

for the day. The Cook Range seemed to shelter us from the storm, but when we had crossed the Hooker River by the cage we caught it, and for the last three miles had to make our way against a raging wind. But the lights of the Hermitage were in sight, and at 7.45 we reached the welcome shelter.

Our expedition up the Tasman Glacier was a very pleasant one, and though Mt. Darwin cannot be considered a first-class peak from a climbing point of view, the ascent is well worth making, as it is one of the few which can be comfortably done from the Maltebrun hut.

(To be continued.)

WINTER EXPLORATION IN THE ALTAI, SOUTH CENTRAL SIBERIA.

By S. TURNER.

BY travelling 2,250 miles beyond Moscow you come to Novo-Nicholaewsk, on the Siberian line at the Obi station. The Obi River flows past this settlement. If you follow the river to its source you come to the Kotanski Belki range, 700 miles direct S. from the railway at Obi.

This range is the highest of the Altai mountains. Belukha (14,800 ft.) is the only peak shown on any map, but there are a number of higher mountains in the range. My expedition was to explore the country as far as Belukha, climb and measure that peak (which was the highest one known, and had only been measured twice; the first time it was 11,200 ft., and the second time 14,800 ft.), and measure any other peaks, and make glacier observations and observations on mountain-formation.

I enquired from the Geographical Society, and was only able to gain a few lines, translated from Russian, to the effect that Professor Sopoizinokoff, of the Tomsk University, had explored this region and climbed 13,300 ft. up Belukha from the S., and measured it 14,800 ft. There is no English literature on the subject, and only one book in Russian. I saw the Professor at the Tomsk University, and found that he was the only explorer of the district mentioned, and that he had also made an excursion to the N. side and gained 8,400 ft. up the Belukha glacier. He also gave me an idea how to get there, but said it was impossible in winter. He went in the summer. There had been several mountains measured about 14,000 ft., including Iktoo and Irbristoo, also

eight first-class glaciers and about twelve second-class. A map of the country had been made. The country as far as Onguadi was previously known to Siberian traders. The district to the S.W. of Onguadi, which I visited, was only known to peasants and Kalmuks, who are nomads living in bark huts.

Leaving Novo-Nicholaewsk in March, the snow was very thick, and it was quite mid-winter weather, 16° below freezing-point,* which was quite cold enough for the sledge journey to Barnaul, which we reached in twenty-eight hours' continuous travelling, excepting four hours in the middle of the night. We passed through several rich pine forests, and had some good shooting of white hare, and of rapcheek and other birds. Barnaul is one of the most thriving towns in the Altai. Leaving for Biisk the sledge road was very rough. The cold registered 5° below freezing-point. The forests are not so thick or so rich as those we had already passed.

In some places the snow was very deep, while in others the wind had blown all of it away. The track was very narrow, only giving room for one horse. The E. side of the river Obi was hilly and covered with forests, while the W. side was quite flat and bare of vegetation. The birch and aspen trees were the most numerous, with a small percentage of pine and dark brown firs. The ash is very small.

Biisk is a town with a population of 20,000. I found I could get here most things for the expedition, including guns. It is the last of any importance in South Siberia, and is quite up to date in many respects—*e.g.* electric lighting. After leaving Biisk we found that the ice on the river was breaking up, so we crossed on a drosky, but after the first stage we changed to a sledge, owing to fresh-fallen snow making sledging possible. The country is flat as far as Altaiskoye. From here the road to Mongolia goes S.E. We went over the Sheemealoffskya pass, 3,550 ft. to the S.W.

This pass is noted for fierce hurricanes. We came to Barancha, where the snow was very deep in a narrow valley, and soon afterwards we ascended the Yedtogol pass. Near the summit it was 38° and on the summit 40° . The trees were all bent towards the S., and had no branches pointing N., showing signs of severe wind; half-way down it was 42° . It was a steep pass, and there was no snow a little way down. The sledge upset several times on this mountain-side. At

* All references to temperature through my paper will be according to Fahrenheit.

the bottom of this pass there is a junction of four valleys. The village is an active one, and it is the chief market for the Kalmuks.

