

ments made at the last meeting in St. James's Hall. On an occasion like that it was a strange thing that the comfort and convenience of the Fellows should have been ignored altogether. The Royal Geographical Society should have been above the ordinary system of granting patronage-tickets to the number, as he had learnt, of 500. Surely it was only becoming on the part of the officials to consider the comfort and convenience of the Fellows, who had supported the Council in their endeavours to persuade the Government to fit out the Arctic Expedition, particularly when it was remembered that amongst the Fellows there were men of advanced age, who had been treated in a manner unparalleled in the history of the Society, while ladies of position were crushed, and obliged to leave after their carriages had gone away.

The PRESIDENT said he was very unwilling to prevent any casual observation upon the Minutes, but, as no notice had been given of the question which Sir Mordaunt Wells had raised, no discussion could be permitted, except as to the accuracy or inaccuracy of the Minutes.

Sir MORDAUNT WELLS maintained that he was speaking with reference to the inaccuracy of the Minutes. The Minutes purported to be those of a Meeting of the Fellows of the Society, but substantially the last meeting was not a meeting of the Fellows of the Royal Geographical Society, and therefore the Minute was inaccurate in asserting that it was.

The PRESIDENT said he must rule that Sir Mordaunt Wells was not in order. The assertion that had been made with regard to the last meeting could not be justified, and distinct notice was given that as there were 6000 persons entitled to admission, it was physically impossible to accommodate one-half of them. This was not the occasion on which to discuss how far the Council exercised the powers given to them by the Charter, wisely or unwisely.

Sir MORDAUNT WELLS wished further to remark that, in consequence of the manner in which that meeting was held, it was quite impossible for any member of the Society to enter upon a discussion on the subject of the Arctic Expedition. The PRESIDENT said that, again, was not a subject for consideration upon this occasion.

Sir MORDAUNT WELLS said that if the President ruled that he could not speak to the Minutes in that respect, of course he must bow to such a decision; but he begged most respectfully, on the part of many of the Fellows not present, to protest against the system that was adopted at the last meeting.

The PRESIDENT said the paper to be read was one of very considerable interest. It related to some Russian Expeditions of a semi-scientific character, accompanied by flying columns of troops, into Central Asia, on the borders of Turkistan by the Alai Mountains and the Pamir, and it raised a geographical question which went back as far as the days of Ptolemy. The paper consisted chiefly of a translation of the accounts rendered by the officers in command.

The following Paper was read:—

The Russian Expedition to the Alai and Pamir in 1876.

By ROBERT MICHELL.

[ABSTRACT.]

CAPTAIN KOSTENKO'S ACCOUNT.*

THE scientific members of the expedition left Gulsha on the 31st of July (N.S.), overtaking the military force at Kizyl-Kurgan.

From Kizyl-Kurgan the road continued to zigzag, for the most

* From the 'Russian Invalid,' Nos. 206, 211, 229, 235, 239, 244, 250, October and November, 1876.

part, along high mountain-ledges. The frail, trembling bridges, suspended over the chasms, occasioned no small trepidation, although the men and horses passed in single file, and at a respectful distance one from the other. For an extent of about five miles, the men had to scramble over rocks and mountain sides, losing, however, only one pack-horse, which tumbled down a precipice.

The route lay up the valley of the Gulsha River.

At Sofi-Kurgan, a former Kokand fort, the road diverges to the Terek Davan (pass); the mountains forming the Gulsha defile lose in height from Sofi-Kurgan.

Towards the end of the second march the detachment emerged from the Gulsha defile, and crossed a small mountain range of soft clay (Kizyl-Kurt), halting for the night at the foot of it, by the margin of the bed of the Gulsha. The camp was pitched in a picturesque spot, after a march of nearly 19 miles.

On the 10th of August, the force struck camp at the Kizyl-Kurt, and proceeded to the Archat defile.

The first five miles of road from the Kizyl-Kurt were easy, after which came the pass over the Archat Mountains. This range is exceedingly steep, the crest of the pass is only one mile from the base, and 1500 feet above it. According to barometrical measurement, the absolute height of the pass is 10,800 feet. The peaks on either side, by measurement with the sextant, attain 13,000 feet.

The Taldyk Pass, further west, is considerably less steep, and may, therefore, more easily be adapted for wheeled carriages.

A magnificent panorama opens to the view from the top of the pass. In the foreground is the Alai Plateau, beyond it rises the Trans-Alai mountain range, screening from sight the least-known portion of the Pamir.

The valley, or rather the high table-land of the Kizyl-Su River, which lay at the bottom of the pass, is skirted on the south by a grand mountain chain, snow-capped throughout its entire extent. Almost directly opposite the Pass rises the peak which Mr. Fedchenko called Kaufmann Peak, in honour of the Governor-General of Turkistan.

The descent from the *Archat Pass* * to the Kizyl-Su Valley, is only 6 miles long. A rivulet runs parallel with the defile, through which lies the descent, and the slopes on both sides are completely bare, while the hollow and the river, and the bottom of the valley

* Probably the same as that named *Shart* on our maps.—R. M.

are fringed and carpeted with a tall, thick and succulent grass variegated with flowers.

Crossing some narrow dry troughs, the detachment came to a halt for the night, at a distance of about 2 miles from the Kizyl-Su, by the side of a small river called the Kitchkene-Kizyl-Su, equally red in colour. The elevation of the ground here is 9300 feet.

On the 11th of August, the detachment marched in a south-easterly direction, to the base of the Trans-Alai Range.

The breadth of the Alai Plain in the section thus traversed is $11\frac{1}{2}$ miles.

The halt was in the sub-alpine zone, on the north side of the Trans-Alai Mountains.

From this position the troops marched 18 miles, to the summit of the pass. There is a small lake beyond the range, called Kizyl-Kul,* which is probably the source of the Kizyl-Daria, an affluent of the Kashgar River.

