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PROCEEDINGS
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ROYAL GEOGRAPHICAL SOCIETY
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*The Herat Valley and the Persian Border, from the Hari-rud
to Sistan.*

By Colonel C. E. STEWART, C.M.G., C.I.E.

(Read at the Evening Meeting, December 14th, 1885.)

Map, p. 216.

Soon after I had the pleasure of reading a paper to the Royal Geographical Society in 1881, on the subject of the Tekeh Turkomans, I was employed by the Government, on special duty, on the Perso-Afghan frontier, and I proceeded to Khaf, on that frontier, with as little delay as possible, and arrived at that place at an exciting moment. Sardar Ayoub Khan, the rival of the present Amir of Afghanistan, had lately been defeated by the Amir at Kandahar, and had been driven across the Persian border. Ayoub Khan's stronghold at Herat had also been captured for the Amir by Sardar Abdul Kudus Khan. The Amir had then but a slender garrison in Herat, the population of which town was at that time more inclined to favour their late ruler, Ayoub Khan, than the Government of the Amir.

Sardar Ayoub Khan entered Khaf with his defeated followers soon after my arrival at that place. The Persian Governor of Khaf, which is a small town on the border, about 75 miles from the Afghan fort of Ghurian, had only a force of some 150 irregular cavalry at his disposal, so he was unable to keep in order the considerable body of Afghan troops who had taken refuge in his town. They were most unruly, and set the orders of the Persian Governor at utter defiance. The Governor retired into a small fort near Khaf, and I accompanied him. Some of my servants, natives of Persia, who remained in the town, were threatened, the Afghans dancing round them with drawn knives, and the door of the building in which some property of mine had been left was broken open; but before the Afghans could do any further harm they were ejected by the Governor's brother, who heard what was going on, and came to the rescue of my servants. For about a week the small town of Khaf was in utter confusion, the Governor, under orders from Tehran,

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directing Sardar Ayoub Khan to move further into the interior of the country, his remaining on the extreme edge of the Persian border and threatening Herat being a breach of neutrality, while Ayoub Khan defiantly replied that he was not going to be dictated to by the Governor and the Englishman, but that he intended to leave Persia altogether and attack Herat. For some time things looked very serious, but at last the Governor directed that no supplies should be sold to any Afghan by a Persian subject; and as this order was strictly obeyed, the Afghans after two days of hunger consented to move on towards Tehran. As soon as a portion of the Afghans had moved out of the town, the Governor, whom I accompanied, re-entered it and restored order, though a considerable number of the Afghans still remained. I stayed at Khaf for some months after this, until matters had settled down.

I had been very anxious to make a rough survey of the country to the southward of Khaf as far as the northern border of Sistan. This country in all maps is marked as being chiefly salt desert, and it had not been passed over in its whole extent by any European. Khanikoff, with the Russian mission which visited Herat in 1861, had passed over a portion of it, and Sir Charles Macgregor had visited a portion; but there remained some 100 miles of the Perso-Afghan frontier quite unvisited by any European, and I was anxious for the sake of geography to fill in this piece of country so as to do away with the blank in maps between the portion surveyed by Sir Frederic Goldsmid's mission to Sistan and the Hari-rud river. This piece of country, though not fertile or inviting, is far from being desert; there is hardly any salt desert at all, one or two narrow strips of salt desert quite insignificant in extent being all that I found. The country is generally mountainous, except close to the Afghan border, where plains of sand or clay are present and the hills are generally of less altitude.

About 18 miles to the southward of Khaf, at a small village named Zuzan, I found the remains of a large town. Heaps of ruins covered a large extent of ground, amongst which men were busily digging the earth for the purpose of extracting saltpetre; to do this they dug up and washed the soil.

In the ruins of most eastern towns saltpetre exists, and is very generally collected. I went over the ruins of Zuzan with an old man who said his ancestors had been here for a great many generations. He said it had been the capital of Persia in ancient times, and pointed out to me the ruins of fortifications. This portion was called the New Palace, and he said it had been built by the Kaian dynasty of Persian kings; but this did not really convey much information, as almost all ancient buildings in Persia are attributed to this dynasty of kings. The ruins covered a very considerable area of ground, and the fortifications were quite traceable but were all of mud, as are most ruins in Persia, except those of very early times. He showed me the Red Garden, where the whole

population, men, women, and children, were led out and slaughtered by order of Chingiz Khan. He said nothing would now grow on that land which had been so thickly watered by blood. The old man was very much disgusted when I told him that Chingiz Khan himself had never been there, but was appeased when I told him that I believed that Zuzan had been destroyed by Tului Khan, the son of Chingiz, in A.D. 1220-21.

After Zuzan was destroyed by the Mongols, it was partly rebuilt by the descendants of Amir Timur. The present fort of burnt brick is evidently of the Timuride period, as is also the handsome mosque with coloured tiles. The arched roof of this mosque had only fallen in a few weeks previous to my arrival. There appears to be a date on this mosque, but, unfortunately, I could not decipher it. The mosque is of large size and solidly built, probably by Shah Rukh, son of Amir Timur. I tried to purchase some coins, but the people digging for saltpetre, declared they never found anything; but I did not believe their statement. Such cruel laws prevail in Persia on the subject of treasure-trove, that any one finding a thing, and even giving it up to the Governors, is ruined, as he is accused of having found much more than he gave up, and of having concealed it, and the matter generally ends in the poor wretch being beaten and his property confiscated. I did secure a few good coins in this part of Persia, but these were almost always purchased from goldsmiths in small towns. The best of them is a daric or stater of King Darius, which I believe is the oldest Persian coin. Every year an immense number of gold and silver coins are melted in Persia which would be priceless to collectors.

I believe that Zuzan is the place mentioned as Susia by Arrian, where Alexander the Great was met by Sartebarzanes, the Governor of Aria. A few miles beyond Zuzan is a range of hills of considerable elevation, called Kyberkuh. The desolation caused in these lands by the Mongol armies in the thirteenth century has never been repaired. I was assured that in the neighbourhood of Zuzan alone, seventy different underground canals which bring water down from the hills can even now be traced, while at the most three or four are at present in good repair and capable of being used.

Another range of hills called Kwajah Shahaz Kuh, and Ahinguran Kuh, rise to a considerable elevation; the highest peak of Kuh Kwaja Shahaz, where there is a shrine visited by pilgrims from considerable distances, was deeply covered with snow, though the weather in the plains below was very hot, and the time of year was towards the end of April. I was not able to take the height of this peak, but it was probably nearly 8000 feet.

I passed through the Ahinguran range by a stony and disagreeable pass, and after several days' march through a hilly country reached the town of Birjand, where the Amir of Kain, Mir Alam Khan, resides.

He governs $9\frac{1}{2}$ baluks or counties of Persia, Sistan being one of these counties. He is a powerful chief and has great local authority.

The Shah has left the Amir of Kain much more independence than he allows the other chiefs of Khorasan. He has a title from the Shah, and has the rank of Amir-i-Toman or Major-General in the Persian army. He is of Arab descent, like a large number of the population of the Kain district. Formerly the seat of government was at Kain, but was removed to Birjand. Birjand is an unwallied town of about 14,000 inhabitants. It has a citadel in very bad repair. The Amirs of Kain are appointed by the Shah, like the chiefs of Tabbas, Bujnurd, Kuchan, Daragaz, and Khaf. They are provincial governors, taking their orders from the Governor-General of Khorasan at Mashad, being removed at the pleasure of the Shah, though a member of the same family is generally appointed.

The whole of the northern portion of the country of the Amir of Kain is very mountainous. The mountains are not generally lofty, the highest peak being about 8000 feet; but the whole country is at a high level, very little of the northern portion being much below 4000 feet, and a considerable portion up to 5000 feet. At one of my camps, not on a mountain, the height of the village was 6500 feet.

