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observation. The maritime capacity of the people varied greatly in different islands. In Aneiteum and Tana the canoes were scarcely better than trees roughly hollowed out, in which the natives were just able to stretch across to Erromango, which lay in sight. In Erromango, however, there were no canoes; while those on the other side, in the Sandwich Islands, were of a superior kind. The only way in which he could account for the fact of the want of canoes in Erromango was, by supposing that the inhabitants, who were distinctly Papuans, had been brought there in a state of slavery, that their masters, by some means or other, having disappeared, the black race remained, retaining their old habits as if they came from the centre of a great continent. To the north of the New Hebrides, in the Solomon Islands, the outrigger quite disappeared, and the inhabitants were able to take long sea-journeys without fear. The Friendly Islands had more of the Polynesian than the Melanesian element, while Vanikoro and others were distinctly Polynesian. To the north of Santa Cruz the Reef Islands were Melanesian. The work of mastering the different languages was very considerable, but Bishop Patteson, before the close of his life, was able to preach in seven or eight different languages, and converse fluently in twice or three times that number. The general character of the islands was also very varied. The coral reefs between New Caledonia and the Loyalty Islands would form a complete example of Darwin's theory of coral reefs. The Island of Mare was only an upraised reef, as was also Lifu. Nea was the same, with the exception that the central lagoon was still covered with water to a depth of from nine to seven fathoms. New Caledonia appeared in the course of ages to be continually sinking, while the Loyalty Islands were continually rising.

Captain **SHERARD OSBORN**, R.N., said the volcano which had been described in the paper was visited by Captain Cook in 1774, and the eruptions and discharges at that time appeared to have been similar to those observed by Commander Markham. Nearly 100 years before that, another navigator had seen the volcano in active operation. This was the most remarkable case of a volcano in constant action that he had heard of in any part of the world. The whole Pacific Ocean might be represented as the crater of one vast volcano, the line of action extending from Kamschatka to New Zealand, and the volcanoes of South America across to those of the Philippines. He did not think the theory of the absence of coral reefs depending on volcanic action was borne out by facts.

The **PRESIDENT** said the coral theory was that the insect could not build at a great depth under water, owing to the pressure. It was, therefore, always endeavouring to reach the surface, and whether coral reefs were present or not, depended on the upward or downward action caused by subterranean movement. The admixture of the two races in these islands, as described by the Bishop of Lichfield, was an exceedingly interesting subject, and the explanation which had been given appeared to him (the President) eminently satisfactory.

Fourteenth Meeting, 24th June, 1872.

MAJOR-GENERAL SIR HENRY C. RAWLINSON, K.C.B., **PRESIDENT**,
in the Chair.

PRESENTATIONS. — *J. Palmer, Esq.; Capt. William Man; Charles Burt, Esq.*

ELECTIONS.—*William Cambridge Barber, Esq.*; *Ramsey Blakemore, Esq.*; *Samuel Booker, Esq.*; *J. G. T. Forbes, Esq.*; *John Fowler, Esq., C.E.*; *Dr. W. W. Hunter*; *Rev. William Roice Jolley*; *Capt. William Man*; *Charles Norris, Esq.*

ACCESSIONS TO THE LIBRARY FROM JUNE 10TH TO JUNE 24TH.—*‘Joannis Bisselii Argonauticon Americanorum.’* 1567. Donor J. V. Irwin, Esq. *‘The Canoe and the Saddle.’* By T. Winthrop. Boston, 1863. Donor J. V. Irwin, Esq. *‘Lithologie du Fond des Mers.’* Par M. Delesse. 2 Parts and Atlas. Paris, 1872. Donor the author. *‘Missionary Voyage to the South Pacific in 1796-1798 in the Ship Duff, Capt. J. Wilson.’* 1799. Purchased. *‘The Survey, &c., of Port Phillip.’* By G. W. Rusden. 1872. Donor the author. *‘The Book of the Conquest and Conversion of the Canarians in 1402.’* By Jean de Bethencourt. Translated by R. H. Major, Esq., Hon. Sec. F.R.G.S. 1872. Donors the Hakluyt Society. *‘A Ride through the Disturbed Districts of New Zealand, &c.’* By H. Meade. 1871. Purchased. *‘Osterreichisch-Ungarische Expedition nach Siam, China, und Japan.’* Von Dr. K. von Scherzer. Stuttgart, 1872. Donor the author. *‘Mountaineering in the Sierra Nevada.’* By Clarence King. 1872. Purchased.

ACCESSIONS TO THE MAP-ROOM SINCE THE LAST MEETING OF JUNE 10TH.—Outline Map of India, showing the Railways in operation and those under construction, 1872. Presented by the Great Indian Peninsula Railway Company. Atlas: *Lithologie du Fond des Mers.* Par M. Delesse. With 2 volumes of letter-press. Presented by the author.

The following Paper was read:—

Central Asia in 1872. By ROBERT B. SHAW, Esq., F.R.G.S.