After crossing a second range of inferior altitude, the Russian detachment came in sight of a large lake—the Kara-Kul—lying within 48 miles of the northern base of the Trans-Alai Mountains. The plateau is surrounded by high snowy mountains. The water of the lake was azure; an island was observable in the middle of it. The surface appeared to be slightly frozen. According to the guides, Kashgar was distant only a leisurely ride of 6 days.

Captain Kostenko, who was sent on a-head to join a detachment which had preceded the main column on its way to Kara-Kul Lake, describes the way up to the Great Kizyl-Yart Pass from the north side, as follows:—

“ We marched out of camp at 9 P.M., when it was pitch-dark, proceeding slowly and carefully, and trusting principally to the instincts of the horses to pass safely over the broken ground, for, although the furrows were not deep, their margins were like those of fissures, and the ground was also riddled by marmots. A ride of not quite 5 miles over the Alai Plateau brought the troop to the Kizyl-Yart defile in the Trans-Alai Mountains, which is formed by a stream of the same name flowing in several channels through the southern portion of the defile in a smooth hollow, so thickly studded with boulders that the horses were obliged to tread with great circumspection. Turning to the left, up an affluent of the main stream, and proceeding up the second or upper portion of the defile, it was found that the obstruction caused by these

* Red Lake,

boulders was still greater. Fortunately, however, the moon rose before the troop filed into this rock-strewn gorge. The top of the Kizyl-Yart Pass is 17 miles from the mouth of the defile. The road may be easily made available for wheeled carriages, by removing the stones which block the bed of the river and cover the mountain-slopes and the pass itself. The defile is particularly wild and desolate near the pass, the summit of which is at an elevation of 11,700 feet.

“From the summit of the pass a view is obtained of the Pamir generally, and in particular of the Pamir *Hargashi** (of Hares), in the southern portion of which lies Kara-Kul Lake.

“A mass of bare mountains, mostly snow-capped, stretching in various directions, also open to the view, and these seem to be intersected by more or less wide valleys and gorges, as denuded of vegetation as the mountains. The descent from the pass is easy and convenient, and is only $1\frac{1}{2}$ mile long, when it terminates in the wide bed of a mountain-stream, called Kurrun-Sai (dry-bed). Notwithstanding this appellation, a stream runs here in a direction from south to north. On the Pamir side the foot of the pass stands on an elevation of 11,000 feet. The long and wide bed of the Kurrun-Sai merges into the very long Zak Valley, which extends from east to west.

“This valley has a width of about $1\frac{1}{2}$ mile. Throughout its entire extent it is covered with boulders or with sand. The series of mountains enclosing the valley do not reach the height of perpetual snow; they are bare and rocky, composed of argillaceous sandstone, and wholly covered with detritus. At right angles with this valley the mountains are broken by transverse valleys. Through the breaks in these mountains (12,000 to 13,000 feet high) snow-capped mountains are visible to right and left. The valley extends 13 miles, gradually rising to the east and terminating in low ridges of conglomerate. Here an elevation is attained of 17,000 feet. From the summit of the pass over these mountains † the descent is into the hollow of the Kara-Kul Lake, and the eye takes in the wide basin of the lake, encircled by mountains.

“These latter mountains are mostly snow-capped, especially those to the east; and it is only on the west and north sides that a break in the snow-line is observable.

“The aspect of the hollow, with the large azure lake and its elevated islands, is very grand.”

* Abdul Medjid's Khurgashee.

† The range of inferior altitude previously alluded to.

After a gradual descent of 8 miles, the troop halted by the bank of a small stream flowing into Kara-Kul Lake, within $1\frac{1}{2}$ mile of its mouth.

On the following day (15th of August) Captain Kostenko made an excursion to the island.

A considerable portion of Kara-Kul Lake is occupied by islands and by necks of land having the appearance of a high longitudinal ridge, intersecting the lake from north to south. The largest of the islands adjoins the north shore, being connected with it by a streak of land, like a bridge, about 250 fathoms long and 10 fathoms wide. This streak is considerably raised, being formed by a deposit of sand, brought by the prevailing north wind.

The island is $5\frac{1}{2}$ miles long by $2\frac{3}{4}$ miles broad, and consists of sand-hillocks, covered with fragments of mica-schist, like flattened skulls. Large masses of this schist project here and there from the tops of the hillocks, being set up almost vertically. The hillocks rise about 600 or 700 feet above the lake, so that both sides of the lake are visible from their tops.

A rude piercing wind blows daily from the north, beginning at 2 or 3 P.M. The hard sandstone exposed to this wind is strangely affected by it. Some of the rocks are perfectly drilled.

A magnificent scene opens to the view from the elevations on the island. The mountain circle seems to spring directly from out of the water, proudly looking at its own reflection in the glassy lake, whose blue waters lave the feet of the heights. In a direction due south, and in prolongation of the island, stretches a high sandy ridge, divided by a strait $\frac{1}{2}$ mile wide by $3\frac{1}{2}$ miles long. This ridge was apparently once an island, but is now a promontory.

The situation gives the idea of a gigantic crater, now filled with water. The snow-wreath of this crater was incomplete only at one point, but this hiatus was filled by a snow-capped range in the background.

Being separated by the above-mentioned ridge, the lake consists of two sheets of water—eastern and western, connected by means of the strait. The length of the lake is $14\frac{3}{4}$ miles from north to south, and the breadth along a line drawn through the strait is $11\frac{1}{2}$ miles from east to west.

The lake has not a single outlet, but, on the other hand, it receives several streams issuing from the mountains, all of which are fordable. The lake had evidently extended some way up the flats through which these rivers run, and in some places the margin of the lake is $6\frac{3}{4}$ miles from the bases of the mountains, on the eastern side, while in some this is reduced to shorter distances.

