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FROM YUNNAN-FU TO PEKING ALONG THE TIBETAN AND MONGOLIAN BORDERS, including the last journey of Brig.-Gen. George E. Pereira

H. Gordon Thompson, M.D., F.R.C.S. Eng,

Read at the Meeting of the Society, 23 November 1925.

IT will be fresh in the minds of every one from the lecture given by Sir Cecil Pereira that in the winter of 1922–23 Brig.-Gen. George Pereira made his memorable journey from Peking to Lhasa on foot, and it was on his return from that expedition as he passed through Yunnan-fu that we laid our plans for another journey, which he quite intended should be his last. For myself I had long wanted to visit the Tibetan border, and thus we joined forces and left Yunnan-fu on July 17.

The journey may be divided into six parts: the first, from Yunnan-fu to Likiang; the second, Likiang to Batang; the third, from Batang across the Washi country to Kantse; the fourth, across the eastern end of the Golok country to Sotsong Gomba at the bend of the Yellow River; the fifth, Sotsong Gomba to Lanchow; the sixth, Lanchow to Paotow and thence by rail to Peking.

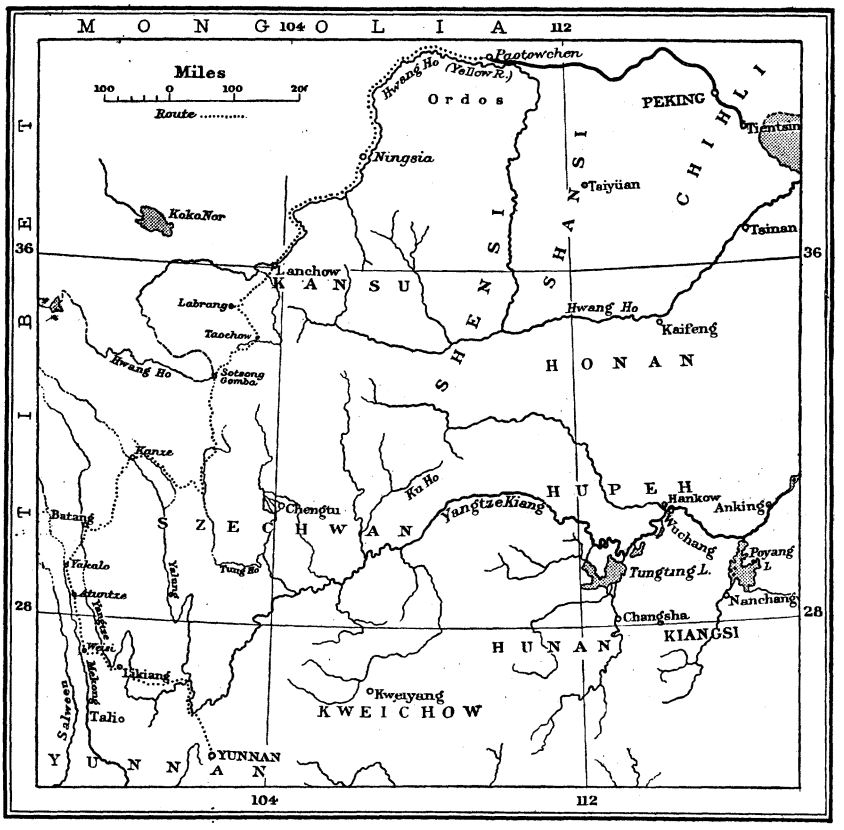
Although we each made our own notes, we divided the duties of the journey roughly as follows: The General made a compass traverse of the route, while I was responsible for the altitudes and the photography; while whenever we stopped for a rest-day, I took the opportunity of promoting goodwill by seeing patients and helping them in body and soul.

Wherever we stopped, when the people knew that I was a doctor, they flocked along with their sick and suffering imploring help. At one little market town where we rested one day I saw 250 patients, and to my mind medical work is a golden key to unlock the doors for peaceable exploration.

The first section of our journey was from Yunnan-fu to Likiang—twenty-one stages. We did not follow the usual road, which is *viâ* Talifu, but struck north-north-west to the Soling, which joins the Yangtze where it gives its most southerly bend. Taking a route about 10 miles from the right bank of the Yangtze we went almost due north, crossed the Yangtze by ferry at a little place called Hsin Chuang, and from there in five stages, going almost due west, we reached Yungpeh—a Hsien city with a good wall, but the city itself in rather a dilapidated condition.

From Yungpeh two stages took us to Tzuli, where, as far as we have been able to discover, is the only bridge spanning the Yangtze. We stayed at Tzuli village, and the next morning at 6.30 started on the last stage to Likiang. It was a beautiful morning, and 2 miles' tramp brought us in view of the great river away down below. On the face of the steep cliffs opposite was a small village, and a temple with white

walls lay glistening in the morning sun, while zigzagging upwards was the track which we should have to follow after crossing. It was a descent of 1500 feet to the river-bank where the dark brown waters, eddying and swirling in great whirlpools, passed under the bridge. It is remarkable that this mighty river, with a course of over 2000 miles, has apparently only this one bridge—a suspension bridge with two pairs of six chains slinging the boards, with a railing along the side, the whole in a very fair state of repair. It is true that there used to be another near Chaotung,



Sketch-map of Dr. Gordon Thompson's route from Yunnan-fu to Peking.

but on account of raids from the independent country to the north whereby Chinese were carried off into slavery, the Chinese broke down the bridge, with the result that at Tzuli is the only one left.

After crossing the bridge we began to climb the hill and cliff—a tremendous pull up of over 5000 feet, passed through the village of Tui Lao Koh and reached the top at 12 noon. From there it was a steady gradient down into the Likiang plain.

We arrived at Likiang at 7.30, and the first section of our journey was over. Here we learned that Mr. D'Arcy Weatherbe, who was travelling

by the main road, had been captured by brigands a few days before, and we felt thankful that we had come by this unfrequented route, and so missed the robber band. At Likiang we engaged Tibetan muleteers for the next three weeks' journey.

It should never be forgotten that more than half of the inhabitants of the Province of Yunnan are not Chinese but tribes-people, each with distinctive language, dress, and customs, quite different from the Chinese. Of the tribes with which we came in contact during our journey probably the most numerous were the Mosu, or, as they call themselves, the Nashih. Where the Mosu came from is somewhat obscure, as they do not appear to be connected with the Tibetan tribes on the west side of the Min river.

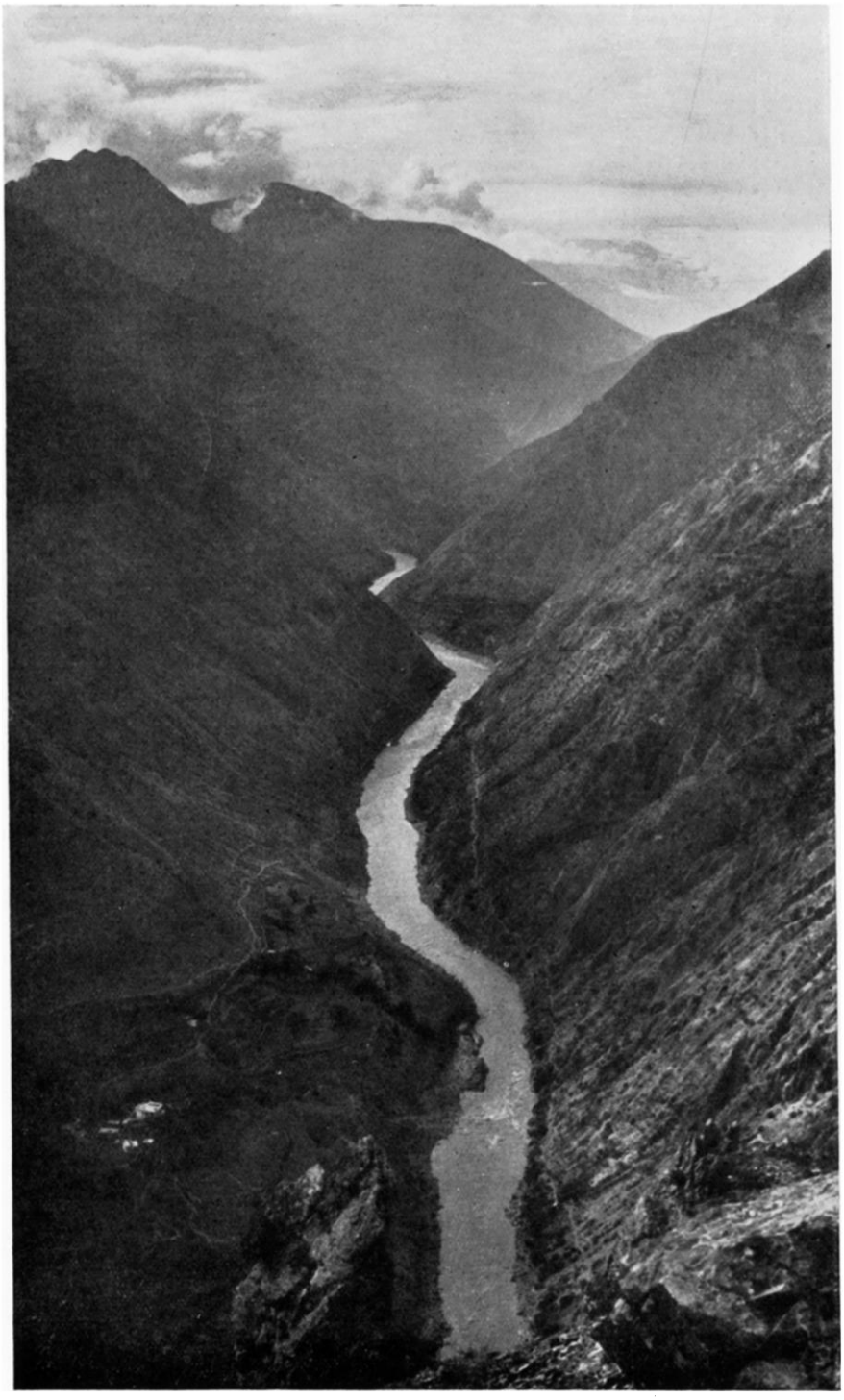
Likiang is the old Mosu capital, and inscriptions relate how, nearly four hundred years ago, the Mosu king drove back the Tibetans, who were encroaching on their territory, and established themselves right along the valley of the Mekong. In the eighteenth century the Mosu king allied himself with the viceroy of Szechwan, hoping to become paramount over the district from Batang to Likiang, but the Chinese, following their custom prevalent even to this day of trying to set off one party against another, divided the country into two parts and attached one to Yunnan and the other to Szechwan. The last of the Mosu chiefs—a woman—welcomed a Chinese official, to whom she practically handed over the sovereignty, and the sub-chieftains were retained in their official posts to assist in the administration of the country. The Mosu, or Nashih, people are thus to be found right up the valley of the Mekong and in the country round Likiang.

The Lisu tribes-people are more aboriginal in character. Driven up to the hills, they inhabit pretty much the same region, but are scattered in the fastnesses of the mountains, while in addition there are Loutze, La-ma-jen, with an infiltration of Tibetans from across the frontier.

I was interested to notice the presence of cowrie shells, especially among the Lisu people. On inquiry I found that they had come from Burma and India; that they are valued at 100 to the Chinese tael, are sometimes used for barter, and are largely used for decoration of the headdress of the girls, being looked upon as a kind of dowry.

We left Likiang after a few days' rest, and crossed the divide between the Yangtze and Mekong by Litiping—a beautiful little plateau about 5 miles in length, carpeted with flowers, with pine woods along its border and great flocks of sheep grazing on the pasture land.

The valley of the Mekong, with its rope bridges, its narrow tracks, and its landslides, has been so frequently described that I will pass rapidly over this part of the journey. We were fortunate in that although we were travelling in the rainy season we did not have such excessive rains as to make the track impassable; but at the time of our journey there was a severe form of malignant malaria prevalent along the Mekong



THE MEKONG VALLEY LOOKING SOUTH

THE MEKONG NEAR ATUNTZE

valley, which the Chinese call the " chang chih," and which is generally very rapidly fatal. Halfway up the Mekong valley our chief Tibetan muleteer developed this malignant malaria and, in spite of intra-muscular injections of quinine, died within thirty-six hours. We had to bury him by the roadside.

We were glad to get away on our journey again after the delay caused by this fatality, and found our last few days before reaching Atuntze very trying. The mules were getting played out, and the road, in places only a handspan wide, was made all the more dangerous by the rains, and a slip of a mule would have meant straight down to the Mekong and the loss of one of our loads. The day before reaching Atuntze one of the mules died, and another was so exhausted that it had to be left behind at a wayside Tibetan house, the occupant giving a sum equivalent to ten shillings for it in the hope that it might recover. A few days' rest in Atuntze, which is 10,300 feet above sea-level, was most welcome.

Leaving Atuntze on September 5, a further climb of 1180 feet brought us to the Chu La, 11,480 feet, and from there the road makes a steady descent, following the Dong River until it again joins the Mekong, the left bank of which we followed for four days until we arrived at Yen Ching (the salt wells) and Yakalo. Each day of this part of our journey was memorable for the magnificence of the scenery. On the third day I have notes as follows in my diary :

" After reaching our highest point, 10,199 feet, we had a most glorious panorama. Behind and to our left was the great sacred mountain of K'a-Ka-Pu, now about 35 miles distant, the top covered with snow. From this ran the range of the Mekong–Salween divide, also snow covered. Further north a great peak stood out glistening white in the sun—this mountain is Ta Mi Yung Below the peaks were banks of white cloud, lower down below the snow-line the reds and greens of the hillsides sloped sharply down to the Mekong, visible as a chocolate-brown streak away below, with patches of vivid green in the lower valleys, where there was land to be cultivated."

On our sixth day we crossed the frontier between Yunnan and Szechwan, and our escort, which on leaving Yunnan-fu was thirty soldiers well armed with repeating rifles, had dwindled down to an old woman, who carried in one hand our precious hurricane lamp and with the other held my pony while I was taking a photograph or carried the official paper to hand on to the headman of the next village.

The salt-wells at Yakalo are on the banks of the Mekong, and the openings of the wells are covered by the river during the rainy season, so that work has to be suspended for several months each year. The brine is drawn from the wells and then poured out to evaporate on the flat terraces built specially for this purpose.

After three days' rest at Yakalo, where we enjoyed the hospitality of Père Goré, who not only provided us with most useful information, but

also arranged for further transport, we started for Batang. It was first necessary to cross the Yangtze–Mekong divide, which we did by the Cha-La pass. This we made 14,130 feet—a stiff climb—5500 feet above Yakalo and 6800 feet above the Mekong River. From the Cha-La one could look back to the Mekong basin with the snow-capped peaks of the Mekong–Salween divide and forward to the Yangtze watershed. Our route was now a gradual descent with one or two smaller passes, in one case rising to 13,111 feet, and the Bong-la 13,054 feet, until at last as we emerged from the Bum valley the Yangtze could be distinguished in the distance away below as a shining ribbon with numerous bends.

The track now descended to the Yangtze, and we stayed at Gunra, a little village 7997 feet above sea-level, and about 150 feet above the river. From near Gunra, looking north, there was an excellent view of the bends, and our route kept close to the right bank until we crossed by the ferry at Drubalong, where we spent the night. After following the left bank for another 13 miles we slowly left the river and crossing a spur of hills were in the valley of the Batang River, and a few hours later were in Batang itself, fifty-five days after leaving Yunnan-fu.

Batang is a small town with from two hundred to four hundred families. We made the altitude 8276 feet. Although the Chinese have a small garrison there, they are hemmed in on all sides by the Tibetans. This is also the case at Litang, halfway between Batang and Tatsienlu. Batang is on one of the main trade routes between China and Lhasa, but although at present most of the trade goes from Tatsienlu by the northern route, yet there is no doubt that Batang is of considerable importance.

A monastery of the Bon sect was founded in A.D. 600, and the district was conquered in turn by Mongols and the Mosu—the Tibetans drove out the Mosu in A.D. 1650, and later the Chinese came into and kept possession, though the population is almost entirely Tibetan.

In 1905 the Chinese Amban, returning from Lhasa, was killed just outside Batang, and in revenge Chao erh fung, the viceroy of Szechwan, destroyed the monastery and beheaded the chief Lama. The Lamasery belongs to the Red sect.

Between Batang and Kantse, our next objective, lies the territory of three important Tibetan tribes—the Lengkashi, the Washi, and the Nyarong. It had been our intention to reach Kantse by a circuitous route more to the north, parallel to the Yangtze, which had been traversed before by Mr. Eric Teichmann, but the Tibetan magistrate at Gartok refused permission, and as it was just inside the Tibetan frontier this route was therefore ruled out.

The usual road due east to Tatsienlu *viâ* Litang was closed by brigand bands of Lengkashi, who were reported to be attacking Litang, and as

we were quite determined not to return by the way that we had come, the suggestion was made that we should attempt to cross the Washi country. This was the more attractive as the Washi country had not previously been crossed by Europeans, yet it was known that the sources of several large tributaries of the Yalung, which in turn pours its waters into the Yangtze, were in this hitherto unexplored country.

With the kind help of Mr. MacLeod and Dr. Hardy of the Tibetan Christian Mission, who had been of service to the Queen of the Washi tribe when she was a fugitive in Batang, we secured Washi tribesmen who expressed their willingness to assist us to cross their country. The Chinese commander of the garrison did his best to stop us making the journey, but after General Pereira had interviewed him and written him a very stiff letter, he gave way on condition that we each signed and sealed a document, in which we stated that we were going against his advice and relieved him of all responsibility for our lives and property.

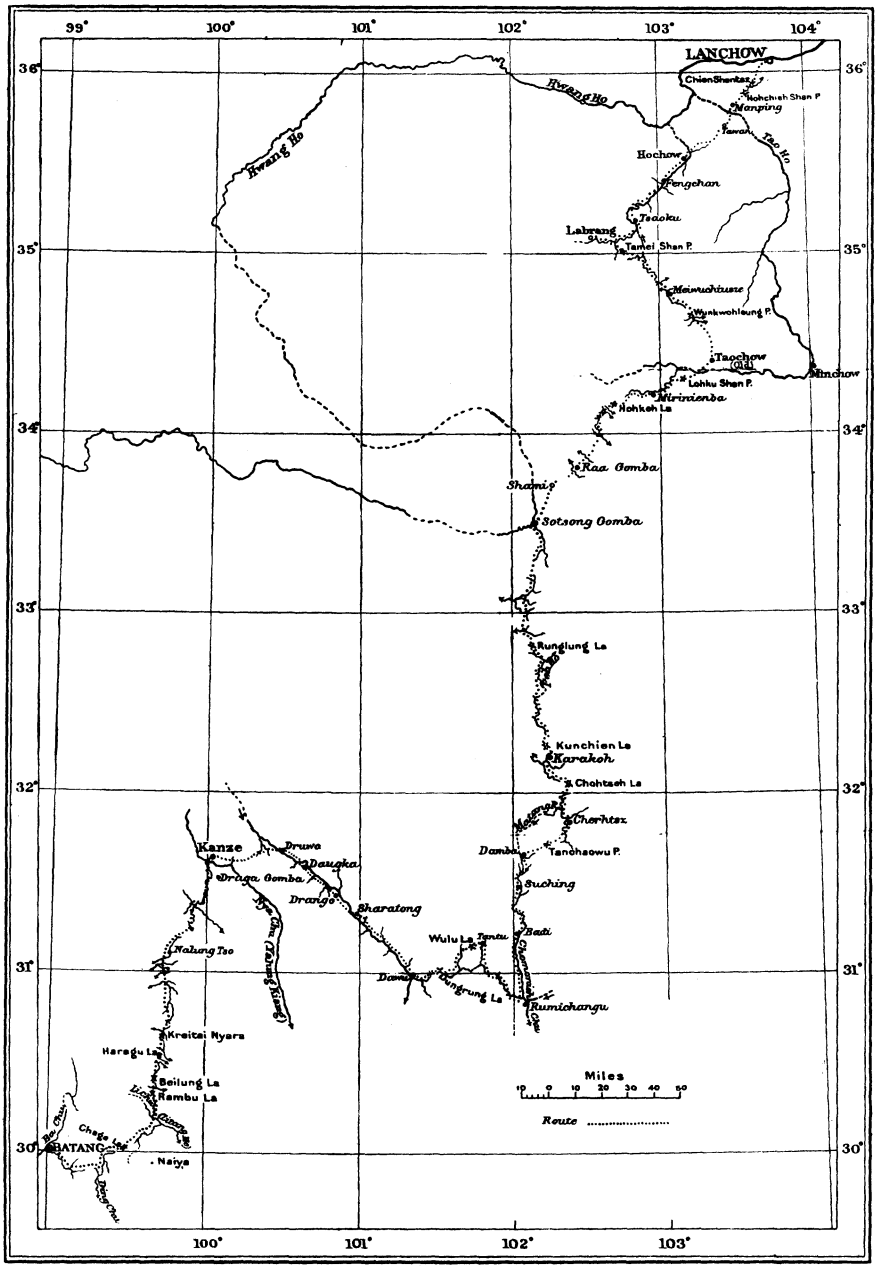
The Washi are divided into three districts, called the Monia or Mao Ya, the Dei Yung or Ko tun, and the Tsong Hsi, each with its separate chief, but all owing a loose allegiance to the Queen.

The Queen of the Washi was written to by MacLeod, and replied that her people might take us to Kantse; she *thought* the road was all right, but it was best to keep our eyes open.

Twelve days were spent in Batang making preparations. As it was all nomad country we had improvised tents of Chinese calico, and at last, on October 5, started with four riding-ponies, fifteen yaks for baggage, and six Washi, mounted and armed.

It was raining as we drew out of Batang and made our way up the valley of the Ba Chu. Our course lay south-east, following the Litang road, and as we entered the gorge with its high rocky hills, at first bare but later covered with trees, it did indeed seem gloomy in the extreme. Only a short distance from Batang we passed the place where the Chinese Amban returning from Lhasa to Peking was killed in 1905. It is marked by an inscription cut in the rock. We crossed the stream four times by rickety bridges, and Pereira said that by the one at the top of the valley a handful of men could hold up an army. The stream, flooded by the rain, roared on its way, and it was difficult to get the yaks across. During this first day we travelled only 9½ miles, but mounted 1260 feet, and at night stayed at a little place called Militing, where was the last house before we got across the Washi country.

The next day, again following the Ba Chu, we saw the traces and passed the place where four days previously a fight took place between the soldiers of the Batang garrison and one of the lamas who was wandering about the country raiding the weaker villages, attacking travellers, and incidentally trying to pay off an old grudge which he had against another of the powerful lamas in the district Several of the yaks were



Sketch-map of the route from Batang to Lanchow.

NOTE.—The longitude of the great bend of the Hwang Ho is from the observations of Capt. de Fleuselle on the expedition of Major D'Ollone (*Geo. Journ.* **36**, 357, September 1910).

particularly obstinate during this day's journey, and one of them took a plunge into the stream with my precious box of photographic material and a leather box containing my warm clothing. However, shortly after we reached a good camping-place at 12,321 feet the sun came out, and we camped at Pangdramo, a sheltered spot where were the ruins of two houses. I was able to empty the saturated boxes and dry off the contents in the sun. The next morning we were off at 7 a.m., and after 6 miles going almost due east we branched off from the Litang main road, and, still steadily mounting, began to get out of the deep and thickly wooded valleys and above the tree-line. We ascended a wide-open valley till at last we came to the pass called by the Chinese Ta Sa Shan and by the Tibetans Tsangbunga La.

There was some snow on the ground, and a cutting wind was blowing over the pass. We wanted to get the height by the boiling-point. The caravan went on while we were fixing up the apparatus, but on attempting to light the lamp match after match went out with the wind until only one was left. I persuaded Pereira and the Tibetan boy to lie on the ground, then I stripped off my raincoat and threw it over them with the hypsometer inside. The last match was struck inside this tent, succeeded, and the altitude proved to be 15,610 feet.

As we crossed the pass, twin peaks with some snow on their summits came into sight, and were typical of this wild and barren country. After a descent of 1700 feet we camped by a beautiful little stream, a tributary of what was sometimes called by our Washi Tibetans the Ding Chu and at other times the Ta So.

