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FROM SWAT TO THE GORGES OF THE INDUS

SIR AUREL STEIN, K.C.I.E.

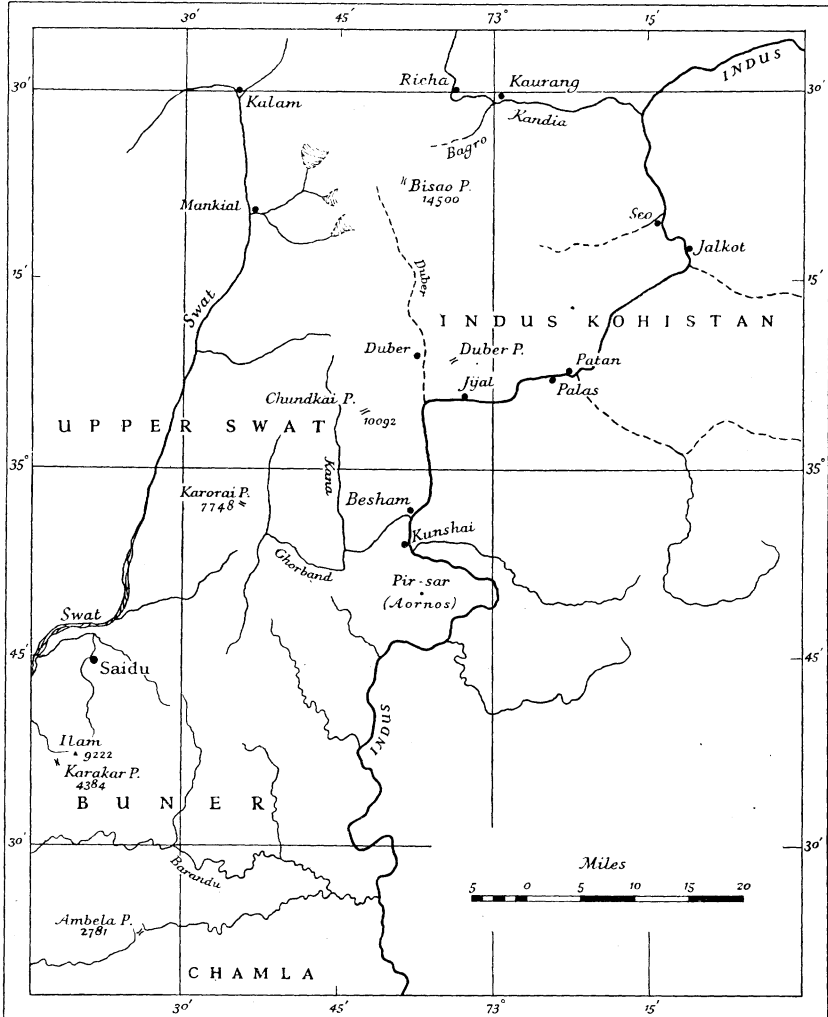
THE mountain territory on the Indian North-West Frontier known as the Indus Kohistan which I was able to explore since November 1941 lies between the river that has given India its western name and the great valley of Swat. This by its many Buddhist remains and by its historical associations offers special interest to the student of antiquity. There in Swat I had been fortunate enough in years past to examine the ruins of many important Buddhist sanctuaries and to trace the sites connected with famous exploits of Alexander. And whenever I set out from my base in Kashmir for my long Central-Asian journeys, my routes, though varied, had always led me through that fascinating high region of the Hindukush range which divides the extreme north-west of India from innermost Asia. On the third of those expeditions in 1913 I passed through Darel and Tangir as the first European to visit those Hindukush valleys. On crossing a high pass between the two I had then been able to sight from afar the deep-cut valley of the Indus where the great river passes down into the Indus Kohistan.

It was then tribal territory, quite inaccessible at the time and practically unexplored. It was known that within that mountain area, bordered by Swat in the west and the British District of Hazara in the east, the Indus, compressed into an exceedingly narrow course, passes through a continuous succession of very difficult gorges flanked on either side by the precipitous faces of high mountain spurs. This information, gathered from native sources and imperfect as it was, fully agreed with the description left by early Buddhist pilgrims from China of the very difficult route they had followed from Darel down the Indus on their way towards Swat. The forbidding character of that route is strikingly reflected by its designation as the "route of the hanging chains" under which early Chinese Annals know it.

All this had made me ever since very eager for a chance of exploring the Indus Kohistan and of following also through the Indus gorges the footsteps of those old Chinese travellers. But I had to wait a very long time for that chance. I owe it solely to the present ruler of the Swat State, Wali Miangul

Gul-shahzada Abdul Wadud Sahib, having completed the annexation of the Indus Kohistan east of the Indus in 1939.

My recent expedition started from Swat and was carried out under the auspices of its ruler. So I may refer here briefly to what my renewed visit to the State he created has shown me of the results achieved there by his rule.



Swat is a large mountain territory very fertile in its main portion and blessed with many favours of nature. The old Chinese pilgrims have much to tell about the prosperity of the country, the many Buddhist sanctuaries and monastic establishments maintained by its population. But after the invasion of the White Huns in the sixth century A.D. a decline set in. Since its conquest by Pathan tribes and probably also earlier in Muhammadan times Swat

never ceased to suffer from internal feuds uncontrolled by any central authority.

In the famous Akhun of Swat a great religious leader arose in the first half of the last century. He was able to unite the tribes in fanatical resistance to the Sikhs and later to the British regime on the Frontier. But internal disorder remained and exposed Swat to aggression by powerful neighbouring chiefs. It was only since the present Wali, a grandson of the great Akhun, had established his control over all the tribal factions, and after prolonged struggles had overcome outside aggression, that Swat has enjoyed peace and order. Under the old Pathan custom all lands held by a tribal sub-section or clan had to be divided afresh every four or five years among all the tribesmen. This custom would not allow of any lasting improvement of the land, such as planting fruit trees, for which Swat is suited. It required wise statecraft and persistent effort to stop this traditional system and replace it by individual holdings. Now I could see everywhere flourishing orchards and other improvements as I passed up the road last October to the Wali's capital, Saidu Sharif, where his grandfather's sacred tomb stands.

From the start the Wali had realized the importance of roads both for trade and military operations. So by 1926 I had already found regular mule-paths made under his orders up the main valleys and over the hill ranges between them. Now I found regular motor roads leading up the main Swat Valley and across the large tract of Buner south of it. A very noticeable increase in the number of shops, in the traffic along the roads, and the growth of some villages into something like market towns afforded striking proof of the benefits which security and peace established under a strong rule had brought to a once turbulent country. It was reassuring to find that so much material advance had been secured without changing the simple methods of an administration based on traditional customs, and as regards justice on Islamic law.

The Wali, though now well above middle age, is still as alert and hard-working as I remembered him. He is quite illiterate. But great personal ability coupled with a remarkable memory and wise trust in two very experienced ministers, brothers and supporters in his initial struggles, enable the Wali to direct all affairs. Telephone lines to the most distant posts permit him to gather information and give orders. He has never failed to maintain very cordial relations with Government on the Frontier.

In the summer of 1939 the Wali, after careful preparation, rounded off his dominion by the occupation of the Kohistan valleys between uppermost Swat and the Indus. The difficulty of access and to some extent the barrenness of the ground had kept Pathan tribal settlement away from the Kohistan and allowed the original population of Dard race and speech to survive there. But just as before in Swat, insecurity and internal disorder had caused the scanty population to remain in a very backward condition.

After this last extension of the Wali's rule Colonel W. R. Hay, then Political Agent for Dir, Swat, and Chitral, informed me that the opportunity for exploration in the Indus Kohistan had come within my reach. When after my return to India in 1939 I learned that the Wali desired a postponement of my expedition I did not feel discouraged, for I knew that the goodwill

and judgment of my old patron could be trusted. Last September I learned that the Wali was now prepared to let me start after the Ramzan, the month of Muslim fasting, had passed by the close of October. That area had remained the only practically unsurveyed ground along the whole course of the Indus from Tibet to the Arabian Sea. So Brigadier E. O. Wheeler, Surveyor-General of India, readily agreed to depute with me Surveyor Muhammad Ayub Khan, who had been my survey assistant on all my four Persian expeditions.

A few days' stay at Peshawar under the hospitable roof of Government House allowed me to thank Sir George Cunningham, Governor of the N.W. Frontier Province, for the friendly interest and help with which he has as always furthered my plans. On the Malakand I could thank Colonel E. G. Mallam for what he had done as Political Agent to smooth my way. At Saidu, the capital of the Swat State, I received the kindest welcome from the Wali. A motor drive of some 120 miles across the Karakar pass and the wide tracts of Buner and Chamla allowed me to visit again the famous Ambela pass.

On October 30 I started with my little party for the Indus Kohistan. The route led up the Kana valley down which I had passed in 1926 on my way to Alexander's Aornos. To reach its mouth by a motor road just completed saved what at that time would have meant a week's travel. On the way up the Kana valley and for two marches beyond it was still possible to use mule transport. But farther on during nearly three months' travel we had to depend on porters and our own feet. It was pleasant to find my passage still well remembered by the old Khans of Kana.