Close to this village the first Kalmuk camp is situated, on the banks of the Chorny-Anni and Belyi-Anna Rivers. These rivers flow into each other two miles from the village, forming the Chorny-Anni River, after which the village is named. This valley is noted for the terrific havoc caused by the repeated winds. We witnessed one of the blizzards. There was no snow in this valley; the wind evidently blows all the snow away.

Through the next three stations to Abbi we passed fine scenery, and entered what I call the circles. The valleys are quite flat, and the mountains rise straight up, and form one complete circle after another. The first would be about 40 miles in circumference and about 20 miles across. The circle grew less and less as the mountains rose higher. Out of 70 miles between Torack and Abbi we had 20 ascending and descending passes.

Along the valleys were large herds of cattle. When we reached Abbi it grew much colder, 7° below freezing-point. After passing Abbi the more S. we went the warmer it grew. When we reached Ouemon the temperature was 98° in the sun. We had come through eight different circles. The largest one was between Oust-Kam and Koksa, about 40 miles across. These circles were very pretty. The valleys here are as flat as tables, and bare of trees. The trees are on the slopes of the mountains. The height of Biisk is 600 ft. We gradually ascended to Altaiskoye, 850 ft., and on the Sheemealoffska pass to 3,550 ft. Here we were in the mountains. Each valley was higher than the last, until about half-way to Kotanda, near Abbi, where we gained a height of 5,000 ft. Afterwards the valleys were lower, down to 2,760 ft. after Ouemon. We went over the Kotanda saddle, 4,850 ft., through forest.

The temperature on the summit was 39° at 10 A.M. We descended to Kotanda, which is at a height of 3,800 ft., also in a circle about 8 miles long and 4 miles across. The temperature, to a great extent, depended on the direction of the wind. It was always very cold when a N. wind sprang up, and mountains seemed to come much nearer with the clear atmosphere, which is clearer than that on the Alps. The rivers are rapid. The main river draws its water through numerous tributaries from N. and S., and flows between the Altai and Altai ranges. The journey from Biisk was done

by eleven stages with sledge and drosky, the longest stage being 40 miles.

The road attains its greatest height on a pass of 5,000 ft., at Kirlick, over the Korigomskie mountains, where the river Abbi commences. This river flows into the Koksa, which eventually joins the Kotan. The Kotan rises on the S. side of Belukha, from the largest discovered glacier in the Altai. It flows S., then W., and afterwards N., to join the Obi. The direction of its course is due to the peculiar circular structure of the mountains.

The rivers are frozen to the bottom from November to February, but there is an under-current at the end of March,



THE RIVER KOKSA GAVE US THE MOST TROUBLE.

which breaks the ice by the end of April. The river Koksa gave us the most trouble, as it was between fairly high mountains. The summer road was impassable, so we went over the river, although we were not sure whether the water had ice under it or not. We had a most exciting time. The horses were often afraid to go through the water. This was at the end of March. It took us three days and the best part of two nights to get from Biisk to Kotanda, a distance of

248 miles. During the journey S. of Biisk we had varying temperatures, according to the situation of the valley and the direction of the wind.

A N. wind would reduce the temperature 20° to 30° even in the middle of the day, when the sun is shining; for the first hundred miles it varied from 7° to 15° below freezing-point at midday. When we went through deep valleys which were sheltered the thermometer registered 46° , and the weather was warmer until we reached Ouemon, when it registered 98° . On the Kotanda saddle the next morning it was 39° at a height of 4,850 ft.

At Kotanda 2 hrs. later, at 3,500 ft., it was 95° in the sun at 9 A.M. At 2 o'clock the same day on the Saptam ridge, at a height of 9,750 ft., the thermometer fell to 5° below freezing-point. While I was climbing six unnamed pinnacles, 10,000 ft. to 10,050 ft., it went down to $15\frac{1}{2}^{\circ}$ below freezing-point. These pinnacles had never been climbed before, and were covered with snow. The summit rocks could be broken with the fingers. They are a continuation of the Saptam mountain. I named four of these pinnacles—Faith, Hope, Charity, and Love. From the highest summit we had a grand view of the Kotanski Belki range in the S., and the Altai in the E., also the Altai in the W. The view is very fine, but the mountains do not seem as high as the Alps. Eight circles could be seen.

