

EXPLORATIONS IN THE EASTERN KARAKORAM AND
IN THE WESTERN KUNLUN: *A paper read at the Evening
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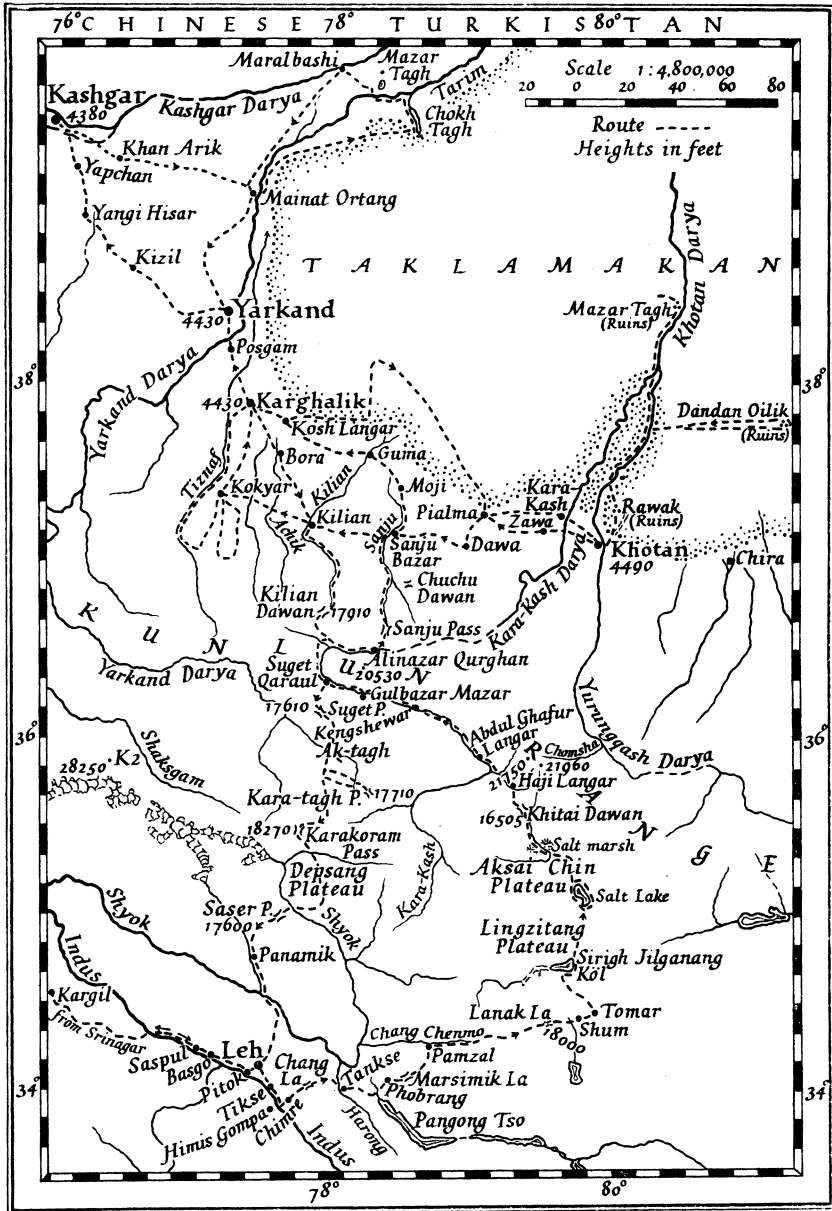
DURING the expedition I undertook in 1927-28 I twice crossed the high mountain ranges and plateaux separating the Upper Indus Valley of Ladakh from the Tarim Basin of Chinese Turkistan or Sinkiang. As my caravan traversed these regions on two different lines we had the chance of studying two different sections across those high mountain regions. This was very important for the geologist of my party, Dr. de Terra, who by a thorough study of the structure of the rocks and mountains got a good idea of the geological history of this part of the world. I myself made a plane-table survey covering the area from the Pangong lake across the high barren plateaux to the Upper Kara-Kash river. My main aim, however, was to obtain a good idea of what the Ice Age on those plateaux had been like.

When starting from Leh in July 1927 my plan was to go around the westernmost end of Pangong Tso to the barren plateaux of the western Tibetan borderland. These plateaux are called Lingzitang and Aksai Chin on the Indian Survey maps, but I never met any native who knew these names. After finishing our work there, I intended to start for Khotan in Chinese Turkistan by travelling through the Upper Keriya Darya district. If I speak here of the Lingzitang and Aksai Chin plateaux as belonging to Western Tibet it is only because of their geographical character, for politically these regions are in Kashmir.

As the part of Central Asia which I wanted to visit is absolutely uninhabited we had to take provisions with us for three months for ourselves, for our Indian servants, and for our coolies. So we started with a rather big caravan when leaving the last Ladakhi stone huts at Phobrang, north of the blue Pangong Tso. As I was well acquainted with the reports of explorers, and had studied all the travel reports dealing with these regions, I knew that sheep could be extremely valuable as transport animals. Captain Biddulph, who once crossed those high plateaux with only a sheep caravan, had practically no losses whatever, and it was probable that sheep could stand the hardships of such a journey at least much better than horses could do. The Tibetans also use sheep as transport animals, loading them with salt and wool. So, besides thirty-one yaks and our riding-ponies, I took seventy sheep.