According to the map " Tibet and Adjacent Countries," the Ding Chu is shown flowing past Ta So. This therefore was probably the Ding Chu, and the next day we followed it up to its source at the pass called the Chaga La

There was some doubt as to whether this so-called Ding Chu was not the Lamaya, but we were forced to the conclusion that the Lamaya, into which the Ding Chu is always described as pouring its waters, almost certainly takes its origin in the southern slopes of the Nai Ya snow range, as suggested in Bacot's map of the Pic Desgodins.

The Ding Chu valley was well wooded, and along this part of the route there were the remains of houses which had been destroyed by Tibetan raiders. As we made our way up this valley our Washi headman, who with another of the Yak drivers had been out scouting, came to tell us that he had heard that the Tibetans were attacking the Chinese garrison at Litang, and that probably the Lengkashi tribesmen, with whom the Washi were not very friendly, would be on the war-path. However, he thought it was best to go on, but keep a sharp look-out by scouts sent on ahead.

About two-thirds of the way up the Ding Chu valley we obtained a good view of two snow-covered peaks between which the track from

Litang to the Lengkashi country enters their territory. Fortunately, we did not encounter the Lengkashi raiders.

The pass called the Chaga La is 14,930 feet high, and not only forms the Ding Chu–Li Chu divide, but also is the boundary between the Batang district and the Washi country. We were now right in the country of the Monia Washi and near the sources of origin of the Li Chu or Litang River.

As we descended from the pass called the Chaga La, we followed a small stream which in turn emptied into the Shara Chu, one of the three main sources of the Litang River. By this tributary of the Ding Chu we pitched what we called our Sum-ba-a-la camp, 1700 feet below the pass and 13,900 feet above sea-level. Looking back up the valley, bare wild rocky moraines with patches of low scrub characterized the view. Looking forward, in the distance running almost at right angles to this valley was a high snow-range, with Nai Ya as its highest point, forming part of the system of which the Pic Desgodins is probably the highest point, variously estimated at from 19,000 to 25,000 feet high. The Shara Chu takes origin on the northern slopes of the Nai Ya snow-range, and here we saw our first Washi nomad encampment. There were about twenty-two tents—twenty black ones and two white lamas' tents—with about six hundred yaks, besides sheep and goats. We crossed the river and passed through the edge of the camp where the sheep and yaks were grazing. With considerable difficulty, owing to the opposition of our Washi yak-drivers, I secured a photograph which shows this camp with the Nai Ya snow-range and the origin of the Shara Chu, one of the sources of the Li Chiu.

The valley, about $\frac{1}{2}$ to $\frac{3}{4}$ mile wide, was grassland with good pasturage, but no trees. We chose a sheltered spot a little lower down the valley and camped, the altitude being 13,450 feet. It was October 9, and the penetrating cold winds from the north swept the valleys. From this date we had practically no fuel except yak-dung.

The next day we moved on down the valley about 4 miles, and after crossing by a ford 25 feet wide by 2 feet deep to the western side of the Shara Chu, camped close to one or two nomad tents, whose owners were friends of our guides. Our Washi yak-drivers took this opportunity of exchanging three of their yaks which were getting somewhat tired, and we were all glad of a short stage and a day's rest.

As we crossed the Shara Chu we noticed a main track going off to the east, and were told that this was the small road to Litang. Our route was now more directly north. We emerged from the Shara Chu valley into a plateau with low hills covered with a coarse grass; higher up was limestone rock, and away to the west a snow-peak called Dun Sha. In this grassy Monia plateau three streams—the Monia Chu from the north-west, the Heimu Chu from the north, and the Shara Chu from the south-west—united to form the Li Chu, or Litang, which flows for 300

miles to its junction with the Yalung, a tributary of the Yangtze. The Monia plateau was about 8 miles each way; on the higher grassy slopes were herds of gazelle, while on the lower parts of the plateau near the small rivers were numerous black tents and thousands of sheep and yaks. In one encampment alone I counted twenty-seven tents.

The Monia plateau and the valley of the Litang river is the main centre of the Monia section of the Washi. Unfortunately we did not see the Queen of the Washi, as she was half a day's journey down the valley. We pushed on due north up the valley of the Heimu Chu till we camped at the foot of the pass called Rambu La. It was a barren spot and bitterly cold. Just as we were turning in I heard a gentle patter on the tent, and found it was snowing hard and blowing from the north. During the night I heard Pereira calling for the Tibetan boy, and looking out I saw that the front of our flimsy tent had collapsed with the weight of snow and the wind. It was fixed up somehow, and soon morning dawned. We struck camp at 7.30 a.m. and struggled up a long steep climb till we reached the top of the Rambu La—about 14,400 feet. Here we had a most wonderful view: looking south we could see range upon range, and in the far distance a very high snow-peak, probably the Pic Desgodins. Northward was a valley with hills surrounding it covered with snow and a river flowing to the east, probably a tributary of the Ho Chu.

I tried to get the boiling-point at the Rambu La, but unfortunately our last bottle of methylated spirit was found to be broken, and in spite of trying to get the tiny cup of water to boil by a continuous supply of matches and some of the fur out of my fur lining, we had at last to give it up and take 14,400 feet as the approximate height.

A descent into the valley and a climb up the opposite side brought us to the next pass—the Beilung La, about 400 feet higher than the Rambu La. This was a very narrow pass, and northward from the top was an amphitheatre of hills with a small stream running out at its eastern side and a high rocky peak to the west. We skirted this circle of hills and crossed another ridge by a pass called the Tachi.

Between the two passes Pereira's pony went lame and something went wrong with his compass. However, one of the Tibetans let him have his pony and I supplied him with a prismatic compass, and so we managed to get along and keep our records. I spent an hour or two fixing up the hypsometer to work with a candle instead of methylated spirit, and found that the boiling-point gave the altitude of our camp as 14,470 feet. It was a bitterly cold night, snow and a strong north wind; hardly any fuel to be obtained, and Pereira beginning to feel distinctly unwell.

We continued down the valley, crossed a small river flowing west—evidently a tributary of the Ho Chu—and then continued across a great open valley now covered with snow. About $5\frac{1}{4}$ miles from the start we

crossed the Haragu La (about 14,400 feet), and descended a few hundred feet down a valley into a big open plateau surrounded by mountains except at a gap at the north side and another at the south, where a small river, the Tzeku Chu, found its way in and out. The whole of this plateau, about 2 miles wide and 7 long, was one large grassy peaty surface with black mud in between the hummocks of grass, very tiring for the animals. There was no sign of life except a few gazelle on the hillside.

We left the plateau by the gap on the north, a low pass called the Creitei Nyara, and after another mile and a half camped in a valley called Jouriku. Again the only fuel obtainable was dried yak-dung, and as all the cooking had to be done in the open, often with snow falling, the little dough cakes which the boy contrived to make were literally dough in the centre, and these and everything else tasted of the smoke from the abominable fuel, and Pereira was ill and was feeling it difficult to take food of any kind. Several inches of snow fell in the night, but in the morning the sun came out and it was a little warmer. We pushed on down the valley and then over a low pass—the Jyarai La, about 13,650 feet.

We had seen no sign of human beings for several days except the remains of old nomad camps, but just before reaching the foot of the pass a Chinese, who had asked if he might join our party from Batang to Kantse, attempted to take a short cut across a spur of hill and through a small valley. He rejoined us and, trembling with fright, told us that he had seen the dead body of a man bound hand and foot close to his path. Our head Washi muleteer immediately took the best pony and went scouting ahead, but nothing happened, and although our path now went through a narrow defile with great cliffs on each side, we crossed the pass without any trouble. The Washi seemed to think the man was probably the victim of one of the blood feuds for which the Tibetans are famous.

Another low pass, the Sama La (13,750 feet), was crossed without difficulty, and we began to get down to the Lung Chu plateau. The valley of this river was quite deserted, but we passed a big camping-ground where I obtained a picture of one of the stone fireplaces which are to be found all over the nomad country. When they strike camp either to move their grazing-ground or to get to lower levels for the winter months, the fireplace is left behind, and is thus ready when they return the next season and erect their tents in the same place.

Before crossing the Sama La we had a sharp fall of snow, and on coming down into the plateau, which was about 6 miles long by 2 wide, it again began to snow heavily, and we had quite a blizzard from the north. The plateau is like sponge, with the usual black peat-like surface about 15 inches thick broken into small islands with patches of boggy water in between. It was difficult to see owing to the blizzard, and intensely

THE MEKONG NEAR PAH-TIH

UPPER VALLEY OF THE YANGTZE NEAR BATANG

cold. However, we made our way slowly across to the west side, and though it was still snowing reached a little firmer ground, pitched our tents, put oil-sheets on the ground, and tried to make ourselves as snug as our calico tents would allow.

The General was very unwell. He tried to eat some soft-boiled rice with milk; but it was of no use. Everything was smoked and hardly anything was cooked. The boy had a frightful job to keep his fire going in the snow and wind. Fortunately, before leaving my wife had put in one or two special things in case of emergency, so with great difficulty I produced some food free from smoke which he could take. Thereafter I kept him going with a simple invalid diet, some of which he managed to retain.

We struck camp in several inches of snow, and at 8 a.m. were under way. A little later, after crossing a shoulder of hill, we entered a valley bearing to the north, and after a steady descent came in sight of two chorten at the end of a good-sized plain about 5 miles by 2, with a number of tents, sheep, and yaks. We were now approaching the region of the Nyarong or Chantui nomads, and our Washi guides were uncertain about the reception we should get. The latest news was that there was a band of forty to fifty robbers between us and Kantse. Pereira asked if we could go by any other route so as to miss them, but the reply was "No, there was no other road." We talked it over, and as I could see that his condition was getting serious, I suggested that we should risk going straight on through and not delay, urging that in robber country it is always good to be ahead of the news about one's own caravan. Heavy clouds everywhere looked like more snow, and I felt that with Pereira failing the sooner we could reach some kind of place with four walls and a roof and a good fire for warmth and cooking, the better. We pushed on, and passing a spur of hill entered a valley, which we mounted steadily till we reached a pass called the Chaolung La (12,885 feet); down the other side, past a Nyarong nomad camp of about six tents, where the dogs were very fierce, and on till we camped in a valley at a height of 12,835 feet, the lowest camp we had had for ten days. The days were getting short, and night soon fell. We had just turned in when suddenly it began to blow hard, and I really thought the tent would either be blown away or be torn from the guy ropes. The pegs were driven in, and then it began to rain, and this turned to snow. However, the night passed, and we were off next morning at 7.30 a.m.

From this point on during the next day's journey we crossed five small rivers, but all were flowing westward and were apparently going direct to the Yangtze. The Creitei Nyara was thus the pass over the Hochu–Yangtze divide.

Two of these small rivers flowing westward take origin in small lakes; the first called Nanlung Tso, about 1 mile long by ¾ mile wide, was very pretty, and almost like Lake Louise in the Rockies. We crossed a

shoulder of hills called the Tsaimi La, and followed a larger river called the Chugu Chu to the second lake, the Nalu Tso about 2¼ miles long by 1 mile wide. Here we camped; the altitude was only 13,111 feet, so it was more comfortable, and the General seemed distinctly a little better.

The following morning, just as we were breaking camp, a great herd of about one thousand yaks with Nyarong tribesmen went past. They were changing their grazing-ground. A young girl with her hair done in numerous plaits woven into round silver plate-like ornaments, with her brightly coloured high-top boots and sheepskin coat and cap, made a picturesque figure as she rode at the rear of the herd. The General, using the Tibetan boy as interpreter, inquired about the road we were to follow. They gave us good news, for they said that the road was clear of bandits. We followed up the Nalu Chu to its source at the foot of the Yangtze–Hochu divide, and crossed by a pass called the Momu La (14,244 feet). Beyond were great rolling stony slopes gradually descending to the valley of the Ho Chu. In the distance could be seen a high snow-covered range running north-west to south-east, which formed the Hochu–Yalung divide—evidently the continuation of the big range described by Teichman in 1922 as beginning south of Jyekundo and continuing down to the south-east, first as the Mekong–Yangtze and later as the Yangtze–Yalung divide, continuing to the neighbourhood of Tatsienlu and the Yunnan border. Approaching this range from the south, one rocky peak called Nashi or Dumbola—covered with snow, but so perpendicular that the rocky face could be plainly seen—reminded one of the design for the new Liverpool Cathedral, for the peak rose in the centre of other rocky crags like the huge tower that is soon to be seen at Liverpool. The track we were following now gradually descended, and soon we were at our camping-place, 13,790 feet.

We were off at 7.30 the next morning, going steadily down to the valley of the Ho Chu, whose headwaters were formed by the confluence of four small streams, the two principal being the Aseiyindu Chu and the Luni Chu; the moraines were noteworthy for the extraordinary size and number of poised rocks on the crests of the lower hills forming the valley boundaries. After crossing the Ho Chu we entered a small side valley which led round the base of Dumbola, and finally after a very stiff climb we crossed the Hochu–Yalung divide at the pass known as Luma La, which we made to be 15,152 feet. There was deep snow on the pass, and as I was getting the boiling-point Pereira came up. He had ridden the pony nearly all the way, but the last 200 feet of the pass was in such deep snow that he had to get off and do it on foot. He seemed in good spirits, for this was, we were sure, our last high pass, and as he went by me he called out to say how much better he felt that morning. After I had taken some photographs I followed him down the valley, a little east of north, until at last we camped at Rajisumdo, under the shadow

of a great mass of grey rock which towered above us crowned with snow and streaked with yellow.

The next morning we started at 7.45. Pereira seemed a little better, and had some milk and cream cracker biscuits for breakfast—more than he had had for days. I took the precaution to fill a thermos with hot chocolate, for though we hoped to reach Kantse, I wanted to be prepared in case of any delay in crossing the river Yalung. It was a weird valley that we were following: moraines with great landslides, the broken rock showing out through the snow, which was still falling; driving banks of mist rolling up the valley, sometimes obscuring everything, sometimes lifting and revealing great rocky crags towering up above us. At 11.30 the valley opened out, and on the hill opposite was a lamasery called Dorga Gomba, with a peculiar lot of hovels, looking very much like cave dwellings built with mud walls on the side of the hill just below.

At 12.5 I was with the muleteers accompanying the first lot of nine yaks when I was told that Pereira was on the ground. I turned back and found that he had had to get off his pony owing to a sudden attack of severe pain. We were only $3\frac{3}{4}$ miles from Kantse, so I gave orders for the caravan to go on and get across the river Yalung, while the Tibetan boy remained with us. The General was very collapsed, but after fifty minutes he seemed easier, and insisted on going on. With difficulty we got him on to a pony and made our way slowly down to the river. We crossed by the coracle ferry, and then, after fixing up his camp bed and lashing the tent poles on to the sides for carrying, he rested comfortably. The pain became less, and we tried to get passing Tibetans to act as bearers up to the town, only $1\frac{3}{4}$ miles away. It was of no use—not even our Washi yak-drivers, who had been with us from Batang, would help to carry a sick man. As time was getting on and it would soon be dark, I sent the Tibetan boy on ahead to find a house for us to stay, and then, as the General thought he could manage on the pony, we lifted him into the saddle and slowly made our way into the town. At 5.20 we arrived at our destination. His bed was soon ready, and in a few minutes we had him snug with hot-water bottles and every comfort that we could give him; but he was very weak. At a quarter to nine he asked for the light to be put out and he would try to sleep. After thanking me for all my trouble he dozed a little and wandered in his sleep, sometimes talking in Chinese, sometimes in English. At 1 a.m. I helped him to turn on to his side, and he talked to me quite rationally; but after a few minutes there was a sudden change, he became unconscious, and ten minutes later he passed away peacefully in my arms. So died a brave soldier, a remarkable traveller, and a devout Christian.

The Tibetans dispose of their dead either by throwing the body into the river or by putting it out to be eaten by vultures; but the Chinese traders in Kantse had a small plot of ground which they used as a

cemetery. The Chinese official offered me a site for a grave, and so I laid him to rest there, under the shadow of the Great Kantse Lamasery and within sight of the great snow-range forming the Ho chu lung divide. Sixteen Tibetans carried the coffin to the grave.

After Pereira's death I decided to continue the journey as we had planned it, aiming to cross part of the Golok country and reach the Yellow River either along the southern part of the bend or at Sotsong Gomba, at the bend of the river. On making careful inquiries I found that the Goloks directly north of Kantse were at war with the Seta nomads, and also they were those who had made the most stubborn resistance when Ma-Chi, the Muhammadan Chinese general, had subdued their country and forced the rest of the Goloks, including the Golok Queen, into submission. These die-hards had settled down on the southern bank of the bend of the Yellow River and had entirely stopped all traffic from Kantse to the country due north, waylaying and plundering any Chinese who attempted to enter their territory. I therefore decided to adopt our alternative plan, which was to go east for a certain distance and then strike north for the bend of the Yellow River, crossing the eastern end of the Golok country. I was fortunate in securing the services of a Muhammadan trader who had been across this country before, and on October 25 said farewell to Kantse and was once more on the road. It seemed strange to be alone, but my time was fully occupied, for in addition to seeing patients when we stopped for a rest, I also was kept busy making a prismatic compass traverse of the route, getting the altitudes, and trying to keep a photographic record.

I followed the usual route towards Tatsienlu for six days until we reached Dawu. Here I got Ula transport and attempted to strike across to Suching. On leaving Dawu I continued along the Tatsienlu road for 8 miles and then entered a side valley going north-east, at the top of which was a pass to Dungrung La. There were numerous hot springs in this valley, and the stream which we were following disappeared and reappeared in the most extraordinary manner, part of its course being below ground. We camped at the foot of the pass at 13,167 feet. Heavy snow fell during the night, and the next morning the pass was several feet deep. It was a hard struggle crossing. I made the altitude 15,316 feet. Steadily we descended from this, the divide between the Sha Chu or Nya Chu and the Taking rivers. The village where we lodged for the night was only 10,755 feet, so we had come down 5000 feet, and it was much warmer.

The next morning we followed up the Kula River, aiming for the little village of Tan tu. To get there we had to cross the pass called the Wulu La. It was November 3, and as we went up the snow got deeper, and the Tibetan drivers declared that the pass was impossible. One or two of the yaks went down in the deep snow, and it was difficult

CONFLUENCE OF SUMBA-A-LA RIVER AND DING CHU

TWIN PEAKS AT TSANGBUNGA LA

LOOKING SOUTH TO TACHI LA, WASHI COUNTRY

THE HOCHU-YALUNG DIVIDE

to know where the track was. It was a knife-edge pass, and with a bitter wind and driving snow was one of the most difficult we had to tackle. Every few steps we had to stop and rest ourselves and the animals, but at last the top was reached and with great difficulty the boiling-point obtained. The altitude was 14,770 feet. Then the snow stopped falling, the mists lifted, and I got a bearing with the compass. It was a descent of 4500 feet from the pass until we reached Tan tu, a village of sixty families, where the Tu Sz, or headman, is a woman. I managed to persuade this old lady to let me photograph her, with the two lamas who were her private domestic chaplains.

There was such difficulty in getting transport direct to Suching that I decided to follow the small Tan tu River down to near Rumichango, and then the Taking River up to Suching and Damba. Ula were obtainable along this route, but the road was so narrow and difficult along the side of the river that pack-animals could not be used, and our riding-animals had difficulty along some of the track. At Damba I took a course towards the north-east, crossing the Tan Chao Wu pass at 14,130 feet, and reached the Taking River, here called the Matang River, at Cherh Tsz. The house of the Tu Sz at Cherh Tsz was more like a small fort and typical of several which we saw *en route*. From Cherh Tsz on to Sotsong Gomba our continual difficulty was transport. We had decided to hire animals as we went along, but the difficulty was that the drivers would only go two or three days' journey and then wished to return to their homes. The reason was obvious, that as soon as they got away from their own people they did not feel safe. At Cherh Tsz the representative of the Tu Sz came and wanted me to go *viâ* Somo and Matang. I asked the reason, and found that there was a feud between two of the lamaseries on our route, the one two days, and the other four days north, and they thought we would not get through.

I put on my severest look and said, "Well, if we alter our route I will make inquiries as we go along, and if I find it was not necessary when I get through I shall be very annoyed," and I tried to look as if my annoyance were a most awful thing to reckon with. After further discussion they gave way, and we started thirty-six hours later. My endeavour was to keep as far west as possible, and we therefore followed the Matang river westward for about 4 miles, and then struck north up the Talung Chao valley until we crossed the divide between the Talung and the Runga rivers by the pass called the Choh Tseh La (13,676 feet). From the top of this pass, far away to the north-west on a bearing of 120°, a high mountain peak could be seen standing out in marked contrast to the rest of the mountain range of which it was the highest point. I came to the conclusion that this was Mount Yabainkara, in the Bayan-tukmu range.

The track now followed the hillside until after a descent of nearly 3000 feet Tatsang Gomba was reached. This was a lamasery with

about two hundred lamas. They had never seen a foreigner before, and were very suspicious. At first we were told that it was quite easy to get yaks for the next two or three days, but after I had paid off the ones which had come from Cherh Tsz the acting headman, who is of course in the power of the lamas, became very difficult, and we could get no one who would provide us with pack-animals, while the only shelter we could get was a shed where refuse was dumped. It was a most awkward position: our retreat was cut off, and we could not go forward. However, by tact and courtesy and by the gift of one or two small presents I managed to gain the friendship of the Living Buddha of the lamasery, and he gave me a room in his house to stay in, but would not help us with transport. Then a happy idea occurred to me. I showed him some photographs and offered to take his picture. He consented on condition that it was done on the flat roof of the house where none of the other lamas could see. The photograph was taken, a print hurried through and duly presented, and this turned the scale. Our host personally took up the matter of transport, secured yaks for us, and came to see us off on our journey. Moreover, he sent his own personal servant with us to help us when, after two days, we must again change animals. The buildings of this lamasery were different from anything I had seen before. In the walls were layers of reeds laid crosswise with the ends cut off evenly, giving the appearance of a stucco. Pereira described this in the *Geographical Journal* of March 1911 as occurring in the Labrang monastery, but he thought it was unique. The roofs are of slate of irregular shape, but give the appearance of a slate roof in England.

Leaving Tatsang Gomba, we stayed overnight at a little village called K'a Ka Koh. The houses were most peculiar. They were mostly five storeys high and had the appearance of a tower, the two upper storeys projecting with a kind of veranda closed in with twisted reeds. The people at first barricaded themselves in their houses, but as soon as they knew we were friendly with the Living Buddha of Tatsang Gomba they took us in.

The next day we crossed the pass called the Kunchien La (13,298 feet), which is part of the divide between the Yangtze and the Yellow River. Although this pass was lower than several we had negotiated before, it was not easy, for it was November 24, and driving snow made it difficult to see the track. I tried to get the boiling-point, but had to descend 300 feet before I could get some slight protection for the hypsometer, and then it took half an hour to get a steady reading. When we had descended a little farther and this downfall of snow had ceased and the cloud lifted, a glorious view burst upon us: a great valley running almost due north as far as the eye could see, the upper slopes entirely, the lower partially, covered with snow.

This was the source of the Peh Ho or White River, which we followed for that and the following two days. The people here were apparently

a mixture of Goloks and Ngaba, the Golok country being more to the west, the Ngaba more to the east, of the White River. A large proportion of the people were nomads with great yak-hair tents, but at intervals we came to groups of mud-walled hovels which might by a stretch of imagination be called villages. These were associated with large stockades where the yaks and ponies could be herded, so that cattle raising seemed to be the one occupation of the people. They spoke a fairly pure Tibetan according to our Tibetan boy, who was readily understood. Fuel is almost entirely dried yak-dung.

On the first day and a half, following the White River, which was full of drifting ice, we found its course was almost due north; but on the third day, after being augmented by numerous small streams the river was of considerable size, and its course was now almost exactly north-east. In places the valley widened out into grassland as at Dorma, where the plain was about 5 miles long by 3 miles broad, and here I counted seven camps or mud-hut villages, and there was splendid grazing for yaks, sheep, and ponies.

At the end of our two and a half days by the White River we had again to negotiate for transport, but as we were told that the lower reaches of the White River were infested with robbers, we took an alternative route more to the westward, and therefore more into the Golok country. Leaving the White River, we struck up a side valley to the Runglung La (12,772 feet).

