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JOURNEYS IN CENTRAL ASIA.*

By Captain H. H. P. DEASY.

For several years I had looked upon the portion of the map of Tibet marked "unexplored" with the greatest interest and curiosity, but it was not till the spring of 1896 that I eventually obtained sufficient leave from my regiment to undertake a journey into this prohibited and but little-known area. I was very fortunate in having for a companion my friend Arnold Pike, with whom I had travelled in the Caucasus some years previously. The object of the expedition was to survey as accurately as possible as much of the unexplored parts of Tibet as circumstances would permit. Being most anxious to carry on triangulation, and to ascertain the heights of the principal peaks, it was necessary to sacrifice to some extent linear for square measurement. In order to enter this inhospitable country without meeting any of its inhabitants at the outset, it was decided to travel by the celebrated valley of Kashmir to Ladak, and thence to the Lanak La pass.

After a brief stay in Srinagar with the hospitable Captain G. Chenevix-Trench, we left the City of the Sun for Leh, the capital of Ladak, or Kashmirian Tibet, on April 27, when the Zoji La, the pass over the Western Himalayas, was still deep in snow. The latter was, moreover, in that intermediate stage when it is most inimical to traffic, as it was soft enough to retard considerably the progress of the 105 coolies carrying our baggage. Leh was, however, reached without misadventure, and here, through the great kindness of Captain Chenevix-Trench, who had purchased for me twenty-five splendid mules in the

* Read at the Royal Geographical Society, April 2, 1900. The map will be issued with the next instalment of the paper.

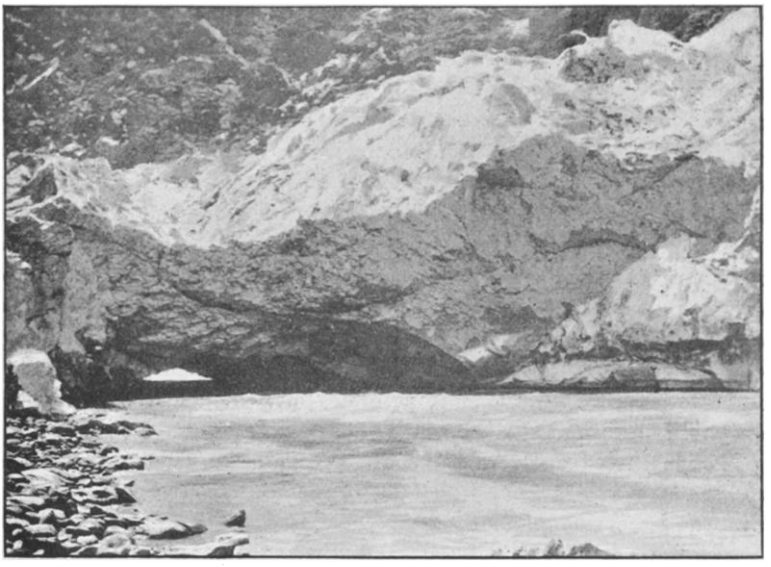
previous autumn, and arranged for the supply of the balance of transport animals in the spring, no delay was experienced on this head in the organization of the expedition. As soon as minor matters had been attended to, supplies obtained, bread made, the loads weighed, and the details of the caravan equipment attended to, it was despatched from Leh on May 25, in charge of sub-surveyor S—— D——, whom we christened Leno, a few days ahead of us, as the Chang La was still impracticable for animals, necessitating a *détour* for them.

The wretched village of Fobrang, not far from the Pangkong Lake, where our remaining stock of barley, suttoo, etc., was obtained through the good offices of the Wazir of Ladak, was the last village we were destined to see until our return to British territory in about five months' time. Our caravan of sixty-six baggage and riding ponies and mules, although aided by several yaks, had great difficulty in crossing the Marsemik La, which, though free from snow on the Fobrang side, was still deeply covered with it on the Tibetan side. The animals soon began to flounder about in the deep and soft snow, and in a very short time after beginning the descent, most of the loads of the first section of the caravan were strewn over the track in deplorable confusion. Finding it hopeless to reach the small camping-ground of Rimdi with the whole expedition in a single day, I had the tents, bedding, cooking-things, etc., loaded up on the freshest beasts, which contrived to struggle on through soft snow, often up to their girths, and thus reached Rimdi before dark, while the unfortunate caravan, both the men and their charges, had to face a bitterly cold night in a bleak, barren, and cheerless spot close to the pass.

Having overtaken the sheep, most of which carried 20 lbs. of barley, and the hired transport close to the Lanak La, which, though 18,000 feet, was perfectly free from snow on June 18, it was decided to halt for a day before entering the to us unknown land of Tibet. Our intention was to follow Bower's route more or less closely for a few marches; then keep to the north of it, so as to visit the north shores of Horpa or Gurmen Cho; and subsequently to travel east, keeping away from Bower's and the Polu route. The western end of the wide valley in which Mangtsa and Horpa or Gurmen Cho are situated being suitable for triangulation, a halt was made there to admit of measuring a base and obtaining a trigonometric value for longitude by means of the peak fixed by the Great Trigonometrical Survey of India, and known as Mangstza Lake, No. 1 peak. Unfortunately, neither the height of this prominent peak nor of Tartary peaks Nos. 1 and 2 had been previously determined, so all the heights shown on my maps of "Portion of Tibet," etc., are based on the readings of a portable mercurial barometer kindly given to me by Prof. Norman Collie, F.R.S., and not on the height of any peak fixed by the Great Trigonometrical Survey of India.

After crossing the Lanak La, neither guides nor information

about the country were obtainable, as the Tankse men who accompanied us as far as Horpa or Gurmen Cho, denied all knowledge of places or route east of this pass. Perhaps it may be interesting to note that the minimum thermometer fell to + 8° or 24° of frost during the night of June 16 at camp 1, the altitude of which is 17,450 feet. Measuring bases at camp 11 was made more tedious and complicated by the men who were sent to erect pillars at hill stations having done so, in two cases, on the sides of mountains instead of on the actual summits, as they were ordered. Unfortunately, these mistakes could not be noticed until I got close to the pillars. From the neighbourhood of this camp most extensive views are obtainable, the finest being that of the snow range



SNOW BRIDGE ON DRAS RIVER.

south of Horpa or Gurmen Cho. Some of the peaks in this range proved to be over 21,000 feet, being considerably lower than a fine double peak on the range south of the Aksai Chin, which is 23,490 feet.

Soon after starting from camp 13, Pike, who was on ahead of the caravan in pursuit of yak, saw a large lake in the distance, so we deviated from our course in order to check its position. This proved to be Yeshil Kul, a most cheerless place to camp by, on very soft ground thoroughly impregnated with salt, and destitute of either grass or fresh water. Fortunately for me, two small springs with a fair amount of grass close by were found not far from the south-east corner of the lake, and camp was moved to the most northerly spring. As it is in a most exposed place, it was by no means a pleasant place to halt in for ten

days, most of which I spent in bed with high fever. For a short time I was quite in the dark as to the nature of my ailment, but after as diligent a study of that excellent book 'Moore's Family Medicine of India' as was feasible, I either diagnosed the case or imagined I did so, and then turned to lighter literature. During the enforced halt at camp 15, or fever camp, the sub-surveyor made a short excursion for topographical purposes, and shortly after his return to this bleak and most uninviting spot, where one of the men became seriously ill and several ponies died from the severity of the weather, we gladly struck camp and moved eastwards.

