

been spent in founding the colony on a spot whose progressive capabilities were a matter of certainty, and where ample room existed for its development, much credit might have been saved to the Brazilian Government, and great profit gained by both parties.

The advantages which this district would afford to the English settler over that of Assungui may be briefly summed up as follows:—More suitable climate; pastoral as well as agricultural land; and more central position with reference to markets for produce. If English colonisation is ever to succeed at all in this province, it must be planted in some such locality as this, and not in the utter depths of isolation in which Assungui is buried. Let, then, the Assungui attempt be abandoned; the colony transferred to the neighbourhood of Tibagy; and the nucleus formed somewhere on the borders of the forest,—not in its far depths.

At Curitiba a large and thriving German population has sprung up out of very small beginnings—and why? Simply because the country and climate are suitable to the people, and there is a market for their labour. At Assungui these conditions are conspicuous by their absence; but at Tibagy they exist to an equal degree with Curitiba, and, for an agricultural colony, no part of the whole province could be better fitted.

New blood would in this way be introduced where it is most wanted, and where it would have the greatest effect. The laws of natural selection might safely be trusted to do the rest. And thus this rich and fertile valley, with an area of nearly 20,000 square miles, would have some chance of attaining, at no distant day, to a position worthy of its great resources.

At present, it must be remembered, it is, like many another rich but not easily accessible country, scarcely known even in its own province, and to the outside world it is altogether a "Terra incognita."

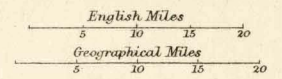
IX.—*A Prince of Káshghar on the Geography of Eastern Turkistan.* By R. B. SHAW.

[Read, June 26th, 1876.]

THE interest attaching to the mountain-region surrounding Kashgharia, of which portions have been recently brought to notice by the explorations of the several parties detached by Sir T. D. Forsyth's Mission, makes it worth while to review



Sketch Map
of
EASTERN TURKISTAN
to illustrate the Paper
by
R. B. Shaw Esq^re



what we know of the remainder, so as to ascertain how much has still to be done before our knowledge is complete.

I have been chiefly led to do this by reading the graphic account of these regions given by Mirza Haidar,* a Prince of the Royal family of Kâshghar, and a contemporary and connection of the Emperor Baber, the first of the Great Moghuls of India. Moreover, though I have not had an opportunity of making any personal explorations in the hill-country west and north of Kashgharia, beyond the determination of the position of several peaks and ridges visible from the plain-country, still I have been able to cross-examine several intelligent natives who have been there, and I have formed to myself a pretty definite notion of some of the natural features; subject, of course, to subsequent correction.

Mirza Haidar thus describes the general characteristics of the region:—

“The mountains of Moghulistân [the Muzart and Thian-Shan Range], from which all the other mountains branch off, passing round the north of Kâshghar, come round to its west, and go off by the south of that city. . . . The province of *Farghâna* [Andijan or Khokand] is in the west of Kâshghar, and these same mountains lie between; and that which is between Kâshghar and Farghâna is called Alaï.†

“*Badakhshân* is on the west of *Yârkand*, and there also these mountains intervene. That which lies between *Yârkand* and *Badakhshân* is called *Pâmîr*. The width of *Pâmîr* is, in some places, seven or eight days’ journey. When one has passed this, there are some of the mountains of *Yârkand* which adjoin *Balor*, such as *Raskam* and *Tâghdumbâsh*; and when one has passed these, the rest is land belonging to ‘Tibet.’”

Here we must remember that the writer is in imagination travelling with the mountains, following their curve as above described, which leads him first into the Alaï plateau, then into the Pâmîr, thence into a region where Balor is conterminous with the districts of Raskam and Tâghdumbâsh, and finally into the Tibetan provinces. This is quite a correct account. Regarding Raskam and Tâghdumbâsh, it is sufficient to say that these names are current at the present day. The districts ‡

* In the ‘*Tarikh-i-Rashidi*,’ a book written by him about the year 1543 A.D. towards the end of his life, in Kashmir, of which he was then ruler. It was at one time hoped that a translation of this work, by the pen of Sir H. Rawlinson, would appear.

† One of the routes (which will be given presently) leads across a corner of the Alaï.

‡ Marco Polo seems to have considered them part of Balor, to judge by the direction in which he says Balor lies from Pâmîr. At the present day also Raskam is a dependency of Kanjut (a part of the ancient Balor).

which are so called lie on the Central Asian *versant* of the *Muztak* (sometimes, though improperly to my mind, called Karakoram) Range, in the corner between it and Pâmir. Tâghdumbâsh is grazed over by the Sarikol Kirghiz, subjects of the Amir of Kashghar. Raskam is held by the Kunjutis of Hunza-Nagar. One of the boundaries of Balor is thus very distinctly marked out. As it adjoined Raskam and Tâghdumbâsh, it must have included Hunza-Nagar.

Mirza Haïdar continues:—

“Badakhshân is in the direction of summer sunset [viz. about 30° N. of W. for that latitude; but the real direction is nearer west, in accordance with his first statement] from Yârkand, as has been mentioned.

“*Kashmir* is in the direction of winter sunset [south of west; but in reality it is very little to the west of south] from Yârkand, and the same mountains lie between. That which lies between Yârkand and Kashmir is a province of Tibet, called *Balti*. And here in the same way that Pâmir is wider than Alaï, so in *Balti* the width of the mountains is, perhaps, twenty days’ journey. As the [chief] acclivity in the ascent from Yârkand is the acclivity of *Sanju* [so], the [chief] declivity in descending towards Kashmir is that of *Iskârdo*.* From this acclivity to that is about twenty days’ journey.

“Similarly in the winter sunset [south of west] of *Khotan* certain of the cities of India are situated, as *Lahor* and *Sultân-pur* and *Bajwâra*;† and the same mountains before-mentioned lie between. That which lies between *Khotan* and the cities of India above-named, forms provinces of Tibet, viz. *Arduk* [Rudok], and *Gugah* [Gugé], and *Aspati*‡ [Spiti]. And this must be borne in mind, that these mountains end in *Khatâi* [China].”

Here we have a geographical description which shows that Mirza Haïdar was able to rise above details and conceive a general idea—a rare faculty among Orientals. The account of the mountain region sweeping round the north, west, and south of Kâshgharia, and thus enclosing that country on three sides, is the simplest and truest that can be given. Our author evidently considers all that lies between Yârkand and Khotan on

* The capital of Baltistan.