We were now in the eastern part of the Golok country, and our new yak-drivers evidently knew their countrymen fairly well, for one of them was invariably about half a mile ahead scouting. We could see his mounted figure making its way up a pass, and hesitate at the top while he dismounted and carefully peered over the top before he beckoned us on. On crossing the Runglung La a solitary horseman appeared on the hillside and then disappeared. A little later three armed mounted men entered the valley down which we were making our way and came rapidly towards us. Our scout, who was quite close to us at the time, shouted to them to stop and say who they were, but they took no notice and came rapidly on. We had only one rifle, a shot gun, and two revolvers in our party, but we got ready for emergencies. However, as they approached our scout found they were friendly, and they gave us information that a band of robbers were just beyond the next bend of the valley. We took counsel and turned up a side ravine, where we concealed ourselves in the hope that they would move on. This apparently happened, and the next day when we continued our journey we passed the place of the robbers' bivouac, but were not molested.

Mile after mile of low hills was the characteristic of this country; no trees, but excellent pasture in the valleys. We travelled all day without seeing a sign of life—no yaks, no sheep, no tents. Suddenly, on turning the spur of a hill there was the dead body of a man put out

for the vultures. It gave one a curious feeling that probably we were being watched all the time. That evening we had just camped in a lonely spot by a small river called the Gia Chu, which our guides told me flows into the Yellow River direct, when two mounted men came over the crest of the hill, looked at us, and, when I sent the Tibetan boy to investigate, disappeared again. The same thing happened again with a single horseman, who came, looked, and disappeared. We posted a sentry that night, but although nothing happened our guides urged us to be on the move next morning the moment we could see, and so we struck our camp in the dark and were a mile or two on our way by daybreak. Another day's journey brought us to the Lohtsz Nyara (a pass of 11,904 feet), and after crossing this we camped only a day's journey from Sotsong Gomba. On two other occasions we had an alarm of attack, but we displayed the fact that we were armed and were not molested.

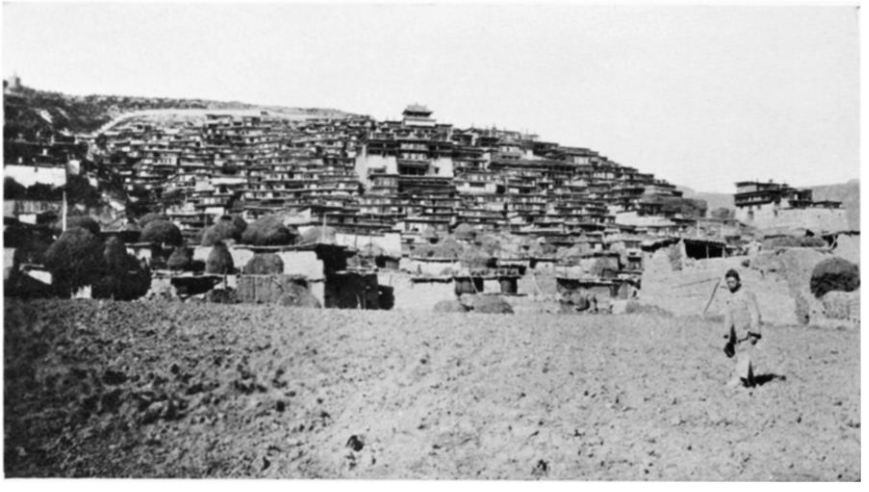
These nomad people—the Goloks and Ngaba—all carry something for protection. If possible they have a gun, which is always provided with the double-pronged rest hinging about halfway along the barrel; and the saying is that "a Golok never wastes a shot." Some have spears about 20 feet long with a sharp iron point; they often use the butt end for driving their yaks.

We were now nearing the lower reaches of the White River, and crossed a great plain from 15 to 20 miles in length and about 6 miles wide, bounded on the west by a range of mountains, the highest peak of which was called Ar Chia. We reached the left bank of the White River about 14 miles from Sotsong Gomba, and 10 miles further on the great Yellow River itself burst into view. It was November 30, and floes of drift ice were coming down both rivers. We forded the White River with difficulty, and then followed the right bank to where it joins the Yellow River. Two miles beyond the confluence, on the banks of the Yellow River, is Sotsong Gomba. This consists only of the rather miserable buildings of the lamasery. The lamas were very anti-foreign, and the only place that we could get as a shelter was a kind of underground cowshed. Nevertheless, the fact that we had got safely through from the south to the bend of the Yellow River—a spot which had only been visited before by about three Europeans—was a source of satisfaction.

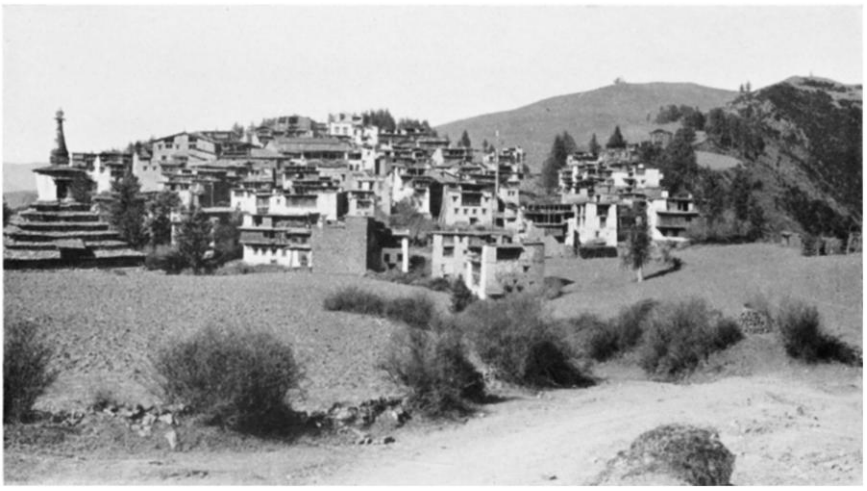
There are numerous sharp bends in the Yellow River to the south-west of Sotsong Gomba, but after the White River joins it the river for the next 5 miles does not take such a sinuous course. The lamas seemed so hostile that I was glad when we got away. I had intended to make my way along the northern arm of the bend of the Yellow River till I reached a little place called Ni Ma, then cross the river and attempt to reach Hwong Mo Ru, the place where the chief Golok camp is generally situated, but at Sotsong Gomba we found that for several reasons this

DESCENDING FROM RAJISUMDO CAMP, WASHI PLATEAU

SOURCE OF YALUNG, MONIA WASHI COUNTRY



KANTSE



TATSANG GOMBA, NORTH OF CHOHTSEH LA

HOUSES IN K'A KA KOH VALLEY

GOLOK COUNTRY FROM SOURCE OF WHITE RIVER

was impossible. We heard that there was civil war in this part of the Golok country, and the Queen of the Goloks had taken refuge in flight. All communication was interrupted, and even the Muhammadan traders, who usually have free access, taking in tea and bringing back wool, did not dare to venture into this region. We were now into December, and the cold was becoming intense. The altitude of Sotsong Gomba was 11,090 feet, and Hwong Mo Ru would be much higher. Our stores were practically exhausted, and we were living largely on what we could get as we went along. I therefore decided to make my way to old Taochow, and thence to Lanchow, making a détour in order to call at Labrang Monastery *en route*.

From Sotsong Gomba for the first 17¾ miles the track gradually leaves the Yellow River and going due north passes through the large grassy plain which borders the Yellow River, and at the end crosses some low hills which hide from view the Tibetan village of Tawa and its associated lamasery Shami Gomba. I stayed at the Shami Gomba, which as far as I could find out had never been visited before by a foreigner, and had a most uncomfortable time with the lamas. By the time we reached Raa Gomba, which stands on the Black River, the river was frozen over, and we crossed on the ice.

From Raa Gomba, going 30° east of north, we crossed a plateau of grassland about 11 miles wide which sends its waters westward by the Tan Chu into the Black River and so into the Yellow River, and then passed through the mountain range on the north by a low pass only about 500 feet above the plateau. This pass was on the west side of a huge rocky crag having a marked resemblance to a lion's head, visible from any part of the plateau, and so a splendid landmark. I found that the mountain range forms the Yellow River–Yangtze divide, for the small stream on the other side of this low pass flowed eastward and was a tributary of the Pai Hsui, eventually going to the Kia Ling, which joins the Yangtze at Chung King.

Konserh Nien Ba is the name of the next lamasery, which stands on a small river. To reach old Taochow we had again to cross into the Yellow River watershed, and the divide in this case is the mountain range known as the Min Shan. As these mountains are supposed to be infested with robbers, we were advised to ask the lamasery to provide us with four lamas to travel with us the next two days, for it was said the robbers would not dare to attack a caravan having lamas; they would be too afraid of their curse. We therefore hired four of these scoundrels to join our caravan, and they kept me awake most of the night by sitting round my tent and howling to each other, the idea being that robbers in the vicinity would know that some one was on the look-out. However they piloted us through the Min Shan range, and got us up at 3 a.m. on the second day in order that we might reach the top of the pass by dawn—before, as they said, the robbers had begun to stir. The pass called

Hohkeh La had three crests; it was 12,300 feet high, and certainly was an ideal spot for robbers.

We crept up to the top of the pass as silently as possible with just the faintest glimmer of moonlight; then rapidly the twilight before the dawn came, and as we reached the top the sun began to light the highest peaks. We were soon hurrying down the other side of the pass, and the danger was over. At parting I presented these four lamas with two empty biscuit tins, and they went back delighted with their present.

Our track now followed the Cheh-Ba-Ku river till it joined the Tao. There was plenty of game—pheasant, partridge and wild duck—in this part of our journey, and after crossing the Tao to its northern or left bank, a few miles brought me to old Taochow on December 9, where it was good to meet the missionaries and again hear good King's English.

The road on from Taochow to Lanchow has been traversed so often that there is no need to describe it. I branched off to visit the great monastery at Labrang, where there are over 4000 lamas. When General Pereira visited Labrang over ten years ago it was impossible to gain access to any of the buildings, but on this occasion the father of the Living Buddha, who is acting as regent, received me quite graciously, and sent one of the under lamas to take me through the lamasery. The great chanting hall with its rows of cushions on which the lamas sit to chant the sacred books was a most impressive place; there were alcoves at the side, each with an image with the usual row of butter lamps and cups for wine, and in front of each a row of white-looking pyramids which I discovered were made of snow. I took a flashlight picture of one of the alcoves, but the old lama did not like it, and politely requested me not to use that bright light again. I managed however to secure time-exposure photographs of the private chapel of the Living Buddha, where the little fellow is brought to recite the sacred books. Here again were the snow offerings. It was so cold at Labrang that these have to be renewed only every three or four days. On the hillside behind the lamasery were a number of whitewashed huts, which I was told were "cells for the little lamas who do not learn their lessons."

From Kantse, where General Pereira died, to Lanchow I had made a prismatic compass traverse of the route all the way, but having arrived at Lanchow I decided to follow the Yellow River through Ningsia and Inner Mongolia to Paotow—the terminus of the Peking–Suiyuan Railway, and then get the train to Peking. This route is so well known and has been so often mapped that I decided not to continue the mapping. With the help of Mr. Andrew of Lanchow I obtained carts to take me through, and on December 27 started on the final section of the route.

All went well until three hours from Paotow, practically the end of this rather long journey; but there two hundred and fifty bandits came along and took me prisoner. As a captive with the brigands we crossed the Yellow River on the ice. The incessant moving about, sometimes

by day, sometimes by night, the intense cold—20° below zero—the loss of camp equipment, blankets, etc., the difficulty about food, made this an experience that I am not anxious to repeat. We spent eight days in the neighbourhood of the Ordos desert, until, with the help of the Chinese officials, I managed to escape, and travelling all night once more crossed the Yellow River on the ice and reached safety.

I was fortunate in being able to save all our maps and important records, which I kept on my person. Photographic records also I saved by posting them to Shanghai from various places *en route*, but all else went: camp equipment, geographical and surgical instruments, etc., were all lost.

There were many difficult experiences on this long and somewhat strenuous journey, but the saddest was the loss of that brave and adventurous explorer, Brig.-General George Pereira, of whom it may truly be said, "He feared man so little because he feared God so much."

Before the paper the PRESIDENT (Dr. D. G. HOGARTH) said: I have to introduce to you Dr. Gordon Thompson, who has been, I believe, for nearly thirty years a medical missionary in China, and who joined General Pereira on his last journey. Those who have attended the meetings here and who have kept abreast of the progress of exploration, will well remember General Pereira's remarkable tramp afoot from the capital of China to the capital of Tibet, from Peking to Lhasa. It was on a subsequent journey that Dr. Gordon Thompson joined forces with General Pereira; and together they undertook a most remarkable journey into the practically unknown borderland between Tibet and China which Dr. Gordon Thompson will describe to you to-night. The journey entailed the greatest hardships, much greater, I fancy, than you will realise from the account that Dr. Gordon Thompson will give. The journey also entailed a tragedy; for before it was over General Pereira was dead, and Dr. Gordon Thompson had to continue alone. It ended in his capture by brigands and his being kept under extraordinary circumstances for eight days in their hands until he had the good fortune, by a series of events which one thinks could only possibly happen in the East, to make his escape. Moreover, the journey was one requiring the utmost resolution and fortitude, and it is a very great tribute, to the explorer who will speak to you to-night, that he continued that journey and that he carried it through. He has a long story to tell you, and I will not stand between you and him but call upon him to give the account of his remarkable experiences.

Dr. Gordon Thompson then read the paper printed above.

The PRESIDENT: I am afraid we are rather unfortunate to-night in not having any one to add anything on the subject. That, of course, is the penalty of travel into countries so unknown as that to which General Pereira and Dr. Gordon Thompson went. I had hoped that Lord Ronaldshay would have been able to say something in general, and Sir Francis Younghusband in particular, about Tibet; but as they live in the country, they have both been obliged to leave to catch trains which, apparently, have no successors until about 2 a.m. Moreover, had General Abbot-Anderson been present, I gather he would have said something. We should have asked also Mr. Archibald

Rose, who is well known in connection with Chinese matters, and Mr. Weatherbe, who has been mentioned by the lecturer as having been taken by brigands, to speak; but neither of them was able to be present. So I must just issue a general invitation. Is there any one present who would like to say anything about the Chinese or Tibetan country, or to ask a question which the lecturer may answer? There seems to be no one who wishes to speak, and therefore I can only, in your name, convey our very cordial thanks to Dr. Gordon Thompson, not only for a most interesting lecture, but for certainly some of the very best photographic views that I have ever seen in this hall or anywhere else. It certainly has been an amazing piece of good management, supplemented, I imagine, by a great deal of good luck, that, considering what happened to Dr. Gordon Thompson in the end, has enabled us to see those photographs. It appears, as he told you, that at every point at which there was anything like a post—certainly not anything like the post we know—he sent off such films as he had already exposed, and by the greatest good luck every single roll came to hand except two which he had taken just before he was captured at the end of his journey. The result is that we have been able to see these astonishing photographs, so extraordinary in their clearness, with perhaps exception of the panoramic photographs which always lack a little definition.

I think the most conspicuous feature of the lecture was the author's extreme modesty and reticence. One would not ask him for a moment to revive the most bitter of his experiences, the experience to which he so feelingly referred, and which has made this meeting almost into a Pereira Memorial Meeting; but I am a little disappointed that he should not have told us more about that very remarkable experience of his towards the end of his journey, namely, his capture by brigands and his sojourn with them. He has told me in private a little about it, enough to make me want to hear a great deal more. It certainly was one of the very oddest experiences, with all kinds of details almost like comic opera but at the same time with an element of possible tragedy; such an experience, in fact, as one could not imagine happening anywhere except in China. As no one has spoken on the subject of the lecture, perhaps the lecturer will tell us a little more about that strange experience. If he does, he will only add to the gratitude which is already felt most keenly by all present. I am sure we are most grateful to him for having come through, and, in spite of the very modest and reticent way in which he has told his story, we are all most appreciative of the courage and endurance which carried him on to the end. In conveying to him your thanks, which you have already expressed most cordially by acclamation, I will ask Dr. Gordon Thompson if he can tell us just a few more details rather of the less formal, less purely geographical kind.

Dr. GORDON THOMPSON: The brigands came along only three hours from the end, one might say, of the journey. In fact, we were within 10 miles of Paotow, the terminus of the Peking–Suiyuan Railway, when we were ambushed by a mixed company of about two hundred and fifty Chinese and Mongol bandits. I was travelling at the time in a cart. There were two things which made the experience most uncomfortable: firstly, the intense cold, the temperature being 20 degrees below zero; and, secondly, the constant moving about. We would arrive at a place, and I as a prisoner would be thrust into a farmhouse or some building and sentries placed outside the door and on the flat roof. We would not know how long we were to stay; sometimes it would be only a few minutes, sometimes a few hours. Occasionally we travelled

all night, whilst sometimes, by changing horses, we travelled all day and all night, so that when we stopped one would not know whether to settle down and try and get sleep or whether it was not worth while because we might be moving on again almost at once.

The great difficulty when the brigands took me prisoner was to get and keep in touch with the outside world. The journey had already lasted over six months, and although I had sent word through to Tatsienlu and so to Peking of Pereira's death, nobody knew by which route I was making for Peking, or expected us in that neighbourhood. When my Chinese servant came and told me that everything was smashed up and all our things were looted, a happy idea occurred to me. I decided to go on a kind of " hunger strike," and when the bandits came and offered me Chinese food, I shook my head and said, " I am a foreigner. You Chinese eat Chinese food. We foreigners eat foreign food. I must have foreign food." They were rather nonplussed, and asked what they could do. I said, " If you don't want me to die, the best thing you can do is to let me send a letter into the town " (three hours' journey away) " and ask for food." They kept me waiting all night, and then they consented. I called the Chinese boy whom I had with me—the only servant left—and having first ascertained that none of the brigands understood English, gave him a letter. In the letter, after asking for some food, I described who I was and how I came to be taken. I requested that Peking should be informed, and after giving as exactly as possible our position, urged the Chinese authorities to attack the robbers and look out for me if I attempted to escape. The boy was to take the letter to the nearest town, and as he was leaving I whispered to him not to come back, because I thought if I got the chance to escape I would not like to leave the boy in the brigands' hands. The boy was very pleased with his instructions; he obeyed them exactly, for he went away and did not return. Then I had to keep myself going with food, because as I had once started I had to keep it up. I managed to subsist on scraps picked up unknown to my captors. We came to one farmhouse, and when I went into the courtyard and stumbled over what I thought was a pile of stones, I found they were actually frozen potatoes. I pocketed about six and went to the room in which I had been put as prisoner. There was a pan of tea boiling on the fire, and when the brigands were not looking, I dropped the six potatoes into the boiling tea. About a quarter of an hour afterwards I managed, when again they were not looking, to get those potatoes out, and then went and lay down. I covered my head up as if going to sleep, and made my supper of boiled potatoes! So it went on, and each day I requested that a messenger be sent to ask for food, and, strange to say, several messengers which the bandits themselves sent out with my letters did not return. Thus I was able to keep the authorities in full possession of all our movements and give them much valuable information, while to the bandits I pretended to be getting weaker and urged them to open negotiations.

We reached one farmhouse, and by this time they were getting rather desperate at my apparently weak condition, so they came and asked me whether I liked pigeon. I replied, " Yes, if it is cooked in foreign style." Thereupon they called my cart-driver and handed to him a pigeon and said, " You must know something about the foreigner because you have been driving his cart for a fortnight or more; see what you can do." He plucked the pigeon, and then came into the place where I was prisoner carrying the pigeon and a pan. He chopped the bird up and put it with potatoes and vegetables into the pan on the fire, and there was very soon a most delicious smell of pigeon stew. I

rather longed for some of that stew, so I asked if he had put any salt in it. When he said he had not, I told him to go and see if he could get any. The brigands were out of the room, and whilst the carter was also away I seized a handful of the stew and put it into my pocket. When he had put the salt in I suggested some sugar might improve it, and whilst he was getting that I pocketed another handful of stew. A quarter of an hour later he said it was ready, but after tasting it I refused to have any more, saying, " You don't know how to cook European food ; you had better put it down." He did so, and went out. I could not resist that stew, for I was really getting very hungry, and having disposed of it I put the bowl on the floor. The usual Chinese dog came in and sniffed round, and when the carter returned the dog was eating up the bones. I said, " Anyhow, the dog likes it." I heard the carter go to the brigands and say that he certainly could not prepare European food properly, for I had given the stew to the dog. He did not know I had had a very good supper.

The matter ended in this way. My letters had been received, and first a Catholic priest came to the bandit camp. He had been promised safe conduct by the brigands if he would bring me food. He tried to negotiate, but he had had to leave because another Catholic priest was in captivity only 8 miles away. That poor man had an awful time. He was a captive for about eight weeks, and when eventually they got him away he only lived two months, dying as the result of his experiences.

Then the Chinese sent an agent over, and he tried to bargain with the bandits for my release. You may be interested to know, as the President has asked for more personal details, what they wanted in the way of ransom. They demanded $10,000, 150 rifles, 50 automatic pistols, 4 machine-guns, and a whole district to control ! I managed afterwards to get the paper on which these demands were written, and I brought it home with me and presented it to my wife, saying, " There, my dear, that's the value of your husband." The Government agent found that he could not make any impression on the bandits, and that it was impossible to argue with them or beat them down. He came to me and said that he must leave as he could not come to terms, and once again one expected to be on the move. But that night, at half-past nine, I was expecting the guards to come in and say they were off on the move, instead of which two crept in and said they were going to help me to get away. I was somewhat suspicious, because I saw behind them the Government agent, whom the Catholic priest had warned me was really a bandit. Therefore at first I refused to go. They went out and talked it over and got very excited outside. Finally, they came in with a rush and got hold of me, and there was no question whether I would go or not. One man held me by the wrist, and with his revolver in the other hand we started out and went, in the darkness of the night, over the frozen country for 2 miles until we came to a farmhouse. They knocked, and we went in. Inside the farmhouse was very brilliantly lighted. There I found the rest of my guards and once again the Government agent. I began to think they were really helping me to get away. I told them that if they were acting true I would help all I could. Ponies were soon ready, and we trekked away to the north, crossed the Yellow River on the ice, which was about 3 feet thick, reached a village at 3 o'clock, rested until daylight, and then mounted our ponies again, striking north as fast as we could go. Finally, at nine o'clock we reached a village where there were 250 troops waiting to take us into safety.

When we reached the town I was received by the son of the Governor and

the Chief of the Staff, who had planned how they would help me. The latter was a Christian man, and he took me aside into a little room, where he knelt down and thanked God for my escape. It was a most touching experience, and when I could find words I said to him, "It is an extraordinary thing that you have done. Why did you send a man who was a bandit to try and help me to get away?" His reply made everything quite clear. He said, "Nobody but a bandit would dare to go into the bandit camp; we had to employ a bandit for the purpose, and his instructions were that when he got into touch with the bandits he should bargain with them, and if they would not come down in their terms, then he was to give some money to the guards and ask them to help." That was what had happened, and the guards were ready to help me to escape. I was very thankful that the time in the hands of the brigands was not longer, and I must say this before you all: that I believe that God Himself overruled things and delivered me out of the hands of the bandits.

The PRESIDENT: Well, ladies and gentlemen, we have heard a good deal in the course of the last two or three years about people being taken by Chinese bandits, but I do not think any of us have ever listened to such a story at first hand as that which Dr. Gordon Thompson has just told. It only makes us feel more warmly towards him, if possible, than we felt before.

THE ORIGIN OF THE TUAREG

Francis Rodd

Read at the Afternoon Meeting of the Society, 16 November 1925.

BEFORE discussing the subject of this paper—The Origin of the Tuareg—it will be advisable to describe the people themselves. They are so little known in Europe, and especially in England, that some definitions are necessary.

The indigenous peoples of North Africa (one must not go too far back and talk about aborigines) are usually called Berbers. But the description is misleading, as it conjures up many popular fallacies and misconceptions. I therefore propose to substitute for this name the geographical term Libyans, which Herodotus first introduced, in speaking of the population of North Africa, by which is meant the whole area west of the Nile basin and north of Equatoria.