Yeshil Kul, like most of the lakes we visited, must have been formerly considerably higher, and covered a very much larger area. After passing a very small salt lake close to the big one, we once more found ourselves in a country with plenty of grass and a moderate amount of fresh water.

Between camps 19 and 20 one of the most striking sights lay to the north of our route. The country was simply alive with antelope, females and young ones only, and, owing to the thousands seen, the name "Antelope Plain" was given to this, comparatively speaking, fairly level ground. As Pike, who reconnoitred for some distance east of camp 20, reported that as far as he could see, which was for many miles, in a very broad valley, there was neither grass nor water, and as the animals were by no means in a fit state to go on, with only a few handfuls of corn each, we very reluctantly decided to retrace our steps for one march, and follow the line which both of us had previously considered to be probably the more suitable, but which had been rejected owing to its leading too much south of east.

The extensive snow range south of camp 20 rendered it necessary to make a large *détour* before an eastward course was resumed. With the exception of camp 20, which was on the shore of a lake whose waters are so full of soda and other substances as to be almost undrinkable, fresh water was always obtained, but at one place the stream by which we camped only flowed for a few hours daily, being fed by the melting of the glaciers on the south side of the valley. When close to Aru Cho the scheme of going for at least a few marches along Bower's route was much favoured for a short time, but the country south-east of that lake, which was *terra incognita* to us, allured us in that direction. Considering it unwise to halt long near Aru Cho owing to the enfeebled state of the mules and ponies, I was successful in fixing the heights of only a few of the fine snow-peaks west of Aru Cho. It was not long before we bitterly regretted our keenness for keeping away from Bower's route, but, alas! it was then too late to return to it. Thinking that the alleged inability of the caravan to find all the animals at camp 31 was due to their being anxious for a day's rest, and as we had not the slightest idea that there were any

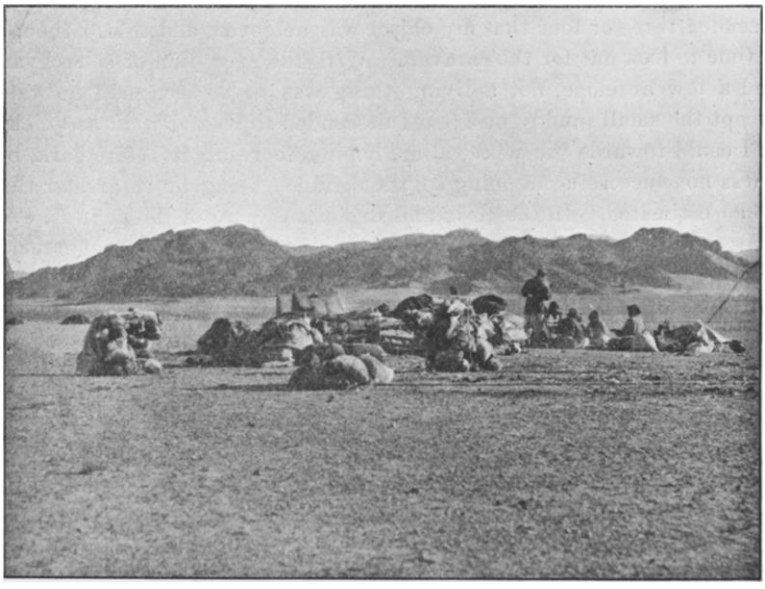
inhabitants near, we decided to leave three men behind to search for the eleven missing animals, and to rejoin us as soon as possible. To our dismay, one of these men turned up early on the second day at the next camp with the news that a few chukpas, or professional robbers, had visited our old camp soon after our departure, that they had stolen as much as they could carry away, and that one of our men was missing. At a council of war hastily convened after the receipt of this crushing news, it was decided that Pike with an escort of three men should track the chukpas to their tents, after despatching the baggage not appropriated by the robbers to the headquarter camp, while I remained behind to guard the camp and see that the animals were tied up and watched at night. I fully expected the chukpas to be watching the camp, and that as soon as Pike and his men had got well away they would pay me a visit. Hoping to encourage them and crediting them with very faint hearts, I ordered the men left behind after a search party had been sent away to look for the missing man, to remain in their tent, with the exception of one man whose duty it was to prevent the animals from straying far. As I felt very doubtful about any of the men keeping awake in the small hours of the morning following Pike's departure, I turned out at 2 a.m. and did sentry-go till daybreak. This proved to be by no means a needless precaution, as the previous sentry had allowed most of the animals who were tied up close to camp to break loose. Much to my disappointment, the chukpas did not honour me with a visit, but contented themselves with the booty already obtained.

In the afternoon of the day after Pike's departure, my mind was relieved from a considerable amount of anxiety when I saw him accompanied by the three men approaching camp. His very plucky punitive mission had been so well carried out that the chukpas, who were fortunately in very small numbers in the immediate vicinity of those whom Pike called on at the early hour of daybreak, were completely surprised. When the first of the band left his tent he must have received a rude shock to his feelings, as he found Pike's revolver in close proximity to his head, and if his disturbed brains permitted, he might have noticed the rest of the force close by with their carbines presented at him. There was no sign of the missing animals, and as there were several tents and numerous yak not far off, Pike considered it expedient to be satisfied with recovering all the property stolen from us, and taking away as ransom the only two ponies that were near and the chukpas' arms. During the fighting that took place, two robbers were wounded and, as we were told long afterwards, subsequently died of their wounds, much to the gratification of our informant, a Tibetan who acted as our guide on our enforced return journey to Ladak. Further delay in hopes of getting back the lost animals, which were the best and most sound-backed, being waste of valuable time, we

decided to go south-east, or as near that direction as the country would allow, in hopes of soon meeting inhabitants. The only point which was perfectly clear was that it would be madness to think of retracing our steps to Ladak, as all the animals were in far too emaciated a condition to reach British territory, or anywhere near it. None of our men had the slightest knowledge of the country, and ours was limited to what is afforded by a blank on the map. In order that the chukpas should not benefit any further from us, we burned everything that would burn, including a Berthon boat, which was the most inflammable article of baggage, and destroyed the superfluous things which could not be disposed of by flames. Our large stock of bovril and other foodstuffs prepared by the Bovril Company, as well as all other stores, spare shoes, nails, etc., were brought on for another march, and "cached" on the off chance that some other traveller may find them useful. The tents that could not be carried were soon used up by the caravan-men for clothes, a very welcome addition to their scant and ancient wardrobes, as they had expended on clothes in the legitimate way little or none of the allowance given to each man before starting. Owing to the mountainous nature of the country, we were obliged to steer in a more or less southerly direction.