On the western side the mountains rise from the water's edge, projecting in the shape of capes. Owing to this, one has to ascend and descend the spurs on the western side in order to pass round the lake. The approach to the lake is easy; the soil is sandy. The water is exceedingly cool and clear, even when agitated. To the taste it is somewhat bitter, so that, when thirsty, horses can very well drink it. There are fish in the lake, many little ones having been seen in the shallows. The great number of water-fowl skimming the surface also proves the presence of fish in the water.

The flat beach along the courses of the tributary streams is covered with a thin, but nourishing grass, which affords sufficient, if not abundant, food for beasts.

On the 18th of August, Captain Kostenko started on an exploring expedition to Lake Riang-Kul,* "in the Sarikol district," towards the Kashgar boundary. The situation of the lake and of the district was roughly ascertained from a native, but the Russian party went on without a guide. Provisions were taken for three days, and the party rode out at 10 A.M., marching along the eastern margin of Lake Kara-Kul.

The road passed over a wide plain between the lake and the base of a snowy range which borders it. This plain was about 4 miles wide, narrowing at one point to $1\frac{1}{2}$ mile.

After marching 16 miles and crossing several streams running into the Kara-Kul, the party put up for the night in a defile emitting one of these streams.

On the 19th of August, Captain Kostenko kept to the plain for about 3 miles further, and then turned into Ala-baital defile. The route lay up the head of the rivulet, which, in some places, ran underground. The defile, scattered with boulders, had a smooth ascent which grows steeper the further one advances. The summit of the pass is 4 miles from the entrance into the defile; the pass is 12,000 feet high. The mountain-sides of the defile, as well as the pass, are composed of soft substances covered in every part with fragments of schist.

A steep descent of $3\frac{1}{2}$ miles brought the party down into the valley of the Chon-Su, at the point of its confluence with an affluent called the Uzbél-Su.

The valley of the Chon-Su † is about 2 miles wide, and it extends from south-east to north-west.

The valley of the Uzbél-Su, the right affluent of the Chon-Su, opens into the main valley at an obtuse angle within $13\frac{1}{2}$ miles of

* Little Kara-Kul (?).

† Big River.

the outflow of the Chon-Su, so that the lower course of the latter is at the same time a continuation of the Uzbel-Su. Lower down the Chon-Su turns abruptly, and falls into the Kara-Kul at its southern extremity.

Having halted at the point of the confluence of these two rivers, Captain Kostenko followed up the course of the first named, going due east. This river has the character of all mountain-streams, and runs a course of 20 miles without any deviation from its general direction. In its lower course it is confined by mountains of an inferior height, which are composed of red clay and conglomerate, the road being obstructed by boulders and stones. The mountain-chains to right and left rise 2000 and 3000 feet above the valley; those, however, skirting the valley on the left or south side are somewhat more elevated, attaining a height of from 15,000 to 16,000 feet, and so rising above the snow-line.

The party advanced for the most part along a beaten path, which was taken to represent the high road from the Alai by Kara-Kul to Sarikol and to the Kashgar confines.

The mountain-ranges on either side of the Uzbel-Su Valley unite at the sources of that river, and so form the Uzbel Pass, separating the basin of the Kara-Kul from that of the Sarikol, and generally speaking from the rivers forming the Tarim-gol.

Two magnificent views are obtained from the summit of the Uzbel Pass, which is 12,500 feet above sea-level; one towards the west, with the entire valley of the Uzbel-Su clearly defined, and of the lower course of the Chon-Su, terminating with a snow-capped range of 16,000 to 18,000 feet in height, and closed as by a crenellated wall.

In front, towards the east, lies the valley of one of the sources of the Kashgar Daria. This high valley, like that of the Chon-Su, is skirted by mountains of no great height, those on the right or south side being again higher than those on the left, and in some parts capped with snow.

This valley, a long way ahead, seemed barred by a grand mountain-range, rising considerably above the snow-line. This is, doubtless, the range mentioned by Colonel Yule in his sketch of the geography and history of the sources of the Oxus,* which forms the eastern boundary of the Pamir Plateau, separating the latter from Eastern Turkistan.

Referring to this range, Colonel Yule says that its peaks rise to an elevation of 20,000 to 21,000 feet. The distance from Uzbel

* Vide new edition of Wood's 'Oxus,'—Introduction.

Pass to this mountain-range is about 53 miles. Beyond it lies Kashgar, 40 miles further.

Captain Kostenko observes, that, as he has actually seen this great snowy range of mountains, one of the most important questions of the geography of Central Asia—that is, the question of Humboldt's meridional Bolor Range—may be considered as settled. He proceeds to say:—

“In recent times Russian travellers—first Severtsof and Fedchenko, and then Englishmen—denied the existence of this mountain-chain, arguing that the Thian-Shan and Himalaya systems combined to form the massy elevation which Humboldt took for a meridional range. It was the opinion of these explorers that the connection of the two gigantic mountain-systems was by means of a series of ranges mainly extending from east to west. Fedchenko, who visited the Ferganah Valley, the Alai Mountains and the Alai Plateau in 1871, came to the conclusion that the construction of the Pamir was similar to that of the tracts which he had seen, *i. e.*, that it was composed of longitudinal valleys skirted by mountains running parallel; and he positively denied the existence of meridional ranges. We have found,” says Captain Kostenko, “that the Pamir is very differently constructed; and having seen the meridional range with my own eyes from the top of Uzbek Pass, and made a discovery which is an important acquisition to geographical science, the range might very properly be called ‘Constantine,’ in honour of the august patron of geographical science in Russia.”

The distance from Uzbek Pass to the small Riangu-Kul Lake was held to be three “tash” = 16 miles, and from the latter to Sarikol, $1\frac{1}{2}$ tash, or 8 miles.

The name *Sarikol*, meaning “yellow-hand,”* is conferred on a locality including a valley and a river. The natives asserted that the valley was occupied by a considerable number of nomads.