I shall not say much here about the road leading from Leh to Phobrang, because it has been described fairly often before and it is well known. We crossed the Chang La, that high pass in the Ladakh range, on July 16. I was rather astonished to find, even at an altitude of 16,000-17,000 feet, carpets of beautiful flowers in the green short grass covering the valley at Zingral. This small grazing-ground is on the southern slopes of the Ladakh range, just below the Chang La. We did not meet with any snow and ice until we reached the top of the pass. The descent on the northern side was not very difficult. On July 17 we entered the small village of Tankse. Here I had the chance of studying thoroughly the big boulders lying amidst the gravel deposits of the

lower Harong valley. Several of these blocks had been studied already, in 1906 and 1911, by missionaries from Leh. Several of the inscriptions are in Tibetan, others in Soghdian characters. One of the Soghdian inscriptions



was partly read by Prof. F. W. K. Mueller of Berlin. He believes that the inscription dates from the ninth century and that it was written by Nestorian Christians. Among the other inscriptions which I discovered there was one

written in old Indian characters, *i.e.* Gupta. The text unfortunately is only a verse of a Buddhist Mahayana Sutra. My Swiss companion, Mr. Bosshard, took snapshots of all these inscriptions, and we hope that before long some of them will be read. Near Tankse also there is a small old monastery in whose gloomy rooms there are elaborate wall-paintings showing scenes I could not identify. The painting is absolutely unlike that in other monasteries of Ladakh. It is much more artistic and is somewhat like Persian miniature paintings. There are very remarkable wall-paintings, often over three hundred years old, in many monasteries in Ladakh, especially in Himis Gompa, Tikse, Pitok, and Chimre.

Two days after leaving Tankse we saw the Pangong Tso stretching before us. It is the most beautiful lake I have ever seen. Its elongated form reminds us of a Norwegian fiord, and the study of the geology and morphology of this region tells us that the origin of the Pangong valley is similar to that of the Norwegian fiords. Old beaches show that the lake formerly stood at a much higher level than to-day. At the western end of the lake the stratified clay deposits are covered by moraine material, evidently deposited on the former bottom of the lake by glaciers advancing down tributary valleys after a period of high water.

The last place where we met shepherds and villagers was at Phobrang. On August 3 we left this place with our big caravan. I think none of us anticipated that our sheep would eventually save our lives, and that only one yak would reach the distant border-post of Suget Qaraul on the Karakoram road. In order to reach the lower Chang Chenmo valley my caravan had to cross the Marsimik La, which was not so difficult as I had supposed it to be. On the banks of the Chang Chenmo there stretch the grazing-grounds of Pamzal, where we stopped for a few days to give our animals a good rest. After twice crossing the Chang Chenmo we reached the hot springs of Kiam and then entered the less-known country. Deasy and Rawling had been there, but we did not know very much about the detailed topography and morphology of this region. The colours of the landscape were beautiful. Especially remarkable were the deep red sandstone mountains, probably of Tertiary Age, the greenish crystalline schists and light red cliffs of Jurassic limestones.

On August 16 we crossed the Lanak La, my plan being to go as far as a spot called Shum on Deasy's map and to try to reach the Lingzitang by a direct route. We succeeded in going a little farther on, to a place near the Sumjiling Plain. Needless to say, all these places were uninhabited, but old fireplaces told us that now and then the Tibetan nomads or the *Changpas* visit even these distant places. The ascent to the Lingzitang could have been effected fairly easily, but the coolies preferred to take a short cut which in the end proved rather trying. The landscape in this region was really wonderful. From a high snow-covered range, whose peaks rise to 20,600 feet, there stretch broad glaciers like big white tongues into the longitudinal valley bordering the range on the west. The Tibetan type of glacier is unlike any other type of the surrounding regions. The big Karakoram glaciers in the west are bordered by extremely steep-sided mountains which are often so perpendicular that the snow cannot find any hold on the slopes. The mountains on the Tibetan Plateau, on the contrary, are rounded and denuded, and are often so buried under ice and snow that you can scarcely detect any rock in the upper part of the ranges.

Once having reached the Lingzitang plateau we had to wend our way for two days amongst red and green hills. We discovered two small lakes and camped on the shores of a large lake called Sirigh Jilganang K l on the maps. This is a Turki name meaning "the lake of the yellow valley." Probably it was called this because the old beach-lines surrounding the lake are a yellowish colour. I have tried in vain to find any hint about this lake in travellers' books as well as in any reports, and I cannot trace where the name comes from. Probably one of the members of the Yarkand Mission or Johnson saw the lake from the distance, and when he asked one of the Turki followers about it, the man answered: "It is Sirigh Jilganang K l," or "the lake of the yellow valley."

We stayed more than fifteen days on the shores of the lake, thoroughly examining the surroundings in every direction. Probably we should not have done so if our horses had not strayed there. Although we sent out coolies equipped with blankets and provisions to bring them in, they could not find them. One of the coolie parties even went back as far as Pamzal, but as there had already been falls of snow at the end of August the footprints of the animals were covered with snow. At this place also, unfortunately, the yaks began to die. At first we could not find out what was the matter. They were unwilling to move on at all, and stood where they were till they suddenly broke down. We dissected several of the dead bodies and found that their stomach walls were pierced by worms or leeches. But I do not believe that this alone was the cause of the collapse of our beasts of burden. I think the bad grazing-grounds also contributed to their collapse. It was absolutely impossible to cover large distances with these sick animals.