The Saptam is a splendid centre. After 6 hrs.' interesting climbing I returned to the Saptam second summit again, which is 9,750 ft., the highest point at which vegetation grows. I was caught in a sudden gale of wind, which blew from the N. We had some interesting ski work on this mountain. We returned to Kotanda, and after making sure that everything was ready we started next morning for the Akkem valley with two hunters and six horses, two of which were pack-horses. There were no other means of travel, and we had to take snow shoes with us, as the snow was deep.

I particularly wanted to go to the southern side of the Belukha mountain. The Belukha resembles Mont Blanc, except that the corresponding faces look to opposite points of the compass.

As we got nearer to the mountain we found that the road leading to the S. side was blocked with snow, making it impossible for us to travel in that direction. We were, therefore, compelled to take the northern and most difficult approach to the range of which Belukha is the chief peak at Kotanda. We had some difficulty here owing to several



Photo by S. Turner.

[Swan Electric Engraving Co.]

KALMUKS ON THE AKKEM PASS AFTER A SNOWSTORM.

hunters refusing to go on what they considered a dangerous journey.

Taking a road leading in a south-westerly direction, we passed by a small village and a wood. Here we crossed the river Kotan, the ice of which was just breaking up. Reaching the other side, we emerged into a dense forest without a track. It was remarkable how the leading horse went through it. We found it impossible to travel more than three miles an hour, owing to the bad state of the roads, but after some rough climbing our horses brought us to mountains of about 11,000 ft. to 12,000 ft. We had intended to walk up the river-bed, but owing to the breaking up of the ice we had to abandon this idea. After finding our way through another forest we came upon a pass (6,100 ft. high), and while traversing this we were overtaken by a snow storm; we soon, however, reached the summit, where the Kalmuks tie pieces of coloured ribbon to the branches of a tree as a thank-offering for their safe arrival. After a little rest we made a sudden descent into the Akkem valley, the snow storm still raging. Night coming on we made our first halting-place, scraping away the snow and pitching our tent. One of the Kalmuks lit our fire and boiled the water. The thermometer registered 20° below freezing-point.

The height of the Akkem valley, in which we were encamped, was 4,325 ft., the place in which we passed the night being the last Kalmuk settlement situated along the Akkem River. The scenery at this point is very wild and rugged. The river winds its way through the mountains, one bank being composed of steep precipices, whilst the other has a formation of steep slopes, growing on the side of which were forests as dense as a jungle. The echo of our voices resounded as though we were in some vast cavern.

One day's journey of 8 hrs. brought us to this Kalmuk settlement, which is situated in the only open space in this valley. We understood that this settlement was twenty miles away, but it must have been fully twenty-five miles, as we had been going 8 hrs., including half an hour's halt. (I calculated our speed by my watch at an average of $3\frac{1}{2}$ miles an hour.) We stayed at this place for the night, during which there was a continuous snow storm, and started early next morning to travel through a thick forest. We found the forest slopes frozen for twenty miles, and the journey was a very exciting one, as our horses constantly lost their footing. Here we had in places some excellent shooting, following the game on our snow shoes, the snow being soft and deep. With the

exception of a few halts to lift up a fallen horse, or to readjust the luggage, or to follow the game on snow shoes, we stayed on our saddles for 9 hrs., there being no convenient place at hand to make a resting-place.

The trees in this part are mostly fir, and are very tall and majestic, tapering to a fine point, and almost devoid of branches. The shape of these trees at their base was quite peculiar, and their formation was different to any other kind of the same species that I have ever seen, the first 8 ft. or 10 ft. being many times thicker than the next portion of the tree. They do not grow in the valleys, but only on the mountain slopes.