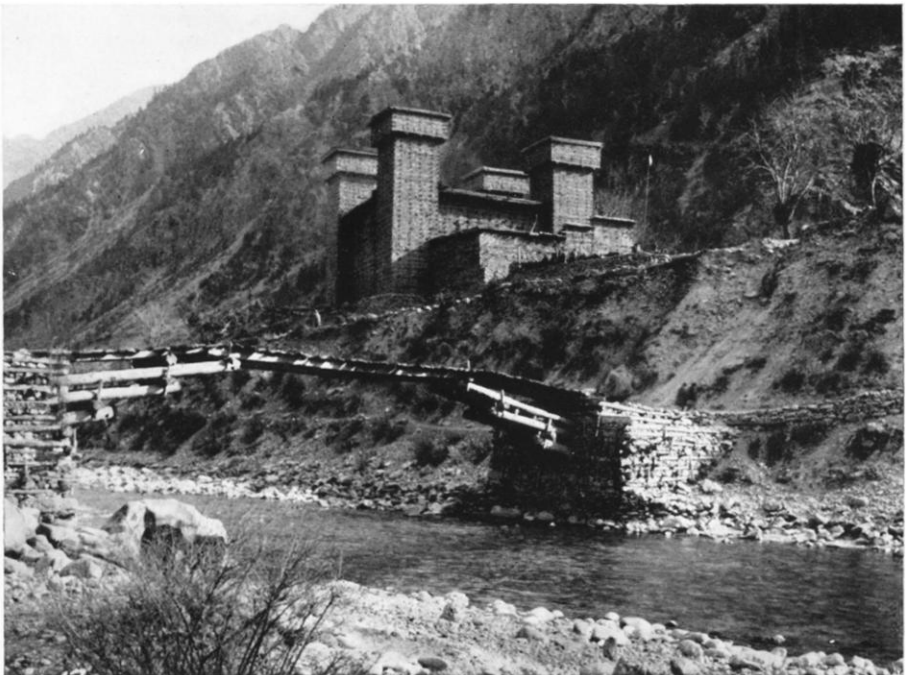
Then from the head of the Kana valley overlooked by high snowy peaks the ascent led to the Chundakai pass. On its top, about 10,000 feet above sea, we were received by Hakim Abdul Qudus, Governor of the Kohistan, who was to accompany us through our difficult travels. It was due mainly to his unfailingly careful arrangements that all the physical difficulties were successfully overcome.

The route chosen for the first marches led along high alps at the head of very narrow valleys descending steeply towards the Indus. From camps near the tree limit it was possible to climb several high spurs, which provided excellent stations for the exact plane-table survey carried along the whole of our journey. They commanded distant views to the north-east and eastward across the Indus valley and beyond it as far as the snowy ranges which divide the Kohistan from Kaghan and Kashmir territory. But the great river in its deep gorges was completely hidden.

When our route had led us down into the side valley of Duber our camp was pitched for the first time under the walls of one of those picturesque timber and rubble-built forts which shelter the Wali's small garrisons in the Kohistan as elsewhere in the State. By their uniform plan they curiously recalled to me those ancient Roman *castella* by which the Roman Empire for centuries guarded the *Limes* routes on its Near-Eastern frontier. The Wali's men-at-arms holding those forts assure order in a previously lawless country. The men as well as their officers and the few local officials are all paid in kind from the *ushar* or land tax, amounting to one-tenth of the actual produce.



The Wali of Swat at Saidu



Gabrial fort and Kandia river



Glacier on range south-east of Bisao pass



Towards Bisao pass from Lal Bek

Such an impost, spent almost wholly in the valleys where it is levied, does not weigh heavily on the local population, poor as it is. The cultivable ground all through the Kohistan is extremely limited; hence its people depend far more on their cattle and goats.

From Duber it was necessary to gain the Kandia valley northward, the only side valley of any size. The Bisao pass, which gives access to it, was likely soon to be closed by snow. It was crossed just in time, but proved trying. After a long march had brought us to the highest of the huts to which the Duber people, like all the others of the Kohistan, repair in the summer for grazing, it took us a day and a half of exacting climbing before the height of the pass was gained. The ascent on the first day lay over a succession of old glacier beds and moraines. The recession of glacier ice, apparently not very distant in geological time, had left here huge masses of rock debris in utter confusion, very trying to the feet, especially to mine, which had lost many toes from frostbite thirty-four years before on the high Kun-lun range. It was long after darkness had set in that the narrow rocky ridge was gained where room could be found for a night's halt.

The morning light revealed an amphitheatre of rugged peaks crowned with *névé* beds and small hanging glaciers. The Bisao pass is formed by the knife-edge *arête* of a rocky spur running down steeply from a great massif with peaks close on 19,000 feet high. In order to gain our way to it we had to scramble up a long series of old terminal moraines. They looked like huge steps laid down by a former great ice flow. From the pass for which aneroid and clinometer observations indicated an approximate height of some 14,500 feet, a wide snowy trough was seen to descend northward. The descent in soft snow hiding detached masses of rock was necessarily slow. So it was quite dark by the time the head of a steep and narrow ravine was gained in which the further descent had to be made. The sides of the ravine were covered with deep snow, and the descent along a very precipitous slope in the light of a lantern looked risky. By the time it had been safely accomplished Surveyor Muhammad Ayub and myself had been six hours in the snow. Three more hours were needed to bring us to the first place where it was possible to camp with some shelter for the load-carrying men. By then it was one hour after midnight.

After that long day's experience the three marches which took us down the Bagro valley to the Kandia river seemed delightfully easy. But we had not yet covered the second when fresh snow was seen falling on the high mountains above. It meant the closing of the Bisao pass until the next summer. At the little village and fort of Karang in the centre of the Kandia valley a halt was imposed partly by survey work and partly by the illness of one of my two old Kashmiri servants. At first it looked serious. But Surveyor Muhammad Ayub was able to proceed up the head of the Kandia valley and in spite of trying climatic conditions to check his position by observation to distant triangulated peaks. Once assured about my servant's condition I followed him to the last small village of Kandia. In ascending the deep-cut gorges of the river difficult cliffs rising high above the rock-bound bed had to be negotiated. As at Karang, so also at the hamlet of Richa I found that old mosques in the designs of their wood-carving showed motifs unmis-

takably derived from the style of Graeco-Buddhist sculpture. It was impressive evidence that the influence of Hellenistic art had penetrated into this far-off mountain region in spite of the very rude conditions of life there.

From the head of the Kandia valley we turned back to reach the gorges of the Indus. But before we arrived there bad weather with rain and snow overtook us at the fort of Tuti which guards the approach from the Tangir side. It was a bad place to get weather-bound in. The Kandia valley is there so narrow that Tuti is never reached by the sun for three months of the winter. Fortunately it was possible to use such enforced halts for some record of specimens of the little-known Kohistani language. It belongs to that Dardic branch of the Indo-Iranian language group which is now confined to Hindu-kush valleys but in earlier times was spoken much farther down the Indus. How the tribes still speaking Dardic languages came to occupy these high mountain tracts is an interesting problem. For its elucidation anthropological evidence is much needed. In order to help towards securing it anthropological measurements and observations were taken on a considerable number of Kohistanis in the course of my journey.

On December 11 at last we could leave gloomy Tuti and descend the Kandia valley to the Indus. For a couple of miles the difficult track lay mostly over galleries clinging to sheer rock faces and supported by tree branches, before the first view of the Indus was gained from a height of some 1000 feet above where the Kandia river joins it: the Indus a narrow band of intense ultramarine green confined to a rock-bound bed between precipitous mountain sides. The track which had brought us to this point, and which we were to follow farther on, had been much improved under the Wali's orders since the occupation of the Kohistan, and for this great credit was due to the Hakim. Even thus it has remained difficult enough and quite impracticable for any laden animal. On the opposite left side of the river the track still in use by the people living east of the Indus clings in places to bare rock walls along narrow ledges, with tree trunks serving as ladders to connect them.

That early Chinese pilgrim, Fa-hsien, has described the forbidding route he and his pious fellow travellers had followed in A.D. 400, after leaving Ta-li-lo, the present Darel. In Professor Giles' translation it runs: "Keeping to the range, the party journeyed on in a south-westerly direction for fifteen days over a difficult, precipitous and dangerous road, the side of the mountain being like a stone wall ten thousand feet in height. On nearing the edge, the eye becomes confused; and wishing to advance, the foot finds no resting place. Below there is a river, named Indus. The men of former times had cut away the rock to make a way down, and had placed ladders on the side of the rock. There are seven hundred rock steps in all; and when these and the ladders have been negotiated, the river is crossed by a suspension bridge of ropes. The two banks of the river are somewhat less than eighty paces apart. . . . Having crossed the river, the pilgrims arrived in the country of Udyana (Swat) which lies due north of India." This description is now fully confirmed by our survey. We have here one more proof how much reliance can be placed on the topographical sense and power of observation of those old Chinese travellers on whose records the historical geography of India so largely depends.