We spent two weeks on the shores of this blue lake, surveying the country around and devoting ourselves to our geological and geographical studies. Like all lakes on the Tibetan plateau, this Sirigh Jilganang K l shows signs of shrinkage. Old beach-lines run along the shore, the lower beach consisting of clay deposits while the higher is represented by a rocky terrace. I believe that these high plateaux, which are at an altitude of about 17,000 feet, were probably covered by stagnant ice-masses and n v . We shall see later on that in the region to the west, in the Karakoram, there are big glacial trough-like valleys of really extraordinary dimensions.

The survey of the lake and its surroundings gave us quite a different idea of the shape of the lake from that shown on the map.

Our next goal was the Aksai Chin, or "White Desert of China," bordering the great valley running along the southern rim of the Kunlun Mountains. In order to reach the big salt lake, formerly visited by Sir Aurel Stein, Crosby, and Sven Hedin, I crossed the mountainous regions rising between the Aksai Chin and the Lingzitang, leaving Hedin's route of 1907 to the west and that of 1908 to the east. We could have crossed these barren mountains easily if our remaining yaks had been in good condition, but already when leaving the Sirigh Jilganang K l several broke down and we had to shoot them. We had to bury some dispensable stuff here because the loads became too heavy for the remaining animals. The more the yaks died, the more our sheep had to carry; they really worked splendidly and they could even carry as much as 30 lbs. weight. The country we had to cross here was practically barren, so to our great disappointment we often did not find any grass or burtze-scrub for our yaks.



Great cirques in range south-east of the Shyok bend from ridge west of Phobrang



The Tibetan Plateau east of Phobrang



Rock terrace along the Chang Chenmo near Pamzal



Looking south into the Rimdi valley at its junction with the Chang Chenmo west of Pamzal

I think the main reason why sheep can stand the hardships of such a journey better than yaks is that sheep can nearly always get enough food while grazing during the march. They pick up small plants or some grass here and there, however scanty it be. But the yak generally needs a good rest for its meals, and if it really is grazing during the march, it will never get enough to be able to do without a good grazing-ground at the end of the day. So if a caravan does not meet with any good grass for two or three days the yaks are very much weakened. We could advance only slowly towards the north, often crossing mountain ranges rising up to 17,600 feet. When after a three days' march we found a fairly good camping-ground with abundant grass we stayed there for several days, hoping that with a good rest our yaks would recover.

The country we had traversed was very interesting from a geological point of view. The mountains here, consisting of Cretaceous and Tertiary rocks, were of a greenish-grey and dark red colour. I shall never forget the beautiful sunset I saw on an evening in September 1927. I had made for a white coral limestone cliff some 17,500 feet high. This rocky cliff was much farther from our camp than I had supposed it to be, and I only arrived there as the sun was setting. I then had an extremely good view across a country of marvellous grandeur and beauty in spite of the desolation around me. On the western horizon I saw in deep blue and violet tints the mighty rampart of the ice-clad giants of the Karakoram behind which the sun was setting, dyeing the skies with a deep saffron colour. Around me and below there stretched, like a rolling sea, the many-coloured mountains. Blue shadows were lying in the valleys and nullahs. As soon as the sunset was over the whole country, lying in deepest solitude and silence, was dipped in bluish tints. Then the moon rose, and its silver rays led me back to our lonely camping-ground.

Very often when I was quite alone amongst these high plateaux, surveying, sketching, or wandering about, I had the feeling of being no longer on our globe but on a far distant planet. What impressed me most on my expedition to Central Asia was the absolute silence and solitude of the uninhabited regions, be it on the westernmost Tibetan Plateau or in the great Taklamakan desert of Chinese Turkistan. We eventually got so accustomed to the deep silence that when we had to pitch our tents again near human settlements we could not sleep at first.

Several of the valleys in the mountainous region to the south of the Aksai Chin are really valley plains. I found that these big valleys run in quite a different direction from that shown on the maps. These valleys, filled with immense gravel deposits and sand, must once have contained great rivers. Valleys with a breadth of one mile and more contain only a tiny rivulet wending its way between the gravel and clay deposits. Valleys containing no water at all are also often found. Sometimes the country looks absolutely dried up. The valleys and the broad river-beds are entirely dry, the lakes are shrinking and their water has a bitter salty taste. The desiccation which set in after the Glacial Period has made the country what it now is.

The beautiful salt lake on the Aksai Chin, with its turquoise-blue colour, also everywhere shows signs of desiccation. The shore around this lake consists of salt-encrusted clay deposits, very often cracked into polygonal fields. On the

shores of the lake the ground is very muddy. Skeletons of wild donkeys and wild yaks, embedded in the mud, show that these animals did not succeed in getting out of the swampy ground. The white clay terraces bordering the lake in the south are dissected by innumerable corridor-like fissures and gullies with many tributary gullies joining them. At the end of one of these I discovered a real cemetery of antelopes and wild yaks. The whole ground was covered with the bones and horns of these animals which had been driven into this trap by wolves, who knew quite well that their prey could not escape, because the walls of the gullies were too steep to allow them to escape. Although the lake water was very bitter and salt we once saw many wild geese on its surface. On several spots just on the shore-line I discovered hundreds of small flies sitting on the moist muddy sand.