Among these Libyans there are certain nomads who inhabit the Sahara or inner parts of North Africa. European travellers first called them the tribe of the Tuareg, or Tawarek, adopting the Arab name which they heard in current use. Although described as a Libyan tribe, these nomads seemed nevertheless to differ from the sedentary inhabitants of the coastal districts along the Mediterranean. At least they possessed some quite remarkable peculiarities of their own. As the Sahara became better known, Tuareg were reported in places as far apart as in the Fezzan or along the Niger. Their striking individual characteristics, their wide extension and the comparatively large numbers of their complex tribal organization, were slowly realized in the course

the German 1/300,000 map close to the river and only some 7 kilometres up from the lake: so there is opportunity for a good fall here. Mr. Scott-Brown's note on the falls does not suggest that they were anything but well known, and his figure of 1200 feet reads as if that were the accepted height: yet we can find no reference to the falls in geographical literature. It will be strange if they really are near the mouth of the Kalambo, halfway between Abercorn and Kasanga (late Bismarckburg), and well known locally, yet undescribed; and we shall be glad to receive any further information.

THE THIRD MOUNT EVEREST BOOK

The Fight for Everest: 1924.— **Lieut.-Col. F. E. Norton, D.S.O.**, and other Members of the Expedition. London: Edward Arnold & Co. 1925. Pp. xi. + 372. *Maps and Illustrations.* 25*s. net.*

'MOUNT Everest, The Reconnaissance, 1921,' was the attractive introduction to 'The Assault on Mount Everest, 1922,' and one hoped then, almost with confidence, that the third volume would bear another title, the last of a triumphant triology. *Sed dis aliter visum.*

In his Introduction Sir Francis Younghusband insists again on the value of this great adventure; he will find few readers who are unconverted. The narrative begins with General Bruce's account of the preparations at Darjeeling, an appreciative sketch of the several members of the party, and a description of the well-known journey to Phari. And then the first misfortune overtook the Expedition: a sharp attack of malaria laid the General on his back, and he was forced to hand over the leadership to Colonel Norton. "Naturally this . . . was a terrible disappointment to me, but there are compensations for everything, and my compensation was Norton. Let me say at once that even if I had continued with the Expedition there was no step taken by Norton, no order issued by him, and no decision made by him of which I should not have been proud to have been the author." General Bruce's generous confidence was abundantly justified; the further conduct of the Expedition could not have been in better hands. It is no disparagement of the leaders of the two former expeditions to say that Colonel Norton at least equals them in his descriptions of the country and in his narrative of things done. He writes with an evident enjoyment, a keen observation, and a fund of humour which lightened what must often have been an irksome task. Many people will remember his despatch to the *Times*, dictated when he was suffering from snow-blindness and shocked by recent tragedy. His single failing is an occasional confusion of his right hand with his left. To a reader who tries to visualize the country as he follows the narrative, it is disconcerting to be told that from Kampa Dzong "Eastward the fine shapes of the Gyankar range merge into the giants of the Mount Everest system"; and again, those six stupendous mountains, Gosainthan, Cho Uyo, Gyachung Kang, Mount Everest, Makalu, and Kangchenjunga—one cannot forego the luxury of repeating their sonorous names—run not from left to right, but contrariwise, when seen from the Pang La.

The history of the Expedition from the time of its arrival at the Rongbuk Base Camp until its final departure thence is so well known that it need not

be outlined here. At the outset the desertion of fifty-two of the locally recruited carriers seriously disorganized the formation of the first three camps. The approach to the North Col was found to be more difficult than in former years, and then the weather went from bad to worse. Four porters were marooned at Camp IV. and had to be rescued with infinite labour and at great risk by three of the climbers, and then a retreat was made to the Base. These preliminary rebuffs certainly damaged beyond hope the *moral* of many of the porters—out of fifty-five only fifteen were pronounced fit for the high work to be done later—and it can hardly be doubted that their efforts in rescuing the porters taxed the climbers more than they could afford. Over all brooded the menace of the foul weather, the worst that had been known in the Eastern Himalaya for many years. Was this the beginning of the monsoon, or was it not? As a matter of fact it was not, but the doubt and anxiety took their toll of the climbers' nervous energy. When at last the weather cleared and a second start was made, nearly a fortnight after scheduled time, the higher camps were established and the attempts on the summit made in astonishingly quick time. Arguments for and against the use of oxygen have been published in this *Journal*; it need only be noted now that the man who had climbed successfully with it in 1922 found it much less helpful in 1924, and that it is the considered opinion of all the surviving climbers that the ascent of Mount Everest is possible without the use of oxygen.

Colonel Norton and Mr. Odell write with admirable feeling and restraint of the two great attempts on the summit and of the final tragedy. Mr. Odell is firmly of the opinion that the last assault achieved its object. The sudden snow-blindness which beset Colonel Norton on his great climb suggests a possible solution of what is likely to remain a mystery. Nothing was wanting in preparation to ensure success, but the adventure will always be a gamble, depending finally on a continued spell of fine weather for three days at least in the regions above the Chang La. None knew this better than Mallory, who concluded his account of the reconnaissance of the mountain in 1921 with the following paragraph :—

"In all it may be said that one factor beyond all others is required for success. Too many chances are against the climbers; too many contingencies may turn against them. Anything like a breakdown of the transport will be fatal; soft snow on the mountain will be an impregnable defence; a big wind will send back the strongest; even so small a matter as a boot fitting a shade too tight may endanger one man's foot and involve the whole party in retreat. The climbers must have above all things, if they are to win through, good fortune, and the greatest good fortune of all for mountaineers, some constant spirit of kindness in Mount Everest itself, the forgetfulness for long enough of its more cruel moods; for we must remember that the highest of mountains is capable of severity, a severity so awful and so fatal that the wiser sort of men do well to think and tremble even on the threshold of their high endeavour."

The second part of the book is a series of letters written by Mallory. The last letter ends: "We shall be going up again the day after to-morrow. Six days to the top from this camp!"

The third part of the book is occupied by most valuable chapters on Physiological Observation and Natural History by Dr. Hingston, Notes on Geology and Glaciology by Mr. Odell, and technical notes on equipment by various members of the party. In considering the all-important question of acclimatization, the case of Mr. Odell must be heavily underlined. Odell was one of the slowest in the party to acclimatize, but when once he had found himself there

seemed no limit to his capabilities. In twelve days he slept eleven nights above 23,000 feet, and made one ascent to 25,200 feet and two ascents to Camp VI. at 26,800 feet, these last ascents being made in four consecutive days. Stress is very properly laid on the importance of comfort at the Base Camp and at Camp III., and (next time) at Camp IV. The increase in comfort in the 1924 Expedition over that of 1922 was as great as that of 1922 over 1921, and no man who has had experience of difficult travel will underestimate the value of comfort. Equally important are mobility and simplicity of "bandobast." The experiences of 1924 lead one to hope that the next expedition will be free of the loads and worries of the oxygen apparatus.

The volume is, like its predecessors, richly illustrated, and has for the first time eight plates in colour by Mr. Somervell. The Frontispiece ("Mount Everest from the Base Camp, 1922") is from the painting in oil which now hangs on the staircase in the Society's house; it required, perhaps, different treatment from the delightful sketches in body-colour on brown paper. The map, compiled during the last summer by M. Jacot-Guillarmod from photographs and Major Wheeler's survey, is a beautiful piece of mountain cartography, reproduced by the Ordnance Survey in a fairly successful attempt to give character to the map by a decorative border and by fine lettering of the title and legends. It is a great misfortune that the cartographer did not live to finish it westward and in the direction of Makalu. The "Panorama of the Route" might have had more names with advantage, and a sketch-map including the regions of Tingri and the Rongshar Valley would have added to the value of the book.

A. F. R. WOLLASTON.

REVIEWS

EUROPE

Two Vagabonds in Languedoc.— **Jan** and **Cora Gordon.** London: John Lane. 1925. 9½ × 6, pp. x. + 242. *Illustrations.* 12*s.* 6*d. net.*

A Wayfarer in Hungary.— **George A. Birmingham.** London: Methuen & Co., Ltd. 1925. 7½ × 5, pp. xvi. + 210. *Illustrations.* 8*s.* 6*d. net.*

A Wayfarer in Czecho-Slovakia.— **E. I. Robson.** With Illustrations by J. R. E. Howard. London: Methuen & Co., Ltd. 1925. 7½ × 5, pp. xv. + 211. 7*s.* 6*d. net.*

The Naples Riviera.— **Herbert M. Vaughan.** 4th edition. London: Methuen & Co., Ltd. 1925. 7½ × 5, pp. xi. + 319. *Illustrated.* 7*s.* 6*d. net.*

THOUGH hardly suggested by its title, the latest book by Jan and Cora Gordon is the result of a four months' sojourn in a small town in Languedoc. Writing throughout only of what they saw or heard, they present a clearly cut picture of French peasant life, touched in with humour and sympathy. With the enthusiastic advocate of peasant proprietorship, however, they have little patience; the system as they see it has little in its favour, while the peasant in their eyes is a compound of "vain shrewdness, covetousness, suspicion and self-satisfaction." Besides supplying many anecdotes of peasant character, their book throws interesting side-lights upon certain economic factors in French provincial life: for example, the employment of numbers of Spanish labourers on the railway, and the drift of the population towards the city. However alive the authors are to the shortcomings of this life, they are also appreciative of its advantages: "Amongst European countries we have visited," they conclude, "France seems the most free on the social side." Every page

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EXPLORATIONS IN SOUTH-EASTERN TIBET

F. Kingdon Ward

Read at the Meeting of the Society, 25 *May* 1925. *Map follows p.* 192.

I. OVER THE TSANGPO–SALWEEN DIVIDE

IN 1923, through the kindness of the Indian and Tibetan governments, I obtained permission for myself and one other white man to botanize in Eastern Tibet. The Government Grant Committee of the Royal Society and the Committee of the Percy Sladen Memorial Fund gave me grants which permitted me to carry out my plans; Earl Cawdor, who had already had experience of travel in the Arctic and elsewhere, volunteered to accompany me, and we sailed from England on 2 February 1924. Darjeeling was reached on March 10, and here General Bruce, who was organizing the Mount Everest Expedition, assisted us in making arrangements for mules and ponies, which were to take us to Phari, just over the Tibetan frontier, and in the selection of a permanent staff of three servants, who spoke both Hindustani and Tibetan. We left Darjeeling on March 14, and proceeding *viâ* Kalimpong, arrived at Gangtok on the 18th, where we were the guests of Major and Mrs. Bailey for two days.

It will be recalled that in 1913 Majors Bailey and Morshead had made their great pioneer journey from Assam *viâ* the Mishmi Hills to the head of the Tsangpo gorge, which they had then penetrated for nearly three-quarters of its length; after which they had returned up the Tsangpo as far as Tsetang, exploring the unknown regions to the south. Practically nothing was known of the flora of this region, but Major Bailey had brought back a few fragmentary dried plants, a number of seeds, and some valuable hints, sufficient to whet the appetite of a botanist. He was now able to give us further information, useful advice, and our Lhasa passport; armed with which, we started for Tibet. We reached Gyantse on April 2 without incident, Mr. MacDonald, the British Trade Agent, having sent a man down to Chumbi to meet us, and make arrangements about transport.

We spent a lively week at Gyantse waiting for our stores, which were being forwarded from Calcutta, and very pleasant it was. Besides the Trade Agent, there were stationed in Gyantse at this time the Com-

mandant of the guard (Captain J. E. Cobbett), the medical officer (Major J. H. Hislop), and the schoolmaster in charge of the new Tibetan School (Mr. F. Ludlow). Our stores having arrived, we took to the road again on April 11, in very cold weather, travelling towards Lhasa; but after crossing the Karo La and descending to the south-west corner of the Yamdrok Tso, we left the Lhasa road and travelled due west along the southern shores of the lake.

In the previous year Major Bailey and Captain Meade had travelled through this region, but the excellent map which the latter had made was not then available. Bailey's story of this journey, with Meade's map, was published in the *Geographical Journal* of October 1924. Not till we reached the south-east corner of the lake were we on unknown ground.

We slept the night of April 17 at a small village called Chogpotung, where a stream enters the lake from the east. From this point to Tsetang we were on unexplored ground. There were hundreds of hares on the stony hills here, as well as duck on the lake. On the 18th we marched due east up a broad grassy valley, and presently reached a small village, where we halted to change transport. Continuing more or less eastwards over wide pastures, we passed a fine fort called Ache Dzong, and entered on a bleak plateau country, where we saw cranes, duck, and geese by the river, and innumerable pica hares, and later a fox. At dusk we reached the stone village of Tragtse, after eight hours' marching.

We had to cross a high pass next day, so we started early. Unfortunately, the view was spoilt by a heavy snowstorm. Actually we crossed two passes, the Dzara La and the Shamda La, after which we descended rapidly, and getting out of the snow, saw below us a valley with trees and houses and green grass—a regular Garden of Eden after three weeks on the plateau. A vast crowd of curious sightseers welcomed us at the monastery of Chonggyechenyag. There were some fine old poplar trees here, one of which was 30 feet in girth at a height of 3 feet from the ground.

On the 20th we marched down the valley, through a certain amount of cultivation and past a number of small villages and scattered houses. There were clumps of trees, mostly willow and poplar, protected by walls, and peach trees in bloom; and along the stream thickets of Hippophæ. Many of the larger trees were pollarded. We saw no sign of crops, but people were ploughing in the fields.

As we got lower down, the valley grew more and more stony, trees and cultivation almost disappeared, and presently the stream did likewise. Ahead of us we saw a great rocky ridge, crowned by an ancient fort, with a newer fort lower down, the two connected by a double wall, leaving a passage between. (It appeared that the upper fort had been abandoned on account of the difficulty of getting water.) At the foot of the ridge was a monastery.

The monastery was called Riudechen, and the fort Chongche; the latter was a fine building in a commanding position, and peculiar for a semicircular bastion at one end and a wooden gallery above, like the poop of a Spanish galleon. There was a stone pillar in the valley below, with an inscription in Chinese, which looked fairly modern.

Continuing down the dry stony valley next day we reached the small monastery of Chongmoche, where there were many large and small chörten, like a cluster of Burmese pagodas. Below this the valley became fertile and thickly populated once more, and the trees were in leaf. Late in the afternoon we reached Netong Dzong, and called on the magistrate; and then rounding the shoulder of the hill, we saw Tsetang, below us, with the Tsangpo beyond.

We spent April 22 in Tsetang and made friends with Ata Ulla Khan, the Ladaki trader who had assisted Bailey and Morshead in 1913. It snowed the next night, but the snow was melting fast when we left Tsetang, following the right bank of the river to Rongchakar, where there is another fine fort. We ought really to have left the river here and turned south-west into the mountains to Lhagyari Dzong, which appears to be the normal route for any one travelling down the valley—if there can be said to be any normal route. This was Bailey's and Morshead's route. But we wanted, if possible, to follow the river through the gorge below Trap, so we continued along the river-bank next day as far as Trap, only to find that there was no way of getting through the gorge. However our journey was not fruitless, for we discovered that it was possible to make a *détour* to the north instead of to the south, and cover some new ground that way. We therefore crossed the Tsangpo in coracles and camped in a valley on the other side, reaching Öga Dzong on the following day. There is a road northwards from Öga Dzong which joins the Lhasa road on the other side of the range; of this more anon. We ourselves turned eastwards again up a broad grassy valley, and soon reached the last village, Pechen, where we halted.

On April 27 we arose at 4.30 to face a long march. The morning was brilliantly fine, but after midday the sky clouded over and snow fell heavily. The pass was not reached till 4 o'clock, and deep soft snow made the going rather bad for the transport. At the head of the valley is the last remnant of a rapidly disappearing glacier.

The Lung La, as the pass is called, is over 16,000 feet, and rather steep on both sides. An hour after dark we reached the monastery of Chögorche, where we put up for the night.

On April 28 we continued down the valley to the wretched village of Tsegyu, where we had difficulty in getting our transport changed. Consequently we did not get away with all hands till 4 o'clock in the afternoon, and another night march ensued, Gyatsa Dzong not being reached till 10 p.m. At Gyatsa we found ourselves by the Tsangpo

once more, having "turned" the gorge below Trap. The maps show Chögorche and Tsegyu on different streams, but this is incorrect.

An interesting geographical point now arises. If one travels from the plains of India to the Tsangpo anywhere west of the 93rd meridian, say, two distinct ranges of mountains are crossed, with a stretch of the plateau supported between them. The first is the Great Himalayan range; the second is the so-called Ladak, or Trans-Himalayan range. We crossed the latter by the Karo La on the outward journey, and by the Yarto Tra La on our return. But crossing the mountains by the Doshong La, or the Nam La, or by any pass east of the 94th meridian, only *one* main range is crossed between the Tsangpo and the plains—the Great Himalayan range. What then has become of the other? We can hardly suppose that it has disappeared, nor is it likely that it has been absorbed into the Himalayan range. The only other possible explanation however is that it is now *north* of the Tsangpo—in other words, that that river has cut across its axis.

There is some little evidence in support of this last view. In the first place the river below Trap flows for 30 or 40 miles in an impassable gorge, descending several hundred feet. To avoid this gorge, Bailey and Morshead crossed a pass over 16,000 feet high to the south, while we crossed one of about the same height to the north. Finally, and more directly, from Öga Dzong, in the winter, we saw a group of snow-clad peaks on the left bank of the river, trending in an east-north-east direction and continuous with a snowy range on the right bank, east of Tsetang. What becomes of this range we do not know, but it may form the watershed between the Lhasa and Gyamda rivers.

For the next three days we followed the left bank of the river, crossing to the right bank at Nang Dzong on May 1. The Tsangpo here twists and turns round craggy spurs in bewildering fashion, flowing however smoothly. Barren stony terraces and large sand-dunes thinly clad with thorn scrub (*Sophora viciifolia*) prove how arid and wind-swept the valley still is. The weather continued cold and inclement, with brief bursts of sunshine followed by showers of sleet, and fresh snow on the hills.

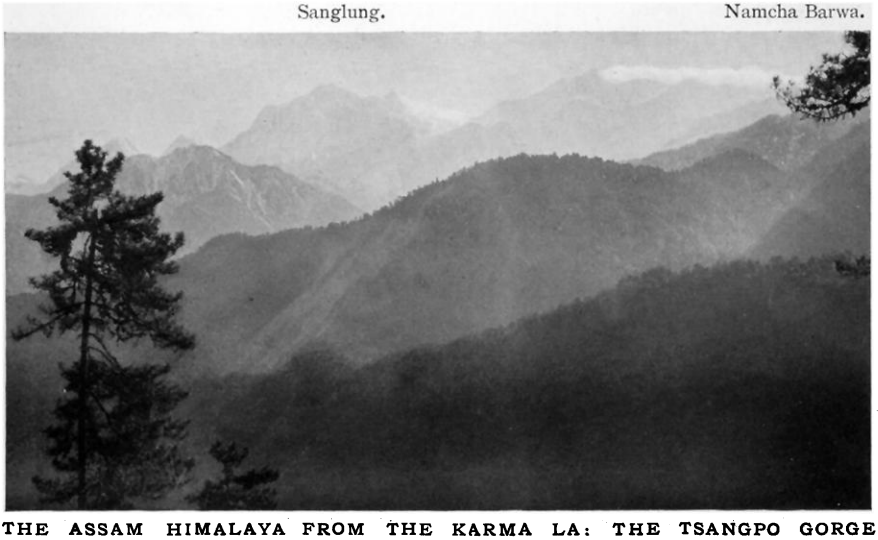
In the villages, however, which were becoming more numerous, there was a change, and we noticed apple, peach, pomegranate, walnut, poplar, and willow trees, besides fields of broad beans. We also saw a variety of birds, including babblers, rose finches, jackdaws, hopoes, choughs, larks, and sparrows; on the rocks were big ugly grey lizards.

In the gorge below Nang Dzong—round which we had to make a second *détour*—we saw scattered juniper trees, which henceforward became common, till replaced by pine trees a few days later.

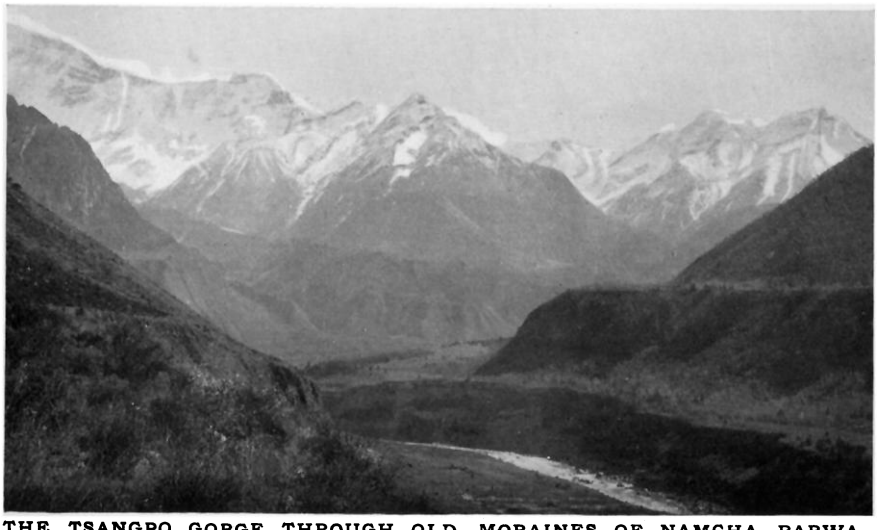
After crossing a wooded limestone ridge by an easy pass we again descended to the river, and marched over high sand-dunes in a boisterous wind, which raised a rasping sand-blast. In the afternoon we reached a village called Lishö, on a small tributary about a mile from the Tsangpo.

THE TRASUM TSO AND TSOSONG MONASTERY

Sanglung. Namcha Barwa.



THE ASSAM HIMALAYA FROM THE KARMA LA: THE TSANGPO GORGE BEYOND SECOND RIDGE



THE TSANGPO GORGE THROUGH OLD MORAINES OF NAMCHA BARWA, BETWEEN PE AND GYALA

RETREATING GLACIERS OF THE TSANGPO-SALWEEN DIVIDE, NORTH OF THE TRASUM KYE LA

There is a road up this valley which crosses the mountains to Tsari, but there was said to be too much snow on it for any one to be able to cross until June.

We continued along the right bank of the river for several days, while the vegetation grew gradually more varied, and the forest crept down lower and lower, denoting approach to a wetter climate. The type of house also changed from the flat-roofed house of the plateau to the pent-house roof of Kongbo; while dug-out canoes showed that there were big trees not very far away. This fact was strikingly brought home to us in one village, where we saw a flag pole 200 feet high!

We came across several Abor slaves hereabouts. We were told that about twenty years ago there had been trouble amongst them on the other side of the Himalayan range, and some of them fled into Tibet to escape unpleasantness, and took service with the Tibetans.

On May 1 we reached Lilung, where a big stream comes in from the south. There is a path up this valley which leads to New Tsari, but it is said to be used only by pilgrims, since New Tsari boasts no population. There was formerly a fine bridge over the tributary stream here, but it had been destroyed by a flood, and we had to march a mile up the valley to another bridge. Villages were now becoming more numerous, and we had to change transport frequently, often three or four times a day, which caused considerable delay.

On May 11 we crossed the river in dugouts and reached Tsela Dzong, at the junction of the Gyamda river. We were given a small house in which to live, as we proposed to settle down here for some days and explore the neighbourhood for plants; but we eventually decided that movement in the angle between two big rivers was too restricted for our purpose, and after spending three weeks at Tsela, we shifted our headquarters 30 miles eastwards, to the village of Tumbatse, by the Rong Chu. During our stay at Tsela we made a botanical reconnaissance of the neighbourhood on both banks of the Tsangpo, and on both banks of the Nyang Chu or Gyamda river, which here flows in four big streams in a valley a mile wide. At this time there were more fields and sandbanks than waterways at the junction, but in the rainy season most of the land is submerged. Fierce winds blew every day, and a perpetual cloud of fine sand hung over the Tsangpo. Nevertheless, on the few really clear days we enjoyed here, we found that the magnificent snow spire of Namcha Barwa, nearly 50 miles distant, was clearly visible from our window.