The stream, pouring down eastwards from Uzbek Pass, falls in with another at the foot of the pass, forming a tolerably large river, which is said to flow through Riangu-Kul Lake, and to run thence into the Kashgar dominions, under the name of Sarikol. This, however, requires further confirmation.

The party returned to camp on the Kara-Kul on the 21st of August, by way of the little Chon-Su defile. This road was found much more convenient, and not at all longer than that over the Ala-baital Pass.

* Colonel Gordon interprets it “head of the mountain,” “Sir-i-Koh.”

On emerging from the defile the party turned to the right, leaving on their left the high road to Badakhshan. There are three roads diverging from the mouth of this defile, viz., one to Badakhshan, another to Kokand (over the Kizyl-Yart), and a third to Kashgar (over the Uzbek Pass). The Kara-Kul was reached at 3 P.M., and on the same day the whole of the detachment started back to the Alai to rejoin the main force, camping at Archa-bulak, at the southern base of the Alai Mountains, within about 13 miles of the mouth of the Kizyl-Yart defile.

A Russian cavalry troop, led by Prince Witgenstein, had preceded Captain Kostenko up the Chon-Su River, returning to Kara-Kul by way of the Tuyuk-Su Pass, over the snowy range. It was ascertained by the Prince, that the Aksu-Murghab flows 53 miles in a south-easterly direction, beyond that pass, after which the river emerges on a wide elevated plateau, known by the name of Ak-baital,† which means "White Mare." The extent of this plateau was said to be so great, that the mountain ranges which skirt it are not visible from the centre; and it is said to be traversed by a large and wide river called the Kara-daria, and by a road leading to Kashgar and to Afghanistan.

The following general observations are made by Captain Kostenko on that portion of the Pamir which he visited.

The Trans-Alai Mountains, having the appearance of an immense white-crested wall, limit the Pamir on the north. Beyond this range* extends a high land gradually rising towards the centre. This high land is in all directions intersected by mountain ranges, some of which are snow-capped, others not; but generally speaking, having only a small elevation above the adjoining valleys and plain surfaces. The plains and valleys, or hollows, do not extend in any one particular direction, and in most cases they are not wide, say two miles. The valleys, as well as the mountain-slopes, are bare; they have neither trees, brushwood, nor grass. Small strips or patches of grass occur only along the courses of the mountain-streams; and this grass is in some places thick and succulent, affording food for the cattle of the nomads.

The mountains being of a soft formation, all the passes are comparatively low and easy. The streams, pouring down from no great altitudes, offer no impediment. Generally speaking, the roads on the Pamir are very easy in all parts; the ground is either sandy and stony, argillaceous, sandy salinous, or simply salinous. Where the salines have got dry, the ground is covered with a

* Mentioned in Abdul Medjid's Itinerary.

† Southwards.

thick layer of magnesium which glistens like snow. Occasionally one falls in with moist places, covered with a thick, but not tall grass, and wherever the ground is soft enough to retain impressions, one may observe the tracks of wild beasts.

There are neither bears, nor tigers, nor wild yaks on that portion of the Pamir which the Russians visited.

Returning from the Pamir to the Alai, that is, descending from an elevation of 11,000 or 12,000 feet to 8300 feet, the position at Archa-bulak, the Russians experienced great relief; they all felt as though they had lost a load from their shoulders; their breathing became more regular, and they felt generally in better spirits.

On the 28th of August, a portion of the Alai military column was moved from the position at Archa-bulak, to the late Kokand fort Daraùt-Kurgan,* along the Kizyl-Su River. This detachment marched all the way along the right bank of the river, skirting the base of the Alai range, which in no part attained the height of the snow-line, so that these mountains may be said to have an elevation of about 13,000 to 13,500 feet. The Trans-Alai Range, on the other hand, is snow-capped throughout its whole extent; but when the detachment passed, this range was enveloped in a dry mist, in reference to which Captain Kostenko observes that it is a common phenomenon in Kokand, and on the Pamir. He says that the mist is occasioned by a current of air in an upward direction, when an extremely fine dust is raised which subsequently carpets the whole neighbourhood.†

Daraùt-Kurgan is situated on the right bank of the Kizyl-Su, at the mouth of the Isfairam defile, through which runs the Daraùt-Su. The detachment took up a position a little below the fort at an elevation of 7400 feet above sea-level.

On the 30th of August, a troop was sent up the Tuz-Altyn-Dara,‡ in order to reduce to obedience the Itchkilik Kirghiz, who evaded the Russian force on the Alai.

The road up this river follows its right bank, but there is a practicable way along the left bank also.

The head-water of this river is remarkable as giving rise to another stream flowing in a diametrically opposite direction. The

* Also occurring in Abdul Medjid's Itinerary.

† It was, perhaps, the prevalence of these mists that gave rise to the expression "Cimmerian darkness;" and Scythia was anciently called Cimmerian.—Rennell's 'Herodotus.'

‡ The river is called "Tuz," after the quarries of rock-salt about 7 miles below the river-mouth.

Ters-Agar streamlet, falling from a snow-capped summit in the left or western range, divides into two at the base of the mountain, one flowing northwards, which forms the above-mentioned Tuz-Altyn-Dara, and the other running due south, preserving the name of Ters-Agar, and reaching the large Muk-Su River. In this way the defile and the source are common to both streams. The pass is almost imperceptible to the eye; its absolute height is 9700 feet above sea-level.

The troop camped on the pass, and resumed its march before day-break on the 31st of August.

Following the gentle decline of the defile 3 miles, the stream tumbles sheer into the deep and clearly-defined valley of the large Muk-Su River. The view of the Muk-Su Valley, and of the gigantic snowy range closing it in on the south, is the most beautiful and the grandest that can be imagined. The picture is changed as by the wand of a magician, and you suddenly behold a deep cavity, in the shape of a leviathan trough, with a smooth surface at bottom, covered with boulders, through which the Muk-Su rushes impetuously in innumerable branches. The trough lies between high, rocky, and precipitous mountains, those on the south being at that time covered with snow over two-thirds of their height. Several peaks project from this range, which the natives call Goh; some of them attaining a height of at least 25,000 feet. Two glaciers are suspended from the top of this mountain-range, reaching the valley below. Numerous milk-white streamlets purl down from under the glaciers. A third glacier clings to the side of a short range which borders the valley on the east.

