

TRAVEL • & EXPLORATION

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[No. 10

Across the "Sea of Sand":

A Journey through the Taklamakan Desert. I.

BY DR. M. AUREL STEIN.

By the beginning of January, 1908, I had returned from nearly a year's work in the gravel wastes and high mountain ranges of Kan-su to the north-eastern corner of Chinese Turkestan. There, close to the northern edge of the great "Sea of Sand," which extends over the largest portion of the Tarim Basin, I felt restored as it were to my own ground. The recollections of two trying but happy winter campaigns (1900-01 and 1906-07), spent over the exploration of ancient sites in the southern part of the desert, would by themselves have sufficed to draw me back there. Fortunately I was free in my archæological conscience to yield to this old fascination of the Taklamakan; for just then, in response to inquiries set on foot by me since leaving the Khotan and Keriya region at the close of 1906, I received information from that side about several ruined sites in the desert which had remained unexplored. I was anxious to visit them before the heat and sandstorms of the spring would make work on that ground impracticable, and for this reason felt glad when the early completion of some tasks in the previously unexplored desert belt between the Tarim and the foot of the Tien-shan left me free for a timely move southwards.

Visits to interesting ruins of Buddhist shrines detained me for a week at the ancient oasis of Kuchar, on the great northern caravan route, and this short halt enabled me to settle my plans for the crossing of the desert from north to south. The heavy convoy of antiquities, amounting to some twenty-four camel loads, the antiquarian spoil of

my explorations during the preceding year, could safely be despatched by the well-known though little frequented route, which leads in the winter along the dry bed of the Khotan River right through the desert to the Khotan oasis, the prospective base for my labours of the spring and summer. Once freed from the care for these precious but embarrassing *impedimenta* I myself should strike due south from Kuchar, to where the Keriya River dies away in the sands. It was a march beset with serious difficulties and risks. But Hedin's pioneer journey of 1896 showed that it was practicable under certain conditions, and, seeing that there were ruins to be visited near the Keriya River course, I decided to try this "short cut" and save time. Yet I must confess that the chance of crossing once more the very heart of the desert might by itself perhaps have proved for me an attraction too great to resist.

A sky heavy with snow clouds had made my dark and confined quarters in Kuchar City look doubly gloomy. So I was heartily glad when by the morning of January 25th the great division of my caravan was completed. After blocking traffic in the narrow street for hours, the heavy goods train of antiques, on twenty-four camels, was started on the long journey to Khotan in charge of my excellent Chinese secretary and the most reliable of my Turki Muhammadans. My own caravan, including my energetic and devoted surveyor, Rai Lal Singh, Naik Ram Singh, my "handy man," and three Indian followers who were supposed to look after their and my own bodily comforts, looked quite handy and light by comparison. The seven fine camels which I had bought one and a half years before at Keriya, and which had since borne up bravely with all the fatigues of our desert wanderings far away into China, would have amply sufficed for our much reduced baggage. But I knew what heavy loads of supplies, fodder and water, would have to be added before the desert march was begun, and wondered whether by taking in addition only eight hired animals with me, I was not cutting the margin too nicely.

A two-days' ride over ground which, in spite of very scanty cultivation and extensive areas of scrub-covered steppe, bore quite a homely Europe look, thanks to a light fall of snow so rare in these dry Central-Asian regions, brought us to Shahyar. The Chinese Amban in charge of this small oasis, recently formed into a separate little district, had provided for me a very hospitable welcome. Beggars and other local dignitaries rode out to meet me, and everything for our onward journey was reported in readiness. But after I had settled down for the night under the modest shelter of a trader's house at a safe distance from the noisy Bazar, it did not take me long to make sure that the report about available guides was quite wrong, and that none of the Shahyar hunters produced had ever seen the route I was anxious to follow through the desert.

What these alleged "guides" knew was the track already referred to, leading along the Tarim and then up the Khotan river-bed. That I should have to abandon all hope of getting local experience for the journey became certain, when next morning the fountain-head of all Shahyar topographical knowledge was produced in the person of an age-bowed hunter named Khalil. He was a quaint, withered, little man, well over eighty, credited with many expeditions after wild camels and a great deal of jungle experience. But he had never been across the real desert, and stoutly denied even hearing of a route to the Keriya River. Khalil, still glib of tongue and quick-witted for a person of his age, hobbled along with difficulty, but once lifted into the saddle could do his day's march with ease. So he agreed to guide us, at least to the point in the forest belt of the Tarim, where Hedin had first touched a shepherd encampment, and which would now serve us as the safest starting point in the inverse direction.

Had I known in Kuchar that guides were not to be secured from this side, I might perhaps have hesitated about the attempt to strike right through the desert to the Keriya River; for without such guides I could not for a moment disguise to myself the serious difficulty of the task and its inherent risks. Hedin, coming from the south, had left the end of the Keriya River with the certainty of striking the broad goal of the Tarim right across his route at some point or other, if only he kept long enough to an approximately northern course. For us, coming from the north, the case was essentially different. Our hope of reaching water within reasonable time depended solely on our steering correctly across some 150 miles of high dunes towards a particular point, the termination of the Keriya River, flowing not right across a route but practically in the same direction—and on the assumption that the river still actually sent its water to where Hedin had seen it. Now, I knew well by experience the difficulty of steering a correct course by the compass alone in a real sea of sand devoid of all directing features. Nor could I overlook the fact that however justified my reliance in Hedin's mapping was, differences in longitude deduced from mere route traverses were bound to be considerable on such deceptive ground, and in our case all depended on the assumed longitude being right. If we failed to strike the actual river end our position in the confusing delta of dried up beds, which the river has formed since early periods in its death struggle with the sands, was bound to be dangerous. There would be nothing to indicate whether the actual water-carrying bed lay to the east or west. If we continued our course to the south, there would be great risk of our water supply getting completely exhausted, and of our animals—if not of ourselves, too—succumbing through thirst long before the line of wells and oases at the foot of the Kun-lun could be reached.

Against these doubts and objections there was to be reckoned the loss of time and other drawbacks which any change of plan would imply. After careful consideration I decided to stick to my programme, and to guard, within limits of human prevision, against the risks before us. An adequate supply of food and water was essential to assure safety. So I took special care to verify that all my people had provided themselves with supplies for one and a half months as ordered, and that the small contingent of labourers I was to take along from Shahyar to help in well-digging and eventual excavations was equally provisioned, and also equipped against the rigours of the desert winter. The selection of the men proved no easy affair; for the rumours about our expedition had been sufficiently deterrent to make it hard for the several village headmen who had to furnish their quota, to find acceptable labourers. At first they tried to pass off helpless persons physically unfit for such a journey, or else without adequate warm clothing and food supplies. The men picked out at last were sturdy enough in body; but in spite of ample advances and the assurance of liberal wages, they were so dismayed at the prospect that when their district officer came to pay me his ceremonial visit they all fell to praying on their knees for release from apprehended sufferings and disaster. Luckily the energetic young Mandarin was a man of the right stuff. He reassured them with my determination to look after their comfort and safety, and promised to exempt their families from all *corvées* for the year.