Indus at confluence with Kandia



Indus above Sio



Indus above Patan



Indus near Kunshai

Our progress down the Indus during the next few weeks showed only too clearly what was meant by Fa-hsien's reference to those many "rock steps," as the translation puts it. On all the eleven trying marches which took us down to where we turned off from the Indus to follow the route up the Ghorband valley to Swat, there was daily a constant succession of tiring ascents to be made. The track climbs up steeply ridge after ridge, each rising sometimes as much as 1000 feet or more above the river, in order to avoid impassable cliffs. From the heights thus gained there were invariably descents, often quite as tiring, to be made again towards the river. Nowhere was it possible to keep for any distance near to the river bank since masses of huge boulders line it wherever the river does not actually wash the foot of impassable rock walls. I have not counted all the climbs, but they must have been still more numerous before the recent track was constructed. When this was being made the men had often to be suspended from pegs while they were at work boring holes to blast the rock or to fix in fissures the tree branches which were to support galleries.

This is not the place to give details of the arduous marches which carried us down the Indus to where the great river leaves its gorges. In comparing the number of our eleven marches with the fifteen counted by Fa-hsien it must be remembered that his reckoning starts from the mouth of the Darel valley, at least 30 miles higher up than that of the Kandia valley.

Throughout the Kohistan the route along either bank of the Indus retains its very trying character. Only at a couple of places, at Sio and Patan on the right bank and Jalkot and Palas on the left, alluvial fans, small in size, leave room enough for settlements deserving to be called villages. But owing to the great summer heat of the narrow Indus valley even these villages with their closely packed rows of low rubble-built dwellings are occupied only during the cold weather months. For the rest of the year their inhabitants retire with their cattle and goats to huts on high grazing grounds.

It is the same with the few hamlets to be found at rare intervals along the river. The mountain sides to which their dwellings and small terraced fields cling, everywhere hundreds of feet above the Indus, are so steep that patches of flat ground for pitching our little tents could be found only with difficulty. The conditions of life among the scanty population, with its extremely limited economic resources, could not have been very different in ancient times. At the few old village sites reported the ruined dwellings examined proved as rude in construction as those inhabited at the present day. Yet the great size of the trees, mainly *Ilex*, growing over the ruined walls proves considerable age for the occupation of these sites.

Owing to the depth and extreme narrowness of the valley in which the Indus has cut its bed through the mountains, it was not possible from our route to sight any high peaks already fixed by triangulation over great distances, but at last Muhammad Ayub, ascending the side valley of Patan to the highest of the summer huts, reached from there positions on high snow-covered spurs which could be fixed on the plane-table; the position thence deduced for the fort at Patan was less than a mile and a half from that previously indicated by his traverse.

These survey operations and other tasks had necessitated a longer halt

at Patan. It allowed Hakim Abdul Qudus to attend to arrears of work at his headquarters there; but it subsequently caused us to be overtaken again by bad weather conditions at two further stages down the Indus. At the fort of Jijal the days of continuous rain mingling with snow were distinctly trying, for the terrace specially raised to provide some level space for our little camp was soon turned into the semblance of a morass, threatening to glide down the steep slope.

Near Sio and at a few points lower down the width of the great river could not much exceed 40 or 50 yards. Near Sio and again below it near the village of Jalkot on the left bank we were shown places where the Indus had been spanned by rough wooden bridgés in quite recent times. The great depth of the water in the narrow bed, even in its reduced winter flow, accounts for the beautiful green colour throughout its course, except where rapids break in white waves. The great height and much increased width to which the river rises during the floods of the spring and summer could be judged by the water-worn appearance of the cliffs and the huge boulders to be seen on either side high above the narrow rock-bound bed.

By the third week of January we emerged near Besham on ground already mapped by the Survey of India at the mouth of the Ghorband valley. Only a couple of miles below must have been that rope bridge crossed by Fa-hsien and his fellow pilgrims. There close to the village of Kunshai the Indus flows in a rock-lined bed about 80 yards wide, closely adjoined on either side by steep equal eminences high enough to allow the rope bridge to hang well above the river even when in flood. On the rocky ridge of the right bank are remains of an ancient watch post to guard the bridge and the passage.

Here our exploration came to its end, but not yet the difficulties of travel. The Ghorband valley farther up was under snow right down to its bottom, and when after three marches we had approached its head the Karorai pass covered with exceptionally heavy snow presented a serious obstacle. But plentiful local help and a favourable turn of the weather allowed us to cross the pass safely, though not without some difficulty. Then the wide open Swat valley lay before us, and soon after being very hospitably welcomed at the Wali's residence I could thank my old patron once again for all that his unfailing support had allowed me to do and enjoy in pursuit of a long-cherished plan.

The sketch-map to show the outline of this journey has been made from Survey of India Half-inch sheet 43 F|NW, Quarter-inch sheets 43 A, B, and E, and 1|M sheet 43 dated 1935, 21, 34, 35, and 30 respectively: the latest we have in our collection. It cannot show all the names mentioned by the author because some are not on these maps. Where his spelling differs from the Survey maps we have retained his spelling in the text, and left the Survey spelling on the sketch-map. Sheet 43 B shows a number of unmetalled roads and tracks as "fair weather motor roads," but it is not possible to select those which have now been improved and made the main road to Saidu, the route of the author's trip to the Ambela pass, or the road north and east of Saidu to the Kana valley.

LIEUT.-COLONEL SIR FRANCIS EDWARD YOUNGHUSBAND,
K.C.S.I., K.C.I.E.

Gold Medallist 1891. Council 1911-14. Hon. Sec. 1914-16.
Vice-President 1916-19, 1922-42. President 1919-22

SIR FRANCIS YOUNGHUSBAND was born at Murree on 31 May 1863, the second son of Major-General J. W. Younghusband. Educated at Clifton and Sandhurst, he was commissioned to the King's Dragoon Guards in 1892, and was soon in India, where his regiment was stationed at Rawalpindi.

His enthusiasm for travel in the Himalaya was first stirred by a visit he paid on leave in 1884 to Dharmasala, the home for many years of his uncle Robert Shaw. There he talked with men who had accompanied Shaw to Yarkand and Kashgar, and examined books and relics of those journeys. He then set off on his first tour in the Himalaya, through the valleys of Kangra and Kulu, discovering the "delicious sense of satisfaction as each long day's march was over, as each pass was crossed, each new valley entered." On his return to duty he was sent at the age of twenty-one on a reconnaissance of the Indus and the Afghan border, and later attached to the Intelligence Department to revise the gazetteer of Kashmir.

His first great opportunity came when Mr. Evan James invited him to join in a journey through Manchuria. For seven months they travelled in that then little-known country, penetrating to the sources of the Sungari in the Chang-pai-shan, and later crossing the northern end of the range to Hunchun. These journeys are described in detail in James' 'Long White Mountain,' and briefly in the first three chapters of 'The heart of Asia.' At the end of this expedition Younghusband proposed to spend the winter in Peking, and to return to India by sea. While in Peking however he met Colonel M. S. Bell, who was preparing to journey overland to India. Younghusband was eager to accompany him; Bell, thinking it a waste of opportunity for both to travel by the same route, suggested that they should arrange to meet at Hami. Younghusband therefore, having secured an extension of leave, decided to travel by the direct route across the Gobi, while Bell journeyed through the more populous provinces within the Great Wall. Younghusband's route had not been traversed by a European, and lay between the usual route to Chinese Turkistan and that followed by Ney Elias in 1872. After three months of preparation he left Peking on 4 April 1886 with one Chinese servant, and traversed the Mongolian plains to Kalgan and Kwei-huachang, where he arrived two weeks later. There he engaged a Chinese camel man, his Mongol assistant, and eight camels for the crossing of the Gobi. The monotony of those long dreary marches was broken by the extreme beauty of the clear starlit nights, and the changing colours of the desert landscape. He noted in his diary how one morning the plain "fades away in various shades of blue, each getting deeper and deeper till the hills are reached, and these again in their rugged outline present many a pleasing variety of colours, all softened down with a hazy bluish tinge." After seventy days, having crossed the Altai at 8000 feet, he reached Hami, where he found that Bell had preceded him by a month. Reorganizing his party, he exchanged the camels for an *araba*, or

travelling cart, and a pony. Thence he journeyed along the southern base of the Tien Shan through Turfan to Aksu. Sending his Chinese servant by the usual route to Kashgar, he made a detour into the Kirghiz country, riding with an Afghan merchant up the Aksu valley to Ush Turfan, and over the Kara Kura or Belowti pass, the pleasantest part of the whole journey. The stage to Kashgar and Yarkand was along a well-known route much frequented by merchants and pilgrims "declaiming loudly in praise of British rule in India."

