800 feet. I made the bearing back to Sirshak to be 35° magnetic.

A circumstance that surprised me at Chang Jangal was that it rained a good deal when I was there, and it rained or snowed at intervals all the time during my march up the Shaiok, even as far as the Suget Pass. I cannot help thinking that the rainfall in this region is greater than in the remainder of Ladakh, where it is less than 4 inches per annum. There is in consequence more grass, of sorts, than in the other plains and valleys, where one can march for days without seeing a blade. When I say grass, I do not mean anything that is recognized as grass in Europe, but small patches of almost imperceptible dry vegetation that are best looked for with a magnifying glass, but from which the astonishing Yarkandi and Ladakhi ponies managed to get some nourishment. The Lanskar-bred ones were the toughest. I had only one Kashmiri, taken as a stopgap; he did not last very well and came to a violent end.

From Chang Jangal we marched to Dansir, which took eight and three-quarter hours. The track led up the eastern bank of the river, in its sandy but level bed, now from 500 yards to 800 yards wide, and flanked by almost perpendicular hillsides. About 3 miles from Chang Jangal we had to go a little way up the hillside to avoid a quicksand brought down by a rivulet. After two and three-quarter hours we reached the confluence of the Chang Chenmo River with the Shaiok, approaching it by a path built up over a cliff. At 100 yards above the mouth of the Chang Chenmo is an excellent bridge, 6 feet wide, built by the British Joint Commissioner, of willow baulks braced with wire. The river itself is narrowed in to 30 yards wide by dry stone walls, and in July was torrential and quite unfordable. The junction of the two valleys forms an open stony plain, and the river-bed is not as shown on the Italian Atlas Sheet, since the Chang Chenmo has apparently shifted some 2 miles lower down, and meets the Shaiok close under the hills, on the former's south or left bank.

Having crossed the Chang Chenmo, this track led for some miles over the bouldery plain of its valley, in which there was a good deal of brushwood and grass. This plain forms a dividing tongue between the two streams. After four hours' marching we came under the cliffs at the corner of the Shaiok and Chang Chenmo valleys. These are of yellow sandstone, portholed, and form a distinct landmark. On the opposite bank is more brushwood and grass. The path continues in the Shaiok bed, now slightly narrower. At six hours the river closes into the hills on the east side, and the track, here about 5 feet wide, is forced to ascend the cliff by built-up zigzags. After crossing a very small side stream, where there is a small patch of grass and some bushes, we descend again steeply into the river-bed an hour and a half later. At the foot of the descent is a small cave, with a spring near by, and enough fuel for a hundred men for one night; there is more fuel and grazing on the

opposite bank of the river, which, however, runs nearly 8 miles an hour, is 200 yards wide, and apparently very deep.

The spot that I understood to be Dansir is round a corner, under some mud cliffs, on a sandy fan. Here there is fuel for five hundred men, grass for a hundred animals, and ample space for a camp. I should have done better to push on for another hour and a half, where there is a good spot for a camp for a small party, with grass and fuel. However, I did not know of the existence of the latter, and so halted at Dansir. One of the annoyances of marching up this valley is that when coming to a patch of grass after six or seven hours' going, one does not know whether to stop there, or, in the attempt to put a good long march behind one, to go on in the hope of finding more grass. If one goes on darkness may come on before reaching the hoped-for spot. If one does not know the road the finding of a patch of grass is a matter of luck, and if the animals spend a night without grass it will undermine their strength enormously and cause casualties later on.

The lower slopes of the hills began to be less steep, and from here onwards both the valley of the Shaiok itself and the side valleys became gradually more open and traversable till one reaches the Depsang plain itself.

From Dansir 12° zigzags led up over the cliff, and the ascent to 13,900 feet took forty minutes. From here one gets an excellent view of several snowy peaks and patches of grass, with the river 500 feet below and 150 yards wide. One hour on from Dansir is a spur, and a little further on one descends into a nullah, by a path sloping 80°. A quarter of an hour later is a torrent 10 feet wide and an ascent on to the high bank of the Shaiok by several 25° zigzags. At eighty minutes is a white pillar rock. The slopes of the hills to the east are easy, and the track crosses the foot of them. A little further on, 100 yards to the west of the track is a yellow crag, about 100 feet in height. Five minutes beyond this is the camping-ground mentioned in the last march, where there is grass for about a hundred animals and plenty of fuel and good water, also the remains of a bransa, or stone shelter. After this an ascent of 20° took us to the top of a curious yellow spur covered with conspicuous black patches. The top was reached at an hour and three-quarters from Dansir, and from here four snowy peaks were visible.

Steep zigzags led down 300-feet cliffs to the crossing of a stream 20 yards wide, 13,400 feet by aneroid. After crossing the stream we had to ford a side channel of the Shaiok twice, diagonally; this was more than 3 feet deep, but the current here was less than 4 miles per hour, as the channel was a sort of backwater under the cliff. The track thence lay in a stony river-bed, and then over a ridge. From the top of the ridge was a high waterfall, on the west bank, bearing 295°. A little further on was some brushwood and grazing, and more on the opposite bank. The river-bed had gradually opened out to a width of 600 yards, and the

hillsides were getting gradually but distinctly easier. At two and three-quarter hours the path was built into a cliff, several minor streams were crossed, and there were at intervals patches of grass and fuel. The road was sometimes on the edge of the 150-feet cliffs, sometimes in the river-bed. I decided to camp where there was good grazing and fuel, after eight and a half hours' marching, at 13,900 feet.

The next day's march was a short one of five and three-quarter hours, and of very much the same character. After three hours and a quarter was a good patch of grass, close by a three-humped hillock. Ten minutes further on one lost sight of the river, ascending at about 20° over two gentle cols to 14,350 feet. A further ascent to 14,950 feet was reached at four and a half hours. The river was here again in sight, with a rocky island in the centre of it about 800 yards long and rather conspicuous, since though the river now begins to hold many islands, the rest are all flat and sandy. Camp was reached at five and three-quarter hours at 14,800 feet, in an open valley out of sight of the river. This was on a pleasant grassy slope, which I estimated at sufficient for one thousand ponies. There was also ample fuel and water here. Again I had some difficulty in deciding whether to push on in the hope of finding more grass, or to stay where we were. It was a pleasant camp, and there were several pigeons there. I had hoped to find burhel all up the Shaiok, but not a single one of any kind came in sight, though I saw plenty of skeletons and heads. Karim told me that this was quite different from other years, though the explanation did not help the commissariat. To stave off famine I had to stalk pigeons with a ·22 bore rifle. This was most anxious work, as the food supply for a day often depended on the result of a single shot.

The next day's journey took us to Kataklik in twelve and a quarter hours. This is not the Kataklik shown on the survey sheet, but in the mouth of the next side valley to the south. These place-names are nebulous, and are merely those allotted by the merchants' custom to vague and ill-defined halting grounds. I found the spot rather hard to identify from the map, as these old sheets are weak in hill features—in fact, the hachuring does nothing to indicate the shape of the ground.

