Private Journal

of

Captain R.W.G.Hingston, Indian Medical Service,

while

Surgeon and Naturalist

with

the Indo-Russian Triangulation Expedition.

April 11th. 1913 to September 15th. 1913.

CHAPTER 1.

The origin and objects of the Expedition.

The International Geodetic Conference, which assembles annually at Hamburg, had some years previous to the date of this expedition, suggested to The Survey of India that a linking together of the Russian and Indian Triangulation Surveys would be a work of great scientific interest and would supply valuable information on which to base our knowledge of the shape of the earth.

The Survey of India undertook to carry out the proposals of the Conference, apparently not recognising the difficulties of the work and the almost impassible nature of the mountainous country through which it must necessarily be conducted.

The Russian Survey had carried their series of triangulations across their Pamir Territory and had reached the frontier between the two great neighbouring coun-

tries of China and Afghanistan. Between that frontier and India lay the great ranges of the Himalayas, here displayed as a mighty maze of snow-clad mountains hewn by glaciers and icy tributaries of the noble Indus into steep inaccessible cliffs and deep abyssal gorges. It was through such a country as this that the work of the Indian triangulation had to be conducted and numerous were the efforts made before a passable course could be discovered across these massive mountain barriers. In the year 1911 Lieutenant H.G.Bell, Royal Engineers was despatched in charge of a Survey party whose duty it was to reconnoitre the country with a view to discovering the most suitable route along which to lay down the triangulation series. Reconnaisance was made along the Indo-Chinese frontier to the North and North-West of Kashmir territory, and as a result of the numerous observations made as to the accessibility of the mountains and the feasibility of obtaining satisfactory observations, it was decided to carry the triangulation series from Kashmir through the Gilgit Agency and along the gorge of the Kanjut River whence after continuing up

the Chapersan tributary of this river, the intention was to cross the frontier and continue over the Taghdumbash Pamir under Chinese Domination until the Russo-chinese border was reached, at which point the link could be completed.

In the Spring of 1912 Lieutenant Bell, in charge of a well-equipped Survey expedetion, left India and early in July reached the Russian border and after exchanging international greetings with his foreign co-workers commenced to carry his series of triangulations over the pre-arranged route back to India. Fate, however, did not permit him to continue his work even to the Indo-chinese frontier . He was attacked with appendicitis on the summit of one of the highest mountains and after a week of severe illness, without a fellow-countryman to comfort him , he died on the 25th July in the silent and desolate altitudes of the "Roof of the World". The expedition then, having effected nothing, returned to India.

By this time The Survey of India apparently regretted the undertaking for which , at the instance of the Hamburg Congress, they had held themselves responsible.

They had lost one of their most trusted and valued Officers, they had expended enormous sums of money on an achievement which had proved abortive and they had discovered that, after two years of earnest endeavour, a work which, at first sight, appeared simple and straightforward was associated with considerable difficulty and still remained incompleted. It was not, therefore, a matter for surprise that, at the Hamburg Geodetic Conference in the Autumn of 1912, the representative of THe Survey of India endeavoured to disassociate his Department from further responsibility in the continuation of this work. He pleaded that, owing to the difficult nature of the country, the technical errors in observation must necessarily become so great as to negative their Geodetic value. By this and other arguments the Conference were not to be baulked in their desires and, rather than agree with the Indian representative as to the desirability of discontinuing further efforts, they went so far as to suggest that The Survey of India would be well advised, on the completion of this link, to continue a second series of triangulations across Persia and thus,

by completing a duplicate link with Russia, the two systems would mutually correct or confirm each other. The Survey of India, thus finding that the Geodetic Conference were not willing to release them from their obligations, came to the conclusion that they were morally responsible for the completion of the undertaking with which they had associated themselves, and they, consequently, determined to despatch a second expedition in the Spring of MCMI 1913 whose duty it would be to continue along the lines on which Lieut. Bell had worked and carry the series of triangulations from the Russian border back to India through that country which he had considered most desirable.

Lieutenant Kenneth Mason, Royal Engineers was selected to take charge of this expedition and two Provincial Surveyors, Mr. Collins and Mr Mc'innes, were placed at his disposal.

Although the work of Triangulation was the main object of the expedition to which all other effort must prove subordinate, yet Mason wished to sieze this opportunity of gathering all the possible information of scientific

interest from those partially known and inhospitable altitudes in which he would be working.

On the 18th. October 1912 Mason inquired from me whether or not I would be desirous of accompanying his expedition as Surgeon and Naturalist if the Medical Department could be persuaded to lend my services. I eagerly replied in the affirmative and set myself to study the scanty publications on the Natural Features of The Pamirs and their neighbouring districts while The Survey of India used their influence with the Medical authorities to secure my services. Files of correspondence began to accumulate on the subject of my being lent to the Survey Department and it was not until 6½ months had elapsed,-a period which may be considered as typical of the molluscan pace at which these great bodies crawl-that I recieved definite instructions to join the expedition at Rawal-Pindi on the 16th. April 1913.

In optimistic anticipation of permission being granted me to join the Party, I had already completed all my arrangements . Scientific equipment and personal baggage had been collected and packed and all possible prepar-

ations were made so that there should be no unreasonable delay when orders would be recieved.

The work for which I held myself responsible was as follows.

(1). Medical Officer to the Expedition.

(2). To obtain a collection of Zoological Specimens both on the Pamirs and on the journey to and from the Pamirs.

(3). To obtain a Geological collection of Rock Specimens from the Pamirs.

(4). To obtain a Botanical collection from the Pamirs.

(5). To maintain a daily record of the nature, direction, and movements of Cirrus clouds.

(6). To obtain a systematic series of blood-counts at various altitudes.

A list of the equipment taken for the performance of this work will be found in the Appendices to this journal.

CHAPTER 2.

April 11th.----- Jhelum to Rawal-Pindi.

April 12th.----- Rawal-Pindi.

April 13th.-----Rawal-Pindi.

April 14th.-----Rawal-Pindi to Domel.

April 15th.-----Domel to Srinagar.

April 11th.

On the 11th.April 1913 at 4.31p.m. the Calcutta Mail shrieking and puffing steamed out of Jhelum station. Mason,Blandy and myself occupied a saloon carraige; a pair of long skis stood in a prominent position against the doorway and every available corner was filled with great piles of our luggage on its way to Central Asia. As we rattled over the iron road to Pindi our journey aand its prospects were discussed in all their details. Mason's mind continually turns to the work and its completion; Blandy,who is accompanying us for sport,wanders to the subject of Ovis poli and Markhor and I gaze at my empty specimen boxes and conjure up visions

of the treasures soon to fill them. As we talk and think the train rushes into Pindi station. The Railway Officials quarrel with us over the large quantity of our luggage but are ultimately pacified.
We drive to the Imperial Hotel and far into the night discuss our forthcoming expedition and all its hopes and fears.

April 12th. Rawal-Pindi.

At 8a.m.this morning we drove to the survey camp at the Company Bagh,a large area of unoccupied land given over to the people as a park in remembrance of the days of the East India Company. The camp had arrived some days before and appeared in excellent order.
Messrs.Jamasjee and Co.had next to be visited. From him our large supply of stores were ordered and it was necessary to see that they were suitably packed and to have them despatched to the camp. We were very satisfied with the manner in which Messrs.Jamasjee had arranged our stores and so excellent were their variety and quality that to the very last day of our journey we

had never cause to complain over a single article.

Later in the day we drove to the Reserve Supply and Transport Depot and took over a large quantity of warm clothing for the khalassies and camp servants. In the evening we watched the bullock-carts being laden with the heavy kit and we ordered our motor to take us to Srinagar. The last hours of the day were spent amongst old friends at the Rawal -Pindi club.

April 13th. Rawal-Pindi.

A railway waggon containing all the heavy equipment of the expedition, arrived early this morning at Pindi station. We superintended the removal of its contents and, having loaded them on bullock-carts, had them transferred to the camp. We followed later and, after giving to each of the khalassies an advance of pay together with a pair of strong marching boots, we had the satisfaction of seeing all our heavy kit and equipment commence its slow march to Srinagar in a long line of lumbering bullock-carts.

April 14th. Rawal-Pindi to Domel.

At 7a.m.this morning we despatched one ekka and one tonga, laden with such light kit as we should require at Srinagar before the heavy bullock-carts could be expected to arrive. We wished to obtain a large two-horse tonga which could perform the journey in 3 days but owing to the unusual rush of tourists to Kashmir almost every variety of vehicle had for some days previously been engaged.

BY 7.30a.m.our motor arrived.It appeared good and reliable but,not being authorities regarding the machinery,we had to remain content with examining the tyres which seemed strong and sound. The motor was loaded up with bedding,portmanteaus and cameras and started off at 9a.m. Rawal-Pindi was rapidly left behind and up to the commencement of the Murree ascent -some 12 miles from Pindi-we proceeded in great comfort and at great speed. At the little village of Baracow we passed our bullock-carts and were well pleased at the good progress they had made. In accordance with regulations

they are permitted to travel by night alone and not by day,in order that they may not block the progress of the tongas and other mobile traffic.

Our troubles commenced as soon as we reached the gradient to Murree ,some three miles from Baracow. Here the motor required water to cool its engine and continued to do so every six or eight miles.The sparking-plugs also caused inconvenience:the driver frequently changed them,cleaned them and replaced them but still they continued unsatisfactory. We were dissatisfied. The sun was uncomfortably warm,the road was crowded and undergoing repair and both between the checks from the traffic and the obstinacy of the motor,we did not reach Murree till 3p.m. A tiffin improved our spirits and we again embarked on our doubtful machine at 3.30. A great change occurred. The road to Kohala was a continuous decline down which we descended at great speed.We swept rapidly over the smooth road,twisted merrily round the sharp corners and skimmed in a manner,which to Blandy seemed reckless,along the edge of those steep precipitous cliffs

which so characterise the Murree-Kashmir tonga road. Kohala was reached at 5.30p.m. Here the usual toll was taken and we crossed the bridge over the Jhelum River and entered Kashmir territory. The car behaved excellently. The route lay along the left bank of the Jhelum River, fairly level but at places relieved by steep inclines and exciting corners. We studied geological strata from the car, discussed the varied forms of the changing clouds which floated above us and checked our opinions and diagnosis of their nature by The International Atlas.

Domeli was reached by 6.45. We proceeded to the Dak Bungalow and there spent the night. A picturesque little spot is this Dak Bungalow, nestling in the midst of a grove of shady trees, beautified by the presence of roses, purple irises, calceolarias, all artistically arranged and in brilliant bloom; whilst deep down below the sound of the Jhelum River, as it dashes and splashes through its steep rocky gorge, lulls the weary body into gentle sleep.

April 15th. Srinagar.

We started from Domel at 8.45 a.m. and had a satisfactory journey. Nothing worthy of special mention occurred. We struck a few lazy dogs with the driving wheel, ran over a flurried hen, bumped hard into an ekka which refused to occupy any other part of the road than the very middle, frightened many people and still more animals but did no damage which could be considered serious. The pleasure of travelling in a hired motor is increased by the fact that the hirer has seldom but little consideration for the wear and tear of the machine. Consequently we felt no qualms o n running over rough piles of stones, winding sharply round difficult corners or bumping the machine in any way provided it increased our excitement or hastened our speed. We admired and discussed the geological strata, well exposed on the road cutting and in the gorge of the Jhelum River. At one place a recent land-slip had occurred and as we passed, the fallen rocks and debris were being cleared away. After a short halt at Baramulla for lunch, we continued our route which now lay through the beautiful valley of

Kashmir. The road was smooth, clear of traffic, lined on each with splendid poplars and in every way suited to the speed of 24 miles an hour at which we travelled. The snow-clad mountains towered over us on all sides. Mason told us many of their names and related his experiences on them. One could never be tired of gazing on their grandeur. We saw the great snowy peaks in the line of our march and thought of all our difficulties in overcoming and surmounting them.

The hotel at Srinagar was reached at 5.15p.m. The car was dismissed and we all felt pleased at the satisfactory termination of another stage in our journey.

The Guide, Abdulla, met us at the hotel almost immediately after our arrival. He is a man of long and varied experience, has accompanied many expeditions to distant parts of the Himalayas and is now to be made responsible for the smooth working of all our transport. He is a strong, thick-set, dark, bearded Kashmiri with a face sparkling with humour and brimming over with intelligence.

Our cook, Ramzana, also appeared, an old servant of Mason and well trained in the culinary duties of camp

life.

CHAPTER 3.

April 16th to April 24th. ------ Srinagar.

April 16th. Srinagar.

To-day we moved from the hotel into a house-boat. The latter is roomy and comfortable and safely moored in the Chenar Bagh. During the morning we visited various outfitters and obtained such warm clothing and necessaries as could not be obtained so satisfactorily elsewhere. This business being finished, we went on a little picnic with some friends of Mason to the Dal Lake. This is not the place to dilate on the beautiful scenery of Kashmir and the enjoyment we obtained in moving about in a swift shikara amongst the quiet waterways of the happy valley. There can surely be no spot on earth which can compare in loveliness to the Vale of Kashmir. After our picnic we spent an hour at the club, returned to the houseboat for dinner, discussed various points on our coming journey and retired weary to bed.

April 17th. Srinagar.

A pleasant and peaceful day. Until our heavy luggage arrives we can but wait here and endeavour to pass the time as pleasantly as possible. This morning Blandy and I visited some of the wood-carvers' establishments. I do not think any kind of shop in any place can be so seductive as these. The excellency of the workmanship is only exceeded by the persistents annoyance of those that sell it, who in displaying the quality of their goods and endeavouring to entice one to purchace, almost drive their customers into a state of wild distraction. I ordered a few small articles which I will take with me on my return from the Pamirs. My literature at present is Lakes Text-book of Geology which I am slowly digesting. When it is finished their is a liberal supply of similar interesting scientific books to follow. ~~tla~~ Blandy and I had a gentle and most enjoyable little paddle on the Dal Lake this evening.

April 18th. Srinagar.

Although an arrangement had been made with some friends

to go with them for a picnic on the Dal Lake yet it had, owing to a continuous rainy drizzle, to be abandoned. The whole day was threatening and the sky cloudy. Towards evening a rather heavy thunder-storm broke and the rain came down in torrents. It must surely be snowing hard on the higher hills and in the passes, and this will undoubtedly add to the difficulties of our march.
We again visited the seductive shops of the wood-carvers and bought some small articles. News arrived that our bullock-carts were proceeding safely along the road and expect to reach Baramulla on the 22nd.

April 19th. SRinagar.
This has proved an enjoyable day, if any day could not be enjoyable in such beautiful surroundings. After breakfast we hired a shikara and were paddled down stream to see the Maharaja's palace, as we had recieved permission the previous day to view the interior of it. From the outside it appears noble and inspiring amongst the small and unstable wooden buildings which stand round

about it. It can be seen to be evidently divided into three portions; one to the left which forms His Highness' dwelling apartments, one in the centre which is the Court or Durbar and a large well-protected portion on the extreme right which contains his voluminous harem. As the Maharaja was absent, the rooms of the palace were denuded of their furniture, but the beautiful paintings on the walls and ceilings, the great piles of carpets, sofas, chairs and other articles of furniture displayed the luxury with which he was surrounded.

The Durbar is a large and artistically painted hall. It contained no throne or seats of any kind. Some 30 or 40 feet from the ground it was surrounded by a gallery in which the Maharaja's wives sat and watched the ceremonies while they were completely cut off from all prying eyes by large vertically hanging curtains, constructed on the principle of Venetian blinds, which prevented them from being seen by those within the court but permitted a fairly clear view of the administration of Oriental justice to the damsels who sat behind them. Needless to say, our guide would not permit us to visit

the harem and was very reticent as to its contents. After leaving the palace we were rowed, through torrents of rain, to the Lal Mundi, which serves as a museum. The collections of birds and geological specimens were most interesting but the whole museum requires a careful supervision by one well instructed and keen on such work. Later in the day Blandy heard the unfortunate news that two men from home were on their way to Kashmir en route through the Pamirs to the Trans-Siberian railway. From his point of view this is most unpleasant information, as they will probably be able to travel more rapidly than we and will therefore reach the shooting grounds earlier. Later in the afternoon we climed the Takht'i Suliman, a conical volcanic peak surmounted by an old Hindu temple and lying to the east of Srinagar. From it we obtained a magnificent view of the Kashmir valley and spent fully an hour feasting our eyes on the beautiful lakes and waterways, the quaint old city with its grass covered roofs spread like a green carpet before us and the massive snow-clad mountains, which towered far above and encircled us on every side, were like the silver set-

ting to the emerald city. Much snow has fallen since our arrival. The lower mountains, which were free a few days ago, are now enveloped in a white mantle. This does not prophesy well for our experiences in the passes or tend to increase our hope of crossing them without difficulty.

April 20th. Srinagar.

Early this morning we went in our swift shikara to the eastern slope of the Takht in order to test our rifles, some of which did not appear as satisfactory as might be. The bolt of Mason's new weapon worked with a certain degree of friction and tended to jam after being fired. He had written to the maker regarding the defect but it was now too late to return it for alteration. However, when he fired it to-day against the massive volcanic debris of the Takht, it was much more supple than ever before, and it is hoped that, with a little more use, the defect may completely pass away. Blandy, the sportsman of the party, has , of course, a perfect weapon which will do great credit to its owner. Not being especially

keen on slaying the splendid wild sheep and goats which haunt the Himalayas, I have brought only an old converted ·303 service rifle. I dare say if an animal is actually foolish enough to tempt me I may let loose at him, but I would much prefer his photograph to his head and horns.

Being satisfied with our shooting equipment, we returned to the houseboat, inspected the new Whymper tents, had alterations made in some of our warm clothing and then sat down for a comfortable hour or two with a pleasant book. At present I am engrossed in the account of The Duke of Abruzzi's expedition to the Karakorum Range. It is beautifully written, illustrated with the most artistic photographs I have ever seen and refers again and again to places which I know and to persons whom I have met in Srinagar, the great outfitting and equipping centre for all expeditions to the Western Himalayas. The guide, Abdulla, who was the Duke's right-hand man, is now with us He tells many stories of his acquaintance with Royal blood and feels proud of his frequent

mention in Count Filitpi's volumes and his prominence in the photographs.

This afternoon we went on a short picnic to the Dal Lake. Our friends were the Sparlings with whom we had before enjoyed a similar trip. Our culinary equipment, or at least that belonging to Mason which had been stored in Srinagar since last season, was later in the day inspected. The most of it was so battered and time-worn as to be quite unserviceable and a fresh stock was ordered.

April 21st. Srinagar.

We spent most of the morning shopping and making complete little details in our equipment. A friend, Carson, lunched with us but I fear was not done very proudly. The afternoon has been wet and threatening. We stayed indoors, chatted, read, and watched the doongas and house-boats on their course up and down the stream. We were amused at one house-boat of ladies attempting to moor in the Chenar Bagh. As this Bagh is reserved for bachelors they were quickly evicted. It is extraordinary how

females love prying into the affairs of men.

This evening Mason and I dined with Colonel Mc'Nab I.M.S., the Resident surgeon in Kashmir. I had not previously called on him and he seemed to think that such was rather a serious shortcoming. One of the guests , who had been over the Burzil Pass, was specially cheering by insisting that the only safe time to cross the Pass was from the 15th. June onward and that the date ~~on~~ which we had arranged for the journey was about the most dangerous that could have been selected. People seem to take a morbid pleasure in communicating any information which may tend to increase ones difficulties or add to ones troubles.

April 22nd. Srinagar.

The heavens poured all day to such an extent that we were confined to the house-boat. In the afternoon it cleared somewhat and I went to the museum and studied the geological specimens contained there. Subsequently I saw some of our outfitters who had not yet supplied all our orders and endeavoured to hasten them in their work.