At Yarkand he received a letter from Colonel Bell suggesting that he should return to India by the direct but unexplored route across the Muztagh range, which had been abandoned by traders owing to its difficulty and the depredations of Kanjut robbers. Younghusband warmly welcomed this opportunity for further exploration. Having engaged a party of Baltis, who had crossed some years before to Yarkand, and obtained ponies and "some good strong ropes and a pickaxe or two," he set out on September 8. His route lay across the Kuen Lun to Chiragsaldi on the Yarkand river. It was supposed that the southern tributaries came straight down from the main Karakoram watershed, but he found that another range, the Aghil mountains, was interposed. This he crossed by the Aghil pass. There he was the first European to see the Karakoram from the north; at the foot of the pass flowed the unexplored Shaksgam river. The next day the party camped below the glacier descending from the Muztagh pass. After struggling for three days to get the ponies up the pass, he decided to send them round by Shahidulla and the trade route to Kashmir, and to attempt the Old Muztagh pass with a small party, the New Muztagh having been reconnoitred and found impracticable. On September 28 the pass was successfully crossed, after a hazardous descent of the precipitous ice slope on the southern side. The main obstacle on the journey had now been overcome, and the journey through Askole to Kashmir was uneventful. He finally reached Rawalpindi on November 4, seven months after leaving Peking.

In August 1889 Younghusband was again in the Karakoram to inquire into the Kanjut raids, and to report upon the passes between the Yarkand and Hunza. From Leh he took the trade route to Shahidulla and the Yarkand valley. Following the river down until he struck his route of 1887, he then turned southwards over the Aghil pass once more. Leaving his escort here he pushed on to explore the upper Shaksgam, which he took to be the headwaters of the Oprang, hoping to reach the Saltoro pass. He was obliged however to abandon the ascent of what appeared to be the main tributary glacier on account of snow storms, avalanches, and crevasses. This glacier was subsequently identified with the Urdok glacier. By an oversight Younghusband's note in his diary that the Shaksgam valley continued south-east of the junction with the Urdok was omitted from his printed report, and for many years this caused the watershed to be misplaced on the maps of this region. His identification of a great peak seen from the Shaksgam valley with K_2 also created some confusion later, as his longitudes depended upon it: it has since been shown that it was almost certainly Conway's Staircase Peak (Skyang Kangri).

Returning to his escort he moved down the Shaksgam to a tributary coming from the direction of the Muztagh pass. A short distance up this was joined by a large glacier flowing from the west. At the head of this glacier (Crevasse glacier) was a pass which he thought might be the Shimshal. After struggling for six days to make his way up it with a small party, frustrated by the many crevasses, he was obliged to return to the Shaksgam, which he followed down to its junction with the Yarkand at Chong Jangal, where he had arranged to meet a party of Kirghiz with supplies from Shahidulla. After an anxious wait, the party arrived, and he turned back up the Shaksgam to the tributary coming

down from the Shimshal. A short distance up it the road was barred by a stronghold of the Kanjut robbers. By Younghusband's courage and firmness, friendly relations were established with the garrison, and the next day he crossed the pass, the first European to do so, finding it exceptionally easy, and travelling some distance down the Shimshal valley. Having thus achieved one of the main objects of his expedition, he returned to the Yarkand on the way to the Pamirs. A day's march below Chong Jangal, he met the Russian (or rather Polish) traveller, Grombchevski, on his way from the Pamirs to explore the country north of the Muztagh. Younghusband met Grombchevski, whose name is more accurately transliterated from the Polish as Grabczewski, in Yarkand the following year. Thirty-five years later he learnt that this enterprising traveller, whom he regarded as a friend though a rival, had died in Poland from hardships endured during the Russian revolution. Leaving the Yarkand valley, Younghusband crossed the Ilisu pass and entered the more open and wind-swept valleys of the Taghdumbash Pamir. Approaching winter prevented a long stay, though he was able to visit Tashkurgan and ascend the Kunjerab pass; after three weeks he returned to Hunza over the Mintaka pass, interviewing the chief, Safder Ali Khan, at Gulmit, and thence to Kashmir.

The sketch-map, drawn by Younghusband in 1889, showing his routes through the Karakoram on these two journeys, and his interpretation of the topography, is in the Society's collections, with his copy of 'Hints to Travellers' and his diary of the 1889 journey.

In the summer of 1890, Younghusband, accompanied by George Macartney, was sent on a mission to the Pamirs. Crossing once more the dreary Karakoram pass to Yarkand, they travelled westwards to Tashkurgan, the northerly limit of his route the year before, and then through the Little and Great Pamirs as far west as Yashil Kul, the morainic lake at the head of the Alichur Pamir. Retracing their route as far as Chadir Tash, they turned northward up the Ak Baital valley, visiting two lakes, Rang Kul and Kara Kul, the latter the largest lake in the region, and an impressive sight when swept by a violent storm. Continuing north-eastwards by the Kara-art pass and the Kizil Su, he reached Kashgar from the west, where he stayed until July 1891.

He returned by the most direct route to the Pamirs, up the defile of the Gez, where he was obliged by the heavy torrent to make several detours over low but difficult passes, and down to the Little Kara Kul. There he established that the great peak, observed from Kashgar by Trotter, was not identical with the Tagharma peak visible from Tashkurgan (25,800 feet), but was a separate peak of about the same height on the opposite side of the Little Kara Kul. From Tashkurgan he followed his earlier route to the Taghdumbash Pamir, diverging from it to cross the Wakhjir pass and to ascend the Pamir-i-Wakhan to Bozai Gumbaz, where he met Colonel Yonoff and a party of Russian soldiers. Russia at that time claimed that this area lay within her sphere, and in the face of superior force Younghusband was obliged to sign an undertaking to proceed to Chinese territory, and not to return to India by any of a number of named passes. Younghusband accordingly went back over the Wakhjir, and camped for six weeks in the Kukturuk valley, north of the Kilik pass, experiencing snow-storms and very low temperatures throughout September. There he was rejoined by an adventurous traveller, Lieut. Davison, who had also been turned back by the Russians.

They then determined to make their way back to India over passes not included in Yonoff's list: "always an easy matter in those parts, for the mountains there are rarely too difficult for small parties to get over." Turning up a side valley east of the Wakhjir they found and crossed a new pass, 8 miles to

the south. On this detour they passed by a small lake joined by a stream to a glacier at the head of the Ab-i-Wakhan. The foot of this glacier was later visited by Curzon who argued that it was the true source of the Oxus. After Curzon had read his paper to the Society, and Younghusband had recalled his visit, the former replied "He, as well as anybody who has been in those regions, knows that when you track a great river up to the glacier from which it springs, you must be content to regard that as its source, and not ferret out the little streams that feed the glacier."

Arrived back in the Pamir-i-Wakhan, they once more passed through Bozai Gumbaz, seeking for a pass across the main Hindu Kush range not included in the Russian list. By careful questioning Younghusband found that there was such a pass, unknown to Europeans, but very difficult, and obtained some unwilling guides. Two days beyond Bozai Gumbaz, they ascended a side valley and a 7-mile glacier, and crossed the narrow and deep-cut pass in a snow storm and a cutting wind. The night was spent on the edge of a precipitous cliff overlooking the Karumbar valley: the next morning they found a path to the valley below, down which lay an easy route to Gilgit, which they reached on 13 October 1891.

Thus in the four-and-a-half years between March 1886 and October 1891 Captain Younghusband had, by the time he was twenty-eight, completed the three journeys which placed him among the great explorers of Central Asia. His first accounts of these explorations were given to our Society in the *Proceedings* (New Series 10 (1888) 485; 14 (1892) 205), and the Founder's Medal was awarded to him before he returned from the third. It was not advisable to disclose at once all the details of his routes in the Karakoram and Pamirs, and the maps illustrating these early papers do not always correspond closely with the narrative which he published in his famous book of 1896, 'The heart of a continent,' from which the above summary has been made. The work with the same title, published in 1937, omits Chapters I-III and IX-XVI of the earlier book, covering only the Peking to India journey of fifty years before, with an additional chapter on later travellers.

In 1890 Captain Younghusband had been transferred to the Indian Political Department, and soon after his return from the Pamirs became Political Officer in Hunza, and then Political Adviser in Chitral, where in 1893 he made a long journey with the Mehtar along the northern boundary, which is described in the *Journal* for 1895 (5 (1895) 409). Long leave in 1896-97 was spent in the Transvaal and Rhodesia, and his book 'South Africa of to-day,' published in 1898, was a valuable study of South African politics before the Boer War. In 1902 he was Resident in Indore, and in the same year his appointment as British Commissioner to Tibet began for him at thirty-nine the second great period of his life. His distinguished conduct of the Mission to Lhasa is too great a subject for narration in a brief memoir, but three of his officers have contributed their remembrance of him as a leader and a friend. His book 'India and Tibet,' published in 1910, is a masterpiece of historical and political geography. Soon after his return from Lhasa he was appointed Resident in Kashmir, and he retired from the Indian Service in 1909.

In 1919 he was elected to succeed Sir Thomas Holdich as President of the Society and next year became the first Chairman of the Mount Everest Committee, in which responsible and not always easy position his tenacity of purpose and his great knowledge of mountain travel beyond the frontiers of India were equally engaged. The relatively great successes upon the first expedition, of exploration, and the second and third, of climbing higher than has been done before or since, owed much to his enthusiasm and judgment. Mount Everest

was always in his thoughts and on his tongue: once when he meant to say Mount Erebus. In the last ten years of his life he gave most of his time to his Presidency of the World Congress of Faiths: and one may see in the seventeenth chapter of his first book of 1896 that this was no new interest but had been in his thoughts from early manhood. He died after a very brief illness shortly after the last meeting of the Congress.