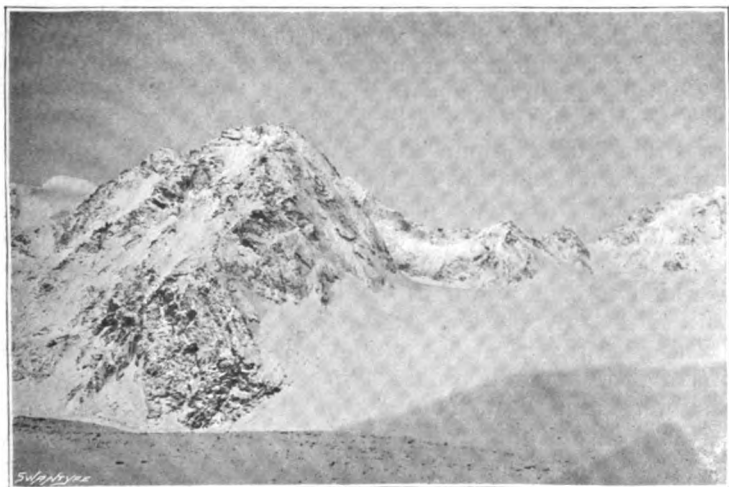
Crossing the Akkem River at a height of 5,650 ft., we had our first close view of the Kotanski Belki range. Reaching the opposite bank, we were compelled to unload our pack-horses, helping them up and dragging up the luggage after us. The trees on this side seemed to have been devastated by a storm, their roots being very thin and loose. The beds in which the trees grew were composed of rock and sand, which may account for their slender roots. Several fell during our progress through the forest, making a dull crashing noise.

We eventually reached the banks of the river Yarlow, which is a tributary of the Akkem. We found this quite dry, owing to the winter's frost being too keen to allow any thaw during the warmest part of the day. This river takes its source in the E. of the Kotanski Belki range, and is a fast-flowing stream in the summer. There is a glacier here which has not yet been explored. I saw it from a hill near where our camp was situated.

We had been on the road two days from Kotanda, 14 hrs. of which had been spent travelling through dense forests. The second evening we encamped 8,150 ft. above sea level at 5.30 P.M., and snow commenced to fall at 8 o'clock, the temperature in the open being 15° below freezing-point. We could see Belukha Mountain rising before us in a direct line about eight miles away, and we were practically in the circle of the Kotanski Belki range.

Opposite our camp was a bank covered with snow to a great depth, a lateral moraine of the Belukha glacier. The glacier had receded four miles, leaving two small lakes to mark its course. The first of these lakes was one mile long and a quarter of a mile broad, the second being about half the size. They were separated by huge boulders. Two streams, together with the glacier, feed these lakes in the summer. At the time of our visit, in April, the lakes and also the river were frozen to the bottom.

Our first day at this place was spent in examining the Belukha glacier, and in getting as near a view of the mountain as we were able from one side of the glacier. On examining the glacier one thing surprised me very much; this was the absence of crevasses. The ice also was very hard. We came across a large number of huge boulders which had been scratched and grooved on the side nearest the glacier. These were situated about two miles from it, and showed how far it had receded. Some of the grooves—of which we took photographs—were half an inch broad and a quarter of an



AN UNNAMED PEAK AT 4 A.M.

inch deep. There were no marks of the glacier's progress on the other side of these stones.

Belukha is a granite mountain, and thousands of great boulders of this rock occur six miles distant from it, so that it must once have been much higher.

The Kotanski Belki group is a circle of mountains, the chief peaks of which have an average height of 14,000 ft. In the centre of this circle there are ranges of mountains branching off N. to S., which, seen from the distance, have the appearance of huge fins. The highest point of the glacier on the northern side reaches 12,000 ft., and the peaks which shed their great rocks upon the glacier tower some 2,000 ft. to 3,000 ft. above.

There had been an exceptionally great fall of rock from a peak on the right side of the glacier, which appeared to have occurred quite recently, and we had the advantage of witnessing several of these rockfalls on our journey, though they made climbing rather risky.

The old moraine is composed of two ridges 200 ft. to 250 ft. higher than the glacier, and there appeared to be more moraine than glacier. In fact this is the largest moraine I have ever seen. I have seen and climbed many in various parts of the Alps, but none of them can compare in magnitude with this one. The glacier was five miles long, but I should think it must have been at one time eight miles. The distance from the glacier to the lateral moraine, including the two lakes already mentioned, covers three miles, both lakes being dammed in by the moraine. Around the second lake there is little vegetation, but what there is here is of the wildest description. There is only one lake shown on Sopozinokoff's map, but he visited these parts in the summer, whereas my visit took place during the winter. I should think these lakes would be a famous place for hunting in the summer, as the animals would find this a very suitable place to which to come down to drink. There are high passes on both sides of the glacier.