The northern range has a height of from 14,000 to 15,000 feet, being covered with snow only in parts. It is less steep than the other, and a pathway has been formed over its crumbling side, by which Captain Kostenko descended into the valley of the Muk-Su. The northern confine of the valley from which the path begins to descend is 9500 feet above sea-level. This path zig-zags between large stones scattered over the detritus, and is three miles long. Vegetation occurs here and there on the declivity, represented by the Archa* and by a few very poor little birch-trees.

The bottom of the Muk-Su Valley is not wholly covered with boulders. At the bases of the northern range there are streaks of land overgrown with copses of willow, briar, and other thickets. These copses are irrigated either by springs, overflows of the Muk-Su, or by rills from the mountains, and are called "tuga."

* *Juniperis pseudo Sabinus.*

They stretch at intervals of about a quarter of a mile, and mainly afford the Kara-Kirghiz (Itchkilikis) that shelter and means of existence which they seek.

The Muk-Su is a large body of water, and is not fordable. The head of the river may be said to be at the spot where Captain Kostenko came down into the valley, being formed by the confluence of several streams viz., the Sel-Sai, the largest of them, which pierces through the southern range (Goh), and flows in a north-western direction; the Kouindy, which flows west; the Suk-Sai, which falls into the Muk-Su, bearing a course towards the south-west; and finally, the above-mentioned Ters-Agar, which comes in from the north. The valley of the Muk-Su extends from east to west, with a slight southing (5°).

This valley preserves the same character for 27 miles, as far as the Hoja-t-*ab* "tuga," after which it contracts, and the road passes over the mountains, where the path, according to the natives, is not practicable to horsemen, on account of the boulders. The river passes into Karateghin, where it joins the Kizyl-Su, and combines in forming the Surkh-*ab* affluent of the Oxus.

Captain Kostenko claims to be the first European who has obtained a sight of the head-waters of the Muk-Su River. The valleys of the Kizyl-Su and of the Muk-Su are totally different in character. The first-named river is much longer than the second, and right up to the Karateghin territories it flows through a valley widening out $13\frac{1}{2}$ miles, and carpeted with grass over its whole extent. The river is not deep, and is fordable at all points as far as Darat-Kurghan, *i. e.* throughout a length of 67 miles.

The Muk-Su, on the other hand, has not so great a length, but is a larger body of water, and is not fordable. The valley of this river is much narrower, and is walled in by wild, almost precipitous mountains, the bottom of the valley is mostly covered with boulders; the colour of the water is opaque from its lime-bed. The bottom of this valley at the point to which Captain Kostenko descended is 8100 feet above sea-level.

It is difficult to determine which of these two rivers is to be taken as the main head-water of the Surkh-*ab*. It were, perhaps, more correct to state that the Kizyl-Su and the Muk-Su equally combine within the Karateghin territories to form the great river, which flows into the Oxus.

On the 5th of September, the entire force was moved towards Great Karamuk.* The road to Great Karamuk—19 miles—follows

* Abdul Medjid evidently passed here and up the Kok-Su, over the Tarak (comb) Pass, into Kokand.

the right bank of the Kizyl-Su. After narrowing to the dimensions of a defile in the vicinity of Daraùt, the valley widens, and the river, receiving a large quantity of water from the mountains, is not fordable below the mouth of the Kok-Su—10 miles below Daraùt-Kurgan.* It runs in a great number of arms, the principal stream being from 70 to 105 feet wide, with a very rapid current.

Here the mountains decline; the rich meadows in this locality attract masses of Kirghiz, whose winter quarters are scattered all over the place. The river is fringed with trees. On the southwest the valley is bounded by low mountains, with a pass, which is visible from Karamuk. The Russian force encamped at the foot of these mountains. Here the valley is 6900 feet above sea-level.

The shortest and most convenient road from Karamuk to Kokand lies up the Kok-Su River (right affluent of the Kizyl-Su). In order to enter the valley of the Kok-Su from Karamuk, it is necessary to traverse a pass over the Gurundu Mountains, which are of no great height, and which are a spur of the main Alai Range. The most direct route into the Kok-Su Valley, over the Gurundu, is about 12½ miles, of which 6½ miles are taken up in the ascent, the remaining 6 miles being descent. The road first conducts over the terraced bank of the Kizyl-Su, which is under cultivation for barley and wheat, and then leads into the wide Djeniké defile, through which runs a stream of the same name, falling into the Kizyl-Su, on the right. A series of Kirghiz winter habitations stretches through the defile. Notwithstanding the squalid aspect of these habitations, the evidences of man's presence is gladdening. Here the picture is embellished with fields of wheat, barley, and lucerne (*djenushka*), and each hut is distinguished by one, two, or three willow-trees or poplars, which give building material, such as poles for ceiling, logs for doors, &c. A peep into any one of these hovels impresses one very painfully with the wretchedness of Kirghiz life; they are more like pigsties than habitations for man; and yet a sight of a Kirghiz settlement is a great relief to the eye. We see here, at all events, an attempt to pass from a wandering life to a settled form of existence, and anything in the form of a dwelling is pleasing to behold.

The pass over the Gurundu is not difficult; the mountains are of soft formation, and are not steep. The summit of the pass is at an elevation of 9509 feet. The descent is equally easy, but the

* Below this fort the Daah-ti-Alai (Alai Steppe) comes to an end, and the locality is simply that of the Alai.

bottom of the defile being choked with stones, which have rolled down, the road passes over a rugged surface. The stream falling into the Kok-Su, disappears under these piles of stones, and emerges only at its mouth.