After leaving camp 33, where our stores, etc., were cached, we followed a well-defined trail, trusting that it would lead to some inhabitants from whom we hoped to obtain fresh transport; but after some miles it suddenly pegged out, and, judging from the numerous offshoots from it, must have been made by kyang and game going to and from water, which was now exceedingly scarce. Distrusting the freshness of the large lake in the distance, we tried to obtain water by digging; but, finding this plan of no avail, I went on a short distance, and from the top of a low ridge saw a few pools of water with a profusion of excellent grass all around, so I signalled to the caravan to follow me. Pike was so seedy, it was marvellous how he managed to last out this march; and, plenty of excellent grass being close by, it was deemed advisable to halt for a day by these small pools of water of very inferior quality. During the halt I went off in search of water, and to reconnoitre for the next march. The result was most disappointing, as the very necessary water was nowhere to be seen from the commanding peak I ascended, except at a great distance in a south-westerly direction, but there was a profusion of grass. Trusting to find water by digging lower down in the valley, where I had seen a stream, we chanced this plan of quenching our thirst, but without avail. The stream had been so thoroughly absorbed by the porous nature of its bed that not a drop was to be had. Pike, with his usual energy, and although still weak, went up a fairly high hill above where camp was pitched to try and discover water, or some more likely spot in which to dig for that precious liquid. From this hill very

distant views were obtained, but no water, except that which I had previously seen, was at once discerned; however, the presence of some tents and yak 5 or 6 miles away cheered us up. Although the men had been warned to husband the supply of water which each one started with from the previous camp, all of them consumed their supply on the march, the only person besides Pike and I who bore in mind the warning being S—— D——. Some of the men having expressed a wish to go in search of water, leave was given them, and although there was bright moonlight all night, and camp was at the foot of a prominent and outlying hill, these men lost their way, and did not return to camp till the next morning, when they came in from the opposite direction to that which they had taken when setting out.



CAMP SCENE IN TIBET.

As the occupiers of the tents seen by Pike might be inclined to relieve us of more animals and baggage if opportunity offered, we thought it best to approach their camp well armed and accompanied by several men, who in all probability would be of far more use with their tongues and heels than with the magazine carbines with which they were armed. In the preliminary negotiations there was a very fair chance of obtaining a guide and some yak, but unfortunately the surly headman of these nomads proved to be as unwilling to accept a present as to allowing the people under him to satisfy any of our wants. After this interference nobody would consent to guide us anywhere, even for a few marches, except for the monstrously exorbitant demand of

100 rupees, which we declined to give. After much talk, the caravan bashi Ramzan, who has now gone back to his original profession of tailoring, induced some of the nomads, under the pretence of giving them medicine, to return our visit the next day, when one of them finally consented to indicate what direction we should take for the modest sum of five rupees, while his companion was detained in camp nominally to answer our queries. This arrangement proved very disastrous to me, as, when I was shown what direction to take, an erroneous one was pointed out. When starting the next morning, a couple of hours ahead of the caravan, I foolishly followed it, and came across a pool of muddy water. After resting for a short time, I went up some hills close by, hoping to get a good view of the neighbouring country, but other heights intervened, and it was not till I had ascended three or four that my object was achieved, and then I thought it time to look out for the caravan. With the exception of some kyang and a few antelope, not a living thing was to be seen, and no water except the small muddy pool; so I descended to it, and went as quickly as I could towards the next valley, hoping to reach it before dark, but I was not successful in doing so, the distance being much greater than I had estimated. In the clear and dry atmosphere of Tibet it is, even after much practice, very hard to judge distances with any pretension to accuracy; objects that appear to be, say, only a few miles away are really 8 to 12 miles distant. By the time the adjoining valley was reached, it was far too dark to see if there were any tracks of the caravan, so I thought of resting for a few hours until the moon had risen; but, although partially sheltered from the wind by lying down in a small watercourse, this idea had to be abandoned owing to the cold, which compelled me to keep moving on. After several hours of anxious marching, varied by occasionally firing off my rifle in the hopes of attracting the attention of some of the caravan, and by continually stumbling over stones, etc., the upper part of the valley was reached, and after a short time the moon had risen sufficiently to enable me to definitely ascertain that the caravan had not ascended the valley. I now recognized that the odds against my getting anything to eat till after daybreak, at the very earliest, were very large; so I tightened my belt, took a few sips of muddy water from my three-parts empty water-bottle, and sallied off to find a short cut back to the spot I had started from, in search of the caravan. Very probably the route on my return was shorter, but several nullahs and watercourses had to be crossed, as well as a couple of steep ridges covered with rocks, over which I continually stumbled. Rest for more than a few minutes at a time was out of the question, as the cold wind soon chilled me so much that, in order to avoid being frostbitten, it was absolutely necessary to keep moving. Fortunately, it was a fine clear night, and with the help of the stars—for I never carried a compass, fearing that the chronometer

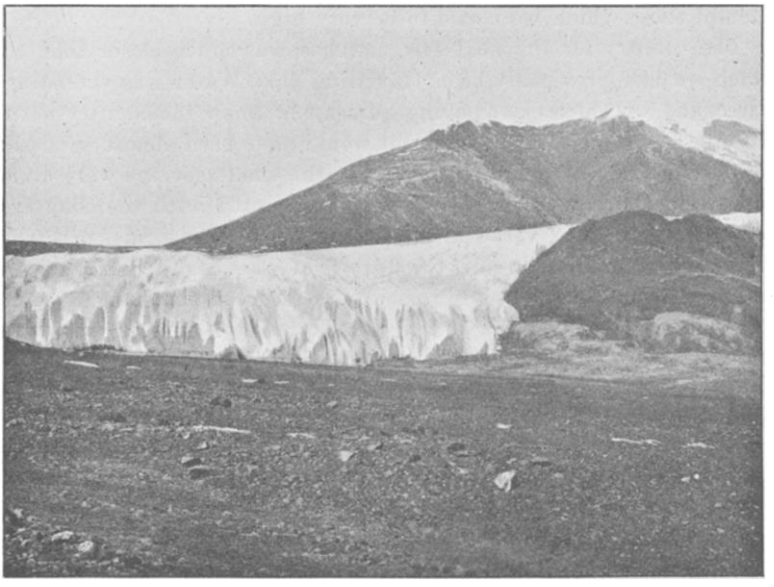
watches would be affected by it—I guided myself back to the place I wanted to reach by daybreak. From this spot, which is on comparatively high ground, the very faint smoke from the camp fire was seen very far away in the main valley, so I dragged my weary limbs towards it, and in a couple of hours was met by Pike, who came out provided with meat, biscuits, and last, but not least, rum and water, all of which were greatly appreciated. The minimum thermometer at camp registered 10° of frost, while I was wandering about on an empty stomach, with fewer clothes than usual, owing to our having entered a lower and warmer part of the country, so the discomforts of the situation were fully felt.