As our yaks had not recovered in spite of a long rest on the old grazing-grounds here as well as on the Aksai Chin, where we also had good grass, we now made for the Kara-Kash valley, where we soon hoped to meet Qirghiz people.

The weather in these regions was rather rough and cold. We had snowstorms in August, and the temperature during the night in September fell to 9° F. There is no question that the monsoon enters these distant regions. If we could carefully collect all data about the influence of the south-west monsoon we should be astonished to see how far the regions of Central Asia are effected by it. The same applies to the south-east monsoon blowing from the Chinese Sea into Eastern Tibet as far as longitude 90° E. But these regions of Central Asia, at least the Western Kunlun and the Westernmost Tibetan Plateau, also get rain during the winter months from depressions wandering from the west probably across Afghanistan and the Upper Oxus Valley into the heart of Asia.

Sometimes we saw beautiful cloud effects on the high plateaux. I remember one afternoon on the Aksai Chin when the rim of every small cumulus cloud was shining in beautiful rainbow colours.

On the southern shore of the Aksai Chin lake we left our big luggage behind us in a depot. Our next goal was the Khitai Dawan, whence we could reach the Upper Kara-Kash. Leaving Sir Aurel Stein's route of 1908 to the north, we crossed the brown mountains separating the Aksai Chin lake from the salt marshes in the west, which had been seen by Johnson in 1865.

Dr. de Terra's explorations in these regions prove that the big broad plain-like valley running along the main range of the Kunlun follows faults which separate geologically the old Kunlun system from the younger folded regions of the Tibetan Plateau. At several places white quartz veins crop out from the detritus of the valley bottom. Dr. de Terra could also follow this line of disjunction farther to the west. The Kunlun is one of the oldest mountain regions in Central Asia, whereas the ranges of the north-western Tibetan Plateau—on the Lingzitang and Aksai Chin—as well as the Karakoram, are as young as of Cretaceous and perhaps even Tertiary age.

The valley leading down from the Khitai Dawan shows traces of former glaciation. It is joined from the south by a broad valley plain which forms a kind of big hanging valley above the easternmost tributary valley of the Upper Kara-Kash River. In the upper part of this tributary, near Haji Langar, there are enormous moraine deposits consisting of granitic boulders. The crossing

of the Khitai Dawan (16,505 feet) was not very difficult, although a snowstorm was raging during the night before our start. Farther downstream I had the good luck to discover a small tributary valley giving access to the main Kunlun range. It would be extremely interesting to explore the upper part of this nullah, which might lead to a pass in the Kunlun range.

I also made a careful study of the Kara-Kash valley. Personally I believe that this big valley also was modelled by the action of the Ice Age glaciers, but unfortunately we have no direct means of proving this assumption. In such a dry continental region no striated boulders are preserved, and you can often only judge from the shape of the valley's trough and from the presence of old shoulders, which are frequently very faintly indicated, what was the former extension of the glaciers. Unfortunately, the lower part of the Kara-Kash river between Alinazar Qurghan and its exit from the Kunlun Mountains, for a length of some 40 miles, is absolutely unknown, and it is very likely that big terminal moraine deposits may be piled up there.

In the upper part of the Kara-Kash we saw wild yaks, big black beasts, as well as herds of antelope, but not a single wild donkey. I think that the wild donkeys only live on the high plateaux over 16,000 feet. The Qirghiz people had already left the upper grazing-grounds in the valleys. Only after crossing a side spur running down from the Kunlun range did we meet a small Qirghiz settlement near Kengshewar. The good nomads were rather astonished when we approached their yurts. But as soon as they learned that we were peaceful travellers, the headman led us into his yurt, where he gave us milk, bread, and butter. He afterwards told us that they had been much astonished at seeing our party coming from the east, which was a no-man's land. They remembered quite well that some twenty years ago a sahib, who had had frozen feet, had come from that direction. So they had not forgotten Sir Aurel Stein's party, which passed this spot in 1908.

We stopped some days in the desolate, dirty, custom serail of Suget Qaraul on the Karakoram road. Here we were able to hire a camel caravan, which, led by two of our best and trustworthy Ladakhi coolies, was sent back to the Aksai Chin to fetch the luggage we had to leave behind. Needless to say, the owner of the camels had never heard the names of the Lingzitang, Aksai Chin, or Khitai Dawan. Afterwards our clever assistant caravan-bashi, Zabur Malek, who went with the camel caravan, told me that they had taken another direction after leaving the Upper Kara-Kash valley. They did not cross the Khitai Dawan as we had done, but passed round to the west and south of it. When coming down from the Khitai Dawan I had seen in the distance a bluesheet of water bordered by beach-lines. The camel caravan went along this lake, met with fresh-water springs, and reached the depot safely. So they did not have to cross the mountains lying between the Aksai Chin and the Khitai Dawan. The road they took seems to be a particularly easy one leading from the Upper Kara-Kash valley directly up on to the big plateaux. There are several smaller lakes in this part of the westernmost edge of the Aksai Chin. I think the only European who ever followed this road was Johnson, although it is often difficult to find one's way through his reports. Hayward in 1868, as well as members of the Yarkand Mission, followed the westernmost main branch of the Kara-Kash down to the junction of the eastern tributary valley.