† Sultânpur is the chief town of Kullu, the valley of the Upper Biâs River. I incline to think that Bajwâra must be an old town of that name, not far from the Satlej near Phillor, from its being mentioned afterwards in connection with that river. There is also a *Bajâora* on the Biâs, near Sultânpur.

‡ Here we have that peculiarity of certain Oriental nations which prevents their being able to pronounce an *s* immediately preceding another consonant at the beginning of a word. Thus, we have *Iemî* for the familiar Smith, *Iskârdo* for Skardo, &c.

the one side, and India on the other, as one great mountain-mass; in the same way as that which divides Yârkand from Badakhshân, or Kâshghar from Khokand,—only, the mass widens as it runs round by south and east. He is not troubled by any theories about the mountains of Sanju (the Kuen-Lun) not forming a part of the same mass. This mass is composed of many subordinate ridges, but they combine to form one grand system. No one of these subordinate ridges or ranges (such as the so-called Kuen-Lun) deserves to be distinguished from the general system, in any sense in which each of the others could not equally be distinguished from the rest. Looked at individually, they are ranges distinct from one another; but viewed *en masse*, they all (including the Kuen-Lun) form but one system or chain.

In another place (referring to “these mountains” which he has been tracing round Kashgharia), he says, “In winter the Champas descend the above-mentioned mountains to the west and south, *which is India.*” And again he says, “All water which flows from the mountains of Tibet [viz. the Tibetan cross-segment of the great curved chain] towards the west and south forms rivers of India. . . . and all waters which flow from the [*same*] mountains of Tibet towards the east and north form the rivers of Yârkand, &c.” Thus, in his estimation, *one* mountain-system, and not *two*, lies between the Indian and the Central Asian basin.

The idea of gauging the width of the chain by giving us lines across it in different parts, together with a statement of the countries which they lead to, is very satisfactory. These lines, radiating from the cities of Eastern Turkistân, are probably routes travelled by himself or by his informants.

With regard to the first of these, viz. that *from Kâshghar to Farghâna*, he merely says that it crosses the Alaï, and that the Alaï is narrower than the Pâmir, which is seven or eight days' journey in width. I have obtained some information regarding one of the routes between Kâshghar and Kokand, which does, in fact, cross the Alaï, and which, I think, has not yet been described. I have drawn up the accompanying sketch map, from the description and under the eyes of a very intelligent native merchant who has traversed it, and who, knowing the kindred region of Tibet well also, was able to point out to me examples in the latter country of the natural features of the Alaï which he was trying to describe. The position of the northern Passes I have taken from Colonel Walker's last map.

The lamented Fedschenko has made us acquainted with a more westerly part of the Alaï, “a table-land at the head of the Surkh-âb, or northern arm of the Oxus. At the point at

which M. Fedschenko visited this plateau, it was about 7 miles wide and 8000 feet high. Towards the east there are no mountains visible, and the plateau seems to widen out towards the north-east. On the south the Alaï is skirted by a snowy range. . . . Across these mountains, which M. Fedschenko calls the 'Trans-Alaï, there is a pass into Sarikol, and further east there is another pass, called *Taiù Murun*, which leads to Kâshghar."* He himself crossed the range which bounds the Alaï on the north by a pass of 13,000 feet.

Now, it is across this same range further east that the *Shart* Pass leads (the *Terek*, or main route between Khokand and Kâshghar, being still further east). On crossing the Shart Pass from the north one enters the flat Alaï plateau, which is here described as a day's march across (say, 12 or 15 miles). At first small rivulets are met with, running west to form the River Surkh-âb, or Kizil-su, seen by Fedschenko. Crossing the plain transversely (south-east?) towards the southern snowy range, one gets to the edge of a sudden depression running along at the foot of the southern mountains, like a ditch under a rampart, with the Alaï plain for a "glacis." In this depression is a small stream running *east* and coming from the *west*, where the depression itself seems to originate only a few miles off, being, in fact, a kind of fissure between the plain and the mountains. This stream flows towards Kâshghar. I am assured by my informant that the whole thing is almost exactly paralleled by the deep cut of the Sum-kyil stream at the edge of the Kiang-chu plain in Tibet (Rupshu), with which I am acquainted. Here the plain is merely the surface of a vast and deep bed of alluvium, between which and the mountains a stream has cut a channel several hundred feet deep; and correspondingly wide, through the same alluvium.†

If this comparison is exact, as seems probable from the intelligence of my informant and from independent corroboration, we have here a singular repetition of the indistinct water-partings of Tibet. For the surface of this same Alaï plain sheds its waters westward; and here, without crossing any ridge, merely by walking across a dead flat, we get to the edge of a channel which feeds the Kâshghar River (eastward). For the road follows this stream for some distance, until the rapid deepening of its bed and the precipitous nature of its banks, compel the traveller to ascend the hill-side, cross a small pass called the *Igizak* (Twins), and return again lower down to the Alaï stream, where its sides

* See 'Ocean Highways,' for August, 1873.

† [These lofty valleys, filled to a flat floor with diluvium, and affording fine pasture, appear to be the features to which the name of *Pamir* is given generically.—H. YULE.]

are less steep. Near a place called *Ok-saldi* (a former Chinese station), the stream is joined by a smaller one from the Terek Pass, and by a larger one from the north from the district of Ketman Tippa. The united stream flows towards Kâshghar, receiving smaller tributaries from both sides; but my informant shortly again diverged from the regular road *viâ* the Terek Pass, which struck into his at *Ok-saldi*. He reached the open country about one march from that place, after crossing a low pass and entering the mouth of a valley containing a stream from the south-west, where it debouches on the plains, and which, after reaching the village of Opal, flows away to the south-eastward.

With reference to the name "Taù-Murun" (mentioned by Fedschenko), this would mean in the Kirghiz dialect "mountain-nose" or "promontory" (Kâshghar Turki, "Tâgh-buruni"), and would be very applicable to the projecting point which is crossed by the Igizak Pass (so called probably from some other local feature). This merely surmounts a steep obstacle, returning to the banks of the same river, unlike most passes, which generally lead over a ridge into a different drainage system. But the name "Taù-murun" has not actually been mentioned to me in this connection.