IN attempting to give some account of the progress of discovery and events in Central Asia (or rather in that eastern part of it with which I am acquainted), I cannot report any explorations in which I have been personally engaged, since I had the honour of describing, in a letter to our late President, Sir Roderick Murchison, my wanderings in the high plains and dark gorges of the Upper Shayok in 1870. Circumstances prevented any such journey last year. I was, however, stationed in Ladak during the whole season, and enjoyed the best opportunities of questioning the numerous travellers from Central Asia who frequent that mart, and of sifting all the information they were possessed of.

I must, therefore, hope for the indulgence of the Society this time, if I give only second hand information; trusting to be able,

at a future time, to show some sense of the honour the Society has done me in making me one of their Medallists, by undertaking other explorations in those regions.

Ladâk is singularly well placed for inquiries of this nature. Though a very small town itself, yet being, as it were, on a four-cross road, it attracts the men of many regions. There are to be seen the wild-looking Afghan, with his long black curls, and an old flint-lock pistol in his girdle. He has spent the preceding summer in Samarkand, where he has visited the Russian cantonments, and compared them with those of our own soldiers in India, where he has been spending the winter. His temper is hot, and he is apt to cut short a bargain, when he is tired of the haggling, by a volley of abuse or a blow. When not excited, however, he is very courteous in his manners, although free-spoken.

Next him comes the stoutly-built, pig-tailed tea-merchant from Lhassa, in Greater Tibet, who has no manners at all. He is merely a good humoured-looking barbarian, with a grin ever ready on his face, where his eyes are set so far forward, and his nose so far back, as to form an almost flat round surface for a countenance.

Then there is the handsome, rather Jewish-looking man of Badakhshân, with his casket of precious stones. His beard is almost brown, and his eyes sometimes hazel. He is the man to tell one all about the Pamir Steppe, with its lakes, and the various sources of the Oxus, which he yearly visits on his way to his home. Unfortunately, his notions of anything off the regular road are hazy; and though he perfectly remembers the river which you are inquiring about; yet he generally forgets which way it runs, and overwhelms you with voluble Persian, a language admirably adapted for vague statements.

Then there is the Chinaman from Yârkand, rather depressed-looking, and without his pig-tail, for he has had to turn Mussulman to save his life in the great slaughter of his countrymen in 1864. His home is generally in Kansuh, the most north-westerly province of China Proper, and he knows something about the Tungânis and the great high road to Peking. But his information can only be got at through a Turki interpreter, and the double translation makes communication slow.

After that the yellow-robed Lâma, from Great Tibet, on his ambling mule. He is come on an ecclesiastical mission, to inspect the subordinate monasteries of Western Tibet. He wears a broad cardinal's hat and twirls in his hand a prayer-wheel. He could perhaps tell us something about the brave French missionaries who have been shut up in Bathang (between Tibet and China) for

years past, and several of whom have been murdered by the authorities. But our Lâma is not communicative, and ignores them.

The Yârkind Haji is more sociable. He has combined spiritual and worldly profit by a trading journey through India, wound up by a pilgrimage per steamer from Bombay to Mecca. He has probably buried a wife and one or two children by the way, for the Yârkindis die fast in the climate of India. Very likely he has visited Constantinople, and stayed six months in Egypt. With their slender purses and slow means of progression, these Central Asiatics put us to shame as enterprising travellers. They will often start on a journey of several thousand miles with money only sufficient to last them a week.

In the same crowd, we have the half-naked Indian *joji* or fanatic, covered with ashes and shivering with the cold; the Sikh merchant, the Dogra soldier, and other Indian types too numerous to mention.

Such are some of the sources from which one has to gather intelligence. The best point in them is that the information cannot be concerted between men of such different origins. Hence wherever their testimony agrees, it is likely to be true.

A great revolution has recently taken place in our ideas of the mountain-systems of Central Asia. Humboldt's conception of them was this: There were five ranges, of which two (the Altaï and the Thiân-Shan) ran about east and west, being placed *en echelon*, as one would say of an army, with their right shoulders advanced. Opposite them were two others (the Himālaya and the Kuen-lun), with *left* shoulders advanced so as to approach the opposite line on the west. Across the interval thus left there ran the *Bolor* range from north to south, like a neutral army placed in observation. This was roughly his view.

But recent observers, both from the Indian and the Russian side, are inclined to alter the arrangement. Admitting that the Altaï and the Thiân-Shan are rightly placed, they would join the three others, viz. the Himālaya, the Kuen-lun, and the (so-called) Bolor, into one chain, or rather one system, running as a whole nearly from south-east to north-west, and uniting with the northern system in a huge knot or boss somewhere west of Yârkind.

With regard to the unity of the *Kuen-lun* with the rest of the Himālaya, we have seen it, and can testify to it. If, when you go up into the mountains, you are to consider yourself as being in the same chain until you come down again, then certainly the *Kuen-lun* and the Himālaya are one. It is true you are not always at the

same level. You cross parallel ridges or ranges more or less high, and descend into valleys more or less deep. But, strange to say, the depression between the Kuen-lun and the rest of the Himālaya is much less deep than any of the other furrows. If the valleys of the Beās, Rāvee, or Chenāb, descending to 3000 and 4000 feet above the sea-level, are not considered as separating off the mountains outside of them from the mass of the Himālaya, why should the Kuen-lun be called a separate chain, when to reach it you scarcely descend below 15,000 feet—a height nearly equal to that of the summit of Mont Blanc?