There are two peaks rather over 14,000 feet in altitude, one on either side of the junction. The peak above Tsela Dzong is called Pab Ri, and is of no particular consequence; but that on the left bank of the Gyamda river, called Kongbo Peri, attracts pilgrims from far away, who march round it. We could see no particular merit in it as the central sun of a solar system; but on climbing to the summit we were

rewarded with one of the most extensive and magnificent mountain views imaginable. To west, north-west, and north, and growing dim in the north-east, stretched a huge range of snow mountains. Namcha Barwa and Gyala Peri in the east were easily recognized; beyond that we felt convinced we were looking at the Tsangpo–Salween divide. Unfortunately, the nearest peaks were at least 50 miles distant. The Himalayan range and this range to the north converge towards the north-east, though whether they eventually become one we could not ascertain.

This Salween divide, which is considerably nearer the Tsangpo than the maps indicate, proved a stumblingblock. We had hoped to visit the Salween, but we spent so long in August looking for a way over this barrier while we marched westwards along its base, that we had no time left to make the journey. Between the 93rd and 95th meridians, one river—the Yigrong—cuts through the range, and two passes—the Trasum Kye La and the Tro La—cross it.

On June 4 we left Tsela Dzong, and crossing the Gyamda river reached Temo Gompa in the afternoon. From here we proceeded over the Temo La, where we camped for a week in order to botanize. Descending to the Rong Chu we took up our residence in Tumbatse. Our first important excursion was over the Nyima La and down to the Tsangpo, which we crossed by canoe below Pe; then up the Doshong Chu (which joins the Tsangpo below Pe) to a camp below the pass. Even as late as June 29 there was very deep soft snow on the Doshong La, which however we crossed, descending 2000 feet on the Pemako side; we could not move our camp over, though this we managed to do towards the end of October under conditions almost as bad. Both sides of the pass show clear evidence of glaciation, and it seems probable that on the north side the glacier must have reached the Tsangpo, which at that date would of course have flowed at a higher level. There is a snow peak immediately south of the pass on the Pe side, though it is not very high.

A tremendous quantity of snow falls on the Doshong La, and much of it rarely, if ever, melts. For eight months in the year it is impossible to cross over, though the height is only 13,500 feet, according to Majors Gunter and Pemberton, who crossed the pass in 1913 from river to river, when surveying with the Abor Exploration party. We ourselves camped at the foot of one big avalanche, and we saw the results of a second one on the other side, which had not all melted when snow was beginning to fall again in October.

The pass is therefore very low compared with the height of Namcha Barwa (25,445 feet), which is only 10 miles distant; but I have frequently observed that the lowest passes are commonly found in the neighbourhood of the highest peaks, at least in Western China and the Himalaya. The explanation of this apparent paradox is quite simple; for these low passes are at the heads of old glaciated valleys, whereas

higher passes in the neighbourhood of lower peaks are either water-worn or owe their origin to much smaller glaciers.

There was an extremely rich and varied flora at the Doshong La, and it was surprising to find that the Alpine flora at this extreme end of the Himalaya was more closely related to that of Western China than to that of the Sikkim Himalaya.

Our second journey from Tumbatse was over the Tang La, a low pass immediately to the north of the Nyima La, and down to the Tsangpo again by an excruciating path. The river was now in flood, and booming into the gorge at high pressure, so we were unable to cross here, but had to march down the left bank and cross by the rope bridge at Gyala, a species of slow torture which we did not appreciate. From Gyala we marched up the right bank a long day's march to a village called Tripe, and on the following day started up the steep path which leads to the Nam La, the most easterly pass across the main Himalayan range proper. After reaching a cultivated terrace about 1200 feet above the river, the path virtually ceased, as few people ever travel this way except to the pastures on this side, and a recent epidemic amongst the yak had so reduced the herds that the pastures were temporarily out of commission. We had to make our own way up the steep flank towards the peak of Namcha Barwa, and finally we camped in a meadow.

Next day we continued the ascent over very rough ground—a series of tree-clad moraines, and climbing steeply through dense Rhododendron scrub, we finally emerged into the Alpine region and camped just above a fine lake—the Nam La Tso—at the head of the valley. Opposite us on the other side of the lake was a snow peak called Temu Tse, and there were other peaks with small glaciers attached near the pass, which was hidden behind a tremendous cliff. A notch in the ridge which ran down from Temu Tse gave entrance for the nimble yak to the Doshong La valley.

The most interesting features here were (i) the enormous amount of deglaciation which had taken place and was still continuing; and (ii) the surprising difference between the flora of this valley and that of the Doshong La valley, a bare 6 miles away. The reason for this seems to be entirely climatic.

On July 24, the day after our arrival at the upper camp, we essayed the ascent of the Nam La, which had not previously been visited by Europeans. There is no way up the valley head, which, above the lake, is choked with moraines and glaciers; and the pass lying some distance back, it is necessary to ascend the cliffs and traverse by a difficult path. We had not brought any animals with us, and in any case they could not have reached the pass, though yak come up as far as the lake.

After much climbing up and down the cliffs, and some bad going over the moraines, we reached a glacier, crossed this, and presently found ourselves at the foot of a very steep snow slope leading to the pass, from

which proceeded a glacier. By this time the day was getting on. One of our guides had already fallen in the rear, and we were chary of taking the other to the top, as he had never been before, and we knew nothing about the glacier conditions or the danger of avalanches. So we pushed on alone, Cawdor leading, and, keeping close under the cliff so as to avoid as far as possible the snow-clad glacier, soon found ourselves floundering knee-deep in the soft snow. It took us nearly an hour to reach the summit, though on our return we skated down through the soft snow in fifteen minutes. In November we camped at the same spot for several days, and on the 6th Cawdor succeeded in reaching the summit again, where he obtained a boiling-point observation which gave the altitude as 7587 feet above the river-level at Pe, or 17,129 feet absolute according to our records (rather more according to Morshead's value for Pe).

We had hoped to cross this pass into Pemako and reach a monastery called Mandalting, below which is a Lopa (Abor) village called Puparang, probably on or near the Tsangpo ; but in view of Cawdor's report and the unsettled weather, we decided that it would have been too risky an undertaking. It was as well we abandoned the project, as it turned out, since we should certainly never have been able to recross the pass.

The Nam La is used only by a few Lopas, and then not regularly. A party of three had crossed in the summer, but the pass is open barely three months in the year, so that nearly all communication with Pemako is carried on over the much lower, though not much easier, Doshong La. But the latter is at any rate safe, whereas natives are known to have been lost and frozen to death trying to find their way over the Nam La.

Returning to the Tsangpo, we made our way back to Gyala, and while the kit was being slung across—an occupation which took practically the whole day—we tried to make our way down the river by a path we had discovered on our previous visit. On that occasion we had pushed on about 2 miles, sometimes waist-deep in the river, but darkness had compelled us to give it up.

In the course of ten days the river had fallen no less than 12 feet by a measured mark, and we were now able to get along without wading till we reached a big torrent with an enormous rapid in the river. Our Tibetan companions discreetly refused to cross this, so Cawdor and I struggled across holding hands, to their unbounded delight. However, immediately afterwards we came up against a huge cliff, which there was no possibility of getting round ; so we returned to Gyala, after taking our first boiling-point observation in the gorge. On the following day we started straight up the mountain for the Tra La, following the torrent which falls over the cliff called Shingche Chögye, opposite Gyala, as described by Bailey. We suspected this of being a glacier stream, and so it proved. It was not till the third day that we reached the pass, which is considerably higher than the Nyima La, having crossed the stream and observed that it came from a group of glaciers, one of them of

fair size, south of Sengdam Pu. The pass is a difficult one on both sides, the approaches being very steep, and only yak perhaps could cross, and not even they if heavily laden.

Returning once more to Tumbatse, we started again on August 9, and followed the Rong Chu northwards to its junction with the Tongkyuk river, and crossing the latter reached Tongkyuk Dzong. We made an excursion to the actual junction of these streams, and ascertained that the Tongkyuk stream is considerably the bigger of the two, as was to be expected of a stream having its origin amongst the snow peaks of the Salween divide. A boiling-point observation gave the altitude at the junction as 8297 feet. Bailey and Morshead had reached Tongkyuk from Showa, but the country to the west of Tongkyuk was entirely unknown.

On August 12 we started up the valley of the Tongkyuk river, and presently came to the village of Temo, outside which stand two large wooden figures, 9 feet high, forming a sort of gateway. We saw the same thing at the next village, Paka, but nowhere else. I have never seen such a thing before in Tibet; but it must be remembered that we were now in Pome, where they do things rather differently; for instance, in one village we saw signs of phallic worship.

After crossing the stream twice by good cantilever bridges, we camped in a meadow. On the following day we marched about 16 miles to Nambu Gompa, a small three-storied stone building in the upper ice-worn valley. The snow peaks of the Salween divide were quite close to us, a little to the north, but we could see nothing on account of the clouds, though we had a glimpse of them in the winter.

On the 15th we crossed the Nambu La, a comparatively easy pass with a lake on each side and a group of snow peaks to the south; we camped in a meadow on the far side, and then descended to a big valley with a small glacier lake at its head (above which, and almost reaching the water's edge, was a glacier). Down this valley we marched to the village of Lopa. Continuing down the same valley for a few miles we reached the beautiful Pasum (or Trasum) * lake next day, and halted at the village of Je. This lake, which is about 8 miles long and 2 miles wide, in a closed valley 12,003 feet above sea-level (by boiling-point), is sacred, and it is considered a meritorious act to walk round it. Near the head of the lake are a number of fine snow peaks—the Salween divide again—the most conspicuous being the pyramid of Nam La Karpo, visible from Je.

A big stream flows in at the head of the lake, but the road shown on the maps as crossing the range above the lake (which in any case is about

* In the Lhasa dialect Tra, but in country speech it is nearly always pronounced Pa. Thus it is generally called Pasum Tso, though actually spelt Trasum. Similarly with the Tra La usually called Pa La; it is not Tara La, as on Sheet 82 K, Survey of India.

30 miles out of position) is fictitious, as we found to our cost; we had to travel yet farther west before we could get over this formidable barrier.

We now proceeded to circumambulate the lake, and reached a village called Tsogo (" lake head "), where we were held up for want of transport. Proceeding along the west shore, we saw a small island with a monastery close in to the opposite shore, and eventually reached a village at the foot of the lake. A large terminal moraine blocks the valley here, and holds up the lake, which occupies the site of a large glacier; but the stream has cut through the moraine, and flows into a broad, fairly thickly populated valley to Shoga Dzong, where another considerable stream comes in from the west; the united streams flow into the Gyamda river about 6 miles below Shoga Dzong, which was reached on August 20.

The Shoga Dzongpen had a small son at the Gyantse school, and was greatly pleased at our being able to give news of him. We now turned northwards, or rather north-westwards, for the first time since leaving Tongkyuk, and felt that we were getting on a little; for our ambition was to reach the Salween. Following up the other branch of the stream a few hours' march brought us to another confluence, where stood the important monastery of Drukla. The Commissioner from Gyamda was here inquiring into certain irregularities of living, the upshot of which was that sixty monks were ignominiously expelled into a cold hard world, and told to go and join the army in Lhasa.

The valley above Drukla was again fairly well populated, and we passed through a number of small villages, the last of which was called Pungkar. We were now well into the great snowy range, and continually saw snow peaks on either side of the valley.

We camped once above Pungkar, and a path which led to the Yigrong river was pointed out to us. We continued towards the source of our stream, however, and at last on August 25 we crossed the Salween divide by a high pass called the Pasum (Trasum) Kye La, 17,230 feet.

From the summit we counted six snub-nosed glaciers at the head of the valley into which we were about to descend, though not one actually reached the valley now. There were snow peaks and glaciers all round us, in fact, but they were withdrawing in force. High as this pass was, however, we were able to take ponies over it, and there was no snow; it gave much less trouble than the Doshong La, for example. The forest, which had been rapidly dwindling, now disappeared entirely, and we descended into a very bleak and desolate valley, where there was not a stick of firewood. We were back on the plateau, and had to put up with plateau conditions.

After camping with some yak-herds we descended gradually, and presently joined the Lhasa road at the small Atsa Tso. In the afternoon we reached Atsa Gompa, the most depressing place we had yet seen. However we managed to spend three more or less profitable days here, with no ill effects. Here of course we were on well-known ground

several explorers, including the late Brigadier-General Pereira, having passed through Atsa. We spent one day on a trip to the Banda La, which had been crossed nearly two years previously by General Pereira on his journey to Lhasa. We made the altitude 18,110 feet by hypsometer, and it certainly seemed it. From here we had a splendid view to the north, where we saw several very lofty snow peaks, beyond which, we were told, lay the Salween; so we gave up all idea of going there. South of us, just across the valley from Atsa, was another snowy range—part of the Tsangpo divide. To the east was a fine snow peak called Chakyajö, in Pome.

The stream from the Atsa Tso flows eastwards and is joined by the stream from Lharugo; the combined stream, which actually starts north of the Tsangpo divide, then cuts through that range and flows south as the Yigrong; the Atsa Tso—or rather the stream from the Tro La which feeds it—is thus really the source of the Yigrong. (Maps show the water from the Atsa Tso flowing to the Trasum Tso, which is incorrect.)

It may be remarked here that the Yigrong is the only river west of the Po Tsangpo which does cut through the range. Neither the Gyamda river nor any of its tributaries do this, all rising from its southern face, which is perhaps the reason why there are so few passes over it.

Retracing our steps to the Atsa Tso we turned up another valley, now following the Lhasa road, and camped at a post below the Tro La, which we crossed on August 31, at 17,650 feet.

No sooner had we crossed the divide again than we came into more fertile country, bushes and shrubs appearing lower down. That night we reached a single house called Tramdo, and on the following day the small village Laru, passing a monastery called Ko, conspicuously perched on a rock at the junction of two valleys. On September 2 we covered the remaining 12 miles to Gyamda, a considerable village in the angle between two rivers. The fine cantilever bridge which formerly spanned the northern stream had been destroyed by a flood, and we crossed in skin boats. By January the river was frozen nearly solid, and a foot bridge was thrown across, but work had not yet been started on the big bridge. Gyamda is dirty and not very interesting; but it boasts a post office, and a shop kept by a Nepali, where one can buy candles, cigarettes, fur caps, and a few other things. Formerly there had been a regular colony of Chinese shops, but these were all destroyed when the Chinese were expelled from Tibet. The road to Lhasa turns north here, but we left the known country behind us, and continued our exploration.

We now turned eastwards down the wide and well-populated Gyamda valley, reaching Napö Dzong the first day, where we were royally entertained to a wonderful Chinese meal. The road follows the left bank of the river for two days' march, then crosses to the right bank by an ex-

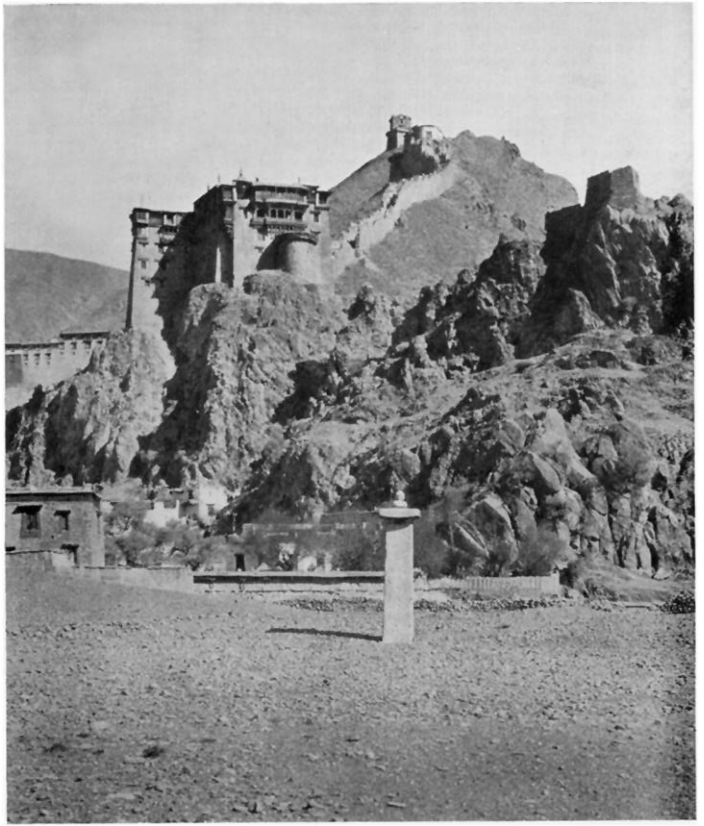
cellent bridge, and keeps to that side till Tsela Dzong is reached. On September 5 we slept at Kangra, having crossed the river. Opposite us on the left bank was the little monastery of Namse, where the Shoga Dzong river joins in; from Namse to Shoga Dzong is a short day's march. There are frequent groups of mud watch-towers scattered over all these valleys; they look rather like factory chimneys, and are said to date back several hundred years.

On September 7 we reached Nyalu, where for the first time since leaving Tumbatse a fine night enabled us to take an observation for latitude; we took another on the following night at Chomo Dzong. Below Chomo Dzong the valley widens out and is quite thickly populated. We reached Puchu that night, and Tsela Dzong on the 10th, having taken eight days to do the 90 odd miles from Gyamda. The river was beginning to fall now, and after stopping a day to collect certain seeds, we set out for Tumbatse *viâ* the Temo La, arriving there on September 15.

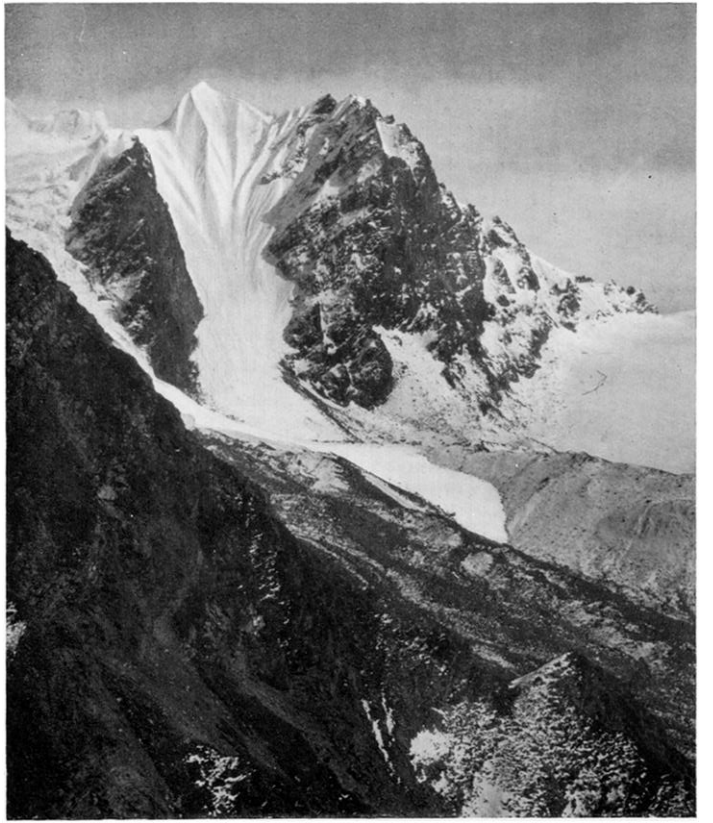
II. THROUGH THE GORGE OF THE TSANGPO

The rest of September and the first week of October were spent seed-collecting north of the Tsangpo. The weather was still very unsettled; rain fell most days, and the snow peaks were seldom clear. From October 1 till the 7th we were on the Temo La again, but only on one occasion did we get a clear view of Namcha Barwa from a camp half a mile north of the pass. At the same time we saw the tip of a sabre-tooth snow peak in the gap between Gyala Peri and Namcha Barwa far down the gorge. This could not have been Sanglung, which is hidden behind Namcha Barwa; the natives called it Trilatsengen, but that name might have been made up on the spot!

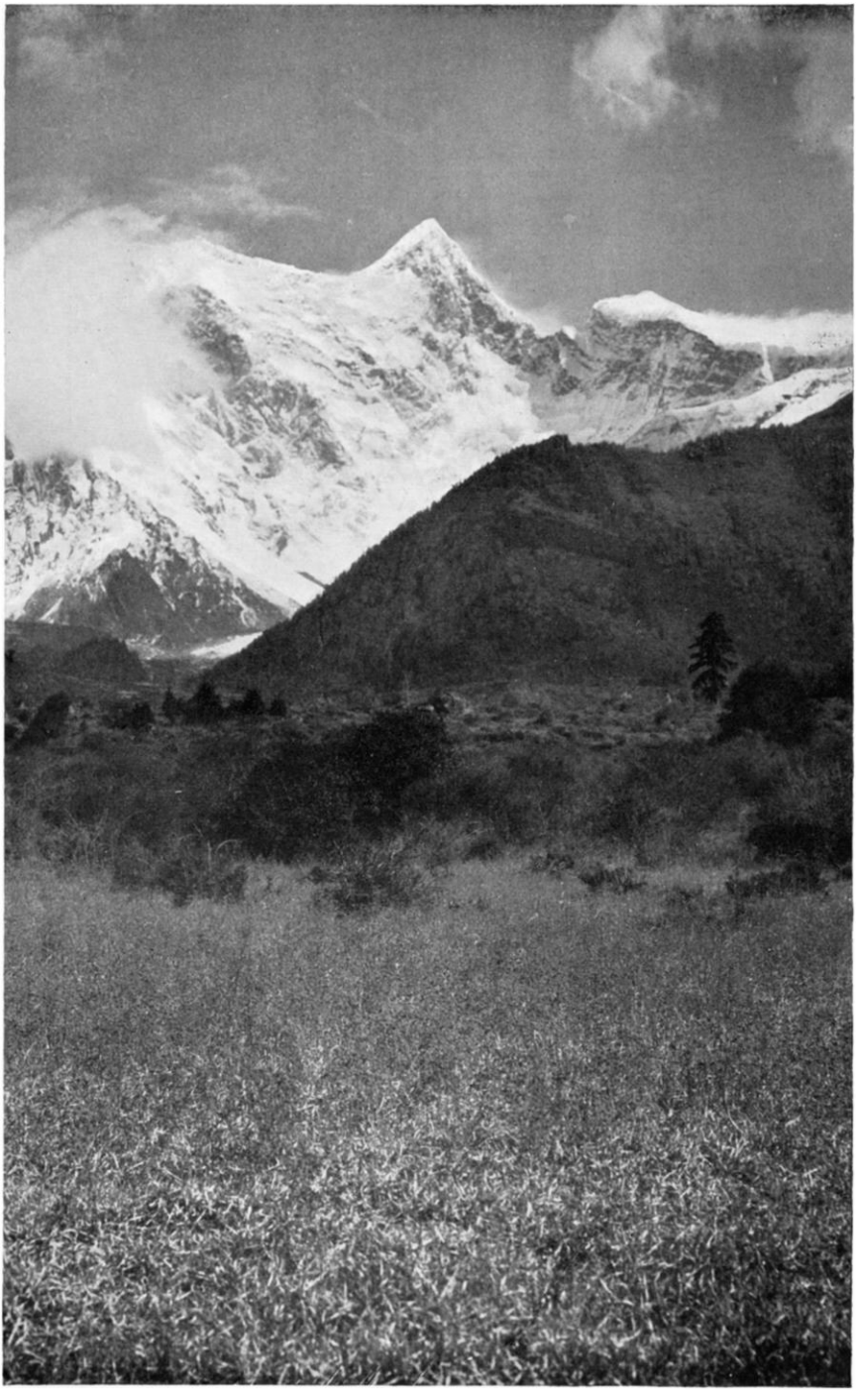
There is a high rocky peak on the divide a few miles north of the Temo La and almost opposite Tumbatse, called (so it is said) Tagkyejopo, though we called it simply the Hump. The least worthy and most obscure places always seem to have the longest native names, which makes one suspect that they are produced at short notice to satisfy the curiosity of the stranger. On October 5 I climbed this peak (16,182 feet), and having got one round of angles before dark, sat up there the night hoping to get another round at dawn. However clouds and snow ruined the view, and I saw nothing; but it may be remarked that a good view of the Salween divide to the north is obtained from here, as well as of Gyala Peri, Namcha Barwa, and the Himalaya to the south. On the other hand, it will be as well to warn future travellers that it is extremely difficult to get a good resection from anywhere near the Temo La, using only the obvious and outstanding fixed peaks to the east, as these are on the arc of a circle whose centre is near the pass. The " Hump " to the west of Tumbatse, and the " Plug " opposite it immediately to the east of Tumbatse (and visible from it), are obvious points to fix, being the



CHONGCHE DZONG ABOVE, TSETANG



THE NAM LA IN NOVEMBER



NAMCHA BARWA, FROM A TERRACE ABOVE THE TSANGPO AT KYIKAR

loftiest in the neighbourhood. On October 11 we left Tumbatse, crossed the Nyima La, and descended to the Tsangpo, proceeding thence to Pe.