Not very far from camp 36, or "lost camp," we came across some rather extensive diggings, where probably gold had been found. Two days after leaving this camp, the river whose course we were following had completely sunk into the ground, and as there was not a trace of water to be seen further on, we had to halt while Pike made a long reconnaissance and spotted a very small spring, to which a move was made the next day after interviewing a native. This man professed to be in search of some of his ponies that had strayed, but it is most probable that he had been sent out from Gerge, which is not far distant, to search for us, as no doubt they had been warned of our presence by the nomads recently met. By the aid of the information extracted from this man, we found our way to Gerge, where there are a few tents, with many more in the various side valleys. Some hours after our arrival, a man, who said he was the servant of the headman of the place, nominally came to ascertain who we were and all about our intentions, but really to find out the size of our caravan. Owing to wild statements about us having been sent to Lhasa from Leh, some time before our departure, strict orders were sent every fortnight from Lhasa warning the people to be on the look-out for about 20 British officers and 3000 soldiers, who were invading Tibet from Ladak, to promptly turn them back, and report to Lhasa. In consequence of these orders, men had been sent out to search for us on the known routes, but we escaped this delicate attention by finding a way for ourselves. Some of the visitors to our camp were much surprised at the smallness of our force, but when they were informed by one of the caravan-men that countless soldiers were packed away in the yak dans and baggage, they seemed to consider the explanation quite satisfactory. When the headman of the scattered encampments, all of which are included in Gerge, came to see us, we endeavoured to get fresh transport and more supplies, but found that this could not be done without an order from the Rudok authorities. Feeling quite sure that no assistance would be obtained from that quarter, and as it was useless to wait there any longer, we gave notice of our intention to go on without it, which rather startled the headman, as he was evidently not accustomed to

having any one not conform with his orders. The messenger who announced our intention to this petty official returned with a request that we should halt for a few days longer, when he would endeavour to furnish sufficient supplies until a reply was received, probably in five or six days, from some higher official not so far distant as Rudok. This request was coupled with the intimation from the headman that our advance could only be made over the dead bodies of himself and all the Gerge people, who considered being killed by us quite as good as being executed in Lhasa for allowing us to proceed. Even talking of fighting was too much for our cowardly caravan-men, Argoons, who soon let it be known that we need not rely on them to fight in case of a row. As no signs of any instalments of supplies promised to us for waiting were visible within the appointed time, and as constant reinforcements were being received by the enemy, we settled to leave Gerge and try to strike a road, which S—— D—— had heard of from a Kulu merchant who was buying wool and gold here, leading towards a place called Kangri, where there is said to be a large bazaar during the autumn. Both Pike and I fully expected a row, so plenty of ammunition was issued to our six armed men, in hopes that they would at least loose off their weapons in the direction of the enemy, and not in ours; strict orders were issued to maintain a slow pace, admitting of the sheep marching with the ponies and mules, thus keeping the caravan in close order. To have started in an easterly direction would have certainly ensured a row, so we at first went about south-west, in the direction the Kulu trader had pointed out as being an alternative route to Kangri. Unfortunately, the information about this route proved to be false. The large crowd of Tibetans, all well mounted and armed with muzzle-loading guns, some with swords as well, who had watched us carefully, knowing that there is no other route in the direction we took except to Ladak, allowed us to depart in peace, much to our surprise, ignorant as we were at the time of the reason, for it was not till we had travelled several miles that we found out we had got false news about the road.

In the main valley (Dalung (?)) grass and fuel were scarce, and the water was of very inferior quality, but in the numerous side valleys grass is said to be plentiful. On the south side of the valley the range of high mountains, very few of which are covered with snow, appears to block the way until close to camp 45, where there is a road leading to Thok yalung, Kangri, and Rudok. Finding it hopeless to obtain any more transport, or procure barley, which was much needed, unless we promised to go to Ladak by the route which would be shown to us, and as the caravan-drivers were by this time too much afraid to go in any other direction except that which the Tibetans wished us to follow, we were compelled to submit to their terms. Besides these factors in the case, there were two others equally important: many of our animals were covered with sores, and all of them were in

far too weak and deplorable a condition for us to think of attempting forced marches in an inhabited country where further progress could very easily be effectively stopped, without the slightest risk to the Tibetans, by their driving away our animals while grazing at night. There was now nothing else to be done but to agree to return to Ladak by the route along which we should be guided. As soon as some very ancient ponies had been purchased at high prices, and sufficient transport obtained locally, we began our return march to Ladak, relieved, at least temporarily, of the anxiety about finding grass and water at the end of every march, as two guides were provided. Up to this point we had found our own way for the last three months over about 460



GLACIER NEAR NABO LA PASS.

miles of, to us, unknown country. Now that there was an opportunity of relieving from loads the animals that were in a very bad way from sores and galls, I commenced to wash and dress the wounds, many of which were far too bad to describe. Although this was done on every possible occasion—not by the caravan-men, whom I could not trust to do the unpleasant work satisfactorily—only one of the animals with sore backs, and that a very slight one, lived to reach Ladak.

The Tibetans evidently feared that we would endeavour to go straight to Rudok, and, no doubt with the intention of preventing us from doing so, led us up a very narrow valley on the north side of the main one, most of which was said to be called Dalung, and accompanied us in

large numbers for five marches, the excuse for taking us by this long route being that if the direct route was followed several high passes would have to be crossed. This proved very fortunate, as the sub-surveyor was thus enabled to sketch the country between the outward and homeward routes. In order to make certain of the guides following this route, which towards the end they were not at all well acquainted with, we expressed great eagerness to go direct to Rudok, and it was only after we had been repeatedly informed that numerous high passes had to be negotiated that we ceased to express any desire to deviate from the line our guides were instructed to show us. I do not know what the Tibetans' idea of high passes may be, but as the height of one we crossed is 18,880 feet, we rejoiced at not having been obliged to attempt those which were said to be very high.

The country for the next few marches was much closer than that which we had previously been travelling in. Water was exceedingly scarce, and, except for our having guides who knew the country not far distant from Lima Ringmo Chaka, it would have been almost impossible to find our own way. For five marches the small springs were almost impossible for any one not thoroughly acquainted with the country to locate, and grass was very scarce, so that our wretched ponies and mules suffered considerably. Besides the scarcity of grass, another matter which caused anxiety was the risk of some of our escort noticing me observing at night, or Leno sketching during the day; but the latter was so well managed that only once were questions asked as to why Leno and the men with him were punished by having to ascend mountains and reach camp after every one else. In order to shelter ourselves from the prevalent strong winds, camp 51 was pitched in a very narrow valley, which rendered the task of measuring bases more troublesome. This, however, was a mere nothing to observing in a very strong and equally cold wind at the hill stations of this camp, when it was necessary for Leno and myself to continually relieve each other, one recording while the other was observing. Even with this division of labour, both of us suffered temporarily from the exposure, but a judicious use of some of the contents of the medicine-chest curtailed the unpleasant effects of the severe weather. Although this camp was only 16,630 feet, nearly all the Ladaki caravan-drivers complained of headaches, etc., which they attributed to the great height, and as they abstained from eating meat until the inconvenience ceased, it was only reasonable to believe their complaints. It is certainly very strange that men who live at heights of between 8000 and 12,000 feet should suffer from the effects of rarefied air when neither Pike nor I, who generally frequent places not much above sea-level, experienced any such symptoms. Owing to the wretched condition of the mules and ponies, and to the scarcity of water, we were obliged to make very short marches. The state of our animals served as an excuse for occasional halts, which were necessary for survey purposes,

to which neither of the guides ever raised the slightest objection; in fact, they several times helped to erect pillars, being quite content with the assertion of the caravan bashi that sahibs do strange things, and that once the all-powerful "hokum" (command) had been given, it was to be obeyed whether its purport was understood or not.