The following may serve as an illustration. When I accompanied Mr. Forsyth's expedition across this region in '1870, the Maharāja of Cashmeer sent with us a high official of his, a man born and bred in the plains of India. Old Bakshee Ram (as his name was) preceded us by a few days, being carried in a palanquin by a dozen porters. One day we met him returning with a rueful face, holding his head with both his hands, and declaring that he should have died had he not come down again at once. Some of our party asked him how long he had stayed on the top? "Top!" he cried (in English), "it is *all* top."

Now, this is the very space where, as some geographers tell us, the Himālaya is so clearly separated off from the Kuenlun as to merit the appellation of a distinct chain.

In a word, if the Oberland is a part of the Alps, then the Kuenlun is a part of the Himālaya, only with a far stronger case in its favour.

Now comes the question of the unity of the so-called Bolor Range with the Himālaya, a question bound up with the name of Major Montgomerie.

In considering the mountain-systems of Central Asia, we should, I think, understand them better if we modified our conception of what a range is. Ordinarily, I suppose, when we hear a range spoken of, we picture to ourselves a ridge of land studded with high points, and from which all the streams flow in opposite directions accordingly as they rise on one side or the other of the mountains. In other words, we identify a watershed with a range. This would generally be a correct view, but in the region we are considering it is nothing of the kind.

I will not detain you with an elaborate proof of this. In a letter to our late revered President, Sir Roderick Murchison, which had the honour of being read before this Society, I described my astonishment at walking across, in an open plain, from waters which run towards Central Asia to others which flow into the Indus; while the mighty mountain-range, topped with glaciers and perpetual

snow, which for days before I reached it had seemed to bar all access to the southern regions, was found, on a nearer approach, to be riddled through and through by the streams which rise in the northern plateaux.

More recently a striking proof of the same fact has reached me. Last year I had recommended certain shooting-grounds north of the Karakoram to some officers of the 37th Regiment in search of sport. Capt. Skinner and his companion, finding themselves on the Upper Karakash River, and their time being scanty, sought to return by a short cut to the Indus, leaving the Karakoram Pass to the west of them. On arriving at Leh their first inquiry of me was, "What has become of the Karakoram Range? it has vanished!" In fact, they had been tempted to follow a broad opening southward from the Karakash River, expecting always to cross the lofty range marked on the maps, but, after traversing several high barren plains, had found themselves on the banks of a stream running into the Indus, without having crossed any range at all.

Having thus abolished the Karakoram Chain, we may, I think, proceed to do the same with several others, and notably with Humboldt's Bolor or Belut-Tagh. The explorations of the Russians from Khokand and Samarkand, and of Major Montgomerie's men from the Upper Oxus, seem to show that the highlands of the Pamir, Alai, &c., participate in the character of the country I have just described. High snowy ranges there are, but they do not determine the main flow of the rivers. On the contrary, the crossing from one great river-system to another is generally over an almost insensible rise.

The same might be gathered from the statement of a Kashmiri prisoner whom we met with in Kāshghar. He had been captured in one of the wild valleys south of the watershed (near that where the unfortunate Hayward was afterwards murdered). In accordance with the custom of that region, he had been sold as a slave. Wounded bare-footed, almost naked, he had been tied to the tail of his master's horse, and led, with other slaves, across into Central Asia. In such a plight he would probably have magnified fourfold any difficulties of the road; but he could not, when asked, remember having crossed any mountain-pass on the journey, and only after repeated inquiry recollected a certain spot where the waters had been shed in opposite directions.

Many other proofs might be brought that there is hereabouts no distinct watershed range. But rather, from at least as far east as the sources of the Indus to near the meridian of Khokand, we have a highland region whose centre is occupied by a broad belt

of neutral ground in which originate, almost intermixedly, the waters running in both directions from it, together with many which flow in neither, but lose themselves in sands or in isolated lakes.

The neutral belt has a direction roughly from south-east to north-west, and belongs equally to the several hydrographical basins.

Lofty mountain ridges also occupy this region, as they do the rest of the highlands, but their axes of upheaval and the strike of their strata do not always, or even often, correspond with the direction of the neutral belt of watershed. Many of the most striking and magnificent mountain-masses would be of but little importance in a hydrographical map. A mountain of 28,000 feet may merely divide two rivulets, while the vast basins of Central and of Southern Asia are separated by a few yards of level sand.

I leave it to geologists to determine the reason of this condition of things. But to the eye of the ordinary observer the effect is as if in this ancient region the old landmarks had become worn out, and the irresistible waters had eaten back into the rocky barriers which formerly bounded them, and had begun to re-fashion the surface of the land at their own will. The rivers have rebelled against the tyranny of the mountains, and have declared their independence.

The whole of this high region is *one* in character, and merits a single appellation. I cannot help thinking that this was what Marco Polo understood by *Bolor*. Having ascended from the western side into the Pamir Steppe, he describes a vast desert region of rivers and mountains stretching to the eastward for forty days, and calls it Bolor. It is evidently not on the route which he himself followed, for by that route he reaches the city of Kâshghar in twelve days.