I decided to explore one of the valleys, being attracted by one or two very high peaks. We started on our snow shoes and were soon over the snow on the lateral moraine, and across the lake to the right. I might mention here that the snow shoes which we wore were made and bound with fur, which was very useful in preventing our sliding backwards, the fur being so placed as to enable the snow to work in against the grain, and thus taking a firm hold.

We then climbed over some steep rocks, and afterwards tried to climb up a frozen stream, but we found that too difficult, as the ice was too hard for the nails of our shoes to make any impression.

After a zigzag course over the snow slopes and some square-shaped pieces of rock covered with snow we reached a glacier, previously unknown, nearly as flat as a billiard table and almost as hard as rock. This was at a height of 13,000 ft. On this our boots would not grip without stamping our feet, and even with this precaution slips occurred. At the top of this small glacier was a very pretty hanging glacier. The ice was covered a foot deep with snow, as was also a steep slope to the left which was exposed to the N.

The hunter whom I had with me would not climb any further,



Photo by S. Turner.]

[*Swan Electric Engraving Co.*

PART OF THE BELUKHA RANGE. WILLERS PEAK ON THE EXTREME RIGHT.

so I left him and took a course up a steep slope, but, fearing an avalanche, I changed my course and took a more difficult way over a peak of steep rocks which was similar in construction to the Matterhorn shoulder, but had an outward dip and downward slope. Once on the top of this I travelled along an easy ridge (13,800 ft. high) which led up to the mountain summit. Much precaution was necessary in stepping from one piece of rock to another, as every piece was loose.

This was on the S. side of the ridge. On the N. side there was a sheer precipice, forming semicircular gullies as smooth as glass, varying from 1,000 ft. to 2,000 ft. in depth, and 300 ft. to 400 ft. in width. The last of these semicircular gullies was about 150 yards from the northern extremity, making almost a complete semicircle of the ridge, and this almost isolated the steep summit and required some stiff rock-climbing to attain. On reaching the summit I found that no snow had accumulated on the steep northern slopes, they being composed of loose rocks. From this peak the view of the whole Belukha Mountain was complete. I placed my aneroid on a sheltered rock, and it registered the height of 17,850 ft.* (allowing 50 ft. for the exact known error made the height 17,800 ft.). I took from this point a round of photographs, as well as prismatic bearings. There was $12\frac{1}{2}^{\circ}$ of frost. I named it Willer's Peak.

After placing my name in English and Russian under a pile of stones I began a very careful descent. I was surprised to see that the summit rocks, composed of schist, mainly felspar and hornblende, were so soft that I could break them with my hand. The mountain view was very pretty, but not so bold as the Swiss Alps, as the valleys here were much higher and the mountains are joined by very high ridges. There was ice on the northern side of every peak except those which were too steep to support it.

The Kotan range forms a circle, and Belukha was apparently the highest peak in the circle. To the N. of Belukha there are three mountains which rise like huge fins, parallel

* The aneroid was a compensated one, made by Baker, High Holborn, London, W.C. I had it tested to the satisfaction of the Geographical Society, and also tested on my return to England, and known error allowed. The aneroid agreed with Professor Sopoizinokoff's measurements at various heights, and on the frozen lake, as well as on the Belukha, which he measured from the base. The ridge I mention on Willer's peak, 13,800 ft., is at the base of the peak. It took me 8 hrs. to climb to the summit and down again from that ridge (13,800 ft.).

with the glacier, very pointed at the top, ranging from N. to S. The third one, which I had climbed, had a position E. to W. These ridges were too thin at the top and too exposed to the breeze of the Akkem valley to allow snow to remain constantly on their summits. One peak that attracted my attention more than any other lay to the W., on the Kotanski range. It had just the shape of the Matterhorn, but the obelisk of rock was only about 2,000 ft. high. This peak had a coat of ice about 30 ft. thick on the N. side up to its summit.

I descended the peak from which I had made these observations, and joining the hunters on the glacier we returned together to our camp.

The next morning opened up calm, and we decided to climb Belukha. The thermometer registered 45° below freezing-point, and there was every prospect of a good climb. It was my intention to move the main camp as near as possible to the mountain, but the hunters would not go so far as I wished.