The summers are very hot and the winters very cold, snow falling in large quantities and remaining for a considerable period on the higher levels. Towards the south it is bounded by the Lut, or desert, which separates it from Baluchistan and the Persian provinces of Bam and Kárman. On the east it is bounded by Afghanistan, and on the west by the Persian salt-desert and the Tun and Tabbas district of Persia. In the southern portion of the Kain district the heat in the summer months is terrific, and I doubt if greater heat than in some portions of the Lut desert could be registered in any country of the world.

The water supply is very small, and the underground canals in the summer often dry up. Enough grain is not produced in the country for the consumption of the people, and grain is largely imported from Sistan, where the quantity produced is far beyond the requirements of the population. The water supplied by the canals is used largely for growing crops other than grain, which can be exported and sold at a large price. Tobacco, poppy for opium, cotton, and saffron are very largely grown. The crocus blossom supplying the saffron grows better in the Kain district than anywhere else, and the saffron of Kain fetches a higher price than that produced elsewhere, with the exception of the saffron of Kashmir. When I was in Birjand, saffron was selling at about 5s. an ounce, but this is far beyond the ordinary price, which is said to be about 2s. an ounce.

A much greater proportion of the people are engaged in manufactures than is usual in other parts of Khorasan. In many villages the carpet manufactories are numerous, and employ a number of people, notably at

Durukhs, near which place I passed, and at Gask, which I visited. The carpets of Kain are very brilliant in colour and fine in quality; but they are dyed with aniline dyes and much cotton is mixed with the wool of which they are made, so that these carpets do not last like good Persian carpets, as made in former times. Kurk, a stuff made of the fine under-wool of the goat and known in India as Pashmina, is largely manufactured and exported to Afghanistan and India.

The winter climate being severe, the soft underdown of the goat, like that brought from Kashmir, is produced in considerable quantity. Opium is very largely exported from the districts ruled by the Amir of Kain, and is consumed in the country in enormous quantities. Men, women, and children even, smoke opium to a terrible extent, and I was assured that hundreds of people died annually from the effects of opium.

The Amir of Kain had not been conspicuous for his civility to the mission under Sir Frederic Goldsmid for the demarcation of the frontier of Sistan, but I had no cause to complain. I was received with all courtesy, and every assistance given me in travelling about. I wished to cross the Lut, or desert, which extends to the southward of Birjand towards Kárman. This has only been directly crossed once, I believe, by Europeans since the days when it was crossed by Marco Polo. It was crossed by Khanikoff's Russian mission in 1861, and the account they gave of it was anything but pleasant.

A portion of this desert, at a point where it is not quite so inhospitable as where it was crossed by Khanikoff, was passed by Sir Frederic Goldsmid's mission to Sistan. But I wished to cross it either on Khanikoff's route, or, if possible, a little to the westward. The Amir of Kain sent two of his personal attendants with me, and I left Birjand on the 25th May, 1882. The weather was intensely hot. The first day I marched to Khusf, a flourishing little place of between five and six thousand inhabitants. The stream of water which takes its rise above Birjand flows by Khusf, and on into the desert, where it forms a salt marsh which dries up in summer. In the lower portion of its course it becomes very salt indeed, and its whole bed is encrusted with sheets of salt. The river at Khusf is sunk considerably below the level of the surrounding country, but the high banks are watered by underground canals brought from points higher up the river, where it is still fresh. The wonderful patience shown by the Persians in excavating these underground tunnels for water is surprising. Every drop of water has to be bored for and tunnelled for through miles of ground before the precious liquid reaches the field for which it is intended. In this barren land nothing will grow without artificial irrigation.

The next day I marched to Khur, the last inhabited place; I had chosen Khur as my point of departure for crossing the desert, as it is at this point narrower than where crossed by Khanikoff. My route is a little westward of that taken by him. A stream, the waters of

which are very salt, takes its rise from a large marsh near Khur, and this stream is lost in the desert near the point where the Khusf river is also lost. I procured two guides mounted on what were represented to be fast-trotting Baluch camels. The men asserted that they were well acquainted with the road, and could show me two places in the first stretch of 80 miles of desert where there was some brackish water, and in consequence it would not be necessary to carry a large supply of water for men and animals, as Khanikoff had done. Both guides and camels proved to be utter impostors, the guides not knowing the way, and the fast-trotting camels not being able to keep pace with a horse at a walk; and my small party very nearly perished in consequence of trusting ourselves to their guidance.

The first night I sent on one of the guides with my baggage mules to the place called Balabund, where the first water was represented to be, while I started later with two mounted servants and the other guide. When day dawned we were in the desert and the guide declared he did not know the least where he was or where the wells were. The heat was very great and we wandered over low stony ridges for two hours, looking about for the well. At last we stumbled upon our party, resting beside two shallow wells of very salt water at the bottom of a ravine where they had been taken by the first guide, who did know something about the road. We spent a day of the most terrible heat that I ever endured in this ravine. My servants, horses, and mules suffered very much. I did not pitch my tent but raised a thick double blanket on two poles and courted the hot wind from the desert, which resembled the air from a hot-blast furnace.

At five P.M., in spite of the tremendous heat, we started again, though men and animals suffered much. Soon after leaving Balabund we saw an antelope with two kids, the only living thing we encountered in the 80 miles of desert. The sufferings of men and animals was much increased by our thirst forcing us to drink the very brackish water brought from our camp, which was made even more nauseous than it naturally was, as it had been carried in goat-skin bags which had not been properly tanned, and which gave the water a putrid taste. By daylight the next morning we had reached the place, nearly 40 miles distant from our last halting-place, where the second water was said to be found.

Both my guides utterly failed me; one said, "I never was here before in my life, and do not know anything about it." The other said, "I was never here but once, and that was fifteen years ago, and I don't know where the water is." I felt utterly nonplussed; men and animals were quite done by their very long march; it was impossible to go on, and equally impossible to go back. I had a little water left in a half-putrid skin, but our party consisted of thirteen men and as many animals, and it would not have given more than a mouthful apiece, while the burning sun, which later in the day scorched almost like fire,

was rising in the east. One of the horsemen furnished me by the Amir of Kain, though he had never been there before, set to work and found some camel tracks, and we spread over a considerable tract of country, some of us following the bed of a dry torrent. At last, in the bed of the torrent we found three small holes scooped in the sand, at the bottom of which there was some water, nearly the colour of rhubarb and magnesia. We tasted it and it was quite sweet, and I thanked God heartily that we had found it, as few, if any, of our party could have hoped to escape if we had not been guided to this water. We cleared out the holes, and though the water never was more than an inch or two in depth, by dipping it out with a bowl and pouring it into a bucket, we got plenty of water for both men and animals. This water is called Shand Ali Rezah. Shand means a shallow well in the half Baluchi-Persian spoken about here. The heat, though not quite so great as the day before, was really wonderful, and there was a sirocco blowing which threatened to carry away the small and thin tent which was all I had with me. With so fierce a sun overhead, even the best tent would have been no protection. I was glad of the burning wind, though it covered us with dust and sand. The water looked too dirty to wash or bathe in, but its taste was better than its look.

At six p.m. we left the wells. Up to this we had occasionally seen a few bushes, and camels could find a little scanty grazing here and there in the desert; but now vegetation of any sort entirely ceased. At eight miles beyond, we crossed a narrow salt river-bed; there was no water, but the whole bed was covered by a thick layer of beautiful white salt, looking like snow. Twenty miles after leaving the wells, we reached the village of Naiband, which is perched on a hill, a spur of the Naiband range, which we had seen for the last two days. The highest peak is about five miles distant from the village of Naiband. This hill, though it can be seen from a great distance, is not, I believe, more than 6000 feet in height. We arrived a little before midnight, but did not enter the village until next morning, for fear of alarming the people, this place being very much subject to raids by marauding Baluchis. I got a room in the village, and though it was a very poor place, it was a great thing to have a roof of some sort between oneself and the fierce sun which blazed on this desert land. Naiband is a village of about 400 inhabitants, and there is a small stream of good water, but the amount of ground fit for cultivation is very small indeed. The principal product of the place usually is dates. Though there were plenty of date-palms, there had been no crop of dates for several years, in consequence of a heavy fall of snow, which had nipped all the palms, and killed many of them. It seems inexplicable that a place with such a torrid summer temperature should ever have a heavy fall of snow; but though it is unusual, snow does now and then fall.

