

YARKUNDO

Yarkundo  
The road was good North of this point

### Summer Route from LEH (LADAK) TO THE KARAKORAM

From Leh to the Karakoram from the records of G.T. from the Karakoram to Journal of the Moonshah

by Capt. T.G. Montgomerie

Note

The Winter route is route used in 1857  
Aghalik near Muzin  
where a river is  
crossing the summer  
route. The river is  
14 days to the east of  
those met with on the  
route being discussed  
in the summer.

Pass  
Karabagh  
Kargalik bazar  
Booharib  
Boora  
Harnagra  
Lungar (2nd)  
Suzam  
Laghoon, or Milyan river  
Biliyan  
Hill pass

First observation North of the Karakoram pass was seen at Soobulash

Soobulash  
Kada masar  
Yogru, Kaphchik  
Chang malak  
Nambung  
Changshabur  
Kachik bishik  
Ungur-aghil  
Chadar-bach  
Toglan-mahala  
Sum of a hill  
Milyan dera (or Valley)

Karakash R.  
Tajoo  
Tugra R.  
Oidobch  
Karakash R.  
Sugut  
Dushbar  
Sigid-daran  
Chabrah

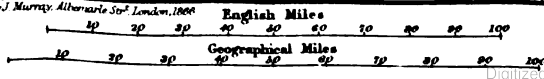
Malikabah

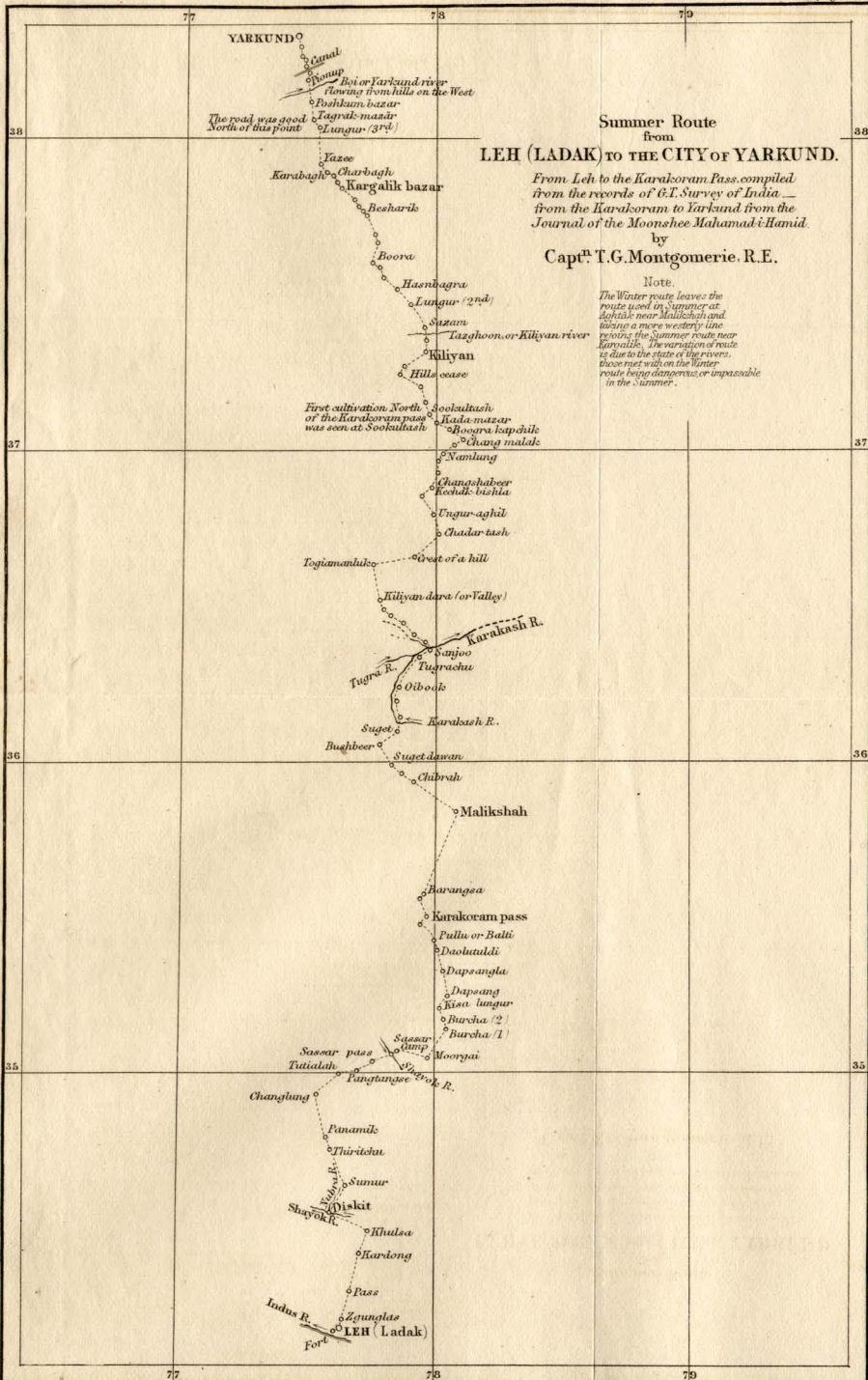
Karakoram pass  
Falka or Baki  
Dawtanakdi  
Dapangla  
Dapwang  
Kian kangur  
Barcha 2  
Barcha 1  
Maorpai

Sassar pass  
Tutalash  
Kangshajoo R.