When in October 1927 we went on from Suget Qaraul into Chinese Turkistan, we made for the Sanju pass, which, in spite of its mean height (16,500 feet), is much more difficult than any other pass we had to cross. I even think that the ill-famed Saser pass is not much more difficult. The Sanju pass has been crossed by many Europeans, and the topography of this region is now well known. Some geographical facts however might be summarized here. In the valley leading down from the pass to the foothill region of the Kunlun marks of former glacial action can be seen at several places. The big well-preserved boulder deposits which are situated in the upper part of the valley give an idea of the former extension of the glaciers. Unfortunately our ride down to Sanju Bazar was carried out in such a hurry, pressed upon us by the orderlies of the Chinese authorities, that we had not enough time to study properly the lower part of the valley. As the Sanju river had not too much water in it, we could follow the direct path leading through the big gorge which the river has cut through the mountains. In one day's march we had to cross the river more than twenty-five times. As soon as the summer floods, caused by the melting of the snows in the mountains, are coming nobody can traverse these gorges, and caravans have to cross the range by the Chuchu Dawan.

I spent the winter months of 1927-28 in the great Taklamakan Desert of Chinese Turkistan, engaged in geographical and archaeological studies. I shall not dwell on these subjects here. I paid a visit to the small deserts west of the Yarkand Darya, and I also visited the strange Mazar Tagh near Maralbashi. The hills which interested me most were the small ridges south of the Yarkand Darya. I found that their structure was rather complicated, and that they consisted of limestones, deep red quartzites, as well as younger volcanic rocks which had been intruded into red sandstone changing it into quartzite. The limestones which form steep cliffs in the Chokh Tagh are probably of Palaeozoic Age. Formerly it was generally believed that an unbroken range crossed the Western Taklamakan from these desert ranges directly to the Mazar Tagh on the Khotan Darya. But Sir Aurel Stein has proved that there is no connecting link between these desert hills, although he believes that formerly there probably was such a range, which has been destroyed by wind-erosion. But the geological structure of the Khotan Mazar Tagh, which consists of younger Tertiary rocks, points to a more independent range, the more so as the strike of the rocks deeper in the desert turns more east-west.

I studied some very remarkable landscapes in the southern part of the Taklamakan between the Yarkand and Keriya Darya. It is the land of withering rivers. Among high belts of sand-dunes you often meet with old river-beds bordered by rows of dead trees and tamarisks. Formerly the rivers coming down from the Kunlun Mountains penetrated farther into the desert. The Keriya Darya once joined the Tarim, and the Niya further east, which once watered the old settlement of Niya, now ends some 70 miles to the south of the ruins. The same applies to other rivers. These rivers often also submerged the southern border of the sea of sand during extraordinary floods. This is proved by extensive clay deposits which can often be traced deep into the heart of the desert. A section near the famous Rawak Stupa showed me that such an inundation had taken place here after the third-fifth centuries A.D., because



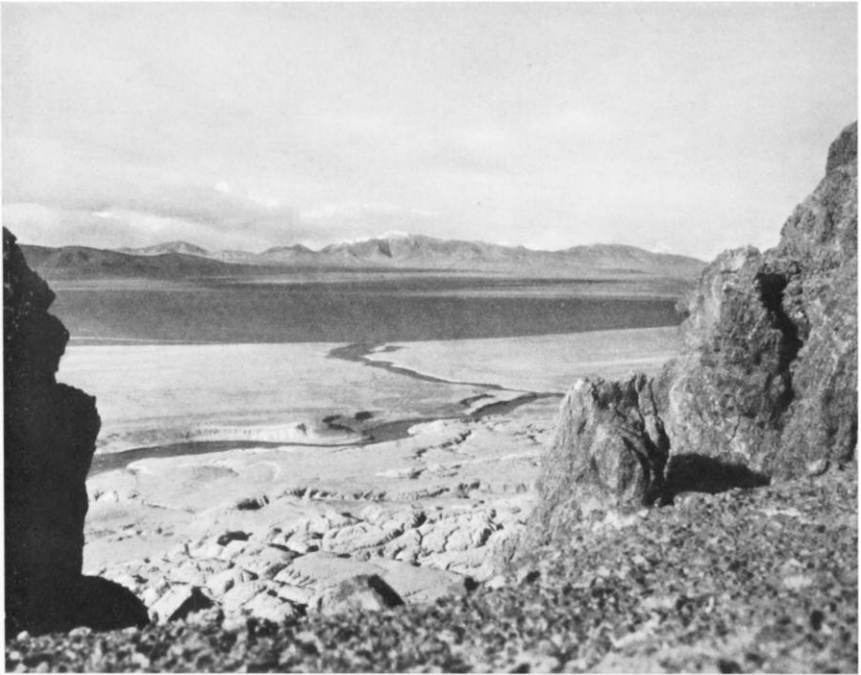
Glaciated range south-east of Tomar



Looking south from the Sirigh Jilganang lake over the old lake bed



Large salt lake on the Aksai Chin from southern shore: Kunlun in distance



The Sirigh Jilganang lake from the south: clay deposits in foreground



Old clay deposits of the Sirigh Jilganang lake

the corresponding culture deposits of pottery debris, Chinese coins, bones, and beads are buried below clay layers. These layers were deposited during an inundation by the Yurungqash Darya. The old dry bed of this river can still be seen some 4 miles to the east of the ruin. After that high flood the river changed its bed, shifting it some 12 to 14 miles to the west.