Turning eastward or northward it quite pained the eye to look out

on a country so barren and so parched, the people call it the burnt soil, and say nothing will grow on it even if they had water to irrigate it. It is not salt, excepting in places of no great extent, where a salt river enters it; but it is a barren, bare, burnt-up plain, about 3000 feet above sea-level, with many rocky ranges of hills rising about 1000 to 1200 feet above the plain. They said that if any of the inhabitants in the summer months wandered a few miles out into the Lut, they almost invariably perished. Naiband is a sort of oasis, miserable place as it is, rendering the journey from Birjand to Kárman possible in the summer. The direct road from Kárman, viâ Khabis, on which there is no water for 150 miles, is quite impassable in the summer months. From the Naiband hill I was able to see the Murghab peak, and also one other point mentioned by Khanikoff.

The Naiband hill, which is shown on a few maps, is very incorrectly placed, being more than 150 miles from its proper position, and could only have been put in from report. The people of the village had never seen a European, and crowded round me to see what a European was like. While I was at Naiband a large caravan of camels arrived from Kuh Banan, in the Kárman district. I was much interested in hearing of Kuh Banan, as it is one of the places mentioned by Marco Polo, as on his route. Kuh Banan is described as a group of villages about 26 miles from the town of Rawar, in the Kárman district. I cannot help thinking the road travelled by Marco Polo from Kárman to Kain is the one by Naiband. Marco Polo speaks of Tun-o-Cain, which Colonel Yule has pointed out, undoubtedly means Tun and Kain. At present Tun does not belong to the Kain district, but to the Tabbas district, and is always spoken of as Tun-o-Tabbas; and if it belonged, as I believe it formerly did, to the Kain district, it would be spoken of as Tun-o-Kain, exactly as Marco Polo does. Through Naiband is the shortest and best road to either Tun or Kain. Finding that south of Naiband the country, though of a desert character, was not really desert, but had halting-places with wells of water at regular intervals, and at many places inhabited villages, I thought it would be useless going further towards Kárman, as I had obtained all the information I wanted about the actual desert. I therefore stayed three days at Naiband to rest my animals, and then I hurried back across the desert to Birjand, where I was seriously ill for about ten days in consequence of the very great heat and bad water.

I then visited the Persian frontier opposite Lash-Jowain and travelled over a large extent of the border country, visiting Duruh, Tabbas, Gazik, and Yazdun. I was much interested in trying to discover into what the drainage of all the rivers and streams that run eastward falls. Near the Persian fort of Yazdun my difficulty was solved. Between Yazdun and the Persian village of Charaks I crossed a deep depression full of very salt water; it was about seven miles wide and I believe

about 26 miles long. Into this depression, which is called Dak-i-Khurshab, all streams in the neighbourhood drained. This would in any country less arid than Persia have been a very fine and permanent lake, but here it is only a lake in winter, and in the fierce heats of summer dries up again. We crossed it a few miles from its northern end, and found that it was then drying up, but the next day when we tried to cross it again, some rain having fallen in the neighbouring hills, the water rose and we were unable to cross so low down as we had done the previous day. There are several of these daks along the Persian frontier from Sistan up to the neighbourhood of the Hari Rud. I know of another in the Dasht-i-na-umid, or Plain of Despair, and the great swamp of Sistan itself is, I fancy, only a very large specimen of these daks.

I got back to my headquarters at Khaf at the end of July, having been about four months away, and soon afterwards returned to England. Shortly after my return I was ordered to proceed again to the Perso-Afghan frontier. I then accompanied the Shah of Persia on his journey along the newly demarcated frontier between Persia and Russia on the northern border of Khorasan, and when I left his camp I proceeded to the village of Mohsinabad, about 80 miles from Herat. Here I lived for some nine months and made a long excursion in 1883 across the Hari Rud into Badghis, as the country between the Hari Rud and the Murghab river is called. You have heard all about Badghis from Sir Peter Lumsden, who read an able paper on it in June last, so I will not say anything of that journey except that it was a very exciting one, as I was travelling with an escort of only ten Persian horsemen, and when I did this journey the Turkoman raiding parties were in full swing, and I on one occasion very narrowly escaped falling into their hands. I came upon their tracks and so was warned in time and avoided them.

On several occasions during my residence at Mohsinabad, I accompanied parties of Persian cavalry in pursuit of Turkoman raiders, and during my stay in that village from September 1883 to May 1884, some thirty persons were carried off into slavery by the Turkomans from that part of the country, a few from the village of Mohsinabad itself.

The utter contempt with which the Turkomans treated the Persian cavalry that pursued them was remarkable. I do not consider the Turkomans a brave race. They seldom made raids on villages inhabited by Afghans, and a small body of Afghan cavalry was always ready to meet a superior force of Turkomans. There is a very marked difference in the feeling of dread which is shown by the Persian borderers of the Turkomans and the sort of half-contemptuous feeling with which they are spoken of as brigands and robbers by the Afghans, but not with fear. The Turkoman raids made on villages in Afghanistan were much less frequent than those made on villages in Persian territory, and very

little booty was carried off by the Turkomans on the Afghan side of the border. A few villages, inhabited chiefly by people of Persian race, just within the Afghan border, such as Kuhsan and Shabash, were liable to attack, but this was accounted for by the Turkomans having discovered that no great resistance would be met with from the Persian inhabitants of these villages. It is curious that the Turkomans, though such good riders and given to riding their horses such long distances, generally, if serious fighting is likely to take place, prefer to fight on foot. In almost all the encounters that I have heard of between Persians and Turkomans, the latter have dismounted or had infantry accompanying them who did the real fighting. A Jamshedi officer in the Persian service said to me, "We can always fight the Turkomans as long as they remain on their horses, but their way of fighting is, to keep a certain number of cavalry skirmishing, who retire and draw us on to a body of infantry hidden in some depression of the ground, who pour a volley into us and empty many saddles; and that is what we cannot stand." Turkomans may therefore be rather considered as mounted infantry than as cavalry.

One day, during my stay at Mohsinabad, a considerable party of travellers were carried off by the Turkomans from the Herat road, not far from that village. The news soon reached a post of Persian cavalry, who went in hot pursuit. The Turkomans, with their prisoners, managed to cross the Hari Rud river, which was in high flood. They tied dry branches of trees together, buoyed them up with a few inflated goat-skins, placed their prisoners in this sort of breakwater, and partly by swimming and partly by wading got them over. The Persian cavalry came up and might easily have caught them up and recovered the prisoners, but they would not face the roaring flood of the river and contented themselves with picking up two or three camels and some articles left on the bank by the Turkomans; amongst these was a lady's back hair and a lady's slipper, showing that there was a female amongst the captives.

Last May I was with Sir Peter Lumsden in his camp at Tirpul, in Afghanistan, as Assistant-Commissioner Afghan Boundary Commission, and I was sent by him with two Engineer officers—Major Holdich and Captain Peacocke—to Herat. None of the members of the Commission had at that time visited Herat, nor had any Englishman been inside the town for several years. The last, or almost the last, Englishman who had been there was Sir Lewis Pelly, who had visited it in 1860.