Chungtang  
Pamarnib  
Thirichak  
Samar  
Yakit  
Khadon  
Hardong  
Pass  
Kangshajoo R.  
LEH (Ladak)

In the Journal of the R.G.S. by J. Murray, Athlone's Ser. London, 1866





YARKUND  
 Canal  
 Boi or Yarkund river  
 flowing from hills on the West  
 Poshkum bazar  
 Tugrak mazar  
 Lungur (3rd)  
 The road was good  
 North of this point

Summer Route  
 from  
**LEH (LADAK) TO THE CITY OF YARKUND.**

From Leh to the Karakoram Pass compiled  
 from the records of G.I. Survey of India —  
 from the Karakoram to Yarkund from the  
 Journal of the Moonshee Mahamad-i-Hamid

by  
**Capt<sup>n</sup> T.G. Montgomerie, R.E.**

Note:  
 The Winter route leaves the  
 route used in Summer at  
 a point near Malikshah and  
 taking a more westerly line  
 joining the Summer route near  
 Karakash. The variation of route  
 is due to the state of the rivers,  
 those met with on the Winter  
 route being dangerous, or impassable  
 in the Summer.

First cultivation North  
 of the Karakoram pass  
 was seen at Soobulash  
 Soobulash  
 Kala mazar  
 Boozra kapshile  
 Chang matak

Namlung  
 Shagshabear  
 Keshik-bichia  
 Ungur-aghil  
 Chadar-tash  
 Togiamantoko  
 West of a hill  
 Kiliyan dara (or Valley)

Karakash R.  
 Sunjoo  
 Tugra R.  
 Tugrachu  
 Oibook  
 Karakash R.  
 Sugat  
 Bughbeer  
 Sugat daman

Chabrsh  
 Malikshah  
 Baranga  
 Karakoram pass  
 Pullu or Balti  
 Daolatuldi  
 Dapsangla  
 Dapsang  
 Kisa lungur  
 Barsha (2)  
 Barsha (1)

Sassar pass  
 Tutalash  
 Sannar  
 Ching  
 Mooryai  
 Pangtanang  
 Shavok R.

Changlung  
 Panamik  
 Thirichu  
 Numur  
 Diskit  
 Shavok R.  
 Khulaa  
 Haralong

Pass  
 Zgunghat  
 Indus R.  
**LEH (Ladak)**  
 Fort

IX.—*On the Geographical Position of Yarkund, and some other places in Central Asia.* By CAPTAIN T. G. MONTGOMERIE, R.E.,  
Astronomical Assistant Great Trigonometrical Survey of India.

Read, May 14, 1866.

WHILST carrying on the survey of Jamoo, Kashmir, Little Tibet, and Ladak, I have always kept in view the possibility of making a reconnaissance of the countries lying to the north of the Mustak and Karakoram ranges, and to the east of Ladak, that is, of Eastern Turkistan, Yarkund, &c.

When the survey was carried up to the frontier every endeavour was made to sketch as much of the country beyond as could be done, without actually involving the surveyors with the wild tribes of Turkistan.

In this way the country was surveyed for several marches beyond the Karakoram Pass, and a rough reconnaissance was made of the Suget Valley, between the Karakoram and the mountains above Khotan. Again, to the east of the Chang-Chenmo a portion of the country was sketched, and along the great Pangkong Lake the reconnaissance was carried about 10 marches east of the frontier. Subsequently, during this last summer, some part of Khotan has been explored by Mr. Johnson, and another branch of the Pangkong Lake has been discovered by Mr. Low. As the latter portion of the country is very sparsely inhabited, and the people met with are not very troublesome, it is possible that a well provisioned party might advance still further. On the Yarkund road, however, it was evident that any further advance would have brought the surveyors within the range of the Khirgiz hordes who infest that road.

As any political complication, such as might be caused by the capture or murder of a surveyor had to be avoided, it was clear nothing more could be done in that direction by the regular survey operations. But while I was in Ladak I noticed that natives of India passed freely backwards and forwards between Ladak and Yarkund, and it consequently occurred to me that it might be possible to make the exploration by their means. If a sharp enough man could be found he would have no difficulty in carrying a few small instruments amongst his merchandize, and with their aid I thought good service might be rendered to geography. Accordingly I addressed the Bengal Asiatic Society with reference to this plan in a letter, extracts of which accompany this paper, *vide* Appendix A.

My proposal received the support of the Asiatic Society, and the Government of India ultimately decided to carry it out. There was some delay in getting the necessary sanction, but in the mean

time Sir Robert Montgomery, the Lieutenant-Governor of the Punjab, took up the proposal most warmly, and said the Punjab Government would pay the expenses of an experimental expedition.

I recommended Yarkund as a suitable goal for the first attempt. Our knowledge of that city being particularly vague, and as it was also known to be comparatively close to our own frontier, only some 15 marches beyond, I thought it more especially adapted to our purpose.

The inhabitants of Yarkund were known to be chiefly Mahomedan, it was therefore necessary to select a Mahomedan for the work. A moonshee called Mahomed-i-Hameed offered his services for the work. He had been employed some years in the north of India and latterly in the Punjab; he was acquainted with the rudiments of route-surveying, and could use a prismatic compass and read a vernier.

Sir R. Forsyth, Secretary of the Punjab Government, assisted me in every way, and all arrangements were made during May, 1863. The moonshee Hameed joined my camp in Kashmir; he was instructed in the method of taking latitudes with a pocket sextant and also in recording the temperature of air and boiling water. As soon as he had acquired tolerable proficiency he was despatched from Kashmir to Leh, the capital of Ladak. The time for training was very short, as it was decided to send Hameed into Yarkund during the summer of 1863, so that he might be able to return early in 1864.

The moonshee left Kashmir on the 12th June, 1863, with a detachment of the Great Trigonometrical Survey which was going in that direction. He reached Leh, the capital of Ladak, on the 4th July. Having made a rough route-survey from Kashmir to Leh, I was able to test his work, as that route had already been regularly surveyed. The results proving satisfactory, the moonshee was directed to proceed from Leh to Yarkund, and to make a similar route-survey along that road.