Shortly after starting we crossed a stream 8 feet wide, 14,700 feet, at the bottom of a deep gorge. At forty-five minutes a slight ascent led over a small col, the back bearing to the camp being 135° magnetic. The ground here was covered with a saline efflorescence. The river continued to be out of sight. The next valley held a rough stone shelter, and some very poor grazing. The lower slopes of the hills are quite open. After climbing steadily to 15,200 feet another col was crossed at one hour ten minutes, the back bearing to the camp being 152°. A few minutes further on was another small open valley, with a pond of about 80 square yards in the centre. A rise of 3° to 4° took us to a patch of quite green grass 200 yards by 20 yards at one hour thirty minutes. This would have formed an excellent place to camp at instead of the night before, thereby

shortening the march to Kataklik. There is another pond a few hundred yards further on, and a dry pond at one hour fifty minutes. Shortly afterwards the road comes to the edge of a precipitous ravine running into the Shaiok (15,400 feet). The track leads down at 14°, amongst big boulders. The last 200 feet of the descent are through heavy sand. The bed of the Shaiok was reached at two hours fifty minutes (14,600 feet). The river is about 600 yards wide, the bed over a mile wide. At the mouth of the gorge there is fuel for two hundred men. Very soon the path climbs up on to the edge of some cliffs; here the going is very bad indeed, with many ups and downs through tumbled boulders. After an hour and a quarter of this the path turns a corner into a side nullah, shown incorrectly on Sheet 44A, but correctly on Dr. Longstaff's map. Sharp zigzags took us down 250 feet, and from there along the left bank of a tributary 50 yards wide. About a mile up is an excellent bridge, 20 yards long and 10 feet wide, with three 5-inch baulks stayed with wire. The exit is rather steep (12°) over a cliff. The path re-enters the Shaiok valley at five and a quarter hours. From here onwards there are frequent patches of fuel. At six hours fifty-five minutes, we climbed over a grey rocky spur; ten minutes further on the track was carried away by a landslide, and it was necessary to make a detour through the side channels of the Shaiok. It took a long time to find the fiords, and we were delayed about an hour. Big glaciers are visible from here on the west bank, also some bright red hills near Kataklik, on a bearing of 355° magnetic.

Twenty-five minutes further on the path, having been high up on the side of the hills, descends 150 feet into the precipitous gorge of a side stream by a 25° slope. The going is bad from here onwards, sometimes in the river, sometimes over the foot of the hillsides. The mouth of the Kataklik nullah was crossed after ten hours forty minutes' marching, and passing a black knoll in the mouth of the nullah we turned up its right bank. A 300-feet climb over a spur showed us the camp 100 feet below at eleven and a quarter hours (15,300 feet). Here there is ample grazing. This place was very difficult to identify from the map, principally owing to the fact that the hill features are very roughly put in. It must be understood that these halting-grounds have merely names given by the caravan people, but I had no doubt that where I had camped was the real Kataklik. The names are not Tibetan but Turki, since, though the country is Tibetan, the majority of the people that travel the roads are Turkoman.

When in Srinagar I had access to the maps published by Sven Hedin of his 1906 journey into Central Asia. These had been most beautifully lithographed by the Swedish General Staff at Stockholm, and I took a lot of trouble to make tracings of them for my own use; however, after two or three days' marching from Leh I recognized that the lithography was far in advance of the topography in them, so I packed them away and regretted the loss of the time I had spent in copying them.

The next day's march to Murgo was short and troublesome. Turning our backs on the Shaiok valley a gentle ascent took us up a pebbly watercourse, very level and open and with easy hills on either hand. Just after leaving camp we saw fresh camel tracks, which of course proves that camels can get through the whole way, for since there are no camels in Ladakh, the animals that made the tracks must have come over from the Chinese side, and therefore, since they had got as far as Murgo, I saw nothing to prevent them getting to Leh. I think the Chang La could certainly be traversed by camel transport, and if they could get to Leh they could also get to India. Of course these remarks refer to the Central Asian Bactrian camel: the ordinary Indian camel of the plains would not survive the cold and the rigours of the journey.

An hour and a quarter took us up to 15,550 feet, where there were several heads and bones of burhel. Round a corner down into a very steep gorge by a sandy zigzag path of 25°, a descent of 350 feet took us down to the stream. The precipitous opposite side of the gorge was of brightly coloured yellow and red and blue rocks. The stream was 10 feet wide and swift. The ascent also of 350 feet was steep (20°) and heavy going. The path gently ascended the side of the hill, and a side nullah is crossed at two hours forty minutes at 15,950 feet. Here is grass for five animals. The hillsides again become open, and the path turns the corner at two hours fifty minutes, where there is a huge chocolate-coloured rock. The Shaiok again becomes visible, some more coloured hills bearing 298° magnetic, and river confluences at 192°, 215°, 275° respectively. A purple hillock bears 311°. The path descends across a pebbly open hillside and two shallow watercourses, each containing fuel. At four hours thirty-five minutes we turned up into the Murgo Gorge, descending into the bed (15,000 feet) by stony zigzags. We crossed the stream and over a spur on the right bank at four hours forty minutes. A 50° descent took us into the bed again, where the red stream joins the bright yellow one. After fording the red stream we got into the narrow gorge, and the trouble commenced. Coming round the corner I met one Ahmed Akhun, who was bringing up supplies for Dr. De Filippi and had been stopped by the river. He said that two Mecca pilgrims had been drowned trying to cross with their camel just before. Crossing the stream again with a certain amount of difficulty, we scrambled along the rocks at the foot of the cliff to an unpromising-looking place where the path stopped and began again on the opposite bank. The river was about 20 yards wide, quite 4 feet deep, and coming down very hard. Ahmed Akhun explained that this was the difficult place. I was determined to get across, as I did not think matters would be improved by waiting for the river to go down, in view of the rain that had fallen. I accordingly had all the ponies unloaded, and while we were doing this the tail of the caravan came up, including Puntsog, looking very bedraggled and sorry for himself. He, or rather Karim, explained that he had been swept off his feet in the river and

carried a long way down on to a handy sandbank, from which he had been rescued, after losing my lamp which he was carrying. I took the two strongest ponies, and, taking all unnecessary gear off them, I mounted Ahmed Ahkun on one and myself on the other; and putting loading ropes round us with a bowline, I told the men to hang on to the other ends of them whatever happened, and just managed to get across, the two ponies supporting each other in the water. There was nothing to spare, and I had grave doubts about getting loaded ponies across. Fastening one baggage rope to a sharp rock on my side, I made Karim do the same on his side of the river. I fitted a stirrup to act as the runner on this rope, and two more ropes to haul this backwards and forwards. A loaded pony then had his bridle lashed to the stirrup leather, and was hauled across after losing his feet once or twice. It took about two hours to ferry all the ponies in loads across in this manner, the only mishap being when Ghulam Ali came across. The stirrup leather in some way became unbuckled and he and his pony were swept down, but by some miracle they got jammed between a pinnacle of rock and the cliff on the right side of the river. We had not much difficulty in getting ropes down to them and hauling them up again.

A little further on there was another crossing of the same kind, which proved no easier. Sidiq's courage began to desert him, and he announced that he "was not for crossing any more rivers." I had to point out to him with some hard words that if he did not cross the river again he would have to spend the rest of his life on the little heap of boulders where we then were. We repeated the procedure, which took quite another two hours, everything getting thoroughly wet by being hauled under water, but the ferry was finished. However, when all the loads were over, the ropes remained with the far end tied to the opposite bank; as we could not spare these ropes I had myself lowered down the rope and unhooked them on the far bank, and placing the loops over one shoulder and the other arm, was hauled by brute force across the stream, again mostly under water. The force of the water was so great that it took four men on the rope to make any progress.