The Mönbas were now crossing the Doshong La in hundreds, a few Kampas, Pobas, and Kongbas with them; we also saw three Lopas—presumably the people we call Abors—who had come 25 marches. They had all come to get salt, bringing rice, curry, vegetable dyes, canes (used for whip stocks in Tibet), maize, tobacco, and a few manufactured articles such as coloured bamboo baskets, garters, and so forth.

There were two officials at Pe to deal with the traffic: a representative of the Tsela Dzongpen, who took half the produce, and a representative of the Pome Raja, who took the other half, and also collected taxes. Each house pays 14 seer of rice, or some equivalent.

The travellers were ill clad for such a journey, especially the dwarfish Lopas, who had hardly any clothing; and though it does not take long to cross the Doshong La, which is the only pass, they carried loads of 80 lbs. through deep snow. By the end of October traffic ceased, the pass being then practically snowed up; but at this time not a day passed without fifty or a hundred people coming over—men, women, and children—and Pe, with its camps, and supplies, and people coming and going, presented a lively scene. Between one and two thousand must have crossed the Doshong La in October, which made Pemako appear quite thickly populated. But it is not. The area of Pemako cannot be less than 20,000 square miles, and probably a third of the population come to Pe for salt each year. Most of the remainder go to Showa.

Some of the travellers carried bows and arrows; both bow and bowstring were made of bamboo, and the bamboo arrows were iron-tipped and poisoned with aconite. Also one end of the bow was iron-shod, so that it could be used as a walking-stick. Cawdor also noticed that bowmen wore on the left wrist a bamboo bracelet, about 2 inches wide.

We spent a fortnight in camp at the Doshong La, experiencing heavy snowstorms on the pass, and particularly on the Pemako side, almost every day. We crossed the pass on the 21st, camping about 2500 feet down on the Pemako side. From here we made a trip down the valley for about 4 miles, though we were still some distance from the Dihang. At this point the Himalayan range reaches its narrowest, and it is only 25 miles from the Tsangpo flowing north-east at Pe, at an altitude of 9700 feet, to the Dihang flowing south-west at Yortong, at an altitude of 2500 feet. But the watershed is much nearer the Tsangpo than it is to the Dihang, the Doshong La being scarcely 8 miles from Pe.

There is a quaint prophecy said to be recorded in a sacred book by some fabulous person whose image is kept in the monastery at Payi, that Namcha Barwa will one day fall into the gorge and block the Tsangpo, which will then flow over the Doshong La! After seeing the large ice-worn valley on the other side, one wonders whether this is not rather a legend of the past than a prophecy of the future.

On the Pemako side the valley descends in a series of gigantic cliff steps separated by glacial flats. Just below our camp a big glacier torrent comes down from the north, evidently rising from the snow peak of Temu Tse; there appears to be another snow peak forming part of the southern wall of the valley, not far from the pass, on the Pemako side. Below the Alpine region the valley is filled with forest—Rhododendrons of all kinds, and conifers—in which we saw monkeys. The rock is everywhere a white-and-black-banded gneiss; but the banding is always highly contorted, and it is difficult to say whether the gneiss was first formed and then crumpled, or whether the banding is itself due to the crumpling.

On October 28 we reached Pe, and having packed our seeds, marched down the river to Kyikar. On November 1 we started for the Nam La, reaching our old camp at 14,000 feet next day. Things were very different here from what they were at the Doshong La. The stream had ceased to flow, and there was only just sufficient snow near at hand to keep us supplied with water. The weather too was fine and clear; consequently it was much colder, the sheltered thermometer recording 11° of frost on November 4, 28° on the 5th, and 25° on the 6th.

We managed to intersect the Nam La from two points fixed from Namcha Barwa (it is shown about 5 miles too far north on maps), and Cawdor reached the summit as described. Then having collected our seeds we returned to Kyikar, another storm having meanwhile swept over the eastern Himalaya.

On November 12 we started for Gyala, reached on the 13th in brilliant weather; and after some delay we started for Pemakochung on the 16th. Our party consisted, besides ourselves, of twenty-three porters (ten men and thirteen women), a lama from Pemakochung, who some years previously had been through the gorge, and Tom (*sirdar*). Dick (cook) was in support as far as Pemakochung, whence he would return to Gyala and rejoin Sunny Jim (servant). They were then to take all our kit back to Tumbatse, and on to Tongkyuk, where the whole party would reassemble about December 10.

Most of the coolies carried rations. Our personal property comprised only bedding (two coolies), collecting box (one coolie), botanical presses (one coolie), and survey instruments (one coolie). We had also two boxes of stores, consisting chiefly of slabs of chocolate and a liberal ration of first-rate soup from home; our only regret was that we were unable to carry more. There had been a hitch at Gyala, because the Depa, who had been so anxious to help us in the summer, had slept on it for two months, and then come to the conclusion that perhaps we ought not to go! He therefore sent a letter to his superior, asking if it was in order. As luck would have it, our friend the Commissioner of Gyamda was at Temo, fumigating more monasteries, and the letter reached him. He not only replied by telling the Depa that he must supply us with

transport, but also sent us the lama from Pemakochung (and known as the Walrus) to be our guide.

The opposition of the Depa was probably connected with some fear that the way through the gorge might be opened again; the policy of the Kongbo officials being to close it, partly no doubt in order to exclude Poba robbers, who in the past have given a lot of trouble, raiding as far as Temo, and partly owing to the difficulty of controlling taxation and trade by this route. As long as the Pemako merchants keep to the Doshong La, this is a comparatively simple matter.

We had no sooner started than another storm swept up the gorge, and we spent two damp nights in the forest before finding shelter under a huge boulder at the Nyukdsang camping ground of Kinthup and Bailey. Here we got a boiling-point in the river-bed. Immediately below Nyukdsang a glacier reaches the river-bed on the left bank. A semicircle of snow peaks, including Gyala Peri and Sengdam Pu, pour five converging glaciers into a common funnel-shaped valley, which contracts below to a steep and narrow glen through which the ice stream reaches the river. No other glacier does this, though many did so in the past.

On November 20 we reached Pemakochung, placed on a knoll in the midst of swamps in a mountain bay between Namcha Barwa and Sanglung. Here we rested on the 21st, Cawdor to visit Kinthup's fall, I to botanize. Next day we continued the march, crossing the Talung and Sanglung glacier streams, and camping in the river-bed just beyond the latter. There were some cold sulphur springs here under a rock, far below high-water mark, but now exposed. We took another boiling-point. A ridge of gneiss, drilled with large pot holes, runs out into the river at this point, squeezing it up against the opposite cliff, and there is an almost vertical fall of about 10 feet.

For the next few days the going over the cliffs was difficult and progress slow. At one place we were held up for two hours by a 40-foot chimney, while trees were felled and notched to make ladders; at another we had to descend a steeply sloping cliff into the river-bed, and then immediately climb a high earth bank in order to get out again. But after crossing another torrent, the Churung Chu, we found ourselves on a takin trail; and though we had to do a good deal of cutting in order to make a way for the coolies, not so much time was wasted seeking a route. We were travelling between 4 and 5 miles a day now. On the 25th we had to descend an awkward cliff, probably the one which had finally baulked Bailey; and on the 26th we camped by another glacier stream, the Shegar Chu. This day also we met with disaster, the metal triangular support of the plane-table being lost. However, we contrived a wooden substitute to fit into the socket of the theodolite stand and support the plane-table.

After the 25th we were on unexplored ground again. All this time

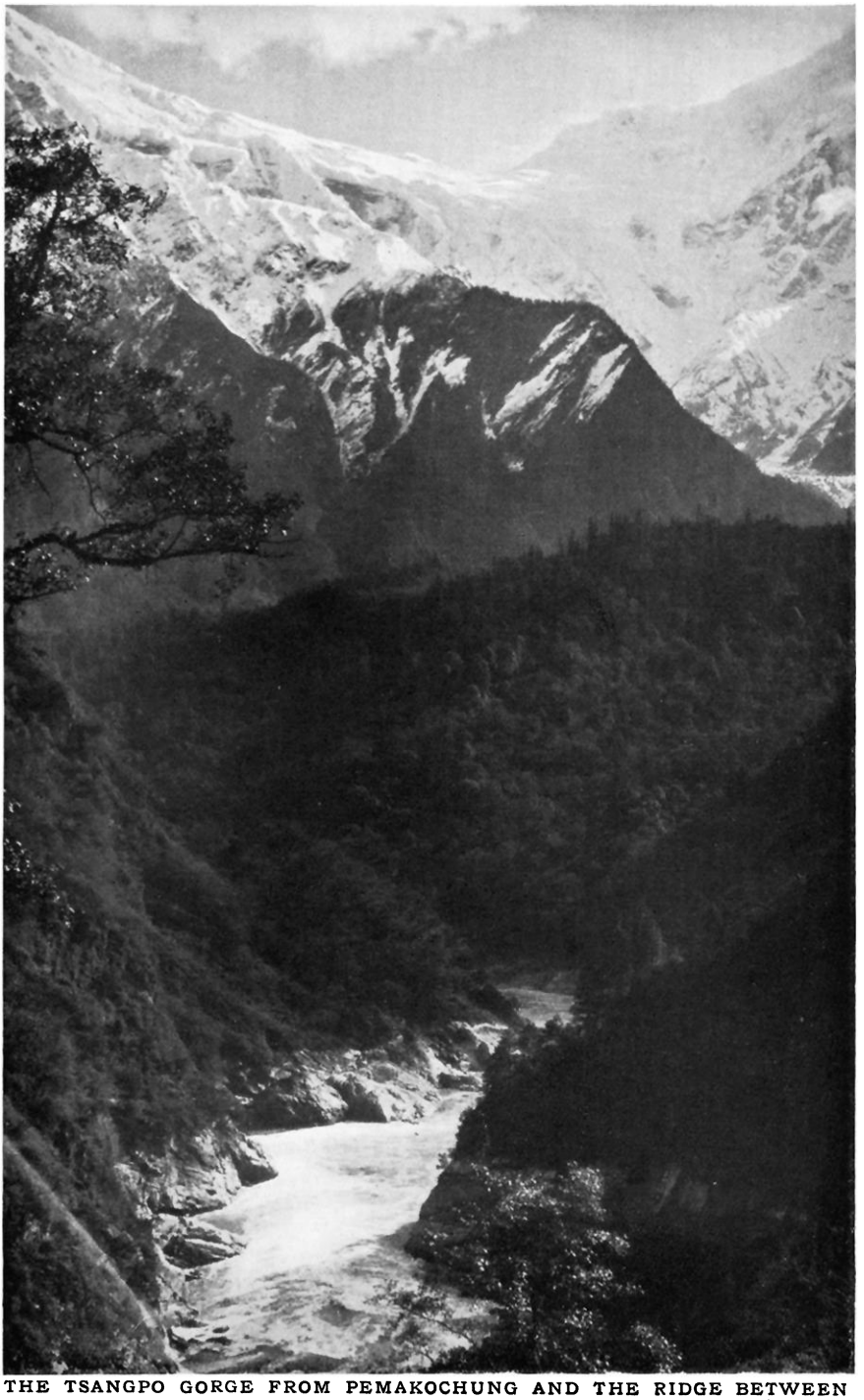
the river was flowing in a general north-easterly direction, in a series of falls and boisterous rapids, skidding violently from time to time, but in the main keeping direction. Dense forest filled the gorge from water-line to snow-line, and every two or three days we found ourselves down to a new stratum of vegetation.

On the 27th we advanced only about 2 miles, the Shegar Chu proving a more formidable obstacle than it looked. I tried to reach the glacier foot by following up the stream, which had cut the abandoned moraines into terraces, but was unable to do so. On the 28th we were again delayed by a high cliff, which the porters descended with difficulty. That night we camped in the river-bed again, between two small streams close to where the great Sanglung spur juts out northwards. The river has thrown up a barrage here, with a deep lake against the cliff on the other side. Unless we could cross the barrage between the violent river and the deep lake, we would have to leave the river-bed altogether and climb the cliff. This is the summer route; and had the water-line been 2 feet deeper it would have been ours too, for even at the end of November water is still pouring over the barrage into the lake. However, by felling trees and laying a bridge we just managed to get across, and so were able to continue in the river-bed for another march. A huge landslide had spoilt the scenery here for the next 2 miles, and we had some difficulty in clambering over the cyclopean angular blocks of gneiss strewn along the shore. The river was having a wild time, keeping a passage open. That night we camped in the river-bed for the last time at the foot of a smooth sheer cliff, where two streams slithered and leaped hundreds of feet into the river.

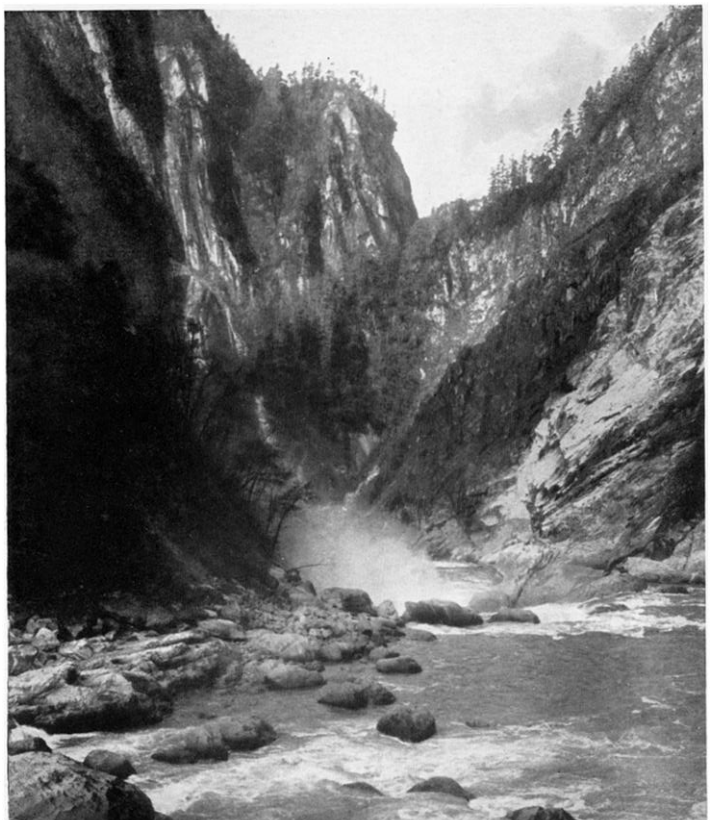
The loaded Tsangpo came up against the Sanglung cliff with terrific force, and skidded away to the west, making straight for Gyala Peri, a long shark-toothed spur of which dovetails into the Sanglung spur. It looked as though we were trapped. The roaring river filled the narrow gorge from wall to wall, and it did not look possible to scale the cliff. Just round the corner it fell about 40 feet over a ledge, sending up clouds of spray in which we saw rainbows; it was the first vertical fall we had seen. At high water it must be an amazing sight—but then of course one cannot reach it!

On the 30th we did the apparently impossible—scaled the cliff, crossed the face of one cascade, and reached the basin of the second, high up. We followed joints and cracks in the coarse-grained gneiss, slanting up the cliff and hauling ourselves vertically upwards by means of small bushes which grew in every crevice. It seemed wonderful enough that the coolies should be able to climb such a face; but our astonishment at this paled beside our speechless surprise when we realized that we were still on the trail of the takin!

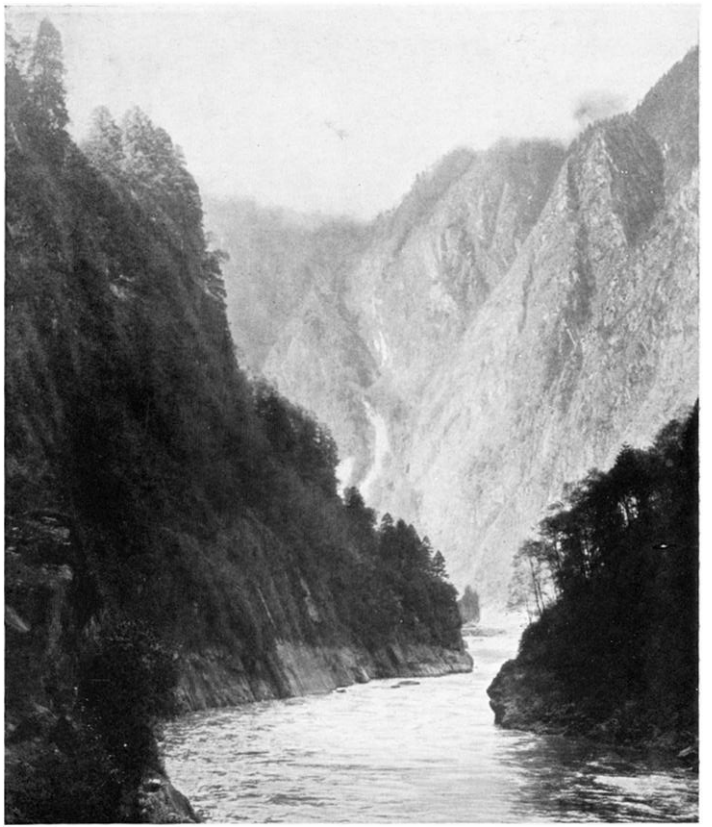
At the top of the cliff we reached a steep stony glen not far below the snow. Here we saw a dead takin which had been caught in a noose of



THE TSANGPO GORGE FROM PEMAKOCHUNG AND THE RIDGE BETWEEN NAMCHA BARWA AND SANGLUNG



THE FIRST FALL ON THE TSANGPO



A QUIET REACH OF THE TSANGPO NEAR CAMP IX.

bamboo rope, and in its struggles to escape had fallen into the glen and broken its neck. There was forest higher up, but the slope was precipitous, and as it was now late we let the coolies seek shelter farther afield while we made the best bivouac we could on the earth slope below. It rained all night, and a cold wind blowing down the glen off the snow made the conditions generally uncomfortable; we could hardly keep the fire alight, and there was not room for us all to sit round it. Meanwhile the coolies had found a hunters' snuggery in the forest, where they kept warm and dry; consequently they were in no hurry to start next day. We got away at last, and climbed very steeply by a good path through thick forest, till we reached fresh snow. From one point we could almost see Pemakochung, which was absurdly close, and had it been clear we should have had a good view of the Namcha Barwa–Sanglung massif, and the saddle connecting those peaks.

At last, still in forest, we reached the crest of the Sanglung spur, and turned north-west; we could see the river, or rather the gorge, on both sides of us. We descended gradually, till from a clearing we were able to see cultivation far away on the left bank of the Tsangpo after it had passed the apex of its northern bend; the village is called Longyul. Shortly after that we crossed the ridge (Sechen La, 3714 feet above our last camp by the Tsangpo), and, descending a few hundred feet, camped by a pool in the forest.

On December 2 we continued the descent, bearing more and more to our right (*i.e.* northwards) along branching spurs of the main ridge, which itself ends in a cliff overlooking the river opposite Gompo Ne. There was a good path, but it became extraordinarily precipitous towards the end. In the afternoon we suddenly emerged from the forest on to a cultivated platform, and reached the so-called Monba village of Payi or Payul. Here we saw subtropical crops, bananas, limes, tobacco, chilis, and so forth.

The Monbas, though taken somewhat in flank by surprise, rallied well, and entertained us hospitably. They sold us rations, promised coolies for the morrow, and prepared quarters for us in the temple. Next day the main body of porters started back for Gyala; but the Walrus and three of the porters who had always been in the van, felling trees, fixing ropes, and generally helping the lame ducks, volunteered to accompany us to Tongkyuk. We took them on at a special rate of pay, and gave them the lightest loads; we also created a favourable impression by giving the returning party a solid reward for their services, in addition to the money which had to be paid over to the Baron of Gyala, who had contracted for the work.

Payi consists of several groups of wooden houses scattered over terraces which must be 1000 feet above the river. The people call themselves Monba, but are evidently a mixture, with Poba and Lopa predominating. Below the village, out of sight, is a rope bridge leading

to the main road on the left bank; there is no road below Payi on the right bank, which consists of a high cliff. The district down river is called Lome, that up river, Lode.

We were unable to follow the river from Payi to Lagung, where Bailey and Morshead left it on their upward journey, as time pressed; consequently that stretch of 8 or 10 miles remains unexplored. Below Payi the valley begins to open out, the spurs to flatten. Traffic is constantly passing up and down the left bank, *en route* to Showa.

Next morning an "arrow letter" was sent off to the villages of Lode, warning them of our approach and requesting assistance. We only required about ten coolies now, of which we had three; but the other seven were a lamentable time in making their appearance. Eventually we started up the path, climbing to a spur whence we had a good view of the surrounding mountains. The great snow cliff of Sanglung, which faces east, was very prominent; beyond that, separated by a gap, is a much lower snow peak, and beyond that again a group of three rocky peaks. After that the spurs flare away to the lower rounded jungle-clad Abor Hills. To the east is a broad gap, and to the north a small snow peak in Pome.

Next day, December 4, we crossed a spur called Pangkyen La, and descended almost to the river, halting at a poor little village, Sengetong. From here we had a fine view of Gyala Peri, just across the gorge, and of a range of glittering snow peaks stretching northwards from it, on the other side of the Po Tsangpo; the most conspicuous of these is Makandro. While crossing the Tsangpo by rope bridge below Sengetong we took a boiling-point in the river-bed, and found that we were 2239 feet below where we had last camped in the gorge, above the rainbow fall. Either the river loop was longer than we supposed, or there was a fall somewhere. We thought the unseen gap might be 10 or 12 miles, but that would require a steady fall of about 200 feet a mile, which was hardly credible. Having crossed the river we climbed a high narrow spur, at the summit of which we reached a village called Tsachugang. On our right, almost directly below, and plainly visible, the Po Tsangpo came galloping down from the north, and on the left the Kongbo Tsangpo went reeling away northwards, slewed sharply round a high cliff, and wriggled eastwards again. Gompo Ne and the confluence lay about 3 miles away to the south, at the end of the narrow rocky tongue on which we stood, with the rivers roaring past in opposite directions 1000 feet below us. We stayed a day at Tsachugang, and ascending the ridge had a wonderful view of the whole Assam Himalaya, with the Tsangpo bursting out from the middle. Afterwards we went down to Gompo Ne, which is at the end of the ridge, half a mile below the confluence of the Po Tsangpo with the Kongbo Tsangpo.

Gompo Ne is only a name; there is nothing there except an open shed for pilgrims and a rock which resembles a chorten. There was

said to have been a monastery here at one time, but it fell into the river. The confluence was hardly as tumultuous as we had expected to find it; but both rivers were of course low, and we were so accustomed to the wild fury of the Tsangpo that a little more or less did not make much difference. The Po Tsangpo comes in at a rather acute angle, and its blue water is instantly engulfed in the grey flood of the Kongbo Tsangpo. A boiling-point reading here gave an altitude of 5247 feet, which agrees pretty closely with Bailey's estimate of 5700 feet. We had now to account for the 1851 feet between the confluence and the "rainbow" fall (7098 feet).

Retracing our steps up the steep ridge, we crossed the Po Tsangpo some 3 miles above the confluence to a Monba village called Sengchen, where we found a colony of hunters; but to our inquiries about getting farther up the river, they said there was no route. Certainly it looked impossible. Below the village was a deep steep-sided glen filled with dense forest; the upper part of the glen was separated from the lower part by a high cliff over which the stream leaped. Across the glen a huge wall-sided spur came down from Gyala Peri to the river, and broke off short, the river itself tearing through a chasm 10,000 feet deep and at the bottom only 50 feet wide.

Our best, indeed our only, hope seemed to be to reach the crest of that spur, when we *might* see the river beyond. But how? We reckoned it would take us at least four days to cut our way there, even supposing we could do it at all. In the mean time we would have to find our own way and cut our own path, since the Monbas obstinately refused to help us, though otherwise they were quite friendly.