The Burzil must now be blocked with soft snow. Mason, this morning, met Dr. Neve, than whom nobody has more experience in Himalayan travel, and he considers that the best plan to adopt is to start from the foot of the pass at about 11pm. and march throughout the whole night so as to reach the summit by day-break. By this means we will be able to march over the snow while it is frozen and avoid sinking into the deep soft and thawed coating which forms after the sun has shone for some few hours and which makes progress impossible.

April 23rd. Srinagar.
We are just waiting for the heavy kit to arrive. Otherwise all arrangements are complete. We hope to leave here on the morning of the 25th.

April 24th. Srinagar.
After breakfast we paid our bills to the various outfitters from whom we had recieved goods.
It is extraordinary the clever manner in which the Kashmiri endeavours to insinuate additional charges into his accounts in such a way that it is difficult to detect it.

Our patience was, however, tested to the utmost when one clever fellow had the impudence to ask nine rupees each for a number of rucksacks which he had made for us. Mason rapidly settled the question by pitching the shopman out of the boat and kicking his goods into the river.

I suppose in no other place more than in Srinagar has one such an opportunity of meeting travellers and explorers. Yesterday we met Whittaker who had crossed Central Asia and today had the good fortune to meet and have a long conversation with the famous archaeologist, Sir Aurel Stein, who , though very reticent regarding his future work, gave us to understand that he is about to enter on a two years journey into Central Asia to continue his wonderful discoveries and investigations into the sand-buried cities and ancient civilisations of that now desolate quarter of the globe. No man ever impressed me more as a type of genius, politeness and energy than he.

This afternoon we attended one of those unpleasant social functions so bound up with British Administration. I refer to the garden party of The Resident in Kashmir. Everybody of importance in Kashmir was there but the great centre of attraction was The Baroness Rotschild, a beautiful

French lady, who with her husband is travelling in Kashmir. I was thoroughly pleased when the function, and all the silly frivolity connected with it, was all over.

After returning from the unpleasant garden party I met a Major Battine, who is accompanying Monsieur Reveliotte, the Russian Consul at Calcutta, over The Pamirs and ultimately to St. Petersburg. It is unfortunate that they are travelling just at this time as there may be some difficulty in the supply of coolies. However The Government cannot allow anybody else to pass through this year.

I have promised to lend them any medical help in my power, should they require it while in communicating distance of me . Blandy suggests that, if the old Russian gentleman gets frostbitten and I cut off his toes, he may decorate me with The Order of the Black Eagle.

The weather still continues bleak and threatening. All those experienced in mountaineering assure us that The Burzil will be heavily blocked with snow and that night will be the only time during which we can effect a crossing.

CHAPTER 4.

April 25th.---- Srinagar to Shadipur.

April 26th.---- Shadipur to Bandipur.

April 27th.---- Bandipur.

April 28th.---- Bandipur to Tragbul.

April 29th.---- Tragbul to Gurai.

April 30th.---- Gurai to Gurais.

May 1st.---- Gurais to Peshwari.

May 2nd.---- Peshwari to Burzil Chowki.

April 25th. Shadipur.

This morning we said au revoir to Srinagar and to the kind friends we met there. After having recieved, counted and packed the money-three thousand, nine hundred rupees-required for our journey as far as Gilgit, we climbed on board our house-boat and commenced our drift to Bandipur. Four boats, heavy laden and of deep draft, formed our transport. We occupied one with our private kit and the remainder were filled up with orderlies, servants, tents, equipment and great piles of smaller accessories, required

either for comfort or utility.

The trip down the river was most enjoyable, although the cloudy weather and strong wind made the evening rather chilly. Native crafts, beautiful in their clumsiness and simplicity, passed and repassed us; the boatmen chanted as they struggled with their oars against the rapid stream or, simply guiding their little vessels with a stout strong pole, they drifted with the current. The primitive wooden houses, standing at every angle but the vertical, looked down upon the river; a shaky and tottering prey to those earthquakes which, every decade, demolish them.

We floated beneath massive bridges amidst the confused shouts of the boatmen who seem compelled to incite every effort with loud cries of encouragement. Ancient mosques, with domes glistening like silver, towered above the simple dwellings and flitting along the banks or washing at the river-side were groups of Kashmiri damsels, clad in brilliant Oriental colours, true pictures of that beauty for which they are so justly famous.

The treasure hilts was lowered into the well of the boat. Anyone who wishes a dive into it during the night will

have to work his way through my bed, which guards it above, or will have to burrow rat-like into the hull of the ship. Later on we must arrange for an orderly to keep watch over our treasure night and day.

We stayed the night at the little village of Shadipur, and slept soundly in spite of the howlings of a thousand dogs and the discomfort of the hard boards which formed our resting place.

Our appetites seem to increase daily. A week ago we considered ourselves voracious but now we are veritable gluttons.

April 26th. Bandipur.

We started from Bandipur at the first streak of dawn. At least our crew did so for we did not rise from our hard but warm beds until 7 a.m. The journey down stream was disagreeable. The rain poured, the wind blew and it was with difficulty that we persuaded the crew to cross the Wular lake. The rain, it raineth every day and now the wind has added its moiety of discomfort.

At one place we were interested in watching a small herd of cattle swimming across the river. They swam strongly and

and faced the current obliquely so as to prevent themselves being carried away by the force of the stream. It surprised us to see bullocks taking so freely to water. Their owner informed me that, twice daily, they performed this novel journey to and from their grazing grounds.

Misery and floods formed the picture of Bandipur camp when we arrived. The khalassies were sheltering themselves in houseboats and tents or else, huddled and squatting, were cooking their food beneath large survey umbrellas. All seemed wet and uncomfortable, pictures of unhappiness, but a day or two of sunny weather will put everyone in good spirits again.

I am compelled to theorise on the cause of this continuous rain. Kashmir valley is surrounded by a circle of high snow-clad mountains which, in the latter half of March and first half of April, must be giving up their moisture, derived from the melting snow, in enormous quantities to the overlying strata of the air. The atmosphere in direct contact with the peaks, therefore, becomes saturated with aqueous vapour and is chilled to a low temperature from its close relation to the melting snows. On the other hand,

the air in the valley is in apposition with no cold or with any moisture of an extent equal to that of the enormous snow-fields which envelop it on all sides. Consequently the valley atmosphere is drier and warmer than that of the mountains. There is , therefore, a great overflow of cold saturated air into the valley to take the place of the dry warm air which must ascend. The cold air pouring into warm surroundings rapidly expands and, as a consequence, condenses and deposits its moisture in the valley.

As evidence in favour of this view may be mentioned.-

(a).The continuous ring of heavy clouds,which lies over the mountains, suggests a saturation of the mountain atmosphere.

(b).The daily appearance of rain in the afternoon after the valley has had time to become warmed by solar heat.

(c).The association, with the rain, of wind coming from the mountains and the absence of wind during rainy intervals.

April 27th. Bandipur.

It was a pleasant change to have a day full of business and

energy. The morning and afternoon were occupied in assorting equipment of all kinds into loads suitable for cooly transport. Each package amounted in weight to about 60 Lbs. Some were less, others rather more. A few reached 80 Lbs. To the last the coolies objected but a gentle persuasion from Abdulla and the promise of a little "douceur" at the end of the day's march managed, in all cases, to smooth over difficulties. A load of 80 Lbs., together with the man's private kit and food, is, by no means, a light weight to carry for a long distance over difficult roads and passes.

I examined and checked my medical equipment to-day and was very pleased with the excellent supply and the splendid manner in which it had been packed.

The Tehsildar visited us in the early morning, proved most obliging and supplied us with sufficient coolies and whatever food we required.

The Khalassies recieved to-day the remainder of their warm kit. In all the total supply per man was; Blankets, 3; Jersey, 1; Pyjamas, 1; Warm coat, 1; Balaclava cap, 1; Paggri, 1; Gloves, 1 pair; Putties, 1pair; Snow glasses, 1pair; Socks, 2 pairs and Boots, 1pair.

On the whole, our day's work exceeded expectations; sixty coolies being sent on the march before dark. This bodes well for the start of our remaining transport by an early hour to-morrow. Up to the present we are a day in advance of our alloted date.

April 28th. Tragbul.

At last we have commenced our long march. We started from Bandipur at 9.15 a.m., having completed and sent off the remainder of the baggage during the previous three hours. The road lay first along a level plain amongst a regular expanse of rice fields, just ready for the seed. Later we reached the base of the Tragbul hill and here our course became somewhat more difficult. The road up the mountain is a long zigzag path which cuts backwards and forwards across its face and is some eleven miles in length. The coolies, however, have beaten away by continued use a rough and broken track up the face of the mountain. This we followed, and after a stiff climb, with frequent rests, reached the snug little bungalow at Tragbul by 3 p.m. The bungalow is situated in a sheltered nook amongst the

pine trees and is surrounded, on all sides, by the beautiful white snow. This has been my first acquaintance with the snow which will be our companion for many long days.
A cooly is an amazing person. He is so strong and enduring and yet so easily persuaded and led that his mind must resemble that of a child.

April 29th. Gurai.

We rose at 2 a.m. in preparation for the march across the Tragbul Pass. Some of the coolies, however, did not appear at the appointed time and we thought that they might have absconded. This caused considerable delay and we did not see all the baggage on its way until 4 a.m. It was a strange and uncanny experience scrambling up the snow-clad mountain in the dark of night and picking out by lantern light the narrow line formed by the imprints of the coolies feet over the soft snow. The stillness of the night was broken only by the solemn tramp of many feet, and the tiny lanterns, glittering in the darkness, seemed even to add to the silence. The summit of the Pass was reached by 6 a.m. and almost at the same moment the mountain became enveloped in

thick cloud and the snow fell quite heavily. This obscured from view the enormous snow fields which surrounded us on all sided and caused us much difficulty in picking out our route as the footsteps became rapidly concealed. The hard frost of the night had covered the snow with a firm coating of ice and it was easy to travel at a fair pace. I had never climbed to such an elevation before-the pass is 11900 feet- and paid the penalty for it by suffering mild symptoms of mountain sickness, chiefly in the nature of a throbbing headache and much breathlessness and palpitation. The north side of the Tragbul is a steep decline for thousands of feet down which we marched, rolled, glissaded, toboganed on one ski and travelled in almost every manner unassociated with dignity. Mason sped on his skis down many of the slopes, but, unfortunately, one ski fell from the orderly's hand, and, sliding down the steep descent, was seen no more.

The pass was blocked in numerous places by avalanches. Some of these were enormous, hundreds of thousands of tons in weight and sometimes blocking the whole valley. The geological effect of these avalanches is amazing. In some parts

it seemed as if almost half the hill-side had been torn away: great boulders being dislodged and trees uprooted and broken through as if they had been match-wood. In one place, as a result of an avalanche crashing down year after year over the same site, the huge piles of debris and tree-trunks, which were driven downwards before it, were not only carried far into the bed of the valley but were swept completely across it and driven over one hundred feet up the steep side of the opposite cliff.

We reached Gurai bungalow at 11.45 a.m. and were glad of both a meal and a rest. The coolies worked hard, many arriving shortly after us. Owing to their long march and the excellent manner in which they had performed it, each cooly was rewarded with a ration of native tea which they thoroughly enjoyed.

April 30th. Gurais.

We continued our march from Gurai at 9.30 a.m., after having seen all our kit well on its way. The day was beautifully fine and the glare of the bright sun, reflected from the snow, caused much discomfort to the coolies eyes and

would, in the absence of our dark glasses, have very quickly produced in us the unpleasant symptoms of snow-blindness.

Our route lay along the right bank of the Kishenganga river, which here flows through a deep rocky gorge and dashes along with tremendous force. The descent was easy and but few avalanches crossed the route. The scenery was massibe. Some nine miles from Gurai we crossed the river and then continued our way along its left bank. We had descended some thousands of feet and had almost reached the lower snow level when we entered the Gurais valley, beautifully wooded and gay with birds of temperate regions, many of which have gone to swell my collection. From the valley we watched the avalanches crashing down the mountains and listened to their deafening roar.

The Kashmir coolies were dismissed and paid this evening. A fresh supply from Gurais are to be present tomorrow morning.

At the rest house we had the good fortune to meet a Lieut. Whittaker of The Rifle Brigade. He is proceeding to Astor but is unable to advance as we have absorbed all the coolies

in the district.

F 1st. May Peshwari.

At the same hour as yesterday morning we left Gurais and had an easy march of 14 miles to Peshwari. Nothing exciting or of special interest occurred. The route lay along the Kishenganga river which at this part of its course cuts deeply down into its narrow gorge. The scenery was grand. At every turn of the road a fresh spectacle of beauty rose before us. Snow-clad mountains towered thousands of feet above the valley and avalanches, blocking the road or roaring down the mountain sides, became so common as to pass unheeded.

Our fresh supply of coolies worked well and arrived in good time. A Kashmir cooly must be one of the finest specimens of manhood which exists on this earth. As an example of his strength and endurance the following incident is typical. At Gurai we discovered that a load had been forgotten at Tragbul. One cooly volunteered to return over the Tragbul Pass and bring again the load not only to Gurai

but right on to Gurais. He had, therefore, travelled 53 miles in 39 hours, and for 40 of those miles had carried a load of about 80 lbs. and crossed a difficult pass with heavy snow three times. I would have thought that such a feat was beyond all human endurance.

We have the good fortune to enjoy Whittaker's company in this and our subsequent marches as far as Bunji.

May 2nd. Burzil Chowki.

Although the distance covered to-day has not been great, yet all the difficulties which presented themselves to us during the march made our journey most trying.

At 5.20 a.m. we left the bungalow and made very fair progress as far as Minnemerg. For the first time since our departure from Srinagar, the sun shone with full strength and the heavens were blue and cloudless. But the air was crisp and frosty. The branches of every pine and willow were laden with white bands of snow and tiny icicles hung from every leaf. And from all around there rose a soft white mist which clothed all verdure in a steamy cloud. During the first hours of the march the snow was hard and firm and we advanced fairly rapidly. Later, however, it

became more and more soft and as the sun grew more intense we sunk knee-deep into it at every step. This made progress difficult and the avalanches which rushed down the mountain side, set free by the thawing effect of the sun's warm rays, added a certain element of danger. On one occasion, just before reaching Minnemerg, an avalanche came down between ourselves and the first batch of coolies. The latter threw their loads and fled but the avalanche did not come sufficiently close to cause any injury.

Minnemerg is a beautiful spot, surrounded by magnificent mountains which at this season of the year, are enveloped in a mantle of snow. It boasts of the highest telegraph station in the world.

The journey from Minnemerg was a severe one . At every moment there was a danger of an avalanche rushing down on us and some of the snow masses, which lay on the hills above, showed every prospect of discharging themselves, at any moment, into the valley below.

The heavily laden coolies plodded slowly and laboriously in a long broken line. Ever and anon they halted and placed their stout sticks behind them in order to support their

burdens. The snow was very soft and progress exceedingly slow.

We did not arrive at Burzil Chowki until 6p.m. and, therefore, spent the whole day, from five in the morning till five in the evening, in travelling but 11 miles. This snail-pace does not bode well for our journey to-night over the Burzil Pass.

CHAPTER 5.

May 3rd.----Burzil Chowki to Chilam.

May 4th.---- Chilam to Gudai.

May 5th.---- Gudai.

May 6th.---- Gudai to Astor.

May 7th.---- Astor to Dushkin.

May 8th.---- Dushkin to Doyen.

May 9th. ----Doyen to Bunji.

May 10th.--- Bunji to Parri.

May 11th.--- Parri to Gilgit.

May 12th.to May 15th.---Gilgit.

May 3rd. Chilam.

The Burzil is behind us at last and we are all heartily glad of it. After reaching Burzil Chowki at 5p.m. on the previous night we rested till 11p.m. and then continued our journey. The night was,fortunately,clear and bright and the temperature fell many degrees below zero. It was a

perfect night to effect a crossing of this difficult pass as the frozen snow made progress possible. The ascent of the pass was about six miles of a steep incline and we considered that the last cooly should be at the summit of the pass by the first streak of dawn.

The transport advanced at the rate of about one mile an hour up the slope of a huge avalanche, known as Dam Singh's pathar. Coolies dropped their loads or stumbled beneath the weight of them. The hindermost had to be continually assisted by words and actions, and urged with threats to raise their burdens. Whittaker and Blandy, with the guide Abdulla, led the way and uttered continually loud shouts of encouragement to the coolies who struggled on behind. Mason and I occupied the rear . Backwards and forwards we wandered amongst the coolies ever inducing them to move forwards. Some collapsed, others fell asleep in the snow while almost all groaned and whined in a most piteous manner. Occasionally one would drop his stick and it would shoot with terrific speed down the steep slope of the icy pass, and, at X times, a cooly would fall and, refusing to move, would complain that he was dying or, with moans, declare that he was actually dead.

By 6a.m.the coolies had reached the summit of the pass, where stands a small wooden shelter in which we enjoyed a little hot cocoa and a stick of chocolate. The Burzil pass is 13900 feet in height and was bitterly cold in the slight but sharp wind which blew across it. Our milk,butter, jam; every liquid or semi-liquid article we possessed was frozen solid. Twelve coolies were frostbitten and all suffered from inflammation of the nose and lips and many, who did not possess dark glasses, were aflicted with snow-blindness.
The descent was fairly easy and the snow remained crisp and suitable for marching until about 11a.m. As we had but little sleep for the previous two nights, we found it difficult to keep awake, even when on the march. Our faces are swollen and painful and on the whole we look rather a disreputable party.
Chilam bungalow was reached at about 11 a.m.but the coolies did not turn up for many hours later.

May 4th. Gudai.

This morning, when checking transport, we found that some ten or twelve loads, with their coolies , had been left

behind on the pass. This was, by no means, a reassuring discovery but, in spite of it, we had to push on. The coolies strongly objected to move when we attempted to rouse them at 6 a.m. Many were frostbitten, many snow-blind and all were most weary after the strenuous time through which they had passed. The 16 miles to Gudai had to be faced and, after some persuasion and a gift of dark glasses to those who moved off first, we started them on their journey. We followed at 7 a.m. and for the first half of the march had to tramp through the heavy snow which was rapidly softening beneath the strong sun. The glare from the snow increased the erythema of our faces. Some of us are almost unrecognisable. My lips are so swollen that it is with some difficulty I manage to eat my food.

The views and grandeur of scenery which flashed before our eyes at each bend of the valley was magnificent; the the scale was immense.

After about 5 miles trudge we met a native Government Official plodding along towards the Burzil Pass. He was most happy and in the greatest of spirits, and no wonder, for during the last twenty years the Burzil had separated

him from the outside world. We recieved from him the pleasing information that, at about three miles distant, the road was clear of snow and marching would be quite easy again. The small village of Karim, half buried in the snow, was reached a little after mid-day. From this point the road was fairly open but was covered with a thick slush. It was, however, very much more acceptable than the soft snow of which we were, by this time, heartily sick. At Karim we obtained two small ponies with uncomfortable wooden saddles. These helped us on our road to Gudai.
We were all rather tired on arrival, and owing to the baggage which was left behind and the arrears of work which had to be completed, we decided to remain the next day at Gudai and collect together our transport and put everything shipshape.

May 5th. Gudai.
To-day has been a day of rest. The change was most pleasant after the hard work which we had just experienced. Most of the missing baggage arrived on the night of the 4th. but two loads are still freezing on the Burzil Pass.

The greater part of the day was spent in developing the photographs taken during the past week and every one seems very satisfied with the results. Blandy and Whittaker have become converts to the "time" system of development.

We are all horrible sights, with scrubby and ragged beards and red swollen faces. After breakfast the coolies were paid off. An attempt was made to recover the dark glasses which we had lent them but out of the supply of 36 only 26 were placed before us on the table.

In the evening we had a guest to dinner. Lieutenant Ponsonby, who was shooting in the neighbourhood with considerable success, had pitched his camp close to the bungalow. He was probably very pleased to come in contact with some of his own nationality in such a wild country.

We are very satisfied with the manner in which the crossing of the Burzil pass has been achieved and are sufficiently vain to congratulate ourselves on the result. Altogether our casualties amounted to 20 cases of frostbite, 36 cases of snow-blindness, a universal complaint of red and swollen faces and the temporary loss of two cooly loads.