After this the gorge opened out, and the crossing of the stream, which had to be repeated a good many times, was quite easy. After seven and three-quarter hours' very wet marching we reached a patch of grass under some mud cliffs, which I understood was Murgo. There was grazing here for fifty animals and a little fuel. Here the track joins that coming over the Sasir Pass, the more usual route to the Karakoram. I think that if there had been any more water coming down the stream, it would have been impossible to cross it, even on camels, without using wire rope. A bridge is distinctly needed here.

The next day's march was the first on the ordinary caravan road. This was obvious from the great numbers of skeletons that we began to see lying along the track. The latter leads up a narrow rocky valley, the hillsides are bare and very steep, and the river runs in a gorge. This is

crossed twice at one hour; then the hillside to the south-east is ascended by zigzags, the top of the ascent being 16,200 feet. The descent is at first gradual, but at two and a quarter hours becomes steeper, with more zigzags. The river, 15,600 feet, is crossed again at two hours thirty-five minutes. Here the alternative track zigzags over a very steep and rough spur up to about 2000 feet. Five minutes further on a natural bridge of boulders is crossed. At three hours the river-bed opens out, and after continually fording channels to the stream, Kizil Langar (Red resting-place) is reached, after nine hours' marching. Halfway there was grass for twenty animals; the spot is, I believe, called Burtsa Chung Bransa, or "the shelter where there is much grass." Another spot is called Burtsa Kichik Bransa, or "the shelter where there is little grazing." Here there was no grass at all. The hillsides now are very much more open, and the valleys are wider; in fact, one again becomes conscious of having a skyline, since there are no great hills towering round. This is not to be wondered at, since it would need a very big hill to look down on 17,000 feet. Some of the hills around are steep, although quite practicable, and the colouring was generally bright.

On this march we met two caravans and several parties of pilgrims—the first human beings we had seen for some time. They were very Central Asian, and several of the pilgrims were women, some of them Kirghiz, wearing the quaint, white, towering headgear that reminds one of pictures of Edward the Third's Court. The men's boots were the most noticeable thing about them, being made of soft leather reaching above the knee, the foot part being made separately, like a stout shoe, so that it can be slipped on and off. This is to conform with the oriental custom of removing one's footgear when stepping on to a carpet; the man slips off the outer shoes, and retains the long soft leather boot. The women wore these boots too; they are practically universal throughout Central Asia.

Another curious feature was the men's hats, made of felt, of the colour and shape of the top of a mushroom, and sometimes bound with black braid. I judge that these were made in Khotan, where there is a considerable felt industry. This was also evidenced in the loads of the caravans, every pony having several felts just over his saddle, acting as pannels on the journey, and destined for the Indian market. These were often of bright colours, orange and purple predominating, and were used as bedding by the merchants in their camps when halting. I cannot help suspecting the use of German aniline dyes, the more so as I remembered seeing, some years before at a Tibetan festival at Kharbu in Ladakh, women wearing sheepskins covered on the outside with bright-coloured cloth embroidered in huge yellow letters "Made in Germany."

The next stage was to a camp on the Depsang plain. A gentle ascent, at first up a narrow ravine, took us in three hours across a spot marked as a pass on the map, on the great Depsang plain (17,800 feet). For an hour and three-quarters on we marched over undulations and watercourses,

almost level the whole way, till we found Dr. De Filippi's base camp in a larger nullah. The Depsang itself is of about the contour of Salisbury Plain, but quite bare, and has a marvellous surrounding of mountains. Here I met the Marquis Ginori and Prof. Alessandri, who entertained me hospitably and showed me all their splendid equipment of instruments. The Doctor's party were then absent on the Remo glacier, and Major Wood's in the unexplored valleys to the north-west of the Karakoram.

The Marquis Ginori told me a very interesting thing about the meteorological pilot balloons that they sent up—that the rate of ascent at the Depsang was considerably greater than at sea-level. One of these balloons, released at Leh, had descended in Rudok and had been the subject of a special commission of investigation from Lhasa; it was supposed to portend great events.

There was no grass or fuel here, but good and ample water. The track, as far as the eye could reach, was marked out by a double line of skeletons, a few of which were those of camels, which confirmed the deduction that I had made at Kataklik.

Starting late the next day we crossed the River Chipchak at one and a half hours, where there was a little grass. From here to the eastwards there is a possible track to the Lingzithang, up which Dr. De Filippi's geologists had gone. The country is all very open here, and going up the valley we passed three ruined huts called Pulo, which are just on the opposite side of the spur to that shown on the map. Camp was reached (17,900 feet) in nine and a half hours. There was no grass or wood, but good water. Just before coming into camp I shot a tsos, which greatly relieved the shortage of rations. We all had a hearty meal that night, and felt better for it. Now one really felt that one was on the roof of the world, but the only one who suffered from the great altitude was Ghulam Ali.

Below Pulo is Daulat Beg-uldi, or "the place where Daulat Beg died." Daulat Beg was the nickname of Sultan Shah, one of the Turkoman invaders of India, who met his end here when returning from one of his incursions, as a result of the great altitude, probably accentuated by Indian capuas. "Uldi" is a grim suffix to many Central Asian place-names. It is strange to think that his men's descendants have been fighting in Flanders.

The next day a gentle ascent of about half an hour took us to the foot of the Karakoram Pass itself, where I shot another gazelle. The actual ascent to the pass is only 300 feet, and not very steep. There is an excellent view from the summit, and it is obvious that the Survey Sheet is wrong in the shape of the hills. I saw no sign of the Chinese board marking the supposed boundary on the top, and what I took to be the monument to Mr. Dalgleish, who was murdered by the Pathan Dad Mahomed, is a little way down the other side, and looks like a pile of

ordinary stones. There is a short and not very steep descent that takes one down to a broad, open, shingly valley, and a patch of grass on the right bank of the stream is passed after six hours' marching; this is called Balti Bransa. The shape of the hills to the west gives one the impression that there is another valley in that direction, running parallel to the one we were in, which latter contains the headwaters of the Yarkand River. An hour and a half further on is a level plain called Baksam Bulak, where there is a good patch of grass, but no fuel. A big valley joins in here from the west. Here there were several more gazelle, but too small to shoot. Seven and three-quarter hours took us on the next day to Malik Shah. A place called Wahab Jilga, where there is no grass, was passed at three hours. We got several glimpses of the great undulating Kara-tagh (Black Mountain) to the east.

At Malik Shah there is a little very thin grass, and the track diverges to Ak-tagh (White Mountain). From here a miserable march through alternate snow and rain, in open valleys, led us at six hours to the Suget Pass (17,610 feet). This was reached by a gentle ascent, and a steep descent took us down to a patch of grass one and a half hours further on, called Kotaz Jilga (Yak Valley). Chibra is a ruined stone shelter about 3 miles short of the pass. I should have done better to push on a bit, and would have found better grazing. The next march led down an easy descent, past patches of good grass, and through a very stony landslide. Steadily descending, the path led round great spurs of the hills. Five and a half hours saw us in sight of the fort of Suget. The background to this was the imposing mass of the Karanghu range, crowned by many 20,000-feet peaks. The valley became much more grassy and full of brushwood, though steeper.