The first day we marched to the village of Rozanak. The next day to the large and flourishing village of Shikeban. The whole country was cultivated like a garden. The inhabitants of this village are chiefly of a tribe called Mervis, they are descendants of a portion of the inhabitants of Merv, who, when that town was taken by Amir-Maasum of Bokhara about 1784, fled to Afghanistan and were given lands at this place

The following day our party marched to the village of Sahar Kiz, and on the 7th May we reached Herat and encamped in a beautiful garden belonging to the Amir full of large yellow rose bushes and fruit-trees of all sorts. We remained a few days encamped in this beautiful garden, and made excursions in all directions to see the sights of the surrounding country. Amongst the places worthy of note that we visited was the holy shrine of Gazer Gah. Gazer Gah contains the tomb of a Mahomedan saint named Abdul Ansari. This shrine was built by Shah Rukh, the son of Amir Timur. A fine tomb has here been erected over the remains of Amir Dost Mahomed Khan, the first Amir of the present reigning family of Afghanistan, who died at Herat very soon after he captured that town, which fell into his hands on the 26th May, 1863. The custodian of the shrine is one of the most influential of the priesthood of the country. We were received with all honour and conducted over the shrine, and were given tea by the chief priest.

Another excursion we made was to the Masulla, or Great Mosque, just outside the town of Herat. The faience that covers the walls is very beautiful, and such enamelled tiles cannot now be made, the art having been lost in Persia and the East.

After a few days' stay in the beautiful garden we moved into the town itself and took up our quarters in the new palace which has been built for the Amir in case he should visit the place. I was much struck by the dress of a portion of the Afghan troops. They were dressed in a close imitation of our own Highland regiments, the tartan worn by them being the Mackenzie tartan. The effect of the kilt was, however, decidedly spoilt by the men wearing white trousers in addition to their kilts. Instead of the Highland bonnet they wore brown felt forage caps with large black peaks. After a most sumptuous breakfast which was provided by the Governor, whose guests we were all the time we remained at Herat, we rode out to see the town.

The town of Herat is built on a high mound situated in a most fertile plain. The mound, which is about a mile square, is raised much above the level of the surrounding country, probably some 60 feet. It is evidently artificial, and is in great part formed of the débris of former cities. The present town is believed to be the seventh town occupying the same site. The surface of the ground immediately outside the town and beyond the great ditch is considerably lower than the surrounding country. The earth over a large surface had evidently been excavated for the purpose of building the fortifications, and also in part for raising the artificial mound on which the town is built. It is nearly square, but is rather more from east to west than from north to south, each side of the town being a little less than a mile. The town is divided into four quarters by two long central streets, the chief one running from the arx or citadel to the Kandahar gate; the other from the Kushk gate

to the Irak gate. The course of these streets, which are about 16 feet wide, is filled up with shops, and these form the four great bazaars of Herat. The point of intersection of these roads is called the Chahar Su or Four Streets, and this point of intersection is the place of chief trade, the best shops being situated in its neighbourhood. The main bazaars were in good order, and the shops mostly occupied and open. The show of goods was, however, inferior to that to be seen in Mash-had or any important Persian town. The population of the town of Herat is largely of the Persian race and of the Shiah Mahommedan form of faith. The number of people of true Afghan race is not considerable. The Chahar Aimak tribes, who form so large a proportion of the population of the Herat district, are also represented in the town. These are Sunni Mahommedan by faith, though non-Afghan by race.

There is a great deal of confusion about the Chahar Aimak tribes; Chahar Aimak means four nomads. Aimak is used in Herat simply to denote a nomad. The tribes now belonging to the Chahar Aimak are Timuri, Jamshedi, Firuzkuhi, Taemuni, Hazara, and Kipchak. The Timuri have their headquarters at Khaf in Persia, but many remain in Afghanistan, especially about Sabzawar. The Timuri, though even now a numerous tribe, were formerly much more powerful and lived in Badghis. They claim to be descended from Arabs, and are called Timuris, because their original chief married a daughter of the Amir Timur. They are, however, called Juts by their enemies, though they resent being so-called. They very much resemble in appearance the Juts of the Panjab, and I should fancy are descendants of the ancient Getæ.

The Jamshedis now dwell in Badghis, especially about the Kushk stream. They claim originally to have come from Sistan, and thus are a Persian race.

The Firuzkuhi are also a powerful tribe, who claim to have been brought from the Firuz Kuh mountains to the northward of Tehran in Persia.

The Hazara tribe included in the Chahar Aimak are chiefly settled about Kala Nau, in Afghanistan, and about Mohsinabad in Persia. The Hazaras say they originally came from Kittai or Western China. Their Tartar faces and crookedly set eyes, and want of beard, show them to be of Turanian race; but it is curious that all these tribes speak neither Turki, Mongol, nor any other Tartar dialect, nor do they speak even Afghan, but Persian. These Hazaras of the Herat district are not all friendly with the mountain Hazaras, who are known to the Afghans as Berbary, and who inhabit so large a portion of the mountainous part of Afghanistan.

The Kipchaks are a small tribe settled about Obek.

Herat in former times is said to have contained 100,000 inhabitants, but at present I do not think that besides the strong Afghan garrison

it contains more than 12,000 inhabitants, though the surrounding country is full of villages and very thickly populated. The whole of the Herat Valley from Obeh to Kuhsan, or a distance of probably 120 miles by about 12, is, I am informed, cultivated like a garden, as the 60 miles or so seen by me from Kuhsan to some miles beyond Herat certainly were. Everything grows with the greatest luxuriance, and in wonderful profusion. Wheat and barley are produced in large quantities, while fruits such as peaches, apricots, grapes of many varieties, plums of many sorts, mulberries, walnuts, and almonds, are grown in great plenty.

Pistachio nuts of a superior sort grow in abundance quite uncultivated on the downs beyond the mountain range, and on the lower slopes of the hills themselves, while the rich down country to the north of the mountains would afford pasturage for unlimited flocks of sheep.

The value of Herat to any one approaching from the north has been shown over and over again. The Herat valley is the only place in this part of Central Asia where a large body of men could be fed, and any one holding possession of Herat would have a most commanding influence in the affairs of Afghanistan and Persia.

The Russians are making their railway from the Caspian Sea via Askabad and Merv to Samarkand; the line, which it is hoped will be finished in three years, will not pass through Bokhara, to which it is proposed to make a branch line.

I believe nothing would insure peace and quietness in Central Asia so much as our continuing the Quetta line of railway to Herat, and this line could eventually be joined on to the Russian line.

If a string is stretched over a globe from England to India, it would nearly follow the line through Russia to Vladikafkas, at the foot of the Caucasus Mountains (where the Russian European system of railroads at present ends, but which is about to be continued to Petrofsk, on the Caspian Sea), and then would pretty nearly follow the Russian Trans-Caspian line, and thence onward through Herat to Quetta. I know there are difficulties to be contended with in the making of a line of railway to Herat, but the difficulties are not of a physical character, but chiefly consist in the prejudices of the Afghan and English peoples. I wish at all events to try and ventilate the possibility of making such a line so as to remove the prejudices of the English. I believe the difficulties which the English would have to contend with as regards the prejudices of the people through whose country it would be made, would be far less than those the Russians will have to contend with in making a railway through Bokharan territory to Samarkand.

The possibility of running railroads in Central Asia has been greatly facilitated by the finding of almost unlimited supplies of fuel, in the shape of petroleum. The whole country from the north-eastern corner of the Black Sea through the Caucasus to Baku on the Caspian Sea, is

full of petroleum, which is found at certain points, such as Baku, in almost unlimited quantities, and also in the Trans-Caspian provinces it is found in large quantities. All the steamers employed on the Caspian, which are very numerous, burn petroleum as fuel, as do also the locomotives used on the Trans-Caspian railroad. The advantage in burning petroleum over coal is that a much less quantity is required to perform the same work. For instance, a steamer would only require to use 90 tons of petroleum, where she would require to use 240 tons of coal. Thus a steamer or an engine burning petroleum could carry a supply of petroleum sufficient to keep their engines going for nearly three times the period that the same quantity of coal would last. Petroleum is sold at Baku at less than a halfpenny a pood of 36 pounds, and the supply is practically unlimited.