Another road across the Western Mountains is given by Mirza Haïdar in a separate passage, in which he describes the rivers of Kashgharia. It lies up the valley of the *Shahnâs*, and leads from Kâshghar to Badakhshân. This introduces us to the question of the drainage of the mysterious region north of that which was the scene of Colonel Gordon and his party's late spirited and valuable exploration, and south of the Alai; and also to that of the origin of the streams which one crosses between Kâshghar and Yârkand. I give the passage from Mirza Haïdar which refers to this subject:—

"When I say that the length of the cultivated country of Kâshghar and Khotan extends along the skirts of the Western Mountains, so that from the borders of Kâshghar (the name of the place is Artuj*) to the extremity of Khotan (which is Kiria† and Chirha) may be one month's journey; still, in the width of the inhabited portion, if one travelled quickly from the Western Mountains in an easterly direction, one would pass out of the cultivated country in one or two days.

"By the side of every river that issues from the mountains corn is sown and the land inhabited. Thus the first river is *Tuman*.‡ It comes out from the mountains which lie between

* *Artush*, on the road from Kâshghar to Vernoy.

† Visited by Mr. Johnson in 1865.

‡ The present city (*Kohna Shahr*) of Kâshghar is situated between two rivers which join together about two miles s.e. of the city. The larger of the

Kâshghar and Farghâna (Andijân). And this river passes through the midst of the old fortress which Mirza Abu-Bakr destroyed. . . . Many districts are fertilised by this water.

"The second river* is called *Kârâ-Tâzghun*. In the idiom of the men of Kâshghar, *Tâzghun* means 'river.'† It passes the above-mentioned fortress 3 farsangs (15 miles) to the south; and most of the districts of Kâshghar are cultivated by means of this water.

"Three farsangs from this river is another, the *Kusun Tâzghun*. The villages of *Yangi-Hissâr* are on this river, and the lands of these are irrigated from this water. From Kâshghar to Yangi-Hissâr the road is 6 farsangs.‡

two, which washes the eastern side of the city is called *Tuman*, or *Ara-Tuman*, i. e. Middle Tuman. The other, flowing a short distance to the south (and crossed by a bridge in going from the fort to the city), is called *Kizil*. The united stream is now often called after the latter; but the name of the former seems to have prevailed in Mirza Haidar's days.

* Mirza Haidar here leaves out several minor streams which cross the road. About half a mile from the (new) Fort to the south (or say nearly 6 miles from the city) is a small muddy stream occupying part of a bed, which is about three or four times its width. This stream, or its branches, are variously called by the natives according to the names given to me; *Telbachuk* تلباچوک (this name I

seem to have applied to the wrong river before), *Kacharchi* (from a village on its banks), and *YAMAN-YAR* (meaning "bad banks"). Three or four miles from this one crosses the *Fatżabad Ustang* (Canal) by a bridge, and about a mile further the *Kizil Bot* ("red length"), and the *Kârâ-su* ("black-water") within 50 yards of (above) their junction. They both seem artificial. The latter is the smaller of the two. I am told that these four above-named, all derive from the same trunk as the Kâshghar River.

About 8 miles beyond this one descends slightly into a broad depression, at the edge of which is a considerable canal, called the *Khan-arik* ("King's canal"). The depression is occupied by three or four branches of a river (larger than any of the preceding), crossed by several bridges. It is variously called *Tâzghun* (which really means "a flood") and *Yupurghi* يوپورغى. I have also heard the

name *Tarim-Moghul* ("Moghul cultivation") applied to it, said to be the name of a district on its banks some 30 miles below. But this is perhaps a corruption of the words *Taram* (meaning "divaricating"), and *Gol* (Mongol for "River"); a name very applicable to the joint stream which loses itself in Lob; and which is the *Tarim Gol* of maps. † Really "flood."

‡ This must be understood to mean to the town of Yangi-Hissâr, not to the above-mentioned villages of that district which are watered by the Kusun River. After crossing the River *Tâzghun* or *Yupurghi* (mentioned above in the note), one enters the district of *Yepchang*; this continues to the River *Kusun* (known for its quicksands), say 5 miles. After crossing this by a bridge one reaches shortly a small canal, called after the villages of *Bêsh-Kent* ("five villages"), which it irrigates. Thence traversing the district of *Sughluk* and a reedy tract through which flows a small stream, called *Saitla*, one reaches the town of Yangi-Hissâr (also called *Lâwar*), which is fed with water by a small channel, called the *Sâilik*. All these, viz. the Kusun, *Bêsh-Kent Ustang*, and the *Sâilik* are said to arise from one head. The *Saitla*, I hear, is produced from certain springs rising in the plains. Two or three miles south of Yangi-Hissâr one crosses a good-sized stream, called the *Saighan Sâr*, also said to originate in the plains. All the streams I have mentioned crossed the road from west to east.

"After Yangi-Hissâr there is an insignificant hamlet called *Kârâ-Khanak*. It may be about 6 farsangs. In front of it flows the River *Shâhnâz*, and several villages are fertilised by this water. *Shâhnâz* is also a valley situated in the Western Mountains, and the road from *Kâshghar* to *Badakhshân* is through that valley.

"From *Karâ-Khanâk* to *Kilbin-Rabât* there are villages which are stages for goers to and fro. It may be 5 farsangs. Then there is another rest-house, which they call *Kosh-Gumbaz* ['Dome of Assembly']. It is a fine halting-place, and irrigated by the River *Shahnâz*. It possesses cultivated fields and gardens, which are all assigned to the service of this rest-house. Goers and comers have the use of this rest-house.

"The next stage is a village called *Kizil*. It has salt-water. At this stage they do not halt unnecessarily. This is the half-way stage between *Yangi-Hissâr* and *Yârkan*.