The fort, which is at the river junction (not as shown on the map), is reached at six hours and three-quarters. Here we seemed to have come back to the world again. Even barley is grown here, and there is ample grass. The fort is a square mud and stone enclosure, not loopholed, but without flank defence; the notched walls are about 7 feet high, there is no ditch, and it is commanded as to rifle-fire from spurs to the south-west. This is the real Indo-Chinese frontier: not, as is so often thought, the summit of the Karakorum. In fact, this same fort used to be garrisoned by the troops of the Maharajah of Kashmir, and was several times attacked, even as late as the nineties, by Kanjuti raiders.

Here there was a Chinese official (Ssu-yeh), a young man who had not altered his ways in consequence of the revolution. He wore the old blue silk habit, a pigtail, and long finger-nails. He was most obliging, and supplied me with 420 lbs. of barley and as much flour as I wanted for 27 rupees in Indian money. He was very pleased to be given some cigarettes and preserved ginger. Some Kirghiz, under a Yuz Bashi (headman of a hundred), called Musabai, were there too with some camels. Musabai came on with me the next day with four camels to show me the road

and the fords through the Karakash. The valley-floor is flat and stony, but the hills of the Karanghu-tagh tower up almost vertically to enormous heights. The path led us through the side of the Karakash River, where the ponies had to swim round a shoulder of rock. The camels, which were carrying their loads, could just keep their feet. This was opposite Shahidulla, where there is an old ruined fort at the mouth of a steep and gloomy-sided valley. This used to be held by the Chinese when the Dogras held Suget fort. Here also there are a few Kirghiz huts and a Mohammedan ziarat (shrine), which however looks very like a Buddhist chorten; it probably fills both rôles, like wayside shrines in India.

After crossing the main channel of the Karakash again we were brought to a halt by the Togra Su (straight river), coming down with great force and quite impassable. Following its right bank for about 1½ mile, where is the usual ford, we met a merchant named Rahman, camped there with his caravan. He explained that he had been waiting a fortnight to cross, which did not sound very cheerful. I spent the afternoon in getting the shoeing of the ponies completed by Musabai's young men, who were real experts. I had had to reshoe some of them at Malik Shah, and Sidiq proving incompetent, had to do it myself, so I was glad to get them all properly shod here. Musabai himself was splendidly mounted on a Karashar Mongol pony, which went at an amble or triple at a great speed. He had a fine silver-mounted bridle, saddle, and stirrups, soft brown leather boots, a tall peaked cap edged with fur, and a long robe of many colours. His kit consisted of a bright orange-coloured piece of felt rolled behind a saddle, and a metal cooking-pot. The outfit was completed with a silver-mounted Badhakshani whip.

Since the Togra Su was glacier fed I hoped that the water would subside in the morning. This came to pass, but not till 11 a.m. The fording had to be done diagonally across a couple of islands, the camels carrying the baggage. We crossed on the riding-ponies, the baggage animals following in our tracks, though all had considerable difficulty in keeping their footing against the force of the current, and the only Kashmiri pony I had, straying a little away from the proper ford, was swept away like a flash; after about two minutes his nose appeared some 300 yards down in the seething waters, and that was the last we saw of him. Another pony foolishly followed him, but did not get quite so far into the torrent, and just managed to scramble ashore lower down, helped by Rahman's men. Just above the ford is a ruined village called Bostan, with a little barley sown around.

The next march took us, after crossing the Kilian-Su near an abandoned fort (Kilian Kurghan), to a place called Pile-toghack. The track ran up the left bank of the Kilian-Su to the Kilian Pass. I discussed the question of going up this with Musabai; he said it would be very difficult to cross the stream higher up at that time of year. It would have been possible to reach Yarkand by this route, though far from easy. Pillata

Gash is a square, fort-like enclosure with high mud walls and rooms inside, owned by a Taghlik (hillman) who cultivated a little barley here and owned some herds of goats. Just before reaching Pillata Gash we had another awkward passage through the edge of the Karakash. The valley had narrowed in, and the path led on to the face of a cliff. The river was here the most violent stream I have ever seen. It closed in to about a hundred yards wide, roaring between the cliffs so that conversation had to be done in shouts. Here all the loads had to be man-handled over the cliffs, and Musabai's men were beyond praise. The camels had been sent back, and the ponies, supported by ropes, went along the path through the rushing water, which towards the end reached nearly up to their withers; however, we got through without any casualties, and were tired enough to be pleased to halt at Pile-toghack.

From here a short march of three hours took us to Ali-nazar-kurghan. To reach this, we again had to man-handle the loads over the cliff face, where the ponies could not get through the water and had to be sent unladen over a very steep spur and down the other side. The path was so steep that I do not think they could have carried loads up it. The halting-ground is half a mile on from this, and is marked by another quite big ziarat and graveyard. Here there were piled a great number of horns which appeared to be small *Ovis poli*. Musabai went back from here. I gave him thirteen rupees, with some small mirrors and gold-embroidered cloth which pleased him greatly.

We had subsisted so far on "kulchas," a sort of biscuit which I had got made at Leh. These were very satisfactory, but had all got damp in the many river crossings, so we laid them all out to dry in the sun. From here we abandoned the Karakash Valley, which appears to become very narrow and precipitous to the north-east. Climbing up the river-bed of the side valley, at three-quarters of an hour we came to a meeting of the streams. The track to follow is that to the right, or east. A little further on is another valley junction; here keep to the left, or west branch. The nullah becomes steep and stony, and the sides precipitous and vertical. Tarboghaz—also a valley junction—was reached at five hours, after a stiffish climb. Here camping in a sort of cave I met two Hindu merchants, who, retiring from business in Turkistan, were going back to India with their savings and the small son of one of them. They were effusively polite, and seemed very pleased to meet a sahib. That night and the next morning it snowed heavily.

The Khirghiz Beg had sent yaks to take my baggage over the Sanju Pass. We started early in the morning, through heavy snow, and up a very steep gully. A heavy climb of two hours took us to the summit, which is a knife edge (17,600 feet). The snow suddenly stopped, and we got a magnificent view of the unknown mountains to the east. All the hillsides here seem very steep, but I could see no trace of the glacier which is reputed to exist on the top of this pass.

A correspondingly steep descent of an hour and a quarter took us to the open, grassy pamir of Kichik-yailak. After an hour's march over undulations where marmots abounded, I caught sight of a white European tent close by a large encampment of Kirghiz, and found here a Russian soldier, presumably a Cossack, who explained that he had come from Prjevalsk, a cantonment on the shores of Issik Kul in Semirachensk, a good many hundred miles away, over intervening mountains and deserts. He was accompanied by three Kalmuks and five horses, which were being shod. He seemed a most enlightened fellow for a private soldier, being able to point out the regions he had traversed on an English map. He was interested to see my photographs and also in Ghulam Ali—a brother in arms had we only known it. He explained he had come to shoot marmots.

The Khirghiz brought me an excellent supply of curds, and also some magnificent butter in a lordly dish, which was very welcome after the weeks we had spent without it. The Beg was a man of over seventy, with a long grey beard. He remembered Sir Robert Forsythe's Mission to Yakub Khan in 1873, with its escort of Guides cavalry. I was very interested to hear about all this, especially as my regiment is the only part of His Majesty's Forces that has served in Central Asia. He had too stories of Kanjuti raiders, and told me the tale of the band that perished on a great glacier in the heart of the Karakoram ranges.