We crossed the lateral moraine, going over the lake to the left, and pitched our camp on the further side of the lake. Continuing our way, we rode the horses to the end of the lake, and tied them to the last trees. After going about an hour up the moraine on the left snow began to fall. The hunters wanted to go back, but I persuaded them to continue for another hour. They would not go any further, however, after this time had elapsed, although I wanted to sleep that night at the base of Belukha, and had only covered two miles out of the six that were required to get to this point. It was very difficult walking over the moraine, owing to fresh-fallen snow. I pitched my tent about 1 o'clock, 11,000 ft. above sea level. The hunters, who were complaining bitterly of the cold and snow, turned back. I made myself as comfortable as possible. The snow was soon frozen an inch thick on my little tent, which, by the way, was rather frail, being only 12 lbs. in weight. It took me all my time to keep up the circulation, and I had to depend upon small blocks of methylated spirit, but they were not of much use to me.

Snow fell all the afternoon and night, ceasing about 2 o'clock in the morning. I prepared for a start at 4 A.M. There was a good light, but the hunters were nowhere to be seen, so after taking a round of photographs I started over the ice- and snow-glazed boulders. I have had a good deal of experience in climbing Alpine boulders, but those forming the moraine were all ice-glazed, with fresh snow on

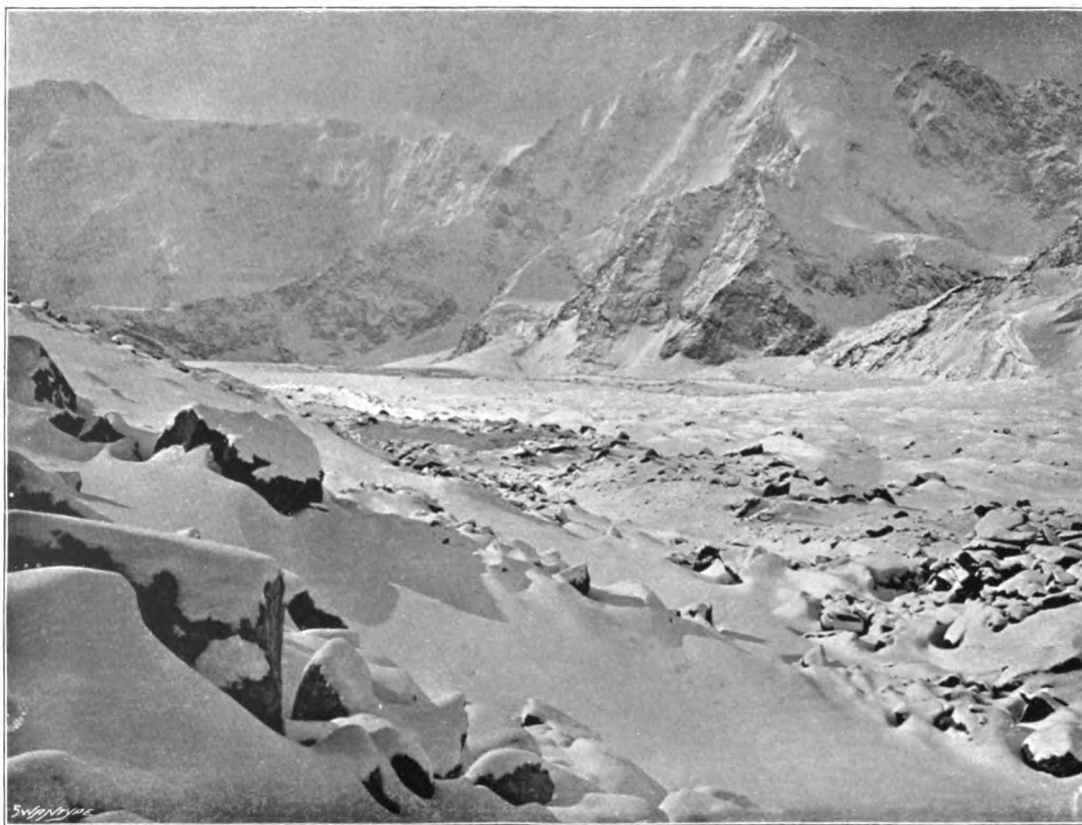


Photo by S. Turner.

[Swan Electric Engraving Co.]