"From *Kizil* to *Kok-Rabât* is about 10 farsangs. From *Kok-Rabât* to the edge of the district of *Yârkan*, which is named *Rabâtchi*, may be estimated as a distance of 7 farsangs. Between *Rabâtchi* and *Kârâ-Khanâk*, besides these stages which have been mentioned, there is little other habitation."*

* To continue the description of the road as it exists now: after crossing the *Saighan-Sûi* (south of *Yangi-Hissâr*), one traverses some low ridges of sand-hills (running nearly east and west), and enters a large, reedy plain, extending up to the skirts of the mountains to the south-west. Just at the edge of this plain, between it and the sand-hills, there is a rest-house, with a spring of water and a few trees. It is called *Suget Bulak* ("Poplar Spring"); but no one knows the name *Kârâ-Khanâk* here. From this, crossing the reedy plain for some miles, one reaches the cultivation of *Kilpin* (*Kilbin Rabât*, see above) extending along the neighbourhood of a water-course from the mountains on the south-west. A couple of miles further is the village and cultivation of *Topluk*, extending in the same way. Again the road passes through a waste, which slopes down gently from the western mountains, reaching presently the villages of *Kosh-Gumbaz*, *Tam-yeri* ("wall-place"), *Kuduk* ("well"), *Chumalung* and *Kizil* ("red"). The cultivation of the two former is conterminous, but spaces of desert separate the others, that between *Topluk* and *Kosh-Gumbaz* being the widest. Of all these villages it must be understood that they are long strips of cultivation, extending several miles south-westward, up the banks of the small water-courses which feed them, and that the road passing from north-west to south-east (roughly) crosses their narrowest direction, which varies from a quarter to half a mile, or a little more. From *Kizil* to *Kok-Rabât* is a long desert tract, known as *Ahmad-Sâyi*, with a single well and rest-house, called *Ak-Langar*, about half-way. On leaving *Kok-Rabât* one turns more to the east, and enters a broad tract of country consisting of sand-hills separated by reedy and marshy flats, and by a few cultivated spots. A stream connecting a string of pools and marshes, and called *Sughuchak*, runs through this tract from south-west to north-east (about). The sand-hills nearest to *Kok-Rabât* are called *Kizil-Kum* ("red sand"), and those nearest to *Yârkan* are called *Kârâ-kum* ("black sand"). The present road does not pass through *Rabâtchi* (which I have, however, visited in a shooting excursion). It lies a little distance to the south-west of the spot where the traveller descends into the plains of *Yârkan*, which extend before him like a garden thickly studded with trees. It is quite correct to say, with our author, that this place in one direction, and *Kârâ-Khanâk* (or say the modern *Suget Bulak*) in the other,

With these two descriptions before us, viz. Mirza Haïdar's, written three centuries ago, and that of the present features of the road given in the notes, we see the water distribution which we have to account for. There is one strange thing about it: that streams crossing the road several miles apart are often said by the natives to be one and the same; and on further inquiry one learns that they are derived from a single trunk-stream. Thus the Telbachuk, the Faïzabad, the Kizil Boï, and the Kârâsu, I was told, have one origin, which is said by some to be identical with that of the Kâshghar rivers; and Captain Biddulph, in the interesting account of his visit to Maralbashi (see Royal Geographical Society's 'Proceedings,' vol. xviii.), mentions "three considerable streams flowing from the south," whose names were given to him as "the Derbuchek" (my Telbachuk), "the Chokanah" and "the Faïzabad." He was told "that they are all united into one stream called the Yamânyâr, at no great distance above where I crossed them." Thus it would seem that all the streams crossing the Kâshghar and Yârkand road over a space of, at the least, some 6 miles, beginning from the Fort, are derived from one parent trunk, whose proper name we may conclude to be the *Yamânyâr*, as stated to Captain Biddulph, notwithstanding that my own informants applied the name more particularly to the northern branch.

Similarly the Khân-arik and the several branches of the Tazghun or Yupurghi are said to be derived from the same origin as the Kusun, the Bésh-kent, and the Saïlik. From the former to the latter the distance is about 20 miles. I am informed that they all issue from the mountains at the same place, and that the water can there be diverted at pleasure from the main river-head into either one or more of the latter, so that one might be made to run dry while the others were full. There is a noted shrine, called after a certain Khoja Paklan, near this spot; and it is said that at the proper season the villagers from below assemble there, and, after prayers, distribute the water into the different channels by means of dams, &c., under the direction of the priests or sheikhs of the shrine, who act as arbiters.

The next river, the Saïghan, is said to rise from springs in

are the limits of the desert region crossed between Kâshghar and Yârkand. His distances are, however, his weak point, as with most Oriental travellers. He probably put them down when he wrote the book in Kashmir (of which he was the ruler) towards the end of his life. With the exception of the first two stages (from Kâshghar to Yangi-Hissâr 6 farsangs) all the distances given in this passage are exaggerated. The tedium of a ride through the desert, and the longing to get it over, would make it seem longer than an equal distance through pleasant country, to one who used no means of measurement beyond his personal impressions.

the plain, though its volume would seem to point to a more distant source in the mountains.

Beyond this, to read Mirza Haïdar's description, one would think that the road led along the banks of the Shâhnâz River, for the stages as far as Kôsh-Gumbaz are said by him to be irrigated by that river. On the contrary, the road runs through a desert, only crossing at intervals strips of cultivation which fringe the few water-courses flowing from the hills on the south-west. But the villagers at the present day have the same story about these being all water of the Shâhnâz, which, they say, is the river which flows in the great valley or opening of the mountains visible to the south-west. Here also the same distribution of water takes place which I have above reported for the Tâzghun and Kusun series of streams. The Shâhnâz water is thus spread over the space from Kilpin to Chumalung, say 13 miles in width.

Thus the natural rivers of the country seem to have disappeared or become merged in the number of artificial water-courses or canals into which they have been distributed by the industry of the children of the soil. And instead of finding the streams diminishing in number and increasing in volume as we follow them downwards, it is the reverse that takes place. There is complexity below and unity above. They resemble arteries rather than veins, though, of course, in the mountains the case is the reverse.