I inquired by what name the Sanju Pass went locally, and was told Jandar Art or Grim Dawan or Muz Art. No one calls it the Sanju Dawan, except the maps.

Descending from the pass the track led along the upper waters in a narrow valley. Here there is grass nearly everywhere, and lower down some patches of cultivation, with an empty hut or two. Tam-karaul is a farm, similar to that at Pile-taghack, reached after a rather short march. The next morning, pushing down the valley for about an hour, we turned up a side nullah to the eastwards. It is sometimes possible to reach Sanju village by going straight on down the Sanju River, but at this time, I was told, there was too much water, and I had to make a *détour* over the Chuchu Dawan. After turning east a short but steep climb took us over a spur, the north end of which forces the river into the gorge. We then crossed the river by a very fairly good wooden bridge about 30 yards long, and pushed on high up a hillside on the east side of a steep valley. The path very soon got into the watercourse, and for a good many miles is shut in by walls of black rock, winding interminably upwards. A steep climb took us over the pass (14,500 feet), and a zigzag descent the other side led down into a narrow grassy valley; the rivulet in this is brackish and unfit to drink. Six and three-quarter hours' marching saw us at Kök-bash (blue head), a farm owned by one Yakub, a Taghlik. Here there was a little cultivation where the two big valleys joined. A path led south-eastwards, and Yakub told me that this led over a pass, about one and a

half marches up the valley, presumably into the great gorge of the Karakash River. Here some of the ponies showed sore backs, which I treated by applying a mixture of equal parts of iodoform and boracic acid, which gave the most excellent results. Luckily, the loads having been nearly all consumed, I was able to relieve of their saddles those animals that were at all bad.

The next day a long march of ten and a half hours, in considerable heat, took us down an open rocky valley leading northwards, past a hamlet called Kizil Ighil at about halfway. Here there were trees, grass, and cultivation, and several families. Going steadily downhill, and with the temperature regularly increasing, we came in sight of an oasis called Posta, or Postaki Langar, with a big area of cultivation and many trees and houses; but we left this about a mile on our right to the east, and quitting the valley climbed over some big sandhills to the Kizil Bash Dawan (Red Head Pass). About 300 feet ascent and heavy going took us on to the sandhills, which here form the border of the Taklamakan Desert.

We reached Sanju after dark, and camped in an orchard belonging to one of the principal inhabitants. Sanju is the first big village, and is quite a trade centre, having a bazaar with twenty shops. The cultivation stretches up the valley for about 2 miles. There are many trees in the oasis, which is celebrated for its fruit. All the inhabitants are most hospitable, and seemed very pleased to meet strangers. When I had settled down into camp my orderly announced that two ladies had come to call; these, however, turned out to be the two Chinese officials, whose straw hats and pigtails, long robes, and smooth faces had deceived Ghulam Ali. They saw my passport, and very politely inquired what they could do to help me.

Nine and three-quarter hours' hot marching over the desert, amid endless sandhills, took us on from here to Koshtagh, an oasis like that at Sanju, but smaller. Oi Toghrak was reached the next day, after a similar march of eight and three-quarter hours. From here to Bora was five hours. All these marches are almost exactly the same, through gravelly and sandy desert scenery, the road running generally east and west. To the south the mountains can be seen in the distance, and to the right nothing but desert. The villages are each in watercourses flowing from south to north across the direction of the march. Where there is water the cultivation is extremely fertile owing to the careful irrigation, and this makes an astonishing contrast in the day's march. The inhabitants are all very courteous and hospitable to strangers, willingly lending their orchards to camp in, and producing all sorts of supplies and fruit. It was even at times a matter of difficulty to get them to accept payment, and they preferred presents in kind to money.

Karghalik was reached the next day. This is a town where there is a Chinese district magistrate, troops, and police. The population of the

towns are called Alti-Sharliks (people of the six cities). They form a section of the population distinct from the Taghliks (men of the hills), such as I had met at Tam-karaul and Kok-bash. These are also cultivators, but more bucolic and hardy. The third division are the Kirghiz, who are entirely nomads, living in tents on the produce of their yaks, camels, horses, and cattle. They have little or no cultivation, and are governed by their Begs, Ming Bashis, and Yuz Bashis. The Kirghiz seem to merge into the Cossack on the Russian side, and to give way to the Kalmuk on the Mongolian border. The Alti-sharliks are nowadays soft and peaceful, and fail to recall the swashbuckling Turkoman of the Middle Ages, or even of the days of Skobeleff and Yakub Khan.

At Karghalik there is an Aksakal (white beard), an official appointed by Sir George Macartney to look after trade to India, and the Aksakals at every town I came to spared no pains whatever to do everything they could for me. The one at Karghalik had a room ready in his sarai, with carpets and felts, and unlimited quantities of fruit, tea and sweets. He also had some Chinese visiting-cards painted for me, and equipped with these I called on the Amban.

It is most important in dealing with Chinese officers to pay attention to their etiquette. I had with me some white review-order uniform, well starched and carefully packed. Having sent a card on ahead about half an hour before, I donned this uniform, and accompanied by the Aksakal and by Ghulam Ali in his blue and gold Peshawar lungi, we went to the yamen on the best horses. Here there were the usual seven carved gates to go through in succession, the passage accompanied by loud salutes from a sort of mortar. Having got through the seventh gate we dismounted, and I met the Amban, who was dressed in a black serge patrol jacket of European cut, trousers to match, Chinese felt-soled boots, and a peaked cap of European shape bearing a gilt dragon crest. He took us in to tea, and employing a double relay of interpreters we carried on a polite conversation. The Chinese officials do not speak the language of the country, and employ Turkoman interpreters, who wear false pigtails and dress as Chinamen. Having ceremoniously taken tea, I left my passport with his secretary and we returned. He sent me a present of grain, grass, and fuel, and in return I sent him a bottle of Crême de Menthe, which he much appreciated, coming the next day to pay a return call to say so.

We rested a day at Karghalik, and several Indian and Pathan traders were brought to me by the Aksakal to pay their salaams. From here onwards on every march all British subjects, whether Hindu or Mohammedan, would come out many miles to meet me, on their best horses and dressed in their best clothes. They all seemed extremely pleased to see a British officer, and did everything they could to make me comfortable. This, I think, was entirely due to their feeling of loyalty and to Sir George Macartney's influence. There were a considerable number of Afghans,

who had no hesitation in telling me that they were British subjects, and were extremely pleased to hear that I came from Mardan and could speak Pashtu.

The next two days took us to Yarkand, the intermediate stage being Posgam. I tried travelling in a "mapa," a Chinese cart with huge wheels and tyres studded with gigantic nails. The vibration caused by these was beyond belief, though by sitting on an air cushion I managed to endure for a few hours at a time. At Posgam I was entertained by a man from Muzufferabad, on the Khagan Kashmir border, who had served in the Hunza expedition in 1891, and had received a sword wound on the scalp which resulted in an enormous cyst on the side of the face. In the sarai here, where he had got a room ready for me, there was the Chinese official in charge at Guma, and travelling back to that place from Yarkand. He was also dressed in Europeanized khaki uniform, and his orderly was so exactly like a Ghurka signaller in my regiment that Ghulam Ali at once called him Dambar Sing Gurumg after him. The Chinese official came to call on me, so again I had to don my review order. He had served in Eastern China, and was acquainted with European ways. He set off the next morning about the same time that I did, on a fine-looking Mongol pony.