ONE OF THE BELUKHA PEAKS DURING A SNOWSTORM.

the top. They were nearly all covered with snow quite level, and I found it exceptionally difficult to retain my balance. It was necessary to jump from one boulder to another, because in stepping between them one would take the risk of sinking to the hips in soft snow, and very possibly of breaking a limb. I have never found any kind of climbing so difficult as this moraine of the Belukha glacier. I then tried the glacier, but could not make much progress. It was too hard to allow the nails in my boots to grip, owing to my not being heavy enough for the purpose. I changed my course, again traversing the boulders. As I stepped from one boulder to another I loosened them, and it was rather interesting work hearing boulder after boulder which I had just stepped off go tumbling down unseen holes. On many occasions I only managed to save myself by throwing my body forward and catching hold of another boulder to prevent my fall.

While resting on one of these boulders one of the hunters, named Cherepanoff, came in sight, beckoning, as I thought, for me to go back, but I did not heed him. I afterwards learned that he had tried to reach me, but had failed, owing to his having had several nasty falls in the holes which abounded. The other hunter had during this time remained at the camp with my interpreter, and gave as a reason for his not accompanying me, as promised, that the journey was too hazardous, and that though I might be willing to risk my life he was not going to risk his. This man was one of Sopo-zinokoff's best men, whom he took with him when he climbed 13,300 ft. on the southern side of Belukha during the summer.

I soon gained the base of a ridge which led up to the Belukha ridge, and after very difficult work (it had again commenced to snow) I reached the top of the ridge. This measured 13,800 ft. I left my card under a rock and proceeded through a slight mist towards the higher ridge, which I found covered with hard ice at a height of 14,300 ft. After taking half an hour to cut a step in the ice I decided that this was too slow, and tried to go round on the shoulder of Belukha, thinking it would be an easier way up the last bit, but I slipped down a slope covered with fresh-fallen snow about 60 ft. in company with the snow, which nearly suffocated me, so that I was very glad to get back to my position on the ridge again. Then the mist cleared, and I was sorry I had left my camera at the base. The N. wind, which had blown the mist away, began to make me feel intensely cold in my damp clothes, and at one time I almost lost the use of my

hands. I began to descend as quickly as possible, intending to complete the ascent on the morrow.

When I consulted my thermometer at the base of the peak, it registered 18° below freezing-point. I had great difficulty in making progress, as the circulation in my hands and one of my feet had stopped. After steady plodding, however, I reached my tent, there to find my hunter wearing my overcoat and sitting with his back to the tent to protect him from the wind. He explained that he had managed to get that far, but the other hunter was afraid to come.

I was feeling very ill, so decided not to spend another night up there. His company was very acceptable during my journey back to the camp, which we reached the same evening. My interpreter remarked that I looked quite green. I attributed my sickness to having swallowed some solder out of the tinned goods we were constantly eating. I have no doubt that the snow water and the ice water we had to drink, and the poor bread we were eating, had something to do with it. I had also inflammation in my eyes. During previous nights, when sleeping in our fur coats in front of a big fire, we kept warm enough, but this night it was blowing a hurricane and the cold was severe—21° below freezing-point.

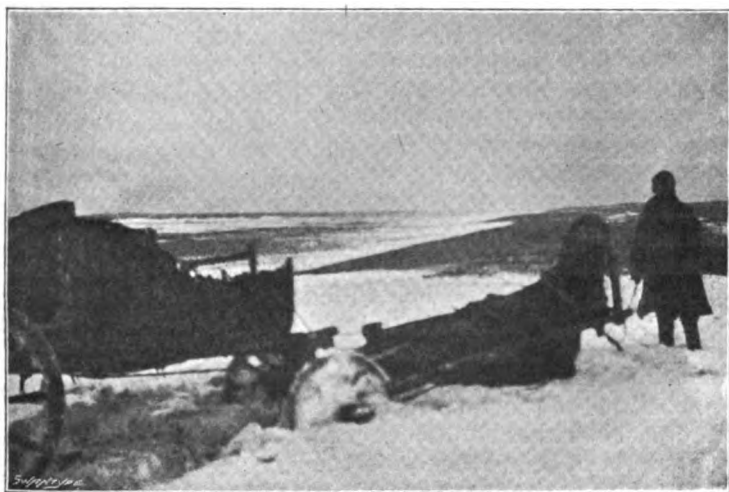
As soon as daylight appeared I gave the order to pack up, which was gladly obeyed. We rode the first ten miles through a snow storm, sheltered only by the trees. Our faces were nearly frozen by the wind. We thought of finding our former track, but the snow had obliterated all traces of this, and so we were very uncertain at times of the direction in which to travel. The horses tumbled down about thirty times during this part of our journey, and it was a pleasure to arrive back at the Kalmuk hut, where we dried our clothes and sheltered. We slept that night in our coats on the floor of the hut.