Some German or Russian geographers have invented a city and river of Bolor on the west of the Pamir; places unknown to the natives of those regions, and, moreover, contradictory of the statement of Marco, who locates the *desert* of Bolor eastward of Pamir. But the fables of the German Count have already been disposed of by our President, so we will leave the city of Bolor to fade into the same mist of confusion as the Karakoram Range and the kingdom of Prester John.

So far, in fact, from there being any north and south running Bolor Range as Humboldt supposed, it is now known that the loftiest ridges of the Pamir region run more nearly east and west. Such is the line of mighty peaks seen by Hayward and myself from

Kâshghar, and of which the culminating point is called by the natives *Taghâlma*. Such also are the ridges described by the Russians as dividing the Upper Jaxartes from the Kizil-su and Zarafshân, and these again from the head-waters of the Oxus. So much for the Belut-Tagh.

If we look upon the mountain-systems which embrace Eastern Turkistân as a bow which is bent nearly double, it is the part about the handle or the middle of the curve which we have been considering.

Let us now turn to the two horns of the bow, and first to the southern one. This is the great Himâlayan mass, of which the most northern flank has been called the Kuen-lun. At one time it was thought that this Kuen-lun constituted a separate and continuous range running in an unbroken line almost into China.

To say nothing of the fact that the Karakash River runs right through this supposed important watershed by the gorge of Shanidulla, we have now an itinerary from the Pangong Lake to Khotan, by a more easterly route than any which has yet been described in detail. An examination of this itinerary shows that the route, starting from a level of 14,000 feet above the sea at the Pangong Lake, rises gradually to a height of about 17,000 feet, which in these regions is the level of the tablelands. After passing across the corner of a basin *draining eastward*, another gradual rise takes the traveller across into the heads of the streams that run northward into the province of Khotan.

If we may assume this assigned elevation of about 17,000 feet to be correct (and it is gathered from a comparison with known heights), we have here a considerable falling off in the level of the watershed. Further westward, about Chang-Chenmo and the Karakoram, the roads rise to 18,000 and 19,000 feet in crossing over to the Central Asian basin.

Moreover, we now hear of a vast tract of country in this direction occupying some 6 or 7 degrees of latitude, where the whole drainage is from west to east. From near the Upper Indus gold-fields, on the south, up to the parallel of Charchand, on the north, we hear of considerable eastward-running streams.

Now, this is the very region where geographers formerly wished to place a continuous snowy Range of Kuen-lun, also running east and west. It is probable, however, that such a range would shed its waters northwards; and I think we may gather from the facts I have stated that the country sinks towards the east, and that no continuous snowy range maintains its elevation in that direction.

The people of the Upper Indus, while denying any knowledge

of a regular road to the eastward of the one which I have given, yet declare that the whole country is passable in every direction, and only not frequented by travellers because no business takes them that way.

From the same informants I hear vague rumours of nomad tribes far to the eastward, whom the Tibetans call Sokpo, and who are probably of the same kindred as the Mongol tribes met with by Hue and Gabet near the Koko-Nur. These tribes of Sokpo have often invaded Ladák, where their name is held in great terror, as also is that of the Hor, or Mussulman Tartars from Eastern Turkistán. The Ladkis relate how, several hundred years ago, an incursion from the north was successfully resisted by the people of the country, and how a large body of them was cut off and massacred. In commemoration of this deed a large monastery was founded on the hill overhanging the town of Leh, and under the foundations of the building were buried the skulls of several hundred of the enemy slain in this encounter.

Invaders of the same race must have penetrated far south, and nearly into India; for even in the province of British Lahaul, graves have been discovered containing skeletons, together with arms and utensils of strange make, ascribed by local tradition to northern invaders. The fact of their having been buried, and not burnt, proves them to have been Mussulmans by religion, as both Hindus and Buddhists burn their dead.

Regarding these incursions and other events in Western Tibet, I hope soon to be able to furnish some information. It had hitherto been supposed that all the early annals of the country had perished in the burning of the monasteries, when Ladák was over-run, some 200 years ago, by an invasion from Baltistán. General Cunningham, when engaged, in 1848, in collecting materials for his valuable work on Ladák, could find no records older than, I think, the beginning of the seventeenth century. But last year I succeeded in making friends with the ex-Râja of Ladák, a descendant of the old family which had reigned many centuries in that country when they were dispossessed of their petty kingdom, nearly forty years ago, by the Sikhs. This ex-Râja, who now occupies himself exclusively with the Buddhist religion and literature, such as it is, is in possession of annals dated a very long time back, and partly printed by the wooden-block type process known in Tibet. The earliest and more valuable of these annals had hitherto been concealed by his family, through a vague feeling of distrust and fear lest these records of the early glories of their race might be taken from them. I have, however, been

entrusted with the loan of them; and I believe that, during the months of the past winter, three or four lamas have been engaged in one of the monasteries of Ladâk in transcribing for me these two volumes, which may, perhaps, throw some light on the earlier history of the region. They were to be transcribed in the Tibetan language in which they are written, and after that will have to be translated into Persian, when they will become available for reference by European inquirers.