To this bare outline of a long, full, and distinguished life, three of his officers on the Tibet Mission, Lieut.-Colonel Sir Frederick O'Connor, Colonel C. E. D. Ryder, and Lieut.-Colonel F. M. Bailey, wish to add their tributes to the memory of their chief.

It was in 1903 that I first met Sir Francis (then Major) Younghusband when he arrived in Sikkim as Commissioner of the Tibet Mission, and in my capacity of Secretary and Interpreter to the Mission I was constantly by his side for the next fifteen to sixteen months till, after the signature of the treaty at Lhasa in September 1904, he, with the rest of the Mission and escort, returned to India, leaving me behind as the first British Trade Agent at Gyantse. I thus came to know him very well and was able to some extent to understand his mentality and his attitude towards current events and life in general. He was a perfect chief to work under. His outstanding characteristic was, I think, his imperturbability. He was never fussed or flurried, always courteous and good-tempered, and perfectly precise in his decisions and instructions. He lived very much in a mental atmosphere of his own, and based his policy for the conduct of the Mission on certain principles carefully thought out and uninfluenced by minor considerations and expediencies. Although always ready to listen to suggestions, he never allowed himself to be swayed by any one contrary to his own deliberately formed judgment.

As an illustration of these characteristics I may mention the occasion when he calmly announced to me one morning his intention of riding over, unescorted, from our camp at Tuna to the Headquarters of the Tibetan army a few miles away, with the object of having a heart-to-heart talk with their leaders. He thought that he might be able to induce them, and through them to persuade the Lhasa Government, to take a more reasonable view regarding the purpose of our mission, and so to avert the fighting and bloodshed which now appeared inevitable. It is a matter of history how, accompanied only by myself and a young officer of the Sikh Pioneers, he rode into the hostile camp, conferred for a couple of hours with the Tibetan Generals and Lamas, and rode back again unmolested. But it was touch and go. I know that we were within an ace of being arrested, and I believe it was only his superb aplomb and coolness that saved us. There is no denying that, however good the intention, it was an unduly risky proceeding, and if we had been made prisoners it would have created a most embarrassing situation for our Government. But he had thought it all out carefully, and he acted as his conscience directed from the highest motives.

Similarly at Lhasa, when the rapid conclusion of a treaty became a matter of urgency and time did not allow of references back to our government, he acted on his own judgment, formulated terms (some of which were afterwards disavowed by the British, not by the Tibetan Government, as too severe), presented an ultimatum to the Tibetan Government, and secured the signature of the treaty on the date he had fixed. It was a great achievement and showed immense moral courage and self-confidence. There are not many men who could have done it,

or who, especially in view of our somewhat drastic proceedings both military and diplomatic, could also have left behind so friendly an atmosphere. He may be criticized, and indeed he was severely criticized at the time, but the broad fact remains that he was successful, and in my opinion his success was due to a great extent to his remarkable gifts of character: courage, sincerity, and broad-mindedness, based upon the principles and the philosophy which he had elaborated for himself and which guided him throughout his life.

FREDERICK O'CONNOR.

Frank Younghusband had the quality not only of extracting devotion and the best work possible from his subordinates but also that of loyalty to them and of supporting them through thick and thin. I speak feelingly as on the Lhasa Mission, when I was in charge of the Survey, I was at first definitely under Younghusband and with his permission started to explore and survey the Chumli valley. Here I was met by the General commanding Younghusband's escort and ordered to return. I did so but referred the matter to Younghusband for a decision, under whose orders I was. Naturally, as he was a well-known explorer, I wanted to be under him, and so by higher authority it was decided, with the proviso that "if military considerations predominated" the Survey party was to be under the General. When later on we were attacked at our post outside Gyantse in the very early morning and collected on the roof of the main house, Younghusband said to me with a laugh, "I'm afraid military considerations predominate." And so it was that for the rest of the time I was under the General, but always had the warmest support from Younghusband whenever I wanted to get surveys carried out: especially was this the case with the proposed trip down the Brahmaputra, which was negated by the Viceroy, and with that up the same river, which Rawling and I, supported by Bailey and Wood, so satisfactorily carried out. But, throughout, the mainspring of any enterprise was Younghusband's. He had a most loveable character and we all loved and admired him.

C. H. D. RYDER.

As a very junior officer I owed a great deal to my contact with Younghusband. Several lessons remain prominently in my memory.

First: If you are offered an appointment and *want* it badly, rush at it! The proposed mission to Tibet in the 'eighties of last century was abandoned because the leader went to London and Peking to make arrangements. When Younghusband was ordered to Kampa Dzong in 1903 he came at once to Sikkim, picked up a double company of my regiment, the 32nd Pioneers, who were making roads, and marched them straight up to Kampa Dzong without any fuss or publicity.

Second: His marvellous calmness, patience, and persistence in his difficult negotiations with the Tibetans. I was present at many of his meetings with them. Their arguments were so hollow, full of repetitions, and so easily confuted that one felt inclined to interrupt and tell them to stick to the point and not talk nonsense. Younghusband was perfectly patient through it all, repeated his side of the question with calmness and, as we know, finally wore them down. It must be remembered that he had not *all* the military strength on his side; the Tibetans had that grand ally winter, and in what Younghusband had to do he was restricted by a narrow time limit.

Thirdly: It does not do simply to know the right thing and to do it, but you must also persuade your superiors that you are right. This was not easy with a Foreign Office in Simla cut off from realities in connection with the North-East Frontier—now, in 1942, unexpectedly a locality of such critical

importance. In this connection I may perhaps be allowed to quote from an encouraging private letter written to me many years ago:

"You will, of course, have heaps of heart-breaking disappointments in the future, for the dear old Political Department is a most maddening service, and for years you are treated as if you are a dangerous lunatic whom it would be unsafe to allow at large. But then the wheel comes round again and they suddenly discover that there never was such a splendid fellow as yourself . . . and clean away through increase your efficiency as much as you possibly can. That is where we generally fail. We have heaps of pluck and spirit and all that kind of thing but we often lack—I have felt it myself—what can only be acquired by good hard training and intellectual effort. You have to learn how to fight official battles, not for your personal advancement but for the job you are on whatever it may be. There is a point, of course, when, as a servant of Government, you have to accept their orders and there is an end of the matter. The responsibility for results rests with them and not with you. But, in the Political Department especially, it is the duty of the local officer to get the local views before Government with all the force he can, and I think it is well to learn young how to do this effectively. Lord Cromer is a splendid instance of a man who learned how to manipulate governments for his local purposes. . . . Perhaps we might still have been in the Chumli Valley if I had known better how to handle Government. The first essential is to *know* them, know their way of looking at things, and when you have learned all this you have to learn how to present your case to them in such a way as to ruffle up as few as possible of their prejudices and enlist as many as possible of their sympathies."

My excuse for this long quotation is that I think it reveals the character of this great man and his willingness to help a young man early in his career. I only wish I had paid more attention to this advice which should be drummed into all young officers who aspire to a similar career. Younghusband wrote a good deal more on this subject in Chapter IX of 'The light of experience.' The whole of this chapter should be studied both by every young frontier officer and also by his superiors who have to deal with him and his problems.

Younghusband had the power of extracting the best from his subordinates and inspiring in them respect and admiration to an extraordinary extent. I shall never forget his departure from Lhasa. I was one of a small escort of mounted infantry who accompanied him by double marches to Gyantse: the Treaty in a despatch box on which I was told that I had "better put a special guard." The troops followed us down the road cheering him for half a mile.

F. M. BAILEY.

A new gas-line connecting Larette in Louisiana with the port of Mobile in Alabama, 200 miles away, crosses the bed of the Mississippi and then for 25 miles lies on the floor of Lake Pontchartrain, so as to short-circuit a much longer detour across swamp land. Laying this lake-bed pipe was itself no small feat, the sections being welded on shore into lengths of 2500 feet and proofed against attack from brackish water before being floated into place, suspended from caissons, and then jointed together on the laying ship before being gently submerged to their final resting place on the bottom.

Most of these recent developments which were brought about to meet the war emergency will, like the spreading network of high-tension power lines, become part of the permanent post-war economy and are destined to play important roles in the peace-time welfare of the petroleum industry in days to come.

NOTES ON ALEXANDER'S CROSSING OF THE TIGRIS AND THE BATTLE OF ARBELA

SIR AUREL STEIN, K.C.I.E., F.B.A.