A few days after our Tibetan guard left us, a couple of men arrived with supplies for the guides and with news that two men, who had been wounded near camp 31 by Pike's force, which consisted of only four men all told, had died of their wounds. They also informed us that a large body of chukpas were in our vicinity; whereupon our brave guides, after due consultation amongst themselves, formed up and suggested that we should attack the robbers, whose property was to be divided between them and ourselves. According to their proposition, all the yaks, goats, sheep, guns, and everything else, in fact nine-tenths of the plunder, was to be given to the guides, who would assist the enterprise by remaining in camp, nominally to guard it, while any animals capable of carrying baggage might be retained by us. These creatures seemed quite disappointed when we refused to fall in with their plans, and did not understand that we wished to travel peacefully through the country, and would not attack or punish any one unless we were first attacked or robbed. As soon as friendly relations were established between the guides and our men, who invariably made the former fag for them, every endeavour was made to obtain simultaneously from both men when apart corroboration for the names of places previously visited, as well as the names of camps, etc., on this route. One of the guides proved to be a great acquisition in many ways, and seemed to be most anxious to serve us in every way, so a much greater value was placed on his replies, most of which were, I am strongly inclined to believe, fairly true. As a rule, neither Pike nor I were ever present when the names of places, etc., were asked, as we considered that the Tibetan would be far more likely to tell our Ladakis the true names when neither of us was within hearing. When possible corroboration was sought for names, and when this was not to be had, the replies of whoever had confirmed the statements *re* custom, taxes, etc., of men previously questioned, or who did not appear to have anything to gain by telling lies, were accepted. Though every endeavour to ascertain the real names of places was made, I do not wish to assert that all the names given in my map are correct. Wellby calls the pass, which is designated Napo La on my map, Napula, and the lake on the west side of it, called Dyap Cho by me, Lake Treb, and as it is well known that Tibetans generally give travellers erroneous names for places, I fail to see any reason why the names Napo La and Dyap Cho should be considered more correct than those given to Wellby.

One of the hardest parts of the surveying during this journey was

undoubtedly the ascent to the very high hill station south of camp 57. The exceedingly steep mountain-side was covered with very loose shale, necessitating a great amount of energy and determination in order to reach the summit, where the heavy theodolite was eventually brought, and successful observations carried out. Another drawback to observing was the very high wind, which at times necessitated piling large stones round the legs of the theodolite-stand to prevent the instrument being blown over. The rarefied air, combined with a very low temperature, was a constant cause of delay and annoyance when taking astronomical observations at night, as the candles gave very bad light and continually went out, very often fifteen to twenty times each night. The low temperature not only tended to make the candle stick in the holder, but also froze the ink, which could only be used occasionally and when the inkstand was kept in the lantern, the temperature of which was just high enough to keep the ink liquid. Very often the wind disturbed the compass so much that when setting up the theodolite previous to taking astronomical observations to determine the deviation error, which was repeatedly done, it was necessary to shelter the instrument by means of rugs held up by some of the caravan-men until the needle became quite steady. Though many attempts were made to observe occultations, bad luck, in the shape of clouds, continually proved obstructive, and also debarred me from observing transits of the moon and stars culminating near it. Much as I regretted not being able to take lunar observations more frequently, the omission proved to be of no great consequence, as, thanks to the chronometer watches which were kindly lent me by the Royal Geographical Society, and to "travelling rates" having been several times ascertained, good chronometric values for longitude were obtained. By "travelling rates" I mean rates while travelling between places, the difference in longitude of which was determined trigonometrically as we went on. This method of obtaining travelling rates has, I believe, never been used by explorers in unknown and unsurveyed country. Comparatively narrow valleys, with high mountains on either side, and lakes, mostly salt, scattered about, are the main features of this part of Tibet, but scarcity of grass and water are by no means unimportant minor facts worthy of notice. Judging from the well-defined marks near the west end of Keze Chaka, this lake must have been formerly considerably deeper, and its area proportionately larger.

When approaching camp 67 much curiosity and anxiety were experienced about water, as none could be seen, although a good-sized stream was observed close by from a hill near the previous camp, which was a waterless one. This proved to be an intermittent stream which existed for only about six hours daily, its breadth being about 12 feet, and the average depth approximately 9 inches. Owing to the exceedingly porous nature of the soil, we were not able to store up any water

by damming the river, which for the three days we halted appeared and disappeared daily with the greatest regularity. As soon as it was decided to halt for a few days for survey purposes at Chagnagma, or camp 67, one of the guides was sent on with Ramzan, the caravan bashi, to try and locate Rundor, the existence of which we had begun to doubt. They were successful in doing so, and met us on the day we left that almost barren camp, accompanied by a few natives of the long and very sparsely populated valley whose head is at the Napo La, and which is known as Rundor. Ramzan, who was mounted on my riding-pony, procured a guide and went on ahead quickly to Lutkum, from which place he sent back some transport, without which we should not

DIFFICULT PART OF ROUTE THROUGH HUNZA.

have been able to cross the last two passes and halt at two consecutive waterless camps.

Besides the repeated scarcity of grass, many of the springs by which we had to camp were small and so well frozen that often no water was to be had, so that our wretched animals suffered considerably, and at times one or two would not leave the vicinity of camp for a long time after the loads were removed. On one occasion a fine mule, which had lost less condition than any of the others, and which had invariably carried the instruments, would not depart from the close proximity of my tent until driven away, when she speedily returned, until at length she fell down and nearly levelled the tent in doing so. It turned out that the poor brute was suffering

from colic, which made her frequent the camp; but it was certainly very curious that she returned so often to the neighbourhood of the medicine-chest. I was in great hopes that she would survive the journey; but, although the attack of colic did not last long, she succumbed in about a week afterwards to the effects of great cold and semi-starvation. When we reached Rundor, the pombo, or headman, and many of the inhabitants were away in Ladak purchasing supplies, so it was rather hard to obtain transport to convey our baggage over the Napo La, a pass 18,880 feet, over which, although it was free from snow and the approaches comparatively gradual, our impoverished animals were quite unable to carry even small loads, while one had to be shot near the top of the pass. From the broad valley lying west of this pass there is a magnificent panorama of very high mountains, many of which are perpetually covered with snow, and it was here that a serious accident happened to the theodolite. The wind was so strong at my last hill station that, although stones were piled round the lower part of the theodolite-stand, it was blown over by an unusually strong gust, and so damaged that further work was out of the question. This, however, was not of great consequence, as the surveying had been satisfactorily finished, and the instrument was soon repaired at Dehra Dun.