In spite of all my efforts and those of my energetic factotum, Ibrahim Beg, the faithful companion and "sub-manager" of all my desert expeditions, the multifarious preparations were not completed until late at night. But the morning after that busy day's halt saw the fully-equipped caravan duly started. The fifteen camels we took along were by no means too many, considering that six weeks' food supplies had to be carried for a party counting altogether twenty men, and that at least eight animals were needed for the carriage of the ice which was to assure a reserve of drinking water. Once in the desert everybody had to walk, though I had this time rather rashly agreed to take four ponies along in order to assure greater mobility for my Indian assistants and myself after we should have struck the river. On the evening of January 28th we reached, under old Khalil's guidance, the last shepherd huts, known as Samsak-daryasi, in the broad belt of luxuriant jungle which lines the river's right bank. Wild enough as the place looked, hidden away in the midst of thickets, it offered a welcome supply of dried green reeds (*kumush*) for the camels and ponies, the last real treat of any sort they could enjoy for a long time. The purchase of four sheep, by no means as fat as one might have expected in such fine jungle grazing, completed our commissariat arrangements.

Next morning we began the journey southwards, but the time had not yet come when we should have to steer by the compass only. A broad belt of jungle, watered at times by floods from the Tarim, still separated us from the desert, and here we had to take the supply of ice which was an essential safeguard for the crossing before us. After covering about ten miles through forest and strips of tamarisk-covered sand, Tokhta, Khalil's thick-headed son, who was acting here as our guide, turned off to the south-west, and by nightfall brought us to the promised pools in a network of deep-cut, dry river beds. The spot was called Lukchikte by the shepherds, who, as broad sheep-tracks showed, resort to it regularly while grazing flocks in these arid jungles. The pools, fully twenty-five feet or so below the level of the surrounding ground, looked very uninviting, with shores of hard-trodden black mud and a tangled mass of decayed Kumush. But the water, in a rough well constructed by their side, proved quite fresh, and the supply of ice was abundant.

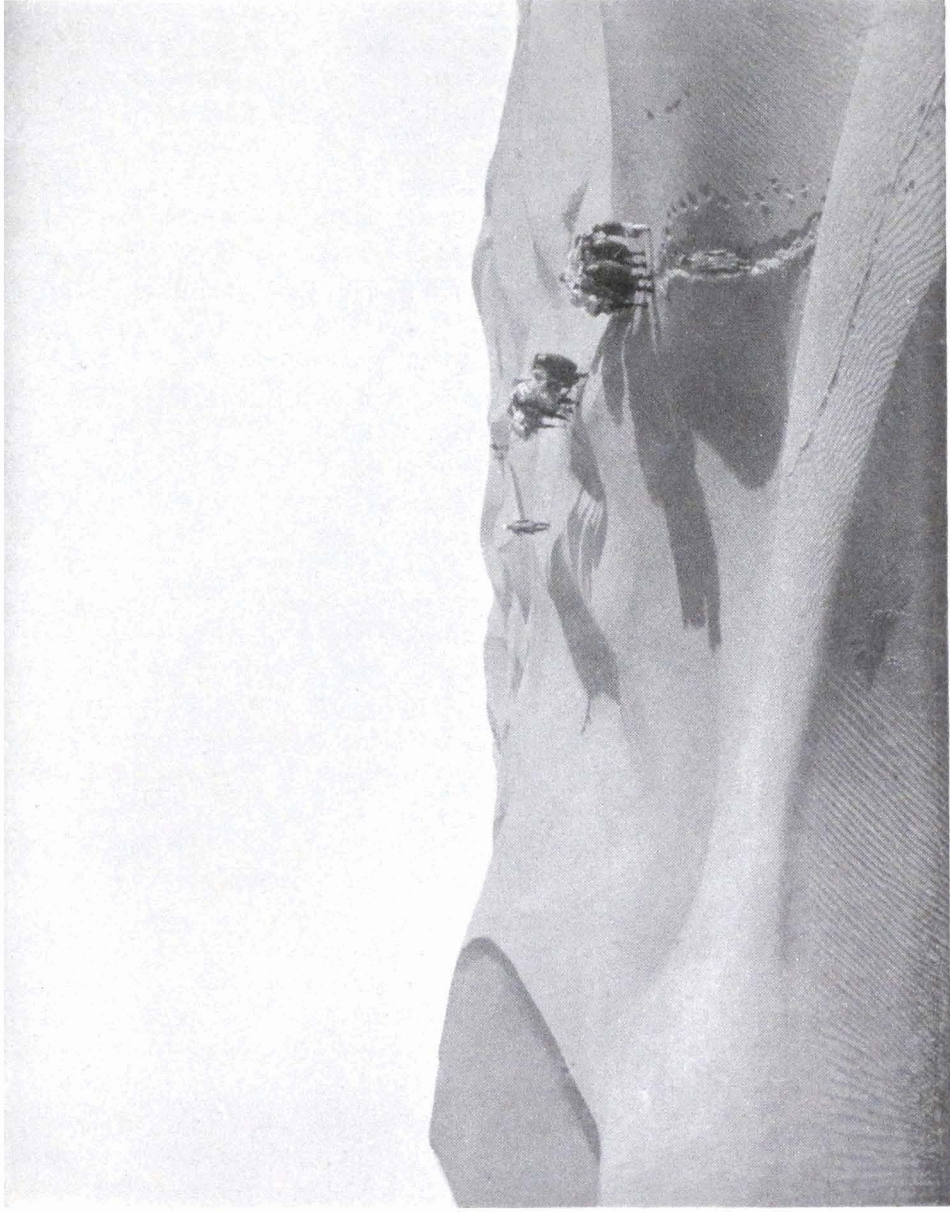
The cutting of ice went on all through the night and the early morning, and it was not till 10 a.m. that we could set out with eight huge bags duly filled and loaded on as many camels. All the camels received here their last watering, six to eight bucketsful making up the regulation "drink" for each before a long journey through waterless ground in the winter. Tokhta's rôle as guide had come to an end; for we now shaped our course by the compass due south until we should strike the Keriya River delta. After about six miles we emerged from the last strip of forest upon an old river-bed, narrow and winding, known as Achchik Darya. It held no ice where we passed it, only luxuriant beds of Kumush. From old Khalil, who caught us up in the morning and who insisted upon accompanying us so far, I learned that until ten years ago or so the bed had been filled by flood water from the Tarim. Now it no longer reached here, and the flourishing lines of wild poplars or toghraks were likely to turn before many years into dead forest or "kötek." A short halt enabled withered little Khalil to give us his last farewell and blessing. He gave it with more ceremony than I should have expected for the occasion, turning towards Mecca in a long prayer, and the men all joining loudly in the "Amān." From Khotan to Lop-nor I had made more than one start into desert quite as forbidding without ever witnessing such display of emotion. But then even reputed hunters along the Tarim are rather tame people, unaccustomed to wilds, and the Shahyar men showed plainly how afraid they were of the venture.