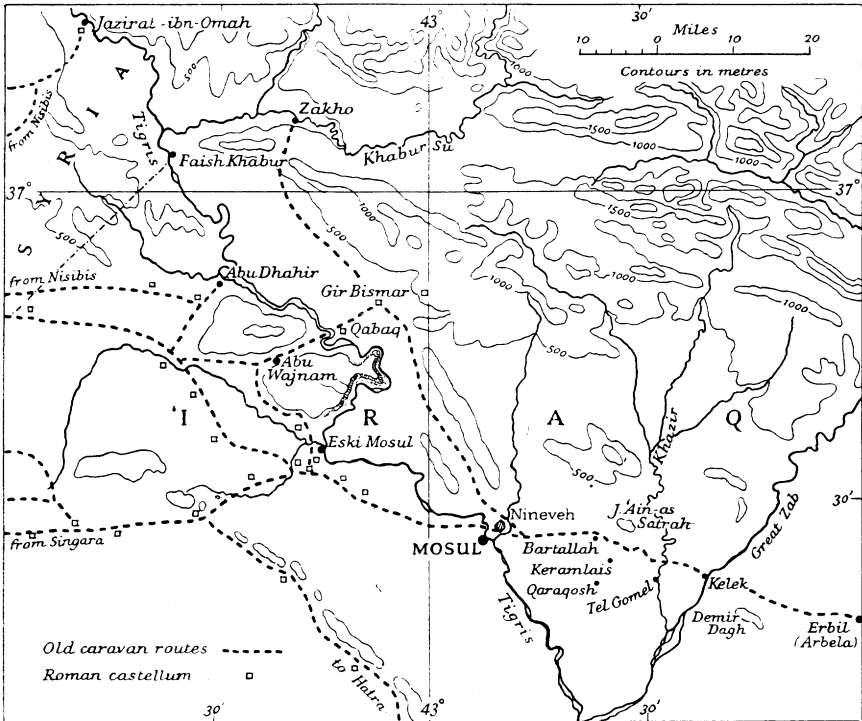
THE explorations I was able to devote in 1938 and 1939 to a survey of Roman frontier defences on the Mesopotamian *Limes* (*Geogr. J.* 92 (1938) 62-66; 95 (1940) 428-438) offered opportunities to gain some closer acquaintance with the ground which had witnessed Alexander's operations in his final campaign against Darius. In the detailed report on my survey of Rome's easternmost *Limes* in 'Iraq and Transjordan, I have discussed the results of my observations. But that report, completed since 1941 with all needful maps and other illustrations, must under the conditions prevailing necessarily await publication for some time. This consideration provides a special reason for recording my observations on the topography of Alexander's campaign on the Middle Tigris separately. I am encouraged to do it since my friend Dr. W. Tarn from his unequalled acquaintance with the literature on Hellenic enterprise in the East assures me that this particular phase in Alexander's exploits has not, so far as he knows, received recent treatment.

All the classical accounts agree in stating that after Alexander had crossed the Euphrates on bridges thrown over the river at Thapsacus he rapidly marched on towards the Tigris and passed his army across it by fording. There is agreement also that though the passage was left unopposed by the Persians it was effected only with much difficulty owing to the depth and swiftness of the river.¹ No information is given by any of Alexander's historians as to the exact ford used. It has often been assumed since Ritter's work and, perhaps, by others also before,² that this crossing, the difficulties of

¹ See Arrian, 'Anabasis,' III, vii, 5; Curtius, 'Historiae,' IV, ix, 15 ff.; Diodorus, 'Bibliotheca,' XVII, lv, 2 ff.

² See Carl Ritter, 'Die Erdkunde,' vol. X (1844) 25; also Herzfeld, 'Archaeologische Reise,' vol. I, 145 ff.

which both Curtius and Diodorus describe at some length, took place at Jazīrat-ibn-Omar, usually identified, though, perhaps, without adequate reason, with the Roman stronghold of Bezabde or Sapha. But there is no evidence supporting this, and a statement of Arrian, who is always more useful than other classical writers as regards the topography of Alexander's operations, distinctly militates against it. We are told by him that "on leaving the Tigris, Alexander passed through the country of Atyria (Assyria) with the Gordyaeen mountains on his left and the Tigris on his right." Farther on we learn that on the fourth day after the crossing "the Macedonian scouts first sighted the enemy cavalry over the plain." When the Persian horsemen had



been put to flight and some captured it was learned from these "that Darius was not far off with a large army."¹ Arrian also records that "on receiving this information from the captured Persian scouts, Alexander stopped where he had received it, for four days; he rested his army after their march and strengthened his camp by a ditch and palisades" (Arrian, 'Anabasis,' III, ix, 1).

As regards the place to which the four days' march had brought Alexander's army we are fortunately helped by Curtius. He does not mention the time taken by the troops to reach it; but he definitely tells us that Alexander, on

¹ Arrian, 'Anabasis,' III, vii, 7; viii, 1 ff. Here and elsewhere passages are as translated by E. I. Robson in The Loeb Classical Library edition.

receiving information about Darius' army being within 150 stadia or about 19 miles, halted his troops and encamped for four days.¹ Reckoning this distance from the position where, as we shall presently see, the site of Gaugamela and its battlefield can be placed with certainty, we must assume that Alexander halted his army on the fourth day of its march in the vicinity of Nineveh, opposite to Mosul. From a variety of topographical and other indications it may be safely concluded that a halt at the site of this ancient capital, commanding important roads in different directions, must have offered distinct advantages to Alexander's army.

The accompanying sketch-map shows that the ford used for Alexander's crossing of the Tigris must be looked for considerably lower down the river than at Jazīrat-ibn-Omar, for the distance between the latter place and the site of Nineveh by the most direct route is fully 100 miles and the marching distance, taking into account road windings due to deep-cut drainage beds descending from the outer Kurdistān hills, must be a good deal more. In addition the considerable Khābūr river presents a serious obstacle. It is obvious that, starting after a difficult crossing, the Macedonian army, encumbered as it was with a heavy baggage train, could not have arrived from Jazīrat-ibn-Omar on the fourth day where Darius' mounted scouts were sighted and encountered in the plain, *i.e.* east of Nineveh. How heavy that train of the army must have been is shown by Curtius' statement that Alexander's force depended on supplies carried along with it, owing to the devastation of the country beyond the Tigris by Mazaeus, the commander of Darius' advance guard. Moreover the captive harem of Darius, treated with all royal honour, was being brought along with the army. Even if Alexander's crossing were assumed to have taken place at Faish Khābūr, a ford about 23 miles lower down, the distance to Nineveh would still have been too great to be covered by the four marches of Arrian's account.

Below Faish Khābūr only two places can come into consideration for fording with a large force after the floods of spring and summer have subsided. They are near the fairly large villages of Abū Dhāhir and Abū Wajnam. At both places easy saddles in the low but rugged chain of hills stretching along the right bank provide convenient approach to the river from the open valley plain which extends from Nisibis south-eastward. I have shown elsewhere that this broad corridor has always served as a natural route for invasion of north-western Mesopotamia (*Geogr. J.* 92 (1938) 65). The approximate road distances to Nineveh, about 69 miles from Abū Dhāhir and 57 from near Abū Wajnam are such as might well be covered in the course of four marches even by a heavily encumbered army.

Several indications point to the second of these as the likely position of Alexander's crossing. East of Abū Wajnam, which extensive remains of ruined structures mark as old, there is a gently sloping saddle down to a wide loop of the Tigris. There a ford leads across to a flat tongue of alluvial ground on the left bank. While distant from libraries I must confine myself to two references to the use of this ford gathered from the great storehouse of Ritter. It is near Abū Wajnam that Dupré, travelling from Nusaybin (anc.

¹ Curtius, 'Historiae,' IV, x, 15. The rough equation in miles is based on the assumption that the Attic stade is meant.

Nisibis) towards Mosul in October, 1808, forded the river on horseback.¹ Again, in the account given of Sultān Murād IV's march of conquest upon Baghdād² the Turkish army is said to have crossed the Tigris to the left bank after six days' march from Nusaybin at a point which lay at a distance of ten hours' journey above Eski Mosul. These distances agree closely with the crossing near Abū Wajnam.³

For the use of this ford in ancient times we have archaeological evidence. Guided first by observation from the air, I was able to trace in its vicinity the remains of two Roman *castella* which could only have served for watching the approach to this river crossing. One of them occupies a position on the left bank of the Tigris overlooking the ford which leads from the side of Abū Wajnam across a large loop of the river to the village of Qabaq. The other *castellum* is found some 6 miles farther north-east at Gir Bismār, where the route from the ford joins the present high road towards Nineveh. It is likely that these Roman *castella* date from the short-lived extension of Roman control to Adiabene under Trajan and the preceding crossing of the Tigris by Trajan's army.³ Our information on Trajan's operations in this direction is very scanty, but one may suggest that the placing of these *castella* had something to do with a surviving tradition of Alexander on his invasion having crossed the Tigris here. There are some indications that Trajan in his Mesopotamian campaign was influenced by recollections of Alexander's more successful and lasting conquest, and that to some extent he endeavoured to emulate it (Guey, 'Essai sur la guerre parthique de Trajan').

However this may be, Alexander's line of advance from the fording place to meet Darius did not lie along the greatly winding course of the Tigris but by the direct route leading, like the present high-road, along the foot of the outermost Kurdish hill chain to Nineveh. Arrian clearly indicates this where he makes Alexander pass between "the Gordyaeon mountains on his left and the Tigris on his right."