The following equipment of instruments was given to him, viz:—

- |                                                           |                                        |
|-----------------------------------------------------------|----------------------------------------|
| 1 Pocket sextant                                          | } All of the smallest size procurable. |
| 1 Dark glass artificial horizon                           |                                        |
| 1 Prismatic compass                                       |                                        |
| 1 Pocket compass                                          |                                        |
| 2 Thermometers                                            |                                        |
| 2 Plain silver watches.                                   |                                        |
| 1 Copper jug and oil lamp for boiling the thermometers.   |                                        |
| 1 Small tin lantern for reading off the sextant at night. |                                        |
| 2 Books for recording; spare paper, &c. &c.               |                                        |

Every endeavour was made to prevent the instruments from being conspicuous; the stand of the prismatic compass was not sent, but in its place the moonshee was provided with an ordinary

spiked staff, such as Himalyan travellers generally carry. The head of the staff was made rather larger than usual and cut off flat so that the compass could be rested on the top. By this means a steady observation could be readily secured without much trouble and in a way little likely to excite suspicion.

The moonshee was detained at Leh some time before satisfactory arrangements could be made to send him on: he accordingly arranged to join some Ladak and other merchants who were at that time forming a kafila or caravan for Yarkund. He hired two servants, viz. Yusuf and Kasim Ali, bought a pony and some ordinary merchandise; he also took with him a letter of credit on Yarkund and a small supply of money.

The kafila left Leh on the 23<sup>rd</sup> August, 1863, and the moonshee Hameed followed the next day. The kafilabashi, or head man of the caravan, decided to take the ordinary summer route from Ladak to Yarkund. Their journey commenced at Leh, 11,278 feet above the sea. The moonshee found the temperature of the air  $42^{\circ}$  at noon, and water boiled at  $181^{\circ} 3''$  of Fahrenheit. From the Karakoram the kafila descended again into Turkistan, and on the 13th September reached Suget on the Karakash River. Following the Karakash for a short way the moonshee again ascended a great northern spur of the Karakoram Mountains, and crossing over it on the 17th, emerged from the mountains on the 20th September. From that time they marched over almost level ground through villages and cultivation, finally reaching the city of Yarkund on Wednesday the 30th September, 1863. The moonshee's last remark being that the country of Yarkund is most fruitful and boasts of many vineyards.

The moonshee left on the 23<sup>rd</sup> August, and, after 30 days' hard marches over the most elevated country in the world, reached Yarkund on the 30th September. The first day the kafila halted near a Buddhist monastery at a village a very short distance from Leh. On the second day they halted at Sipol, which is a barren waste, having no sign of human habitation, and boasting only of a Buddhist shrine (Choortan). The moonshee, who caught up the kafila or caravan at this place, remarks that here all travellers are seized with a bad headache, owing, no doubt, to the great elevation, as the moonshee says he found a great quantity of snow on the ground on the 24th August. The third day they crossed a very high pass, but halted at a village where barley and mustard thrive capitally, though it was too cold for wheat, &c. During the night the surrounding hills had the benefit of a heavy fall of snow.

The fourth day the kafila halted at the village of Kardoan, which boasts of orchards of apples, apricots, and walnuts. The fifth day they halted at the village of Diskit, about 9000 feet above the sea, a large village on the Shayok River. Here the

moonshee says wheat was scarce, but there was plenty of barley and mustard.

The sixth march the *kafila* crossed the Shayok River, and ascended the Nubra valley, halting at a small village, and the seventh march brought them to Panamikh. This is the last village, and also the last place where good grass is obtainable on the Ladak side of the Karakoram Pass. Travellers generally halt for a few days, so as to rest their cattle and give them a good feed before crossing. The *kafila* therefore halted two or three days, and started from Panamikh on the 1st September.

During the next 19 days they passed over very lofty desolate mountains, and never saw either a village or cultivation during the whole of that time. On the nineteenth day they reached Kilyan, the first village of Yarkund.

These nineteen days were the most trying of the journey. No grass could be got for the cattle during twelve days till they reached Suget, on the Karakash River. The *kafila* had on this account to take a large supply of grain with it, and only a very small quantity daily could be doled out to the ponies. Numbers of ponies died in consequence.

From Kilyan the moonshee made his way to Yarkund with the *kafila* in five more marches, halting each day at some village. He was much struck with the fertility of the country, and after crossing such difficult and desolate mountains very probably thought it much better than it was in reality. On reaching Yarkund the moonshee seems to have had no difficulty in making friends. Though the province is ruled by a Chinese official and the city garrisoned by Chinese troops, the mass of the population is Mahomedan, and ruled in ordinary matters by their own governor, subordinate to the Chinese. The Mahomedan governor at that time was half a Kashmirian by blood, but had never been out of Yarkund. The moonshee ultimately became a great friend of this governor, but how he succeeded in becoming so is not known for certain; it was most probably through an old friend of his own, called Awaz Ali, whom he found settled in Yarkund. By the assistance of Awaz Ali the moonshee seems to have been housed without any difficulty, for it appears he was able to take star observations on the third night after his arrival in Yarkund; and as he could have done this only in a private place, where no stranger could see him, most probably it was from the roof of his friend's house.