When returning from Chinese Turkistan in July 1927 I crossed the Kunlun with Dr. de Terra by the Kilian Dawan, which is to the west of the Sanju pass, while Bosshard returned to Europe via Russia with the heavy luggage and our collections. The valley of the Kilian river everywhere, especially in its upper part, shows marks of former glacial action. The valley has a beautiful trough form, in places resembling our famous Alpine valleys. The river often runs in a deep gorge cut in black slates and metamorphic rocks. The valleys also to the south of the Kunlun, which we entered after crossing the Kilian Dawan, were bordered by well-preserved rock terraces, which must have been modelled by former glacial action.

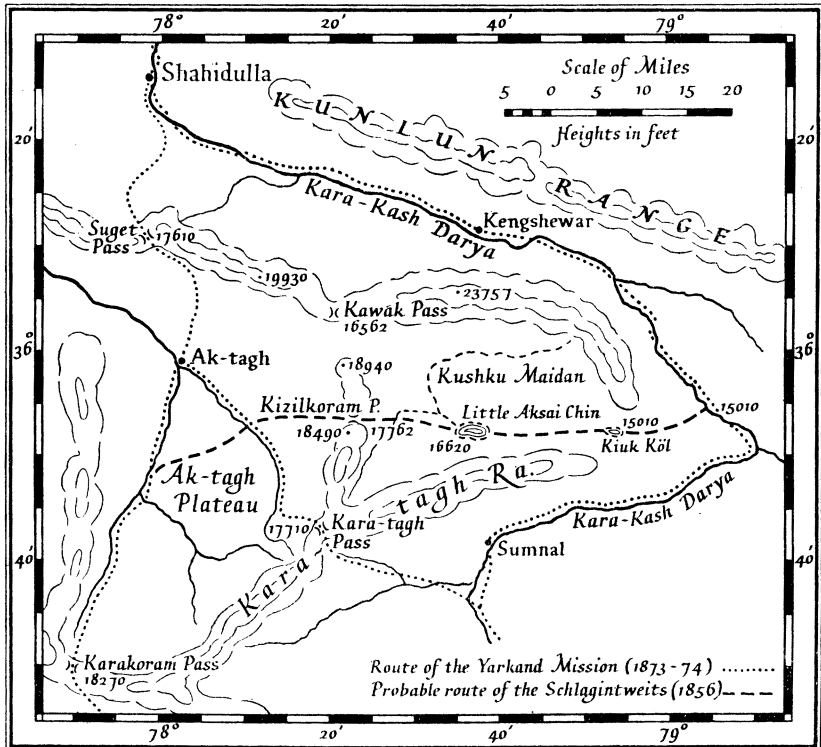
On July 22 we reached Suget Qaraul again, and from here we started for the Karakoram road. Although we generally followed the Karakoram road we were able to explore some hitherto largely unexplored regions north-west of the Karakoram range. I visited the plateau of Ak-tagh, and reconnoitred the region to the west of the Kara-tagh pass. Only Hayward and members of the Yarkand Mission have crossed this pass, which is situated in a range bordering the Upper Kara-Kash valley in the west, and which stretches east-north-east to west-south-west. The strike of the rocks in these regions is quite extraordinary because it is contrary to the strike of the main ranges. Our geological studies showed us that a younger folding has taken place in the sedimentary filling of Cretaceous and Tertiary rocks, and that the pressure was contrary to that which folded the Kunlun and the Karakoram ranges. I searched in vain for the lake which was seen by members of the Yarkand Mission when they went from the Kara-tagh pass to Ak-tagh. Probably the lake has dried up in the meantime. I believe that my countrymen, the Schlagintweits, were the first Europeans to cross the big plateau which is bordered in the north by the so-called Ak-tagh range, in the east by the Kara-tagh range, and in the south by the Karakoram. What they called the Little Aksai Chin is probably the Kushku Maidan of the maps of the Survey of India. It is still a puzzle to me what these explorers meant by the Kizilkoram pass, which is said to lie in a dark red range. I suppose this pass is to be found in a range which separates the Kushku Maidan from the plateau of Ak-tagh. The Schlagintweits mention that the Kizilkoram range branches from the Kara-tagh, the last name meaning the "Black Range." When I approached the Kara-tagh in September 1928 I had to climb a range consisting of red brecciated rocks, and this range perhaps finds its continuation in the north. The two lakes which the Schlagintweits mention, the Little Aksai Chin lake and the Kiuk Köll (the Blue Lake: Turki, Kök Köl), must be situated on the Kushku Maidan.

I have tried on the sketch-map overleaf to give an idea of the topography of those regions according to the descriptions which we find in the reports of the Schlagintweits. It is a pity that they have not published any detailed maps of their journeys. All we can do is to interpret their reports and to try to enter their observations on our maps. Their original diaries are stored in the

library at Munich, and I hope to examine them some day to see whether they contain any unpublished material.

