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GEOGRAPHICAL JOURNAL

Vol CVII Nos 1, 2 R.G.S. *Jan.—Feb. 1946*

UPPER BURMA, 1943–44

BRIGADIER BERNARD FERGUSSON

Evening Meeting of the Society, 29 October 1945

FOR TWO reasons I am conscious of a certain diffidence in reading the following paper before the Royal Geographical Society. First, my companions and I were engaged primarily on fighting the Japanese; and, being somewhat preoccupied with that aspect, we did not turn our opportunities to account. Secondly, the country and the experience were both new to us; so that we were not really qualified to know how much of what we saw and of what we experienced was new and original. Many travellers, such as Mr. Kingdon Ward, Mr. Kaulback, and Mr. Hanbury-Tracy, have covered far greater distances and spent much more time in the country. I therefore think I had best start by defining the area which we got to know so well, and by giving a very brief summary of the two distinct expeditions.

To travellers such as those whom I have mentioned, I fear that our stamping ground will seem rather surburban. When we talked about Upper Burma, we meant the area bounded on the west by the river Chindwin, on the north by the approximate area of Myitkyina, on the east by the Chinese frontier, and on the south by latitude 23°. That was our cockpit. The marches which we had to make in approaching or in disengaging from our enemy took us through different country, less well known to Europeans. For instance in 1943 a party led by Major Kenneth Gilkes disengaged by marching into Yunnan through the Kaolikung Hills, and in 1944 I led my brigade in over a part of the Patkai Hills which I believe not to have been previously traversed. But the country over which we fought, and which we got to know so well, was mostly country which was worked in peace time by one or other of the big timber firms. In shape it resembles an inverted horseshoe, surrounded on three sides by high mountains, and ridged internally by the valleys of the Irrawaddy and the Chindwin.

The first expedition led by the late General Wingate may be said to have lasted from 12 February 1943, when his first party crossed the Chindwin, until the middle of June of the same year, when the last considerable party reached

safety. The second can be taken as having begun in the first week of February 1944, when the 16th Infantry Brigade started over the Patkai Hills, and ended in August of the same year, when the last troops marched out through the American-Chinese lines near Mogaung. In those twenty months, there were thus only seven when the Japanese were wholly free from Chindit operations.

The scope and purpose of each year's campaign must be briefly described. In 1943, the force consisted of one battalion of British, one battalion of Gurkha, and one battalion of Burman troops. I use the word "Burman" in its widest sense, implying "inhabitants of Burma," for in actual fact there was only one Burmese in the whole expedition: the remainder were Kachin, Karen, or Chin. The original object was to further the projected invasion of Burma by our forces in India, by preceding them and harassing the Japanese defence by operations far behind their front line. Unfortunately the hoped-for offensive could not be mounted; and it was only after some pleading that General Wingate obtained from General Wavell permission to cross the Chindwin (the "Jordan" was our nickname for it) and to carry out our task unsupported.

Three months later, over 60 per cent. of the Force had returned safely. All had gone well until we allowed ourselves to be surrounded in that awkward triangle of rivers south and south-east of the junction of the Irrawaddy and Shweli. Hemmed in on three sides by Japanese and by the rivers, we had to break through the ring surrounding us by splitting into small parties. There were not enough wireless sets to ensure that supplies could reach us all; and there was a good deal of suffering on short commons. My own column's casualties were the heaviest. Out of three hundred and eighteen men who came in with me, only ninety-five got back to India. Of the remainder, some were battle casualties, some died of starvation or disease, some were drowned; one hundred and forty fell into Japanese hands, and of these one hundred and twelve died. Twenty-seven were rescued in Rangoon in May of this year, and one more has been found in Malaya, whither he was removed by the enemy. I give these appalling figures both to show what a beastly enemy the Japanese was, and to indicate why we were all so loath to become his prisoner.

The achievement of that first expedition was not spectacular but it provided useful experience. We learned a great deal about tactics, about the shortcomings (as well as the virtues) of the Japanese as a fighting man, about the military topography of the country, and about the enemy's communication system. We also proved that supply-dropping was feasible. On the credit side also we had some considerable damage to the Mandalay–Myitkyina railway; a number of dead Japanese; and the fact that we had put them off their stroke, and caused them to call off more than one projected operation.

So much for 1943. The year 1944 was a different affair altogether. This time we went in in great strength, and strongly supported by a private American Air Force with which we had been endowed by President Roosevelt. The President had been greatly shocked to learn that in 1943 we had had no means of getting out our sick and wounded, who had had to be abandoned if they could not walk. He therefore gave us no less than four squadrons of light aircraft which could land in under 300 yards on rough runways prepared in twenty minutes or half an hour, by removing the bunds (or *Kezins* as they

call them in Burma) from paddy fields. Although their primary function was the evacuation of wounded, they were also extremely useful for reconnaissance and liaison flights. In addition, we had a squadron of bombers and another of fighters, whom we came to know intimately during training, and whose work was integrated with ours to a degree never achieved elsewhere. We had also a magnificent corps of gliders and glider pilots, and a fleet of transport aircraft of our own. In fact, we were so well equipped as regards air forces that every column, except those of my own brigade, were flown into our combat area 150 miles beyond the Chindwin, amounting in all to something like fifteen thousand men and two thousand animals.

The 1944 campaign was in every respect more ambitious. Until the death of General Wingate in an aircrash, during the last week of March, the plan was to seize and hold the vital communications centre of Indaw. This little town on the railway was of great strategic importance. It is the northernmost point in Burma from which routes radiate in every direction. North of it, one is committed by the mountain ranges, which grow steadily in size the farther north one travels, to one route or another. From Indaw one has the choice of journeying westward to the Chindwin or the Mu Valley; eastward to the Irrawaddy at Katha by rail or road: southward by rail or road to the plains of the Dry Belt or northward by rail or road (the Japanese had built the road) up the narrow valley to Myitkyina. The railway was the line of communications supporting the Japanese 18th Division opposing the Chinese-American army of General Stilwell in the north, which was advancing slowly and painfully along the so-called Ledo Road, which it built as it went.

After General Wingate's death, the plan, no longer sponsored by his vigorous advocacy and endangered by the Japanese advance across the Chindwin, underwent a change; and our efforts were diverted towards helping General Stilwell reach the line Mogaung–Myitkyina. Under pressure from General Stilwell in the north and the Chindits to the south of them, and with their vulnerable supply line cut, the Japanese 18th Division was gradually strangled, and finally ceased to exist.

I would like to emphasize once again the difference between the two campaigns. That of 1943 was merely a raid, an unsupported foray, when we were vastly outnumbered, when our object was to emerge suddenly from the jungle, strike a swift blow, disappear again, and reappear later to destroy some new objective. However much we tried to persuade ourselves that we were the hunters, we ended by being thoroughly and most unpleasantly hunted. In 1944, by contrast, we were present in great strength, prepared and able to fight pitched battles. In both years, rivers and mountain ranges were our great obstacles, particularly the former, and the study of topography was vital.