The moonshee settled down in Yarkund for the winter, and remained there and in its vicinity during the whole of October, November, December, January, February, and nearly the whole of March; his last observation taken in Yarkund being dated the 27th March, 1864. The winter in Yarkund seems to have been

very severe: the thermometer early in January having fallen nearly to zero, or  $32^{\circ}$  below the freezing-point. At times the weather was cloudy, and from the 19th to the 26th January snow fell; but, judging from the general regularity of the observations of the sun and various stars, the atmosphere on the whole must have been very clear. Beyond the 27th March no record is forthcoming, but it was afterwards ascertained that the moonshee had in some way excited the suspicion of the Chinese officials, or some one had drawn their attention to the moonshee. At any rate, the Mahommedan governor told the moonshee that the Chinese were making inquiries about him, and that he had better not remain in Yarkund any longer. He advised him to send off his property at once, and to follow it himself before a fortnight was over, otherwise he would most probably get into trouble. Following this friendly advice, the moonshee despatched his servants and property with a kafila just starting for Leh, and he himself overtook them at the Suget grazing-ground, where they had promised to wait for him. The moonshee's friend or relation, Awaz Ali, accompanied him, and they went on with the kafila and recrossed the Karakoram Mountains in safety. After crossing the pass, the moonshee and his friend, Awaz Ali, both became ill and got very weak, and ultimately they both died, within two or three days of each other, when only at a short distance from Ladak. The kafila had at that time reached British protected territory, and happened to be quite close to an encampment of the Great Trigonometrical Survey under Mr. Johnson. Mr. Johnson heard of the death of the moonshee, and at once proceeded to inquire into the matter. The men with the Kafila said the moonshee and his friend died from eating wild rhubarb, which in April and May is abundant; but Mr. Johnson thought there was good cause to doubt this statement, and, accordingly, he took possession of such of the moonshee's property and papers as he could get hold of, and sent the whole to the British officer then on political duty in Kashmir. This officer inquired into the matter, examined the moonshee's two servants and others, and finally came to the decision that there was nothing beyond a case of suspicion.

The death of the poor moonshee was most unfortunate, after he had passed safely through the real dangers of the expedition, viz., those incidental to travelling in Turkistan and to a residence in a semi-barbarous place like Yarkund, where the mere fact of possessing instruments and taking notes was likely to get a man into trouble. If the moonshee had been killed by the robbers that infest the Yarkund road, or had been imprisoned or put out of the way by the Chinese officials, it would not have been very surprising.

The best-armed kafilas passing through Turkistan are some-

times robbed by the Kirghis hordes, and those who resist are generally killed; and in Yarkund the Chinese are, to say the least, very arbitrary in their dealings with strangers. The poor moonshee got safely through all these dangers and died, after he had left Turkistan, either from natural causes or in a way that might have happened to a native in the most civilised parts of the British territory.

The moonshee's watch, instruments, papers, and manuscript books do not seem to have been touched, though his fellow-travellers appropriated some of his more saleable property; but this they would most probably have done whether his death was natural or otherwise. Though the moonshee's papers, &c., were untouched still the value of the work is much diminished by the want of those explanations which can be obtained only from the recorder, and no doubt a great deal of unrecorded information is altogether lost.

Owing to the examination regarding the moonshee's death and other causes his books and papers reached me only at the beginning of 1865, just as I was leaving India for England.

The instruments were all in good order, except the smaller thermometer, which was unfortunately broken after despatch from Lahore. The books consisted of one volume of *Astronomical Observations*, in English; one volume of a *Magnetic Route-Survey*, in English; one volume *Vernacular Journal*; one volume of *Observations and Route-Survey*, in vernacular (Persian character); some miscellaneous papers, and a plan of the position of the various towns in Eastern Turkistan.

The above are all in my possession, except a paper or papers containing an account of Yarkund, and of the Chinese administration, and the state of parties in Eastern Turkistan, which is in the hands of the Punjab Government.

The General map found among the moonshee's papers is a very interesting one; it gives the position of all the chief places in Eastern Turkistan, and it also shows what the moonshee's views were as to the countries west and north. The progress of Russia in the Ileh valley seems to be correctly noted; but whether he is right in saying that the Russians have a fort near Lake Lop, and mean to build others in Eastern Turkistan, is very doubtful.

The moonshee gives the position of Shukhargäu, which he says was the capital of Afräsiäb, a real or fabulous conqueror of Persia, much celebrated in Persian poetry, said to have lived seven centuries before the Christian era. The town of Sirikul is said to have been the capital of the son of Afräsiäb; but as Afräsiäb is supposed to have been a sort of family surname, like the Pharaohs, Ptolemies, or Cæsars, there is no saying whether the son of the conqueror of Persia is referred to, or only one of his descendants.



From the books, &c., it appears that the moonshee made a complete route-survey from Leh to Yarkund. As he was marching with a kafilā, all measurements of the road with a chain would have been quite out of the question, even if the nature of the country permitted of it; but in such mountains it was physically impossible. I therefore desired he should simply record the bearing and direction of the road as far as he could see along it at one time, and with his watch note the time he marched in that direction. By this means I trusted that a very fair route-survey might be obtained, if the value or rate per hour could be satisfactorily established. This rate I was able to determine from the average of his marches before and after reaching Leh. On leaving Kashmir the moonshee, with the above object in view, was made to record the direction and time between Kashmir and Leh. And again, beyond Leh, the regular survey had been carried three marches down the Turkistan side of the Karakoram Pass. The latter enabled me to follow the moonshee's work for 18 out of the 30 marches; and by this means it was easy to form an opinion on the amount of reliance that ought to be placed on his route-survey of the other 12 marches.

The observations for latitude formed a further very valuable check, and prevented any great accumulation of error. A great number of observations were taken at Yarkund, and by combining the route-survey with the latitude, I think it may be concluded that the latitude and longitude of Yarkund have been determined within narrow limits.

The bearings or azimuths for the route-survey were taken with a good prismatic compass; and the moonshee was capable of observing as accurately as the instrument permitted.