May 6th. Astor.

Pony transport has now replaced the coolies and good roads and fertile valleys have given way to slushy paths and snowy wastes. Each little pony took two cooly loads and the whole detachment was off by about 8a.m. We followed in about an hour and fortunately did not see our transport until our arrival at Astor. What a change from the coolies. The latter we passed again and again during our previous marches and often had to wait to urge them on.

The march to Astor was 17 miles but, owing to the good roads, was far less tiring than one half the distance on soft snow. The route lay through the gorge of the Astor River. Several items of geological interest occupied our attention throughout the march. The great depth of the river gorge, the old fluviatile deposits of sandy sediment lying high up on the mountain side, the river terraces on either bank reaching hundreds of feet above the present river bed, the evidence of rejuvenation of the stream in the neighbourhood of Astor all pointed to the recent elevation of the mountains from which the river derived its source and the rapidity with which it is now eating its way down

into its former bed. The lovely valley of Astor was reached at 3 45p.m. and the remainder of the day till dinner time was occupied in packing away the insect specimens and checking the diagnosis of the birds shot during the march.

May 7th. Dushkin.

The transport was away from Astor this morning at 9a.m. At the time of its departure a note came from Mr. Collins, who was following in our rear with more of the party, that he was suffering from bronchitis and asking me to postbone my departure from Astor until he arrived. This delayed Mason and myself till about mid-day. Collins, fortunately, had only a mild attack and will probably be himself again after a few days.

The journey to Dushkin was uninteresting in comparison with the beautiful scenery through which we had just passed. The distance was about 14 miles of which half was covered on a pony and the remainder on foot. The deep gorge of the Astor river and its steep, almost vertical, sides could not but attract attention. It appeals to me as a magnificent example of the rejuvenation of a river.

Mason shot four red-legged partridge (chucor) on the march. They will prove an acceptable addition to our daily meals. We arrived at the rest-house by 6.30p.m. Our march was, therefore, a very slow one but this was chiefly due to the time occupied in sport.

Before leaving Astor this morning we visited the ancient fort which stands on the remains of an old river terrace and commands the Astor valley. The walls were built of alternate layers of stone and beams all held together with mud plaster and now crumbling rapidly into decay. The interior consisted of small dwelling rooms surrounding a central space. The former were in a state of dilapidation and the latter contained a small square building and used as a store by the Supply Depot. The roofs of the dwelling rooms formed the platform on which the troops stood when discharging their cannons through the small loopholes. Numbers of round iron cannon balls lay scattered about as relics of its ancient armament.

May 8th. Doyen.

The journey was continued this morning at about 8a.m. The

distance from Dushkin to Doyen is but ten miles. The greater portion of it consists of an up-hill climb along the side of a bare mountain. After a few miles the road winds through a beautiful wooded country, thickly clothed with majestic pines which almost reminded one of an English forest. While wandering along this delightful hill-side a huge crash was heard, followed by a low rumbling which echoed and re-echoed amongst the neighbouring mountains. This was caused by an enormous mass of rock rolling down the mountain side and breaking into masses of debris in the valley beneath. An enormous cloud of dust rose from the ravine into which this rocky avalanche had poured and, while in that stage, I obtained a photograph of it. Some four miles from Doyen at a sharp bend in the mountain road, we came suddenly in full view of the Bunji valley and the noble Indus flowing deep down in its sandy bed. The view was magnificent, the scale stupendous. Enormous mountains towered aloft on all sides while far in the distance still loftier peaks showed above their summits, and amazingly far below lay the river Indus like a narrow sinuous streak sparkling in the sunshine, the only bright spot in the grey desert through

which it flows.

We halted for tiffin and feasted our the glorious scenery displayed before us. Our road could be discerned like a tiny line along the distant mountain side, while high above it lay the snow-clad peaks like a great white barrier opposed to those who should seek to penetrate beyond..

May 9th. Bunji.

Eighteen miles lie behind us since the morning. We commenced our journey early after all the transport was safely on its way. The first nine miles of the route formed a steep and continual decline. In places the road appeared actually dangerous owing to the large boulders and masses of debris which seem to be falling down continually upon it. Fortunately we were able to shorten the actual distance by shuffling down the side of the mountain and thus again meet the road at a lower level, without having to follow it throughout the numerous zigzags and convolutions. A discussion arose as to the amount by which, through this means, we had diminished our journey and, like most similar arguments, each party seemed more convinced in his own opinions at the termination than at the commencement

of the discussion. The day was unpleasantly warm and both thermos flask and water-bottle were continually demanded. The alterations in extremes of temperature in a journey such as this are remarkable. It seems but yesterday that we were shivering in the snow and urging on our frostbitten coolies to repeated efforts, while today we plod laboriously through a drear and barren country which a traveller has, perhaps with some exaggeration, likened to a realistic Hades.

The Astor river, close to its junction with the Indus, was crossed by an excellent suspension bridge. From here our descent ceased and the remainder of our route lay along the ancient bed of the Indus which for miles formed a treeless waterless waste, a stony desert supporting no life and offering no shade from the fierce rays of a tropical sun. It is stupefying to contemplate the dimensions of this valley and the mass of sediment that fills it. To think over the countless years that this river must have taken to hew out so broad and so deep a bed and to reflect over the immeasurable quantities of sandy sediment accumulated by the wanderings of the sluggish river is as satisfying

to the human mind as to brood over infinity.

About mid-day we discerned, in the far distance, the little village of Bunji. The green trees and fields of cultivation appeared like a beautiful oasis in this mountain desert. The mulberries were ripe in Bunji and shortly after our arrival we did full justice to a substantial dish of them. Later in the day Lieut. Cole, a gunner stationed at Bunji, called to see us. He entertained us all most hospitably to dinner in the evening and to breakfast the following morning.

May 10th. Parri.

Today has been a day of partings. Blandy left us early this morning to pursue Sharpu (Ovis vignei) in the neighbourhood of Gilgit. His absence is only a temporary one and he will soon rejoin us. Our start this morning was rather later than usual owing to our lingering over the pleasant breakfast given us by Cole. We suffered for this later by having to endure all the toil and heat of the day. Fortunately the sky was enveloped in clouds and a gentle breeze was blowing. In spite of these, however, the day was oppressively

warm and the absence of water added still more to our discomfort. The extremity of the arid waste, which we had been traversing for the past two days, is bounded by the Indus river. Here the second parting took place. Whittaker, our pleasant companion, had reached the spot where he must leave for his shooting grounds. We wished each other fortune on our respective pursuits. He struck east towards his nullah; we crossed the Indus.

After a short ascent along the right bank of the Indus, the road wound away to the left and continued along the Gilgit river through a stony desert waste as inhospitable and barren as that through which we had just passed. The sun now shone in his full strength and we felt most uncomfortable. No water was to be had save from the muddy river which, from hygienic reasons, we refrained from drinking. Thermos flasks and water-bottles were soon emptied and nothing was left but to push on to Parri as hard as possible. The 18 miles were completed by about 4 30p.m.and we had been but a short time housed in the little rest bungalow when a fierce dust storm arose followed by a heavy shower of cooling rain. The dust seemed to penetrate everything but by now we are so accustomed to dirt that

it did not appear to cause us any discomfort.

May 11th. Gilgit.

We have at last arrived at Gilgit which has been looked on as the half-way house to The Pamirs. The same barren mountain desert, through which we had marched for the last few days, was still our unpleasant companion. For nineteen miles we wended our way along the sandy road, with the monotony only broken at occasional intervals, by green oases and patches of cultivation springing up about a mountain stream. Owing to the heat endured on the previous day, we started at dawn and succeeded in placing many miles behind us before the sun became unpleasantly warm. The ponies, on which we rode, were weary and we found the continual urging of a tired beast a most tiresome occupation.
Gilgit was reached at about 3 p.m. It seemed a spot of beauty after the desolation of the past few days. The Political Agent, Major Macpherson, had three large tents erected in his garden and placed them at our disposal. In the evening he asked us to dinner but we pleaded our dishevelled state as an excuse.

May 12th. Gilgit.

A day of comparative rest in this desert oasis. All round about lie the barren hills and rocky desert which separate the little green and fertile Gilgit from the outside world. We seem like a plague traversing a district. Our men and animals devour all the produce of the country side.The Gilgit authorities dislike any expeditions, except the very smallest, passing through their country. The result is that the inhabitants, who live an ant-like life, storing up their summer food and consuming it in the winter, find much difficulty in obtaining even the bare necessities of existence. After breakfast our transport was inspected and found complete. Later I visited the local hospital and everything there was shown to me. The large grants and excellent equipment are a great contrast to the penury of a military hospital.After lunch a few hours were occupied in completing an accumulated pile of correspondence, after which I chased butterflies and added many to my growing collection. In the evening. Blandy and I enjoyed a little stroll in the Bazar but could find nothing which would be of any use to us. Later in the evening we dined with Turner and Moore,two of

the Gilgit officials, and had a most pleasant time.

May 13th. Gilgit.

The pony-men give us much annoyance. They thoroughly dislike the work on which they are employed but the orders of the Kashmir Government compells them to perform it. Unfortunately The Gilgit Supply Depot is unable to give us sufficient fodder for the animals and the result is a continuous worry and grumbling from their owners. Yesterday afternoon a Pathan came to our camp with the information that he could supply us with 32 ponies by 12 noon today. We accepted the offer and sent out to graze the tired animals which had accompanied us to Gilgit. The Pathan's promise has not, as yet, been fulfilled and we hope it is not a ruse on the part of the present pony-men to obtain their discharge. However they have not been paid and will recieve nothing until the Pathan's ponies arrive. We wished to despatch a portion of our equipment to-day, but , owing to the non-appearance of our transport, were unable to do so. We inspected tentage this morning and made arrangements for repairs. About mid-day Blandy and I ~~made~~ paid a duty call at the Political Agency and found them at home. Mason

gave me a second lesson, after lunch, in the technique of the Survey camera. I think I shall be able to work it satisfactorily.

All the pony-men were paid this afternoon and, as usual, were dissatisfied. A little corporal punishment soon set matters aright. I do not think that some of them ever before saw so much money together. One recieved more than 100 rupees for 23 ponies and he had to count and recount this enormous fortune many times with the help of his companions before his dull mind could appreciate the full amount.

May 14th. Gilgit.

The Pathan transport arrived this morning. It is a strange assortment of ponies, mules and donkeys. The animals, however appear strong and have good thick numdah saddles. The men, furthermore, are employed at their own free will and will probably grumble less and work more satisfactorily than the previous ones who were impressed forcibly into our service. All the morning was occupied ~~was~~ in loading the animals and seeing a portion of the transport on its journey to Hunza. We hope that it will reach Hunza in four

days and that the animals will return empty in two days more and thus be ready to convey the remainder of our baggage in six days from now. Such would be good work and it remains to be seen whether it will be fulfilled. Up to the present we have enjoyed a strange assortment of transport. We commenced with the train, then followed motor, ekka and bullock-cart; subsequently by boat to Bandipur, then by cooly through Kashmir followed by pony, mule and donkey and we contemplate Yak transport on The Pamirs. This afternoon a number of Baltis arrived in our camp and offered their services as permament coolies. They appear willing and strong but, being foreigners in the country, we have, unfortunately, no definite hold over them. The barren land from which they have emigrated must indeed be inhospitable to have driven them to such a desert as this to eke out a scanty livelihood.

The origin of the Balti is a subject of some dispute. These men seemed to be a strange mixture of Nationalities rather than one people. Some possessed the characters of the Mongolian countenance and general build of body in as typical a manner as it is possible to concieve; while others, in stature, features and expression, were unmistakebly of

Aryan origin. It might have been expected that such definite and distinct types would in an isolated country soon blend and form an intermediate stock but such does not appear to have occurred in this obscure and interesting people. They have been enrolled as coolies and will start on their journey tomorrow morning. Abdulla has great faith in the Balti as a cooly and I hope, by their work, that his high opinion of them will be found correct.
We all three dined this evening with the Political Agent, a kindly and shrewd old gentleman, whose attitude, general appearance and intellectual expression reminded me forcibly of Mr. Balfour.

May 16th. Gilgit.
The morning I spent in collecting insects and succeeded in adding a few more species to my growing collection. The season is a little early for butterflies; I hardly think I have, up to the present, more than eight or ten different species. Nevertheless I have gained in another respect in that the time of our crossing the passes was at the termination of the migration period and consequently

I have obtained more species of birds than would have been expected at a later date. Mc'Innes and the third detachment arrived this morning after a successful journey. He leaves tomorrow for Hunza. The survey party, this afternoon, took part in a football match against the Kashmir troops stationed at Gilgit but were defeated by 4 goals to 2.

The remainder of the day was occupied in making small preparations for the continuation of our journey. The meteorological equipment was examined and an improvised nephescope manufactured from a photographic printing-frame. The accounts of the glaciers, which we intend to examine within the next few days, were studied and the most favourable time for visiting them was discussed. Almost all our baggage is now past Gilgit and, consequently, half the journey to The Pamirs is behind us.

Gilgit is, in truth, a beauty spot, not that it possesses any lovely spectacles of Nature for which tourists travel far to see, but because, in the midst of a scorching rocky waste, nestling deep down amongst the mountains, it lies a green and fertile garden, ripe with crops and fruits, blooming with lovely flowers; a beautiful oasis in a desert.

May 16th. Gilgit.

This morning was again occupied in collecting Natural History specimens. Mc'Innes moved away in the afternoon so that our detachment now takes up the rearg.

Later we had tea at the tennis ground with the Mc'phersons, thanked them for their kindness to us, wished them goodbye and returned to put our private kit in readiness for its early start at dawn tomorrow morning. We intend to follow later in the afternoon.

CHAPTER 6.

May 17th.---- Gilgit to Nomal.

May 18th.---- Nomal to Chalt.

May 19th.---- Chalt to Minapin.

May 20th.---- Minapin to Aliabad.

May 21st.---- Aliabad.

May22nd.----- Aliabad.

May 23rd.---- Aliabad to Atabad.

May 24th.---- Atabad to Gulmit.

May 25th.---- Gulmit to Pasu.

May 26th.---- Pasu to Khaiber.

May 27th.---- Khaiber to Gircha.

May 28th.---- Gircha to Misgah.

May 29th.---- Misgah to Mercushi.

May 17th. Nomal.

All our private kit was despatched early this morning at dawn and Blandy left at about the same time. Turner kindly offered us meals and Mason and I availed ourselves of breakfast and lunch. All my Zoological specimens collected

up to date have been packed and stored in the office at Gilgit. I shall take them with me on my return.

The Survey Accounts caused Mason some considerable annoyance this morning but, whether in accordance with regulations or not, we succeeded in transfering a substantial sum from the Gilgit Treasury to our own hiltas.

We left Gilgit at about 4p.m. after a very pleasant rest and enjoyable stay there. After crossing the suspension bridge, the road lay, for the first five miles, along the left bank of the Gilgit river through the same stony waste which we had been previously traversing. The sun was still high in the heavens and unpleasantly warm. After leaving the Gilgit river we turned north along the right bank of the Hunza river which here joins the Gilgit river at an obtuse angle. From this point we enjoyed the shade cast by the mountains on our west which continued during the remainder of our journey. Our ponies were excellent when compared with those supplied us on the road to Gilgit. At times they could be induced to break into a canter and never refused to go at a jog-trot. However it was by no means comfortable to be perched on the summit of

an enormous numdah softened by a thick poshteen and with ones legs stretched apart at almost a right angle and feet dangling about owing to the absence of even an improvised stirrup. The animal possessed no bit or reins and the only available means of guiding it was by an old dog chain attached to a dilapidated tangle of rope and hide which was dignified by the name of bridle.
The road lay along the side of a steep cliff which, at places, was so sheer as to necessitate caution in the riding of ones pony. We greatly enjoyed the march in spite of the eighteen miles of drear and uninteresting country through which we passed. Nanga Parbat lay behind us and towards sunset it glowed most beautifully in the rosy rays of the setting sun.
At 9p.m. we arrived at Nomal and were met by a howling mob of village pariah dogs whose cowardliness and timidity made their bark both more annoying and dangerous than their bite.

May 18th. Chalt.

Today's march has been a short one of only 14 miles. We left

the little Nomal bungalow at dawn and journeyed along the right bank of the Hunza river which here rushes along the rocky bottom of a deep precipitous gorge. The road is hewn out of the solid cliff hundreds of feet above the torrent and stands as a magnificent example of modern industry. Until about 8a.m. our march took place amidst the shade and shelter of the eastern mountains. As soon, however, as the sun rose above their summits the whole valley, enclosed by enormous hills, glowed with a tropical heat. Hundreds of feet above the present river bed could be seen the alluvial deposits and remains of old terraces formed by the same river when it flowed at a much higher level. At one place on the opposite side of the gorge was seen a fine example of what Lydeker has described as an alluvial fan. After arriving at Chalt, a few hours were spent in collecting insects and packing them safely away. In the evening Captain Franklin I.M.S. arrived at the bungalow and we remained till midnight chatting over various topics.

May 19th. Minapin.

Todays march has been rather a long but interesting one.

According to the milestones the distance from Chalt to Minapin is 21 miles but whether due to some error in the position of these stones or to the enjoyment derived from contemplating the beautiful scenery and reflecting on the historical associations connected with the various parts through which we passed; the march did not appear to any of us nearly as long as we had anticipated.

Shortly after leaving Chalt the road made a detour of about 4 miles along the steep side of a lateral ravine. From this point we enjoyed a magnificent view of the lofty peak of one of the most beautiful mountains on earth. Rakaposhi, the cloudmaker, surmounted by a silver spear, rose before us like some great human monster ruling and subduing all his fellows. His peak towered into the blue sky, veiled in a film of fleecy cloud and with a carpet of eternal snow glistening like pearl in the morning sunlight. As we watched a dark cloud passed before the sun and he ceased to glitter with his former lustre. Nearer and nearer crept the cloud till it gently touched on Rakaposhi and like a dull girdle wrapped itself about the mountain. The whole mass of elemental rock and the great ice-fields on its slopes appeared to be bisected by this cloud and the

pyramidal summit seemed to float above the base. Slowly the obscuring veil increased, denser and denser it grew; higher into the heavens it rose, lower to earth it sank until the mountain, steaming in vapour from base to summit, was hidden from our view. We watched it awhile and wondered. For aeons the shining spear has stood aloft amidst the heavens and braved the mighty tempests which are moulding it. His roots sink deep down into the bowels of the earth where are generated those convulsions by which he has been raised.

Later the road again rejoined the left bank of the Hunza river and wound along the perpendicular wall of the deep gorge high above the river which rumbled far beneath. We crossed a large suspension bridge to reach Sikunderabad and in about another hour arrived at Nilt. Here we breakfasted and visited the old fort, the scene of many an exciting venture in the Hunza-Nagar blockade. The fort was a human rabbit-warren, a maze of tiny houses and narrow streets without any regularity or any design. Every little village in this district has its fort, in fact the fort and village are one. Isolated houses were rare along the route and the

whole countryside apppear to have congregated in the interior of these old mudden forts the protection of which, in olden times, was no doubt a necessity for them.

We arrived at Minapin at about 3 in the afternoon and saw, when crossing the bridge about a mile outside the village, the black snout of the Minapin glacier curling round a limestone cliff and blocking up the wide ravine about a mile above us. From a comparison of its position with photographs taken by Mr.Hayden of The Geological Survey some years ago we believe it has advanced a considerable distance but we intend to make definite measurements and comparisons tomorrow.

May 20th. Aliabad.

Before continuing our journey this morning we visited the snout of the Minapin Glacier. The ideas one conjures up in the mind regarding a glacier were rudely shaken. Instead of a bright, glistening river of green ice sparkling in the sunlight, there was seen a dark and ugly mass, black with dust and in part covered with hillocks of debris and large boulders which it was carrying with it into the valley below.