As we leave Kizil and travel towards Kok-Rabât, the secret of this curious state of things begins to reveal itself. The skirts of the mountains are here nearer the road than before, and the desert sloping down from the low outer hills on our right-hand begins to exhibit, on a scale not too large for comprehension, a surface-formation which is common in Tibet, where it can be recognised and studied with greater ease than here. This formation has been most graphically described by Mr. F. Drew, F.G.S., in a paper read before the Geological Society in August, 1873. He has given the name of "alluvial fans" to these deposits of loose material (a sort of convex deltas) brought down through narrow ravines and laid out on the flat land outside their mouths:—"At the mouth of each of these (ravines) are 'alluvial fans' which project out into the flat of the river-alluvium. . . . The radii of the fan are about a mile long; the slope of the ground along these radii (which are each in the direction of the greatest slope) is 5 or 6 degrees. The *fan* is properly a flat cone, having its apex at the mouth of the ravine. In this instance the length of the axis, that is to say, the vertical height of the apex above the alluvial plain, will be about 500 feet, the length of the base of the generating triangle being

about a mile. It will be observed" [from an accompanying illustration] "how very straight is the line of the profile. This is highly characteristic of these fans; and the character is equally marked whatever portion of it we get into view—whatever radius comes into profile. The hard straight line among the irregular outlines of the mountains adds a strange and unlooked-for feature to the landscape. . . . The *radial* lines (seen in Fig. 3) are as faithful representations as I could make of the water-courses with which the surface of the fan is scored. Whether we start from the furthest projecting point of the circumference or edge along the mountains (against which the fan abuts, ending off sharply) to go to the apex at the ravine's mouth, we are always on an equal slope, in this case of 5 or 6 degrees, as before said. In walking across one of the large fans along the path, which is usually made in a curve between the arc and the chord, one is apt to be continually expecting in a few steps to arrive at the summit of the slope; but again and again one is disappointed, new portions of the cone intervening in succession till the central radius is reached.

"The mode of formation of this fan it is not difficult to trace. . . . When the alluvial matter which had been accumulating in the ravine reached past its mouth, there was a tendency of the stream to flow over the material it was bringing down—now in one direction, now in another—in every direction, indeed, from the mouth of the gorge as a centre; and along each line, as it flowed, it accumulated material at an equal angle. Thus cone after cone was formed, each coating the last, and the sloping fan both rose and spread."

I must refer the reader to the rest of this interesting paper for a fuller account of these formations.

With regard to the desert slope in the road from Kizil to Kok-Rabât, I can best characterise it by saying that it consists of a series of fans such as that described by Mr. Drew, only they are on a much larger scale, and (as generally follows) with a gentler inclination. The road rises and sinks in undulations of great width (say 5 or 6 miles from trough to trough). These are the tails of the alluvial fans. The changing horizon-line is always remarkably straight, with a distinct slope downwards from right to left (as one travels south-eastwards). When the traveller approaches the summit of each undulation, another but fainter horizon-line is seen, peeping over that which is immediately before him. This is the central slope of the next fan, several miles off. On looking towards the mountains the profile of the desert is seen defined against the distant hill-side, either as a single slope dipping in the same direction as his own road, or else as a double slope, synclinal if he be in the trough, or anti-

clinal if on the summit of an undulation. The trough, as I have called it, while apparently narrowing as it approaches the hills, widens out often into a small triangular plain *below* the road, as the circumference-curves of the adjacent fans sweep away from it.

These features are on such a large scale (the slope being perhaps 6 or 8 miles in radius) that the eye has a difficulty in taking them in as a whole. But what proves the undulations to be not mere surfaces of sloping parallel cylinders, but low cones—each like a lady's fan spread open, whose axis is propped up (on a reel of cotton, say), so that its surface droops down in every direction from that centre—the proof of this is the distinctly *radial* direction of the water-courses (dry for the most part when I have seen them) which score the ground. As one ascends the slope of each undulation these dry water-courses cross the road, neither at right angles nor parallel to the slope of the horizon, but partly meeting one, as it were, at an obtuse angle. On the other hand, as one descends on the further side, they join the road at an acute angle, inclining towards the direction that one is oneself taking. They all seem to point back towards one source, the apex of the fan or the mouth of its parent ravine.*

Now it is probably this fan-formation and the radial direction of the water-courses caused by it which enables the water issuing from one ravine-mouth to embrace in its branches wide tracts of country. For example, after leaving a certain ruined Chinese post-house, situated in one of the triangular flats between the fan-edges (near the above-mentioned well and rest-house of Ak-langar), one rises up the slope of a fan which is seen to come from a remarkable ravine-cutting in a low range of outer hills to the south-westward. After traversing this fan-undulation for about 7 miles, one reaches the bottom of another trough, marked by a dry water-course which is distinctly seen to come from the same unmistakable cutting, away to the west. So that when the water flows in spring (if it ever does here) the depression in which stands the Chinese Post-house and that near Kok-Rabât (some 7 miles apart) must be supplied with water radiating from one and the same spot.

If we judge by analogy we shall conclude that in the other instances where we see the same result, viz. widely-separated water-courses ascribed to one source or origin, the cause is the same, although we have not yet had the opportunity of verifying

* At the foot of these fan-slopes is a tract of country covered with fine bedded clay, apparently of lacustrine origin. This is very much cut up into irregular hummocks exhibiting the bedded structure; and is partly covered with grassy vegetation, and even small trees and bushes. The road from Topluk to Kôsh-Gumbaz passes along the edge of this broken country, while from Kizil to Kok-Rabât it crosses the tails of the barren alluvial fans.

it by ocular inspection, as in the district between Kizil and Kok-Rabât.* Thus, to begin again from the south, the Shahnâz Valley may be supposed to have produced a gigantic though gently-sloping alluvial fan, which radiates its waters through the various villages from Kilpin to Chamalung. Again, the waters of the Yangi-Hissâr district from the Saïlik to the Kusun River, and possibly the Tâzghun as well, would be radiated by another gigantic fan; for some accounts connect the much greater volume of water of the Tâzghun and Khân-arik with the same system as the Kusun. The case of the Yamân-yâr and Tuman river-systems is more doubtful, for the mountains are here much more distant, and the intervening country is very flat. Hence we seem here to have a kind of inland *delta*, that is, a tract so level as to enable the trunk-river to separate into diverging branches, artificial or natural.

We may perhaps take Mirza Haïdar to be detailing only the natural river-systems, each under the name of its principal branch, and neglecting the artificial and perhaps more modern subdivisions of the water. Even then, in an author usually so careful and accurate, it would be difficult to account for the omission of any representative of the Yamân-yâr or Telbachuk system from his list, unless it be that they are derived from the parent trunk of the Tuman. The considerable stream, called *Saighan* (south of Yangi-Hissâr), is also passed over in silence, whether because he considers it to belong to some other system, or because it does not rise in the mountains. It may be that he includes it in the Shahnâz system, whose waters may perhaps at one time have filled it (as they are said even now to reach it) before they were diverted to such an extent as they are now, for the irrigation of the villages between Kilpin and Chamalung, which appear to be more numerous than they were in Mirza Haïdar's days.