The latitudes were taken with a very small pocket box-sextant without a telescope, and consequently observations of stars (and more especially of such a small one as the pole-star) could not be made very accurately. The sextant could be read to half a minute, but the observations, owing to the above want, do not in any way approach that degree of accuracy. The great number of observations, taken at Yarkund, is, however, some compensation. The mean of eleven days' observations, in October, November, December, 1863, gives a latitude of  $38^{\circ} 20'$  for Yarkund. And, as a general rule, the latitude deduced on any one day does not differ from that determined on any other more than  $12'$ , so that I conclude  $38^{\circ} 20'$  to be a very fair approximation to the latitude.

The observations of the temperature of the air and boiling water give a fair idea of the climate, and also determine pretty closely the height of Yarkund above the sea. The height was a very great desideratum, as hitherto there was nothing beyond the

vaguest speculation as to how much Yarkund is above the sea. The known products of the country, viz., silk, cotton, rice, grapes, &c., enabled geographers, with the aid of the supposed latitude, to make a guess at the height; but in no other way could any approximation be arrived at. By some it was supposed to be 2000 feet above the sea, and by others as much as 5000. The observations of the boiling-point give a mean height of about 4000 feet, which is perhaps within a few hundred feet of the truth. Certain products are known to grow at nearly the same height at a similar latitude in the Himalayas; but the climate of China and Central Asia are known to be so very different from that of Hindustan, that geographers naturally felt very doubtful about any such deductions.

From the above it will be seen that the latitude and height of Yarkund (lat.  $38^{\circ} 20'$ , height 4000 feet) had been fairly determined by actual observation, while the remaining element of geographical position, viz., the longitude (long.  $77^{\circ} 30'$ ), can be pretty closely deduced from the route-survey, and more especially as its general direction was nearly meridional. And these were the main geographical objects of the expedition. The river of Yarkund flows rapidly past the town, and goes to the east of Aksu \* for 18 or more marches—say 200 miles; and I do not think it is too much to assume that in that distance it must fall at least 1500 feet; and I conclude that most probably any surplus water of the Yarkund River falls into an inland lake, or is swallowed up by sand at an elevation of little over 2000 feet above the sea, some 28 marches beyond Yarkund. The lake or desert in which the Yarkund River is lost has been generally marked on the maps as Lob-nor Lake, in the great desert (or Gobi). This forms an extraordinary basin or depression in the heart of Asia, surrounded by mountains with no gap or pass of a less elevation than 13,000 feet on the north, of 18,000 on the south, of perhaps 10,000 on the west, and 10,000 on the east.

Whilst at Yarkund the moonshee sent his friend Awaz Ali to Kokan, and intended to have followed himself, but the suspicions of the Chinese authorities having been aroused he was unable to do so. From Yarkund he was, however, able to get bearings of all the principal towns of Eastern Turkistan, from which he made a rough map of the country.

The towns, the bearings of which are likely to be most accurate, are Kashgar, Khotan, and Sirikul, as shown in the moonshee's map; but I do not think much reliance can be placed on the others.

Khotan, which is only 8 or 9 marches east of Yarkund, is the

---

\* Aksu is on a river that joins the Yarkund River.

name of a province which was formerly said to contain seven large towns, but the sand of the Great Desert seems to have encroached on them, and only three towns of any great size remain. Khotan, the old capital of the province, was long ago swallowed up by the sand. Its site was not many miles from Ilchi, the modern capital.

The inhabitants of Ilchi say that within the last few years, when the wind blows hard, some of the old houses of Khotan have been laid bare, and they often succeed in digging out various articles that have been buried. From this it would appear as if the city had been buried suddenly before the inhabitants had time to remove their property, but however that may be, the town no longer exists.

About 10 miles to the west of Ilchi is the town of Karakash, on a large river of the same name, which flows within a few miles of Ilchi. From the bed of the Karakash River the greater part of the Chinese jade-stone is procured. This jade-stone, of which there was such large quantities in Calcutta, after the last Chinese expedition, is called yeshm in the Persian and sootash in the Turki language. I saw several pieces of it that had been brought from Barakach, cut into buckles, &c., and I have no doubt of its being the same as that brought from China. The Nukshibunnédé Synd, a resident of Kashmir, who had been to Ilchi, told me that the Khan's (*i. e.*, the Emperor of China) palace was built or lined with it. In the route-survey it is noted that the Karakash River joins the Suget River, not far below Suget itself, and that there is a jade-quarry (Kan-Sang), about 26 miles distant from the junction, and near the Karakash River, and I suppose that the jade is procured from this and perhaps other quarries, as well as from the bed of the Karakash River.

Kashgar is the most easterly town under Chinese authority, it is supposed to stand higher than Yarkund.

The direction of Aksu, derived from the moonshee's map, agrees tolerably with that given in the map accompanying Semenov's paper in the Geographical Society's 'Journal,' and consequently accounts pretty well for all the unknown ground between the work of the survey of India and the explorations of Semenov.

On the whole I think it may be concluded that the results are satisfactory, and had the poor moonshee not died after completing his work, nothing more could have been expected from a first attempt. I think he was an honest and patient observer, and had he lived his exertions would, I am sure, have been handsomely rewarded by the Punjab Government.

Two Bhotiyas of Milum, from the British Hill district of Kumaon have been carefully trained, and just before leaving India I started them on an expedition to Lassa. These men being natives of Tibet ought to have no difficulty in making their way, and as

they are very intelligent and well trained, I hope hereafter to be able to send the Geographical Society some valuable results. Should this last expedition prove successful, various other explorations will be made in the same manner.

The moonshee's route enables me to give you some idea as to the enormous width of the Himalayan Range. For after marching about fifty-one days across the mountains, he only reached the watershed dividing Hindostan from Turkistan, and after 15 marches more, or in all after 66 marches, he reached Yarkund, on the opposite slope, and even then was 4000 feet above the sea.