After a very similar march to the preceding ones we reached Yarkand, and were put up in a house just outside the city walls by the Aksakal, a fine old Pathan from Bajaur. Here I met Mr. Cotton, I.C.S., who had come over the Pamirs, and proposed to return to India across the Lingzi-thang. I spent three days at Yarkand, calling on the Swedish missionaries and the Chinese Amban. The latter was one of the old school in his retinue and surroundings; the only European thing about him was his hat, which was of soft black felt. He also was extremely good to me, and gave me a sort of "laisser passer." In the yamen here were several criminals expiating their sentences, some in cages, and one with a log of wood chained to his neck and ankle.

Yarkand is rather a disappointing city. Like all the big towns in Central Asia there are separate Chinese and Mohammedan quarters, the former called Yangi-shahr and the latter Koneh-shahr. The Koneh-shahr is a great collection of narrow streets and bazaars, mostly covered over as a protection from the sun. There are many Chinese shops, the majority of which seem to be pawnbrokers. The Yangi-shahr communicates with these by a bridge over its moat, leading into a fine gateway. This is a portion of the high and well-kept wall of the Chinese city, which is separated from the old city, the latter having a wall of its own. The gates are shut punctually at dusk. The heat began to be pronounced, and so I marched out through the Yangi-shahr at 10 p.m. I passed a small mud fort, Utekchi Langar, which forms a sort of desert lighthouse, a red lamp being hoisted on a staff as a guide to travellers.

The road is very dusty and toilsome and leads across a desolate tract

due north towards Yangi Hissar. Early in the morning I reached a village called Kizil Bazar and slept in one of the houses. When we woke it was bright daylight, and going into the courtyard I was surprised to meet a Cossack subaltern with four of his men. His name was Gorieff, and he belonged to the 5th Orenburg regiment. They were travelling very light, with nothing but what they carried with one spare horse. Their turn-out struck me as being distinctly smart, and rather a contrast to Ghulam Ali and myself, who were now a bit travel stained. One of the Cossacks was a Mohammedan named Rakhmat. It came as a shock to Ghulam Ali to find Mohammedans and Christians soldiering in the same squadron. Gorieff and I breakfasted together, conversing by means of a pair of interpreters. On August 10 I reached Yangi Hissar (new fort). This is the third biggest town in Turkestan and has an imposing and well-kept fort standing a little away from the bazaar.

The Aksakal here was a Hindu, and he put me up in his house and entertained the party most hospitably. The next place was Yapchan. Here I met an Afghan trader who, in common with the other Afghans in the country, considered himself a British subject. Early next morning we pushed on to Kashgar, first crossing the Khan Arik River in a big ferry-boat. At about halfway I met a mounted man who had a letter for me from Sir George Macartney. This note ended by saying that there was a rumour of war between Germany and Russia, which came as rather a shock, since when I left India the whole of Europe was utterly peaceful. About 4 miles before reaching Kashgar I passed the Yangi-shahr and saw a number of Chinese soldiers strolling about the bazaar. They were all well dressed in black uniforms of European cut and peaked caps with a brass dragon badge.

I was very kindly and hospitably received by Sir George and Lady Macartney, and met Mr. Hayden of the Geological Survey of India. The principal talk of course was about the rumour of the European war. I called on the Cossack Mess and Prince Mischersky, the Russian Consul. He advised me to wait for a few days until the mail should come through from the Russian post Irkeshtam. Eventually the jigit arrived with a great handful of telegrams containing news of the apocryphal battle in the North Sea, the despatch of the British Expeditionary Force, the retreat from Mons, and the siege of Königsberg. This news decided my future movements, and so after lunching with the Chinese Amban—a repast which ran into over thirty courses—I supped with the Cossack officers, drinking confusion to the Germans, and pushed off early next morning with Mr. Hayden to Min Yol (the thousand roads). This was a long march across a high plain, and just took us into the foothills. I had decided to send Ghulam Ali back to India; so giving him some money, a bag of flour, and a horse and saddle, I indicated the way back to India over the Pamirs, and trusted he would arrive in about three months. He completed his journey, and I next saw him in Belgium, where he stopped a German bullet in the neighbourhood of Ypres.

From Min Yol our road lay through the Trans-Alai mountains *viâ* Irkeshtam, Osh to Andijan. The country and the track were very like the Indian frontier. From Kashgar to Andijan took nine days, making long marches and crossing the Terek Pass. Irkeshtam was reached on the fourth day from Kashgar: a polygonal stone fort with a moat and a garrison of Cossacks, with a telegraph office and a Russian customs post, in view of the considerable trade that passes between Russia and China. The telegraph line was not working much eastward of Irkeshtam, but there were a number of telegraph poles along the road ready to be erected. This route is traversable by camels, though not by any sort of wheeled transport. At every stage there is a room for travellers, generally in a farm or sarai. The ascent to the Terek Dawan is quite easy though rocky, and there is a Russian rest house about an hour's march down on the south side of it. The descent is distinctly steep, and many skeletons testified to the trouble caravans have in crossing it in bad weather. Across the pass there is another rest-house called Kizil Kurghan, and a little further on the track drops down a long steep and rocky gully with precipitous sides, at the foot of which is a Kirghiz encampment. Two marches further on we reached Sufi Kurghan, after marching through an enclosed but fertile valley. Here the track joined the Alai road over the Taldik Dawan and the telegraph line; there were also Russian verst posts, painted red, white, and blue, and the road became distinctly possible for wheels.

The next stage was Gulcha, where there is another obsolete earthwork fort, and quite a large garrison of Cossacks. From here there are two roads to Osh: one easy, bearing westwards, the other due north-west over the hills, and passable only for pack-transport. We took the latter over the Kaplan Kul Pass and were rewarded by a fine view of the lower Alai Hills. These are far less rugged than any I had seen, and were covered with grass; and in the valleys were many isolated homesteads. We passed the night in a barn in a village halfway to Osh. Here I saw for the first time one of the remarkable Kirghiz carts with wheels well over 7 feet in diameter. The single horse is harnessed between the shafts and ridden. This conveyance is called an Arba, and owing to its huge wheels and resiliency can be used to travel over the roughest country.

The next march was over very easy country, which seemed almost flat after what we had already passed through, and took us to Osh. On the way we passed a patrol of about six men, apparently on their way to Pamirski post. They seemed very well uniformed, equipped, and turned out; and not only the non-commissioned officer but each of the men had one of the excellent Russian maps which he was studying. They had the long "three-line" rifle slung from the right shoulder, the Cossack sword and dagger, but no bayonets or lances. We also passed a tribe of nomad Kirghiz on the move. All hands, men, women, and children, with their tents and property, were mounted on the huge Bactrian camels, the larger

of which were caparisoned with brightly coloured tassels and carpets. The last few miles into Osh were level in an almost European setting.

The town reminds one somewhat of Egypt, and is overlooked by a steep bare brown hill. Here we discharged our pack-ponies and proceeded along the high-road in a couple of landaus. A dusty drive through a richly cultivated and wooded country took us to Andijan, where we suddenly dropped into the civilization of electric light, railway terminus, and European shops. The effects of the war were already noticeable in the number of soldiers and reservists about the place.