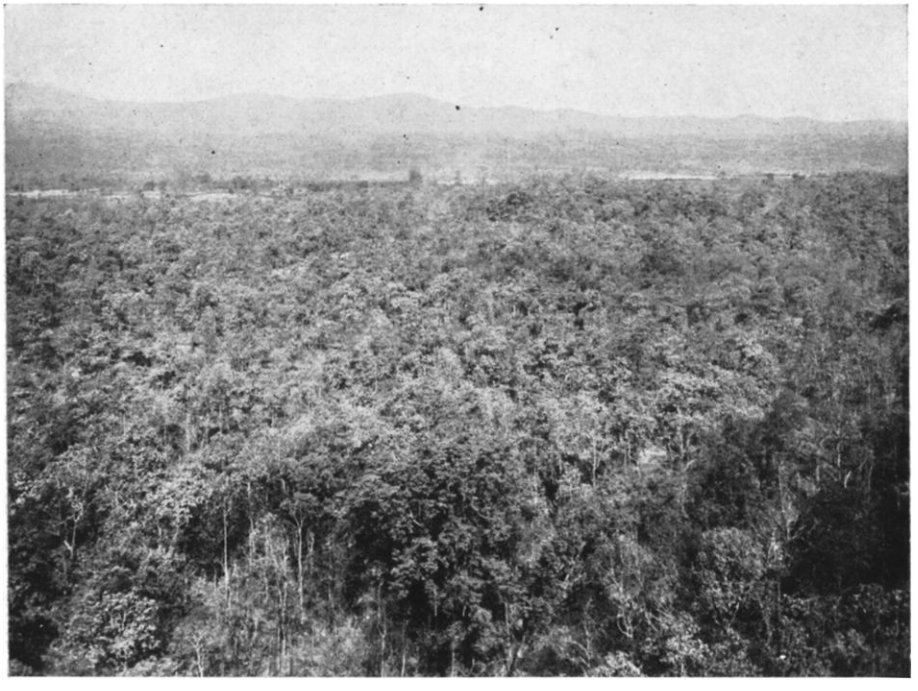
The basic unit was the column, of approximately four hundred men and sixty animals. Each man carried a load of seventy pounds, which is half the weight of the average man. He was armed with rifle, bayonet, grenades, and the broad-bladed Burmese knife, about 18 inches long, known as a *dah*. Also in the column were Bren guns, mortars, Vickers machine-guns, and, in 1944, flame-throwers. These heavier weapons were carried on mules until the moment of battle.

The needs of a guerilla soldier are surprisingly few. They are: food, water, ammunition, information, and health. The great mistake which we made in 1943 was in providing insufficient food. Lack of food undermines morale quicker than any other enemy. From the moment we left roadhead we were hungry: and except for a few days when, on the way home, we came under the protection of the Kachins, we never had an adequate meal. At best the daily ration was eight biscuits, one ounce of cheese, half a pound of nuts and raisins, and half a pound of dates, in addition to tea, sugar, and milk. In theory we eked it out with rice and game; but in practice this did not work out. We were often unable to forage, either owing to the presence of Japanese, or to the need for remaining concealed. Sometimes also we were in areas remote from villages. As for hunting game, this was rarely possible. We were always in a hurry, and a column on the march, however cautiously it may be moving, will make enough noise to scare away any beast.

Much time has been wasted in teaching the doctrine that a man who knows what is what in the jungle can subsist on edible roots. This may be possible in certain jungles at certain seasons, but it is a whole-time job, and it is nonsense to suggest that troops can carry out their job, cover their daily distance, and fight the enemy, on what they can find in the jungle. I feel bitter about this, because at one period my men and I subsisted for eleven days in the dry and dusty jungle, near the mouth of the Shweli, on three mugfuls of rice, two malted milk tablets, and a lump of pork about the size of a golf ball for each man. Natives with us were as baffled as we ourselves, and none of the familiar edible roots were to be found. The greatest deprivation of all was undoubtedly sugar. I am quite prepared to accept the medical doctrine that salt is a greater need; but in those extremities one does not crave for it as one does for sugar. That desire becomes almost tangible; it torments one with hallucinations; it paralyses one's very tongue. The first mouthful of sugar after a long abstinence releases one from a bondage which those who have not known it can never appreciate.

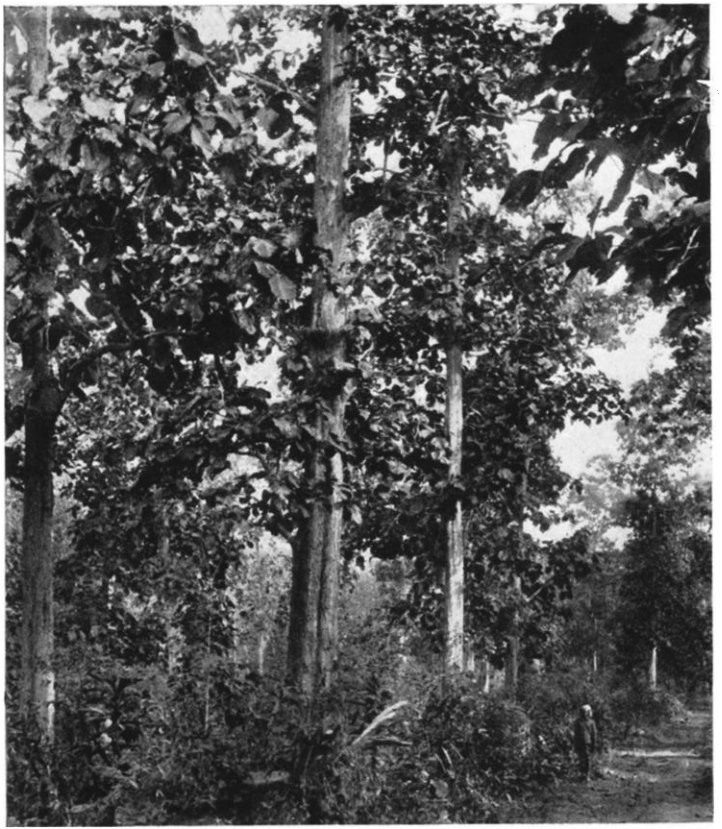
Twice in this war I have seen troops go practically crazy for lack of water. The first time was in the Syrian campaign in 1941; the second was in Burma in 1944. Near Indaw, at the end of March, two of my columns assaulting a Japanese position across 10 or 12 miles of waterless jungle, failed to carry it, and were forced to withdraw for lack of water. The Japs fully appreciated the situation and, using motor transport, occupied all the water-holes in the area. The only stream in the neighbourhood ran between fields of open paddy, which were swept by machine-gun fire. Some of the troops were killed when their craving for water drove them across the paddy to the stream, even though they well knew that to venture on to the paddy meant certain death.

Around Indaw in March and April running streams are few and far between. One can gauge with some certainty from the map which streams dry up, from the absence of villages along their banks. Sometimes, high up on the hillsides, one may find pools, and sometimes, particularly at corners where the course of the stream has been diverted by a rock formation, one can detect a certain stickiness in the sand which indicates that it is worth while digging. It is a slow job, though, and means a wait of an hour or two even after reaching the water, while the sediment settles. The mules have to be kept away from



Mixed deciduous forest, Katha district

Bamboo jungle



Teak forest

Dense lentana and creeper, Katha district. A track is being cut

it, since if they once get the smell of it they rush in and trample down the water-hole won by hours of patience. Incidentally, on the occasion I have referred to above, near Indaw, the animals of those columns went for five days with only one drink; and only one—a pony and not a mule—succumbed. A number were killed when, maddened by the smell of water, they broke away from their muleteers and galloped across the paddy to the stream.

I have said enough to show that an appreciation of the water situation is very necessary when operating during the last two months of the dry season. This applies particularly to the teak forests. At this point I will break off to discuss the different types of jungle from the point of view of the war-time traveller.

For campaigning, teak forests are admirable, since it is possible to travel in any direction owing to the lack of undergrowth. In proper teak forests which have never been felled, the only undergrowth is the teak seedlings themselves. These grow to a height of about 2 feet, with huge leaves like rhubarb leaves, and with soft stalks which are easily trampled. Visibility extends to about 100 yards. In February and early March teak jungle makes delightful marching. After that, the leaves are off the trees, there is no shade, and the forests are intolerably hot and dusty.

Whatever type of jungle you are in, you always pine for another—until you get it. Most of all I dislike dead bamboo. It blocks the path in every direction, it is exceedingly hard to cut, and a dah becomes blunt after a dozen strokes. Green bamboo is better, and travelling is sometimes fast under its green archways. But unfortunately the arch is usually just too low for the mule's head, and then it has to be cut. Too often the result of a cut, however skilful, is that the whole arch falls, and you are confronted with a tumbled mass of greenery to clear.