From Jummoo (or any point in the Punjab at the foot of the Himalayas), it takes a man, assisted by a pony, sixty-six days to cross the mountains; and I think that even if a man tried his utmost he could not well do it much under fifty-five days; during that distance the road is, for 25 marches, never under an elevation of 15,000 feet, and during 45 marches never descends below 9000 feet.

Direct, that is as the crow flies, the distance from Jummoo or Hushiapore to Yarkund is 430 miles. So that the mountains may be said to be at least 400 miles across their smallest breadth.

The Alps, I suppose, would take at the outside three days for a man to cross, and I believe that a good walker can cross from a village on one side to a village on the other in one summer's day. The moonshee took twenty-five days to march from the last village south of the Karakoram to the first village of Yarkund, north of the Karakoram.

---

## APPENDICES.

### (A.)

Extract from CAPTAIN T. G. MONTGOMERIE'S Letter to the Secretary of the Bengal Asiatic Society.

“Camp Ladak, 21st July, 1862.

“SIR,—I have now the honour to address you with reference to my proposal for employing natives in the exploration of countries which are not as yet accessible to Europeans.

“I think that for Central Asia, Mahommedans from our North-Western frontier are most likely to supply the best recruits; for other countries, Great Tibet, &c., it may, from time to time, be found expedient to train a different class.

“The observations to be made by such natives should be as simple as possible. The instrumental equipment should be compact.

“I should propose the following as the primary objects of their explorations; 1st, the latitude of important points; 2nd, the heights of ditto; and 3rd, a rough survey from point to point; 4th, an account of each march and of each remarkable place visited.

“From the conjoint observations of the compass and watch, for the direc-

tion and the time occupied on each march, I should hope that we would also get a fair approximation to the longitude of the various places.

" I think the following instruments would be sufficient, viz. :—

" One small sextant and artificial horizon.

" Two small thermometers to record the temperature of air and of boiling water.

" Two good silver watches, &c.

" The above skilfully used and the results honestly recorded, would at any rate give us an intelligible idea as to the whole of Eastern Turkistan.

" At present we are in great doubt as to what really is the position of the various cities and places in that portion of Central Asia.

" After Eastern Turkistan, I should recommend exploration to the east of the Pangkong Lake district, then in the Laasa direction and so on; but in each case I should recommend the explorers to accompany men who have been in the habit of visiting the countries in question."

(B.)

With reference to the route-survey and the latitude observations, my opinion is that, as far as they go, they are thoroughly trustworthy. The moonshee did not understand even the meaning of latitude, he knew the Pole Star, and thought he knew several other stars; but as far as I can make out he applied the Arabic names to the wrong stars. On the road between Kashmir and Leh, he was quite distressed to find the altitude of the Pole Star vary, and I feel quite certain he could never have had any idea of making up his observations, for he was quite incapable of working out a latitude from the sun or any southerly star, and indeed I doubt if he had any notion of getting it even from observations to the Pole Star.

With reference to his route-survey, he had no possible means of access to the survey of the first 15 marches, and indeed at the time he started, 5 of those marches had not been surveyed, and as the moonshee's survey of the first 15 agrees very fairly with those of the survey, I think similar credit can be given to the remaining 15.

(C.)

LATITUDES deduced from Star Observations taken at YARKUND, with a small pocket sextant without a telescope.

On the 20th October, 1863	.. .. .	n. lat.	38	24	44
" 21st "	.. .. .	"	38	17	2
" 22nd "	.. .. .	"	38	21	43
" 12th November	.. .. .	"	38	16	0
" 16th "	.. .. .	"	38	27	15
" 17th "	.. .. .	"	38	7	35
" 18th "	.. .. .	"	38	5	55
" 5th December	.. .. .	"	38	29	1
" 15th "	.. .. .	"	38	22	10
" 17th "	.. .. .	"	38	23	0
" 18th "	.. .. .	"	38	22	59

Mean latitude of Yarkund .. .. . 38 19 46

NOTE.—On each of the above days the latitude given is from the mean of

deductions from North to South Stars, so that index error is eliminated. The index error was taken, but the above method was considered to be the most satisfactory.

## (D.)

## COMPARISON OF THE OLD AND NEW POSITIONS OF PLACES IN EASTERN TURKISTAN.

Hitherto the positions of all places in the interior of the Chinese Empire have been derived from the Survey made by the French Jesuit Missionaries or their pupils, more than 100 years ago.

As far as modern experience in China Proper extends, there is every reason for confidence in the work of the learned fathers; but with reference to the latitude and position of places in frontier provinces, such as Eastern Turkistan, &c., there has hitherto been no means of testing their accuracy, and at the same time it was doubtful whether the positions were all determined with the same regularity as those of places in China Proper.

It seemed to be very unsatisfactory that the geography of that part of Central Asia should depend upon observations taken so long ago, and which had never been tested.

I consequently tried to fix the position of places in Eastern Turkistan from known points to the south of the Karakoram, and solely from modern information collected in British India.

In a memorandum written several years ago, I in the above way deduced the position of Yarkund,\* and came to the conclusion that its latitude was somewhat to the south, and its longitude considerably to the east of the values given by Humboldt in his 'Asie Centrale' on the authority of the French Jesuits. I also deduced the position of Ilchi, the capital of Khotan, and came to the conclusion that it was very considerably to the west, and a good deal to the north of the Jesuits' value.

Now it is evident that my means of determining the longitude were likely to give a favourable result, my deductions being made from points very close to the meridian of both Yarkund and Ilchi, whilst the Jesuits' values were made, in connection with Pekin  $30^{\circ}$  to  $40'$  to the east of those places.

It appeared to me strange that I should in the one case deduce a longitude considerably to the *East*, and in the other a longitude still more to the *West* of those given by the Jesuits. The only conclusion that I could come to was that the Jesuits' longitude of either one or the other was radically wrong.