On the 11th September Captain Kostenko advanced at 8 A.M. to Kara-Kazyk Pass. The pass leads all the way over piles of stones which have fallen from the rocky sides of the Kara-Kazyk defile. These sides are precipitous and grand. In some places they overhang the path. The torrent sweeps, with a tumultuous noise, over the obstructing boulders, and near its mouth it falls in picturesque cascades. The wildness and imposing grandeur of the scenery in the defile increases as one ascends the course of the torrent. The rocks are steeper, and the peaks more pointed; the path, however, does not lead by any dangerous ledges, but runs over a soft soil. Within 2 miles of the summit of the pass, there is a very steep ascent to the top of the main ridge, and the path is zigzaggy. The pass was covered with snow, which lay on the mountain sides, 2 miles below the crest. The reflection of the light was blinding. For pack-animals and for weak horses this pass is somewhat dangerous, as was evidenced by many a carcass lying in the precipices. The summit of the pass is at a height of 12,600 feet; the crest is very narrow, having the appearance of a wall about 28 inches thick. It is formed by a sort of opening (about 35 or 42 feet wide) between a couple of peaks cloven into a comb shape. The crest of the *Tarak* in the Alai Range, further west, is probably the same, *tarak* meaning comb.

The Kara-Kazyk Pass has received its name from a high peak visible to the left, which, in some degree, bears a resemblance to a stake (*kazyk*). Kara-Kazyk signifies black-stake. The view from the top of the pass is very striking by its wild grandeur. A mass of rocky ridges and peaks, crowded together in the greatest disorder, form a remarkable picture of dreadful chaos. Some of these ridges and peaks wore, as it were, a shroud of snow, which glared most painfully in the sun; those on the north were as yet free from snow, and wore a greyish or brown hue.

Shah-i-Mardan, which Captain Kostenko reached on the night of the 11th of September, is celebrated for the loveliness of its situation. It nestles in a pretty spot at the opening of several defiles, and as it is not confined by high mountains, the view from Shah-i-Mardan is varied and charming.

The beauty of the scene is greatly enhanced by the animation imparted to it by a scattering of hamlets, and by fields and gardens in the hollow of the river, and on the undulations.

It may not be difficult to imagine the effect produced, after a long sojourn in a wilderness occupied by nomads alone, by the aspect of this lovely settlement, the houses of which were drowned in a sea of gardens with towering spiral poplars.

From Shah-i-Mardan Captain Kostenko proceeded, on the 13th of September, to Vadil. The road follows the left bank of the stream. The mountains decrease in height very considerably, and the defile is tolerably wide. A continuous chain of hamlets stretches from Shah-i-Mardan to Vadil, 15 miles, in the hollow; there is a break only within a short distance of Vadil, where the rocky mountains close in, and where the road passes over broad ledges. It is a cart-road all the way. At Vadil the mountains fall away much more, and the defile comes to an end, so that Vadil blocks the entrance.

Vadil is in the Ferghana Valley, and is the first populated place of large dimensions at which one arrives coming from the Alai. It is situated at a height of 3000 feet, and lies embedded in a mass of luxuriant and shady gardens.

[The Paper will be published *in extenso*, in the 'Journal,' vol. xlvii, accompanied by an emended table of elevations by Captain Kostenko.]

Colonel H. YULE said the Russians seemed to attach a great deal of importance to the discovery of the so-called meridional range, but Lieutenant Hayward had described the same mountains seven or eight years ago, and, after him, Captain Trotter stated that the eastern portion of the Pamir was bordered by a very high, snowy chain of mountains, running from north to south. The Russian Expedition had attached a factitious importance to this, recalling the ideas of Humboldt, and going back to the views of Ptolemy, and they proposed to call the range, after the great patron of Geographical science in Russia, the Constantine Range; but if it had to be called after the great pillar of geographical science at the time of its discovery, it should rather have the name of Roderick or Henry! It was said in the paper that Ptolemy described the Imäus as a meridional range (*i. e.*, running from north to south), and as distinct from the mountains to the south and north of it; but the fact was that Ptolemy's authority, so far as it went, was just the other way. Ptolemy called all the mountainous region by the same name—"Imäus"—which was merely a Grecising of the word Himalaya, or whatever was the form of that name in his day. The real, prominent distinction between these two parts of the great elevation of Central Asia was not physical, but historical. The Himalayas proper had been in all history the great impassable barrier between Central Asia and India, while the Pamir had been the great *col* or hill-passage between Western and Eastern Asia—between Asia inhabited by Persian and Turkish races, and Asia inhabited by the races from time to time subject to the Chinese Empire. In fact the Pamir was a sort of sea-wall, against which the ocean of Chinese domination had beaten again and again in the course of the last three thousand years. What Ptolemy said about it was probably the most interesting part in the dry bones of his geographical tables. In the introduction to his Geography, when discussing the length of the habitable earth, not having many data at hand, he quoted the account of the journey of a certain Macedonian merchant,

Mæus Titianus, who went to China for silk. Mr. Michell alluded to this, and spoke of the approach to Kashgar as having been from the north. That was an old idea, but an entirely mistaken one. Of late years a perfect key had been discovered to this journey of Ptolemy's merchant, for he mentioned that after leaving Bactra (or Balkh) they travelled somewhat to the north, and entered the hill-country of the Comedæ. It was now known from the Chinese travellers, who had been translated by the great French scholars within the last twenty or thirty years, where the exact position of the Comedæ was. The district was described as having Shignan to the south, Khotlan to the west, and the Oxus along the south-west. The position of London on the Thames could not be described more exactly, and that fixed the position of the Comedæ in what was now Darwaz and Roshan. From the hill-country of the Comedæ the merchant went somewhat to the south, and then turned up a great gorge which led him to the "stone tower," traces of which would probably be found when the hill-country of Shignan was better known. Thence he crossed the Imäus into the empire of China. So far, then, as Ptolemy's authority bore on the physical history of this isthmus of mountains, it was in favour of its identification with the Himalya; though his authority in that respect was not worth much. The Russians, too, seemed to desire to return to the old name of Bolor. Their proof of the name seemed to be something like Jack Cade's proof of his Mortimer ancestry. His putative father being a bricklayer, Jack's friend Smith, the weaver, says, "Yes, and he built the chimney of my father's house, and the very bricks are there to this day to testify thereof: therefore deny it not!" The name "Bolor" arose entirely out of a mistake, and he hoped it would not be used again, merely because it had been found that there was a range of mountains running from north to south.