Dense evergreen jungle is a nightmare: every foot of the way has to be cut, and I have known my speed, even without mules, to be reduced to less than ½ mile an hour. With loaded mules the position is worse: they require a track 6 feet high and 5 feet broad. The job of track-cutting is exhausting, and the "slashers" have to be frequently relieved. The system is for the leading men to cut a track wide enough for themselves, and for those coming after them to widen it gradually until the full breadth is reached.

I suppose no jungle is really impenetrable. General Wingate once issued a very characteristic order: "No patrol will report any jungle impenetrable until it has penetrated it." But some jungle is certainly so thick as to make it not worth while trying to negotiate. Such an area is that on the east side of the Chindwin east of Tamanthi and north of the Uyu. I have never met anybody, European or native, who has crossed it: although I know three who have tried. I have flown over it twice, and any crossing would be seriously complicated by several escarpments which look to me to be virtually unscalable. The escarpment known as the Zibyu Taungdan, running from the Chaunggyi southward, is nearly so. Coming out of Burma in April 1943 troops took two days to clamber up it, unimpeded by mules.

I would certainly never try to negotiate either prickly bamboo [1] or elephant grass, unless preceded—or pursued—by an elephant. Luckily neither of these is abundant, and they usually exist in small patches, which can be outflanked.

[1] I understand that this is really a species of palm.

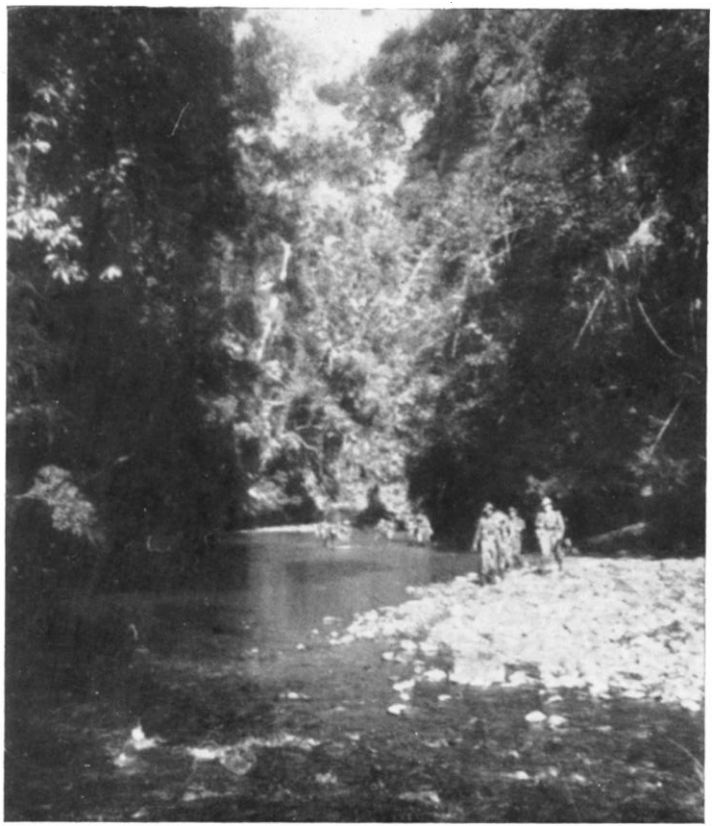
In all cross-country travel the principle should be to make for the watershed and travel along it. Here the jungle is usually thinner; and along the top of it there is almost always a game track. In spite of possible trouble in reaching water, the watershed principle is sound. It often pays to make a detour of one or more days, depending on the length of your journey, in order to reach a watershed and to travel along it instead of across the grain of the country.

Cross-country travel is always slow, and we travelled by track whenever we were in a hurry and whenever we were confident that we could travel faster than the news of our journey. This implied a knowledge of the enemy; which brings me on to the next great need of the guerilla fighter: information. (I have not dealt with ammunition because the need for it is obvious. We always carried far too much ammunition until we learnt that replenishments from the air worked.) In our type of warfare, the least valuable information was that which came from our own headquarters in a sealed envelope. We had our maps, and although they were often inaccurate it was surprising how good they were. But all the most important information we had to get for ourselves, and we got it principally through our Burma Rifle Scouts. Far too little is known in this country of the part played by these troops. There were very few of them, less than a thousand in all. They left their homes to come out to India in 1942, and came back into Burma with us twice in the years that followed. They had only to don native dress and go home if they wished; but they willingly returned to India each time. They were our eyes and our ears, and we owe them more than we can say.

In 1943 each column had fifty; in the following year a dozen to each column was all we could afford. They were mostly Karen or Kachin; but in 1944 two of my columns had Burmese, who did very well. They would go into villages and pick up the gossip; and contrary to opinion in India, we found local information exceedingly accurate up to a range of 8 or 10 miles: beyond that it would get a bit distorted. We found local information 100 per cent. accurate about enemy on the move, but it tended to exaggerate enemy who were static. There is nothing surprising about this. Living in Aldershot, it would be difficult to assess how many troops were there; but if they all marched past a given point it would be easy to get a fair idea.

Altogether we traversed areas belonging to four different races. First, there were the Nagas. Some of those living near Manipur were reasonably civilized. The wildest I saw were in the Patkai Hills. Here they are still completely unadministered, and in fact we were the first Europeans they had seen. They wore only a blanket and beads, and had quills in their hair, and were not good-looking. Head-hunting was still prevalent, and they kept asking us to help them against each other. We captured a Japanese document from a junior officer to a senior explaining patiently that it was impossible to organize the Nagas against the British, as each village only wanted to be organized against its neighbour.

The Kachin villages are set on the hill-tops. They grow their rice on the hill-sides, enough only for their own use. Unlike the provident Burmese, who keep quantities of rice all ready for consumption, the Kachins husk only



Column on the march near Kamkam Bum, between the Chindwin and Uyu rivers

Mixed evergreen jungle

Indaing forest and undergrowth, Katha district

Government reserved indaing forest with self-planted seedlings

enough for their day-to-day use. They dress in black silk-like clothes, and the women wear head-dresses of the same stuff. There were missions before the war in Lonkin and Sumprabum, but for the most part they remain nat-worshippers, animists; and on all the tracks leading into the villages you find their little offerings lodged in a wicker tray or swinging in the wind. They are thoroughly unpopular with their neighbours in the plains, as it was their wont to plunder them freely and often.

Cases of Kachins cooperating with the Japanese were exceedingly rare. The only serious instance was the Kansi Duwa, a big chieftain near Lonkin, who had fallen out with the British some years before the war owing to some dispute over the royalties from his jade mines. But in the main the Kachins waged a fierce and unrelenting war against the Japanese. The doings of the Kachin levies around Sumprabum are well known. Down in our area the Kachins were more exposed to Japanese vengeance than in the far north, but they were the staunchest allies we had, and in the miserable march out of Burma in 1943 we had no qualms whatever about sleeping in their villages without posting a single sentry. In 1944 we armed numbers of them; and I remember in particular one boy aged not more than fourteen who single-handed attacked a Japanese patrol at its midday meal, killed three and sent the rest flying.

The Burmese in Upper Burma are only to be found along the Irrawaddy and the railways. I found them hard to distinguish from the local type of Shan and Shan-Kadu. They were friendly enough, but the only occasion on which I have absolute proof that we were denounced to the enemy in 1943 it was Burmese who were responsible. In fairness to them, their position was exceedingly difficult, as the punishment for failing to denounce us was torture and death.