In the year 1881, the last year for which I have returns, the quantity of petroleum extracted from the wells in the neighbourhood of Baku was 30,000,000 poods. This was before the railway from the Caspian to the Black Sea, which is now open, was finished, and I have reason to believe that the quantity of petroleum extracted in the current year will far exceed, if it should not prove to be double the quantity, extracted in 1881. Though the crude petroleum as extracted from the soil is generally used for burning in steam engines, the *astaki*, or refuse remaining after kerosine oil has been extracted from the petroleum, is almost as useful for burning in steam engines as the actual crude petroleum itself, and is frequently used in steamers on the Caspian. Mineral wax also is found in considerable quantities in the island of Cheleken in the Caspian Sea.

In the trans-Caspian territory of Russia, near the line of railway from Michailofsk to Askabad, a boring has been made, and a large quantity of petroleum is here produced. A refinery has been established and a small branch line of railway has been laid down to connect these naphtha-springs with the main line.

The quantity of petroleum found near Novorassisk, on the Black Sea, and in the whole district of the Kouban, is very great, and being obtained near the Black Sea is much more accessible to Europe than the petroleum found near the Caspian Sea. Besides the enormous quantities of petroleum found in Russia and America, large quantities could, I believe, be procured by boring in Burmah, and petroleum has also been found in the country near Quetta. This last, if it should prove to be in considerable quantities, would be most useful in case the Indian railway lines were extended to Herat. A railway joining our Indian system of railways to the Russian system, would, I believe, be the finest guarantee of tranquillity in Central Asia. From London to Quetta on an arc of the great circle is 3165 geographical miles or 3640 English statute miles. If this line were completed the journey from London to India could easily be accomplished in eight days; there would only be two breaks,

one at the Straits of Dover, and the other between Petrosk, on the western side of the Caspian, and Krasnovodsk on the eastern side of the same sea. This piece of sea is now crossed by the Russian steamers in eighteen hours, but they are of very small power, and travel at a low rate of speed; such steamers as carry the Irish mails could cross the Caspian in about nine or ten hours.

Copper is found in very large quantities in Eastern Persia, near the Afghan border; lead is also found there in considerable quantities. At present, in consequence of the scarcity of wood in this part of Persia, it does not pay to smelt it, but if petroleum were brought by the railway from the trans-Caspian province of Russia to the neighbourhood of Herat, these metals would probably be smelted and carried by the railway.

After the paper,

Sir HENRY RAWLINSON said he very much agreed with all that Colonel Stewart had stated on the subject of the fertility and importance of Herat. Colonel Stewart had dealt with the question in a very wise and cautious manner. It was an understood thing in official circles that whilst any question was actually under negotiation it was not considered decent to discuss it in public. A commission was at present employed in delimiting a line between Russia and Afghanistan, and therefore it would be very inconvenient to discuss the general political aspect of the question. It should be remembered that Herat was an independent city, belonging neither to Russia nor to England, but to Afghanistan. It was a very suitable, not to say a formidable position, when viewed as a defence and support of Afghanistan; but in the possession of either England or Russia he believed it would be what was generally called a white elephant—at any rate, in the present state of railway communication. It would be almost impossible for either Russia or England to maintain an efficient garrison there, the distance from either frontier being so great that a garrison in Herat could never be supplied with carriage, provisions, arms, munitions of war, and all the requisites of an army except at such an enormous expense as would far outweigh the political value. “*Le jeu ne vaut pas la chandelle.*” He believed that that was the feeling actuating both countries, and that Herat would be left as a defence to Afghanistan uninterfered with by any other Power. At the same time, he quite endorsed what Colonel Stewart had said, that from its extraordinary fertility and geographical position, the Power that held Herat, whether Russia or England, or Persia, or Cabul, would exert a very strong, if not a commanding influence, on the surrounding regions of Central Asia. He trusted, however, that English efforts would be directed towards maintaining Herat for the Afghans.

Sir FREDERIC GOLDSMID said that some twenty years ago, when he had returned through Beluchistan to India from Tehran, he had the pleasure of meeting a young officer from the Panjab, who asked him a great many questions about travelling in Persia. These questions were put in a very pertinent form and with a great deal of intelligence, and evidently the officer meant more than mere questioning. Shortly afterwards, that same officer went to Persia and made his mark there; he it is who has just read the paper before the Royal Geographical Society. What Colonel Stewart had now stated was hardly one-tenth of what he had done in the way of exploration and research—chiefly in the north-east above Khorasan, in the Turkoman country. Reference had been made to his (Sir Frederic Goldsmid's) journey into Sistan. That was only one of two expeditions he had made under Government

orders about thirteen or fourteen years ago. If he were to speak about those missions he would have to tell a very long story indeed, because he did not believe that much was known about them at the present day. He had no special correspondents in his camp: moreover, he was obliged to put a veto upon any writing for the press, and to keep that veto in mind more particularly in his own case. Consequently, very little was known about those missions. For his own part, he could not but wish they had appeared in the shape of a Blue Book, because there was an interesting correspondence between himself and the Persian Commissioner, which he thought would be found a curiosity of Oriental literature, and a very good lesson for those who studied Oriental diplomacy at the present time. He would only allude to the geographical part of his second mission. He then travelled from Karman across the Lut Desert, arriving near the Lake of Sistan about the beginning of January. It was an exceedingly cold night and, as their tents had not come up, he and his companions slept out in the open air around a brushwood fire. They made the best of their coats and wrappers, but in the morning his beard was covered with icicles: there was much frost, and the cold was greater than he had been led to expect in that quarter. He next went to Lash, then struck to the westward of Birjand, from there up to Kain (not by Colonel Stewart's route, but by a more direct route), from Kain up to Turbut Haidari, and then on to Mashad. Colonel Stewart had referred to the traditions or legends of the country, and he (Sir Frederic Goldsmid) remembers passing a place called Yunsi after the prophet Jonas, because the prophet Jonas really was thrown up there from a whale. The idea naturally was that the whole of that region had in former days been a sea. Colonel Stewart had very truly mentioned that the Amir of Kain did not treat him (Sir Frederic Goldsmid) with great civility, though he treated Colonel Stewart particularly well. He quite admitted that; but the fact was to be attributed to the circumstances of the Sistan Arbitration, when the Arbitrator had to pass judgment on the Amir's encroachments. On his going to Karman in 1866, with Major Murdoch Smith and five Persian servants, they were treated with a hospitality which he could never forget: his servants were all cross-examined by the Governor himself in order to make sure that they were men who could be trusted: every possible advice and assistance was given to him, and everything done to make the journey comfortable. When he asked the Governor what he should give him in return, or send him from Bombay, the answer he received was, "There is only one thing I wish for: when I was a boy, Sir John Malcolm took me upon his lap and was very good to me. I understand he has written a history of Persia. If you can get me a translation of that history, it will be the greatest pleasure you can bestow upon me." Through the kindness of the then Governor of Bombay, Sir Bartle Frere, he was enabled to obtain the translation, and present it to the Governor's son, the Governor having died previous to the completion of the work. If he had gone by himself to Kain, he did not believe he should have been treated worse than he was by the excellent Governor of Karman. It must not, therefore, be supposed that it was the usual habit of Persian Governors to be unfriendly to visitors. He was sorry to differ from Colonel Stewart on the railway question, but he did not like pushing the line further from Kandahar towards Herat, unless the whole country were in English hands. He would much prefer an international railway from the Herat direction down to the sea. There were ports such as Gwâdur or Gwatar which might be made the outlet from Central Asia and be connected at the same time with Karâchi by railway along the Makran coast.