¹ See Ritter, 'Erdkunde,' vol. xi, 428 ff., quoting Dupré, 'Voyages,' vol. 1, 114. The mention of Telmus, *i.e.* present Tell Mūs, on the way followed by Dupré from the caravan route to the ford, makes it certain that by the ruined village he passed before descending to the river, Abū Wajnam is meant.

² See Ritter, 'Erdkunde,' vol. xi, 153. Whether the ford of which Kinneir, 'Journey through Asia Minor,' p. 457, as quoted by Ritter, had heard in the vicinity of Eski Mosul as the only one passable in the summer, is the one at Abū Wajnam, is uncertain.

³ For a succinct account of the information to be gathered from Dion Cassius (LXVIII, 27-28) about the Roman crossing of the Tigris on Trajan's campaign, in the winter of 115-116, see Guey, 'Essai sur la guerre parthique de Trajan' (Bibliothèque d'Istros, 1937). The passage of the Tigris valiantly contested by the Cardukoi, *i.e.* the Kurds, of Adiabene is said to have lain *κατὰ τὸ καρδύηνον ὄρος*, *i.e.* below the Kurdistan foothills.

In order to facilitate the crossing Trajan had small boats constructed at Nisibis with timber from the forests of Mygdonia and transported on carts to the bank of the Tigris. The distance from Nisibis to the Tigris ford and ferry near Abū Wajnam is somewhat greater than to the crossing-place at Jazīrat-ibn-Omar. But the transport of boats over the flat valley plain of the corridor stretching all the way from Nisibis down to Abū Wajnam would have been far easier than along the stony foothills of Mons Masius to be followed on the way from Nisibis to Jazīrat-ibn-Omar. I regret that neither the text of Dion Cassius nor Longden, "Notes on the Parthian campaigns of Trajan," *J. Roy. Soc.* 21 (1931) 13, note 5, quoted by Guey, is at present accessible to me.

Having followed the Macedonian army's march so far, we may now question the correct location of the great battle which played so decisive a part in shaping the relations between the classical West and the Middle East. There was doubt already in ancient times on this point as is shown by the critical remarks with which Arrian judiciously treats "the universal tradition . . . that the last battle with Darius . . . took place at Arbēla." "But most historians state that Arbēla was six hundred stades away from the place where Darius and Alexander fought their last battle: those who make the distance least, put it at five hundred stades. But Ptolemaeus and Aristobulus state that the battle took place at Gaugamela by the river Bumōdus. Gaugamela, moreover, was not a city, but a large village; it was not an important place, and the name has rather an awkward sound; and thus, as I opine, Arbēla, being a city, carried off the glory of this great battle."¹

Neither at the time of my visits to this ground nor since have I been in a position to collect and consider the various opinions which scholars have expressed before as to the exact position of the battlefield in the light of such cartographical information as was available to them at the time. But when on 26 November 1938 I was on my way from Mosul to Erbil, I closely examined the area which could come into consideration with the accurate topographical evidence from the 1/2-inch-scale map sheets Nos. 137.P.S.W. and 137.P.S.E. of the 'Iraq Survey. The observations then made, confirmed on my subsequent passage over this ground a year later, have convinced me that, by comparing significant topographical features of the ground with such clear indications as are given by the classical texts, the battlefield can be definitely determined.

The essential evidence is supplied by Arrian, where he tells us: "With this army Darius had encamped at Gaugamela by the river Bumōdus, about six hundred stadia from the city Arbēla, in a position level on all sides; for what few uneven parts for cavalry there had been the Persians had mostly made convenient both for chariot driving and for cavalry to ride over" (Arrian, III, viii, 7). This unequivocal statement as to the battle having taken place near the river Bumōdus is all the more important as it is based on the authority of Ptolemaeus and Aristobulus, who both shared Alexander's campaign in prominent positions.² Arrian in his detailed account of the battle does not mention the Bumōdus (or Bumēlus) again. But as he tells us that Alexander when pursuing Darius on his flight crossed the river Lycus before reaching Arbēla next day, it is certain that by the Bumōdus must be meant a river to

¹ Arrian, VI, xi, 4 ff.; Robson, whose translation is here quoted, puts the river name as Bumōdus in agreement with Arrian's text, III, viii, 7, but points out that the text has *Βουμήλω*; Curtius, IV, ix, 10, has also *Bumelo*.

² See Arrian's statement, VI, xi, 5. It must be specially noted that this passage, as it stands, does not imply the authority of Ptolemaeus and Aristobulus for the distance between the place of battle and Arbēla. That estimate, whether 600 stades, as attributed in that passage to "most historians," or 500 stades given as that of "those who make the distance least," is impossible. The distance between Gaugamela and Arbēla, according to the positions indicated by Ptolemy, 'Geographia,' VI, i, 5, is either 200 or 320 stades, but the coordinate readings are uncertain. The former distance would approximately agree with the distance from Erbil to the river Khāzīr. But no reliance can be placed on Ptolemy's mapping. For the supposed distance derived from the latter, see Herzfeld, 'Archaeologische Reise,' i, 144, note.

the west of the Great Zab, the identity of which with the Lycus cannot be doubted. The only river which any route from the vicinity of Mosul can cross before reaching the Great Zab is the Khāzir, a tributary of the Zab but far smaller and fordable during most of the year. The direct high-road, connecting Mosul with Erbil and used to the present day, leads across the Khāzir at a distance of about 5 miles in a straight line to the north-west of Kelek. This, as its very name shows, is the traditional crossing-place of the Great Zab on the high-road.

We are told by Curtius that Darius, after depositing most of his stores at the town of Arbēla, had the Lycus river bridged and in the course of five days passed his army across it. Proceeding hence for close on 80 stades he encamped at another river called Bumēlo: "It was ground suitable for deploying the forces, a uniform great plain. No trunks or brushwood cover the soil, and an open view is offered to the eyes even to distant objects, and wherever ground rose higher he (Darius) ordered the whole space to be levelled and extended" (Curtius, IV, ix, 9 ff.). From Curtius' elaborate and highly rhetorical account of the great contest no definite topographical indications can be gathered. In his description of the Persians' flight after the fate of the battle was decided, no mention is made again of the Bumēlo river. But we are told of the disaster which attended their retreat to Arbēla when the bridge across the Lycus could no longer withstand the onrush of the fugitive host (Curtius, IV, xvi, 16 ff.). Curtius' statement that Darius on his flight after the battle reached Arbēla close on midnight is credible and of special interest. It proves how greatly exaggerated was the general belief which, as Arrian records with just doubt, put the battlefield at 600 or 500 stades (roughly 75 or 62½ miles, respectively) away from Arbēla. The more succinct account given by Diodorus of the battle and the moves of the armies preceding it furnish no topographical indications. But it mentions that Darius was induced to lead his forces towards Ninos or Nineveh by the advantage which the open plain of that region could offer for the disposition and full use of his huge host (Diodorus, XVII, liii, 4).

From this rapid review of the essential classical notices bearing on the battlefield we may now turn to the evidence of the ground. From Erbil, the undisputed site of Arbēla of which it perpetuates the name, towards Nineveh by the line which the high-road must have followed in ancient times as it does now, the ground slopes gently flanked on the south by the hill chain of the Demir-dāgh. After about 23 miles the Great Zab is reached where now a long iron bridge leads across to the village of Kelek. Beyond the Great Zab there stretches much broken hilly ground where the battle could not possibly have been fought. After crossing this ground for 6 miles, the high-road takes us to a point on the Khāzir river, the Bumōdus, flowing in a winding bed from north to south where the bed is wide and easily fordable, except at times of heavy rain floods.

Beyond this there lies open ground giving access after 2 miles to a remarkably level plain steadily widening towards the north-west. As the sketch-map shows, this plain extends for fully 8 miles from south-east to north-west with a maximum width of about 7 miles. On the south it is flanked by low flat-topped hills trending towards the Tigris and rising to heights of a little over

1000 feet above sea-level. On the north the wide plain is overlooked by the steep Jabal 'Ain-as-Satrah culminating in a rugged crest at a height of 2200 feet. Near the large village of Bartallah, a flourishing place of Catholic Jacobites, the foot of the Jabal 'Ain-as-Satrah is approached by a low outlier of the southern hill chain stretching to the north-east. Here the level plain which concerns us may be considered to end.

On a line running from Bartallah due south as far as the village of Qaraqosh the ground is very flat. When passing across it with a motor car I noticed only one insignificant shallow drainage channel. The watershed which the map indicates between a wadi farther west draining into the Tigris and a small brook fed by springs near the large village of Keramlais was quite imperceptible to the eye. Only at one point on this fertile well-cultivated plain is there a marked elevation. It is a small but in its isolation very conspicuous mound, unmistakably artificial and probably of prehistoric origin, some 300 yards to the west of the nearest dwellings of Keramlais. It rises steeply to some 70 feet above the level ground and measures about 120 feet across its flat top. Into its foot has been built a small and apparently old church, one of the three which serve the spiritual needs of the five hundred odd Jacobite households of Keramlais. The mound would have served as an excellent observation post to watch the course of the fighting had Darius chosen, as his ancestor Xerxes did at Salamis, to be a spectator of the battle instead of sharing the fray. It was easy to see, both from the top of the mound and on the ground below, how admirably the flat plain fits the description given by both Arrian and Curtius of the wide field of battle which the Persians had taken care to choose and prepare for easy movement of both cavalry and chariots. The great advantage that the battle was fought in the month of October (331 B.C.) should be remembered (Arrian, III, xv, 7). This was before the autumn rains had started and when after the long dry season of the Assyrian plains the surface even of irrigated ground must have been very firm and hard.