We began by descending 2000 feet to the river-bed in order to convince ourselves that there was no possible route in this direction. But after clambering over the boulders and along the face of a cliff till even the vegetation came to an end, we found that farther progress was only possible for creatures provided with more than the human allowance of hands and feet; not even a monkey or a cat could have clung to those walls.

We were now about $\frac{3}{4}$ mile above the confluence, and the altitude was 5302 feet. There were many steam jets issuing from beneath boulders in the river-bed, and we noticed that the coarse grey-banded gneiss of the upper gorge had changed to a finer sugary-looking schist, though it still showed the same black-and-white banding; here however the bands were straight, not crumpled. Returning to Sengchen, I climbed to the top of a grassy alp behind the village to seek a theodolite station, and noticed a good path going up the ridge. Just as I was about to descend at dusk, I saw the glow of a camp fire across the deep glen and high up on the face of the cliff where the hunters had told us it was impossible to go.

Next day (December 11) Cawdor explored the path up the ridge, and

on his return reported a good place for a bivouac high up ; the path, he said, continued. The hunters, in the face of accumulating evidence, unblushingly admitted that they had lied ; it was possible to reach the crest of the spur, and from there we should see the Tsangpo. Also they offered to take us. Their reluctance was due to the fact that this was the pet preserve of a rival tribe of Lopas, with whom they wished to keep on good terms, and who would be sore at such barefaced trespass.

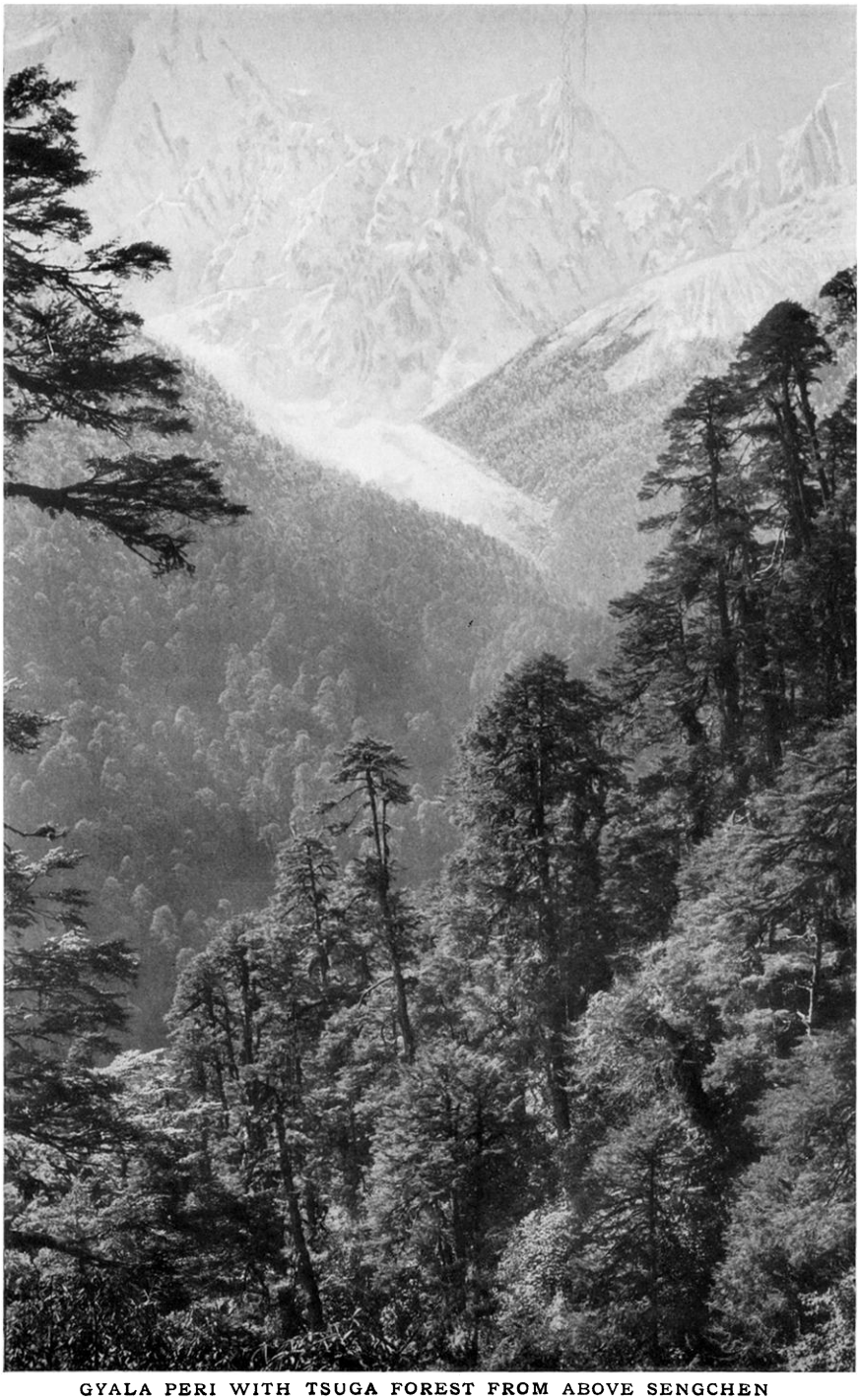
On December 12 we started, with food for five days, all the porters bringing their gas-pipe guns. For, they argued, they might as well be hanged for a sheep as a lamb. If the Lopas were going to make themselves unpleasant because they had trespassed, they might as well poach too, and have done with it. Eventually they slew two of their neighbours' takin, several pheasants, and a gooral ; and then persuaded us to write a letter to the incensed Lopas saying that we took all responsibility ! To such low intrigue is the explorer reduced !

On December 12 the weather broke again, a storm coming up from the south. We bivouacked under a rock, high up on the ridge, and awoke next morning to find it snowing hard. We began to fear that even if we reached the next ridge we should not be able to see anything.

Crossing the burn above the cascade we climbed the ridge, and early in the afternoon reached a col from where we could see the Tsangpo, 4000 feet below. There had been a terrific washout on this side, and half the face of the mountain had peeled off, allowing a superb view southwards to the Assam Himalaya, if only it had been clear. A bad descent of 2000 feet brought us to vegetation again, and we bivouacked on the precipitous hillside in twos and threes. We were told there was a big waterfall below, and next day I descended the remaining 2000 feet to the river.

Here a vertical plate of rock reached diagonally across the river, and the loaded water had blown a hole 15 feet wide clean through the middle of it. At present all the water rushed through the breach, but in flood the river pours right over the ledge, falling about 30 feet. A little below is another vertical fall of 40 feet (as near as I could judge), and altogether the river falls about 100 feet in a quarter of a mile. A boiling-point observation gave the altitude as 5751 feet. As we could not have been more than 5 miles above the confluence at the outside, this gives a fall of 101 feet a mile. That 5 miles we had all but seen with our own eyes. We still had to account for a difference of 1347 feet between this fall and the " rainbow " fall. We had seen another 4 miles up the river from the ridge above, and the gradient was extraordinarily steep ; and from above the " rainbow " fall we had seen about 2 miles down the river. If the fall here was 100 feet a mile, half the difference was accounted for ; and there might be another 4 or 5 miles of the river which was hidden from us. The Monbas said there were no larger falls than those we had seen, and that there were about seventy such falls altogether, which would easily account

THE SECOND FALL OF THE TSANGPO, GOMPO NE.



GYALA PERI WITH TSUGA FOREST FROM ABOVE SENGCHEN

for the difference of height. At any rate, we could endorse Bailey's and Morshead's conclusion, that there was no necessity to postulate the existence of a big fall in order to account for the enormous descent of the Tsangpo from the Plateau of Tibet to the Plain of Assam. We were satisfied that no greater waterfalls than those we saw existed, and that we had in fact seen the river in the deepest, steepest, and narrowest part of the gorge.

One final argument. At the lowest point reached by Bailey the altitude of the river was 7480 feet. He calculated the altitude at Gompo Ne to be 5700 feet, and the distance at 20 miles, giving a fall of 89 feet a mile (*Geogr. Journ.*, October 1914).

According to our reckoning, from Bailey's lowest point to Gompo Ne is 26 miles and the fall 2233 feet, giving an *average* of 86 feet a mile, or almost exactly the same. But this average fall is misleading, and is really made up as follows: From Bailey's lowest point to the "rainbow" fall, 11 miles, fall 382 feet, average 35 feet a mile; this includes several quiet reaches. From the "rainbow" fall to the lower fall, 10 miles, fall 1347 feet, average 134 feet a mile. From the lower fall to Gompo Ne, 5 miles, fall 504 feet, 101 feet a mile. That is to say, the river-bed is steepest where the river is doubling back on itself between Sanglung and Gyala Peri, and the rock is changing its character. The accuracy of this depends not only upon our boiling-point readings and estimation of distances, but also on our recognition of Bailey's cliff; it is therefore only approximately correct.

Next day we started back for Sengchen, reached on the 16th. The weather turned fine again, and we had magnificent views of Gyala Peri at the head of the glen, and quite close. Recrossing the Po Tsangpo, we started northwards up the left bank on the 18th. The weather broke, and after crossing the Karma La, which is the last point from which we could see the Assam Himalaya, we sat down in Lubong for two days while it rained and snowed. On the third day it cleared up, and we returned to the Karma La for a last fixing, and to photograph the snow-peaks.

Resuming the march, we reached the rope bridge above the Rong Chu confluence on the 23rd, and Tongkyuk on Boxing Day. Here we rejoined the main body, who, having waited a fortnight, were beginning to think something untoward must have befallen us. Halting a day here to pack, we started for the plateau on the 28th, following the same route as in August.

I must here draw attention to a point which struck us as curious. When we reached Gompo Ne we had undoubtedly passed through a great range of snow mountains. The Namcha Barwa–Gyala Peri line was behind, *i.e.* to the west of us. On the other hand, Namcha Barwa and Sanglung still lay to the south of us; we were not actually on the southern slope of the Himalaya any more than we had been at Gyala or Pe.

The question was, had we or had we not crossed the Himalayan axis? If so, then that axis here trends north and south, or at least north-east and south-west, and obviously we should have to recross it somewhere in order to reach the Tibetan plateau; possibly we had already done so at the Karma La, the Po Tsangpo also cutting a passage through the range. If not, then the Himalayan axis must continue eastwards from Sanglung, in the lower peaks we had seen, to be cut through by the Tsangpo further east, where that river bends to the south. In that case, what about Gyala Peri, Makandro, and the other snow peaks on both sides of the Po Tsangpo? To what range do they belong? It is a nice problem for geologists as well as geographers, which we can state but cannot solve; the information is still too meagre.

Arrived at Nambu Gompa, which had been long since deserted, we waited two days in the hope of fixing the high peaks on the Salween divide; but a continuous fall of snow prevented this, and we decided we had better cross the pass before it was blocked. From the Nambu La therefore we descended to the Trasum Lake and Shoga Dzong, the snow-storm continuing for five days.

Then, retracing our steps up the Drukla valley as far as Pungkar, and finding that we could not get over the Trasum Kye La, we returned to Shoga and continued down the river to Namse Gompa, on the Gyamda river. Turning westwards we reached Gyamda three days later, and made an excursion up the valley to Ko Gompa beyond Laru, whence we returned to Gyamda. We could probably have crossed the Tro La and reached Atsa, but time was getting on now, and we were due back in India shortly.

On January 24 we finally left Gyamda, following the Lhasa road for three days, over the Kongbo Pa La, 18,022 feet, to Tsumara. Here we turned due south, crossing a low pass, the Kumba La, from where we had a view of the snow peaks east of Oga Dzong, which was reached on the following day. Following the main road up the left bank of the Tsangpo, we reached Tsetang three days later (January 31), crossing by the ferry just below the town.

Between Tongkyuk and Tsetang we kept a route traverse, checked by ten observations for latitudes, and boiling-point observations on the passes.

No time was wasted at Tsetang. On February 1 we started due south for India, following Bailey's and Morshead's route up the Yarlung valley and so over the Yartö Tra La, 16,700 feet. Keeping just east of the Trigu Tso, between which and us were some fine snow peaks, we crossed the Kale La and came down to the headwaters of the Subansiri. We were on new ground all the way from the Yartö Tra La to Tsöna, though we crossed Bailey's and Morshead's east-west routes at more than one point. The weather was bright and bitterly cold, fierce winds springing up after eleven o'clock each morning. The valleys of the upper Suban-

siri, though well populated, looked very barren, and choking dust-storms made travelling uncomfortable. But there was very little snow till we crossed the Debshi La, over 16,000 feet, and approached the main Himalayan range. After skirting the Nera Yü Tso in a thick snow-storm, we crossed the Torgon La and reached Tsöna Dzong on February 7.

We had to halt here a day, and were told that the Tawang route was blocked. On the 9th we started again, following Bailey's and Morshead's route, crossed the last pass called Pö La, 14,900 feet, and descended once more into forested country, in the valley of the Nyamjang Chu. Two days later we finally left the snow behind us.

We now followed the river southwards into Eastern Bhutan, where we were well received, especially at Trashigang Dzong. Thence we reached the plains in six days, and Rangyia railway station the same night, February 23, having done the last 25 miles across the plain by Ford car.

The geographical results of the expedition may be briefly tabulated.

(i) Discovery of a new route from Trap, on the Tsangpo, *viâ* Öga Dzong, the Lung La, and Chögorche, to Gyatsa Dzong; and from Trap, northwards *viâ* Öga Dzong to the Lhasa road at Tsumara.

(ii) Exploration of the Gyamda valley from Tsela Dzong to the Lhasa road at Gyamda; and of its chief tributary, the Shoga Dzong stream.

(iii) Discovery of Drukla Gompa, the Drukla river, and the Trasum Kye La, with the route from Shoga Dzong to Atsa.

(iv) Exploration of the Trasum lake, and of the route *viâ* the Nambu La from Shoga Dzong to Tongkyuk.

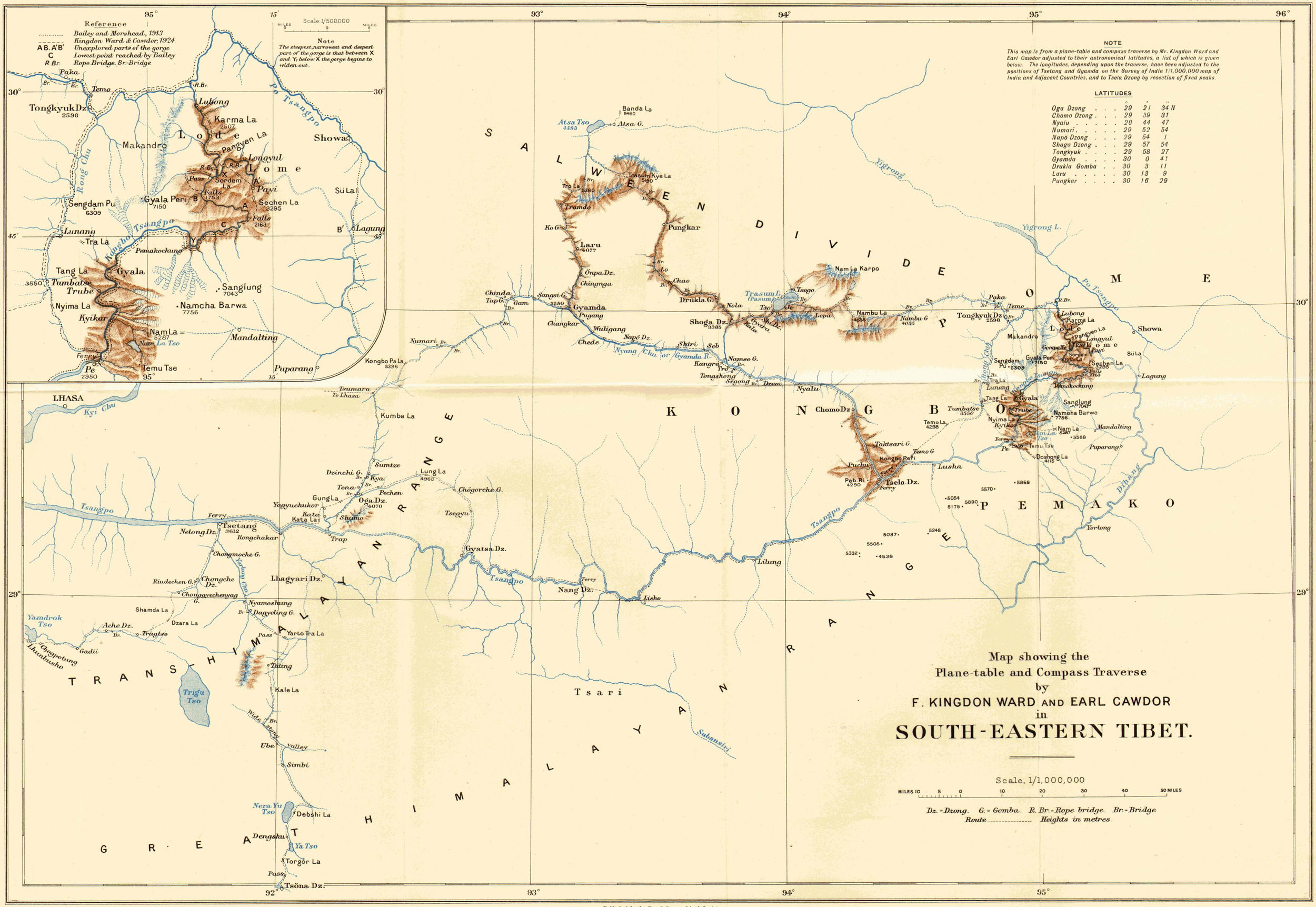
(v) Exploration of the Nam La.

(vi) Exploration of the Tsangpo gorge from the lowest point reached by Bailey to Payi, and the discovery of two small falls; and of the Po-Tsangpo from Gompo Ne to Trulung.

(vii) Exploration of the route due south from Tsetang to Tsöna Dzong.

Our botanical discoveries are dealt with elsewhere.

Before the paper the PRESIDENT said: We welcome back this evening, after a journey extending over a year, our lecturer Mr. Kingdon Ward, no stranger to the platform of our hall. In the course of his last journey Mr. Kingdon Ward and his companion, Lord Cawdor, completed the exploration of the great bend of the Tsangpo River which was begun between forty and fifty years ago by one Kinthup, a native employed by the Survey of India. Let me remind you in a few sentences of the story of the exploration of this river. In 1879 it was determined that an attempt should be made to decide once for all whether the Tsangpo of Tibet and the Brahmaputra of Assam were parts of one and the same great river. A Chinese Lama, trained as an explorer, was therefore despatched to Tibet with instructions to follow the course of the Tsangpo River as far as he could, and then to throw into its waters specially



Published by the Royal Geographical Society.


Reference
Bailey and Morshead., 1913
Kingdon Ward & Cawdor, 1924
AB. A'B' Unexplored parts of the gorge
C Lowest point reached by Bailey
R Br. Rope Bridge. Br.-Bridge
Scale: 1/500000
MILES 5 0 5 MILES
Note
The steepest, narrowest and deepest part of the gorge is that between X and Y; below X the gorge begins to widen out.
95° 15'
30°
45'
Paka
Br.
Br.
Temo
R.Br.
Po Tsangpo
Tongkyuk Dz.
2598
Lubong
Karma La
2507
L o d e
Showa
Makandro
Pangyen La
Rong Chu
Longyul
L o m e
R.Br.
R.Br.
X
Pass
Sordem La
A'
Falls
1753
Payi
Su La
Sengdam Pu
6309
Gyala Peri
7150
B
Sechen La
3295
A
Falls
2163
C
Kongbo Tsangpo
Lunang
Tra La
Y
B'
Lagung
Pemakochung
Tang La
Gyala
3550
Tumbatse
Trube
Sanglung
7043
Nyima La
Namcha Barwa
7756
Kyikar
Nam La
5287
Nam La Tso
Mandalting
Ferry
Pe
2950
Temu Tse
Puparang
Kongbo Pa La
5396
LHASA
Kyi Chu
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4070
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Ferry
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3612
Netong Dz.
Rongchakar
Trap
Chongmoche G.
Yarlung Chu
Riudechen G.
Chongche Dz.
Lhagyari Dz.
29°
Chonggyechenyag G.
Nyamoshung
Br.
Dagyeling G.
Shamda La
Yamdrok Tso
Ache Dz.
Dzara La
HIMALAYAN RANGE


93°
Scale: 1/500000
MILES 5 0 5
Note
The steepest, narrowest and deepest part of the gorge is that between X and Y; below X the gorge begins to widen out.
30°
Tsangpo
Showa
Su La
Lagung
B'
Puparang
Kongbo Pa La
5396
Numari
Tsumara
To Lhasa
Kumba La
Sumtze
Dzinchi G.
Kya
Lung La
4968
Tena
Pechen
Chögorche G.
Gung La
Oga Dz.
4070
Yagyuchukor
Kata
Kata La
Shumo
Tsegyu
Trap
Gyatsa Dz.
Tsangpo
Ferry
Nang Dz.
Lisho
Banda La
5460
Atsa Tso
4493
Atsa G.
Trasum Kye La
5190
Tro La
5380
Tramdo
Ko G.
Laru
4077
Pungkar
Lo
Chao
Drukla G.
Önpa Dz.
Chingnga
Chinda
Tap G.
Gam
Sangsi G.
3550
Gyamda
Pugang
Changkar
Wuligang
Napö Dz.
Chede
Nyang Chu or Gyamda R.
Shiri
Seb
Shoga Dz.
3385
Kangra
Tongshong
Br.
SALWEEN
RANGE
K

94°
95°
This map is
Earl Cawdor
below. The
positions of
India and
Banda La
5460
Atsa G.
Trasum Kye La
5190
5380
Br.
W E N D I V I D E
Pungkar
Laru
4077
Lo
Önpa Dz.
Chingnga
Chao
Drukla G.
Nola
Nam La Karpo
Tsogo
Trasum L.
(Pasum)
3598
Tso
Je
Lopa
Shoga Dz.
3385
Gyara
Kala
Shi Dz.
Nambu La
4535
Nambu G
4055
Paka
Temo
Tongkyuk Dz
2598
Makandro
Pugang
Wuligang
Napö Dz.
Chede
Shiri
Seb
Nyang Chu or Gyamda R.
Namse G.
Kangra
Trö
Tongshong
Segong
Dzem
Nyalu
Yigrong
K O N G B O
Chomo Dz
Sengdam Pu
6309
Rong Chu
Tra La
Lunang
Tang La
Gyala
Trube
Tumbatse
3550
Nyima La
Kyikar
Temo La
4298
Taktsari G.
Temo G
Kongbo Pe Ri
Puchu
Lusha
Ferry
Pe
Pab Ri
4290
Tsela Dz.
5868
5570
5054
5890
5175
P E
Tsangpo
5087
5248
5505
5332
4538
E
G
N
Lilung
Lisho
Dz.