The vast majority of the country which we traversed was peopled by Shan-Kadu. Like everybody else, they feared and hated the Japanese; and they feared us because they knew that to have dealings with us laid them open to the enemy's vengeance. Yet they helped us as they could, with foodstuffs and information.

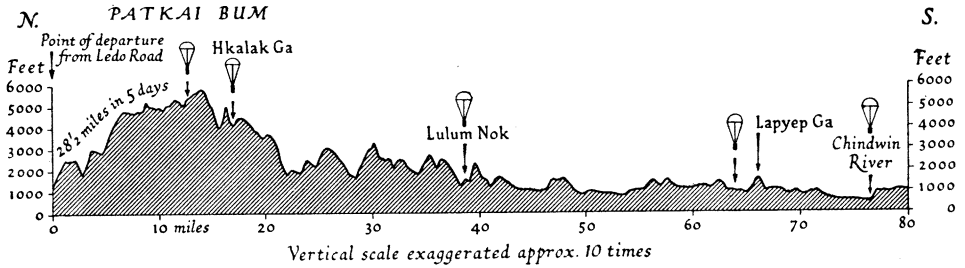
We worked chiefly from $\frac{1}{2}$-inch maps. It was remarkable how accurate they were in detail, although much of the country had been surveyed only from the air. The task of the cartographer in Burma is not made easier by the habit of the natives of shifting their villages every ten or fifteen years. With the village, the whole local system of tracks naturally shifts as well. We realized early that we must accept accuracy only in natural features, such as contours and streams; and not to rely too much on finding man-made features, such as villages or tracks, where the map showed them to be.

In some of the wilder country even the natural features were apt to let us down. Some areas were shown white on the map, others were liberally studded with question marks. One surprising feature however was boldly shown without a question mark, which it obviously deserved. This was a stream called the Puk Yu, which was shown as rising in a range on the south side of the Patkai Hills. It flowed downhill, gaining in thickness and importance; and then surprisingly flowed uphill again, culminating in a source near

the top of another range. Odd as the country was, it was hard to believe that it was as odd as all that.

The first year we tended to avoid villages except when we needed food or information. The second year, confident in our enhanced strength, we passed through them freely, and often bivouacked near them, so that our Burmese speakers had leisure to drink in gossip and pour out propaganda. It was probably largely due to this that the incidence of malaria was far higher the second year, than the first.

That brings me on to health, the last of the five primary needs of the guerilla soldier. We relied entirely on suppressive tablets for our immunity from malaria, taking one every day. Once a month we took three a day for a period of five days. Although not a certain protection against the very high infection in our blood, the suppressive tablets did much to keep malaria within reasonable limits; and in defiance of medical practice and precept we refused to regard malaria as grounds for going sick. In 1944, with evacuation possible, men's staying powers were definitely inferior to the standard of 1943,



Profile of 1944 route over part of Patkai Bum to the Chindwin. Parachutes indicate supply drops

when evacuation was impossible. In those circumstances, as General Wingate said in his report, "men not only did not go sick: they did not even feel sick."

Minor troubles which easily became major unless they were watched were jungle sores and footrot. Both were due to carelessness: the latter through failing to let air get to feet which were invariably in wet socks (because it was normal to splash through streams twenty times a day). I managed to stamp out jungle sores by making it a punishable crime to have one, unless you could produce a medical certificate to say that you were not to blame.

It is impossible to say what an average day's march would be in terms of miles, since it depends entirely on the nature of the going. In 1943, including the last month, when we had abandoned the animals, we averaged about 90 miles a week over the whole period. In 1944 our average was very much lower, partly owing to the long, slow pull over the Patkai Hills, and partly owing to the fact that we spent far more time in static warfare. It is wiser to speak in terms of hours of marching. In the Patkai Hills I took five days to cover 28½ miles, and reckoned I was doing well.

I have mentioned several times our march over the Patkai Hills in February 1944. It was quite the hardest march I have ever done, and quite the worst

country I have ever seen animals go over. A few details may be of interest. I chose to go in by that route because the Japanese were watching the Chindwin very closely since our activities of the previous year. Although we might have managed to cross the Chindwin I feared we were certain to be held up on the Zibyu Taungdan escarpment, where it would be easy for the enemy to hold the few and narrow routes across it. I flew up and down the Chindwin many times, and interviewed many people of all races with any knowledge of the country. The only one who held out any hope was an American serjeant, who had been over a little of the country the previous year. We backed him against more expert opinion, and he turned out to be right.

I despatched a sapper major a fortnight ahead of me, with a force of a hundred and fifty sappers and fifty infantrymen, to find and improve on the track. It was in occasional use by Nagas, of whom we met one or two parties on the way. It took off from General Stilwell's Road at the ninetieth milestone from Ledo, at a place called Tagap Ga; and it began with a heartbreaking climb of some 2000 almost vertical feet. Working flat out we averaged 4 miles a day.

The Chindwin was a welcome sight when at last we reached it on the morning of February 29, after splashing 4 miles knee-deep along a tributary. We crossed it some 10 miles above Singkaling Hkamti, where there was a small Japanese garrison. This we had enticed away by landing a small patrol by glider on a sandbank some miles still farther downstream, and thus diverting their attention. From then on we knew we were sure to reach the Indaw area, because one of our parties coming out the previous year had reported a good track all the way. They had hit the Chindwin at Singkaling Hkamti, and from there gone downstream by raft 90 miles to Tamanthi.

I repeat what I said at the beginning of this paper: that I am well aware (and nobody is more ashamed of it than myself) that we failed to make proper use of the situation in which we found ourselves, wandering about in this highly interesting but little-known country. Exploration in the future can be made very much easier by such aids as we enjoyed. Supply-dropping is the most obvious; glider towing and glider-snatching could also be useful. For instance, when we reached the Chindwin river some miles downstream from where it emerges from the Kyaukse Rapids, gliders landed on the shingle-bank on the far side of the river, and disgorged motor-boats for us, complete with fuel and engineers to work them. These had been towed all the way from Hailakandi in Assam, a distance of over 200 miles.

It would be enthralling one day to go back on our tracks, and to journey through the same country at a more leisurely rate, without having Japanese to distract us. I have a large $\frac{1}{4}$-inch map of the area, which I often look at, and which brings back very many memories, some of them pleasant and some of them much otherwise. Most vividly it brings back the memories of some very fine men whom we had the misfortune to lose during these two campaigns.