The surface was irregular and fissured by deep crevasses into which stones and moraine debris at intervals tumbled. Underneath the snout was a large ice cave from which emerged a rushing torrent of muddy water. Measurements of the glacier from a point fixed in 1906 showed that it had advanced about 1000 feet since that date. After completing our observations at the snout of the glacier, we continued our march along the side of the ravine through which the Hunza river flows. The portion of the road along the steep precipice was very similar to that of the previous march. On one occasion I fell ignominiously from my insecure perch on the back of my pony but took good care, when doing so, to tumble on the inner side of the animal and not down the cliff. Shortly before arriving at Aliabad we again had a splendid view of Rakaposhi which seemed even more magnificent than ever. The Aliabad glacier descends into a large ravine about three miles from the town of the same name. We made a detour up the valley in order to photograph it and observe whether any changes had occurred in the position of its snout since the previous measurements of 1906. No alteration in position was found. The general aspect of

the glacier, its filthy colour and its coating of moraine debris bears a resemblance to that at Minapin. Shortly after our arrival at Aliabad we were greeted by the Mir of Hunza who, accompanied by his bodyguard of ruffians, had come from his capital to welcome us. We entertained him to tea. He does not seem an individual in whom one would care to place implicit trust.

May 21st. Aliabad.

A few days halt at Aliabad is necessary to put everything into final order before the different sections of which the party is composed separate. The morning was occupied in a practical lesson with the survey camera. The object on which my attempts were directed was the beautiful Rakaposhi which towers above us and almost under the very shadow of which we appear to have pitched our camp. In the afternoon photographic development occupied us but we were very unsatisfied with the results. Later in the day we made arrangements for a supply of permament coolies to accompany us to the Pamirs. Of the Baltis we selected about 30 and the remainder will be Hunza men.

After completing a few minor details of work this morning, we started off at about 4p.m.to pay a return visit to the Mir, the king of the country. He sent three polo ponies to take us to his fort, strong and hardy animals and a most agreeable change from the poor starved beasts which up till now had been supplied to us.

The road to the fort, though very indifferent, lay through a lovely shady country, gay with fruit trees and green cultivated fields and surrounded on all sides by enormous snow clad mountains. At the summit of a rounded hill was situated the"palace", a large and prominent building high above the mudden houses which on all sides surrounded it like bees around a royal cell. After winding our way amongst the maze of tiny dwellings along the rough and broken roadway we reached the entrance to the Mir's palace. He met us at the summit of the rickety stairway up which we had to climb in order to reach his private appartments. His rooms were gay with brilliant carpets and curtains and the walls were decorated with a strange assortment of skins, photographs, portraits, antique china, cuttings from illustrated papers and advertisements of melling food. Three clocks occupied

prominent positions but all of them were stopped. The Mir and his two sons entertained us to tea but unfortunately none of the ginger wine which was given him as a present appeared at the function. Oh the whole he appeared a kindly old man and his nice manners and knowledge of English customs and little forms of politeness were surprising in one who lived almost his whole life amongst the primitive and semi-civilised people which occupy his country. After finding sufficient conversation to chat to him for a few hours, we left and returned on our good little ponies. The Mir seems to be continually surrounded by a band of ruffianly looking blackguards. They followed us into his private rooms, glared in at us through the open door while having tea and followed us in a long line when leaving the palace. We were not sufficiently fortunate to see them in the maroon uniform in which, on State occasions, the Mir dresses them. They looked evil enough when unwashed and in their own filthy clothes and any attempt at decorating them would probably make them look even greater criminals.

May 23rd. Atabad.

While travelling through Hunza territory today we had an opportunity of studying the inhabitants. They appeared a polite and friendly people and crowded out of their little villages to greet us as we passed. The careful cultivation of the crops, the ingenious methods in which the water supply is directed by channels to the fields, the excellent arrangement of superimposing the areas under cultivation in tiers one above the other until in some cases they reach high up the steep mountain side all point to the thrift and indhstry of this interesting people. They appear even a purer type of Aryan extraction than the Kashmiri. Some of the children were almost as fair and of the same cast of countenance as any European. All were well but simply clothed and cleanly in their appearance. They are a fine type of manhood, strong and healthy, but as submissive as children to the authority of their Mir whom they implicitly obey. Today civilization in its simplest form has been left behind. No telephone poles stand along the hilly pathway dignified by the name of road. No rest houses await us at the end of the day's march. Our letters are recieved by relays of mail runners but the arrangement is our own. We are away in the

deep gorges of the Hindu-Kush, "far from the madding crowd". Today's march continued along the right bank of the deep Hunza gorge. Along the ~~deep~~ steep cliffs of schist and limestone hung the narrow pathway which, in numerous places, was lost to view in the flow of debris which is continually pouring down upon it. At one part of the road it was necessary to make an individual rush in order to escape the stones which at any moment might have made an unpleasant acquaintance with us. The Hunza gorge is here deep and wide but owing to the river being broken up into numerous smaller streams we had but little difficulty in fording it. The polished limestone cliffs, striated rocks and old moraines interested me as evidence of the lower descent of a glacier which once filled the valley but has now retreated many miles. In some places piles of debris with smooth and streaked boulders lay superimposed on the polished limestone. These were presumably the lateral moraines deposited by the glacier at the time of its retreat. The schist of which the mountains are chiefly composed contains much mica and is studded with garnets. During its degradation by rain the lighter mica, instead of sinking to the bottom of the streams with the heavier constituents, remains in

a state of fine suspension. This gives all the water supply in the district a glistening and metallic lustre and the particles of mica seem to roll in layers one upon the other like shining flocculi. The Europeans living at Gilgit consider the water harmful owing to the mechanical irritation of the mica crystals. The natives, whom I questioned on the subject, have, however, a directly opposite opinion and I am inclined to think that they are probably correct. Microbes and not mica should be their danger signal.

May 24th. Gulmit.

The Hunza gorge, through which our route today lay, is stupendous. The gorges of the other rivers, along which we marched, bear no comparison to it in depth and magnitude. As usual we started at about 6.30a.m.and followed the little narrow track -it can hardly be called a road- throughout its various windings. In places it lay along the sandy or gravelly bed of the river and, in other parts, it rose hundreds of feet high up on the sheer rocky cliffs. The construction of this track did not seem to require much actual hewing of the rock as advantage was taken of every natural ledge which presented itself and the intervals be-

tween these ledges were bridged over by beams of wood supported by stout pegs and on the surface of which were placed smaller transverse branches and large flat stones. It was on the whole a primitive structure and was usually lost when followed down into the sand of the river bed while frequently it was completely broken by minor branches of the Hunza river which, on such occasions, had to be forded. From the highly polished and streaked appearance of the granite walls of this enormous gorge, it was evident that glacial action must in ancient times have played an important part in its formation.

Gulmit was reached at about 3p.m.and our baggage followed a few hours later. Gulmit is a pretty little village on the right bank of the river. The inhabitants live a simple and apparently happy life. They have no bazar, no shops and no buying or selling exists amongst them. They simply till their little fields, tend their goats and sheep, live on the products of their simple cultivation and spin the wool of their animals into the rough but warm garments in which they are clothed. The Mir has a summer residence at Gulmit; an unattractive mudden building, part of which, at the time of our visit, formed a store for grain which he had accumu-

lated from the taxation of his subjects.

May 25th. Pasu.

Today's journey was a short one of only eight miles and continued as before through the Hunza gorge. The scenery was more magnificent than ever. The mind is baffled at the contemplation of the enormous numbers of years which must have elapsed since the Hunza river first commenced to cut its way down into its deep valley; yet, so vast is that period as to surpass the powers of human comprehension, it is but one moment in the whole aeons of geological time.

Shortly after leaving Gulmit we forded a small tributary of the Hunza river and almost immediately reached the snout of the Susaini glacier. A large moraine -or rather a series of moraines- deposited by the glacier in ages past lay along the route. The surmounting of the debris and rugged boulders, though incurring no difficulty, was not the most pleasant means of progression. After crossing the moraine the path continued amongst the mountains some little distance from the gorge and again, after a few miles, returned to the right bank of the river from which point a splen-

did view of the gorge was obtained. To the north stood a range of lofty mountains of which every peak was subdivided into a multitude of sharp tiny pinacles projecting upwards like needles in the clouds. The Pasu glacier descends close to the little village of the same name at which we camped. Its appearance satisfied ones conceptions of a glacier much more fully than those we had previously seen. Its structure, though dark with mountain dust, in places revealed its icy structure. No great mass of debris lay upon it nor did any recent moraine exist in front of its snout. On the southern side a considerable interval lay between the margin of the glacier and the ravine. Nevertheless the enormous moraines indicated that at one period the glacier must have completely filled the valley. This moraine displayed a number of alternating ridges and troughs, all parallel to the glacier, the troughs, where less deposit occurred, presumably represent periods when the narrowing of the glacier was more rapid and the elevated ridges more stationary intervals in its shrinkage.

At dusk we were spectators at a native dance in which our Hunza coolies took part. All collected together so as to form

a large semi-circle and one of their number advanced into the open and danced while the audience with song and clapping of hands gave the time. Now the time was low and the dancer remained almost motionless and gently beat his foot upon the ground, then suddenly the rythm changed and he sprang wildly into the air amidst the shouts and applause of all the spectators.

May 26th. Khaibar.

Our march was continued this morning at about 7.30a.m. After travelling a few miles we reached the Batura glacier. We had but little difficulty in surmounting its lateral moraine and on arriving at its summit we saw the whole width of the huge glacier spread out like a barrier before us. Here our troubles commenced; we stumbled over the loose moraine debris which lay upon its broken surface; we climbed over huge boulders, descended into deep crevasses, fell on the slippery ice but ultimately reached in safety the other side of the ravine. The glacier seemed like some great monster creeping down the valley and crushing all before it with its irresistible force. Its very surface appeared alive.

Ever and anon stony debris or large boulders slid from it and splashed in the pools of icy water or rumbled in the crevasses far beneath. It was a rough and rugged sight. One felt as though one stood in an ocean of ice, the crevasses were like the troughs of mighty waves and the crests between them like breakers in a stormy sea.

After crossing the glacier we again met the narrow path which led us over the opposite moraine and through great piles of slatey debris, the products of the denudation of the mountains which towered above us. The alternations of temperature, both diurnal and seasonal, must be most ~~un~~ important factors in the geological degradation of this rainless district. The camp at Khaibar was reached at about 3p.m. We are continually ascending and each day seems a little cooler than the previous one, by no means an unpleasant change.

May 27th. Gircha.

This has been an easy day. We left camp at 7a.m.and reached Gircha not long after noon. The track lay along the bed of the river and consequently there were no hills to be

climbed or fords to cross.

On arriving at Gircha I collected a number of shells of the "Natica" group which were found embedded in a recent deposit.

May 28th. Misgah. Alt. 10150.

Today we continued our tramp through the sand and water-worn pebble of the Hunza gorge. The river had to be forded several times, and as the water reached almost as high as the coolies' waists and rushed along with almost torrential force, each crossing caused us considerable amusement accompanied with the fear that some of our retinue or belongings might at any moment be carried away in the fierce current and recieve rough treatment in the rapids below. Two of the khalassies recieved a substantial ducking. It was interesting to watch the manner in which the coolies stemmed the strong current. They entered the water in batches of three and four and, having joined hands, they advanced in a line parallel to the direction of the stream. The uppermost cooly, by dragging on the one next below, prevented him from being washed down while the lowermost, by pushing up-

wards, produced the same effect. By the combined efforts of all in the batch each rendered the other a mutual support. On arriving at Misgah, I was told of some caves which existed in the conglomerate cliff above the village and which had been used by the inhabitants in days gone by as a protection from their enemies. I had hopes that they might contain stone implements or other relics of the past. In order to reach the entrance I had to be hauled up by a rope and found myself in a spacious cavern, capable of containing some one hundred people and divided by a large horozontal ledge into an upper and lower compartment. The door and windows in the face of the cliff were used by those inside for the purpose of hurling down stones on their attackers. A careful search, which included a digging up of a large portion of the floor of the cave, revealed nothing of interest. The caves, being of artificial construction and probably of fairly modern date, would not be likely to contain any relics belonging to an age so far distant as the neolithic period. After returning from my interesting but unsuccessful exploration of the caves, I was about to commence a haematological examination when, without warning and with extraordinary suddeness, a fierce dust storm raged

down the valley. It whistled about our tents, blew one completely down, damaged several and hurled all loose articles and cooking utensils in all directions. We required all our strength and that of our servants, when clinging to the poles of our large tent, to prevent it from being carried away. The dust storm lasted but some 15 minutes and was followed by a gentbe rainfall.

CHAPTER 7.

May 29th.---- Misgah to Merkushi.

May 30th.---- Merkushi.

May 31st.---- Boihill

June 1st.---- Boihill.

June 2nd. Boihill to Gul Kwaga

June 3rd Gul Kwaga to Mintaga Agzi (The Pamirs)

June 4th. to July 30th.---- The Taghdumbash Pamir.

May 29th. Merkushi. Alt. 11960 feet.

The Hunza river is becoming narrow as we proceed north and leave the tributaries behind us and its fords cause us but little difficulty. This is, in truth, a waste and barren country destitute of all but the very hardiest forms of organic life. The rugged mountains support no verdure and the valleys are endless deserts of stones, huge boulders and great piles of shaley debris, the result of centuries of degradation. Scarce any rain falls in this inhospitable district and its scanty inhabitants have formed tiny comm-

unities about the mountain streams which descend from the melting snow, and on their banks have cultivated narrow strips of the soil from which they eke out a contented but miserable existence. In days gone by their struggle for life was increased by continued feuds and raids with their neighbours over the Chinese frontier. The strong positions which their little villages occupy, the primitive forts from which they rolled down great stones on their enemies, the ruined watch towers and the caves into which, in time of stress, they retreated bear evidence of the harder part they had once to play in the battle of life.

Throughout the morning a strong and biting wind blew against us, an unpleasant foretaste of what we may anticipate on "The Roof of the World". We are gradually ascending and have now reached 12000 feet. The change is notiçeable by the same slight headache, increased depth of respiration and occasional tendency to faintness from which I suffered on the Tragbul Pass.

In the midst of today's wilderness I obtained a specimen of The Turtle Dove. It seemed an annomalous home for so gentle a creature. After arriving at Merkushi, Mason shot some Thibetan Hares; an agreeable addition to our pot.

May 30th. Merkushi. Alt.11960.

Owing to the supply of yaks not having arrived from the Pamirs we were compelled to halt for the day at Merkushi. The time was however not wasted. All the morning was occupied in paying off the crowd of coolies which will now be mostly replaced by yaks. Some 70 permament coolies will be retained. In the afternoon Mason busied himself over his complicated accounts and succeeded in balancing everything to his satisfaction. Blood examination, photography, doctoring and writing all my notes up to date occupied my time. Merkushi differs from the other halt stations along the route in that its barreness is relieved by a sparse jungle and a scanty supply of coarse grass. It is the last place at which we shall obtain wood for many days to come.

May 31 st. Boihill. Alt. 12600.

The yaks have not yet arrived. However we were able to proceed about five miles by sending off the coolies early with some of the kit and making them return later for the remainder. It is possible that our yaks may arrive to-morrow. Even if they do not, we intend to cross the Mintaka pass with

~~mat~~ whatever loads the coolies can carry and leave the remainder to be brought over later. The altitude is now 12500 feet and the barometric pressure 19.5. At nights the temperature falls well below freezing point; our minimum thermometer at Merkushi registered 28 F.

Our first acquaintance with the Sarikolis took place today. Four of them, with a few yaks, were coming from the Pamirs to Merkushi. They were very polite and greeted us with many "salaams". The excellent way in which they were wrapped up in their close warm garments interested me.

The Yak appears a splendid beast, with short legs, low quarters, head hanging close to the ground, warmly clad in thick long hair and with a great bushy tail. His colour, as far as I have seen, is either black, white or a combination of the two, and there seems to be the same tendency to the white coloration of the face so common in other domesticated bovine species.

Two khalassies are ill today with severe mountain sickness. Little can be done for them. Nature, in Her wonderful way, will stimulate their blood-forming mechanism and compel their bodies to accomodate themselves to the new conditions of life.

June 1st. Bothill. Alt. 12500.

We are still held up owing to the absence of yaks. We intended to cross the Mintaka pass today, but, owing to the long time taken by our permament coolies to go to Merkushi and bring the remainder of our kit here, we decided to postpone the crossing till to-morrow. All day long the mountains above us have been pouring down small avalanches of stones and debris. There is no rain to wear away the rock or help in its disintegration. All seems to be the effect of the enormous variations of temperature between the day and night. In the afternoon we all went shooting. Mason enjoyed himself after Ibex but, as the animals he saw were all small, he did not shoot any. Blandy wounded a Himalayan Snowcock, but failed to find it . I was quite unsuccessful.

June 2nd. Gul Kwaga. Alt. 13500.

A number of yaks, 25 in all, arrived early this morning with their Sarikoli owners. They had travelled over the Pass during the night and were rather tired when they reached us. We struck camp and loaded the yaks and permament coolies with as much baggage as they could carry and pushed on. One rid-

ing yak was supplied us. It progressed in a slow and lumbering manner but allowed no obstacle to overcome it. Give the beast time and, in spite of its apparent clumsiness, it will travel in safety mountain paths, pick its way in a wonderful manner from stone to stone, shuffle down the rocky slope and ford the most rapid of streams.

The route was a gradual incline, the ascent of which, at an altitude of 13000 feet, gave most in the camp a severe headache. Numerous Ibex-skulls were passed in the bed of the valley, some of which would have been considered as passable trophies by sportsmen. They reminded me vividly of the numbers of these animals which inhabit the surrounding mountains and the great devastation which occurs amongst them.

Having reached the snout of the Mintaka Glacier, the Sarikolis came to us with the information that some of their party were ill and that the yaks were too tired, after the night's journey, to proceed any further. As their complaint appeared reasonable we decided to halt and leave the crossing of the Pass till to-morrow.

Our camp was pitched amongst the huge boulders in front of the snout of the glacier and the tents were studded at intervals amongst the rocks wherever a suitable place could

be found. In the afternoon news arrived that a herd of Ibex were seen on a neighbouring hill-side. Mason and I went after them but, as the heads were all small, Mason did not care to stalk them. He fired at them from a distance of some three or four hundred yards and they made off along the steep slope at an enormous speed. Four more shots followed them at a long range but only served to accelerate their pace.

June 3rd. Mintaka Agzi. Alt. 13300.

At last we are on the Pamirs, the "Roof of the World". After breakfast at 6a.m. we started from our camp at the snout of the Mintaka Glacier and followed the narrow path for about a mile along the lateral moraine. In places progress was a little difficult and, on one occasion, the axe was required to cut steps in the solid ice. After leaving the moraine, we toiled up the mountain side and, after much puffing and blowing and painful heart-throbbings from the high altitude, we reached the summit of the Pass. It was covered with a layer of thick snow but, as the latter was frozen hard, there was no difficulty in marching over it. On the ascent of the Pass we met the remainder of our yaks

coming to meet us accompanied by Mahomed, the British Representative on The Pamirs. As soon as we had crossed the Mintaka, the Taghdumbash Pamir lay spread out before us. The undulating country, with its rounded hills and grass-covered valleys, was a refreshing sight after the rugged barreness through which we had just passed. The sky was cloudless, the day beautifully warm and the fertile valleys, studded here and there with white patches of still unmelted snow, afforded a lovely view. After taking a few photographs with the Survey camera, we had breakfast and then commenced the descent of the Pass. It was indeed a pleasant change to walk over the soft grass which was just springing up afresh after the melting of its covering of winter snow. Numbers of heads of Ibex and Ovis poli were passed on the descent to Mintaka Agzi. Many of these were large specimens and well fitted to deck a sportsman's gallery. Erratic granite boulders were common on both banks of the Mintaka river and rested on the shaley debris which had fallen, in enormous quantities from the surrounding hills. On arriving at Mintaka Agzi, a "Khurga" was placed at our disposal by the hospitable Sarikoli nomads who also supplied us with refreshment including a sheep and a substantial supply of delicious cream.