South of the Shahnâz there is no other important stream till we get to the Yârkand River. For the village of Kizil seems to monopolise a little rivulet from the lower hills, said to be distinct from the Shahnâz, being no longer dependent on salt or brackish wells as in former days. Kok-Rabât obtains water by a long cut from the Yârkand River, at the place where it issues from the hills in a district called *Karchung*. This, and its town or large village of the same name, would seem to have supplied the name, if not the locality, of the mysterious *Karchu* of geo-

* This has proved to be true in the case of the far more important fan-delta of the Yarkand River, which, issuing from the mountains below *Karchung*, embraces in its radiating branches the whole cultivation of the Yarkand district, 40 miles in width. See my "Report of an Excursion to the Karchung Valley," in the 'Gazette of India' of October 1875. (R. B. S., March 1877.)

as Dr. Stoliczka expressed it, "the system of drainage has no essential effect upon the direction of the hill-ranges. This, dating from much older times, was mainly an east-westerly one, following the strike of the rocks which compose the whole mountain-system."^{*}

A somewhat corresponding account is given by Colonel Gordon's party of the Southern Pâmir region, adjoining the district in question. Captain Biddulph writes: "The Pâmir, instead of being a steppe which you can march across in every direction, consists, as far as we can make out, of a series of broad valleys at a great elevation, called by the names of the different Pâmirs, along which the different roads run" (between Eastern and Western Turkistan and Badakhshân). "The whole way from Aktash to Sarhad, four days' march, we were in one broad valley, there being no perceptible rise between the lake (Pâmir Kul) and the commencement of the waters flowing west."[†] The forthcoming report by Captain Trotter, R.E., on the exploration of the Southern Pâmir, may be expected to clear away all remaining difficulties on this subject.

It is across this Pâmir region that Mirza Haïdar's next gauge-line leads, viz. that from Yârkand to Badakhshân (to which we may now return after this long digression). In speaking of "seven or eight days' journey," he expressly refers to Pâmir itself, viz. the country *on* the mountains, and excludes the defiles and valleys by which it is approached, which extend over a much longer distance.

We may now give a glance at *Balor*, which is here mentioned in passing as being conterminous with the Yârkand provinces of Raskam and Tâghdumbâsh in the region which succeeds Pâmir, as one follows round the mountain-curve. The name is distinctly spelt *Balor* (بلور), in my copy, and not *Malaur* (ملور), as seems to be the case in some other MSS. The dot under the *b* would easily slip out in transcription, and leave the semblance of an *m*. After Balor comes Tibet, ac-

^{*} 'Records of the Geological Survey of India,' No. 3, 1874, p. 85.

[†] I may here quote a passage from a paper read by me before the Geological Section of the British Association at Brighton in August 1872: "My idea then of the Pâmir is that, instead of a *meridional* range, there is a series of *latitudinal* ribs or ridges running east and west. The spaces between these are occupied by high plateaux dotted with lakes, whence issue various streams flowing some east and some west, and which, as they leave behind them the central plateaux, cut their way gradually into deeper and deeper gorges to reach the plains. . . If I am right in my conclusions, there is no one Pâmir plain, but several separate ones divided off by the more or less elevated mountain ridges, which run across from east to west. . . . It is probable that everything in this district deserving the name of a ridge or range of mountains has its axis directed not far from east and west, and that the great Eastern and Western systems of drainage originate near together on the high intervening plateaux, on which the waters divide almost as the drops of rain on a duck's back, some trickling down to the right and some to the left."

ording to our author. Now, the farthest province of Tibet in this direction, as described by him, is *Balti*.*

We thus get an exact description of the North-Eastern boundary of Balor. For what adjoins Tâghdumbâsh and Raskam and Balti towards the south and west respectively, is the country now called Kanjut (Hunza and Nagar).

In another passage he tells us: "The Eastern border of *Baloristân* adjoins the country of Kâshghar and Yârkand" (viz. the provinces of Tâghdumbâsh and Raskam above-mentioned), "its Northern border adjoins Badakhshân, its Western, Kâbul and Lumghan (Lughman), and its Southern border is the country of Kashmir."†

Balor, therefore, included the present districts of Kafirstân, Chitrâl, Yas-in, Gilgit, Hunza-Nagar, &c. Probably, it also extended south of the Indus to Astor and Chilâs. Wakhân is excluded, being considered part of Badakhshân, since Mirza Haïdar says: "I returned from Balor to Sarigh Juyân (Chaupân, چوپان for جویان), which is at the head of Wakhân. There is a common tie between all the districts thus indicated, in that they constitute the habitation of the *Dard* race.

According to Mirza Haïdar's definition, therefore (and he was in a good position to judge, having conquered the country), Balor answered to *Dardistân*. Colonel Yule has already shown, from a comparison of authorities, that this is where we must look for it.‡

We now come to the route from Yârkand to Kashmir. Starting *viâ* Sanju he makes it traverse Baltistân. Had he taken it *viâ* Kugiâr and the Muztak Pass, the distance across the mountains would have been nearer what he says, viz. 20 days' march. But going *viâ* Sanju proper, it would be considerably more, unless for a lightly-equipped horseman travelling at speed. Moreover, Iskardo (Baltistân) is not on the road from *Sanju* to Kashmir, while it does lie on the Muztak Pass route. We may therefore suppose that to be the route which Mirza Haïdar had in his mind, if we allow that he has extended the name *Sanju* to the more westerly part of the same Kuen-Lun Range (the portion now called "Yangi-Dawân"). For as I have before pointed out, it is probable that the lines which he gives are the routes travelled by himself or his informants. In the

* In another place he writes: "Balti is one of the provinces of Tibet, and it (viz. Tibet) comprehends several other provinces, such as Purik, Khapulah, and Ishgar (Shigar), and Iskardo and Ladaka." (This is the correct spelling.)

† This might perhaps be read, "Swat and Kashmir," the words being *سوا و کشمیر*; but I think the above translation is more correct.

‡ See also Vigne's 'Travels,' vol. ii. p. 309.

absence of maps, he is not likely to have described the course of an imaginary straight line drawn from point to point.

But we know that he also traversed in person the Karakoram Route, though whether by precisely the same line as is now in use seems uncertain. And here I must mention a feature which I noticed in my last journey, having missed it before.