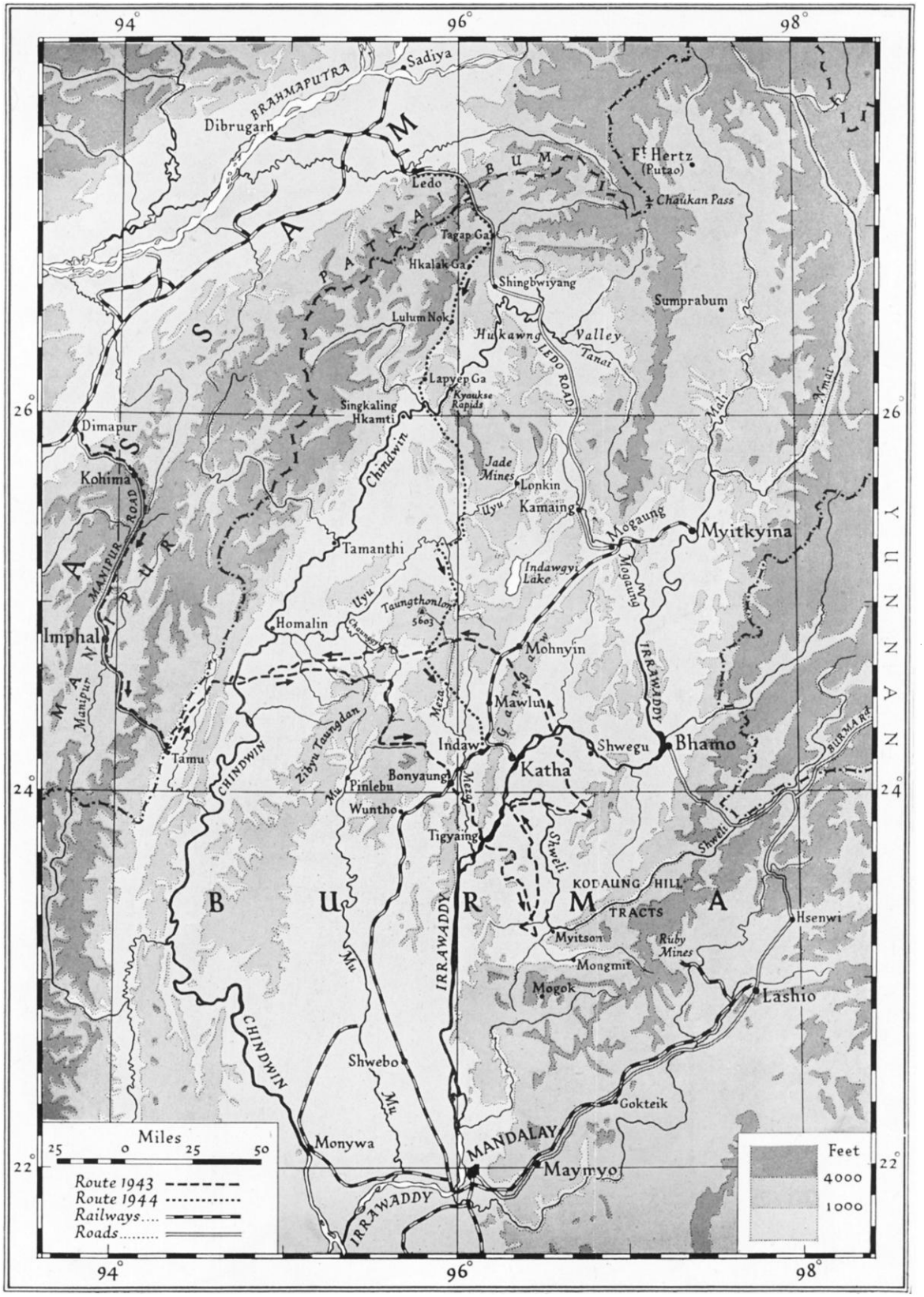
DISCUSSION

Before the paper the PRESIDENT (The Rt. Hon. LORD RENNELL OF RODD) said: To-night you are to hear of Burma. Brigadier Fergusson, now of the Headquarters of Combined Operations, is going to speak on that subject and to show

some pictures of the Burma campaign, or rather of the Wingate campaigns. This is not an account primarily of geographical work done in the field; it is rather an account of the effects of geography on the conduct of the campaign. This campaign will be remembered and associated in many of your minds with General Wingate, who started on his momentous career with the patriot campaign in Ethiopia and lost his life in Burma. But this should not obscure the major issue in Burma, which was the reconquest of Burma by the 14th Army, one of the most important and dramatic features of the war against Japan. It is a matter of great satisfaction to all of us that Burma was liberated, not by the capitulation of the Japanese but by its re-conquest, by the gallantry and skill of our men on the ground and by the assistance of the Anglo-American air forces in the skies. I now ask Brigadier Fergusson to address you.

Brigadier Fergusson then read the paper printed above.

The PRESIDENT: You have heard from Brigadier Fergusson an extraordinary account of a part of a military campaign; you have heard of the great things that have been done by those who innovated this type of warfare, and also the limitations of it. It remains for me to thank Brigadier Fergusson, on your behalf, for a very interesting and entertaining account of a part of one of the most arduous campaigns in which our Army has fought, told with all that good humour which conceals so much of hardship and of courage.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26°
24°
22°
Sadiya
BRAHMAPUTRA
Dibrugarh
Ledo
BURMA ROAD
Ft Hertz
(Putao)
Chaukan Pass
Tagap Ga
Hkalak Ga
PATKAI RANGE
Shingbwiyang
Sumprabum
Lulum Nok
Hukawng Valley
LEDO ROAD
Tanai
Lapyep Ga
Kyaukse Rapids
Singkaling Hkamti
Dimapur
Kohima
MANIPUR ROAD
Chindwin
Jade Mines
Lonkin
Uyu
Kamaing
Mogaung
Myitkyina
Mali
Tamanthi
Indawgyi Lake
Taungthonlon 5603
Homalin
Imphal
Manipur
Mohnyin
Mawlu
Meza
Ganai
IRRAWADDY
Shwegu
Bhamo
BURMA RD
Tamu
CHINDWIN
Zibyu Taungdan
Indaw
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Katha
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Tigyaing
Shweli
KODAUNG HILL TRACTS
Hsenwi
Myitson
Ruby Mines
Mongmit
Mogok
Lashio
Mu
Shwebo
Gokteik
Monywa
MANDALAY
Maymyo
Miles
25 0 25 50
Route 1943
Route 1944
Railways
Roads
Feet
4000
1000

waits between moves; but at length we reached easier ground, the moon rose over the shoulder of the mountain, and we knew we would make camp that night. It was two o'clock in the morning when we eventually reached our tent, after nearly twenty hours out on the mountain side. During that time we had explored a new route on a mountain which, considering its accessibility, is remarkably seldom climbed.

After we had rested a day in the camp, Pasten came to fetch us with the mules, and we returned to Puente del Inca. Here we learned that, three days before, the Argentine Army expedition had climbed Aconcagua, and had found the bodies of Link and his wife 250 feet below the highest point, where they had apparently collapsed after reaching the summit. Of the last member of the party still unaccounted for no trace was found. Most of the expedition had already returned to Mendoza, but we learned with amusement that the Commanding Officer of the Regiment, warmed no doubt by the champagne with which my wife had toasted the returning Argentinians in our absence, had given orders that "in the event of an accident to the Tolosa expedition, the cost of a search party and any funeral expenses would be borne by the Argentine Government." Needless to say, my wife was relieved that this generous offer did not have to be implemented.

TURKISTAN IN TRANSITION

H. E. ADLER

This paper was written in 1944 and has not been revised. The author wishes to thank Mrs. J. A. Steers for her help in preparing the manuscript

BETWEEN THE eastern shore of the Caspian Sea and the mass of highland in Central Asia lies the region known as Turkistan. It is crossed by two great rivers, the Syr Darya and the Amu Darya (the Jaxartes and the Oxus of classical fame). Both now run into the Aral Sea, the Syr Darya having its source in the Tien Shan ranges and the Amu Darya rising farther to the south-west in the Hindu Kush mountains. Since the Bolshevik Revolution, Turkistan has been divided into the five republics of the Uzbek, Turkmen, Tajik, Kirgiz, and Kazakh peoples.

Physically and structurally, Turkistan is divided into two. The western and greater part is lowland, a southward continuation of Kazakhstan, but to the east and south-east the country rises to mighty ranges which include the great peaks of Mount Stalin and Mount Lenin. In Tertiary times the whole of Turkistan was submerged, and this is evident in the landscape features of the west and centre. In the mountainous east the most conspicuous land-forms derive from much later glaciation. Boulders and rubble have been shifted by glaciers and streams, and strewn alike over the Hercynian Tien Shan ranges with their wide depressions and the Tertiary Pamir-Alai mountains with their deep, precipitous, river gorges.