The Akkem valley is very long and narrow. It leads straight up to the Kotanski Belki, and gradually rises from 3,800 ft. to the Akkem Lake, 8,000 ft.—a rise of 4,200 ft. in forty miles. The road is through forest slopes for about thirty miles. Before my visit nobody had been here in the winter, and, considering the frozen state of these slopes, we were fortunate to get our horses to go there and back without breaking a leg or two. The Russian gentleman (Sopozinokoff) already mentioned is the only man who had been up this valley before, and his expedition was in summer, and any part of Belukha Mountain is thought inaccessible during the winter. After my experience I do not recommend exploration in the Altai Mountains in winter. The cold is then

so intense that every living thing, from bears to birds, is asleep, and we did not come across any animals except a few herds of wild goats, and a few sheep, stags, and rapcheek. I should think that the best time to make a journey in these regions would be in the month of July.

On reaching Kotanda we received quite an ovation. We were invited to dinner in many places, but had to hurry home, as the breaking up of the spring was coming and the roads were getting into a bad state.

I could fill volumes with accounts of our exciting times whilst crossing rivers, which were breaking up, and snow



THE PLEASURES OF A THAW.

heaps just melting. Of course the rivers break up at different times, according to the situation and the district. Our horses had to swim many rivers and pull the drosky after them. In some places the mud was 2 ft. deep.

As we left Kotanda the weather became very hot—up to 110° in the sun. This made the road bad all at once. Seven miles an hour is the average speed on a drosky or sledge. The quickest speed at which we travelled was sixteen miles in 3 hrs., and in one place we only managed to go twenty-three miles in 9 hrs. This was when we were nearing Biisk. From Biisk we went by the post road, and found it in fairly good condition.

The ice in the river at Barnaul was just breaking as we arrived, and was not expected to hold for more than two days. After crossing the river, we continued on the post road from Barnaul, on the W. side, until we reached the last village before arriving at Novo-Nicholaewsk. We experienced great difficulty here, as we had to cross the Obi River twice, and in crossing at Novo-Nicholaewsk we had to take to a drosky to get over the last ten yards of broken ice.

At Kourgan, where we arrived two days later, the ice was flowing down the river, and after another two days' journey we found ourselves in summer weather buying flowers at the stations, with the temperature at 98° to 100°.

There is one thing that I remarked with regard to Siberian weather, and that was that it is most erratic, the weather in one part being no indication of what it might be like in another. The Altai summer was six weeks late and that of the West Siberian district four weeks late last season.

The fauna and flora are very varied, and their examination would repay tenfold any one who would make this trip to the mountain districts. From information I gathered I find that in summer the flora of the S. Altai is magnificent.

The greatest drawback to mountaineering is the extremely hard ice. This must be met with sharper ice axes and nails than those used on the Alps.

The district I visited should become one of the most interesting exploration grounds in the world, and I hope I have led the way to further explorers by showing that even the dreaded winter of Siberia cannot keep an enthusiastic explorer out of this little known country.

NOTES FROM TIBET.

BY DOUGLAS W. FRESHFIELD.

LORD CURZON has recently forwarded to the Secretary of the Royal Geographical Society a set of thirteen photographs taken by Mr. J. Hayden, the geologist attached to the Tibetan Mission, during its stay at Khamba Jong last summer. These views have a double interest. In the first place they illustrate the account given by Sir Joseph Hooker and other travellers of the rolling uplands that extend from the top of the long staircase which leads from the plains of India up into Tibet.

Segnius irritant animos demissa per aurem
Quam quæ sunt oculis subjecta fidelibus.

These photographs should serve to persuade to an honest recognition of things as they are the ill-informed critics of the Indian Government who have imagined facts—*e.g.* 'stupendous passes'—