Mr. BLANFORD said that no doubt small quantities of petroleum had been found in a great many parts of the Indian Empire, and probably in various other places in Central Asia, but in the majority of cases it had not been sufficient to afford any large supply. Of course he was not referring to such places as the neighbourhood

of Baku. It had also been found in Burmah and Assam as well as in two or three localities in the Punjab. Some years ago gasworks were started at Rawal Pindi with the hope that sufficient petroleum would be found in the neighbourhood to supply the gas, but the result was not very satisfactory. The place near Quetta to which Colonel Stewart had alluded, was doubtless one in the Marri hills. It had not yet been properly explored. He had intended to go there himself, but unfortunately had not time to do so. All that was known about it was that a certain quantity of petroleum did exist there, and was used by the people chiefly as a medicine or ointment for their cattle, but whether the yield would prove to be large was very doubtful. Judging from other instances in that part of the world in which the occurrence of petroleum had been reported, he did not think it would be wise to attach much importance to it. Some time ago it was believed that coal would be found on a part of the route along which the railway was being made to Quetta, but he feared that in that case also the quantity was but small. There was one peculiarity about the whole of the plains of Central Asia which they shared with many of the plains in the central portion of North America, namely, that they had no outlet, and that the small streams, which usually only ran for a very short distance, were quite insufficient to do more than to supply the rapid evaporation, and as many of the plains had the appearance of having been formerly lakes, it had occurred to several persons that such was really the case, and that by the gradual decrease of the rainfall they had been dried up; but Baron von Richthofen, who examined several similar plains in the north of China, where he had better opportunities of noticing their structure in consequence of their being traversed by streams, found a remarkable resemblance between the deposits in them and the deposit which occurred in the valley of the Rhine known as loess, and suggested that they were not formed by the deposition of water, but of the fine dust which was carried about by the winds. The form of these great plains without an outlet was of course caused by certain geological changes which had taken place, in all probability at no very distant epoch, but the filling up of the centres of the plains so as to convert them into sheets of fine deposit was very probably due to the winds carrying the dust formed by the disintegration of the rocks in the surrounding country. The small quantity of water that reached the plain always contained some salt, and when the water dried up, the salt remained to form the pans that were so very frequently met with.

Brigade-Surgeon ARCHISON (Naturalist to the Afghan Delimitation Commission), read to the meeting the following account of the botany of the region:—The valley of the Hari-rúd, taking Herat as its centre, of which Colonel Stewart has just given such an interesting account, is extremely fertile, this being dependent upon an easy access to water, of which there is an unlimited supply, as well as to the richness of the soil. The cultivated area produces magnificent crops of wheat, barley, cotton, grapes, melons, and the mulberry tree, the last yielding food for the silkworm. At this elevation these crops all require careful irrigation; but at higher altitudes, viz. above 4000 feet, and in certain localities, good wheat and barley are grown without irrigation. In the valley itself the extent of the cultivated area is only limited by the amount of labour procurable. The cotton produced is, comparatively speaking, poor, and silk culture has of late years greatly fallen off, owing to sickness amongst the worms—indeed, in many of the villages they are now no longer reared. Surrounding the villages, and in orchards, we find the following trees cultivated, some held sacred, as *Pinus halepensis* and an ash, others for their timber, as two species of elm, or for their fruit, as the apricot, apple, plum, quince, peach, pomegranate, *elæagnus*, and *zizyphus*. In one or two favourable localities, at 6000 to 8000 feet, *Pinus halepensis*, although originally cultivated, has become almost naturalised

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On the islands of the river and its low banks the Euphratic poplar occurs as a fine tree, forming forests, which are greatly resorted to for fuel.

The general appearance of the country during winter is barren and arid in the extreme, owing to the absence of trees and woody shrubs; these, where they do exist, are localised. The great and sudden alteration that takes place in the appearance of the country upon the advent of spring and summer is scarcely to be credited, the mass of the vegetation consisting of perennials that throw up their annual foliage from great underground root-stocks, bulbs, tubers, and rhizomes. By the middle of May prairies of foliage have suddenly appeared over a country that in March looked incapable of producing anything. The shrubs that attracted my attention most from early spring were the several species of large Umbelliferae so truly distinct from anything of the sort that I have heretofore seen. Each of these species was more or less localised, yet all spread like extensive miniature forests over the great plains and plateaus; these, when in blossom, gave a grand colouring to the landscape, from shades of pale lemon to autumnal russet, depending on their stages of growth. The most prominent and remarkable of these was the assafoetida plant (*Ferula scorodosma*), which, when it begins to throw up its flowering stem, at first presents the appearance of a large cabbage; another, the plant that yields a galbanum (*Ferula galbaniflua*); the amoniacum plant (*Dorema* sp.), a *Ferula* of which the stipules form large cups round the main stem; and, lastly, one so tall that it is called the Horse *Ferula*, owing to its being much taller than a man on horseback. This has such a large stem that it actually assists to form a jungle, along with the usual tamarisk met with in these regions. In special localities, and where the sandstone rocks are exposed and come to the surface, forests of a pistachio, which I believe to be *Pistachio vera* in its natural wild state, are much met with. The districts yielding these forests are called by the natives *pistalik*. In their leafless winter condition, as I first saw them, owing to the peculiar grey colouring of the bark, these trees give a character to the country as if one were looking at the rocks and background through a haze or smoke. They are of no great height, from 12 to 18 feet, with poor timber, but excellent material for fuel. In summer they are covered with a deep green dense leathery foliage that gives good shade; from the tree is collected, in due season, the pistachio nuts that are so largely exported to India from Afghanistan, as well as a gall that is developed on the leaves, for tanning and other similar processes.

Close to the Do Shakh peaks, on the limestone cliffs, and chiefly the southern exposure, *Pistachio mutica* exists as a good-sized tree; its leaves are collected to be employed in dyeing processes, but the galls of this species, which are of a different form from those of *Pistachio vera*, are not used. In this locality, on the northern exposure of these hills, in the dry stream beds, I collected a species of *Cercis*, the wands of which, in the neighbourhood of Mashad, are largely employed in basket work. From above 5000 feet on the hill ranges the common Afghan and Himalayan tree juniper, viz. *excelsa*, exists in more or less dense forests, and this is the only true conifer in a wild state that I came across.

In the rocky regions and interior of the hills, where moisture is present, at and over 5000 feet, a *cotoneaster* is common; this in certain localities yields the manna-like product called *sher-khist*, which is collected in the heat of summer; but it only occurs every second or third year. It is pleasanter to eat than the other two mannas collected near this, viz. that from a thorny pea shrub, *Alhagi*, called *taranjabin*, and from a tamarisk called *gaz-anjabin*. The other trees that I met with were a hawthorn, an *elæagnus*, a maple, and two or three species of *Prunus*. The earliest spring flowers are three species of *merendera* or allied genera. These are closely followed by a fine bright-coloured tulip, varying from light pink

through every shade of red, red and yellow, to pure yellow; later in the season several *eremuri*, a Liliaceous genus, are spread over the great slopes of the rolling hills, which, when in full blossom, give a grandeur in colouring only to be eclipsed by the wealth of the golden flowers of a *delphinium*, that are collected for dyeing silk yellow, and which, as a trade article, is exported through Persia, Turkistan, and even south as far as Umritsir. The roots of one or probably several of these *eremuri* are largely employed to manufacture vessels for holding oil. The roots are dried, powdered, and then boiled in water, yielding a gummy mass which is painted on to a mould. When dry, the mould is broken up and removed.

Those I have mentioned are the more interesting plants; but the ordinary everyday types are two low artemisias, two species of *ephedra*, a small yellow rose, and numerous *astragali*, which with grasses form the most of the herbage of the country. An *astragalus* that may prove to be *A. veri* yields largely a gum—the gum tragacanth of commerce—collected and exported to Mashad and Turkistan, to be employed in stiffening fabrics.