In the region as a whole therefore, the environmental settings for human activity are sharply contrasting. In the lowland west are the huge deserts of Kara Kum and Kizil Kum, together forming one of the great arid areas of the world. Of the two, the Kara Kum, lying to the south, is the more formidable, with vast expanses of wind-formed ripple ridges and, to the east, the gigantic crescent-shaped dunes or *barkhani* sometimes rising to more than 30 feet. In both deserts, according to the findings of geographers and archaeologists and the fragmentary comments of travellers through the ages, desiccation is on the increase and the possibilities of human settlement and exploitation were shrinking until political change and the impact of modern science brought about an abrupt transformation in land use and an awareness of mineral wealth. John de Plano Carpini, the Franciscan traveller of the mid-thirteenth century, reported that "in this country we found innumerable cities with castles ruined and many towns left desolate." In the Kizil Kum the writer noticed simple cubes with cupola roofs standing on some of the dunes; these are the burial places of holy men and chieftains, which form landmarks visible for many miles around. Crumbling vaults and arches, the ruins of splendid mosques, are scattered about in this limitless sea of sand and dust like nutshells crunched under a giant heel.

Away to the south-east and in impressive contrast lie the mountain republic of Tajikstan and the highland part of the Kirgiz Republic. In Tajikstan, the appearance of the Galcha tribes surprised Benedict Goes, the Jesuit traveller of the early seventeenth century, especially their "yellow hair and beards like Flemings." Franz von Schwarz, the German scientist, who worked at the Tashkent Observatory some three centuries later, was equally interested, but his reflections took the form of an attempt to establish the racial affinity of the "yellow-haired," an example of German obsession with the idea of an Aryan race. The Tajik tribes indeed stand apart from the majority of inhabitants of western Central Asia. Their physical appearance has struck many travellers, they speak an Iranian tongue distinct from the Turki of the majority, and they continue to practise, largely undisturbed, the self-sufficient mixed farming of high altitudes. Neither the activity of nomad warriors in the past nor that of the Slavs in more recent history has affected at all deeply their farming, their customs, or their paganism. Remote as yet, they move between the high-level, stone-built villages of the alpine pastures and the lower-level, winter settlements, watered by icy rivers, where cultivation is possible. The main transformation in landscape and economy has taken place farther west.

On the edge of the highlands, between the two extremes of remote mountain and repellent desert, lie the oasis cities, famous in the history of commerce. North-east of the main stream of the Syr Darya in the valley of the Chirchik stands Tashkent, now the greatest city in Central Asia. To the south-west, in the valley of the Zeravshan,[1] are Samarkand and Bukhara. South-west again is Merv in the valley of the Murgab. These are the outstanding centres in the ribbons of intensive cultivation and close settlement which follow the shallow,

[1] The amount of water used by the irrigation schemes (see pp. 233-4) is so great that the stream of the Zeravshan is now reduced to a thin trickle, which disappears in the sands about 20 miles from the Amu Darya.

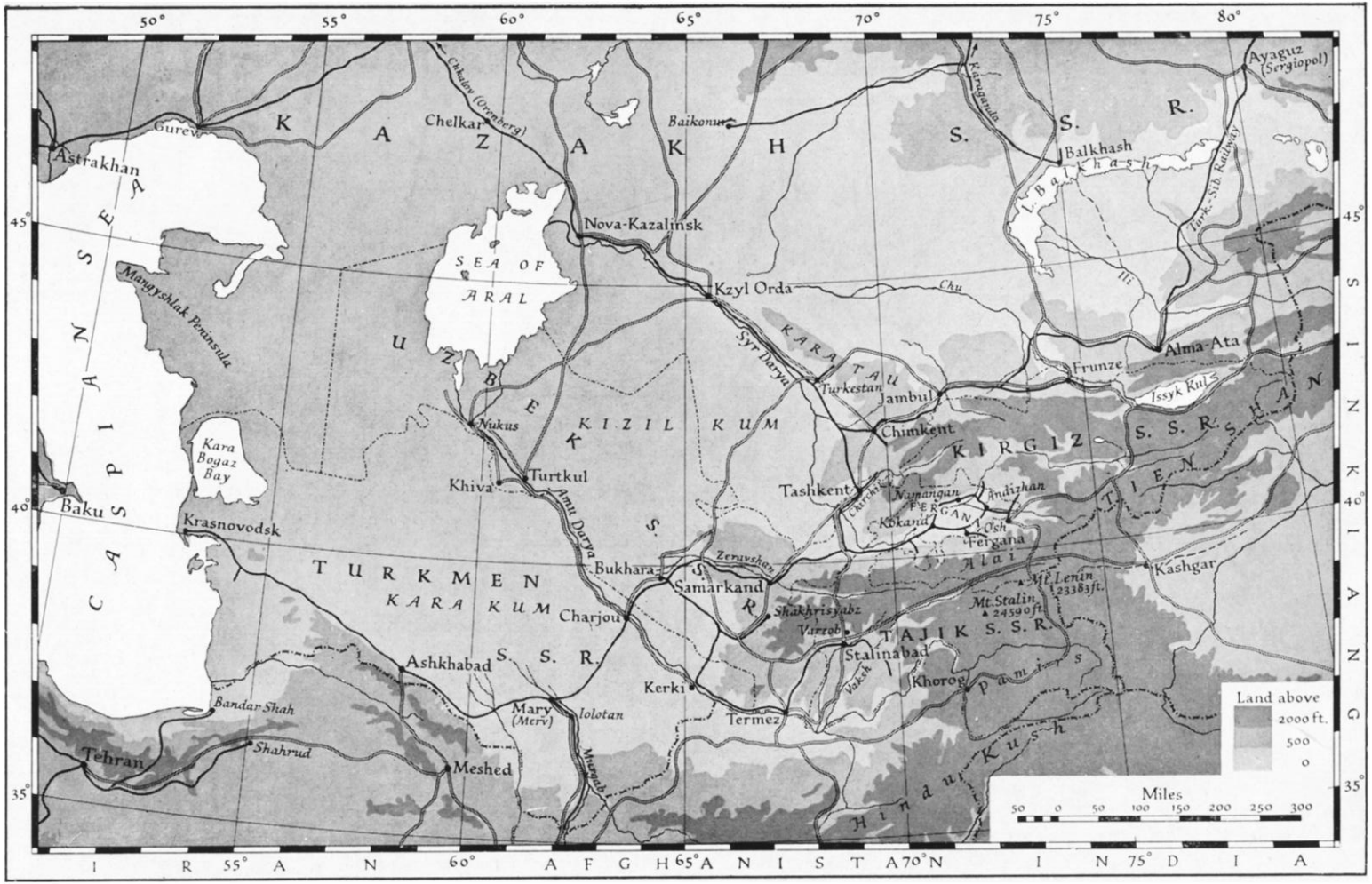
silt-laden rivers and branching canals of this vast inland drainage basin. Many of these ribbon oases border the mountains, but many also stretch in green threads across the grey and yellow sand of the desert. The fertile loess soils and high temperatures have stimulated flood-farming, which has here been continuous from generation to generation both for subsistence and for exchange. But the tiller of the soil has his problems, not least of which are the hot, dry, withering winds of summer (*garmsyl* and *tebbab*, the "fever wind") and the sand-storms which fill the air with fine yellow dust. Like the oasis cultivators, the caravan merchants have existed here for centuries, carrying on a precarious and fluctuating trade across the highlands to the east and south and the deserts to the west. The furs of Siberia, the alluvial gold of the rivers of Central Asia, the semi-precious stones of the mountains, and the silk and tea of China changed hands in the oasis towns of Turkistan, and in Bukhara in particular.

The caravan trade, of course, touched the pastoralists of the lowlands and foothills. Distinct from the mountain farmers and the oasis cultivators, the pastoralists formed the third group of peoples living on the land. Sheep and cattle, camels and horses have been reared on the steppes and foothills of Turkistan from time immemorial, and the Kirgiz horse-breeders have a particular interest in the trade routes.