Besides books, the Tibetans have another mode of recording past events, which is by placing coins and written sheets inside the heads of their idols; in the same way that we enclose a current number of the 'Times,' and a collection of coins, under the foundation stone of a new building. Their idols being made of clay, covered over with plates of gold or brass, occasionally, in the lapse of centuries, fall into disrepair, and have to be renewed. This happened to one of the chief images in Ladâk last year; but unfortunately he was quite a recent creation, and the contents of his brain proved to be of little interest, being only coins of the reign of Shah-Jehân.

If the former invaders of Ladâk had possessed more antiquarian enthusiasm, it is probable that their iconoclastic propensities would have been still further developed.

To return to the highland homes of the invading Sokpos. We have seen that the Kuen-lun is probably replaced further east by vast irregular high plateaux draining eastward, and which must also diminish in height to the northward, in order to attain the lower levels of the deserts of Takla-Makân, and Gobi. Charchand, which lies on the skirts of these highlands, cannot be above 6000 feet, judging by its produce, and its river descends for six days' march to the Lake of Lob further north. This lake is probably formed by the waters of Eastern Turkistân; but whether the united Rivers Yârkind and Tumân flow directly into it or not, it must be one of the lowest points in the region to allow for such an agglomeration of waters, and, therefore, is probably not more than 2000 feet above the sea-level, allowing for the descent of the Yarkand River in some 350 miles of its course from the city.

I will not detain you with accounts of the dwellers by Lake Lob, who are said to be clothed in the bark of trees, to feed on fishes, and to speak the language of birds; nor with the terrors and apparitions of the neighbouring desert, all in the style of Marco Polo, which are current to this day. For here we are brought face to face with the opposite or northern horn of the great bent bow to which we have compared the mountain-systems of Eastern

Turkistan. Into Lake Lob there comes a stream from the Thiân-Shan Mountains, passing by the town of Karashahr, at a distance of 100 miles, and then marches up from the Lake. Thus the Charchand River, the Lake of Lob, and the stream of Karashahr form together the string of the bow. That portion of the great desert which lies inside the string, or to the west of Lake Lob, is properly called the Takla-Makân; while the greater desert to the east up to the Great Wall of China and the wilds of Mongolia is the Gobi.

Here we again come into contact with Russian enterprise, for just beyond the Thiân-Shan Range is the scene of their latest advance. We have before compared the Thiân-Shan and the Altaï ranges to an army *en echelon* in two lines. The front line is the Thiân-Shan, and between its left flank and the right flank of the Altaï, there extends, as it were, a cloud of skirmishers in the shape of lesser mountains. It is into the midst of this space that the Russians advanced last year, when they took Kulja.

At that time the Atalik-Ghâzi, or new Ruler of Eastern Turkistan (whom I visited three years ago), was engaged in a war with the Tungânis, a mixed race of Mussulmans, who inhabit the region round the extreme eastern end of the Thiân-Shan Mountains where they sink to the level of the great plains. As we are likely to hear more of these regions within the next few years, it is as well to note that the Tungâni settlements form a kind of crescent embracing within its arms the end of the Thiân-Shan Range. The northern arm of the crescent, therefore, comes in between the Thiân-Shan and the Altaï mountains, while its centre and southern arms intervene as a fertile strip between the former range and the great desert.

The two chief cities are Urumchi, on the north, and Turfân, on the south; and the communication between them lies either across the mountainous country formed by the sinking of the Thiân-Shan Range, or else by a long *détour* eastward round its end. Between Urumchi and the Russian territory of Almaty or Vernoj lies the hilly district of Kulja, which I have compared to a cloud of skirmishers stretching between the Altaï and the Thiân-Shan. We are now able to follow the moves and countermoves of the Atalik-Ghâzi and of the Russians.

The former, during the year 1870, being attacked by the Tungânis from Turfân, drove back his assailants and conquered the whole of that portion of their territory which lay on the south of the mountains. He followed up this success by crossing into the northern side and attacking Urumchi. Here, however, an advanced guard of 2000 men, which he had sent forward, was cut off and destroyed

by the enemy, and he himself was beleaguered for some time in a position which he had taken up and fortified. But the Tungānis, although they were able to check his advance, were unable to drive him of this dangerous intruder from their country. At this point both parties happened to remember that they were fellow Mussulmans. Appeals were made to their common religion. A venerable and holy man of the Tungānis came out and said to the Atalik-Ghazi: "Why should we fight, we are brethren?" Peace was made with much effusion, presents and wives were exchanged between the families of the chiefs on both sides, and it is even said that the Atalik-Ghazi afforded the Tungānis some military assistance against their Chinese enemies on the east.

However, about this time, viz., in the early summer of last year, the Russians appeared on the scene. Advancing between the two ranges (the Thiān-Shan and Altai), they captured Kulja, an outlying province of the Tungāni kingdoms, but ruled by a Mussulman tribe of Turki extraction, called the Taranchis.