June 4th. Mintaka Agzi. (Base Camp). Alt. 13800.

After a most comfortable night in the cosy khurga, we started off at about 9a.m.for the survey hill station at Mintaka Agzi which had been made there during the previous year by Lieut.Bell. Blandy did not accompany us as he left after breakfast for the Beyik Nullah where he intends to commence his shoot. For the first half of the ascent we rode yaks but then had to take to our legs and tramp up the loose shale, halting at numerous intervals to take our breath which was necessarily somewhat short in these high altitudes. By 2p.m.we reached the summit which, by my anaeroid, was 17000 feet high. The survey tent of last year was found fairly intact. It is a marvel how it braved the fierce winter weather of the Pamirs. The view from the summit was magnificent; on all sides, as far as the eye could reach, snowy peaks and jagged ridges lay spread out before us in what appeared an interminable confusion. After the signallers were shown their station we commenced the descent. This was simple and we rapidly shuffled down the loose shale and reached our camp well before sunset. This was my highest altitude and I may perhaps be excused for complaining of an unpleasant throbbing headache, the first symptom of

mountain-sickness. After returning to camp I doctored a few sick Sarikolis who seemed grateful for anything I could do for them.

June 5th. Foot of Takhtakhun. Alt. 13100.

The Nomads seem to have considerable faith in Western medicine. This morning a number of both sexes claimed my services, many of whom came from some little distance. One old woman was greatly surprised and the onlookers equally amused when I broke, with a blow of my hand, a large ganglion on the back of her wrist. We started from camp at about 1p.m. after Mason had completed his arrangements as to the signallers which should occupy the various hills. Mintaka Agzi is to be our base while on the Pamirs and consequently only a light camp accompanied us. Our route lay along the right bank of the Mintaka river for the first three quarters of the march and over the grassy valley which was just becoming green after losing its covering of winter snow. We rode on yaks for the most part of the journey and at intervals I dismounted to collect insects and bird specimens or to try my skill in shooting the Golden Marmots which were very numerous along the banks of the river.

June 6th. Camp on Takhtakhun. Alt. 16350.

We were early astir this morning and started off in good time on the ascent of Takhtakhun. The first 1000 feet was not very steep as we worked slowly up a narrow ravine. Here our one yak was able to travel and gave us alternately a comfortable ride. After about the first thousand feet, we had to trust to our legs and slowly, with much panting and many halts, reached an altitude of 16350 feet. We now found that the snow was too soft to permit us to advance further and consequently we decided to remain on the mountain side for the night and continue the ascent in the early morning when the snow would be frozen hard. As we had anticipated such a difficulty we arranged, before starting, for a light camp to follow us up the mountain. After having taken some survey photographs the camp arrived and we turned in early to bed. This was the highest altitude at which I had ever camped and, though covered up with blankets and poshteen and snug in the inside of a sleeping bag, I found the night uncomfortably cold.

June 7th. Foot of Takhtakhun. Alt. 13100.

The ascent of the mountain was continued early this morning The snow was hard and firm but the climb was steep and, owing to the rarefaction of the atmosphere, we sufferred much from difficulty in breathing and had to halt numerous times. On reaching the summit we found the survey tent of last year still in position but much battered and torn. My anaeroid registered 18000 feet but as Masons indicated 300 feet lower we took the mean and considered the height about 17850 feet. Almost the whole day was spent on the summit. Mason took observations in all directions and I took two photographs with the survey camera.

Late in the afternoon we descended Takhtakhun on the opposite side to that up which we had climbed. By so doing we were able to travel quickly and pick up our camp which had moved on during the day. Although the snow was soft, to such an extent that we often sunk into it well above our knees, yet the descent was fairly gradual and in no way difficult. Camp was reached at about 6.30p.m. and photographic development occupied most of our time till dinner.

June 8th. Foot of Sarblock. Alt. 13850.

While at breakfast this morning one of our servants brought the extraordinary news that two Englishmen were outside the tent. On going out we found two Russian cossacks who had been wandering over the Pamirs searching for and collecting yaks. We tried them in French and Broken German but failed to make ourselves understood. They however knew a little Eastern Turki which, by the aid of an interpreter, was translated to us. We gave them some tobacco and a bottle of brandy, the latter of which pleased them greatly and was quickly emptied.

We had an easy march to the foot of Sarblock which, on two occasions, was interrupted by halts for the purpose of taking Survey photographs. The Russian friends still accompany us; they seem to consider themselves quite an important part of our miscellaneous retinue. I expect it is the hope of more brandy attracts them. One of our yaks was very stubborn and threw both the Cossack and myself on different occasions. Nevertheless we forced him to carry both of us at the same time across the Beyik river, a feat which he violently resisted.

June 9th. Foot of Sarblock. Alt. 18850.

Last night our camp contained a motley crowd. It included Englishmen, Russian Cossacks, Men of Hunza, Baltis, Kashmiri Mussalmans, Kashmiri Hindus, Hindustani Mohamedans, Gurkhas, Sarikolis, Kirghiz and Chinamen. Numerous languages and religions were represented but, in spite of all the difference of opinion, never was a camp more happy and more harmonious. A strange mixture of peoples takes place at the boundary line between great empires and East and West seem to meet on the Pamirs as surely as they do at Suez. Mason left at dawn this morning after a large herd of Ibex which we saw the evening before on the neighbouring hillside. He shot one and wounded two others. Unfortunately the animal was left in the nullah till evening without any special charge and, on returning from work, it was found completely eaten by vultures. The Gurkhas were dissapointed as they enjoy a meal of Ibex flesh in spite of its strong flavour.

We ascended Sarblock today. The ascent, which can scarcely be called a climb, was very easy. It was bitterly cold on the summit, an altitude of 17850 feet, and a strong

wind seems to penetrate everything. We lunched on the top- in Russian Territory- close to the large wooden framework surmounted by a dilapidated flag with which the Russians mark their Survey stations. The descent in the evening was easy. Our Cossacks had left during the day and their Chinese servants with them.

June 10th. Foot of Sarblock. Alt. 13850.
It snowed all day and we were weather-bound in our tents. The most of the time was occupied in writing letters, cleaning photographs and getting affairs up to date. Blandy and Mason are quarrelling with each other and coolies are dashing backwards and forwards carrying letters to and from them. Surely there can be no great difficulty in a small band of Englishmen working smoothly and harmoniously in a drear and distant country. And in this case both seem to be at fault

June 11th. Foot of Sarblock. Alt. 13850.
All day long the snow is pouring down and the wild country, bleak at all times, looks indeed drear and dismal in the white mantle which covers it. We are weather-bound; no work, no progress, nothing to do but wait until the snow ceases

and the clouds dissipate. The inhabitants of the Taghdumbash Pamir are an interesting people, strong and sturdy, generous and hospitable, happy and contented. They appear to be divided into two groups; the one most numerous are the Sarikolis, tall of stature, fair of face and undoubtedly of Aryan extraction. The other , the Kirghiz which have almost all crossed over to the Russian Pamirs, is a very much smaller section, of short stature, yellow complexion, oblique eyes, scanty beard and bearing every evidence of Mongolian origin. The two types are very distinct and marraige between them is very rare. There is no cultivation on the Pamirs. Even the Arctic willow does not grow here. No tree, no shrub, only the rankest of mountain grasses can exist in these cold altitudes. The sole work of the people is grazing their yaks, sheep and ponies and driving them from place to place in order to find the most fertile pasture lands. It is extraordinary that the Camel, which we associate with the tropical deserts, finds a livelihood on the Pamirs. The Nomads scarcely know the meaning of money or the value of it. All their purchases are done in"kind", yet they are well clothed, well fed, warm and snug in their

cosy khurgas and, though a ~~cosy khurg~~ nomadic people, they occupy a far more comfortable and happier station in life than the miserable inhabitants of that mountain desert on the other side of the Mintaka.

Mason has been shooting all day; he stalked a number of poli many miles, almost into Russian Territory, but unfortunately was not successful. He had a hard day in a continuous snowstorm and did not get back to camp till nearly midnight.

June 12th. Foot of Sarblock. 13850.

We are still weather-bound. Occasionally the almost continual ~~down~~fall of snow grows lighter and sometimes a faint gleam of sunshine raises in us the false hopes of a brighter morrow. Last night was very cold. The minimum thermometer registered 14 degrees below freezing point. Even at midday yesterday, when developing photographs in the tent, I had to break the ice in the bucket of water in order to put the photos in and break it again when taking them out a few minutes later. Every fresh change of water required the same treatment.

This has been a day of idleness. Photography and literature

were our recreations and our hopes were for a sunny and cloudless morrow. The orderlies today shot two magnificent Himalayan Snowcock,(Tetraogallus himalayensis). They are as large as turkeys. We gave them one and the other will be a pleasant change from our eternal mutton.

June 13th. Foot of Tongder. Alt. 14500.

Today's sky beamed clearer and brighter than we had seen it for many days. We anticipated a fine morning and started off from our camp in order to commence the ascent of Tonger. However, as soon as we had reached the foot of the mountain, the clouds, which had been threatening in the distance, rolled nearer and soon broke into a snowstorm. The ascent had to be abandoned and we pitched camp at the foot of the mountain and hoped to be able to reach the summit on the morrow. I spent the afternoon searching for insects in the neighbourhood of the camp. Animal life is indeed scanty in these high and dreary altitudes. A few fish occupy the river, a very few insects live on the land and these, with a scanty number of hardy birds and mammals, seem to form the whole Fauna of the country. No trees grow on the Pamirs; our fuel consists of yak-dung which, in the

wet weather we are now experiencing, gives off dense clouds of evil-smelling smoke which penetrates all our food and gives it no pleasant flavour. The Himalayan Snowcock was a delightful morsel at this evening's dinner.

June 14th. Foot of Tonger. Alt. 14600.
The morning was bright, but dark and threatening clouds loomed in the far distance. We were up at 4.30a.m. and, an hour later, started the ascent of Tongder. Hour after hour we climbed slowly up the steep snowy slopes, halting after every twenty or thirty steps to gasp for breath. The snow, being so recent, had not consolidated into a firm mass and consequently we sunk rather deeply into it. The summit was reached before midday and as much work as could be accomplished in such cloudy weather was completed in about an hour. The summit was about 18000 feet. The descent down the steep slopes was very rapid as we were able to glissade over the soft snow. The mail arrived this afternoon in a snowstorm and the rest of the day well into the night was spent in reading and re-reading home letters and looking through the bundle of Pioneers and Illustrated papers. We have laid out a series of mail-runners between Hunza and the Pamirs and they are working well.

June 15th. Beyik Nullah. Alt. 13100.

Another snowy day, occasionally broken by lucid intervals during which the sun shone with his full strength. We struck camp at about 9am. and marched through snow, wind and bursts of sunshine towards the Beyik Nullah. On reaching our previous camp at the foot of Sarblock we met coolies with letters from Blandy. After an easy and uneventful march we came to the foot of Takhtakhun and encamped. The evening was occupied in correspondence.

June 16th. Takhtakhun. 15500.

Takhtakhun was ascended today as far as a point about half way up its slope. A light camp was sent forward in the morning and we remained at the foot till midday in order to complete our mail and see it start safely on its long journey. Then we gradually worked our way up the mountain side to an altitude of 15500 feet where we encamped.

We must start early tomorrow morning as the mountain above us is thickly covered in a mantle of recent snow.

June 17th. Takhtakhun. Alt. 17900 feet.

The summit of Takhtakhun was reached without difficulty after a long trudge through the heavy snow. The day was cloudy and but little work could be done. Orders were sent down for a very light camp to be brought to the summit and we encamped there for the night in the hope that the morning would be brighter and the work continued. A camp at 18000 feet was a novelty and I did not sleep well but this was possibly due to a slack afternoon than to the actual height. I was interested in listening to the marked Eupnea from which Mason sufferred during the night whenever I was conscious enough to notice it. I have never before heard of Eupnea occurring as a consequence of sleeping at high altitudes. Nevertheless in spite of the height, the cold and the falling snow we were fairly comfortable.

June 18th. Foot of Dastur. Alt. 14000.

The morning was cloudy and dismal and we woke to hear the snow beating against our snug little tent which, though a Whymper pattern of about 20 Lbs.weight, shelters both of us. No observations were possible on such a day and we

determined to leave the work on Takhtakhun till a later date. The coolies arrived up at about midday and immediately the descent was commenced. The foot of the mountain was soon reached as the steep slopes and soft snow made progress rapid. Here we were met by two venerable old Sarikolis who had brought us riding-yaks. These latter we mounted and continued our journey at a smart amble. It was refreshing to ride along the bank of the river over the soft green grass after the snow and desolation of Takhtakhun. We discussed the affairs of nations with our Sarikoli friends, for even they have their little politics, and they told us of their relations with England, Russia and China and the varying esteem in which they held the people of those countries. Camp was not reached until dusk and the march was much longer than we had expected. Shortly before actually arriving at the camp we crossed over a series of old moraines on the right bank of the river. Almost every valley displays evidence of old glacial action, but the huge lateral moraines hundreds of feet in height, and the enormous granite boulders over which we crossed today were powerful reminders of the great glaciers which in ages past must have flowed down ev-

ery valley and of which the stunted ice streams, now existing high up amongst the mountains, are the diminutive remnants.

June 19th. Foot of Dastur. Alt.14000.

Today Dastur was ascended but we were unable to start until rather late owing to the coolies being tired out after the long march of yesterday. The sky was clear; a pleasant change after the cloudy and snowy weather which we have lately experienced. About four hours trudge through the snow brought us to the summit and, after an hour had elapsed in calling up the signallers from the surrounding hill-stations, work was commenced and continued until dusk. I took a few Survey photographs. The descent was easy and a tramp down the mountain side brought us quickly to the bottom.

June 20th. Mintaka Agzi.(Base Camp). Alt.13000.

This has been the brightest and most promising day since we arrived on the Pamirs. Mason went to the summit of Dastur to continue his observations from that station and I spent the morning on a ridge of the same mountain with the Survey camera. Later in the day we descended and pushed on

to Mintaka Agzi, our base camp on the Pamirs. It was pleasant to get into a comfortable Khurga after being cramped up for weeks in our little tent. Letters arrived by coolies this evening and the rest of the day was occupied in correspondence. It was pleasant to have a good wash and change and not have to sleep in ones day-clothes.

June 21st. Mintaka Agzi Hill Station. Alt. 15100.
We ascended Mintaka Agzi today but as we were kept up till late on the previous evening completing all correspondence, we did not leave our camp until the sun had well risen and, consequently, were not able to complete work on the summit before dark. The climb was easy but fatiguing and seemed much longer than on the previous occasion. In the evening we came down the mountain from 16900 feet at the summit to our camp at 15100 feet which had been ordered up to meet us. The Sarikolis are becoming a nuisance; no sooner do we arrive in camp than they all crowd round and pester me for medicines.

June 22nd. Mintaka Agzi.(Base Camp).Alt. 13000
Mintaka Agzi was again climbed today. The weather was glor-

ious and no difficulties were experienced. Work was completed at the summit and we descended in the afternoon to our lonely khurga.

June 23rd. Camp on Tomtek. Alt. 15600.

Mintaka Agzi was left behind at about 11a.m.this morning and we started for Tomtek Hill-station. Some trouble was caused before leaving by the owner of our yaks presenting us with an absurd bill in which the number of animals far exceeded those we had actually used. One would have expected more honourable dealings from a people as kind and hospitable as these and who are so ignorant of all the frauds connected with monetary transactions. The journey to Tomtek was a pleasant yak-ride. For the first six or eight miles the animals went well but, on ascending the mountain side, they displayed all the obstinacy and stubborness which only a yak can possess. My beast and myself were finally parted as a result of all the saddlery, with myself on the top, slipping down over the animals hind quarters as he was climbing up a steep incline. I tied his nose rope to a stone, left the saddlery on the ground and proceeded on foot. Camp was

pitched at about 7p.m.on Tomtek just below the snow level. We hope to reach the summit tomorrow.

June 24th. Camp on Tomtek.Alt. 16600.

We were early astir this morning and continued the ascent of Tomtek at 5.30a.m. Yaks took us for a short distance up the enormous moraine which flanks the nullah. Soon, however, the ascent became too steep for them and mine, with characteristic yak-like stubborness, faced round, rushed down the mountain side and no human power could make him climb up again. We took to our feet and plodded upwards slowly and breathlessly over the jagged granite rocks and hard frozen snow. The summit was reached at about 10a.m. Mason had a long day over the theodolite and I took a few Survey photographs. The altitude, by my anaeroid, registered 18800 and Mason's showed a little over 19000 feet. This was the highest altitude I had yet experienced but, having by now a little experience of heights, I suffered no incovenience from "mountain sickness".

The World of mountains looked vast indeed from such a standpoint. Those peaks of 16000 and 17000, which we had recently climbed, lay spread out like diminutive hills beneath us,

while range after range of what seemed an interminable sea of mountains, clothed in eternal snow, extended in every direction as far as the eye could reach. The human gaze is stupefied at such a view. Ridge upon ridge, peak upon peak, crest upon crest, they seemed to reach unto infinity. The heart of no mountaineer is thrilled at the sight of them, the very nomads beneath their shadow have scarcely seen them; unknown, unnamed, unnumbered, they fulfil their silent function in the balance of the world; into three Empires extend their mighty crags and buttresses, inaccessible and unexplored. It was a picture of grandeur and of desolation. Russia, India and China lay exposed before us in all their rugged beauty. Where Empires meet one expects trade, commerce and civilisation at their highest and at their best yet here, at the frontiers between three of the greatest nations of the world, nothing is found but mountain desolation and nomadic life.

The descent of Tomtek in the afternoon was easy and we reached our 15600 foot camp by nightfall.

June 25th. Mintaka Agzi.(Base Camp). Alt.13800.

Mason and I separated this morning. He went towards Takhtakhun and I towards Mintaka Hill Station as I intend to climb the Station tomorrow in order to retake some Survey photographs which did not before turn out satisfactory. The march was easy and pleasant. I collected a number of rock and botanical specimens and arrived at Mintaka by evening and lodged myself in a comfortable khurga. The fat-tailed sheep which the nomads tend are interesting creatures. In the winter, when food is scarce, the fat in the tail disappears and in the summer it accumulates to such an extent as to form a large rounded mass projecting from the hinder extremity of the animal. Thus does Nature convert that mysterious animal appendage, the tail, into a storehouse for food which, in time of need, the creature can burn up and use as fuel in its economy. The shearing season has just passed and most of the sheep are bare of their wool with the exception, in many cases, of a large area over the buttocks which has not been deprived of its natural covering. I was unable to understand clearly why that part of the animal

had not been shorn. The sheep's great enemy is an animal called by the nomads"The Wild Dog"; but ,in all probability, they refer to the Common Wolf(Canis lupus), which also is said to cause much destruction amongst the Ovis poli. The Sarikolis use the domesticated dog for protecting their flocks against its wild congener.

June 26th. Mintaka Agzi. (Base Lamp). Alt.13800.
The Hill Station of Mintaka Agzi was climbed today for the third, and most probably, the last time. I took some photographs and made an haematological examination at the summit. My blood corpuscles registered 7640000 per cubic millimetre at the top of Mintaka, that is half again as much as the normal at sea level. I find that Nature accomodates the animal body to an atmosphere deficient in oxygen not by increasing the respiratory frequency so as to produce a greater intake of the rarefied air, except under conditions of strenuous exertion, nor by an increase in the cardiac rhythm, but soley by a stimulation of the blood-forming mechanism to a greater energy and activity. Camp was reached this afternoon at about 4p.m.and photographic development occupied the remainder of the evening.

June 27th. Mintaka Agzi. (Base Camp). Alt. 13300.