In lowland Turkistan, until the twentieth century, an interesting balance was maintained between the nomad on the one hand and the tiller and merchant on the other. In the steppes of Central Asia, nomadic warriors appeared and disappeared like dust-clouds, occasionally establishing political and military structures of real significance, like that of the Mongols, but more often enjoying a short phase only of conquest and destruction. Their prey and their sources of supply were the cultivators and merchant groups of the oases, who survived and absorbed one set of conquerors after another. Until the collapse of the imperial regime in Russia, the Emir of Khiva controlled northern Turkistan and the Emir of Bukhara the south. The tribal chiefs or Begs owed them both military allegiance and taxes in kind. It was a system which punished the cultivator and the pastoralist, especially when the Beg was hard put to it to collect his annual due of slaves, cattle, and silk. The "Ark" dungeon of the Citadel of Bukhara and the minaret Minar Khatan (the "tower of death") of the same city are evidence of the Emirs' long-established tyranny.[1]

Into this varied and unquiet society came the Slavs from the north-west. Soviet literature tends to suggest a sudden irruption in the twentieth century as part and parcel of the Bolshevik upheaval, and this is in one sense correct. The rule of the Emirs and the Begs, which had persisted under the Tsars, was swept away after the Revolution, and from the records of foreign technical experts who were employed in Turkistan during the implementing of the Five Year Plans (up to 1937), it would seem that economic change was no less drastic. Moreover, we are accustomed to regard emphasis on the more remote territories of the Soviet Union as characteristic of Russian economic history

[1] In 1841 Conolly and Stoddard, the envoys of the East India Company to the Emir of Bukhara, after being imprisoned for three years in the Ark, were flung down from the minaret 210 feet to the pavement below.


50°
55°
60°
65°
70°
75°
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45°
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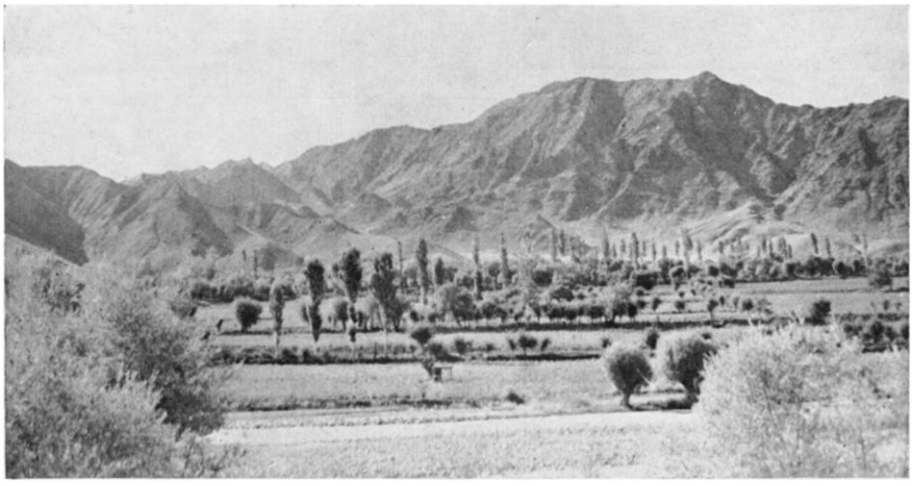
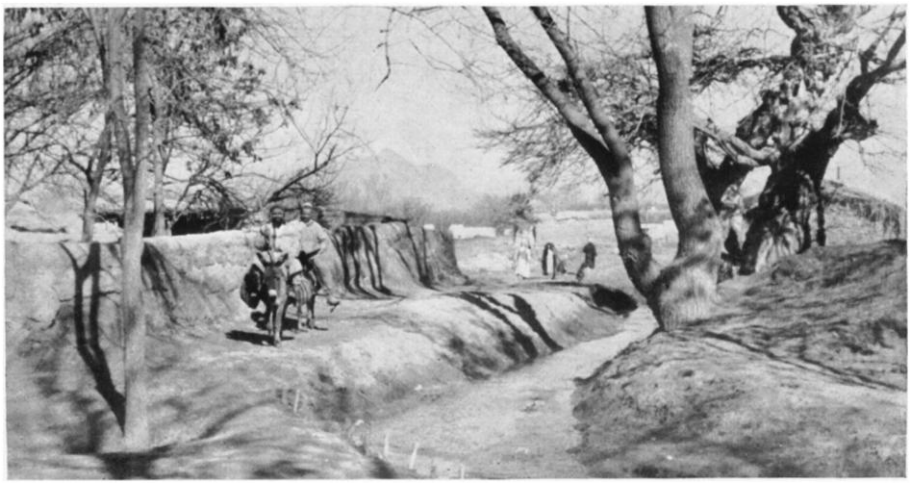
Astrakhan
Gurev
Chkalov (Orenberg)
Chelkar
Baikonur
Karaganda
Ayaguz (Sergiopol)
Balkhash
Lake Balkhash
Turk.-Sib. Railway
Nova-Kazalinsk
SEA OF ARAL
Kzyl Orda
Chu
Mangyshlak Peninsula
Syr Darya
KARATAU
Turkestan
Jambul
Frunze
Alma-Ata
Issyk Kul
Nukus
KIZIL KUM
Chimkent
Kara Bogaz Bay
Khiva
Turtkul
Tashkent
Chirchik
Namangan
Andizhan
FERGANA
Kokand
Osh
Fergana
Baku
Krasnovodsk
Amu Darya
Zeravshan
Bukhara
Samarkand
Alai
Mt. Lenin 23383ft.
Kashgar
TURKMEN
KARA KUM
Charjou
Shakhrisyabz
Yarrob
Mt. Stalin 24590ft.
TAJIK S.S.R.
Stalinabad
Ashkhabad
Kerki
Khorog
Pamirs
Bandar Shah
Mary (Merv)
Iolotan
Termez
Vakhsh
Tehran
Shahrud
Meshed
Murgab
Hindu Kush
Land above
2000 ft.
500
0
Miles
50 0 50 100 150 200 250 300
CASPIAN SEA
KAZAKH S.S.R.
UZBEK S.S.R.
KIRGIZ S.S.R.
TIEN SHAN
SINKIANG
IRAN
AFGHANISTAN
INDIA

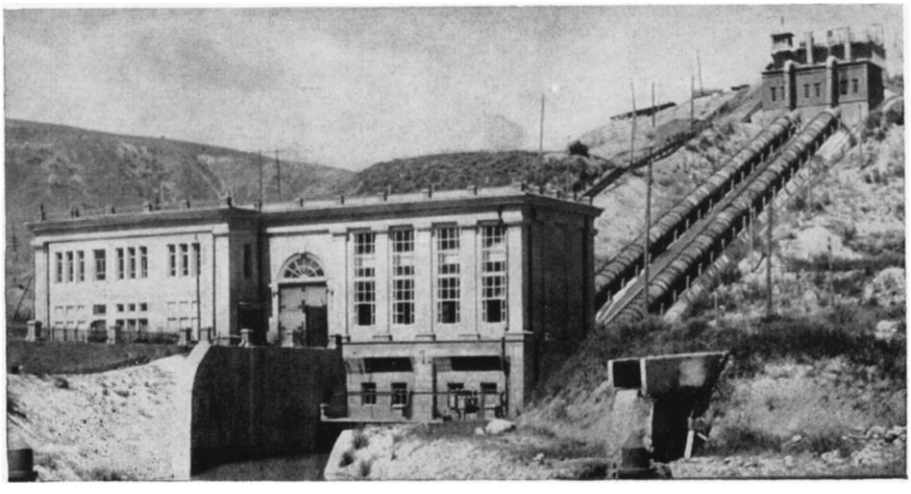


Phots. S. I. B.

Cotton fields beneath the mountains of northern Tajikstan



Irrigation canal near Kurgan-Tube in Tajikstan



Power station of Varzobstroy, north of Stalinabad

of our time. What has been planned and achieved in Turkistan is akin to the spectacular developments in the Urals, and these eastward shifts in economic gravity are not difficult to explain.