Once across the dry river-bed the dunes were not slow to appear; but scattered Toghraaks and plentiful scrub grew between them. I was surprised to note the numerous fresh tracks of wild camels. Evidently

they were not much afraid of the prowess of the Shahyar hunters. Where the zone of occasional kumush growth seemed to end we decided to halt for the night, so as to give the camels their last chance of some grazing. There was not a man in the party with professional desert experience. So it fell upon me to look out for a likely spot where water might be reached by digging. Below a tamarisk cone the soil felt damp, and a well sunk here through unfrozen clay reached sub-soil water at only five feet depth. It tasted salt enough, as was to be expected close to the riverine belt, but was just drinkable for the ponies.

I had warned our camel-men about the risk of the animals straying, where wild camels and more tempting grazing were so near, but in vain. The baggage was ready for loading before 8 a.m., but the hired camels had absconded about dawn and their owner was too late in pursuing them. I had to send out my own camel-man, Hassan Akhun, a wily but experienced fellow, to help in the tracking, and even with his help the fugitives were not brought back till three hours later. The day's march was short, but proved tiring. The dunes rose rapidly to twenty or twenty-five feet, and we had not yet got accustomed to long tramps in soft sand. After we had surmounted a great ridge of sand stretching east-west the height of individual dunes sank, and on bare patches of ground between them the hardy *sagsag* plant showed itself frequently. Then came a fresh belt of closely-packed dunes, now forty to fifty feet in height, which would have been still harder to cross had not their crest-line been also the direction of our advance. The concave side of the dunes lay generally facing the west, a proof of the prevailing east winds. The camels under their heavy loads could not cover more than one and a half miles per hour. So after a short march of only a little over ten miles we were obliged to pitch camp in the midst of towering dunes. Luckily here, too, depressions showing damp soil were frequent, and the well we dug in one of them yielded water at five and a half feet depth, somewhat less brackish than at the previous camp, but too scanty to save much of our ice.

Next day (February 2nd) we had a desolate march under a grey sky heavy with clouds, amidst high bare dunes rolling on all sides like the waves of a choppy sea. The first five miles lay over a regular "Dawan" of closely-packed ridges rising to fifty to eighty feet above the rare depressions. It was well I could encourage the men by pointing to signs of moisture in the latter. With some relief, too, we sighted towards the evening two big Dawans to south-west and south-east, perhaps marking the last offshoots of the high ridges of sand which flank the course of the Keriya River. The dunes grew perfectly bare after about ten miles, and the apprehension about fuel obliged us to stop at the first sand-cone with dead tamarisk we encountered. In a crater-



Camels on the March across Dunes of a Dawan.

like depression a well was dug, which at a depth of only five feet gave us water sufficient for the men and ponies, with only a slight taste of saltiness.

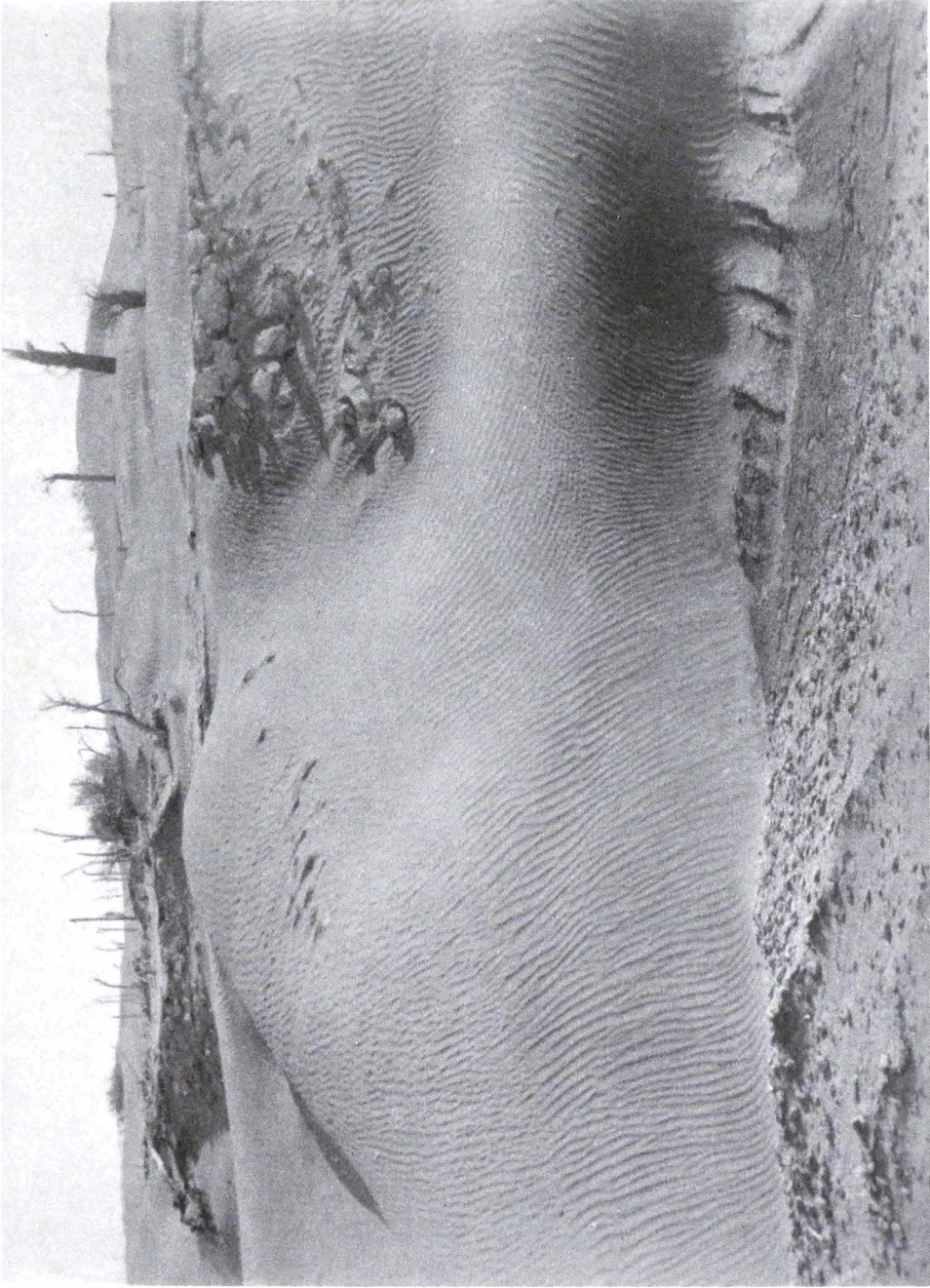
Next morning, after three miles' weary tramp along the crests of huge dunes, we emerged upon a broad belt of living wild poplars and tamarisks. It was a strange sight this strip of vegetation stretching away for at least six miles from north-north-east to south-south-west. It took us nearly a mile to cross it. The trees were all growing on small cones, as I had seen them so often in the desert beyond the Niya and Endere rivers. The direction of this jungle belt was clearly the same as that of the lowest Keriya River. After we had crossed it living trees in a thin line still kept in view both on our right and left, though at a distance. They helped to keep up the spirits of our hapless Shahyar men, who no longer believed that they were being led to their doom, but fondly fancied the Keriya River to be quite near. It cost me some effort to undeceive them. After we had crossed a small area of Toghraks, all dead here, the dunes rose once more to thirty or forty feet. But tamarisks grew plentifully between them. So when we halted in the evening by the side of a big tamarisk-covered cone we had fuel in plenty. The well I had dug led through hard-frozen damp sand to water at a depth of only three and a half feet, and the water was now perfectly sweet. So there was contentment throughout the camp. There was nothing to eat for the camels, except bits from some huge cakes of bread I got baked for them. This emergency treat was repeated wherever subsequently we got water enough for the purpose. It was amusing to watch how fond my burly big camels grew of their bread. By giving them the pieces with my own hand I made a rapid advance in their friendship. Willingly they would let me now stroke their heads, instead of meeting my friendly attentions, as so often before, with surly grunts and unmannerly spitting.