This has been an easy day owing to the absence of any mountain climbing. All the morning and most of the afternoon was spent in taking Survey photographs. On my return to camp I found that Mason had arrived before me from Takhtakhun and was engrossed in his mail which had come some little time before.

An attempt was made to pay the Sarikolis for their yaks but, owing to their dissatisfaction and improper accounts, the payment had to be postboned. It was amusing to note the manner in whilh they endeavoured, with the help of strings of beads, to count and calculate.

June 28th. Mintaka Agzi. (Base Camp). Alt. 13300.

A day of rest at Mintaka during which letters were written, accounts brought up to date and all arrears satisfactorily settled before the continuation of the work tomorrow.

In the afternoon a number of our gurkhas and khalassies appeared arrayed in Sarikoli costume and requested that their photographs might be taken. It was amusing to see them in these brilliant garments, many of which were of the womens'

best. All seemed happy and enjoyed the day of well-earned recreation. The slopes in the neighbourhood of Mintaka teem with Ibex. Almost every day heads are seen and our gurkhas have shot a number for food.

June 29th. Mintaka Agzi.(Base Camp). Alt. 13300.

This morning we were awakened with the news that a Chinese Officer was in our camp and wished to see us. We dressed in rather cleaner clothes than usual, had our khurga made neat and tidy and had a large tent erected close by. He then appeared and greeted with many bows and handshakes our foreign visitor. He sat down to breakfast with us and, through the intermediation of three interpreters, we carried on a conversation with him. The Chinese orderly, who accompanied him, converted his language into Turki and one of our Sarikolis, Arzu, translated the latter into broken Urdu which Abdulla, with I think many additions and alterations, made intelligible to us. However we managed to converse fairly freely without any serious mutilation of meaning during the process of interpretation. He appeared to be quite lost when confronted with an English meal and was astonished at the

number of our meals and the amount we ate. Our cigarettes seemed to be more pleasing to him than our food and he swallowed the nips of brandy with relish while we clicked glasses in Russian manner and wished each other good health, or as he expressed it "askole". The Chinese orderly was a splendid interpreter and with stolid, expressionless face translated freely from Chinese to Turki. We discussed such matters as the journey, the town of Tashkurghan from which he came, his regiment and his army but he appeared to display a complete ignorance of what we would consider to be uppermost in the mind of a Chinese officer, namely their recent expedition to Thibet. About 6p.m. he retired to his khurga as he considered that, as he had eaten so much, he could not attempt to dine with us. I think, on the whole, we gave him a good time and parted for the night excellent friends.

June 30th. Tagramansu. Alt. 13500.

Our Chinese friend accompanied us on the march today. We all rode ponies, a pleasant change from the lumbering yak. The journey was most pleasant and interesting and the green valley an acceptable change from the rugged mountain side.

On either side of the river and in places high up the mountains were alluvial deposits in the form of river terraces; evidence of the greater altitude at which the river once flowed before it had cut its way down into its present bed. The Chinese officer - whose name was Yun Chun Lun, and rank Colinshabé of the 500th. Regiment - rode on in front mounted on a disreputable white horse with his orderly, on a still more skinny animal, following close behind. It was not possible with three interpreters to carry on a conversation while on the march. Shortly before reaching camp we passed an old Kirghiz graveyard, the first we had seen in these parts and a relic of the ancient inhabitants which have now all crossed over into Russian territory. The Sarikolis send their dead to Tashkurghan and the Kirghiz bury theirs in graves on the Pamirs. On arrival at Tagramansu we were ushured into a kurgha by the hospitable Sarikolis. Tea, with delilious cream, was supplied us and an enormous wooden dish of thick buttermilk from which each in turn helped himself with a long wood spoon. We regaled the Chinese and Sarikolis with cigarettes and spent a pleasant few hours chatting and smoking before a blazing yak-dung fire. Yun Chun

Lun amused us by displaying his blunt and rusty sword with which He said he had slain six men and on it were still the stains of blood to which he proudly pointed. Our camp having arrived and tents being pitched, we ordered tea and our Chinese friend joined us. We gave him of our best and he seemed to enjoy what to him must have been a strange meal. He was profuse in his thanks for what we had done for him, referred again and again to the friendly relations between his country and ours, hoped to see us soon again at Tashkurghan, wished us the heartiest of "askoles" and with many salutes, handshakes and bows, which we equally returned, took his leave. Presumably he had been sent to discover who we were and what we were doing in Chinese territory. However we spent a happy few days together and parted the very best of friends.

July1st. Killik Pass. Alt. 15600.

Our letters were despatched about 9a.m. this morning after which we continued our journey. The march along the valley was most pleasant and in parts became quite exciting owing to our being accompanied by a large and swift Sarikol dog

which continually dashed off after marmots and imbued in us the spirit of the chase. Stealthily and silently he crept forward and, only if the Marmot appeared some distance from the mouth of the burrow, would the dog expend its energies in chasing it. One was captured and soon devoured.

We had lunch in a khurga about half way on the march. Here we again met Yun Chun Lun with whom we thought we had finally parted on the day before. The owners of the khurga supplied us with thick chappaties and delicious cream followed by mutton and rice. We made an excellent meal, thanked our hosts and continued our march up to the Killik Pass. After climbing up a series of enormous old moraines, we reached the Pass, 15800 feet high, and at this season partly under snow. Here we expected to meet Mc'innes, who had been carrying the triangulation system through Hunza in order to ultimately link on with us, but we did not find him. Our camp arrived about an hour later and was pitched almost exactly between the Killik East and Killik West survey stations near the summit of the Pass.

July 2nd. Killik Pass. Alt. 16600.

This morning early we met Mc'innes and the day was spent in discussing future plans and arrangements. It is very cold on this exposed Pass and a biting wind pierces one through and through. Our faces are continually raw; since arriving on the Pamirs I have not had a complete skin, and as fast as Nature endeavours to provide me with one, the fierce cutting wind peels it off again and leaves a bleeding and painful surface. The only place of real comfort is the inside of a sleeping bag. The happiest moment of the day is in the evening when we enter it and the gloomiest in the early morning when we come out of it.

July 3rd. Killik East Hill Station. Alt. 16600.

Camp was struck early and we commenced the ascent of Killik East. From the base everything appeared easy and we anticipated no difficulty in reaching the summit at an early hour. Our trouble, however, soon commenced, and whether due to the easy time we had experienced in the valleys for the past week or to some special characters associated with the mountain itself, every few paces found us panting and

gasping for breath which demanded short halts every few minutes. The sky was dark and threatening and it may be that the great excess of watery vapour in the atmosphere was the direct cause of our troubles. After a long and laborious climb we at length reached the summit, prepared the station for observation on the morrow and then descended to the light camp which had been sent half way up the mountain and pitched in a sheltered glen on the loose and slippery shale. The supply of "ata" for the expedition has not yet arrived owing to the Mir of Hunza not acting up to his promise and sending it on the day which was originally arranged.

July 4th. Camp on Killik East. Alt. 18500.
I woke this morning from my hard bed on the shale to hear the snow beating on the little Whymper tent which sheltered both of us. On peeping out, a drear and dismal sight confronted us. The whole country was covered in a thick mantle of snow which must have fallen almost continually during the night. Dark and heavy clouds rolled across the sky, through the thinner portions of which the sun occasionally cast a few feeble rays and imbued in us the false hopes of

brighter weather to come. It was very cold and we crept back into our sleeping bags and remained in them for the remainder of the day. A few books were fortunately with us and these we read until we were heartily sick of them. All day long the snow poured down and the outside world was cold and dismal. Every one has been put on half-rations today as only five days' supplies are left and the "ata" has not yet arrived.

July 5th. Summit of Killik East. Alt. 19000.
The world looked a little brighter this morning though much snow had fallen during the night and heavy clouds hung over the neighbouring mountains. We trudged laboriously through the fresh snow up to the summit of Killik East accompanied by our light camp and all the necessaries for making a prolonged stay should the weather not clear. After a very little work was completed the heavy clouds, which loomed all round, gradually closed in on us, enveloped the mountain, and breaking into showers of snow drove us rapidly to our little shelter. Here, in our sleeping bags, we listened to the driving snow beating against the tent. Everything was miserable. ~~XXXXXXXXX~~ Any food that could be cooked was eat-

urated with the fumes of the moist yak-dung which, to people at 19000 feet experiencing the pangs of mountain sickness, did not appear exceptionally palatable. The "ata" has arrived so that as far as food is conlerned the expedition is safe.

July 6th. Summit of Killik East. Alt. 19000.
A cold, dreary and miserable morning. The mountain is covered with feet of snow and the heavens are pouring down thickly on us. We must remain in our sleeping bags as it is far too cold to creep out of them and no work can be done in such weather. The mountains, the valleys, every corner of the earth,which can be seen from these high altitudes, is clothed in a white mantle and overhung with dense and treacherous clouds. The day crept along slowly and miserably but to our great joy it was brightened towards evening by the arrival of a bundle of letters which had been carried by a Hunza cooly up the mountain side on this awful day. This broke the monotony and the remainder of the day was spent in devouring our letters and the large bundle of newspapers which had so fortunately arrived.

July 7th. Killik. Alt. 16000.

This morning broke a little brighter but this was but a short lull in the cold and dreary weather. Very soon the snow poured down again as heavily as before. All our provisions were frozen, the cream, given us by the nomads, was solid and large flakes of ice were found even in the centre of our potatoes. We decided to quit. No work could be done in such weather and Mason determined to alter his plans. We both suffered from headache and sleeplessness which could but be expected at such an altitude and with a barometric pressure but half that at sea-level.

After descending about half way the snowstorm again broke on us and pierced us through. Dreary and inhospitable as the world appeared when we reached the Killik Pass, yet our main camp, though enveloped in snow, was like a Paradise after the lonely isolation of the mountain top. We did not remain at our camp but continued down the Killik Pass until we reached the Sarikoli encampment at Killik.

Everything seemed bright and cheerful again. We made ourselves snug in a khurga, ate delicious cream, changed our clothing, had a warm bath and, after writing our mail letters,

crept into our beds and slept like civilized beings and not in the clothes which for days past we had worn both night and day. And as in unison with our happiness the sun shone brightly, the clouds dissipated and the blue sky, which peeped through the roof of the khurga, betokened a more prosperous morrow.

July 8th. Foot of Jalam Jilga. Alt. 15800.

Refreshed after a deep sleep in the pleasant khurga, we continued our journey late in the morning. Along the valley we rode on yaks and reached the base of Jalum Jilga early in the afternoon. It was a glorious change from the snowy mountain summit. The Alpine flowers of Summer were commencing to bloom; purple primulas and golden buttercups sparkled in the green brass and the clear stream, shining beneath a cloudless sky, filled us with the happiness of Spring. How vastly different does a country appear when viewed from opposite standpoints. No picture could appear more dreary than the limitless ranges of mountains clothed in eternal snow beneath a canopy of dark and dismal clouds with the piercing wind shrieking round their summits; and none more

full of peace and loveliness than the cool and sheltered valleys beaming in the sunlight, with flocks and herds browzing on the hill-side, with the clear river rumbling over its rocky bed and all the living creatures filled with joy at the coming Spring.

July 9th. Foot of Jalum Jilga. Alt. 15500.
On rising this morning at dawn my stomach rebelled against its functions and became an expulsive rather than a digestive organ. Consequently I did not commence the ascent of Jalum Jilga until a few hours after the remainder had started. The day was beautifully fine, the climb easy and a considerable amount of work completed on the summit. The altitude was 18100 feet. Later in the afternoon we descended, had "chappaties", cream and tea in a khurga at the mouth of the little valley and, having crossed over a huge pile of old moraine debris, reached the foot of Karakokti before dusk.

July 10th. Foot of Karakokti. Alt. 15500.
No hill was more easily climbed by human beings than was

Karakoti by us today. After an early breakfast we mounted on yaks and remained on their backs until the summit was reached. By anaeroid the altitude was 18450 feet. Mason was able to do a good days work as all the signallers were at their posts on the surrounding hill-stations. I took a few survey photographs. The descent in the evening was easy and rapid. Four Thibetan Hares were brought to camp by the Sarikolis today. They will be an agreeable change from the everlasting mutton. The latter, however, was today replaced by yak which, though as tough as old boots, was welcomed as the first beef diet we had tasted since leaving the plains of India.

July 11th. Foot of Tomtek. Alt. 13500.

After breakfast, at about 9a.m., we started on an easy march to the foot of Tomtek. The ride on yaks along the bed of the fertile valley was delightful and most enjoyable after our previous day spent on the hill-top. At tiffin-time we arrived at the khurga of a Sarikoli named Duffedar who formed one of our retinue. They were apparently expecting us as we were immediately ushured into the khurga and pro-

vided with a delicious lunch of tea, "chappaties" and cream. During the meal our hosts brought forth their musical instruments, which consisted of a pair of banjoes made of wood, leather and ordinary linen string, and on these they played lively tunes while some of their number danced and sang. We lingered in the khurga for some hours enjoying the novel music and the primitive surroundings.

Shortly after leaving we met Blandy, who had now been absent from us for over a month. He was quite friendly in spite of the little quarrel which arose between him and Mason and, I think, enjoyed the pleasure of our society as much as we appreciated his. He has shot four Ovis poli, of which three are fine specimens.

July 12th. Foot of Tomtek. Alt. 13500.

Early this morning, at the first break of dawn, we were astir and commenced the ascent of Tomtek. Our yaks worked splendidly and carried us in quick time to about 15600 feet after which they could advance no further so we had to dismount and climb the remainder on foot. We seemed to be imbued with the spirit of the yaks for we made rapid progress

up the mountain side and reached the summit at, what we considered, to be about 10.30a.m. All the watches in the party have either stopped or become very irregular owing to the high altitude, so that our determination of the time has to be made chiefly by guess work.

The recorder, having yesterday fallen from a yak, was laid up with synovitis of the knee joint and could not ascend the hill. Consequently I acted as recorder and though the work was, as a result, somewhat prolonged, yet it was satisfactorily completed.

The descent in the evening was thrilling and exciting. We sat on our hind-quarters in the soft snow, stretched our legs well in front and raised our feet into the air. Gravity did the rest. Down the steep mountain side for thousands of feet we slid in a long line; ourselves, Gurkhas, Khalassies, coolies, all mingled together one behind the other, each making the slide more slippery for him who came after. Occasionally a great rock would project up through the snowy covering and a little care would then be required to steer clear of it successfully. That portion of my anatomy on which I rested was, unfortunately, not accustomed

to the cold of the snow or the friction of the slide and, as a consequence, it was not the most comfortable part of my body by the time we reached the bottom; and, after rising and wondering at the cause of the smiles and titters of those who stood behind me, I discovered that I no longer possessed a seat to my breeches. We reached camp at dark after a long but successful day.

July 13th. Lupgaz Valley. Alt. 15700.

Tomtek being finished, we marched to Lupgaz. The transport was despatched early and we went for a short distance up the Tomtek "nullah" to examine some nests of the Siberian Martin (Chelidon lagopus) which we had found the day before. It was impossible to reach them in spite of the fact that the mountain rope was pressed into the service.

The ride to Lupgaz was pleasant. We halted at Mintaka Agzi for lunch which was again supplied us by the Sarikolis. They are a most hospitable people and always give us the very best of their simple food. Camp was reached at about 6p.m.and was pitched in the place where Bell died last year. Blandy left us this morning in order to continue his shoot

but we expect to meet him again at Kukturuk in a few days. The little differences between him and Mason have all passed away.

July 14th. Lupgaz Valley. Alt. 16700.

Today Lupgaz was ascended and work completed on the summit. Like almost all the other stations the ascent was easy, the greater portion being performed on yaks. I acted as recorder. In the evening we descended after a long day and returned to camp. While we were absent from camp our men built a large cairn on a prominent mound in the valley on the front of which was inserted a large flat stone bearing an inscription to Bell's memory. The cairn is about 40 feet in circumference, strongly built and capable of resisting the weather for many centuries. Our Sarikoli interpreter, Arzu, who had been with Bell when he died, promised to keep it in good order.

July 15th. Mintaka Agzi. (Base Camp). Alt. 13300.

A quiet and easy march to Mintaka was very enjoyable today. My yak bolted and, consequently, I had to do the journey on

foot. Tonight we relish a general clean, a change of clothing and a comfortable sleep in a khurga.

July 16th. Foot of Jalam Jilga. Alt. 14200.

A gentle march today through the sheltered valleys to the foot of Jalam Jilga. These yaks are most obstinate and annoying beasts. Mine, on one occasion, considered that he had carried me far enough and determined to make himself scarce while I was pursueing some butterflies. At such times they always dash towards and succeed in crossing the nearest river and thus place an obstruction between their owners and themselves. They are but semi-domesticated, they find their food where and when they can; they are dependent not on the care and attention of their owners but on the abundance of food and the clemency of the season; they live in a continual struggle with the fiercest elements of Nature in the bitter cold of these silent altitudes. We had much difficulty in capturing the runaway. Abdulla crossed the river and I remained on the near bank, but the yak with his usual cunning and obstinacy, stayed in mid-stream and absolutely refused to come to either bank. It was some considerable time

before we could capture him and we were both rather wet after our efforts.

July 17th. Kukturuk Valley. Alt. 14000.

The ascent of Jalam Jilga was today rather more difficult than usual. The yaks were not able to take us very far and the soft crumbling shale, which gave beneath the feet at every step and slipped downwards, added to our difficulties. At places the shale projected from the mountain side in strong outcrops and necessitated a certain amount of easy climbing but this was more pleasant than the crumbling and slippery debris. The little work on the summit was soon completed and the descent commenced on the other side of the mountain. Here the snow assisted us considerably as we simply sat on its surface and allowed gravity to do the remainder. At the foot of the station yaks met us and took us down the "nullah" to Duffedar's khurga where we were invited to tea, chappaties and cream which I heartily enjoyed.

After the meal we continued our course along the Karachukar valley. The river had, in places, to be crossed and at times the crossing was a little exciting owing to the sun having

melted quantities of snow during the day and converted the usually placid stream into a rapid torrent. At camp Blandy met us. Up to the present he has had no further success.

July 18th. Kukturuk Valley. Alt. 14000.

The climb to the summit of Kukturuk Hill Station was very easy as the yaks were able to travel a considerable distance up the shaley mountain side. A yak is able to go almost anywhere and can force his way along, even when breast-deep in the soft snow. Work being completed, we descended early to camp. All are tired after the almost continual work on the hill-tops and Mason has decided to give the camp a rest for the next three days.

July 19th. Kukturuk Valley. Alt. 14000.

A quiet and restful day in camp during which letter-writing, photography and haematological examinations occupied most of my time. Blandy left us this morning on his way back to India. He hopes to obtain some shooting both at Gilgit and at Srinagar.

July 20th. Kukturuk Valley. Alt. 14000.

The day was dull and gloomy and rain fell at frequent intervals. Nevertheless the complete rest in camp was pleasant and enjoyable.

July 21st. Kukturuk Valley. Alt. 14000.

My time today was occupied in the pursuit of Natural History. Bird-life is scanty. Nevertheless I found three nests, includind that of Guldenstadt's Redstart (Rutticilla erythrogaster), the nidification of which has not before been described by any Naturalist. The nests of The White-Bellied Dipper(Cinclus leucogaster) and Gould's Horned Lark (Otocorys penicillata) were also found.

July 22nd. Killik Pass. Alt. 15600.

Our three days'rest being over, we marched today to the Killik Pass and camped on the summit in readiness to ascend the Killik East Station on the next morning.