We went to see the great cotton-seed oil mills under the guidance of an American engineer. The plant was remarkably up to date, driven by electric motors to which current was supplied from alternators actuated by 8000-horsepower Diesel engines. These prime movers are much in evidence in Russian Central Asia on account of the easy supplies of "mazub" or crude oil that comes from Baku. I noticed that a great number of the work-people were Persians, who had an almost inhuman reputation for industry. They were fine stalwart men to look at, and it seemed strange that they should be so lacking in manly qualities. Some of the remainder were Armenians. There were very few Turkomans or Sarts, as the Russians call them, as these people generally prefer idleness to hard work.

We entrained in the evening *en route* for Tashkent and Moscow Owing to the situation in Turkey I had to abandon any idea of going home *viâ* Baku and Batum. We travelled with the Governor of Skobelev (New Margelan)—the Aldershot or Rawal Pindi of these parts—where are the headquarters of the 5th Orenburg Cossacks and other troops. The General did everything he could to make us comfortable. The railway reminds one of India; but the beneficial effects of the "mazut" which is burnt on the railroads is very noticeable, in that rolling stock, stations, and everything remained perfectly clean. The difference this make to comfort in travelling can scarcely be imagined unless one has actually experienced it. The road-beds seemed securely laid with heavy rails, and the stations are solidly constructed of grey stone, and are remarkably clean. The signs of mobilization were everywhere.

Changing at Chernayevo, we reached Tashkent on the second day. This is called the Paris of Central Asia, and is certainly a remarkable city. The cantonment is absolutely European to look at, with hotels, shops and banks, electric trams and light. It gave one the impression of being centuries in advance of the Central Asia of Skobeleff's time, although the grass-covered ramparts of the fort bring his campaigns to mind. The Sartski city is quite separate and quite oriental, although on a much more affluent scale than Yarkand or Kashgar. Here we bought some carpets and shawls, having two or three days to wait for the return of the Governor-General's diplomatic secretary, without whose permission foreigners may not travel through Orenburg. The Governor-General was no

other than General Samsōnoff, who had made his name in the Japanese war and was killed while commanding the army then besieging Königsberg. His diplomatic secretary had been Russian Consul in Bombay, and knew all about India. He even had a servant who spoke Hindustani. He did everything he could to help us, and did not take long in giving us a permit for the Tashkent–Orenburg line. We left that night in the only non-troop train. Even this had a draft on board of the 4th Turkestan Rifles. Their officer, with another subaltern commanding machine-guns of the 6th Turkestan Regiment, took me to the car in which his men were travelling. I was very well impressed with them and their equipment. In physique they reminded one of Australians, and were darker than the average Russian of Europe, but very thick-set, hard and sturdy. They had excellent khaki uniforms, almost our shade of colour, and good knee-boots. They carried their great-coats *en banderole* over the left shoulder, with the ends tucked into a copper cooking-pot. The ammunition was carried in two pouches and a canvas bandolier; but the bayonet was, of course, always carried fixed, and each man had a spade on his belt similar in pattern to the German implement. The N.C.O.s had binoculars and compasses, and some had small axes. The machine-guns were in a separate company. The men seemed full of good spirits and contented.

It took us several days and nights to reach Orenburg, each day's journey seeming the same as the last. On both sides grassy steppes stretched to the horizon, almost always flat, and nowhere more undulating than Salisbury Plain. The stations were all exactly the same, with an oil tank, a water tank, and a greyish stone building. At frequent intervals there were sidings, in nearly every one of which was a troop train. Although the progress was slow and the country monotonous, the journey did not lack interest. It was strange to skirt the Sea of Aral with light-house and fishing-vessels in the middle of a huge continent.

Orenburg is a picturesque town on the border between Europe and Asia. The railway approaches it over a big iron bridge, from which is obtained an excellent view of the town, whose gilt and bronze domes and coloured buildings form a pleasant foreground to the Ural Hills in the background. Here were more newish-looking barracks and Cossacks. From Moscow I had to hurry home through Petrograd, Finland, and Torneå. Sweden seemed completely mobilized and very pro-German. In spite of this, apart from the official precautions against misdoings on our part, we were very courteously treated, and my passport, covered with Chinese stamps and writings, not to mention Russian and Indian inscriptions, was a great source of wonder to the officials. Avoiding Stockholm we passed through Christiania to Bergen, whence a very small Norwegian steamer took us across the North Sea. Every member of the crew appeared to spend his time with his eyes goggling out looking for mines, but we arrived safely, and that evening saw me in the War Office, thus

completing a journey which ended up very differently from what I had anticipated.

The road journey was by no means so arduous as I had expected, and the only real difficulties that I met were at the crossings of the rivers, which in the Kuen-Lun are much larger and swifter than I had anticipated. The desert in Turkestan, though sultry, is nothing to one used to Indian hot weather, whilst the fruit in the villages of the oasis makes up for a good deal.

The hospitality that I met with everywhere from the inhabitants, whether Russians, Cossacks, Kirghiz, Tibetans, Hindus, Pathans, or Turkomans, must be experienced to be appreciated; more especially the goodwill of the Indians in the villages showed that their loyalty to the British Government was more than a mere phrase, and made me think that the sedition one had heard so much about in India was even more of the nature of froth than could have been imagined.

The great heights traversed had no ill effects whatever either on beast or man. Ghulam Ali, it is true, suffered a little from mountain sickness in the Shaiok Valley, but I think this was mainly the result of farewell banquets at Leh. Not even when camping at 18,000 feet did any one suffer from insomnia. The only casualty was the pony that was drowned at Togra Su. Several of the animals acquired sore backs, but the treatment with equal parts of iodoform and boracic acid gave results little short of marvellous, and the general state of the ponies at the end of the journey was infinitely better than in the ordinary caravan.

The Shaiok route is most interesting, and undoubtedly far superior to the Nubra. I am positive that it could be traversed by camels, and the amount of vegetation for grazing is by no means beneath contempt. Since Major Wood's party had surveyed the valley, I did not spend much time on its topography, merely taking compass bearings from point to point, and recording aneroid readings. The latter, as mentioned in the itinerary, must be taken as relative, and were only taken to show the ups and downs of the day's march, and not with any idea of accuracy.

In Turkestan the people looked remarkably well fed and prosperous, the astonishing lack of sanitation seeming to have little ill effect, presumably on account of the extreme dryness of the country. In Kashgar and to a certain extent in Yarkand Russian influence was very prominent, not only in the presence of the troops, but in the trade and currency, the rouble passing freely.

The coin of the country is the seer, corresponding to the Chinese tael: a silver coin, no two specimens of which seem to be the same in pattern or size, and valued at about two rupees. I found that sovereigns were quite acceptable to the Kirghiz and the Turkomen, though they had never seen them before; they were quite willing, however, to take my word for their value. There are smaller silver coins, but the principal copper coin is the darchin; about the size of a halfpenny with a square hole in the

middle. About four hundred of these go to the seer or tael, so that for any purchase a pony-load of copper coins is needed. I noticed also a great number of roughly printed but artistic Chinese notes, with a huge pink and yellow dragon on one side. These were lithographed on mulberry paper, and were introduced to the extent of several millions by the Republican Government. Since they were never even theoretically supposed to have any equivalent in bullion, and were not exchangeable when worn out, their introduction was a stroke of financial genius. The wear and tear on them was great, and any merchant who refused to accept a paper note was led to the executioner, whose establishment is a prominent feature of all the towns and villages. Two beheading swords with the blades painted red are hung up on either side of the door of the police station.