Our march on February 4th seemed easy; for the dunes sank soon to modest height, only eight to ten feet, and only two dawans were encountered on the fourteen miles' march to the south. Even over them there was good going. Up to the middle of the march moist depressions showed here and there amidst the dunes, and here wells could have been dug with ease. Dead Kumush, showing on bare patches of ground close to living tamarisks, seemed also a hopeful sign. But as we marched on, the number of dead trees and bushes increased, while living Toghraks were now rarely within view. The ground, when clear of dunes, had changed to a hard clay, and I was not surprised, when, at the place where the dusk had obliged us to halt, our attempt to reach water by digging proved fruitless. The well was sunk at the most likely spot, in a hollow below a big old Toghrak still living; but the

sand, after digging down to fully fifteen feet, still felt so dry that the work had to be abandoned. Evidently the sub-soil water from which the roots of this veteran drew their nourishment, was still far below this level. So the Shahyar men grew once more despondent.

Next morning by daybreak I marched off ahead of the caravan with a few men in order to dig a well *en route* as soon as favourable ground should offer. But the eagerly desired chance failed completely. The dunes kept high and closely packed all day long (see illustration). Even dead poplars were met rarely ; but in the few groups we passed they stood in a clear line from north to south, just as they would grow along a watercourse having that bearing. But vainly I looked out for any sign of our nearing the actual river delta. From a Dawan some fifty feet high I made out a line of scattered Toghraks still alive, far away to the south. When we reached them, after a total tramp of fourteen miles, the sand around proved so high that well-digging was hopeless. It was sad to watch the depressed look in the men's faces as they came up two hours later to find that my advance guard's halt did not mean water. Only sturdy and experienced Lal Singh kept up reliance in our route and refrained from any sign of anxiety. Of course, when we were moving ahead and far from the others, we did not hide to each other that things were beginning to look serious for our poor ponies. A mile and a half more were covered that evening, and then we had to halt for the night amidst dismal dunes rising to thirty feet and more. The last night's temperature had dropped to 4° Fahrenheit, so we were glad at least to have plentiful fuel in the débris of ancient poplars fallen since who could say how many centuries. Our water supply had now been reduced to three bags and two galvanised iron tanks full of ice.

It was a poor night's rest for me ; for the anxiety to wake the men in good time for an early start kept me from sleep from about 2 a.m. The packing and loading was done in darkness. After going for a couple of miles over heavy dunes we were just approaching a broad Dawan some sixty feet high when the frequency of living tamarisks attracted my attention. One bush was growing almost on the surface of a bare patch of clayey soil, without the usual cone, and close to it there was a hollow to a depth of ten feet below the ground level. More with a wish to divert the gloomy thoughts of the Shahyar men than from real hope I set them to work here. After clearing away some two feet of drift sand, blue clay was struck, which felt heavy, with the faintest suggestion of damp. The sand below this layer, of about one foot, felt cool and another stratum of clay beneath it distinctly clammy. So nine "Ketmans" worked away for all their wielders were worth. With the last two days' scanty water rations we all felt thirsty. From a depth of five feet downwards the sand grew distinctly damp. How eagerly



201J *Journal of the Royal Society of New Zealand* 31(1): 1-10 (2001) **Ancient River Bed with Dead Trees and Live Tamarisks.**

the clods thrown out from the bottom were weighed by us, who watched the work ! At last the strokes of Muhammad, the best of the Shahyar men, who was digging away at the bottom, gave a clicking sound suggestive of increased moisture, and at ten feet depth the damp sand changed into mud. Two feet more and water began slowly to gather under the man's feet. It was deliciously fresh, but gathered quite slowly. I had let all the camels but one march ahead under Lal Singh's steering ; the ponies were kept back by the well. They seemed to realise for what purpose, and eagerly pricked their ears at every click of the mud-hauling hoes. At last we could let them have their first sorely-needed drink—a kettle full of muddy water for each animal. Then the filling of four skins, or "mussucks," began, intended to replenish our store of water. It was terribly slow work, as the sides of the well below where the sand had been drained of its moisture kept falling in, and necessitated again and again fresh clearing. But how elated we all felt by the sight of this precious water !

The relief from immediate anxiety about water was doubly welcome, since the distant view which opened from the Dawan just before us was more desolate than any previously encountered. A perfect sea of high and absolutely barren sands stretched southwards, bordered only by huge Dawans to the south-east and south-west. Leaving Ibrahim Beg behind with a few men to complete the filling of the mussucks and to bring them into camp later, I hurried ahead to catch up the caravan. In the midst of high dunes I passed a broad hollow where old Kumush, white with age and quite brittle, covered banks of clay in profusion. It was manifestly an ancient terminal lagoon. But how many centuries might have passed since it last saw water ? Three or four days' marching would certainly be needed before we could hope to reach the actual death-bed of the river.

The track which Lal Singh had followed under my instructions to 190° south-west, kept steadily rising over broad rolling dunes, and after about ten miles from camp ascended the shoulder of a mighty ridge of sand, culminating at a height of about three hundred feet. I caught up the camels just as they were rounding the ridge, only a hundred feet or so below its bold topline, and almost at the same time saw to my delight a broad valley-like belt of dead forest and living tamarisk scrub stretching away below to south-south-west. The mere sight of the dark belt of vegetation was enough to put fresh heart into the men. Our hapless "Yolbegi" ("road-master"), as the Shahyar people euphemistically styled him, Khalil's weak-kneed son, who, ever since the previous day's vain search for water, had kept bewailing, "Atam, atam !" ("Father, father !") as if he were a mere boy instead of a man of forty-five, now revived like a half-withered sprig put into water.