One thing further he would remark, that had struck him in connection with the name of the Muk-Su, which the Russians had described as a tributary of the Surkhab, the great northern branch of the Oxus, because it curiously illustrated how different was the fate of truth and falsehood. In that fictitious narrative which caused so much discussion some years ago, this region was crossed and recrossed by an imaginary traveller who gave many names. Since then new names had been learnt and old ones recovered, but none of the names mentioned by the German traveller had been recovered. The name "Muk," however, occurred in the history of the Mogul Emperors. The Emperor Humayun had a rebellious brother who was sent into banishment, and made Nawab, or whatever it was, of Karategin and *Muk*. Probably that name of Muk had hardly ever been heard since the sixteenth century until within the last two or three years. Thus the real name turned up in the real country, while the false names were heard of no more.

Sir H. RAWLINSON said he had very little to add to what Colonel Yule had said. There were a few points upon which he did not entirely agree with Colonel Yule, but generally he was in accord with him upon this subject. His recent inquiries had led him to the conclusion that the real route of Ptolemy's merchant was up the Surkhab. All the late Russian surveys had been in the north-east portion of the Pamir, about one-third of which they had crossed, and their approach in that direction had not unnaturally excited a good deal of interest, and perhaps apprehension, in India; but he thought the result of the survey had been to show that that line of country was quite impassable by an army; though it was an easy enough country for the Kirghiz to pass over. He felt bound also to protest against the idea that the Kirghiz were of Aryan derivation. If ever there was a pure Turanian race it was the Kirghiz; and the notion of their being Aryans was one of Klaproth's paradoxes, like his fable of the identity of the Irrawaddy with the great river of Thibet. These Kirghiz now possessed the whole of the Pamir, and found

it very easy to travel over in all directions, but it could not be crossed by an army. It contained, indeed, no supplies whatever except herbage in summer. If ever the Russians approached the Valley of the Oxus—which was a very rich and attractive country—it would most assuredly be by the line of the Surkhab or the great Wakhsh River, and not by the Pamir. Perhaps he would rather surprise Colonel Yule when he stated that he believed that was Ptolemy's old route, and that the famous stone tower would probably be found somewhere in Karategin; in fact it might be the same as the Rasht of the geographers, which for many centuries was the limit of the Mohammedan world. Waahgird, which was the capital of this region, was, he believed, at Fyzabad, where there was a river—the Ilek—along which passed the route from Waahgird towards Rasht, which latter site would probably be found at Garm. In Timour's campaigns, when they wished to pass from Hissar to Mogulistan, they invariably went up this river, and Baber did the same. Karategin was first mentioned in the wars of Timour, the name being derived from Karategin, a local chief who, under the Samanides, was governor of that country, and who died at Bost, in A.H. 317, and was buried at Isfijáb in the famous Robot Karategin. He believed there was a European still living—Colonel Gardiner—who had actually crossed from the Valley of the Oxus into the Alai, along the course of the Surkhab or Wakhsh. In the biography, at any rate, of that extraordinary man, which was published by Sir Henry Durand in the 'Friend of India,' some ten or twelve years ago, it was stated that Colonel Gardiner did actually pass from Badakhshan through Darwaz to the Alai, and if that were so, he ought to have information concerning those countries of the greatest value; but his papers were in such a confused and unintelligible state that nothing worth geographical discussion had ever yet been recovered from them. No doubt the questions of physical geography which arose in consequence of these Russian discoveries were important, but he quite agreed with Colonel Yule that there was nothing very new about them. The so-called meridional range was, he believed, not meridional, but slanted off to the west. Neither was it a separate range, but merely the series of eastern culminating points of the ranges which transected Pamir, and of which the Alai and Trans-Alai were branches.

Sir DOUGLAS FORSYTH said he exceedingly regretted that Captain Trotter, who was more competent than any other Englishman to speak on the subject before the meeting, was not present, but in a short time he would read a paper upon it. He did not want to say much about Ptolemy; in fact he was rather afraid to touch the subject at all, but Heeren, in his 'Researches on Asiatic History,' suggested that between Kasghar and Kokand, over the Terek Pass, and so on to Samarcand was the great route by which the trade from China passed to the west; and certainly the traders would take that route if they were wise, for it was decidedly the easiest.

Sir H. RAWLINSON said that Ptolemy's line passed through Balkh.

Sir DOUGLAS FORSYTH replied that it also went to Samarcand.

Colonel YULE: Never.

Sir DOUGLAS FORSYTH was of opinion that one route did, and went to Kasghar, though it was not Ptolemy's. The officers connected with his mission went from Yangi Hissar across the Pamir to Wood's lake, down to Kilapunja, and back to Yarkand. Captain Kostenko saw the meridional range for a day or two, considered he had discovered it, and called it after the Grand Duke Constantine; but the English Mission at Kasghar before then saw it day after day for about six months, and did not attempt to give it a name; but they learned the actual names of the different peaks. The range was not in so straight a line as it appeared on the map. One peak called Chishtagh was about 26,000 feet high, and another, the Tagarma, about 23,500 feet.