This is not the occasion to discuss the disposition of the forces on both sides and the development of the action. Arrian's account, written with the author's military knowledge, presents it very clearly in its successive phases. Arrian tells us that when Alexander after the four days' halt, close to Nineveh as we must assume, had brought up his forces in battle array about dawn to within 60 stades of the Persian position, the two armies "did not as yet sight one another; for there were hillocks (*γῆλοφοὶ*) intervening in front of both (*ἐπίπροσθεν*). When Alexander was about 30 stades away and his army was already descending these hillocks sighting the barbarians, he drew up there his phalanx." After taking council with his generals Alexander on Parmenio's advice encamped and then, taking with him the light-armed troops and territorial cavalry, rode all round surveying the ground which was to be the battlefield (Arrian, III, ix, 2 ff.). After this reconnaissance he let his army take their meal and rest. Deciding against a night attack as recommended by Parmenio, he resolved upon action on the morrow (Arrian, III, x, 1 ff.). On the Persian side we are told that "Darius and his army remained during the night marshalled in the order which they had drawn up at first; for they had no proper entrenched camp" (Arrian, III, xi, 1).

If we follow the direct line from the left bank of the Tigris below Nineveh towards the flat plain above described we can see that a march to within 60 stades or $7\frac{1}{2}$ miles of the Persian position, assuming this to be aligned near the middle of the plain about Keramlais, would have carried Alexander's force to a fold of lower ground north of that outlier of the hill chain which stretches, as shown by the 100-foot contour of the $\frac{1}{2}$ -inch map, from the left bank of the Tigris towards the northern extremity of the plain near the village of Bartallah. From this ground the Persian array would certainly not be visible. But an onward march of 30 stades or $3\frac{3}{4}$ miles across that low outlier would have brought Alexander's troops to its southern foot and thus approximately to the position marked by the village of Minārah Shebek on the north-western edge of the plain.

We have to take into account the great size of Darius' army, comprising contingents from the most distant parts of the Empire and estimated in Arrian's record at 40,000 horse and 1,000,000 foot. It seems clear that a host so great, even allowing for exaggeration in numbers, could be drawn up in the array which Arrian describes on the authority of Aristobulus from captured Persian records only where the plain was sufficiently wide. Such a width, in the westward direction from which the Macedonian attack was bound to come, is shown by the plain first on a line running approximately from near Qaraqosh in the south past Keramlais to the foot of the Jabal 'Ain-as-Satrah.

The latter provided safe protection for the Persian army's right flank against any mounted attack. Similar though less effective flanking defence on the left flank might have been sought on the lower hills stretching along the southern edge of the plain past Qaraqosh. The high mound close to Keramlais with its commanding prospect was not likely to be left outside the line assigned to the Persian army when arrayed for battle. The natural flanking protection afforded by hills may have had something to do with the Persians having had no proper entrenched camp. This fact is emphasized by Arrian as having "more than anything else hampered the fortunes of the Persians at this crisis," as it implied for them a long stand under arms preceding the day of battle (Arrian, III, xi, 1 ff.).

In Arrian's account of the actual battle, we find some indication of the ground in what we are told of the initial operation on the Macedonian right wing. This Alexander himself commanded, having with him the royal squadron. He is said to have "led off his men rather in the direction of his right, on which the Persians moved accordingly, their left far outflanking the Greeks. Already the Scythian cavalry, riding parallel with the Greeks, found touch with the troops posted in front of Alexander's main body; but Alexander still continued steadily his march towards his right, and was nearly clear of the ground which had been trampled level by the Persians," until Darius became "afraid lest—if the Macedonians reached the uneven ground—his chariots would be of no service" (Arrian, III, xiii, 1 ff.).

There is no need for us to follow the manoeuvres by which Darius attempted to insure that "the Greeks might not prolong their wing any further," nor the subsequent course of the fighting. This definite reference to the uneven ground at which Alexander with his right wing aimed by the

steady move to the right is fully understood if we look at the map. It shows clearly that by moving his wing to the right Alexander was bound to reach the higher ground where it skirts the southern edge of the plain marked by the hill contours beyond Qaraqosh. There the artificial levelling could no longer serve the Persians for the use of their scythe-armed chariots.

Curtius mentions a hill on which Mazaeus, sent ahead by Darius on a reconnaissance, had placed himself and which the Macedonians subsequently occupied. This agrees with the ground as described above (Curtius, IV, xii, 18 ff.). Similarly we may, perhaps, recognize some reference to the height of the Jabal 'Aīn-as-Satrah in the passage which rhetorically describes how Alexander lying sleepless during the night preceding the battle pondered whether he ought to attack the Persian right *e iugo montis* or charge the enemy straight in front (Curtius, IV, xiii, 16).

What we learn from Alexander's historians of the pursuit of Darius and his vanquished hosts which brought the great conqueror to Arbēla and secured to him all the royal treasures there deposited, does not help us to determine the exact ground where the hard-won victory was achieved which gave Alexander domination over the vast Achaemenian empire and finally opened the way for Hellenistic penetration into Asia. The estimate of distance from the battlefield to Arbēla as 600 or 500 stades, as we have seen, is certainly much exaggerated.¹ The distance between Arbēla, or Erbil, and the Bumōdus or Khāzir river where Darius' camp is stated to have stood, is in reality less than 30 miles along the present high-road. This, considering the topography, must always have been the line followed by traffic.

Whatever may be the explanation for this error in recording the distance, it is significant that Arrian quotes it in the same place where he records his just dissent from the "universal tradition which has it that the last battle with Darius took place at Arbēla." We have equal cause to be grateful also for Arrian's critical judgement where he quotes the authority of Ptolemaeus and Aristobulus for the definite statement "that the battle took place at Gaugamela by the river Bumōdus" and rightly explains the reason for this instead of the prevailing but erroneous location.

To Arbēla that fame has clung ever since. The huge mound, probably of prehistoric origin, on which the town of Erbil stands, still rises, conspicuous from great distance, as if it were a monument to commemorate the great event. But Gaugamela, too, has left its mark on the ground, be it only by its name, to confirm the true site. Long after the above discussed topographical indications had led me to recognize in the plain near Keramlais the site where the battle was fought, I found in a brief note of Professor Herzfeld the name of Tel Gōmel identified with that of Gaugamela (Sarre-Herzfeld, 'Archaeologische Reise,' I, p. 144). Unaware of this identification, convincing enough on philological grounds, I did not at the time visit the locality. Nor is its name to be found in the 'Iraq Survey's map. But I have since been kindly informed by Mr. Taylor, Chief Engineer of the 'Iraq Petroleum Company,

¹ Arrian, VI, xi, 5. It is assumed that Attic stades are meant. Even if Bematists' stades instead of Attic stades were intended in Arrian's text, the distance estimate, at the usual rough reckoning of 1 : 34, would be too great.

Kirkuk, that the War Office Map, 1 : 125,000, No. J 38/T, marks Tel Gōmel about 6 miles due north of the confluence of the Khāzir with the Great Zab. This takes us to a point on the Khāzir river, just 6 miles south-east of Keramlais and on the direct track leading to the latter place from Kelek. Gaugamela by the Bumōdus was the place where Darius' army was encamped (Arrian, III, viii, 7). Professor Herzfeld's identification of the name of Tel Gōmel, derived from Gaugamela, can hence be accepted as confirming the battlefield we arrived at on purely topographical grounds.

The observations set forth may be held to illustrate once again the words of a great strategist and student of history: "The locality is the surviving portion of an event that has long passed by. . . . It often restores to clearness the picture which history has preserved in half-effaced outlines" (Helmuth von Moltke).

Since the chapter of the report on my *Limes* explorations was written from which the above pages are extracted, information kindly given me by Dr. W. Tarn in a letter dated 27 December 1940 has brought to my notice that Droysen, guided mainly by a sketch-map by Černik (*Petermann's Mitt.* No. 45) of the caravan road from Erbil to Mosul, had in the second edition of his great work, 'Geschichte des Hellenismus' (1877), quite rightly placed the battlefield near the village of Keramlais (or Keremlis as he calls it); and that in this other writers have since followed that great scholar. Unable to gain access in India either to Droysen's text or to Černik's sketch-map, I am left in doubt as to what extent the imperfect topographical data available at the time may account for Droysen's suggestion that Keremlis is Gaugamela where Darius' army was encamped, and the small brook which flows near the village is the river Bumōdus. In view of the greater knowledge of the ground now secured this identification can no longer recommend itself.