When we had descended from the Dawan there was, indeed, plenty for all of us to rejoice at. Amidst low dunes and tamarisk cones we came upon a regular grove of fine old Toghraaks, some living, some dead. Here camp was pitched, and before dusk had settled, Hassan Akhun, my quicksilver camel-man, whom I had told off to search what unmistakably was an old river-bed marked by eroded clay banks, came back with hysterical shouts of elation. At a point some eleven feet below the level of the nearest bank, the surface of the sand was in truth hard frozen, and when this had been hewn through with some trouble, it needed only digging to a depth of scarcely more than four feet to give us water. It tasted delightfully fresh, but once again it gathered very slowly. However, we had a whole night to fill kettles and buckets. Contentment was great that evening throughout the camp. It seemed as if our main troubles were now ended. I had a huge dead tree turned into a bonfire to guide Ibrahim Beg, and warmed myself by its blaze until I could retire to my little tent. The night promised to be cold, under a sky at last perfectly clear of clouds, and in fact I registered next morning a minimum of thirty-seven degrees of frost. My chief treat that cheerful evening was a "wash," such as I had sadly been obliged to forego for several days. From the men's camp-fire came sounds of a rabab they had brought along from Shahyar to console themselves with in the wilderness.

Our journey was resumed in good cheer on the morning of February 7th. If we were right in locating our camping ground we ought to reach the grazing ground of Koshlash, where Hedin found the river ending, in three days. Shaping our course upon this assumption, we steered to south-south-west, and after passing for some five miles through regular thickets of dead trees between high bare ridges, emerged on more open ground, where dunes were quite low and live tamarisks plentiful. Here we picked up again a dry river-bed, quite well defined in some places, but elsewhere completely smothered by drift-sand (see illustration). After a few miles it became continuous, its width varying from sixty to one hundred yards and its depth from twenty to thirty feet. Up to eleven miles we steadily followed this winding dead river course, and then tried to cut off a great bend by going due south. The result was that, after some three miles' progress through dead forest, we found ourselves between two huge ridges of drift-sand, with no trace of the river-bed that was to guide us and not a single living tree anywhere.

We were, by the showing of our plane-table, still a long way north of latitude 39° where the waters of the river lose themselves in the sand, and our chance of getting water by wells depended entirely on following some dry bed receiving subsoil drainage from the terminal river course.



Halt near Dead River Bed.

The safest plan was to regain the previous guide, the old bed, before it was too late. So with beasts and men much fatigued—even alert and hard-marching Lal Singh had dropped behind this day—the high Dawan to our right was climbed. The view from the top in the evening light was distinctly depressing. To east, west, and south alike there extended with bewildering uniformity vast stretches of dead forest, tamarisk cones, and intervening ridges of sterile sand. It was clear we were now in the ancient dried-up delta which had once seen the death struggle of the Keriya River. But which of the many dry beds which lay hidden in this strangely oppressive wilderness of dead jungle was the one leading to the actual river end? My secret apprehension that our real trouble would begin on reaching this dried-up delta was about to be fully verified. It was as if after navigating an open sea we had reached the treacherous marsh coast of a tropical delta without any lighthouses or landmarks to guide us into the right channel. With these doubts weighing heavily on my mind I descended south-westwards, wishing to strike again the bed we had followed during the morning. But growing darkness obliged us to halt before we could locate it.

The following morning opened more hopefully after this night of worrying doubts. When day broke, it was found that the depression where we had camped, formed part of the old river-bed we had tried to regain, and this we decided to follow southward. For about three miles we succeeded, as its course, though buried in places by heavy sand, could be generally made out by lines of dead Toghraks lining the banks. But further on all trace of it vanished in a maze of dunes and dead forest. The landscape was singularly flat and open. But as far as the eye would carry, there extended the same desolate grey screen of dead jungle. Only to the west far away there showed ridges of bare sand; their bright yellow was almost a relief to the eye, wearied by the dismal greyish brown of the dead scrub.

With nothing to guide us in this never-ending delta I was particularly anxious to make sure at least of our latitude. A mid-day observation was the simplest process to ascertain this, and luckily all clouds had now disappeared for some days past. So Lal Singh was left behind with the theodolite near a row of tamarisk-covered hillocks we passed at 11 a.m., while I pushed on to the south. The Shahyar men had become again very downcast, even the increasing frequency of wild camels' droppings failed to rouse confidence. Luckily the going was easy, the dunes being quite low. After nine miles from our last camp I found myself suddenly on the left bank of a wide river-bed, cut to a depth of twenty to thirty feet and only partially filled by dunes. In its deep hollows emerged below banks of hard mud not covered by dunes, and one of these, with a bottom fully twenty-five feet lower than the bank, tempted me to try

digging a well. The camels were far behind, and no time would be lost thus if we failed. To my delighted surprise, after a few feet the men struck what felt like damp sand, and as the digging continued with vigour, in spite of the threatening vicinity of a big dune, water was at last reached at a depth of fourteen feet. But it oozed out very slowly, and the sand of the sides kept falling in for several feet from the bottom. The whole of the well led through fine river sand, and I kept wondering how long this would hold under the pressure of the dune towering above the mouth at only a few feet's distance. Of course the caravan was halted, in spite of the shortness of the day's march; for such a chance was not to be missed lightly. Not till eight in the evening had water gathered sufficiently for the immediate need of every man, and in spite of men being kept at work in batches all through the night, only four half-filled mussucks were ready by daybreak, and the ponies had got only a few glassfuls.

(To be concluded.)



John Thomson, Phot.]

Dr. M. A. Stein.

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Across the "Sea of Sand":

A Journey through the Taklamakan Desert.

(Conclusion.)

BY DR. M. AUREL STEIN,

OUR march on February 9th opened hopefully. The discovery of water seemed to justify confidence in our dry river-bed being the right guide, and the imposing width with which it stretched ahead, two hundred to three hundred yards broad and almost straight for some miles, gave a sense of space and freedom. The tracks of wild camels crossed frequently the flat sands filling the bed. But more curious was the find of a worked flint on a patch of bare clay. It was a clear proof that this desolate region had known human beings, at least in the Stone Age. The river vanished after some four miles under smothering dunes; but passing through dead forest and low tamarisk cones due south we found ourselves suddenly back again on its bank. As we followed it further, living poplars increased in such number by its banks that even the low-spirited Shahyar men began to believe in our nearing the real river end.