You will observe that Kulja lies on the north of the Thiān-Shan Range, almost opposite Aksu, an important city of Eastern Turkistān. A road here crosses the range, passing over a difficult glacier-pass, which is said to require the constant labour of forty men to keep it open for horse traffic by roughing the surface of the ice.

Between Kulja and the cities of Zungaria, however, there intervene only comparatively low hills, such that carts constantly perform the journey. This position thus affords an easy access from the Russian provinces into Eastern Turkistan, by turning the flank of the Thiān-Shan Range, which further west interposes its snows and glaciers between the two regions.

The Tungānis are, therefore, so unfortunately placed as to lie on the easiest route from Western Siberia towards both China and Eastern Turkistan. We may, therefore, fairly assume that this warlike people will soon have to deal with a far more formidable neighbour than Mahamad Yakub, the Atalik-Ghazi of Kāshghar and Yārkanđ; and it is this which gives present interest to these ancient regions.

This potentate, who was engaged in pacifying and organising his recently acquired dominions of Turfān when the news of the Russian advance reached him, lost no time in retracing his steps to Aksu, where, near the mouth of the direct passage from Kulja, he established himself for some months with his forces.

This is now the second time that he has been recalled from his easterly conquests by the movements of the Russians on his

northern frontier. It has since been rumoured that he has lost Turfân, but this rumour is not, I believe, confirmed.

I have given a sketch of these recent transactions, for the purpose of elucidating the political geography of this region. What with the annual additions to our knowledge of its physical features, and the continued changes of frontier wrought by the decay of the Chinese empire, the progress of the Russian, and the birth of ephemeral native States between the two, the map-makers must have a hard task of it. Theories of physical geography are daily being brought to the test of experience, unexplored regions are being wiped off the map, and the "unchangeable East" now requires constant attention to record its alterations.

These districts are not devoid of natural advantages. Turfân produces the finest goats'-wool in the world, compared with which the wool of Tibet is coarse and cheap. Cashmir monopolises the Turfân wool for its shawls, and it is only under recent treaties that any of it has been allowed to reach India. It has probably never been seen in Europe in its unmanufactured state.

The same hills are rich in minerals, a great part of the copper coinage of Western China being derived thence. Nor is the still more valuable mineral, *coal*, wanting. My friend Doctor Henderson, who on our last journey to Yârkand directed his attention to geology and natural history, brought back with him several fossils from the hills skirting Yârkand on the south. These fossils were recognised as belonging to the coal-measures, and it was judged, from the dip of the strata in which they were found, that coal deposits might probably exist under the plains of Yârkand. Strange to say, while these conclusions were being arrived at in England, I was obtaining native information up in Ladâk, which confirmed them. I was assured that a black substance, called by the Turkis "tash-kûmür," or "stone-charcoal," was found in the hills above Turfân, and used as fuel by the inhabitants.

Such a discovery would probably render the northern dependencies of the Atalik-Ghâzi more valuable than even the gold-fields and silk-producing districts of his southern province of Khotan.

While noticing these latest extensions of the Mahomedan Power in Central Asia, I may, perhaps, be allowed to refer to a misconception on the subject which has found expression in England. It has been suggested that the Atalik-Ghâzi's kingdom may present a danger to the peace of our frontier, and may excite the Mussulman populations of India.

I think, however, it will be agreed, by all who have studied the subject, that the sight of these neighbouring Mussulman Powers,

Afghanistan, Bokhâra, Yarkand, whose orthodoxy is unquestioned, voluntarily seeking our friendship and sending periodical embassies to the Court of the Viceroy, cannot fail to strengthen our influence among our Indian subjects of the same religion, and to counteract the preaching of the Wahabi fanatics, by showing that England is a friend to Islam all over Asia.

As for frontier quarrels, the desert plateaux, 18,000 and 19,000 feet above the sea-level, interpose too efficient a barrier to leave any fear of such disturbances.

It may interest this Society more to know that our relations with the Atalik-Ghâzi promise further facilities for geographical research in Eastern Turkistân. His Envoy last year came down through Ladâk, with complimentary letters for the Viceroy and the Queen, and after visiting Calcutta, where he had several interviews with the late Lord Mayo, and Delhi, where he was impressed by the sight of our European and native troops assembled together at the Camp of Exercise, he started back in April for his own country. At his parting interview with the Lieutenant-Governor of the Panjab, he made a formal request that his visit to India might be returned by the despatch of a British official on a friendly mission to the Court of his King. Renewed opportunities are thus likely to offer for the gratification of our legitimate desire to enlarge the bounds of our knowledge in those regions, where no prejudice seems any longer to close the way against moderate and judicious explorations.