The valley by which one approaches the Karakoram Pass from the south side is a broad open one, bordered by comparatively low ridges on either hand which are arranged as it were *en échelon*. After ascending very gradually for some 12 miles from Daulat-Beg Uldi (the last camp), rising only some 800 feet in that distance, the road leaves the valley and turns up the hill-side on the right, and after a short ascent (of some 700 feet) crosses a low neck into other equally gently-sloping open valleys leading north. This is the Karakoram Pass.* There is no snow near it, and the neighbouring ridges are only 100 or 200 feet higher than it. But while resting on the southern ascent above mentioned, I noticed that the broad Daulat Beg Valley culminates a mile or two beyond where we had left it, and rises no longer. On the contrary, after seeming to continue at the same level for a short distance, it begins to slope distinctly downwards and away from us towards some snow-mountains on the north-west. Further it seems to turn *northwards* under these mountains (disappearing from the sight), and the caravanmen reported that it joins the Yârkand River at *Kufalung*. The following was my note, written on the spot:—"It seems certain that it cannot turn *southwards* and join the Shayok, for a careful distant scrutiny reveals no opening in the wall of mountain which forms its south-west side, and which appears to join on to the mass of snowy mountain which bears from 293° to 300° (about)."

This appearance might be deceptive, but there remains the fact that all the head-waters of the Shayok, south of this, as well as of the Nubra River, come out of vast glaciers amongst gigantic mountains; and it is almost impossible to conceive that a higher source should exist, whose water would have to enter one of these glaciers at its head and flow out under it.† The

* If one attempted to give an idea of the gradients by a section drawn to scale, in which the lowest points of the country lying between the Karakoram and the ranges north and south of it respectively, should be represented as 6 inches apart; the height of the Karakoram above the straight line which joins them would be rather less than one-twentieth of an inch, or as much as the thickness of two good strokes of a soft pencil. The actual figures are: Daulat-beg (about) 16,652 feet; Malikhah (about) 15,140 feet; Karakoram (about) 18,172 feet. The two camps here mentioned are about 45 miles apart, and on either side of them the ground rises again.

† Moreover, the drainage of the space between this and the Shayok Glaciers seems to be accounted for as follows: At a place called *Balti Polo*, some two

native report of the junction of this valley from the southern side of the Karakoram, with the Yârkand River at Kufalung, seems less liable to objection, and agrees better with other circumstances. Strangely enough, we have a report to the same effect, given by Vigne: "The Kurukurum Mountains I believe to be a branch or spur from the Muztak. . . . The appellation appears to be applied to a crest at the summit, 500 feet high, which can, however, be avoided by a circuit of a few miles."* The easiness of the ascent of the small rise constituting the pass, and the importance of avoiding any prolonged stay in this rarefied atmosphere (which forms the real difficulty of the Karakoram), accounts for the fact of the short cut over the "col" being used by caravans instead of the *détour* by the almost equally elevated valley.

But if the above conclusions be correct, it is evident that the so-called Karakoram Range has no *locus standi* left. It has before been shown that further east, the water-parting represented by that name on the maps is not even a ridge, but that many of the streams running into the Indus on one side, and into the Turkistân rivers on the other, originate close together on open (though elevated) plains.† But now it would seem that even directly west of the Karakoram Pass we may ride across on a level from sources that feed the Indus into others which join the Yârkand River. The little ridge of

miles above Daulat-Beg, a considerable stream (larger than that from the main valley) comes in from the west. I hear from several independent witnesses that there is a way, by following up this river, of reaching Baltistân, over a difficult Glacier Pass. Two days above (west of) Balti Polo, the foot of the glacier is reached. Horses have to be turned back from this point, and coolies come from Baltistân to fetch the loads, on the rare occasions when this route is used. After crossing a high glacier pass (to the east of the Muztak Pass) the traveller descends upon *Tsaloro*, and thence to *Kapalu* in Baltistân. From Polo to Kapalu takes about ten days. Vigne seems to have made an attempt to traverse this route. See his 'Travels,' vol. ii. pp. 382-3. This line, therefore, running west from Daulat Beg would seem to cut off any retreat southwards for the valley which runs in a direction north-west from the same point. And, as a corollary, if anything were wanting to show how erroneous is the identification of the Muztak Range with a so-called Karakoram Range, it would be this fact: that a road leading from Baltistân across a high glacier pass of the Muztak Range, on reaching the northern side of that pass still finds itself south of Karakoram. The truth is, that while the Muztak Range coincides with the water-parting between the Indus and Yârkand rivers as far east as the seventy-seventh degree of longitude (about), from that point eastward the range and the water-parting are divorced; the former continues its previous direction with its mighty snow-peaks and glaciers, running across the head-waters of the Shayok, which pierce it through narrow, often almost tunnel-like, gorges; while the latter (the water-parting) turns off to the north-east across the high Karakoram plateau, winding about among the hills which stud its surface, sometimes coinciding for a short distance with a ridge, and forming an imaginary line across the elevated plains.

* See Vigne's 'Travels in Kashmir,' &c., vol. ii. p. 361. Ed. 1844.

† See opposite page 77 of Henderson's 'Lahore to Yarkand' for a photograph view of a part of these plains. It will be observed that there is quite a sea-horizon.

Karakoram, therefore, is cut off on both sides, and has no physical connection with the mighty Muztak Range and its peaks of 28,000 feet of elevation,* on which it has wrongly imposed its name in European maps, though never in the minds or speech of the natives.

It may perhaps be urged in reply (as it has been before) that this is a mere question of names. But I venture to think that, unless it be considered that the difference between a *range* and a *plateau* is unimportant, it is best to keep its own proper name for each. The fact that river-basins are often divided from one another by ranges (or long masses of mountain raised steeply above the surrounding level) is no good reason why we should give that name to a water-parting which is *not* so formed. If it be, then we must be prepared to find *ranges* starting up all over England.

By talking of the Karakoram Range, moreover, a false idea of the natural features of the country is fostered. For instance, in the recent discussions concerning the plan for a railway from India to Central Asia, the necessity for a tunnel through the Karakoram Range was mentioned as one of the obstacles. Nothing of the kind would be required; and a line could in many places be run across the water-parting itself, with no steeper gradient than is often to be met with on European railways. It is almost needless to add that the real obstacles to such a scheme (taking into consideration only physical difficulties) occur elsewhere, and are of a different sort—probably far more fatal.