Yet this glimmer of confidence did not last long. When after crossing a great bend of the river through dead forest we touched it again on the east bank, the look of the bed was more desolate than ever. We had now closely approached the latitude where according to Hedin's map the actual river with its jungle belt ended. Yet vainly we looked out for the live Kumush and scrub, which our camels were needing so badly. The attempt to dig a well at our camping place proved fruitless. The hired camels were showing signs of exhaustion. Even our own, far

bigger and more adapted for desert work—were they not bred in the Keriya jungle, and probably distant kindred of the wild camels with the tracks of which we were growing now so familiar?—felt the pinch, and used to approach me with pathetic appeals for bread. How glad I should have been to afford them a really good treat of this cherished luxury! But a ten-pound loaf disappeared only too quickly between these seven hungrily gaping mouths, and our supply of flour and water to bake was getting too low for such additional customers.

February 10th was a day full of anxious uncertainty. After little more than a mile on our march southward the river-bed, so imposing before, became completely buried under big dunes. As we moved on, all trace of living vegetation vanished. A depression formed by a network of narrow dry water channels, to which we came after some five miles, was so closely hemmed in by big sand cones with dry tamarisk, that it looked like a very trap of this treacherous dead delta. The thought struck me in this lugubrious, sombre maze how much better it would be to face the open sea of barren dunes, if our supplies and the animals' strength should give out before water was reached.

In a gloomy hollow between two high tamarisk cones the men thought they could discover traces of moisture in the sand. So a party was left behind under Ibrahim Beg's direction to try and dig a well. I myself had my hopes roused far more by the wide view which from the top of a high ridge suddenly opened over sandy jungle to the south. We had only covered eleven miles when the sight of many fine poplars still alive made the camel-men eagerly plead for a halt. The heaps of dry leaves beneath the trees would offer some grazing for the poor beasts. There could be no doubt that the spot was a regular feeding ground for wild camels. Their tracks were exceedingly frequent among the trees, and some looked perfectly fresh. Most were pointing southward, and there, we concluded, must be the water which had given drink to the animals. But how far might it be yet?

For our ponies and camels the need of water was now pressing. So Naik Ram Singh and myself set out in different directions to seek for likely places to dig a well. But though I struck another broad river-bed before I had gone a mile or so southward, no damp spot could be found anywhere at its bottom. From a high tamarisk cone on the bank I was scanning the horizon, dark with scrub and Toghraks, when I heard the Naik shouting from a distance. He had an exciting tale to tell when he came up panting. His search for moist sand had been as futile as mine; but, going to the south-east, he had come across what seemed almost better—the footprints of two men. I hastened, of course, back with the Naik, and soon verified his discovery. There could be no doubt, we had before us the track of two men, faint or effaced in some places, but clear enough

where scrub or low dunes had afforded shelter. The footprints led to a high cone commanding a wide view of the jungle. The hunters—for clearly such the men must have been—had ascended it for a look-out, since their footsteps turned thence sharply to the south-east. They followed now closely the track of some camels, no doubt the game they were looking out for.

It was getting dark before we could trace their track much further. But I had seen enough to convince me that we could not do better on the morrow than try and follow the footprints back to where the hunters must have camped. The only question was, had they come from a well or the river, or had they brought ice to their last camping place. There were no questions of this sort to damp the joy of our people in camp. Ibrahim Beg had just brought in the men, who had vainly laboured at a well down to a depth of sixteen feet.

Unusual alacrity prevailed on the morning of February 11th throughout the camp, and by rousing Ibrahim Beg at 4 a.m. I managed to get the camels to move off just before sunrise. The hillock which the two hunters had ascended was soon reached, and taking the cleverest of the party ahead we set out to track the footprints along the route they had come. It proved an exciting and by no means easy task. Wherever they led along the crest of dunes or on the lee slope, the traces had become faint indeed, and often completely effaced. Some two miles off to the south they disappeared in a tangle of dead brushwood. The tracks of wild camels were here exceedingly numerous, and, as most of these seemed to come from the south or south-west, parallel to the river-bed, we thought it best to continue in that direction. We had not gone more than a mile when shouts from some of the men who had spread out in line for a wider search, told us that the track had been picked up again. This time the footprints led close along the traces of two camels, and, as the camels' feet had left depressions in the sand less easily effaced, the tracking became once more easier. So the chase went on quite merrily for miles more. The camels and their pursuers had followed no straight line, but crossed the old river-bed again and again. The dunes, which had smothered this in most places, made heavy going, and what with the many climbs up steep sand slopes and the hard marching of so many days on scanty rations of water, our human pack became sadly straggling. Only Ibrahim Beg kept steadily up with me.

After about nine miles we came again upon a group of fine old Toghraaks still alive. Here we lost the hunters' footprints, and when my breathless human pack had spotted them again, the track to our dismay took a decided turn to the south-east amidst barren dunes. There was no 'kötek' here to shelter the footprints, and the search for them became so difficult and the look of the sandy waste so discouraging that, after

a couple of miles, we decided to resume our southward course as the safest. Over high ridges of sand we regained the bed followed during the morning. But soon afterwards, all traces of it disappeared under heavy dunes. High sand-cones, with dead tamarisk clumps on the top, closed around us. Nowhere a living bush or tree. Vainly I climbed up the sand-cones and ridges to catch a glimpse of the river-bed which we had been following. Yet suddenly, when the sun was setting, we emerged once more on a short reach of open river-bed. Was it the same we had followed in the morning or another channel of this confusing delta? Little it mattered as things now stood. A look at the few patches of dry clayey soil across the bed showed that there was no hope of reaching water here. Yet the men, driven by thirst, settled down in sullen despair to dig a well. After eight feet or so no trace of moisture appeared, and the work was stopped.

It was a dismal enough camp. Nothing to eat for the camels but the branches of some old Tograks still alive by the banks. How glad I was that the patient hardy animals, upon the strength of which our safety depended, took kindly to the twigs I had cut down for them! No doubt the sap in the latter was refreshing. Even our hard-trying ponies, which had tasted no water for three days, munched this strange fodder greedily. The time had now come when a final effort became imperative for us to locate the actual river and reach water. The only safe course open was to reconnoitre straight through to the east and west, and with a view to this I made our arrangements for the next day. We should march due south for another eight miles or so, and after a sun-observation for latitude Lal Singh and myself would set out with two camels each and food for three days in opposite directions. By hard marching we could hope to extend our reconnaissances some twenty-five miles to east and west and return to the camp, where the men and animals were to rest, within forty-eight hours. Then the whole would move to wherever we might have found water in river or well.

Three much reduced bags and two iron tanks full of ice represented our available water supply, sufficient to see us humans through six more days if rations, as for some days back, were kept limited to about one pint per diem per man. It was a small enough allowance considering that food, too, had to be prepared with it. With some self-restraint it allayed the worst of thirst. But how was one to preach restraint to weary and improvident people like our Shahyar men? Some of them quaffed off their water ration almost as soon as it had been poured into their gourds. I felt more pity for the poor dumb ponies, which showed now signs of real distress, and was glad when we managed to squeeze out of the frozen 'mussucks' a glass full of muddy liquid for each of them, all that was left of the water brought away

from the last well. For "Dash," my little terrier, alert and unconcerned as ever, a saucerful, spared from my cup of tea, was fortunately quite sufficient, and this faithful companion caused me no special anxiety. But the ponies would succumb if some water was not reached, and I counted the cartridges in the holster of my revolver to make sure of the means for putting them out of pain when the time came.