But Russian interest in Turkistan preceded the Soviet regime by centuries. It was an off-shoot of the great Russian drift across Siberia, beside which the German *Drang nach Osten* pales into insignificance. The phase of military conquest began under Peter the Great with the object of subduing the fierce nomadic tribes to the south of the Ural Mountains, and it continued in the form of punitive expeditions for some two hundred years, bringing Russian influence to the borders of Afghanistan and China. Until the beginning of the twentieth century however it was largely a strategic enterprise, with a direct garrison control of a skeleton kind in remote Tajikstan to guard the frontiers, while the Emirs continued to rule the plains. The industrial growth of Russia in the early twentieth century explains a fresh interest in Turkistan, which has developed in our own time past all imagination. Before 1914 the extension of irrigation had begun, mainly to establish cotton production, and the Soviet authorities inherited something like 4^{1}_{2} million hectares of irrigated land. Orenburg, in the steppes of European Russia, and Tashkent were linked by railway in 1905, and the track of the Turk-Sib railway had been surveyed. The Repetek Research Station for advising the cotton farmers was established in Turkmenia in 1912, and the textile manufacturers at St. Petersburg and Moscow were already looking to Turkistan as a more valuable source of supply for cotton than the sea-borne imports.

The increase of irrigation farming in Turkistan before the Revolution was achieved by an extended use of time-honoured methods. Flood-farming here is an age-old economy, but the technique is slow and laborious. The *aryks* or channels were multiplied many times by means of the traditional *ketmenj*, or long-handled hoe, and the higher fields were watered from earthenware jugs fitted to primitive wooden wheels. This development of flood farming by an amplification of simple practices continued until 1933.

The change in technique in the years before the present war was remarkable. The first new irrigation scheme affected the Vaksh tributary of the Amu Darya in Tajikstan at the point of its emergence from the Alai Mountains. Over long sections a new course for the river has been blasted out of the rock, and at the junction of the canalized stream with the power station the water passes through seven sluice gates and successive semi-circular spill-ways. Below the power-station its waters feed a wide network of narrow channels, so that a great stretch of arid steppe has been reclaimed. Between 1933 and 1938, 41,000 hectares were irrigated here for the cultivation of Egyptian cotton.

Even more important is the project for dividing the waters of the Amu Darya in its lower course. At Kerki, the point where the Tashkent–Termez railway approaches the river, part of the water has been diverted to the Uz'boy Channel, a deep dry valley running for several hundred miles through the Kara Kum desert and reaching the Caspian Sea near Krasnovodsk, the eastern terminus of the trans-Caspian railway ferry. This channel is a former bed of the Amu Darya. The sand dunes at Kerki, which had piled up for centuries and choked any inflow to the former channel, were levelled away,

and the hot sand of the channel, after a greedy absorption of the diverted water, became thoroughly saturated. The potentialities for agriculture in the scheme are remarkable. The course of the Uz'boy Channel is about 300 miles in length and the silt brought down by the Amu Darya is very fertile. Something like 1,250,000 hectares of former desert land are being reclaimed for farming. The great commercial crop is cotton, but drought-resisting plants like sesame are favoured, and *kendyr* (*Apocynum Sibiricum*), which is the raw material for hemp. Rice-fields and orchards for sub-tropical fruits are being laid out, and deciduous trees like willows, poplars, and almonds fringe the irrigation channels.

Farther north, in the basin of the Syr Darya, a third irrigation scheme has changed the landscape. The Fergana region is naturally highly favourable to farming, and ranks as one of the great natural gardens of the Old World. The flat valley floor is sheltered by the surrounding hills from the cold, dry winds of Central Asia, and is covered with a maze of irrigation channels outlined by rows of poplar and willow. The possibilities of farming have been much increased by the recent construction of the great Fergana canal, some 200 miles in length. Formerly the spring thaw led to a swamping of the eastern and upper part of the valley, while the western part lacked sufficient water. Now the run-off is distributed evenly, with a consequent increase of cotton and sugar-beet production.

In all regions of irrigation farming affected by shifting sand, the possibilities of binding the soil with fresh plant and tree growth need careful consideration. Sand-barley and sand-oats are useful crops for this purpose, but the most essential feature of afforestation is the *saksaul* (*Haloxylon ammodendron*), a stunted tamarisk very common in western Turkistan. The wood is hard as bone and in great demand for fuel, so that the depletion of the existing trees has been very severe. It is a slow-growing tree, but if grown from a shoot it matures about five times as quickly as if planted from seed, and by this method considerable areas have been reafforested.

To the original research station in Turkmenia, four others have been added. In Tashkent is the Nikhi Cotton Research Station, which is extremely important. Experiments in cross-breeding Russian cotton with Egyptian and American varieties, the introduction of rotation crops such as lucerne on cotton farms, the range and use of fertilizers, the control of pests, and the possibilities of new irrigation schemes are studied there. Moreover the staff, originally Russian, is now drawn increasingly from the local population, Kirgiz, Uzbek, and Tajik. Farther north, on the shores of the Aral Sea, is the Chelkar Desert Cultivation Station. The Iolotan station lies in the south-eastern extremity of the Kara Kum region, on the Murgab river, upstream from Merv. High up in the Pamirs, near the frontier with Afghanistan, is the Pamir Biological Station, the Tajik branch of the Academy of Science, where experiments in cultivating hardy crops at high altitudes are carried out.

Turkistan has a long history of mining and craftsmanship: gold and precious stones, metal-work, pottery, and carpets are the traditional wares of the caravan traders. They imply an element in the population with considerable manual skill and commercial awareness. But the last generation has brought about a different assessment of mineral and manufacturing resources.

The survey of minerals shows a wide range which await full exploitation: coal at Mangyshlak, the great peninsula on the north-eastern shores of the Caspian Sea, copper at Almalyk, near Tashkent, and mercury in the Fergana region are conspicuous forms of wealth. Most significant of all for the development of chemical industries and the supply of agricultural fertilizers are the sulphur deposits in the middle of the Kara Kum desert, the huge deposits of sulphate of sodium (Glauber salts) near the Kara Bogaz Bay of the Caspian Sea, and the abundant phosphates of the Kara Tau, the long ridge of hills beyond the Syr Darya: the last are largely on the surface. The possibility of mining and processing these resources suggests a fresh chapter in the economy of Turkistan.

More important in manufacture is the growth of agricultural industries deriving from a better land-use. This is taking the form of factories for processing flour, rice, fruit, and hides, and a great development of textile production, both of silk and cotton, in all the main towns. The towns, like the oases, reflect the arrival of a new economy, with their substantial factories and modern flats and bungalows surrounding the old houses of sun-baked brick used by the traditional craftsmen.

Industry has been stimulated too by the development of hydro-electricity, for the water power of the upper courses of the rivers is a valuable natural asset. In Tajikstan the great dam and power station of Varzobstroy, 10 miles north of the capital, Stalinabad, supplies electricity in southern Turkistan. Farther north is the Farkhadstroy station, where the Syr Darya river leaves the fertile Fergana region and flows towards the steppes. Northwards again, the Chu River has been harnessed to supply the Kirgiz Republic.

Finally, the pattern of the communication system is emerging as a necessary accompaniment to farming, manufacture, and trade. A railway system and skeleton motor roads have appeared where a generation ago movement depended on the one railway track and the caravan routes. The great feats of road-building are those of the Tashkent–Stalinabad highway and the "Road above the Clouds" which crosses the Pamirs. A northern highway of 500 miles is under construction in the Tien Shan ranges to open up the eastern frontier region. Air lines have been important in linking the administrative capitals of the Turkistan Republics, and also in anticipating ground communications over huge distances of steppe and desert, high ranges, and unbridged rivers.