I have not very much to say about the Karakoram road. In general I can confirm Prof. Dainelli's view about the former extensive glaciation of those regions. Big glacier streams once ran through the broad valleys of the Upper Indus district. We were held up in the Shyok valley for one day owing to the news that the ice-dam of the Chong Kumdun glacier, which had dammed up the Upper Shyok, was broken. But it was only a false alarm, and we could cross the river the next day safely by the ferry boat working there.

The rocks in this region are often deeply disintegrated. Boulders can be seen



Sketch-map showing probable route of the Schlagintweits, with names inserted from their reports

of which only the outer crust is left. Often the cavity was large enough to give shelter to our dog, who was always looking out for a shady place. Coming from the barren and high Karakoram regions we were much impressed by the beautiful Nubra Valley with its small picturesque villages. There are numerous small monasteries in the Nubra-Shyok Valley, and many of them are more or less unknown. I am sure that on old "mani" walls slabs of slate could be picked up bearing inscriptions which could tell us something about the ancient history of Baltistan and Ladakh.

After having spent more than eight months among the Turki population of



Peak 21,750, Kunlun, from ridge above Haji Langar



Kunlun from valley leading south from Peak 21,960 to salt marsh of the Aksai Chin



The upper Kara-Kash valley west of Abdul Ghafur Langar, and snow peaks of the Kunlun



Peak, probably 20,530 of Indian Survey Sheet 5I (Yarkand), in Kunlun north of Gulbazar Mazar



Looking up the Kara-Kash at great bend above Abdul Ghafur Langar

Chinese Turkistan we were rather glad to be back again in Ladakh. I personally like the Ladakhis more than the Turkis; they are always cheerful and always willing to work, they never or rarely complain, and they can stand the greatest hardships. The Turkis, on the other hand, are not so willing to work. Their struggle for life is not so hard, and they need not work so much in order to get their living.

On August 17 we were again in Leh, where we found the necessary rest after the long journey. Here I should like to mention an ancient monastery in Ladakh, which is situated at Basgo. In this monastery there are beautiful wall-paintings, and every traveller will be impressed by the huge statues of the Champa or Buddha Maitreya. Another spot worth seeing in the Upper Indus valley is Saspul, where there are beautiful old frescoes in small caves cut into the rocky cliffs. Several of these paintings are beautifully done, and the art-loving traveller should not miss a visit to these caves which are quite near to the bungalow.

On the last stage of our journey we were able to gather more observations about the morphology and geology of the country traversed. When one day the comprehensive scientific results of my expedition have been worked out and are properly published, I hope to be able to return to Central Asia to start special systematic investigations. There is an immense territory still to be explored, not so much from a topographical as from a geological and geographical point of view.

I should like, in closing, to express my deepest gratitude to the Government of India and to all the British officials who gave me so much help during my expedition.

DISCUSSION

Before the paper the PRESIDENT (Colonel Sir CHARLES CLOSE) said: To-night we are to listen to a lecture by Dr. Emil Trinkler, who is a Fellow of the Society and has often studied in our House. He is known to us for his journeys in Afghanistan and, more lately, for his researches and explorations in the Karakoram and Western Kunlun. He was accompanied on his journeys by Mr. Bosshard and Dr. De Terra, neither of whom, I regret to say, is with us this evening. Dr. Trinkler, you may remember, contributed a valuable paper on the Glaciation of the Tibetan Plateau in the recent March number of the *Geographical Journal*.

Dr. Trinkler then read the paper printed above, and a discussion followed.

The PRESIDENT: We are honoured to-night by the presence of H.E. the German Ambassador, who has kindly consented to say a few words.

H.E. THE GERMAN AMBASSADOR (Dr. FRIEDRICH STHAMER): I wish to thank you for the cordial reception which you gave my countryman, Dr. Trinkler, and for the great approval you showed of his lecture as well as for the interest with which you followed it. I venture to say that we were all very interested in what we have heard to-night and that we were highly impressed by the picture which Dr. Trinkler drew of those unknown regions, regions which emulate in grandeur and picturesqueness the Alps, which you probably all know, and regions which would be worth a visit if they were not so distant and if they afforded the comfort to which modern people are accustomed.

I wish also to express my thanks to the Royal Geographical Society for having invited Dr. Trinkler to come to London to lecture on his experiences. It is the privilege of the Society to hear lectures by explorers, scientists, and members of

geographical societies all over the world, because the character of this Society and its work is international and embraces the whole world. It is interested in the experiences of and explorations by any expert from any nation. I am especially glad to put on record that Dr. Trinkler is not the first German scientist to lecture on his experiences, but is one in the list of many German explorers who have visited London at the invitation of the Royal Geographical Society. I may mention Dr. Filchner and Mr. Rickmers, who, in turn, explored the same or contiguous regions as Dr. Trinkler, and who gave us an insight into the life and customs of the people of Central Asia.

I am glad that my countrymen have been the guests of the Royal Geographical Society, and I know that is a sign of the extremely good relations which exist between your Society and my country. I may refer also to the visit which was paid three years ago to the Geographical Society of Berlin on the occasion of its centenary, and I hope that members of this Society and of my country will take part in the centenary of the Royal Geographical Society which is to take place in London this year. I thank you very much for your attention.