It was an anxious night for me. The disposition of the Shahyar men had grown so sullen and disquieting that special precautions seemed advisable to prevent a rush upon our ice supply. The now sadly slender bags had been carefully sewn up and stacked close to Lal Singh's tent. Twice before midnight I approached to make sure that the precious store was safe, and had the satisfaction of being challenged by the ever-alert and cautious Surveyor. That I had an assistant so energetic and cheerful by my side was a comfort for which I felt deeply grateful.

I was awake soon after 3 a.m., and long before day-break we might have started had not despair and unreasoning fear driven the Shahyar men into an attempt at desertion and ill-disguised mutiny. When the camels ought to have been loaded they crowded before me and in excited language declared their refusal to march with us any further. Thought of flight northwards had been tempting them for days past into what was bound to prove destruction. I knew only too well and explained that they could not possibly find their way back to the Tarim in safety, and threatened to use force against any one attempting such foolish desertion. Whether it was some comprehension of the justice of my arguments or merely the fear of force, the men fell to their tasks again, but with sullen looks betraying despair. Worthy Tokhta, old Khalil's son, cut the most miserable figure of all.

I had decided to steer again due south, and a conspicuous ridge of high sand, sighted the previous evening in that direction, served as a useful landmark. Leaving brave Naik Ram Singh and Jasvant Singh, both armed, in charge of the baggage, and all men except the two needed for plane table and cyclometer, I pushed ahead with Lal Singh. After two miles or so the dry bed dropped away to our right. Then we emerged on a wide depression covered with low bare dunes. Here dead Tograks of small growth stood in long rows, just as I had seen them seven years before near the site of Kara-dong, along side channels of the Keriya River deserted at no distant period. The sight of some trees still living, not on the usual sand cones, but growing on almost level ground, instilled me for a brief time with something like hope. But the outlook became more depressing than ever. Big barren dunes rose before us in a chain running approximately south-west, and only at rare intervals there emerged between them dreary dark cones with tangled dead tamarisk.

I had hoped against hope that the ridge, once ascended, would show us at least ground where I could leave our camp with some chance of subsistence for the camels, practically fasting since a fortnight. But the view which opened before me was of oppressive desolation. Wide, indeed, it was, extending to a broken chain of Dawans far away on the eastern horizon, with a vast valley-like depression before them. But the eye caught nothing but rolling dunes of yellow sand and grey patches of eroded clayey soil. A light haze hung over this forbidding landscape and strangely fused its colours into deathlike paleness. It looked as if we had neared now the extreme east of this awful dead delta which had already held us fast so long. Was it to any purpose to reconnoitre the absolute desert eastwards?

But the high ridge of sand, which had guided us so far, rose now quite close on our right and was too good a survey station to be missed for anything. Fully three hundred feet or so it seemed, and the expanse of bare clay ground at its foot, overrun only by low dunes, made it look still more imposing. The crests of the big dunes forming its base rose up steeply, with curves of beautiful sharpness. We clambered up in haste to the first shoulder; but the view obtained here, at about 150 feet above the plain, was so unpromising that Lal Singh, who needed time to prepare for his latitude observation at mid-day, descended in dismay. I ordered him to move the caravan back to where we had left the last living Toghraks, and then, with "Dash," my little terrier, continued the climb for the sake of assuring my conscience.

From the top the panorama was grand, but at first sight just as depressing. I was searching the ground with my glasses for indications of living jungle, when suddenly to the south some narrow bands of white caught my eye. Looking closer through the binocular I could scarcely believe my eyes when they showed me in four distinct places glittering streaks of what could only be ice—or else salt efflorescence. The distance was fully four miles.

What joy here rose in my mind at this suddenly revealed chance of finding water! It might be that these were only the four small salt lakes which Hedin had heard of from shepherds as situated at the very end of the eastern branch of the river. But, however, undrinkable their water, they would give us fresh ice if frozen. And even if they had since dried up completely, they would at least enable us to ascertain our position and guide us into the right direction. So in haste I shouted the order to Ibrahim Beg below to let the caravan move on. When, after taking careful bearings of those saving streaks of white, I ran down the steep sand slopes and joined the men, all were in high-strung excitement. I could not restrain myself from announcing the hope of finding ice, but thought it safest to let them know also that it might prove



56. New Course of Keriya River. [1962]

but a thin sheet over salt water. With the terribly barren desert before us it seemed almost a mockery to call up visions of pure drinkable water. The whole caravan was now moving ahead at a pace such as had never been attained by it since we entered the desert. Even the slowest of the men mounted to the top of every high dune which might offer a glimpse. But it was only after two miles or so that their impatient rush was rewarded by the sight of one streak at least of what now decidedly looked like ice. The sand was as barren as ever.

A mile further ahead a halt had to be made to unload the theodolite needed by Lal Singh in time for his mid-day observation. So restless and eager were the men now that I had to exert my authority to assure a sufficient number remaining to help the Surveyor with the reloading. We had scarcely moved ahead more than a few hundred yards when a figure was seen running frantically towards us. It was young Turdi, my second camel-man, who had previously broken ahead in his eagerness to make sure of the water. What he waved in his hand was soon recognised as a big cake of ice, and joyful shouts rose at once all along the hurrying line of men. It was ice, a big sheet of ice, Turdi reported it as soon as he recovered breath enough for articulate speech, and flowing through it a current of open fresh water! It was the real river then we had struck, changed to a new bed in this desolate desert. Half a mile further ahead we should reach it. Quickly all the men were munching the bits of ice-cake which Turdi was distributing with no small satisfaction. There was relief now of all doubts and shining contentment on the faces of the mutineers of the morning. The moment was opportune for giving a well-deserved lesson, and it fell on a choleric young fellow who at daybreak had been the loudest and most unreasoning of the rebels. Ibrahim Beg was ready at hand, accustomed to functions of corrective justice. The ringleader was given a big piece of ice, and then told to prepare for the whip in reward of his conduct. He was as loud in his howling for pardon as he had been in cantankerous speech in the morning. But it was of no avail against Ibrahim Beg's practised arm, and half a dozen strokes with the 'kamchi' were duly administered before Mamun had finished his ice. The others looked on with evident approbation, and readily proclaimed the folly of their own plans of desertion.