General STRACHEY said he was glad to find that the explorations which had been made during recent years had altogether confirmed the conclusions arrived at by him twenty years ago. In the 'Journal' of the Society would be found papers in which he and his brother had sketched out very much the same general view as had just been more fully explained by Mr. Shaw, as to the general unity of the great mass of mountains that existed between India and Central Asia. There could be no question that the country from Western China to near the Caspian was in reality one great protuberance above the earth's surface, broken up in a very remarkable way, but wonderfully uniform in character throughout its whole length. The general characteristics of the mountain tracts on the northern border of the mass were very similar to those of the Himalayan portion, which was sufficiently well known. The results of Mr. Shaw's explorations into Yarkand proved that these characteristics continued for a certain breadth, and then the mountains ceased, and were succeeded by a comparative plain at a lower level. The geological formation of this mountain-mass, so far as it was known, indicating structural uniformity from the extreme end of Assam to the borders of Afghanistan, was a strong argument in favour of physical continuity. There was a great deal that was misleading in the manner in which geographers were in the habit of describing mountains; and the expression "mountain-range," as used by Humboldt, amongst others, was extremely vague. He agreed with Mr. Shaw that, in reality, the Himalayas and the Kuen Luen were nothing more than the southern and northern borders of the same mass of elevated land,

Bolor representing its western termination, while the Thian Shan was the accepted name of the mountain-mass which ran across the northern part of Central Asia; but there was certainly no special range, in the sense in which the word was commonly used, as implying an elevated mass with an equal ascent and descent on either side, which could properly be designated as Himalaya, Kuen Luen, Bolor, &c. From the plains of India (1000 feet) there was a rise of 15,000 or 16,000 feet, then a broad space with an average elevation of perhaps 13,000 or 14,000 feet, and then a fall on the opposite side to 6000 feet or lower. The whole interval being occupied by a mass of mountains; but there was nothing at all resembling what was commonly understood by a mountain-range.

Mr. SAUNDERS expressed his regret at having to differ from the views expressed in the paper. Mr. Shaw wished to obliterate the Kuen Luen, but that involved the question of what was a mountain-chain. From the plains of the Ganges the Himalaya could be seen rising, snow-capped, to an immense height. Was that a mountain-chain? On the other side, the plains were certainly not quite so low, but still they only had an altitude of 2000 to 4000 feet above the sea, while those of the Ganges rose to 700 and 1000 feet. On the west, the Kuen Luen Mountains were almost as high as those seen from the Ganges, rising 20,000 feet and upwards, while at the eastern extremity the elevations were equally high. Was not the Kuen Luen, then, a range of mountains as much as those seen from the valley of the Ganges? He did not deny that they were parts of the same elevated mass, but, as that mass had a breadth of 600 miles, it was desirable to distinguish its different parts by distinct names. It would be very much better still to recognise the range of the Himalaya in the culminating summits of the mass rising from the Ganges and Lower Indus, and limited on the north by the Upper Indus and the Sanpu; while we regarded as another range the culminating summits rising from the plains of Lake Lob. He was prepared to accept in its breadth the conclusion at which Humboldt arrived with regard to the structure of Central Asia. What was wanted was a better knowledge of the details. One great mountain-belt surrounded the plains of Central Asia, descending to the Arctic Ocean on the north, to the Pacific on the east, the Indian Ocean on the south, and the plains of Western Asia and Europe on the west. It was now known that this belt expanded into one vast plateau between India and the plains of Ili and Mongolia, or between the Himalaya and Kuen Luen Mountains; rising to 17,000 feet in the plains, and to altitudes of 29,000 feet in the summits. He had no doubt that the space between the Thian Shan on the south and the Altai on the north presented a similar plateau, though perhaps not so elevated; the Thian Shan bounding it towards the interior, as the Kuen Luen bounded the other plateau towards the interior, and the Altai Mountains performing the same function towards the Arctic Ocean as the Himalaya did for the other plateau towards the Indian Ocean. He also contended for a distinct application of the name Karakorum Mountains. It might be very true that the slopes over the Karakorum Mountains were easy, and the traveller was hardly conscious of passing a range of mountains; but that was nothing new. The rise from the valley of the Saskatchewan to the summit of the Rocky Mountains was, on one route, by a cart-road up an easy slope, and the traveller was only conscious of being on the top of the mountains when he commenced the descent on the other side by a steep escarp. So, in the plateau of Central Asia, the ascent from the plateau to the summit of the Karakorum may be very slight, and that the elevation of the Karakorum above the valley of the Indus was not to be compared with that of the Himalaya above the valley of the Ganges; but still the Karakorum water-parting performed a distinct function, separating the basin of the Indus from that of the Tarim. What was that water-parting to be called?—Should it not be regarded

as a range, when its summits reached an elevation of 28,000 feet? He trusted that the day was coming when political restrictions would be so far removed, that the geography of the Himalaya might become as well known as that of the Alps.

Mr. F. DREW said the difference between the views expressed by Mr. Shaw and those stated by Mr. Saunders appeared to be chiefly a question of words, and to resolve itself into what was to be considered a mountain-range, and what was not. From the plains of India to the first range of the Himalayas at Cashmere the ascent was 15,000 feet, while the descent was to 5000 feet. That was distinctly called a mountain-range. The next ascent was to 15,000 feet or 18,000 feet, and the descent to 11,000 feet. That was also recognised as a mountain-range. Further on the valleys became higher, and the difference between them and the hills became gradually less, until it resembled one general mass. The best way of deciding the matter would be to make a vertical section right through.