Sir FRANCIS YOUNGHUSBAND: I think we should, in the first place, remember that the first Europeans to explore the region that has been described this evening were the two brothers Schlagintweits, countrymen of the lecturer. They were very remarkable men, and had in other parts of the Himalaya made some original surveys, and brought back some beautiful pictures which are now to be obtained in colour prints published during the 1850's. Probably the reason why the records of that part of their explorations which has been described this evening have apparently not been preserved is because one of them was murdered in Central Asia. He was the first European to cross the Karakoram Mountains into the plains of Turkistan, but he lost his life in Kashgar. As I say, they were two very remarkable men, and on an occasion such as this we ought to remember the services they rendered to geographical science.

I have not myself been to the eastern part of the region the lecturer described. I crossed the Karakoram Pass in the years 1889 and 1890, and I could see from it the kind of country which Dr. Trinkler traversed in the journey he has described this evening. Certainly a more desolate and depressing region you could hardly imagine. It is not only very bare but, being at the height of 16,000 to 18,000 feet, it seems more desolate, because you feel in a very depressed state of mind on account of the altitude. Nevertheless, as Dr. Trinkler has said, you do on special occasions find real beauty there. Such occasions are sunsets, when the light slanting across the mountains and valleys has the most marvellous effects both of colour and of light. It is well that a traveller like Dr. Trinkler has taken the trouble to describe such a scene to us.

Also what is remarkable in that mountainous region and, again, also in the desolate region of the Taklamakan, which Dr. Trinkler afterwards traversed, was the extraordinary stillness, especially at night when you get out under the stars. It is then that you feel the wonderful stillness and silence impressed upon you and producing an effect which it does not produce in anything like the same degree in Europe.

Dr. Trinkler went to that region especially to see what the Ice Age was like; and any one who has been in that part of the mountains can see the way that the ice covering there has moulded the mountains and broadened out the valleys. But what has often puzzled me is why in that region of the Karakoram and away to the east there are rounded mountains and great broad open valleys, and again in the Pamir region, away farther to the west and north, you see the same thing, and yet in the middle, between these two regions, round K₂, you find deep-cut valleys and steep hillsides. It is very difficult to understand why in that gap of about

200 miles there should be mountains and valleys of such a different type. I do not know that the explanation has yet been given.

There is a lot, as you can see from the maps, still to be done; and we hope that Dr. Trinkler will be going to that region again, as he has suggested this evening. One of the things that impressed me was the way in which he overcame his transport difficulties with the aid of sheep. I have had sheep in that region, but rather for supply purposes than for transport. Somehow or other sheep do manage to pick up food in those desolate regions, and after several weeks they are still quite good eating. Dr. Trinkler was, apparently, able to use them as useful transport animals for weeks and weeks together.

I should also like to agree with the lecturer in what he said with regard to the cheeriness of the Ladakhis as compared with the Turakis of Turkistan, the latter being a very amiable type of people, but not very cheerful or very willing to work hard. On the other hand, the Ladakhis, in my experience, have been cheerful and very delightful people to have with one. Any one who wants to know their character and habits of life and their customs cannot do better than read a most interesting and entertaining book by one of themselves, entitled 'The Servant of Sahibs.' That book is written by a caravan boy, Ghulan Rasal, who started with me in 1890 and who was afterwards with many Europeans and Americans and was persuaded by Mr. Barrett, an American with whom he travelled in those regions, to write his experiences. The book is written in a most wonderful pigeon-English, but is most entertaining. I recommend all travellers who are able to get it to read it because they will not only learn something of Ladakhis' ways and customs but also what the Europeans appear like in the eyes of the Ladakhis. That they will find in good strong colours.

The PRESIDENT: Dr. Trinkler tells me that there is still a brother of the two brothers Schlagintweits alive in Germany, and I understand it is his desire to try to find if there are not some records left amongst the family papers from which he could reconstruct some portions of their many journeys which are at present obscure. It would certainly be interesting and important for the study of that part of Central Asia if we could discover their diaries.

The lecturer is one of a number of distinguished explorers who have been to that part of Asia, and I feel that bit by bit we are getting to know something about it. We have had several lectures upon the subject, and Dr. Trinkler's is not the least important. We have had, for instance, a lecture recently by H.R.H. the Duke of Spoleto and an afternoon lecture by Colonel Schomberg on country a little farther north. I feel that one day we shall get a complete synthesis of that country based, I hope, on Dr. Trinkler's work, and on the labours of those other explorers whose names I have mentioned, and their predecessors.

It must not be supposed that it is possible to go into that country and start exploring without any previous study. You need to know, first of all, how to make a map; you need to be a bit of a geologist and to know some of the languages. To give you some idea of the sort of study necessary, I gathered from Dr. Trinkler that he began studying Tibetan when he was thirteen years of age. I think I am safe in saying that there are very few present who studied Tibetan at as early an age as that. Then you have to get accustomed to all sorts of strange food, and Dr. Trinkler tells me that the meat of wild donkeys is admirable: quite equal to English beef. I have not been able to make the comparison, but it must be admitted that explorers are sometimes very hungry.

We thank the lecturer sincerely for his lecture, and are glad that the Government of India was able to afford him facilities. The results have fully justified their action, and we shall look forward to Dr. Trinkler's detailed publications on the journeys that he has made.