The dunes in front of us were so high that we did not realise the full width of the river until we almost dropped down over the last steep sand-slope on to its ice. In a glittering sheet of delightfully clear ice from 160 to 200 yards broad, it stretched away to the north. For the greatest part the ice formed only a thin sheet, resting directly on the mud of the bottom. But where the current had cut into our bank the water flowed in an open channel about twelve feet broad. The men

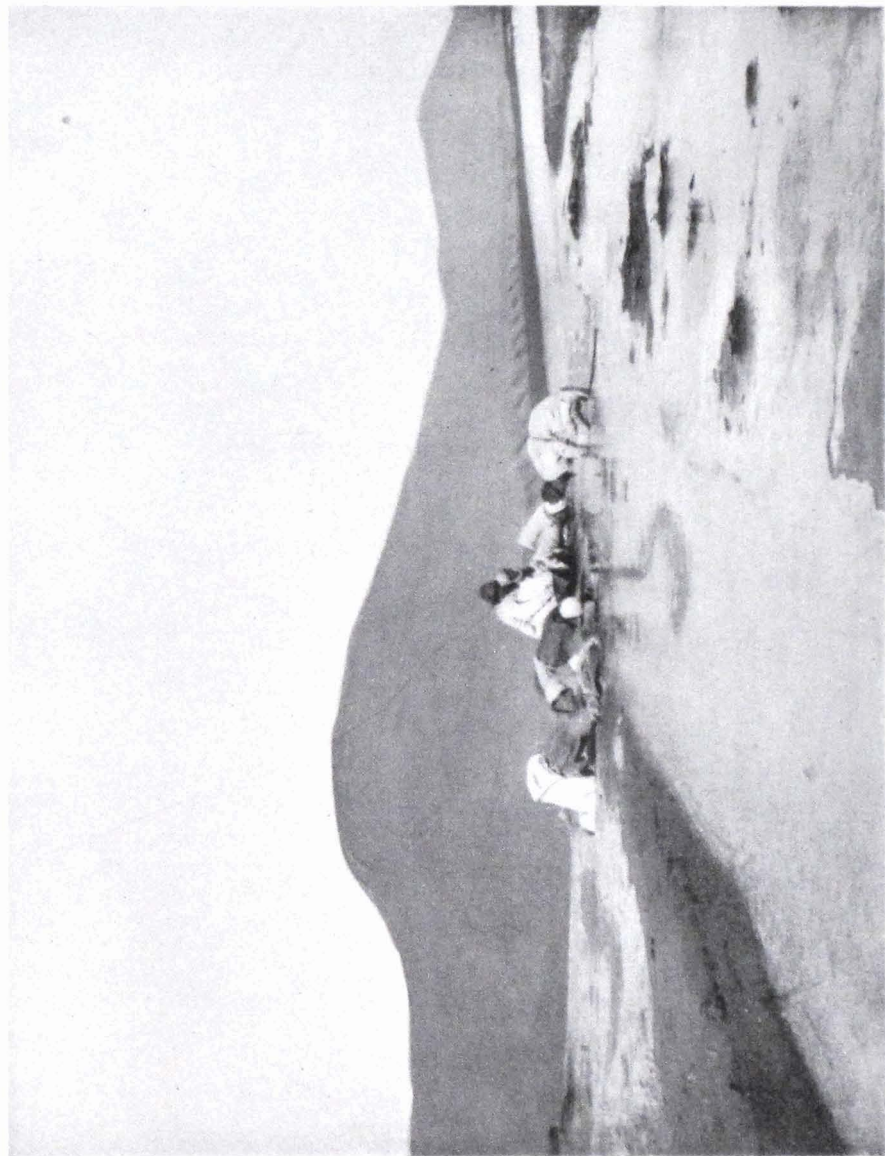
rushed down to the brink of this, and bending down on hands and knees took time over their drinks such as probably never before.

Moving down the river, we found a little bay where the dunes had left patches of ground bare, with dead scrub and trees attesting that here, too, the river had once flowed long before its latest migration. Here my tent was pitched in what I called my dead orchard. Ponies and camels all seemed full of life now in sight of the glorious water, and, after having been given a good rest to cool down, were allowed to drink *ad libitum*. What a joy it was to watch them as they took their long long draughts until they swelled visibly! Then the poor hard-trying ponies, which had been thirsting since four days, fell greedily to the dry leaves, which were collected for them from the few live Toghraks around.

For the camels, which had marched so bravely without once tasting water during the last thirteen days and under heavy loads, there was, alas, but the scantiest fare within reach. The Toghraks were too few to satisfy their hunger with dry foliage, and even of that hardiest of scrubby plants, the yellow *kamghak*, which appeared in a sheltered inlet, not enough could be found for even a pretence of grazing. As to my own treat, it came, when, for the first time since Shahyar, I could indulge in a tub. At first it seemed an unholy procedure to use precious water in so lavish a way. But luckily the privation had been too short to break old habits. So when I could at last sit down to my modest tiffin and breakfast combined, the big cups of tea I could now indulge in, tasted doubly refreshing after the liberal wash bestowed upon the outer man.

After the sixteen days' continuous tramp a short halt was imperative both for men and beasts. So the 13th of February was spent in enjoyable rest at our river camp. There was plenty to do for us all, writing of notes for me, and much mending of worn-out boots and clothing for the men. There was delightful peace all around, and now that we were not ourselves on the move the total absence of life was more than ever impressive. Since we left the Tarim I had seen not a single living creature and had grown accustomed to a quasi-dead world. Yet here was life-giving water flowing past me in abundance, and still the banks were as silent and dead as if they were those of a sand-buried, dried-up river.

The ever errant river had evidently formed a new bed at a considerable distance from the one where Hedin had seen it, and the time passed since the change (some four years, as I found out subsequently) had not sufficed yet for vegetation to invade the absolutely sterile sands of the new course. To get at some grazing for our poor camels and ponies was now the most urgent task. Not knowing whether the old river-bed lay to the east or west, it seemed the safest plan to follow our channel



The First Drink from the Keriya River.

upwards. This was sure to bring us earlier or later to the point where the new river course had branched off, and where the riverine belt of living jungle would be struck.

I cannot find space to describe here the many curious observations made in the course of the two long days which we spent in tracking the strange lifeless river southwards, wending our way past high ridges of sand and a maze of shallow lagoons where the ice was rapidly melting. The story, too, of the third day, when we approached at last the edge of the living riverine forest, and, after an exciting chase, captured our first man, must be told elsewhere. It was a lusty young herdsman from Keriya, a sufficiently wild-looking figure in his goat-skins and furs to have frightened our tame men from Shahyar if they had met him alone. How relieved they felt when under this uncouth appearance a good Mohammedan greeted them! To me, too, no *Salam alaikum* had ever sounded more welcome. When the young fellow had recovered from his fright at seeing himself set upon by a crowd of strange people, such as had never disturbed his lonely forests, he gave *Yoghan-kum* ("High Sands") as the name of his grazing ground. Then I knew at once where our three weeks' tramp through the desert had brought us, and that the new river-bed branched off from the old one close to the northernmost point I had reached here in 1901.

Two days later we were all hard at work, digging at the ruins of Kara-dong.