Soon after writing the above memorandum, I obtained a copy of the geographical values assigned by the Schlagintweits to places in Eastern Turkistan.

The comparatively small differences in longitude at the Karakoram Pass and at Ilchi, contrasted with the very large differences at Yarkund and Kashgar, between the Schlagintweits' values and mine still farther excited my curiosity, and induced me to test the probability of the positions assigned to the cities of Turkistan by the Schlagintweits.

It is well known that there are but 8 marches between Ilchi and Yarkund. According to the Schlagintweits the distance between those towns is 254 miles, which would make the average direct length of each march about 32 miles, a rate quite out of the question, as it would represent at least 40 to 50 miles per day over a rough country. After analyzing several other routes, I came to the conclusion that the Schlagintweits' longitude of Ilchi was likely

---

\* I feel convinced that my longitude was likely to be a good approximation, because all said it lay w. of Ken and n. of Musla.

to be a good approximation, but that their values of Yarkund and all places to the north and east were not in accordance with their value of Ichi.

The differences between the new values and those of the French Jesuits and the Schlagintweits can be readily seen in Appendix E.

(E.)

Position of	By the French Jesuits.		By Schlagintweit.		By Capt. Montgomerie from Hameed.	
	Lat. °	Long. '	Lat. °	Long. '	Lat. °	Long. '
Yarkund .. .. .	38 19*	76 16	38 10	74 10	38 20	77 30†
Ichi, Khotan .. .. .	35 50†	80 33	36 50	78 20	37 37	78 57
Kashgar‡ .. .. .	39 25§	73 57	39 15	71 50	39 25	75 21
Sirikul town .. .. .	..	..	..	..	38 10	75 39

\* Latitude of Yarkund is given in Humboldt's 'Asie Centrale,' vol. ii. 429.

† Vide *ibid.* p. 418.

‡ Kashgar and Khotan are given in the same work, vol. iii. p. 437.

§ Latitude of Kashgar from Jesuits' longitude from the Jesuits.

(F.)

ABSTRACT OF MARCHES OF MAHOMED-I-HAMEED.

The moonshee left the town of Leh, the capital of Ladak, on the 23rd August, 1863, and reached—

Number of March.		
1.	Gaulis, a village and monastery, on the .. ..	23 Aug.
2.	Supole encamping-ground, on a barren part of the } mountain .. .. .	24 "
3.	Khurdoon, village .. .. .	25 "
4.	Khulsur, village .. .. .	26 "
5.	Diskit, village .. .. .	27 "
6.	Chimshin, village .. .. .	28 "
7.	Panamik, village .. .. .	29 "
	and halting there two days, reached—	
8.	Stuksha, village .. .. .	1 Sept.
9.	Changhung, village .. .. .	2 "
10.	Spungshear, no village .. .. .	3 "
11.	Gumloo, no village .. .. .	4 "
12.	Sassar, no village .. .. .	5 "
13.	Khooboolaku, no village .. .. .	6 "
14.	Boasa Kalan, no village .. .. .	7 "
15.	Daulatooldee, no village .. .. .	8 "
	and crossing the Karakoram Pass reached—	
16.	Barangsa Abdoolah, no village .. .. .	9 "
17.	Malikshah, no village .. .. .	10 "
18.	Bushbeer .. .. .	11 "
19.	Suget .. .. .	12 "
20.	Oibook .. .. .	13 "
21.	Sanjoo, valley .. .. .	14 "
22.	Kiliyan, valley .. .. .	15 "
23.	Toogiamauluk .. .. .	16 "
24.	Ungoor Aghil .. .. .	17 "

170 MONTGOMERIE on the Geographical Position of Yarkund

25. Namloang .. .. .	18 Sept.
26. Sookltash .. .. .	19 "
27. Kiliyan, village .. .. .	20 "
28. Lungar (2nd), village .. .. .	21 "
29. Boora, village .. .. .	22 "
30. Yazee, village .. .. .	23 "
31. Piorurp, village .. .. .	24 "
32. Yarkund, city .. .. .	25 "

Between the 9th and 27th camping-places there were no villages or shelter of any kind, except occasionally some dry stone walls put up by travellers to keep off the wind in very elevated places.

(G.)

ABSTRACT of the MOONSHEK MAHOMED-I-HAMEED'S ROUTE-SURVEY from the KARAKORAM PASS to YARKUND.

Name of Place.	Time occupied in Marching from Place to Place.		Observed Magnetic Bearings.	Remarks.
	H.	M.		
Karakoram Pass .. .. .	..	..	..	Variation of the needle 2½ E.
Jamaeooldee .. .. .	1 12	50 0		
Barangsa (Balti) .. .. .	2 41	346 0		
Barangsa (Abdulah Khan)	0 29	65 0		
Kaztak .. .. .	2 0	17 30		
Chadurtash .. .. .	2 16	17 30		
Wahabjalgalah .. .. .	1 11	17 0		
Dubdasurghod .. .. .	0 24	17 0		
Nizaetash .. .. .	0 39	17 0		
Malikabab .. .. .	3 40	17 0		
Aghtak Angoor .. .. .	1 10	301 0		
* * *	1 59	301 0		
Chibrah .. .. .	2 42	301 0		
* * *	1 19	295 0		
Sugut dāwān .. .. .	1 39	315 0		{ Dāwān means a mountain or pass.
Khoeshjalgalah .. .. .	0 13	328 0		
Bel dāwān .. .. .	1 3	328 0		Mountain.
Bashabeer .. .. .	1 52	328 0		
Sooget .. .. .	2 30	57 30		
Belagchikulshah .. .. .	1 20	11 0		Khojah.
* * *	2 12	340 0		
Sadoola Khojah .. .. .	1 25	11 30		
Oibook .. .. .	0 18	11 30		
* * *	1 20	35 0		
Chizghanluk .. .. .	1 44	35 0		
Toogra-chu .. .. .	1 1	35 0		{ Or Toograo River coming from the village of Jularik and the Kalik Mountains.
Chaglak .. .. .	0 31	58 30		
Sanjoodara .. .. .	0 50	58 30		Or valley, Ali-Nazr Kurghan.
* * *	0 47	328 0		
Bastung .. .. .	1 32	306 0		
* * *	0 14	306 0		
* * *	1 36	323 0		
* * *	1 53	288 30		



ABSTRACT of the MOONSHEE MAHOMED-I-HAMEED'S ROUTE-SURVEY.—continued.