In Ferghana (Russian Turkestan) the population seemed even more prosperous and well-to-do than in Chinese Turkestan. The country is marvellously fertile and the crops, especially of cotton, beyond belief. On the upland farms in the Alai one saw Russian settlers occupying holdings on the same scale and in the same condition as their Kirghiz neighbours.

Note on the name Shyok or Shaiok.

The name has usually been written Shyok; but on one sheet of the Indian Atlas it is Shayok, and on "Punjab N.W. Frontier Province and Kashmir, 1909," it is written Shaiok. The latter spelling has been adopted in this paper, in the belief that the second-mentioned sheet represented the mature opinion of the Survey of India. On still later sheets they have, however, reverted to Shyok, which should, by the usual rules of geographical spelling, treat the *y* as consonantal and be pronounced as a monosyllable. If the word is a disyllable, and the first vowel sound a diphthong having the sound of *y* in 'why' or of *ai* in 'aisle,' the name should be spelled Shaiok rather than Shyok. Pending a decision by the Survey of India, the spelling of the name here adopted should not be taken as certain.—Ed. *G.J.*

EROSION AND THE RESULTING LAND FORMS IN SUB-ARID WESTERN AUSTRALIA, INCLUDING THE ORIGIN AND GROWTH OF THE DRY LAKES

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(By permission of the Director of the Survey)

Read at the Afternoon Meeting of the Society, 22 February 1917.

IN the writer's work on the physiography of Western Australia, the process of arid erosion in the Salt Lake Division was described to some extent, and the origin of the 'dry' or 'salt' lakes of that area was discussed. Since then the writer has given closer attention to the subject in the field, and is therefore in a position to discuss more fully the various

the Sinai Peninsula as a conquest of Germany and her allies. The most curious feature is a "future world-traffic route" from Germany to the East, through Serajevo and Mostar to the coast about Ragusa, thence through Albania and Greece, across the west end of Crete to Ras el Tin, coastwise to Alexandria, and then across the Delta to Suez. The choice of such a route is 'wrop up in mystery.'

The third map is presumably for propaganda. It is all in pretty good English, but displays the name of the well-known Berlin publisher. British possessions are coloured red, and an ample reference-list shows against each a date, and a brief note of "How acquired." These notes have a certain acid or even toxic flavour: thus:—

Dominion of Canada, 1713–1763		Captured from France in the War of the Spanish Succession and in the Seven Years' War.
Falkland Islands	1832	Occupied despite previous Spanish claims.
Tasmania	1803	Occupied after previous Dutch settlements.
Sikhim	1890	Taken from China and declared a Protectorate.

Happily they are all plainly labelled "LEGEND." Egypt appears as "occupied and taken from Turkey during the insurrection of 1882"—whereas the Freytag map claims even the Anglo-Egyptian Sudan as still half Turkish. Lemnos and Tenedos appear for the first time as parts of the British Empire; but Togoland and German New Guinea and the rest of the then vanishing German Colonial Empire remain virgin white.

We will not on this occasion make the mistake of underrating even the most extravagant features of such maps. In our former note we were surprised at the idea that it was worth while to show the boundaries of the Ukraine Kingdom in the thirteenth century. Now it is only too plain that the separation of the Cossacks was part of the German reckoning; and we must recognize that outrageous productions of the private German map-publishers are more likely to be inspired by official wire-pullers than by unauthorized enthusiasts.

REVIEWS

ASIA

Bengal, Bihar and Orissa, Sikkim. (Provincial Geographies of India).—L. S. S. O'Malley. Cambridge: University Press. 1917. 6*s. net.*

The editor of this series was well advised in disregarding the recent administrative changes, about which so much controversy has raged, and considering the whole area, geographically, in a single survey. To the student of the British connection with India the grant, in 1764, of the Diwani of the combined regions Bengal, Bihar, and Orissa, is the outstanding landmark of the transition from commerce to government. The 153 years that have elapsed show advances in order and material progress unequalled in any other country of the Old World, but, as shown in the excellent account herein given of the religious and social life of the people, the civilization which prevailed in the days of Clive remains in essentials as it was, or if progress has been here made it is strictly on the old lines, almost unpenetrated by foreign ideas.

In an area so large as that in question there are, of course, marked differences, physical, racial, and linguistic, which are concisely and explicitly set

forth in an introductory description. They are not exactly co-extensive with the administrative frontiers, but approximate sufficiently to justify the time-honoured tripartite subdivision.

The greatest variety is found in the western section, a considerable part of which consists of hill-tracts stretching far beyond the southern and western boundaries of the province. The other upland regions included in the area here dealt with are, so to speak, outside India proper. That skirting the Himalaya is quite a modern addition to British territory, while the other is more akin to western Burma. The paramount feature of the whole of this part of India is the vast alluvial plain of the Ganges, constituting the greater portion of Bihar, and, with its terminus in the amphibious conditions of a great delta, practically the whole of Bengal. The striking differences between these tracts are well brought out in the chapters on climate, population, and occupations. The swarthy denizens of the forest-clad hills of Chutia Nagpur and Orissa appear to furnish a complete Pactolus of primitive languages, customs, traditions, and views on life and death. The most remarkable and potent influence, upon the fringe of these tribes at all events, has been the temporary migration due to the opening of new labour fields by British industrial enterprise, either close at hand, in the coal districts, or as far away as the tea-gardens of Assam. The demand for alien labour in Bengal is no novelty, but until within the last generation or so it was restricted to porters from Orissa and the bodyguard of territorial magnates. The enervating climate and the extraordinary fertility of the lower Ganges valley tend to make the natives averse from arduous or risky physical pursuits, whilst, on the other hand, the keener struggle for life on the densely peopled plains of Bihar renders the hardier and more strenuous peasantry of that region ready to better itself by undertaking such duties. This migration, however, like that of the hill tribes, is but temporary, often indeed only seasonal. One of the drawbacks of this tendency, accordingly, to which the author calls attention, is the extent to which it retards the progress of factorial industry in Eastern India by preventing the formation of a permanent manufacturing element in the population. The workers, in fact, in their respective industries have to become a caste, even as have to a certain degree the cotton operatives of Lancashire.

The editor has again been fortunate in his choice of an expert to deal with this very important part of India. Mr. O'Malley was very successful in the hard task of following Sir Edward Gait in the Bengal census, and as editor of the district Gazetteers of the two provinces he has acquired a local knowledge which serves him admirably in the work under review. His chapters on the physical features of the country, and the races, religions, and industries of the people, are most instructive—and pleasant to read. J. A. B.

Mission A. F. Legendre: Massif Sino-Thibétain. Provinces du Setchouen, du Yunnan et Marches Thibétaines. Paris: Emile Larose. 1916.

The journeys of Dr. A. F. Legendre in Western Stechuen and Northern Yunnan, which were frequently referred to at the time in the *Journal* (see especially vol. **33**, p. 327; vol. **39**, pp. 72, 280), extended with interruptions due to political and other events from 1907 to 1912. During this time the whole of the very interesting loop of high mountain land enclosed in the bend of the Yangtse and Yalung rivers was thoroughly explored, together with a part of Yunnan south of the Yangtse, but unfortunately many of the notes and scientific data obtained were lost in an attack made upon the mission.

The volume now published is mainly devoted to geological studies of the