Mirza Haïdar does not seem to have considered that he crossed a range here, for he writes (in the account of his journey back from Ladâk): "The air was bitterly cold, for (the Sun) was in the mansion of Virgo. We arrived at a place † called Karakoram at sunset. There is a large stream; it was all frozen. Wherever we broke it, there was not a drop of water. Our cattle had travelled all day, through a district where the breath is caught, ‡ a waterless march. . . . Jân Ahmad said: 'I once saw a spring of water (here); we must go nearly half a *farsang* (further).' He showed us the place in the middle of the ice, where we should make a hole. When they had broken (the ice), there was water, and they gave the cattle to drink. . . . Through such hardships we reached the place (written *Taghatak*; ? Aktagh or Taghalik) where the unknown road leading to Badakhshân separates off."

* In the Karakoram Ridge, and near the line of the water-parting, which is east of the great sources of the Shayok, I have seen no peak more than 2000 feet higher than the pass, or say 3000 feet above the general level of the plateau.

† موضع ‡ That is, when the breathing is affected by the rarity of the air.

His next gauge-line is that from Khotan to Lahore, *viâ* Rudok, Gugé, and Spiti. Supposing, as before, that this represents an actual road, he must have known of the route (often noticed lately) leading *viâ* Kiria and Pulu (in *Khotan*) to *Rudok* (in Tibet, near the Pangong Lake), and thence by a road closed to Europeans through a corner of the Chinese province of *Gugé* (Chumurti), probably over the Budpo Lâ (Pass) and down the Pâra River into *Spiti* (a British 'district), and so through Kulu by *Sultânpur*, on the River Biâs, to Kângra and Lahore.

To complete Mirza Haïdar's account of the geography of Eastern Turkistan, I will quote his description of the Eastern termination of the great mountain-mass which he has traced round in its grand sweep from the north, by the west and south of Kashgaria.

"The land of Tibet," viz. the southern arm of the great mass, "is a highland. . . Its point of departure on the north-west adjoins Balor, the position of which has been already mentioned. It extends on the south-east to Sâlâr * itself, which is among the dependencies of Khatâyan (Chinese) *Kanjan-fu*. † . . . On the north and east of Tibet are Yârkand, Khotan, Charchan, Lob, Kank, ‡ and Sarigh-Aïghur, and beyond this is sand, whose further boundary reaches to *Kanju* and *Sakju* § of Khataï (China). . . . All waters which flow from the mountains of Tibet towards the east and north, form the river of Yârkand and the River Ak-kash, and the rivers of Kiria and Charchan, and the rest. They flow into *Kok-naur* || (Koko Nor). Koknaur is a lake in the sandy desert which has been mentioned. I hear from several Moghuls, who have seen it, that one can go round it for three months, and (that) a large river comes out of its lower extremity, || which is called the *Kârâ-turan* ¶ of Khataï (China)."

* *Sâlâr* is identified by Colonel Yule with Ho-chau. It is described to me as a mountain district, the stronghold of the rebel Tunganis, who, up till lately at any rate, held it against the Manchus. This is much beyond the present limits of Tibet, but Marco Polo also gives Tibet a great easterly extension. See Yule's 'Marco Polo,' vol. ii. p. 29. 1st Ed. (I now find that Sâlâr is a hill-district on the southern bank of the Yellow River (Hoang-Ho) a couple of marches west of Ho-chau and the home of a tribe of Turkish extraction, allies of the Tunganis. R. B. S., 1877.)

† *Kanjan-fu* is identified by Colonel Yule with the important city of Singan-fu. [It is interesting to find this *Polonian* name of Singanfu still used by Mirza Haïdar in the sixteenth century. His mention of *Charch'an* between Khotan and Lob is another most interesting illustration of Polo.—H. Y.]

‡ *Kank*, of which I cannot get any modern account, seems to Sir H. Rawlinson to be possibly connected with the Perso-Aryan Kang-diz myth. I may add that the same idea at once struck an educated native of the Panjâb, to whom I showed the passage from Mirza Haïdar.

§ *Kanju* is Marco Polo's Campichu; and *Sakju* is Suhchau [Yule].

|| These seem to be popular misconceptions. See also Vigne's 'Travels,' vol. ii. p. 369.

¶ *Kârâ-turan* for *Kârâ-muran*; the Hoang-Ho.

Since writing the above I have come across Severtsoff's paper in the 'Royal Geographical Society's Journal' for 1870. The following passages corroborate some of the views taken by me:—

"The Bolor* is not a distinct meridional range, but merely a north-western continuation of the Himalayas, or more correctly, of the Himalayan branch of the Tsun-lin, which is a gigantic convexity, connecting, by means of gradual transitions, the system of the Thian-Shan with that of the Himalayas" (p. 392, note). . . . "The real orographical import of my observations on the mountains between the Chu and the Syr Daria lies in . . . the confirmation of the ideas of Huen Tsan and of the Chinese generally, concerning them (the Tsun-lin Mountains), viz. that they are . . . an extensive mountain region, formed by the meeting and blending of the two distinct and colossal systems, those of the Thian-Shan and of the Himalayas. The Kuen-Lun and Bolor,* as we have seen, do not form separate ranges, but both belong to the Himalayan system. . . . The Thian-Shan and the Himalayan systems respectively represent a wide and continuous convexity, upon which rise numerous ranges subsidiary to the general convexity, and consequently of secondary orographical importance. . . . The Altaï also presents the appearance of a wide protuberance, studded with numerous ridges" (pp. 399, 400).

To this very clear view of the matter I should be inclined to add, that the "gradual transition" between the Thian Shan and the Himalayan system, spoken of above by M. Severtsoff, is effected in a different manner for the *ridges* and for the *water-parting* respectively. The *former*, being the result of vast upheavals of earlier date than the present drainage-system, retain, even where broken up into short lengths, their own directions, which are generally intermediate between those of the two mountain-systems to which they are more or less subordinate. They are like splinters lying between two ends of a divided trunk, whose other extremities have been dragged asunder. While the *water-parting*, which begins by coinciding in direction with the axis of the Himalayan system (running about south-east to north-west) and ends by going from south-west to north-east (about) with the Thian-Shan system, sweeps round in a wide curve from the one to the other, its general direction cutting the said splinter-ridges at all angles in its course, it being, in fact, a mere imaginary line joining the culminating portions of the intervening plateaux. Its manner of transition is like that of a willow-wand which is bent almost double without breaking.

* The name given to a supposed range in the place actually occupied by the mountainous plateaux of Pâmîr.