Name of Place.	Time occupied in Marching from Place to Place.†		Observed Magnetic Bearings.	Remarks.
	H.	M.		
Kiliyan darra .. .. .	0	52	330 0	Or Kiliyan Valley.
Changshabeer .. .. .	1	17	330 0	
* * *	1	28	345 0	
Togiamanluk .. .. .	2	47	345 0	
* * *	1	0	80 0	} Usually called the Kiliyan dāwān, a halting-place taking its name from a large flat stone.
Crest of a mountain ..	3	51	40 0	
Chadurtash .. .. .	3	49	40 0	
Choonaghil .. .. .	1	0	350 0	
Ungoor aghil .. .. .	1	13	350 0	
Kechakbishla .. .. .	2	31	320 0	
Choongbishla .. .. .	1	1	50 0	
Changshabeer .. .. .	0	19	50 0	
* * *	0	43	20 0	
* * *	0	51	20 0	
Khathaitam .. .. .	0	27	360 0	Khathaitam (? Chinese pillar).
* * *	0	36	360 0	
Namloang .. .. .	1	0	50 0	} Khajum.
* * *	1	33	50 0	
Choongmalik .. .. .	0	43	40 0	
Tatookiya .. .. .	1	4	315 0	
Bogarakachik .. .. .	1	3	315 0	
* * *	0	20	280 0	
Kodamazar .. .. .	0	15	290 0	
Bashtarum .. .. .	0	16	290 0	
* * *	0	35	290 0	
Kahram Angoor .. .. .	0	41	325 0	
Sookultash .. .. .	0	34	325 0	} First cultivation seen north of the Karakoram.
Akshoor .. .. .	0	33	342 0	
* * *	0	32	342 0	
* * *	2	5	335 0	
Kauchong .. .. .	0	15	310 0	} Mountains cease north of this point.
Saragharok .. .. .	1	58	310 0	
* * *	0	30	310 0	
* * *	0	31	15 0	
Kiliyan .. .. .	2	14	45 0	} A Yarkundie village
* * *	0	35	15 0	
* * *	0	55	15 0	
Tazghoon River .. .. .	0	38	350 0	} Or Kiliyan River. Village.
Sazam .. .. .	0	12	350 0	
* * *	0	23	350 0	
Lungur, 1st .. .. .	1	49	330 0	} Lungur means a small police or custom-house station.
Lungur, 2nd .. .. .	0	41	330 0	
Hasanbayhra Village ..	1	8	310 0	} The grave of the king's brother is here (name of king not given).
* * *	0	20	310 0	
* * *	0	47	310 0	
* * *	1	58	307 0	
* * *	1	22	335 0	

## ABSTRACT of the MOONSHEE MAHOMED-I-HAMEED'S ROUTE-SURVEY.—continued.

Name of Place.	Time occupied in Marching from Place to Place.	Observed Magnetic Bearings.	Remarks.
	H. M.	° ' "	
Boora.. .. .	0 35	320 0	A village.
* * *	2 12	15 0	
* * *	0 50	345 0	
* * *	2 22	332 0	
Besharik .. .. .	0 33	315 0	{ This is the name of a pergunah containing 25 to 30 villages.
* * *	0 38	315 0	
* * *	0 45	830 0	
Kurkalik .. .. .	1 33	310 0	{ A town or large village with a bazar.
* * *	0 28	310 0	
Charbagh .. .. .	0 57	338 0	A village.
Kurrabagh .. .. .	0 44	307 30	
Yazee .. .. .	1 1	307 30	
Kichee .. .. .	2 10	355 0	
Tograchee .. .. .	0 39	355 0	
Tawakashbrook .. .. .	0 21	355 0	
* * *	0 17	355 0	
* * *	0 33	355 0	{ North of this point the path becomes more like a road.
Lungur, 3rd .. .. .	0 16	315 0	
Jalkajee .. .. .	0 34	315 0	Oostung means a canal.
* * *	0 27	315 0	
Toghrak mazar .. .. .	0 49	350 0	
Yusra oostung .. .. .	0 11	350 0	
Poshkum oostung .. .. .	1 39	350 0	
Poshkumbazar .. .. .	0 5	350 0	
River Boi .. .. .	1 30	350 0	
Pionup .. .. .	1 27	350 0	
A canal .. .. .	0 35	360 0	
* * *	0 23	325 30	
Lungur chalk .. .. .	0 15	360 0	{ Or Yarkund River flowing from hills on the west.
Lungur .. .. .	0 22	360 0	
* * *	0 28	315 0	
Lungur .. .. .	0 18	355 0	
Lungur .. .. .	0 18	355 0	
* * *	0 18	355 0	
Lungur .. .. .	0 18	355 0	
* * *	0 18	355 0	
Yarkund city .. .. .	1 0	335 0	{ A rich country with many vineyards.
Total number of hours from Karakoram Pass to Yarkund .. .. .	124 30		

*Note.*—The bearings were taken with a good prismatic compass, and the time was noted by an ordinary watch.—T. G. MONTGOMERIE, Capt. R.E.