Sir DOUGLAS described, with the aid of the wall-map, the course which the

range took, and said he believed the smaller Kara-Kul was the head of the Yaman-Yar. The Russian travellers spoke of the larger Kara-Kul as having no outlet of any kind, and that matter had given him a great deal of trouble. Everybody he asked about it told him a different story. Some said it had an outlet to the west, others to the east, others that there was an outlet at each end; but nobody ever suggested that it had no outlet at all; and, with all due deference to Mr. Michell's authority, he did not think it had yet been proved that there was no outlet, for Captain Kostenko had not actually been round it. In the Pangong Lake, near Leh a traveller might keep close to the edge, and go almost entirely round the lake, without finding an outlet, but at the west end, in a gorge about a mile below, the water issued forth with as great force as if it came directly out of the lake itself, there being an underground passage. He joined with Colonel Yule in thinking that the word "Bolor" ought to be absolutely abolished, because it was unknown to the present inhabitants of those parts. Some centuries ago, however, a country called Bolor was so accurately described, that the boundaries might almost be walked blindfold.

General R. STRACHEY hoped that all travellers who had their accounts translated into another language would have such an excellent interpreter as Mr. Michell. He entirely agreed with Colonel Yule regarding the general view that should be taken of the mountain-ridges that had been discussed. When a mountain-range was spoken of, it should, first of all, be clearly understood what was meant by the expression. The mountains to which Humboldt gave the name of Bolor were, in reality, nothing more than that portion of the elevated mass of land which formed the barrier between the head-waters of the rivers trending west into Turkistan and those trending east into Central Asia. No one could say to which particular part of the systems of elevation that here united it physically belonged, because no one knew anything about the Thian Shan, and very little was known about the western extremity of the Tibetan high lands, or the northern portion of the Afghan table-land. His own impression was that the mountains which had been referred to in the paper were a prolongation of the Tibetan highlands and the Himalaya. The particular ridge, to which such special importance seemed to be attached by this traveller, was certainly nothing more than a lofty part of the general system of elevation, and apart from it called for no particular notice, excepting as a topographical detail. Captain Kostenko had referred to the dry haze observed in one of the valleys of a tributary to the Oxus, as something very peculiar; but every one who had been in the Himalaya knew that a similar condition of the air was a very common phenomenon there. Along the whole face of the Himalaya during the dry months a wind blew from the heated plains during the day, bringing with it great quantities of dust, and the haze thereby caused entirely obscured the view, and its effects were manifest on the tops of the glaciers at an elevation of 10,000 or 11,000 feet, though not so bad as a London fog. The same dry north-west winds blew with equal violence along the Valley of the Oxus during the hot months, as over the plains of Northern India, and he had no doubt a haze was produced there in the same way as in the Himalayas.

Sir GEORGE CAMPBELL said he had always understood that the Valley of the Oxus was by no means a rich country, and he was therefore surprised to hear Sir Henry Rawlinson speak of it as a region which the Russian would covet.

Sir H. RAWLINSON replied that he did not refer to the immediate banks of the River Oxus, but to the plains on each side watered by the streams descending from the mountains. All the streams running from the Hindu Kush were exhausted by irrigation canals in highly cultivated regions before reaching the Oxus. The district of Kunduz was thus notoriously rich, as was also Kholm, while Balkh was one of the most fertile districts in Asia, only surpassed indeed by Merv. On the northern side, again, the Valley of Kulab

was exceedingly fertile. Where there were large mountain-streams running down into an alluvial valley under a tropical sun, it was a law of nature that there must be fertility. Sir George Campbell was quite right, however, in saying that the immediate banks of the Oxus were comparatively uncultivated, because the irrigation water was all consumed before reaching that point. At the same time the character of the Valley of the Oxus, taken as a whole, was certainly one favourable to cultivation.

The PRESIDENT, in summing up, observed that the paper and the discussion to which it had led, proved that with regard to this part of Asia less was positively and scientifically known than of almost any other portion of the world. Geographers must, therefore, be very grateful for every modicum of real knowledge that could be obtained. Mere general observation was of very little value when such a confused chaos of mountains was under consideration. He hoped that now, when by a new convention with China, the road into Central Asia, Mongolia, and Thibet, seemed likely to be opened up, the Government would take care that any political mission that was sent to these little-known regions would be accompanied by scientific explorers, who could really obtain trustworthy scientific results, and he thought the Society would be perfectly justified in pressing that consideration as one of great importance.

ADDITIONAL NOTICES.

(Printed by order of Council.)

1. *The Navigator Islands.* By LITTON FORBES, M.D.

THE annexation of the Fiji Islands by Great Britain has to no small extent altered the political and commercial importance of many of the island groups of the South Pacific. More particularly is this true with regard to the Friendly and Navigator Islands. Both of these groups are in close proximity to the Fijis, and the future of both is bound up with that of the latter. Geographically the three groups form a triangle, the apex of which is Samoa, the base Fiji and Tonga. These groups are almost equally distant from each other, and are moreover connected by language, inhabitants, productions, and now by a nascent commerce. Colonisation has already passed from New South Wales, which was no long time ago the outpost of western civilisation in the South Pacific to Fiji, and from Fiji it is rapidly passing on to the two neighbouring groups. A few years ago the Navigator Islands were known to the world chiefly as the ill-omened spot where so many of La Pérouse's crew were massacred; but to-day they are actually the seat of an important commerce with Germany, and one of the most profitable channels for Australian enterprise. In a few years more, important and difficult problems will have to be solved regarding this group, just as they had to be solved with regard to Fiji. By their position, the three groups of Fiji, Samoa, and Tonga, are well adapted for a confederation. The distance from Ongea, in Fiji, to Vavau, in the Friendly Islands, is not more than 240 miles; while the distance from Savaii to Vavau is about 300 miles. From Vanua Levu, in Fiji, to Savaii, is 420 miles, or 36 hours' run for a steamer. The three groups are not only geographically allied, but also are being peopled simultaneously from the