The last and to me the most interesting plant that I would wish to bring to your notice here, is a species of asclepiad that grows in the beds of streams at 4000 feet on the eastern side of the Paropamisus Range, at and in the vicinity of Gulran. It was winter when I first came across this shrub, growing out of a swampy stream bed; it consists of an underground creeping root-stock, that throws up annual stems; these flower, fruit, and die, but remain attached to the parent stock for several years, so that clumps of shoots of several years in different stages of disintegration are seen to remain still united to the parent stock. On looking at the bases of these stems, I found quantities of fibre, naturally accumulated, rubbed off from the stems by friction against each other. The Turkomans told me that this was made into cloth, and the fibre is an excellent material for such purpose. The bark of the root is well known to the nomad tribes, being employed by them in tanning their water-skins. I believe this to be the same plant as that similarly employed near Lob-nor, in Eastern Turkistan. Living roots of it I was able to send to the gardens at Seharanpore, where they arrived alive, and were in good growing condition when I last heard from Mr. Duthie. I regret to say that I was unable subsequently to collect herbaceous species during the summer.

Sir GEORGE CAMPBELL, M.P., said he had paid a good deal of attention to all that had been written on the subject, but he had never quite realised the actual extent of the Herat Valley proper, its population, and its cultivation. Colonel Stewart said it was about 100 miles long, by about 12 miles broad; but he understood that the cultivation was by artificial irrigation, and that perhaps involved a good many breaks in cultivation. He desired to know whether the population was to be reckoned by tens of thousands, by hundreds of thousands, or by millions, or what was the approximate land revenue derived from it by the Amir.

Colonel C. E. STEWART, in answer, said there were, of course, broken spaces where there was no cultivation, but he should say, speaking roughly, that the valley was about 120 miles long, and that from four to six, or even seven miles on each side of the river was irrigated and cultivated, with occasional patches that were not cultivated. If the population was large enough, the cultivation could be very widely extended, all that was required being labour to make new canals. He could not, off-hand, furnish information as to the number of the population, but he had notes on the subject, which he would communicate to Sir George Campbell privately.

General Sir F. P. HAINES said that Colonel Stewart's remarks about the shortest line from England to Quetta would give considerable matter for thought to

strategists, and there was no doubt that the interest taken in the geography of the region described in the paper arose from its strategical aspect. It was really a somewhat serious matter that Baku, Krasnovodsk, and Askabad were precisely the points on our shortest line of communication with India, especially when it was remembered that Russia was striving her utmost to improve her communications by that route, so as to enable her to put the screw on England at any moment she might desire to do so. Seeing the thing very plainly in his own mind, he had never been in the least degree alarmed as to what was being done by Russia so long as England was awake to it. He thought it would be quite sufficient for England to make her railway safe to Kandahar without going on at present to meet the great strategical line which Russia was forming. He wished to ask Colonel Stewart if the petroleum was capable of being used for smelting ore? and to ask Dr. Aitchison if he had met with any ferns in the districts he had explored.

Col. C. E. STEWART replied that he had seen petroleum used for working steam engines and steam hammers, and for making gas, but as yet it had not been applied to smelting purposes in Central Asia.

Dr. AITCHISON said he only met with one species of fern, and that in very small quantities; it was a species of *Adiantum*.

The PRESIDENT, in concluding the proceedings, said they had had a singularly attractive paper upon a region part of which had not much natural attraction. These border regions were until recently so little known, that he believed the Persians themselves hardly knew where their own frontier lay. He had heard of a traveller who, wishing to go north from Tehran, asked the British Minister there where he should find himself over the Persian frontier and in the Turkoman country, and was told to go to the Persian Minister of Foreign Affairs in order to obtain the information. He went, and by the Persian Minister was referred back again to the British Embassy, it being perfectly unknown at Tehran where the frontier was. Almost all the information obtainable about the region was derived from gentlemen who had been brave and courageous enough to risk their lives, and very often their freedom, in such explorations. He would not allude to politics; still he could not but express a hope that the stores of petroleum would do something to oil the wheels of diplomacy. The country seemed somewhat analogous to the great plains of North-West Canada, where large streams and lakes had dried up, and where, so far as Athabasca was concerned, there were vast stores of petroleum. Every one must hope that the country described by Colonel Stewart, which was once highly civilised, might again become the home of a numerous and happy people.

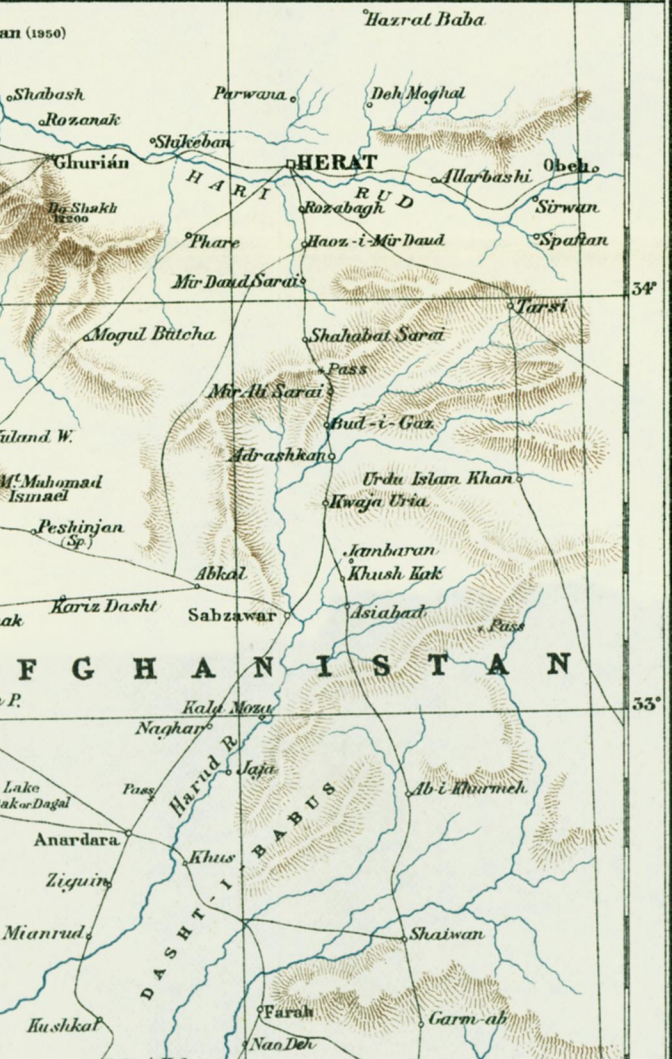
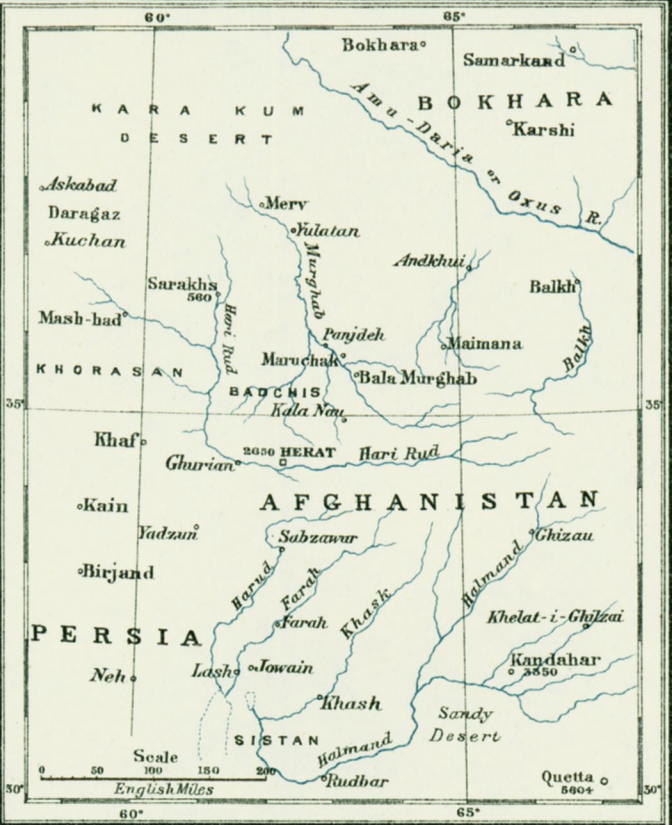
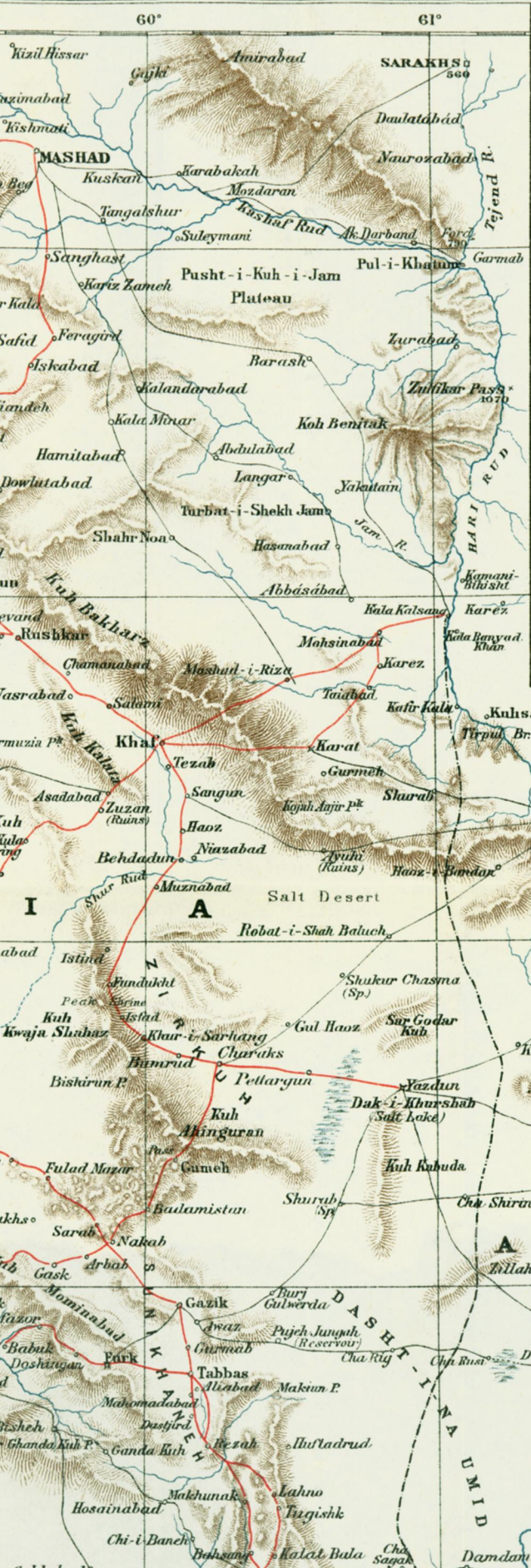
Arctic Exploration, with reference to Grinnell Land.