The tiers of terraces, which occupy the sides of the Killik and Karachukar Valleys, are most interesting. At one place I counted as many as twelve terraces, one above the other,

at regular intervals, and reaching hundreds of feet up the mountain side. These, at first sight, appeared to be, undoubtedly, the ancient beds of the present river before it had cut its way down into the valley; but, on examining them more closely, I was surprised to find that they were composed to a large extent of enormous granite boulders, polished and facetted, and irregularly scattered through the finer debris in which they were embedded. No river, not even the most rapid mountain torrent, could have moulded such enormous blocks of granite or have rolled them to their present site. They are, without doubt, the products of glacial action and must have been deposited in the form of terraced moraines by enormous glaciers which once occupied all these valleys and must have given to the Pamirs a Geological resemblance to that of Greenland at the present day. One can conceive a glacier filling a wide valley depositing on each margin a lateral moraine and gradually, but possibly not uniformly, shrinking owing to the mountains at its source undergoing degradation or to a gradual decrease in the annual snowfall. If, throughout centuries, the glacier continues to cut its way deeper and deeper into the valley and to

shrink irregularly, at times remaining stationary and at other times narrowing with considerable rapidity; the lateral moraines, continually undergoing deposition, will take the form of tiers of terraces of which the vertical thicknesses will represent periods when the glacier was more or less stationary and the moraine deposit was in rapid progress, while the horozontal parts of the terraces will correspond to that period in the existence of the glacier when moraine formation was at a minimum owing to the formers rapid shrinkage. A gradual, continual but intermittent diminution in the snowfall throughout a vast period of time would be the main agent in bringing about this effect but the extreme regularity in the formation of these terraces strongly suggests a similar regularity in the occurrence of cyclical conditions of greater and lesser snowfall during the long period of its general diminution. In fact the whole picture seems to be one of periodicity.

Jul, 23rd. Summit of Killik East. Alt. 19000.

A clear and cloudless morning found us clambering up the shaley slopes of Killik East Hill Station. On this occas-

ion we did not experience the intense distress which before had made the ascent so laborious and caused us to dread our second attempt on it . This I attribute to the absence of watery vapour in the atmosphere as, on our former climb up this mountain, the sky was overhung with dark and heavy snow-clouds and the air densly saturated with moisture. Excess of watery vapour in a given mass of air must be associated with a diminution in the percentage of oxygen and the latter would necessarily give rise to exaggerated symptoms of mountain sickness. The summit of the station, not being reached till late in the afternoon, but little work was completed and we encamped in the permament snow at 19000 feet. An unpleasant night was passed owing to insomnia, the combined result of altitude, difficulty in breathing, headache, a hard bed and general discomfort.

July 24th. Killik Pass. Alt. 18600.

A beautiful clear day during which the work from this station was nearly completed. As one helio. was not visible the station must again be climbed at a later date. In the evening we descended to our camp on the Pass. Travellers appear

to consider these Passes at 15000 feet as hardships to be faced and difficulties to be overcome, but our camp on the Killik was a joy after our experiences on the summit of Killik East.

July 25th. Killik Pass. Alt. 15600.

A large bundle of letters and newspapers arrived this morning. The day was spent quietly in camp and the contents of the mail-bag gave us plenty of occupation well into the evening. For over two months we have lived at an altitude of over 13000 feet and have worked hard on the mountain sides. We all feel the depressing effects of continual residence at these heights and shall not be sorry to descend again to sea-level.

July 26th. Killik Pass. Alt. 15600.

This day has been a quiet one in camp during which most of my time was occupied in collecting and packing away Natural History specimens.

July 27th. Killik Pass. Alt. 15600.
Still on the Pass. The day has been dark and gloomy and the weather again appears threatening. Killik West will probably be ready for observation tomorrow if the weather remains fine.

July 28th. Summit of Killik West. Alt. 18000.
Killik West Hill Station was today ascended but without much difficulty. Yaks are wonderful creatures. No other animal but a yak could carry a human being up such steep slopes and over such treacherous boulders as occurred on our way to the summit of the mountain. We must have appeared a wild and brutal crowd, shouting and beating our yaks and urging them, by every possible means, over the rough and difficult ground. But a yak, though clumsy in appearance, is wonderfully surefooted. He steps from stone to stone, seldom slipping, and always succeeds in choosing those stones which are stable and firmly fixed. In the snow, quite human-like, a yak will always place his feet in the hoof-marks left by the animal that has preceeded him. Should he slip on the snow or shale, the animal depresses one of

its shoulders and uses it as a support to protect him from falling.

No work was completed on the summit so we camped and passed a tolerably comfortable night in spite of the high altitude.

July 29th. Killik Pass. Alt. 15600.

Observations being finished on Killik West, we descended the mountain in the evening. The day was, at intervals, cloudy and, on one occasion, the snow fell. This somewhat prolonged the work. On reaching the camp I found a number of Kirghiz, males and females, awaiting me. They had come from the Great Pamir in search of medical help. Idid what I could for them but for such chronic conditions as Rheumatoid Arthritis and Senile Cataract it was not possible to do very much.

July 30th. Killik Pass. Alt. 15600.

The world appears dark and gloomy in our eyes today. We have sufficient rations to last us but six days more, much ofthe work remains to be done, a long march has to be completed and but little hope remains of getting more food. The Pamirs can supply nothing and we must send men to forage

for grain amongst the little barren villages between this and Hunza. All the camp are on half rations and, as a result, there is much grumbling and discontent. The allowance of "ata" Lb.1 per man is supplemented as far as possible by sour milk curds made by the nomads,and known as "lhassi", and also by occasional sheep but the latter are difficult to obtain even at a ruinous price. In addition , the connecting ofthe Survey Link over the Killik Pass is a far more difficult operation than at first appeared. The country to the South is a regular sea of mountains, strewn with high and inaccessible peaks resembling mighty Matterhorns. Almost every valley contains an enormous glacier and this renders work exceedingly difficult.

CHAPTER 8.

July 31st.---- Killik Pass to Merkushi.

August 1st.---- Merkushi.

August 2nd.---- Merkushi to Killik Pass.

August 3rd. ---- Killik Pass.

August4th. to August 13th.---- The Taghdumbash Pamir.

August 14th.---- Mintaka Agzi to Gul Kwaja.

July 31st. Merkushi. Alt. 11960.

This morning we left our camp on the summit of the Killik and proceeded down the Pass to Merkushi. Our intention is to help Mc'innes, who is in difficulties to the South and seems unable to find a suitable station amongst the lofty mountains which tower all around him, and until he finds one we, on the Pamirs, are held up.

The march was very pleasant and the high cliffs on either side afforded a magnificent view. The general aspect of the country immediately changes on passing from Chinese into

British Territory. On the northern side of the Killik, the undulating Pamirs, with their rounded hills and wide grassy valleys, lie spread out for miles before one. To the south the country is more rugged; the round hills are replaced by steep inaccessible mountains and the valleys by deep river gorges. For two months we had endured an altitude of over 13000 feet and it was with feelings of relief and pleasure that we today descended to 11500 feet. It seemed as though we had reached sea-level.

The trees at Merkushi were delightful. Beneath the shade of some of the largest of them our camp was pitched. One does not value the green trees unless one has not seen them for months and on the Pamirs there is not even the vestige of a shrub. These stunted Alpine willows of Merkushi were like a lovely garden after the treeless waste of the Pamirs.

August 1st. Merkushi. Alt.11960.

Early this morning we left Merkushi with a light camp and marched southwards with the intention of joining Mc'innes to assist him in his difficult work. After travelling for about a mile we were met by a cooly bringing a note from

Mc'innes in which he stated that he did not require any help. Consequently we returned to Merkushi and encamped amongst the willows. Letters arrived this afternoon and the completion of correspondence provided us with occupation throughout the remainder of the day. Our relays of mail-runners have worked punctually and well.

August 2nd. Killik Pass. 15600.

We marched back again today to our old camp on the summit of the Killik Pass.

The geological conditions of the Killik Pass cannot but excite interest. The ascent on each side is bounded by high perpendicular cliffs smoothened and polished by old glacial action while, at their foot, lie large moraines on the surface of which "talus shoots" of granite debris pour down from the neighbouring mountains. Deep down in this moraine, the river, laden with black sediment derived from the outcrops of shale at the summit of the Pass, has slowly cut its way and, by sweeping before it the finer debris, has exposed the enormous glacial boulders round which it now

flows. Black shale is being now deposited in the river bed and, as not a single particle of shale could at first be seen along the steep sides of the moraine which had been eroded by the river, it appeared that this shaley sediment must have been a recent addition. However, at intervals, higher up the Pass, the old river bed greatly widened and these broad expances, over which the river must have meandered in a slow and sluggish manner, were covered with a thick layer of water-worn shaley deposit. It is more probable, therefore, that originally the stream was even more torrential than at present, was a river of pure erosion and, except in those broad sluggish areas, did not leave on the sides of the moraine a single trace of the mass of sediment with which it was, undoubtedly, charged.

It is difficult to estimate the length of time which has elapsed since the glacier retreated and the river took its place. In parts it seems as though the stream had just commenced to flow through the old moraine and, in other places, as much as sixty or seventy feet of granite debris have been completely washed away. At intervals rows of terraces have been formed on the sides of the moraine indicating the

varying position and levels which the river once occupied while at one point, and that high up in the Pass, full fifty feet of solid quartzite had been eaten through by the river and such erosion could not have been performed by any torrent, though charged with the most destructive form of sediment, in an inappreciable period of geological time.

August 3rd. Killik Pass. Alt. 15600.

A quiet day in camp during which the Geological and Meteorological reports on the work done with the expedition were discussed and rough drafts made. No work can be continued by us until McInnes has completed his Station at the south and finished all his observations towards the Killik stations.

August 4th. Killik Pass. Alt. 15600.

A lazy day in camp. A helio. has been seen from Killik East far away to the south so that Mc'innes is probably now in touch with us and will soon have completed his work.

August 5th. Killik East. Hill Station. Alt. 19000.

This station was ascended for the third and probably the last

time. We encamped on the summit and passed a restless and uncomfortable night.

August 6th. Foot of Killik Pass. Alt. 14000.

Work on Killik East Hill-Station was completed by noon and we gladly descended the mountain. At the foot we were met by a group of Sarikolis and Kirghiz with yaks and ponies. The Kirghiz had come a six-days journey from the Great Pamir in search of medical assistance. They lent us their ponies and we made a rapid journey to Duffedar's encampment at Killik. A khurga had been prepared for us in which we made ourselves comfortable. The greater portion of the evening before dinner was occupied in doing what was possible for the ailments of my patients.

August 7th. Karachukar Valley. Alt. 13600.

From Duffedar's cosy khurga near the foot of the Killik Pass we enjoyed an easy march along the bed of the Karachukar Valley. The sky was covered with thick heavy clouds and the day was dark and threatening. Our yaks travelled well and a suitable camping-ground was reached before dark.

As the sun was all day hidden, the journey was unpleasantly cold and a strong biting head-wind added to our discomfort. It was, therefore, with feelings of relief that we sought the shelter of our tent.

August 8th. Karachukar Valley. Alt. 13600.
A dull and gloomy day in camp. The snow fell at intervals and consequently we determined to remain in the Karachukar valley and not move on until the weather clears. Our men, whom we sent to forage , have been able to discover a little grain in some of the villages to the south, so that we are able to exist, in a haphazard way, on half-rations.

August 9th. Karachukar Valley. Alt. 13600.
We awoke this morning to find the whole valley clothed in a thick carpet of snow and the surrounding mountains enveloped in dense white clouds. As the day advanced the sky cleared overhead and the warm sun rapidly melted the fresh soft snow. We decided to remain in camp. All the morning was occupied in haematological work. I find the best method of inducing the nomads to give specimens of their blood

for examination is to sit outside the tent with my microscope and other equipment on a box before me. The Sarikolis and Kirghiz collect around and wonder at the novel sight. With a little tact and persuasion it is not then difficult to induce them to lend themselves in the cause of science.

August 10th. Karachukar Valley. Alt. 13600.

The weather is still wet and gloomy and we are confined to our tents. This afternoon I visited an old graveyard, one of the burying places of the Kirghiz nomads who originally shared the Taghdumbash Pamir with the Sarikolis. As predicted by the members of the Pamir Boundary Commission of 1896, all the Kirghiz have crossed over to the Great and Little Pamirs and have thus come under Russian domination.

The methods adopted by the Kirghiz for burying their dead were interesting. A large grave was dug about four or five feet in depth and the body placed within. It appears, however, that, instead of filling the grave with earth, the custom was to lay a number of large flat stones over the grave opening and on them to pile a great mound of earth. The dilapidated condition of the graves revealed their orig-

inal structure. Human bones lay scattered about in all directions; the stony roofs of the graves had, in many cases, completely collapsed and in one grave, which from its conspicuous encircling barrier of stones, must have belonged to somebody of importance, the roof had been partially torn away and the buried remains exposed to view. Sarikoli dogs, which prowled about the neighbourhood, must have been mainly responsible for the desecration of the tombs. The exumation of the bones and the general state of ruin of the graves bore evidence to the absolute inefficiency of this method of disposal of the dead.

August 11th. Karachukar Valley. Alt. 13600.

The day was dark and miserable. Heavy snow-clouds rolled, at intervals, down the valley, covering all with a white sheet. Then suddenly the wind would change and those same dense clouds would sweep back along the valley and pour their contents a second time upon us.

The presence of that truly tropical bird, the Hoopoe, on the Pamirs is surprising. It is strange that a bird whose natur- habitat is the warm sunny plains of India should appear so contented in the cold and barren uplands of Central Asia.

August 12th. Mintaka Agzi. (Base Camp). Alt. 13000.
Owing to the threatening state of the weather and the shortage of food and supplies, Mason decided not to return to Tomtek in order to correct an unavoidable error that had occurred there, but to march immediately to Mintaka Base Camp and prepare for our return journey.
After proceeding a few miles along the Karachukar Valley a snowstorm, accompanied by a bitter wind, broke upon us.
We found shelter in a Khurga at the entrance to the Mintaka "nullah", had lunch and moved on later in the afternoon to our base camp at Mintaka.

August 13th. Mintaka Agzi. (Base Camp). Alt. 13000.
A quiet day was spent in camp during which kit was checked and transport assorted in preparation for tomorrow's departure from the Pamirs.

August 14th. Gul Kwaja. Alt. 13500.
This morning we said goodbye to the Pamirs. A number of the Sarikolis, who had been unfailing in their kindness to us, came to Mintaka to bid us farewell. The day was dark and

gloomy and no feelings of sorrow were aroused in us when taking leave of such an inhospitable country.

The crossing of the Mintaka Pass was not difficult although the summit was covered in a thin layer of recent snow, and a slight snow storm broke upon us and compelled us to take shelter in a little stone hut used as a refuge for those hardy men who carry the mail from Indian Territory into Kashgar in China.

CHAPTER. 9.

August 15th to September 15th.---- The return journey to Kashmir.

August 15th. Merkushi. Alt. 11960.

We are back again on our old road and, consequently, there will be but little to record.

The deep valley, through which we passed, was lovely. But two months ago it was clothed in snow and now the summer flowers bloom on either bank, the butterflies flit about the green grass and the whole valley is filled with the joy of summer.

August 16th. Merkushi. Alt. 11960

Owing to the supply of coolies at Merkushi being deficient, we were compelled to halt for the day, Most of the baggage has been sent on and the remainder will accompany us to-morrow.

August 17th. Misgah. Alt. 10150.

The journey was today continued back along our old tracks. The Killik Gorge, through which we passed, is deep and imposing. As is the case with many of the Himalayan rivers, a Geological trisequence may be recognised in the formation of this gorge. First came a period of erosion during which the main gorge was hewn out of the solid mountain. This may have been the result of a rapid river or, as the vertical granite sides of the gorge seem to suggest, may have been caused by glacial action. Subsequent to this came a period of sedimentation; a calm and sluggish river took the place of either the rapid torrent or the glacier, and resulted in the accumulation of a vast mass of alluvial deposit which partially filled up the pre-existing gorge. This deposit can now be seen laterally imposed on the granite cliffs, reaching hundreds of feet up the side of the gorge, and undergoing rapid denudation. The alluvial beds are usually horizontal but, in places, they display a series of low synclines and anticlines or gentle contortions which suggest that an elevation of the river bed must have occurred subsequent to their deposit, but they may represent the irreg-

ular bedding laid down by a river flowing with some rapidity over an uneven floor. Then followed another period of erosion in which the sluggish river was replaced by a rapid torrent. This latter quickly formed a new gorge in the sedimentary deposits of its predecessor and, as it still continues to hew its way into this great mass of alluvium, it is impossible to determine the depth to which the latter descends.

~~Shortly after~~

August 18th. Khudabad. Alt. 9450.

Shortly after leaving Misgah, I became interested in a solitary Pine tree standing alone on a mountain summit. I could not detect another Pine over the whole hill side and I wondered why this hardy tree should chose the exposed mountain top while all around lay beautifully sheltered glens and well-watered valleys. I remember reading in one of those charming letters from Huxley to his friend Hooker how the former remarked on the extraordinary distribution of conifers near an Alpine village. How his great intellect would have shone had he seen this solitary Pine exposed to every

wind of heaven. Whence came the tiny seed that reached such a rugged altitude? Where are its companions? Why does it chose the solid rock of the loftiest and wildest peak and renounce the fertile, watered and sheltered valleys? It stands companionless upon the hill-top, a leafy sentinel amongst the mountains.

Today's march has been most interesting. The Hunza river was in flood and many of the primitive bridges were completely washed away. Consequently we were unable to retrace our steps through the river bed and were compelled to follow the narrow and difficult track along the steep side of the gorge. This led us at times down to the river bank or hundreds of feet up the side of the mountain. It was extremely narrow and irregular and the greatest care was often required to prevent slipping on its uneven surface and falling down into the deep gorge beneath.

Although the journey in miles was not a long one yet, owing to the bad nature of the road along which we had to clamber rather than march, we did not arrive at Khudabad until nearly dark. The local Rajah visited us shortly after our arrival and brought us a most acceptable present of fruit and

vegetables which were a real luxury after their complete absence on the Pamirs.

August 19th. Khudabad. Alt. 9450.

A quiet day in camp. We are unable to continue our return journey until Mc'innes has finished his work and joins us here.

August 20th. Khudabad. Alt. 9450.

A rather curious incident occurred today. While sitting quietly in our tent, a Hunza villager appeared before us at the tent door. After greeting us with the usual "salaam", he threw himself violently to the ground, buried his face in the earth and, accompanied with loud shrieks and groans, continued to cast handfuls of dust over his writhing body. The cause of all this commotion was due solely to the fact that he had recieved a gentle chastisement from one of the Gurkhas and, brimming over with grief and rage, he endeavoured to evoke our sympathy by this dramatic scene.

August 21st. Khaiber. 8800.

We left Khudabad today and decided to await Mc'innes at Hunza. The gorge seemed more barren and stupendous than ever. The river, which two and a half months ago we forded with ease, is now a roaring torrent fed by the swollen streams which descend from the melting snows.

On arrival at Khaiber we found the trees laden with ripe apricots. The whole expedition fell upon them and many of the trees were soon stripped of their delicious fruit.

I have been meditating over the extraordinary relationship between the breath of these Himalayan rivers and that of the gorge in which they flow. The former are so narrow; in fact they fill but a small fraction of the bed of the gorge, and it seems difficult to understand how a gorge of such great width could have been hewn out by a river which, even when in flood, only partially fills it. I have a shrewd suspicion that, as a river meanders and continually alters its course over the plains, so also does a river tend to meander though enclosed in a rocky gorge and that it is this compulsion of a narrow river to move first to one side and then to another, possibly in cyclical rythm, which cuts out

a gorge of such wide extent. One tends to look on a mountain river as being definitely confined and bound in by the great precipitous walls between which it flows and no doubt, to a limited degree, it is so ; but I have seen the Hunza river dashing, swirling and roaring against one side of this hard rocky gorge, eroding it with all the force that water can bring to bear against a cliff; while between the other river bank and the opposite side of the gorge there existed a broad expanse of flat alluvium over which the river, if it willed, could have flown in a placid and resistless course. Some great Natural force was compelling this river to chose the line of GREATEST resistance and whatever that force may be, it must possess such power and persistence as to impell a river to eat into the solid rock rather than to flow tranquil over the plain. Cyclical repitition of such a force would produce a wide gorge in the bed of which flowed a narrow river.