Altogether about 24,000 square miles of country had been surveyed on the side of 8 miles to 1 inch, and the heights of seventy-nine peaks determined. Triangulation was carried on as far as possible, a 6-inch theodolite being used, and a 10-feet subtense bar for measuring bases by; but, owing mainly to my want of previous practice in this class of work, it was not without breaks, when longitudes were checked either chronometrically or by latitudes and azimuths. The heights are barometric, a Collie's portable mercurial barometer being read twice daily, except when I was laid up with fever, and are based on a series of observations at camps the relative heights of which had been determined by triangulation, and were computed differentially from Leh. As a proof of the great accuracy and skill of Leno, it may be stated that his average error in latitude for each camp was only about one-third of a mile. Since crossing the Lanak La, astronomical observations, including numerous ones to determine the deviation of the compass, were taken at all but four camps. Very careful meteorological observations were regularly taken by Pike, who was of the utmost service in every way, especially in reconnoitring, issuing rations, and looking after the natural history and botanical collections. I have not the slightest hesitation in saying that only for the very valuable co-operation and companionship of Arnold Pike, the results of the expedition in every way would have been far smaller, and I feel that I owe a great debt of gratitude to him for having accompanied me. Although topographical work had now been carried on right up to the frontier, the

journey was by no means ended—three high passes and some almost barren camps had to be negotiated before reaching the few houses at Lutkoum.

Of the sixty-six mules and ponies which composed our caravan when it left Leh in May, only six survived to reach Lutkoum in November, and they were only just able to crawl along unladen. Sheep proved to be the best transport animals, very few being unable to carry loads of about 20 lbs., which were subsequently increased after the loss of the ten mules and ponies. After a few days' rest in Leh, I said good-bye to Pike, who wished to remain some time longer in Ladak for shooting, and, setting out for the Zoji La, which was crossed with great difficulty, reached Srinagar on December 10, after walking 600 miles, mostly in Tibet.

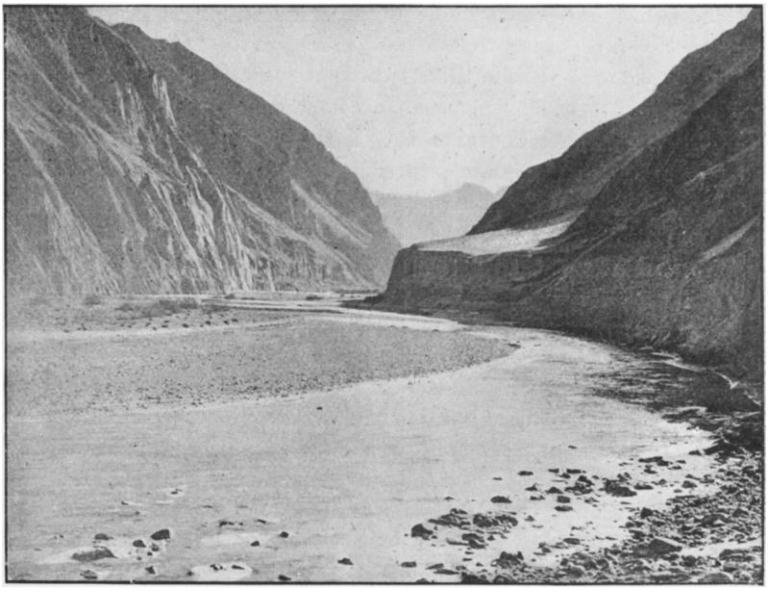
Once again Srinagar was the starting-point, and on September 14, 1897, I set out for the Pamirs, *viâ* Gilgit and Hunza, as the Indian Government had very kindly given me permission to use that route, thus enabling me to commence surveying a few days after crossing the frontier, and before any heavy snow had fallen. I was accompanied as far as the Taghdumbash Pamir by R. P. Cobbold, who was so much impressed by the tales of excellent shooting related to us by an American named Isidore Morse, who met us close to the Kilik pass, that he was eager to go direct to Kashgar and apply for permission to shoot in the so-called Eldorado of sportsmen in Russian territory. My party consisted of a sub-surveyor and an orderly, both of whom were kindly lent to me by the Indian Government, a cook, a native collector, and six Argoons headed by Abdul Khalik, who was soon proved to be one of the greatest scoundrels and robbers in Central Asia.

Owing to the demand for ponies for the Tirah Field Force, it was very difficult to obtain suitable animals in Srinagar, but this difficulty was removed by Major Yeilding, D.S.O., C.I.E., who rendered me very valuable assistance by hiring some ponies to go as far as the frontier, and in addition twelve mules in charge of four Pathans, who met me at Gilgit. The Pathans stuck to me for six months, and proved such hard-working and faithful fellows, that I parted from them with the very greatest regret. The miserable cowardly liars who came with the ponies from Astor continually gave plenty of trouble, and although they were most anxious, in Srinagar, to be engaged for six months, they refused for some time to go beyond Hunza, until the matter was reported to Captain McMahon, C.I.E., C.S.I., political agent, Gilgit, who soon arranged matters very satisfactorily. The smallness of my own caravan was a source of much unfavourable comment on the part of Abdul Khalik, the caravan bashi, against whom I had soon accumulated sufficient evidence to convict him, while he swaggeringly informed the rest of the caravan-men and others that I was a poor sort of sahib who bought everything

himself, and who had very few animals of his own, and that he could not make anything out of me, whereas from other sahibs he had pocketed large sums daily. This was speedily reported to me, and in a short time afterwards he was, greatly to his surprise, arrested at Gilgit, where, after a very tedious and impartial trial by the wazir, or native governor, who utterly ignored the threats to murder me which Khalik made in court, he was sentenced to a year's imprisonment for robbing me. This sentence was afterwards commuted considerably, much to my disgust, as it was well known that he had robbed other Europeans and innumerable natives in the sahibs' name; but then, some native states are by no means hostile to men who would soon be turned out of India. While marching from Srinagar to Gilgit, my orderly, Abdul Karim, of the 3rd Madras Lancers, in answer to my query as to his opinion of the caravan bashi, said, "Sahib, he is a very bad man and a robber; kill him, and then there will not be any more trouble." As I did not at once concur with him, he added, "If you do not like to kill him, give me the order, and I will do so at once, then all the trouble will be over." Not wishing to utterly damp my orderly's spirits, I partially contented him by stating that I would make arrangements for the cessation of the trouble in a quieter way.