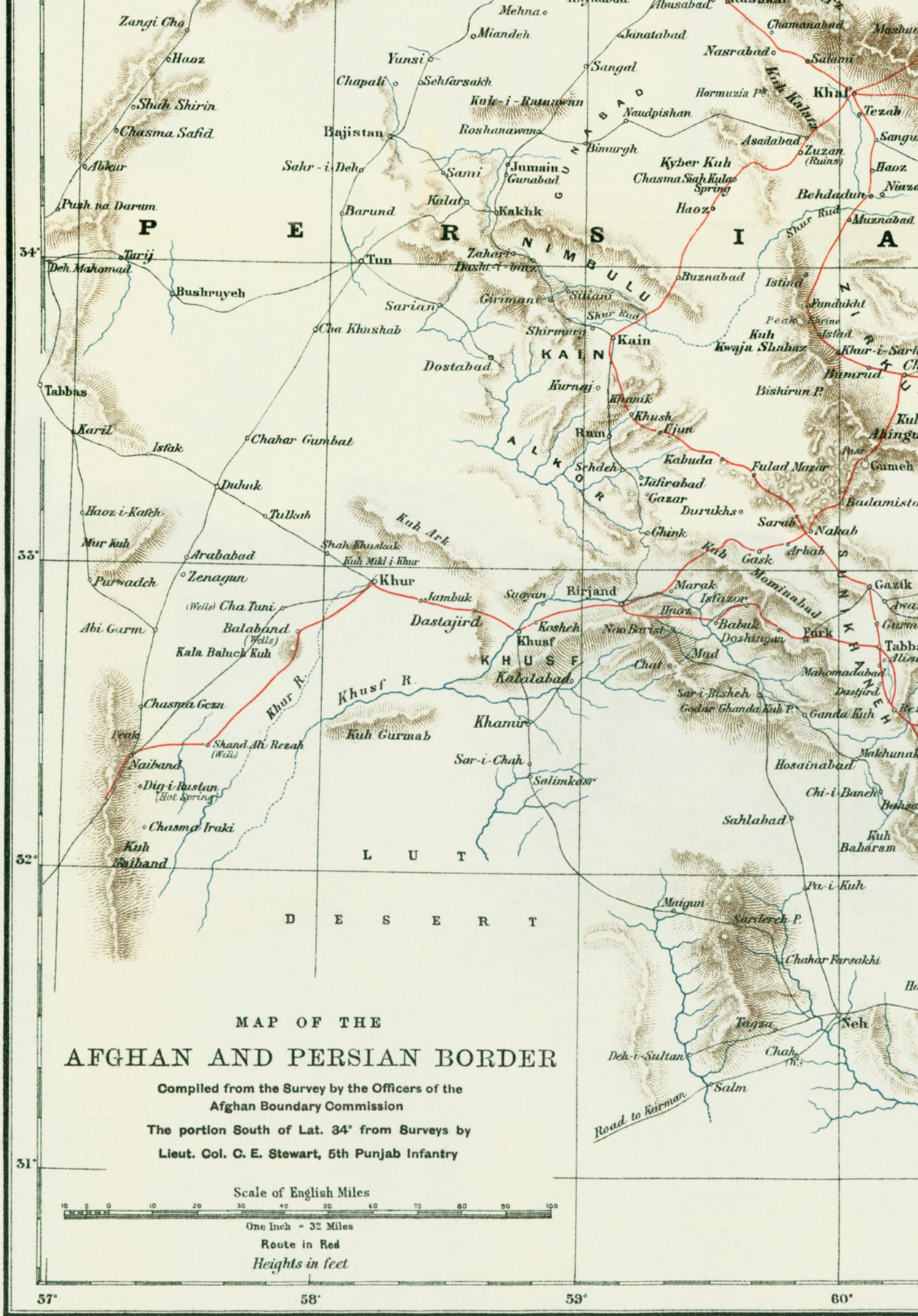
Address by Major A. W. GREELY (United States Army).

Delivered at a Special Evening Meeting, December 21st, 1885.

It must be with a certain degree of hesitation that a gentleman addresses an audience as large and distinguished as this, knowing that he has made no especial preparation for a meeting which does him so much honour. Time and my health would have failed me if I had attempted to do this, and so I come to speak extemporaneously. If in so doing my remarks may not be as coherent or as well-connected as

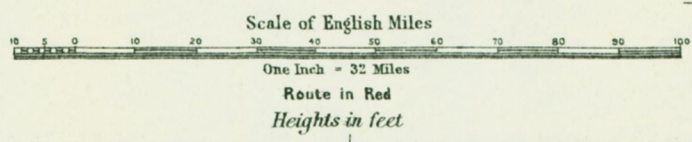






MAP OF THE
AFGHAN AND PERSIAN BORDER

Compiled from the Survey by the Officers of the
 Afghan Boundary Commission
 The portion South of Lat. 34° from Surveys by
 Lieut. Col. C. E. Stewart, 5th Punjab Infantry



H. Sharbau R. G. S. del.

o Khabis

Pub^d for the Proceedings of the Royal Geograph

o Kármán