August 22nd. Pasu. Alt. 8000.

In no part of the Hunza gorge does one meet such quantities of rock ruin as between Khaiber and Pasu. Great fans

of debris pour down the precipitous mountain side and in places deflect the river from its course. Huge blocks of jagged limestone and rounded granite boulders lie spread in all directions; the broad Batura glacier is almost concealed from view by hillocks of moraine and the banks of the Hunza river are composed of steep cliffs of conglomerate, the products of the denudation of the mountains. One reads of countries being degraded and of mountain ranges rising from their debris, but one must gaze on the huge piles of superimposed sediment and the desert wastes of rocky ruin before one realizes how the tardy forces of Nature, accumulating through centuries, can change the whole sculpture of the earth.

August 23rd. Gulmit.

Our first duty was to measure the position of the snout of the Pasu Glacier. It was impossible to obtain suitable points on each side of the gorge through which the glacier flows and we had, consequently, to be content with the painting of two marks on the northern side of the mouth of the gorge such that the prolongation of the line which joins

them will cut the extremity of the snout of the glacier. The marks were painted thus $\frac{13}{S.I.}{}_{28.8.}$. A subsequent examination of the relationship of the snout of the glacier to these marks will indicate its amount of advance or retreat.

The short march to Gulmit was most enjoyable. The fierce rays of the sun were almost of tropical intensity and filled the deep gorge with a radiant glow. Precipitous limestone cliffs on each side towered above us. Up to the tongue of the Pasu glacier the river has cut its bed along the strike of the rocks, but later it sweeps to the south-east and divides the strike at almost a right-angle. In places

beds of shale alternate with the deposit of limestone and the high dip of both sediments explains the cause of the fissility of the former and the advanced state of crystalization of the latter. An obstacle was encountered at the snout of the Susaini glacier. The stream which flows from the ice-cave at its extremity was swollen into a mighty torrent and dashed down to the Hunza river with enormous force. This had to be forded. Coolies clung to one another in groups or grasped the tail of our solitary pony while they braved

the current. The most experienced were stationed at intervals in the ford to support any who might lose their footing, and numbers of sticks were extended from the opposite bank to render a final aid. Ultimately all, though thoroughly wet, crossed in safety. On reaching Gulmit the remainder of the day till nightfall was occupied in dressing wounds, examining bloods, diagnosing birds and packing the specimens collected on the march.

August 24th. Atabad.

Most of our route lay over the narrow ledge-like track which clings to the sheer granite cliffs. The flooded river dashed and eddied thousands of feet beneath and, in places, the track was so narrow and the cliffs so precipitous that a single false step would hurl one down into the torrent. The construction of this primitive road along the vertical face of the cliff by means of wooden pegs driven into the solid rock, and surmounted by flat stones and branches of trees, is a monument to the ingenuity and industry of this hardy mountain race. It appeals to the mind as a more worthy feat than the broad thoroughfares of our great cities.

August 26th. Aliabad (Hunza). Alt. 7500.

Our entrance into Hunza was like reaching the Promised Land, The rich cultivated fields ripe with corn; the trees laden with delicious fruit and the green fertile land, in all directions irrigated, tilled and cultured, formed a more delightful picture of simple prosperity than I had ever seen. Mahomedabad is a small village north of Hunza. Here we halted and for a full hour gorged ourselves with rosy apples and delicious peaches.

The Mir came to meet us at the summit of the steep entrance that leads to his palace, and his capital. He invited us to tea beneath a canvas awning situated in a shady orchard, and we spent a pleasant hour chatting with him and his Wazir.

Nothing could have been more enjoyable than the continuation of our ride to Aliabad. The desolation of the Pamirs and the desert mountain fastnesses of the Himalaya must be experienced before one can appreciate the flowering gardens and the cool shady groves of Hunza. At Aliabad the ripe fruit of the country was showered upon us and we feasted sumptuously. Within the four walls of a real room we entered

and we slept beneath a solid roof. We have, in fact, again reached the confines of civilization

August 26th. Aliabad.(Hunza). Alt. 7500.
A quiet and peaceful day spent partly in completing arrangements for the continuation of our journey but mainly in recovering from the unpleasant effects of my gluttonous onslaught on the fruit of Hunza.

August 27th. Aliabad. (Hunza). Alt. 7500.
We have determined to return to Kashmir by a new and more difficult route. From Hunza we intend to travel through Nagar, thence along the Biafo and Hispar glaciers to Askole in Baltistan and from there through Skardu and over the Deosai plains to Burzil Chowki. The Biafo and Hispar glaciers are the largest in the World outside Polar Regions, and the route over them is considered to be exceedingly difficult and may possibly be impassible. The glaciers have been traversed but twice ybefore. Firstly by Sir Martin Conway's expedition in 1892 and later by the Bullock-Workman's expedition of 1908.

August 28th. Aliabad. (Hunza). Alt. 7500.

A visit from the Mir of Hunza occupied most of the morning and a little work with a game of football on the polo-ground as a diversion amused us in the afternoon.

August 29th. Aliabad. (Hunza). Alt. 7500.

Kul Bir and I paid a visit to the Hassanabad glacier in order to repaint the marks made by Mr. Hayden of the Geological Survey in 1906. These marks indicate the position of the snout of the glacier and were perfectly legible after the lapse of seven years. The mark on the right bank being completed, we crossed over the glacier and after a difficult climb reached the opposite mark high up on the left side of the gorge. A pathway originally ran close to and just beneath the mark but a large landslide had carried away the track with the result that we were faced into such a clamber along the steep moraine that nothing would again induce me to repeat it.

August 30th. Aliabad. (Hunza). Alt. 7500.

I paid this afternoon an Official visit to the Wazir of Hunza.

When admiring the numbers of Ibex and Markhor heads with which he had decorated the roof and outside walls of his dwelling place, he kindly offered to give me whichever trophy pleased me most. I chose a large Markhor head, which with two heads of Ovis poli will be sent to The Bombay Natural History Museum.

On returning, I found the Mir in the verandah of the rest-house. He was distributing presents and gave me a large roll of native-spun pashmina cloth, beautifully soft and warm and capable of being made into a useful garment..

August 31st. Aliabad. (Hunza). Alt. 7500.

The day was spent in repacking kit into light loads suitable for conveyance over the difficult glacier. The heavy rains, almost unceasing throughout the month, still continue and threaten to destroy the prospects of our journey.

September 1st. Aliabad. (Hunza). Alt. 7500.

A prolonged crashing noise in the distant mountains attracted our attention this morning. After watching carefully we detected the cause. Down the steep surface of a talus shoot

could be seen pouring quantities of rock-debris, some of which must have been enormous blocks many tons in weight. Volumes of dust rose into the air as the boulders crashed upon the ground and beautifully curved furrows were formed in their wake. For some three minutes the rocky deluge continued and then all was silence. It was but another addition to the great piles of rocky ruin which have been formed at the base of all these mountains by the accumulation through ages of thousands of similar landfalls.

The rains, continuing all day, have forced us to abandon our journey over the Hispar glacier and we return tomorrow to Gilgit. To attempt the glaciers so late in the year and after so much fresh snow has fallen would only be foolhardy and not justifiable.

September 2nd. Minapin.

Back again on the solid road to Gilgit. The milestones, suspension bridges and telephone poles seem strange and unreal after our long absence from such luxuries.

September 3rd. Chalt.

Early this morning we painted the marks made by Mr. Hayden in 1906 near the tongue of the Minapin Glacier. Later we continued our march of 21 miles to Chalt. Grapes, melons, peaches and apples grew in profusion along the route and at almost every village we enjoyed a sumptuous feast.

September 4th. Nomal.

Owing to a long halt in the heat of the day under the shelter of a large boulder, we did not reach Minapin till long after dark.

September 5th. Gilgit.

A pleasant march brought us to Gilgit late in the afternoon. We dined with Turner in the evening and enjoyed all the comforts and luxuries of civilized surroundings.

September 6th. Gilgit.

All Gilgit, including ourselves, were assembled this evening at a dinner given by the Political Agent to the Resident in Kashmir who is at present touring through the country. We

appeared rather disreputable amidst the finery of all the other guests.

September 7th. Pari.

The greater portion of our transport was despatched at an early hour this morning but we did not follow till late in the afternoon. The absence of riding ponies at the time when we had arranged to start still further delayed us and the greater portion of our march was, consequently, performed during the dark hours of the night.

Heavy black clouds, intermittent dust-storms, occasional flashes of lightening and an unpleasant road along the steep side of the gorge made the journey in many ways difficult. At times we had to dismount in order to search for the track which, in the darkness, was nearly lost in the loose sand of the river bed. We did not reach Pasu till nearly midnight.

September 8th. Bunji.

A pleasant breeze made today's journey cooler than was expected and although the sun was high in the heavens when we

started from Pari yet we covered the eighteen miles to Bunji before four in the afternoon.

September 9th. Doyan.

The broad and arid gorge of the Indus river was rapidly crossed in the small hours of the morning and the steady climb along the convaluted road up the flank of the Hattu Pir brought us to Doyan early in the afternoon.

September 10th. Astor.

After leaving Doyan at dawn and strolling leisurely through the beautiful forest whilh clothes the hill-side, I arrived at Dushkin by about 10 a.m. Here I had a hurried breakfast and hastened along the fourteen odd miles to Astor, stopping at frequent intervals to collect the birds and insects which teem in these wooded districts. The whole march was 24 miles.

September 11th. Rattu.

We are no longer hurrying back along our previous tracks but have struck another route which will lead us over the

Kamri Pass and thence to Srinagar. The journey was delightful and, although we covered 21 miles, was not in any way fatigueing. From the bridge which crosses the river we had expected a magnificent view of Nanga Parbat but were greatly disappointed to find that, on our arrival, the mountain was clothed from base to summit in dense white clouds.

September 12th. Kalapani.

Every turn in the road displays some new scene of beauty. It may be the clear river dashing through a dark forest of pines or it may be the glorious Nanga Parbat(26629) glistening in the sunlight and forming an everchanging picture of grandeur as the white fleecy clouds, playing about his summit, now hide and now reveal his loveliness. One cannot but ponder over his great snow-fields and glaciers and wonder how the wind howls in those deep ravines. What a mighty convulsion of the earth's crust must have forced that stupendous mass of igneous rock to its present height and what ages of Natural forces must have moulded it to its present shape. The human mind cannot grasp the meaning of such awful force nor concieve the lapses of such illimit-

able time. No human foot has ever stood upon that massive ridge though man has struggled and died in the ascent and men will struggle again. The inevitable "Cui bono" rises to ones mind; and as man seems compelled to pry into the secrets of Nature, to examine her workings, discover her mysteries and control her powers, so he battles with the mighty obstructions she places in his path and is driven to overcome them.

After a long march of 26 miles we reached the little bungalow of Kalapani at the northern foot of the Kamri Pass.

September 13th. Kamri.

We were early astir as we wished to reach the summit of the Kamri Pass before the bright rays of the morning sun, condensing the vast snow-fields of Nanga Parbat, should clothe the whole mountain in vapourous cloud and hide from our eyes its gigantic beauty. For nine miles we toiled slowly up a steep incline and were only just in time to enjoy the last glimpses of the famous view before the clouds had hidden it for the remainder of the day.

Far away to the north stood the most beautiful of the

Himalayan giants with its peak glistening like pearl above the dense belt of cloud which below encircled it. As the sun increased in strength, the cloud grew larger and denser and, imperceptibly rising higher and higher, soon enveloped the shining peak and concealed it from our sight. For a few hours we lingered in the vain hope that the clouds might again disperse and unveil the mountain beauty. But we were to be disappointed. The dense masses of vapour raised aloft by the glowing sun condensing the moisture from the fields of snow, wrapped the mountain in an impenetrable veil.
The descent of the Kamri Pass was like a ramble through a beautiful garden. Every corner of the hill-side was gay with wild flowers. Every variety, every tint of colour seemed to be present, and the dark pine-woods through which we wandered near the foot of the Pass reminded us of the happy valley towards which we were rapidly approaching.

September 14th. Gurai.
Our journey is drawing to a close and we expect tomorrow to reach Bandipore. Progress from Gilgit has been rapid. The distance from Gilgit to Bandipore is 195 miles which, being

traversed in nine days, gives an average of nearly 22 miles per day. Our longest march has been 29 miles. We are back again on our old tracks and look on all the old landmarks as so many stepping-stones to home.

Bandipore. 15th. September.

As though to greet us with defiance on our last march, dark gloomy clouds covered the threatening heavens and a fierce gale with blinding sleet roared in our faces as we ascended the Tragbul Pass. Heavy peals of thunder roared overhead and, as we neared the summit of the Pass, the biting blizzard almost compelled us to retire. However we struggled on till the elements, exhausted from their fury, gradually abated. Through the dense mist and heavy snow-clouds we could see far beneath us the calm and placid lakes in the Valley of Kashmir. We looked on them as the termination of our work and the end of our journey. Gradually the mist grew thinner and the clouds rose higher into the heavens; boats could be seen drifting idly on the placid waters beneath the shadow of the snow-clad mountains. Groups of happy villages

lay scattered in profusion amongst the fields of golden corn, and as the landscape cleared and the dark clouds dissipated, the Happy Valley, sparkling and glistening in the sunlight, was a true picture of loveliness.

The bleak desolation of Central Asia was but a dream and the most beautiful valley on earth a glorious reality.

APPENDICES.

GEOLOGICAL EQUIPMENT.

1. Geological hammers.....2.
2. Combined clinometer and compass.....1.
3. Pocket lens.....1.
4. Strong knife.....1.
5. Specimen boxes with wool and blank labels....6.
6. Reference work on Field Geology.....1.
7. Text Book of Geology.....1.
8. Geography and Geology of the Himalaya .....1.

ZOOLOGICAL EQUIPMENT.

1. Microscope and accessories (complete).....1.
2. Dissecting instruments, (knives, scissors, forceps, needles, etc.) in case.....1.
3. Collecting nets.....4.
4. Spring traps.....2.
5. Dissecting board.....1.
6. Glass slides.....2 Doz.
7. Cover slips.....1 Box.
8. Pins.....1Box.
9. Blunt hooks.....1 Set.
10. Tape measure.....1.
11. Millemetre rule.....1.
12. Balance.....1.
13. Measuring pipette.....1.
14. Measure phial.....1
15. Cedar oil.....1 Phial.
16. Canada balsam.....1 Phial.

17. Skin preservative.....1 Jar.
18. Insect preservative.....1 Box.
19. Small specimen boxes.....20.
20. Reference Zoological work.1.
21. "Pamir Boundary Coomission"1.
22. Note books.....4.
23. Indelible pencils.....8.
24. Ink tabloids.....1 tube.
25. Ink pot and pens.....1 Set.
26. Small specimen labels.....1000.
27. Paper insect wrappers.....500.
28. Small specimen tubes.....2 gross.
29. Methylated Spirit.....1 Gallon.
30. Bird collecting gun.....1.
31. Cartriges.....500.
32. Haversacks for collecting.2.
33. Spare paper for wrappers..1 Box.
34. Fish hooks.....1 Doz.
35. Fly spoon.....1.
36. Chloroform.....20 Ozs.
37. Wool for specimens.....2 Lbs.
38. Cyanide of Potash.....8 Tin.
39. Hydrochloric acid.....1 Bottle.
40. Killing bottles.....8.

BOTANICAL EQUIPMENT.

1. Vasculum and Papers.....1.
2. Spare vasculum.....1.
3. Trowel.....1.....1.

HAEMATOLOGICAL EQUIPMENT.

1. Haemocytometer.....1.
2 Tabloid Toisson's fluid....2 Boxes.
3. Glycerin etc.....1.Box.

PRIVATE PHOTOGRAPHIC EQUIPMENT.

1. Camera, Half- plate.....2.
2. Panorama camera.....1.
3. Kodak films.....150.
4. Developing tank.....1.
5. Developing dishes.....4.
6. Thermometer.....1
7. Exposure Meter.....2.
8. Developing and fixing salt.
9. String ball.....1.
10. Concealing box for camera.1.
11. Book of instructions.....1.

SURVEY PHOTOGRAPHIC OUTFIT.

1. Case 1.,containing Camera,
   release dust cap etc.
2. Case 2, containing Camera
   fittings, screws,
   key, slides etc.etc,
3. Tripods with dust caps.....2.
4. Subtense bar in case.....1.
5. Changing bag.....1.
6. Developing tank.....1.
7. Sun and snow screens..... .2.
8. Metal case for negatives...1.
9. Isochromatic Plates.....2 Cases.
10. Imperial lantern plates.
11. Welcome Exposure diary....2.
12. Record note Book.....1.
13. Plane-table, plotted.....1.
14. Sight rule.....1
15. Trough compass.....1
16. Clinometer.....1
17. Pencils and indiarubber.
18. Ink and pens.
19. Rytol developing tabloids.

20. Hypo. crystals.
21. Spare dishes. (½ plate)...4.
22. Folding red lamp.....1.
23. Printing frames.....2.
24. Thermometer.....2.
25. String.....100 yds.
26. Map, ½ inch.....1.

EQUIPMENT FOR CLOUD OBSERVATIONS.

1. Nephescope, complete.....1.
2. Record diary.....1.

CLOTHING, ETC.

1. Sleeping bag.....1.
2. Blankets.....6.
3. Towels, (large).....3.
4. Pillows.....2.
5. Sheets.....2. (Left at Srinagar.
6. Valise.....1
7. Warm sleeping socks.....1 Pair.
8. Balaclava sleeping cap.....1
9. Vests, (warm).....4.
10. Drawers, (warm).....4.
11. Shirts, (thick flannel)...4.
12. Socks, thick.....6 Pairs.
13. Socks, thin.....4 Pairs.
14. Boots, climbing.....1.Pair.
15. Chaplies, (& socks).....2 Pairs.
16. Boot-laces.....12 Pairs.

17. Gilgit boots.....1 Pair.
18. No-fingered gloves.....1 Pair.
19. Gloves, woollen.....2 Pairs.
20. Double-thick puttoo suit..1.
21. Puttees.....2 Pairs.
22. Khaki shorts.....2 Pairs.
23. Poshteen.....1.
24. Fur-lined waistcoat.....1.
25. Cholera belts.....3.
26. Pyjamas.....2 Pairs.
27. Braces.....1.
28. Topee.....1.
29. Puggaree.....1.
30. Muffler, woollen.....1.
31. Sweater, (roll-collar)....1.
32. Handkerchiefs.....12.
33. Collars, soft.....6.
34. Tie.....1.
35. Belt.....1.
36. Waterproof sheet.....1.
37. Notepaper and envelopes...1 Package.

PERSONAL ACCESSORIES.

1. Razor.....1.
2. Penknife.....1.
3. Scissors.....1
4. Housewife, (filled).....1
5. Shaving brush.....1
6. Hair brushes & comb.....1.
7. Tooth powder.....3 tins.

8. Odol.....2 Bottles.
9. Soap.....8 Cakes.
10. Watch.....1.
11. Snow goggles.....2 Pairs.
12. Binoculars.....1
13. Mirror.....1
14. Strop.....1
15. Rifle and cartridges.....1.
16. 12-bore and cartridges....1.
17. Revolver and cartridges...1.
18. German text-book.....1.
19. Text-book of Zoology.....1.
20. Tobacco.
21. Thermos flask.....1.
22. Brandy flask.....1.
23. Yakdans.....6.

CAMP EQUIPMENT&

1. Tent, 80 Lbs.....1.
2. X-Pattern chair.....1.
3. " " bed.....1.
4. " " table.....1
5. " " bath and basin...1.
6. Hurricane lamp.....1.

MOUNTAIN EQUIPMENT.

1. Iceaxes.....6.
2. Alpine ropes.....2.
3. Running skis.....2 Pairs.
4. Ski sticks.....3
5. Rucksacks.....2.
6. Spare bindings.....4.
7. Screwdrivers and Alpine nails.
8. Whymper, 16Lb. tent.....2.

Results of Expidition, Publications, Etc.