After a few days' stay in Gilgit, where we were most hospitably received by Captain and Mrs. McMahon, we continued our journey, escorted by the former and the genial and very good natured agency surgeon, Captain Roberts, I.M.S., who most kindly acted as cicerone during the march to Baltit. Captain MacMahon was most anxious for us to postpone our departure from the charming Hunza valley until he could accompany us as far as the Kilik pass, whither he was going on tour; but it was now so late in the season that we were reluctantly obliged to deny ourselves this pleasure, and hasten on in hopes of reaching the Taghdumbash Pamir before any heavy fall of snow had rendered the passes more difficult. On October 22 I commenced work in the west end of the Taghdumbash Pamir, and obtained a good value for my longitude by triangulation, as well as by latitudes and azimuths to some peaks fixed by the Survey of India, but not before my hands were frost-bitten at the highest hill station, which is about 16,000 feet. After spending some days trying to shoot some *Ovis poli*, I moved to Ujadbai and Mazar Sultan, where a halt was made for some days while fresh values for the longitude of my starting-point of mapping were obtained, as I was not quite satisfied with the previous ones. The task of identifying peaks from positions the longitudes of which were not accurately known was rendered still more difficult by being unable to go to a sufficiently high altitude, whence the more prominent peaks could be easily discerned. Deep snow on the higher mountains necessitated lower sites being selected for the hill stations, but even on these the strong biting cold wind was a serious hindrance, not to say discomfort, to surveying

at the altitude of 16,000 feet in the month of November. Several of the peaks which had been previously fixed by the Survey of India, and which I was anxious to observe, were not very prominent ones, and from my observing-stations appeared to be so close to peaks of similar height that the slightest movement of the ruler on the plane-table aligned them on to other peaks, thus adding great doubt and uncertainty to some of the observations. In order to be sure of obtaining satisfactory results, I four or five times went up to the highest hill station near Mazar Sultan, and, when feasible, camped the previous night close to the foot of the mountain, so that by starting a couple of hours before day-break work might be commenced soon after sunrise, and, if possible,

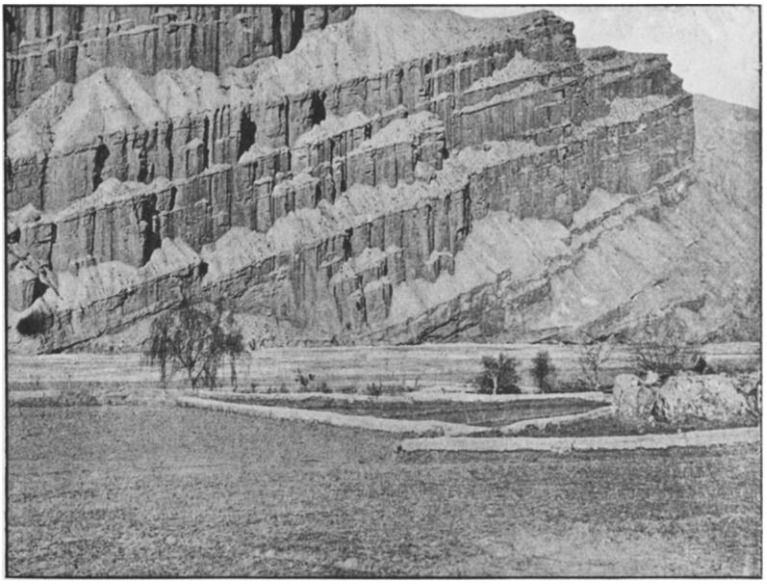


SCENE IN RASKAM.

completed before the strong wind, always trying to the temper, had sprung up. The instruments were carried up the steep mountain-side, which was covered with loose shale and large stones, on a yak, and two more of these most useful and exceptionally hardy and sure-footed beasts transported the sub-surveyor and myself, until the gradient became so steep that it was infinitely preferable to crawl up by hanging on to the yaks' tails than to endeavour to remain in the saddles, which continually slipped back. Much as the ascents were disliked by some, if not all of us, I have no doubt that the yaks resented their being employed in this way, and as a rule required much force, sometimes applied in the shape of a stirrup-iron until it became bent, to make them continue the ascent

even at a very slow pace. However, the results proved satisfactory, as the greatest difference between any two of the three values for the longitude of this starting-point was only some seconds, and the height of Muz Tagh Ata (father of ice mountains) was only about 20 feet less than the two values obtained in the next year from the Wacha or Uchi valley. It was during this halt at Mazar Sultan that obstruction from the natives was first experienced. They tried hard to dissuade me from travelling to the valley of the Yarkand river by stating that the roads had become, and still were, quite impassable, owing to earthquakes, that no guides were obtainable, and that nobody would supply me transport to go there. After some delay, one man, who owned to having formerly known the route to the west end of Raskam, was discovered and induced to accompany one of my men as far as the Raskam or Yarkand river, in order to see how much of the information already obtained was true. While these two went reconnoitring, I moved camp to Oprang, and sent another man accompanied by a native from there to report on another route to the Yarkand river. The native who accompanied my man Islam assured him that there was no route *via* the Oprang pass, and did his best to dissuade him from going; but Islam obeyed the strict orders received from me, and reported the route to be quite easy. Cobbold, who had reached Oprang before me, sent back word that it was only about 10 miles from my camp at Mazar Sultan; but his estimate proved to be so much below the actual distance, that I did not reach his camp till after eight o'clock at night, while one of my men, who declined to be guided, was rewarded for the exalted opinion he had of his own power of guiding himself to a place whose whereabouts he did not know, by spending the night in the open—a far from delightful experience, as the thermometer fell near zero before morning. At length, the headmen, seeing that I was determined to go to the Yarkand river, arranged for transport, and no doubt issued orders to the men who accompanied it that they were to feign ignorance of the route, as was undoubtedly done. I was for some time inclined to attribute these difficulties to the stay-at-home propensities of the Tajiks, but I subsequently ascertained that strict orders had been sent from Kashgar to the Amban of Tashkurghan to warn the people that no attention was to be paid to the public orders issued on my behalf, and that they were to do their best to prevent me from going to the Yarkand river, but that if I proved obstinate and really meant to go there, then transport was to be provided, but no guides on any account. Curious to relate, two shocks of earthquake were felt the night before crossing the Ilisu pass, into what may be called forbidden ground, whereupon I was greeted with the proverbial "I told you so." It was with rather a considerable amount of surprise that those who thought fit to remind me of their previous statements departed from my tent on being told that they were annoying me exceedingly by preventing me from going to sleep.

The descent from the top of the Ilisu pass towards the Yarkand river is fairly gradual, and a great contrast to the steep and rocky ascent from the north. Unfortunately, the route lay along the bottom of the valley of the Talde Kol Su, which was now frozen hard in the upper part of its course, necessitating the frequent use of pickaxes to roughen the ice, and to improve the track where it was impracticable to closely follow the river, while lower down the jungle was so dense that baggage animals were much impeded, and one of them lost an eye. Finding no suitable camping-ground at the mouth of the Talde Kol Su, we ascended the Yarkand river to Sarok Kamish (? Tugrok), and halted there while I followed the well-marked track which crosses the Topa Dawan and



PECULIAR FORMATION IN ASGAN SAL VALLEY.