The PRESIDENT said the vertical section would, of course, vary according to the point at which it was taken: one of the most interesting points of Mr. Shaw's discovery showed how the range filed off to the eastward. A vertical section from Yarkand to Lahore would differ greatly from one between Lhasa and Benares. The relative heights of the parallel chains varied considerably in different parts of the great chain. The essential improvement in our present knowledge of the physical geography of Central Asia over that of the time of Humboldt was, that the continuity of the Pamir with the Himalayas had been established. The whole range of mountains, from the Himalayas and the Pamir to the Caspian, were now proved to be continuous, running in a direction more or less north-west and south-east, instead of there being two chains connected by an unnatural transverse ridge, which was Humboldt's favourite theory. The true view originated with the Stracheys amongst modern geographers, but it was well known among Oriental geographers from the earliest times. Mr. Shaw's statement with regard to coal was very interesting. The Russians were actually using coal found in the hills to the north of the Jaxartes, and the steamers on that river derived their supply from the mines in the neighbourhood. If coal should ever be obtained near Thibet, it would be of enormous importance. The reason why that country was uninhabited, and almost inaccessible, was the entire absence of fuel. The occupation of Kulja by the Russians was declared by them to be merely temporary; they had recovered them from the Chinese rebels, and held them in charge until relieved by the Chinese Government. This was the recognised political status up to the present time. The Chinese Government had not relieved them of the charge, and so the Russians remained. Of course Kashgar and Yarkand were in the same position with regard to China as Kulja was, and could be recovered in a similar manner; only the Chief of Kulja was not quite so independent as the Atalik-Ghazi. This gave a great interest to those countries, for through them Russia and England must ultimately be brought into contact. It was a law of nature, and must happen. The great object should therefore be, so to conduct relations between the two great empires, that when the contact took place it should not be in the form of a collision, but as an ordinary approach of civilized nations; and under those circumstances, he did not himself apprehend any danger.

* This attempt to curtail the nomenclature of the Central Asian Mountains, at a time when our knowledge of their details is rapidly increasing, is in concurrence with the views of the Russian geologist Severtsof, whose opinions on the subject appear to be too exclusively geological to be adopted in systematic geography. See Severtsof's paper in the 'Journal of the Royal Geographical Society,' vol. xl., which, while deserving of eulogium for the information it conveys, demands criticism to counteract the influence which it seems to be exercising.—[T. SAUNDERS.]

culminating ridge. He saw that several points just within the Dora Pass had been trigonometrically fixed at 16,500 feet.

Colonel WALKER said that these points were on an outer range, not on the main watershed, which was hidden from view by the outer range, so that it had not been possible to fix any trigonometrical points on this portion of the watershed.

The PRESIDENT said there was no doubt that the great range, which we called the Indian Caucasus, decreased in height as it stretched to the westward. The mountains north of Cabúl were not so high as those to the north of Chitrál. It was quite possible that the crest which the Havildar traversed might be lower than that further south. Still it was a point he should like to have verified: because glaciers certainly did exist on that watershed, the Chitrál River itself coming out of a glacier. Geographers, indeed, would remember that Macartney, sixty years ago, laid down a glacier on the north side of the range, from which the head-waters of the Oxus flowed; but he (the President) had never heard of glaciers south of Chitrál. The Havildar's journey was exceedingly important, because he was the first man who had determined the position of the Chitrál Valley astronomically. He seemed indeed to be a most remarkable man. Major Montgomerie, in a private letter to him (the President) had mentioned that the Havildar, on his return-journey, went into the presence of Amán-el-Múlk and Mir Walí, convinced that he would never come out alive; but he kept his hand on a loaded revolver in his pocket throughout the interview, with the full determination, should a signal be given to seize him, to despatch both of these redoubtable chiefs before yielding. He had presence of mind, however, to carry on the conversation with perfect calmness, and was ultimately allowed to come out in safety. He (the President) only hoped the Havildar would not retire from the work of surveying. He was pleased to hear that Major Montgomerie was training up other native explorers in the same field; for we looked to them, and to them only, to clear up those geographical problems that were still perplexing us beyond our frontiers, in regions that were inaccessible to British officers. Before closing his remarks, he wished to call attention to the gradual approach of Russia to the northernmost frontiers of India. They were now in possession of the province of Dzungaria, holding it vicariously for the Chinese, who, however, he should think, were not likely very soon to resume the occupation of their territory. At the same time, the Russians were doing good service, geographically, by extending our knowledge of Central Asia. Their frontier, at one point near Artúsh, was within 300 miles of the extreme limit determined by Colonel Walker's survey. So that it was possible, in fact probable, that, in a short time, triangulation would be carried across the interval; in which case we should have a continuous series of triangles from Cape Comorin to Siberia, across the entire continent of Asia.

3. *Route from Shiraz to Bam.* By MAJOR B. LOVETT, R.E.

[EXTRACTS.]

THERE are several roads that run between Shiraz and Kerman. The road I took leaves the Shiraz Valley to the north-east, passing by the Bagh-i-Dilkhusha and Saadi's tomb; and as far as the town of Niriz, is a very fair road, so that carts could proceed along it without the slightest difficulty. After arriving at Dodeh, our first stage, I found the road to Niriz lay in the Persepolis Valley, as