leads in the direction in which I desired to go. None of the Tajiks who accompanied me from the Taghdumbash Pamir would agree to accompany me along this track, and as I was dependent on them, it was necessary to ascend the Yarkand river to Bazar Dara, where a messenger was sent to arrange for fresh transport. The mountains on the left bank of the river near Sarok Kamish being far too steep to think of getting any instruments carried up them, I was forced to content myself with those on the opposite bank, which are too low to afford a view of any of the peaks fixed from near Mazar Sultan, thus increasing the difficulties of surveying. The only untoward incident of the march through Raskam was the loss of one pony, which stumbled on a very

bad part of the track and fell on to the rock below, where his load was completely smashed up. Although the river was then very low, the fording of it was not easy for laden animals, and between Surukwat and Bazar Dara the difficulty was increased by the thick slippery ice, which extended for several yards from each bank. Here the very necessary pickaxes were in constant use, as passages through this ice had to be cut before the caravan could proceed with any degree of safety. In the march to Bazar Dara the river has to be repeatedly crossed, and as it was frozen over in only two or three places the march occupied a very long time. When close to this place, which consists of a small fort with a nominal garrison of twenty Kirghiz and a petty Chinese official, I was greatly amused by Raju, my caravan bashi, strongly protesting against my riding a nearly barebacked pony which I had caught when grazing, on the score that it would be most unseemly for me not to ride my own well-saddled pony when entering Bazar Dara. Owing to the exceedingly high mountains which hem in Bazar Dara at the mouth of the Dozok Dara Su, the task of measuring a base was very difficult, and reaching the sites selected for hill stations proved to be no light one, especially for the men with the yak carrying the instruments. On previous occasions I was struck by the wonderful agility and surefootedness of the yak, but I was fairly astonished by the way this particular beast got along over ground where the two Kirghiz, who accompanied him, experienced great difficulty.

From Bazar Dara the route lay along the bottom of the exceedingly narrow valley called Dozok Dara, with vertical rock towering above it in many places to a considerable height. The approach to the Kukalung pass was very trying to mules and ponies, the former being undoubtedly by far the worst when marching up the very slippery and sloping ice, which for some distance completely filled the bottom of the narrow valley we had to ascend. The actual pass, though over 16,000 feet, is quite easy when there is no snow or ice on the north side, where the descent for some hundreds of feet is very steep. After a day's rest at Zad, the largest Kirghiz settlement in the Kulan Urgi valley, I managed to hire a few yaks, and started to recross the Kukalung pass, determined to carry the triangulation across it to Zad. On account of the great cold—the minimum thermometer fell to $-12°$ Fahr. on the night of December 14—and the almost total absence of grass where it was necessary to halt on the south side of the pass, yaks were the only animals who could stand the double journey. These useful beasts can easily go for a few days with little or nothing to eat, and their thick coats protect them from the severity of the weather. On my return to camp 24, after a long and hard day's work on the high ground, where there was a fairly strong wind and the thermometer about zero, my beard and moustache were covered with icicles, which had to be melted in front of a small fire of dung and boortza. Feeling doubtful about being

able to identify from Zad the peaks observed at camps 19 and 21, I decided to spend a night close to the summit of the Kukalung pass and devote the next day, Christmas Eve, to measuring a base, etc., at the altitude of about 16,000 feet. Fortunately, we had brought a couple of sacks of dung and boortza to this barren and waterless spot, as the supply of fuel ordered from Zad was never sent.

It is exceedingly hard to state truly which was the worst day devoted to surveying on this journey, but it may be confidently stated that Christmas Eve, 1897, was quite one of if not the worst. The first item of that day's work was to climb up about 1000 feet to a site which commanded an extensive view, and spend a long time in the usual wind, with the thermometer below zero. As soon as the theodolite was packed up, the yak loaded, and a large pillar erected to mark the site, the descent to the other station was begun. Bad as the ascent was, the descent was far worse, the shale being more slippery and the gradient steeper. Owing to dearth of fuel, etc., it was imperative to complete the work at this camp in one day, the consequence being that I did not reach camp in the valley of the Kulan Urgi till about nine o'clock at night, and the men with the yaks much later.

At Zad more triangulation was done, and a last attempt was made two marches further on, but it was now too late in the season to permit of ascending to a suitable height whence the high barren mountains lying between me and the Yarkand river could be plainly seen, so recourse had to be made to observations of moon culminating stars for longitude. Bad weather put a stop to this, and the illness of the sub-surveyor, Dalbir Rai, to further topographical work, so a move was made to Yarkand. From Issok Bulok Agzee, or camp 26, onwards to the Yarkand river, the Kulan Urgi valley is exceedingly narrow, and bounded by precipitous mountains of considerable height. From Tir, a small village a few miles from where the Kulan Urgi river joins the Yarkand river, there is the choice of two routes of about equal length to Yarkand. That leading over the Sandal Dawan being reported less difficult than that over the Kuramut Dawan, I settled to travel by the former. The usual frozen river often proved very difficult for the baggage animals, but the main obstacle was encountered in a spot where the only possible way of getting the animals on was by hauling them up two steep drops of solid rock, where none but men, goats, and mountain sheep could ascend without assistance. A narrow ledge of rock halfway between the very steep parts enabled men and animals to rest before reaching the summit. Many of the animals were got up without much difficulty, but some proved very troublesome, and it was only with very great difficulty and hard work on the part of numerous men that the refractory ones were hauled up without turning somersaults. Needless to say, all the baggage had to be brought up by men, which added considerably to the delay.

About halfway between this obstruction and the summit there is another spot impracticable for laden mules and ponies. As to this fact we had not been enlightened by the Uz Bashi, or headman, of Tir, who returned to his village together with all the other men who assisted in getting the caravan up the rocks, thus leaving us in the lurch. This delayed the march considerably, as there were no extra men to assist, but the descent on the other side of the pass taxed the caravan-men and their charges severely. The gradient is very steep, and a recent slight fall of snow had so covered the rocks, stones, and shale that no track could be discerned, so we had to find our own way down. Men and animals continually fell down, especially at the foot of the very steep part where the narrow valley was for some distance a mass of sloping and slippery ice, on which they had to travel as best they could. We had hoped to reach some inhabited place before dark, but the difficulties of the march necessitated bivouacking on the mountain-side, where there was fortunately sufficient grass and a fair amount of partially dry yak-dung, the only available fuel. The old Pathan, Mohammed Amin, and his section of the caravan did not reach this inhospitable spot till after nine o'clock, having left all the baggage higher up. Wonderful to relate, the barometer, which was carried by one of the Pathans, survived this day's most trying march. The next day dysentery attacked Dalbir Rai, the sub-surveyor, and as little or no milk was obtainable, it was necessary to have him carried to Yarkand, where we arrived on January 20. Almost as soon as he recovered from this attack, rheumatism attacked him in a mild form, no doubt the result of exposure in the mountains. The latter also had its effect on me, and aided by a Chinese dinner which the Amban of Yarkand invited me to, and which was served in an open courtyard with a temperature considerably below freezing-point, proved too much for my constitution, which is not seasoned to a meal consisting of more than twenty-five dishes, washed down by the most evil-smelling hot and raw spirit that my nasal organ has ever been near.

(*To be continued.*)

THROUGH AFRICA FROM THE CAPE TO CAIRO.*

By EWART S. GROGAN.

THERE is a saying in South Africa that "every one who has once drunk dop (a brandy made in the Cape) and smoked Transvaal tobacco will, in spite of all inducements to the contrary, in spite of all the abominable discomforts inseparable from life in Africa, continually return to the old free untrammelled life of the veldt."

Anything more ridiculous than the possibility of my return to

* Read at the Royal Geographical Society, April 30, 1900. Map, p. 264.