95°
96°
30°
29°
NOTE
This map is from a plane-table and compass traverse by Mr. Kingdon Ward and Earl Cawdor adjusted to their astronomical latitudes, a list of which is given below. The longitudes, depending upon the traverse, have been adjusted to the positions of Tsetang and Gyamda on the Survey of India 1/1,000,000 map of India and Adjacent Countries, and to Tsela Dzong by resection of fixed peaks.
LATITUDES
Oga Dzong . . . 29 21 34 N
Chomo Dzong . . . 29 39 31
Nyalu 29 44 47
Numari. 29 52 54
Napö Dzong . . . 29 54 1
Shoga Dzong . . . 29 57 54
Tongkyuk 29 58 27
Gyamda 30 0 41
Drukla Gomba . . 30 3 11
Laru 30 13 9
Pungkar 30 16 29
Yigrong L.
Po Tsangpo
D E
P O M E
Paka
Temo
Tongkyuk Dz
2598
Nambu G
4055
Lubong
Karma La
2507
Lo de
Pangyen La
Longyul
Lo m e
Showa
Makandro
Gompa Ne
Sordem
Payi
Sü La
Sengdam Pu 6309
Gyala Peri 7150
Sechen La
3295
Falls
2163
Lagung
Rong Chu
Tra La
Lunang
Rongbo Tsangpo
Pemakochung
Tang La
Gyala
Sanglung 7043
B O
Tumbatse
3550
Trube
Namcha Barwa
7756
Temo La
4298
Nyima La
Kyikar
Nam La
5287
Mandalting
5568
Nam La Tso
Temo G
Ferry
Pe
Temu Tse
Puparang
Doshong La
4115
Lusha
Tsela Dz.
5868
5570
Dihang
5054
5890
5175
P E M A K O
Yortong
5248
5087
E
G


Kyikar
Nam La
5287
Nam La Tso
Ferry
Pe
2950
Temu Tse
95°
7756
Mandalting
15'
Puparang
Kongbo Pa La
5396
Tsumara
To Lhasa
LHASA
Kyi Chu
Kumba La
Sumtze
Dzinchi G.
Kya
Tena
Pechen
Gung La
Oga Dz.
4070
Yagyuchukor
Kata
Kata La
Shumo
Tsangpo
Ferry
Tsetang
3612
Netong Dz.
Rongchakar
Trap
Chongmoche G.
Yarlung Chu
Riudechen G.
Chongche
Dz.
Lhagyari Dz.
Chonggyechenyag
G.
Nyamoshung
Dagyeling G.
Shamda La
Yamdrok
Tso
Ache Dz.
Tragtse
Dzara La
Pass
Yarto Tra La
Chogpotung
Lhunbusho
Gadii
Taling
Kale La
Trigu
Tso
Wide
stony
valley
Ube
Simbi
Nera Yu
Tso
Debshi La
Dengshu
Ya Tso
Torgor La
Pass
Tsöna Dz.
92°
TRANS-HIMALAYAN RANGES
GREAT

Published by the Royal Geographical Society.

Map show
Plane-table and C
by
F. KINGDON WARD
in
SOUTH-EAS

Scale, 1/1,

MILES 10 5 0 10

Dz. = *Dzong.* *G.* = *Gomba.* *R.* B

Route .....

94°

9

Published by the Royal Geographical Society.

29°

Map showing the Plane-table and Compass Traverse by F. KINGDON WARD AND EARL CAWDOR in SOUTH-EASTERN TIBET.

Scale, 1/1,000,000

MILES 10 5 0 10 20 30 40 50 MILES

Dz. = Dzong. G. = Gomba. R. Br. = Rope bridge. Br. = Bridge
Route ..... Heights in metres.

95°

SOUTH-EASTERN TIBET
Kingdon Ward & Cawdor

marked logs of wood. For two years careful watch was kept on the waters of the rivers of Assam. The watch proved to be vain, and the reason became apparent four years later, when Kinthup, who had been in the service of the Lama, made his appearance once more and reported to the Survey of India. It seemed that the Lama had played his employers false, and had sold Kinthup himself into slavery. The latter, after gaining his freedom, made his way down the course of the river as far as he could, and then threw the logs into its waters. But the watch upon the rivers of Assam had by then been abandoned, and it was not until 1913 that the general accuracy of Kinthup's report was verified by Captains Bailey and Morshead. These two explorers went far to solve the problem of the great bend of the river, but they left a piece of some 30 miles of stupendous gorge untraversed, and it is that gap which our lecturer this evening will be able to fill in. In the course of his journey he covered the larger part of these immense gorges, and so has solved for all time the problem of the Tsangpo and the Brahmaputra rivers; and in the expectation that he will devote no small part of his lecture this evening to describing these hitherto unknown and most interesting tracts of country I have great pleasure in calling upon Mr. Kingdon Ward to tell us his story.

Mr. Kingdon Ward then read the paper printed above, and a discussion followed.

Sir DAVID PRAIN: The lecturer has told you that he has been to ferret out the geographical features of one of the last-explored bits of the globe; and he has done the same thing for the plants. We were just as interested to know what species might be brought from that gorge and the country behind it as you were to know what sort of country he saw. He has told you that in all Alpine lands the plants look very much the same, that the plants that he saw on those high alps were very much like the plants you have seen in Switzerland. Although that is perfectly true as far as general appearance goes, it is also true that there is the very greatest difference in detail. We knew very well what could be got from Sikkim and Chumbi, and also, thanks largely to Mr. Kingdon Ward, what could be got from Szechwan and Yunnan. We knew also that in this particular area, which is, roughly, about halfway between Yunnan and Szechwan on the one hand and Sikkim and Chumbi on the other, his party would get the same kind of plants, but that they would also probably get plants differing from those either to the east or west. Mr. Kingdon Ward has told you that amongst the mountain poppies, of which there are about forty altogether—half of them being in the Himalayas and the other half in China—they have ten, most of which are new. And the same with rhododendrons. There are sixty or seventy sorts in Sikkim, and I do not know how many—Mr. Kingdon Ward might know—probably something like three hundred in the south-west corner of China; but I have not the slightest doubt that amongst the seventy or eighty he tells us he has seen a very considerable number will be different from those that he and others have already brought from south-west China and from those we know from the Himalayas. I think that although you as geographers are very much to be congratulated on having heard what Mr. Kingdon Ward had to say to-night, those of us who are interested in botany and gardens regard him as one of ourselves, and are even more interested in what he has said and what he has done than you can be.

The PRESIDENT: After the botanist I had perhaps better invite a geographer to speak. Colonel Ryder of the Survey of India is present, and no one can speak with more authority than he, if he will be kind enough to do so.

Colonel C. H. D. RYDER: Besides the many years that I have spent in the Survey of India, my particular claim to talk on this especial portion of the Himalayas is that I nearly, but never did, go there. During Sir Francis Younghusband's Expedition to Tibet we were all, naturally, very keen to explore in any direction that we could. He had organized expeditions up the Brahmaputra, which I joined, and an expedition, to the command of which I was nominated, down the Brahmaputra, which unfortunately was entirely stopped by orders from home and from the Government of India; so that that part remained really an entirely unknown country until Major Bailey and Major Morshead of the Survey of India made their exploration thirteen years ago. They were preceded only by that well-known traveller, the Indian Kinthup. All the Indian surveyors that we sent up into Tibet in olden times, with one exception, namely that villainous Lama whom Lord Ronaldshay mentioned, were successes; they all did their work in a most excellent manner. Old Kinthup was discovered a few years since living in humble circumstances in Darjeeling. He died only a year or two ago, but I think his end was made happy by the recognition that he received, pecuniary and otherwise, from the Government of India.

The controversy on the problem of the Brahmaputra was an old-standing one. If you study the proceedings of this Society forty or fifty years ago, you will see many very heated arguments used to take place as to which river the Tsangpo of Tibet became. A predecessor of mine, a very distinguished Surveyor-General of India, used hotly to maintain that it became the Irrawaddy. He was wrong. It is only by the wonderful energy, the tact and skill of explorers such as Majors Bailey and Morshead and Mr. Kingdon Ward in this particular locality, that we finally arrive at the solution of these problems. I think that geographers as well as botanists are to be congratulated on the lecture which has been delivered this evening.

Sir FRANCIS YOUNGHUSBAND: Twenty-one years ago, when we were at Lhasa and the Treaty had been concluded, we thought we would take the opportunity of solving the great question of the Tsangpo River—both where it came from and where it went to. And so, finding the Tibetan Government were in an entirely friendly mood, we approached them and obtained permission to send two expeditions: one to go up the Tsangpo and discover its source, and the other down it to see if it was the same as the Brahmaputra. Colonel Ryder was told off to the expedition which was to go down the river and decide, once for all, whether the Tsangpo which we crossed on the way to Lhasa did force its way through the Himalaya Mountains and become the Dihong (or Brahmaputra) in Assam. The Tibetans said, "You can go down the river. We have not the foggiest idea where it goes to, but if you like to take your chance of coming out somewhere at the other end, very well, we shall be prepared to help you along." It would have been a risky expedition. It could get through the Tibetan portion, but what sort of reception it would meet with amongst the tribes between Tibet and Assam was uncertain; and for that reason the Government of India thought it would be best to await a better occasion. That occasion came when Major Bailey made that adventurous journey up the Dihong to the gorges and found it practically certain that the Tsangpo and the Dihong were the same. Nevertheless, there was a gap of about 30 miles remaining, and it has been most delightful to sit in a comfortable armchair and see that gorge being disclosed to us by photographs as a result of the remarkable journey which Mr. Kingdon Ward has described. We now have in detail, right from one end to the other, the whole history of the Tsangpo.

I think we are to be congratulated upon those two very adventurous explorers, Major Bailey and Mr. Kingdon Ward, and their companions, Major Morshead and Lord Cawdor. I must also congratulate Mr. Kingdon Ward both upon his adventurous journey and upon the beautiful photographs he has shown. I am sure some of the geographers present are also flower lovers, and we shall be only too delighted to hear more of the wonderful flower world which he has disclosed.

The PRESIDENT: I would like on your behalf to thank Mr. Kingdon Ward for his most interesting lecture this evening. It has, indeed, fallen to his fortune to solve finally one of the few problems of exploration which the nineteenth century left to the twentieth century for solution. He has finally confirmed two things: first, that the Tsangpo does make this tremendous right-angled turn to force its way across the main axis of the Eastern Himalaya Mountains; and, secondly, that it does that somewhat unexpectedly, without any very outstanding fall of water taking place in the process. So far as one can judge from what Mr. Kingdon Ward has told us this evening, there is no huge waterfall at any part of the course of the river where it makes its way through the mountains, but it does so with a more or less steady descent through this stupendous 30-mile gorge which he has so well described. It is a matter of regret to Mr. Kingdon Ward, as it must be to us also, that his companion upon this adventurous journey, the Earl Cawdor, is not present to-night. Lord Cawdor, I believe, reached England safely yesterday, but after a period of a year amid the comparative solitude of the Eastern Himalayan Mountains and of Tibet it seems that the attractions—and of course to a Scotsman they would be great—of the Caledonian Ball have been too much. An engagement to take part in that function has deprived us of the pleasure of his presence this evening. None the less we do most heartily congratulate him and Mr. Kingdon Ward, the seasoned traveller of the party, upon the splendid results of their most recent expedition.

Sir Louis Dane sends us the following note as a contribution to the discussion:

The remarks of Colonel Ryder and Sir Francis Younghusband at the meeting on May 25, no doubt unintentionally, may have raised the idea that the Government of India were obstructive as regards the exploration of the Tsangpo after the Mission to Lhasa in 1904. I should have liked to correct this impression at once, but the hour was late, and I was not favourably placed for saying anything. The facts are that the Government of India were most anxious to facilitate the exploration of the territory in Tibet adjoining the Indian frontier, and especially that on the Nepal border, as the Nepalese Government were nervous about the movements of Russian emissaries in Tibet. Sir Francis Younghusband was therefore asked if he could induce the Tibetan authorities to issue safe conduct for one surveying pary to proceed from Lhasa to Gartok to open the trade mart there in Western Tibet and to return down the Sutlej to Simla, and for another party to descend the Tsangpo to Assam. There was a little trouble with the Abors at the time, and it was thought that the Tsangpo party might be accompanied by the Gurkha regiment returning to Assam. It was hoped that the attention of the Abors would be kept on the Assam front by operations there, and that the Gurkhas arriving unexpectedly in the rear from Tibetan territory would secure the opening up of the whole country. Sir Francis Younghusband duly obtained the safe conduct for the parties, but the military authorities raised objections to the Gurkhas returning by the Tsangpo, and it was not considered safe for the

survey party to proceed unescorted through Abor territory; consequently that exploration fell through, and it remained for Captains Bailey and Morshead and Mr. Kingdon Ward to clear up the Tsangpo mystery. It is interesting to find that there are considerable falls on the Tsangpo, but, as in the case of the Sutlej and other rivers cutting through the central Himalayas, they are rather continuous rapids than high perpendicular falls. It is also interesting to find that tribal territory under Tibetan influence lies to the south of the Tsangpo gorge, so that perhaps the Gurkhas could have safely accomplished their return journey and a troublesome and somewhat costly Abor expedition might have been saved. But the risks of the unknown were no doubt serious. The western exploration though arduous was in every way successful, and, as was hoped, did much to clear up the status of Mount Everest.

Very few of the authorities probably knew much about Gartok, or even where it was; otherwise we might not have secured our trade post there. My personal knowledge of Gartok dates back to 1883, when I was in charge of the Kulu subdivision of the Kangra District. It was reported that an emissary of the Garpun of Gartok was collecting dues in British territory from the Kampa and other traders on the threat that unless they paid they would not be allowed to enter Tibet. He was detained and an order from the Garpun and several hundreds of rupees found on him. His story was that the Garpun had sent down a flock of sheep with borax for sale, and the man in charge went off with the price, so the Garpun decided to recoup his loss in this way. I reported the circumstances, and added that, if the Government would permit me to leave Kulu for three months, I was willing at my own risk to take the Garpun's emissary and some Spiti Tibetan horsemen with me to ascertain if the story were true, and that in this way travelling lightly by the Parang La route we might explore the country to Gartok, and even beyond, without being stopped. The Punjab Government was not adventurous. I was told I must not leave my subdivision. If an offence had been committed the case must take its course, and so on. Law was not at a premium in Spiti, and the emissary was allowed to depart in peace. Now we have an agent in Gartok, and know all that there is to be known about the goldfields and other points of interest in that desolate but not unimportant tract. Perhaps this note of my recollection of the facts may be of sufficient interest to warrant its being added to the discussion.

THE FIFTH THULE EXPEDITION, 1921–24

The Danish Ethnographical and Geographical Expedition from Greenland to the Pacific

Knud Rasmussen, Ph.D.

Read at the Meeting of the Society, 9 November 1925. Map follows p. 192.

WHEN you are driving a dog team through the desolate region of the North-West Passage, you do not often meet another sledge. But I once had that experience myself, and I think it may interest you to hear about it. I was coming down past the Kent Peninsula on my way to Coronation Gulf when I had the good fortune to

Miss Christie pictures everyday life, both of Russian and of Mussulman, very vividly: the descriptions of the existence of the Sarts of the towns are excellent. The many photographs with which the book is illustrated are apposite in character and of first-class technique; but the work deserves a better map. L. V. S. B.

Naar Himalaya en Karakorum.— Ph. C. Visser. Rotterdam: Nijh & Van Ditmar's Uitgevers-Maatschappij. 1923. 11½ × 5½, pp. 154. *Sketch-Maps and Illustrations.*

Bijlage bevattende de wetenschappelijke uitkomsten der Kara-Korum Expeditie 1922.— Ph. C. Visser en Mevrouw J. Visser-Hooft. Rotterdam: Same publishers. 1925. 9 × 6, pp. 96. *Map.*

The huge mountain system of the Karakorum extends from the Pamir over the border of Tibet for a distance equal to that from the Hague to Zürich, and covers an area of 25,000 square miles, more or less, and therefore it is not surprising that, though Mr. Visser reckons up nineteen expeditions to this region, it is still in great part unknown. The part he chose for exploration lies south of the Sasir pass and between the Nubra and Shyok rivers, and has a length of about 68 miles with a maximum breadth of about 34. In 1922 Mr. Visser sailed for India with his wife and two guides, Fr. Lochmatter and Joh. Brantschen, from St. Niklaus in Switzerland, and on reaching Leh collected a caravan of ponies and about twenty men, with which he travelled over the Kardong pass to the Nubra valley. Thence he ascended the Thalam Buti valley to the northern part of the country he had chosen for exploration, the group of mountains adjoining the Murgisthang glacier, which was visited by Neve and Oliver. Here he explored several side streams descending from heavily glaciated valleys, and climbed peaks 20,000 feet high, whence he obtained extensive views of this imposing group. He then turned his attention to the southern group dominated by the lofty Sasir Peak, which he endeavoured to climb, but was unable to reach the highest point. With a small caravan of indifferent men it was difficult to ascend the long rocky and glaciated valleys and camp at heights to which even firewood had to be carried from a considerable distance. He was very successful considering the resources at his disposal, and he and Mrs. Visser have been doing more excellent work in this region during the past summer.

The *Bijlage* contains reports of specialists on the scientific observations of the expedition, on the plants collected by Mrs. Visser, the meteorological records of Mr. Visser, and the rock specimens brought home by him, besides his observations on the physical effect of the climate and elevation on members of the expedition, and other subjects. There is also a sketch-map of the region explored, based on bearings taken from peaks and prominent points of observation. Unfortunately, only two geodetic points were available for orientation, namely, K_2 (Mount Godwin-Austen) and Pk. 29 of the Indian Survey; it is doubtful whether the latter is the Sasir Peak of Mr. Visser, the highest of the group. W. A. T.

In the High Himalayas: Sport and Travel in the Rhotang and Baralacha, with some Notes on the Natural History of that Area.— Hugh Whistler, F.Z.S., Indian (Imperial) Police. London: H. F. & G. Witherby. 1924. 9 × 5½, pp. 223. *Thirty-one Illustrations from Photographs and Outline Map.* 15*s. net.*

Mr. Whistler is a well-known Indian ornithologist and a keen sportsman, who has spent much of his leave in the Himalaya north of Simla. As an

officer of the Imperial Police his knowledge of native custom and languages puts his book on a plane of reliability well above that of the globe-trotter, and though it neither claims nor aims at any complete or scientific treatment of his subject, it may be thoroughly recommended to the general reader. Specialists will cavil at the spelling of some of the place-names, as, for instance, " Humpta," but these are small points—and controversial !

The author clearly brings out the curious mixture of the two races of Lahul, with their different language and religion, and gives a good picture of that remote and sparsely peopled wilderness encircled by the Chandra and Bhaga rivers, which take their ultimate source so close together almost on the summit of the Baralacha Pass. Across this pass we are taken to the Lingti Plains, and later over the Kunzam Pass to Spiti, where, of course, conditions are completely Tibetan. The well-known charms of Kulu are lightly sketched by way of contrast at the end of the volume.

Good notes on the game and other animals and birds are scattered through the book, and the last chapter deals with " Birds by the Wayside." The photographs are well selected, and if not as striking as those we have become accustomed to from other parts of the Himalaya, that is the fault of the region, and not of the artist.

Angkor the Magnificent, the Wonder City of Ancient Cambodia.— H. Churchill Candee. London : H. F. & G. Witherby. 1925. $8\frac{1}{2} \times 5\frac{1}{2}$, pp. xx. + 303. *Seventy-nine Illustrations and one Map.* 20*s. net.*

" Still another book on Angkor ! " is the exclamation that comes naturally to one's lips when another popular work on this great ruined capital makes its appearance. Such appearance however is all to the good, for there must still be numberless English readers who have never even heard of the place and who would be puzzled to locate it on the map if they had. The work under review will give them some ideas on the subject ; but it makes no pretension to being a scholarly or scientific monograph. In fact, it is to a great extent a travel book, and is freely interspersed with *personalia*, irrelevant incidents, and irresponsible reflections on many matters. For all that, its descriptions are good and its illustrations (though on a rather small scale) are even better.

It seems a pity, but is no doubt inevitable, that amateurs in archæological matters should be so prone to indulge in unproved and improbable theories. So here we are treated to fantastic speculations about *nāgas*, lions, etc., in sculpture, as if these things had sprung straight from the soil of Cambodia, instead of having had a long previous history in India, the Motherland of Cambodian art. Likewise there are quaint errors (*e.g.* that Sita was the monkey wife of Hanuman) and some curious spellings of proper names (*e.g.* " Civa rides abroad on a white bull, Nanda "), to say nothing of inept phrases like " rice paddies " for " paddy-fields," and a good many other eccentricities which are probably in part at least uncorrected misprints. No one who has had to revise proofs himself will be inclined to be unduly severe on that score ; and on the whole the book can be recommended as being both readable and informative. On the other hand, some rather uncharitable reflections on French (and, in general, European) administration and policy in the East might well have been omitted. C. O. B.

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THE ASSAM–BURMA FRONTIER

J. P. Mills, I.C.S.

Read at the Meeting of the Society, 11 January 1926.

I GREATLY appreciate the honour which the Royal Geographical Society has done me in asking me to lecture on the Assam–Burma frontier. Would that my qualifications were greater! All the knowledge I can boast is that picked up during some years of very busy service in that corner of our Indian Empire. In describing the country which I know I shall not confine myself to its physical features, but shall say something of the little-known tribes inhabiting it. In doing so I feel I have ancient and excellent authority behind me, for the early geographers never failed, when writing of strange mountains and deserts, to say something of the even stranger races to be found there. Indeed, it is in these very hills of Eastern India that some of these queer folk are placed. One night in 1922, sitting by a camp fire, I was told by a Naga of a tradition of a tribe whose ears were so long that when they went to bed one served as a mattress and the other as a blanket. Dr. Hutton has pointed out to me that Pliny had not only heard and recorded this story nearly sixteen hundred years before I did, but that he also places *in quadam convalle Imai* (*e.g.* Himalaya) *montis*, a tribe of cannibals which he calls *Abarimon*, which is simply the Assamese words *abări manuh* (" independent men "), a term commonly used to this day for any wild hill tribe. This proves the interesting fact that Pliny must have used an Assamese source, and makes one realize how far stories travelled in ancient times, and how long-lived they are, even when false. The inhabitants of these hills are of particular importance, as their methods of agriculture seem to be causing no small alteration in the geographical features of the country.

A glance at the map will show what a curious position Assam occupies, tucked away in the far north-east corner of India proper. It is itself a great alluvial plain, only 300 feet above sea-level, though it is 600 miles from the mouth of the Brahmaputra, which waters it. It is united in the south with the alluvial plain of Bengal. Its inhabitants are closely allied to those of Bengal. But almost surrounding it are great mountain ranges inhabited by people of Mongolian stock. To the north and east of it are the Himalayas, rising almost sheer up to enormous heights, and to the south-east a long range of mountains stretches for 500 miles

down towards the Bay of Bengal, continuing as a raised line under the sea till it reappears as the Andamans and Nicobars, and passes through Sumatra and Java and beyond, forming one of the longest ranges on the Earth's surface. For much of its length this range forms the boundary between Assam and Burma. Very little has been written on this frontier, and most of what has been recorded is hidden away in obscure journals. About 1825 a pretender to the throne of Assam prevailed upon the King of Burma to send an army to assist him. It marched through the Naga hills, it is uncertain by what route, committing horrible atrocities on the way, and spread terror and destruction throughout Assam. We sent troops which turned the Burmese out, and ourselves took over Assam. Then followed a series of reports, mostly based on hearsay, on routes through the hills. But this temporary interest died down when the annexation of Upper Burma put an end to all further fear of an invasion from that side. It is one of the most curious frontiers in the world, and a great natural boundary. On the west lies the valley of Assam, and on the east the valleys of Chindwin and Irrawady. Yet, though it lies between two fertile, populous provinces, with their railways, roads, and steamer services, it is as yet largely unexplored and contains some of the most primitive tribes to be found within our Indian Empire. In the northern portion it has been crossed only in a few places. Sadiya, in the north-east of Assam, has been reached from Burma more than once, but with great difficulty. There is a way through the Hukong valley which has been surveyed with a view to building a railway at some future date. The route from Burma would be up the Hukong, over a divide at about 3000 feet, I think, and down the Dihing to Margherita, where the line would link up with the Assam–Bengal Railway. At present, if a traveller wishes to go from Dibrugash, say, to Myitkina, in Upper Burma, about 200 miles away as the crow flies, he has to go by train to Calcutta, where he takes a boat to Rangoon, from which he begins another enormous railway journey. South of the Hukong valley no white man has been through till we get down to the level of Kohima, the headquarters of the Naga Hills district. Up to Kohima there is a metalled road from the plains of Assam. From there there is a bridle path which reaches almost to the Burmese boundary, some way south of Saramatti. It is possible to get through from there, and every two or three years the Deputy Commissioner of the Naga Hills, and the Deputy Commissioner of the Upper Chindwin meet and discuss various local matters which require settlement. From Kohima too it is quite easy to get through Manipur State to the Chindwin valley. Further south there are several ways through.

It will thus be seen that the least penetrated, and so the least known, portion of the frontier is that between the Hukong valley and the southern end of the Naga Hills district. It is here that I served, and it is with this little-known country that I have to deal. The Naga Hills district

is a long strip of hill country bordering the plains of Upper Assam. It was taken over in order to protect the plains from raids by head-hunters. To the east of this strip is a block of independent territory inhabited by wild tribes, between the Assam and the Burma administrative boundaries. It is this which forms the barrier.

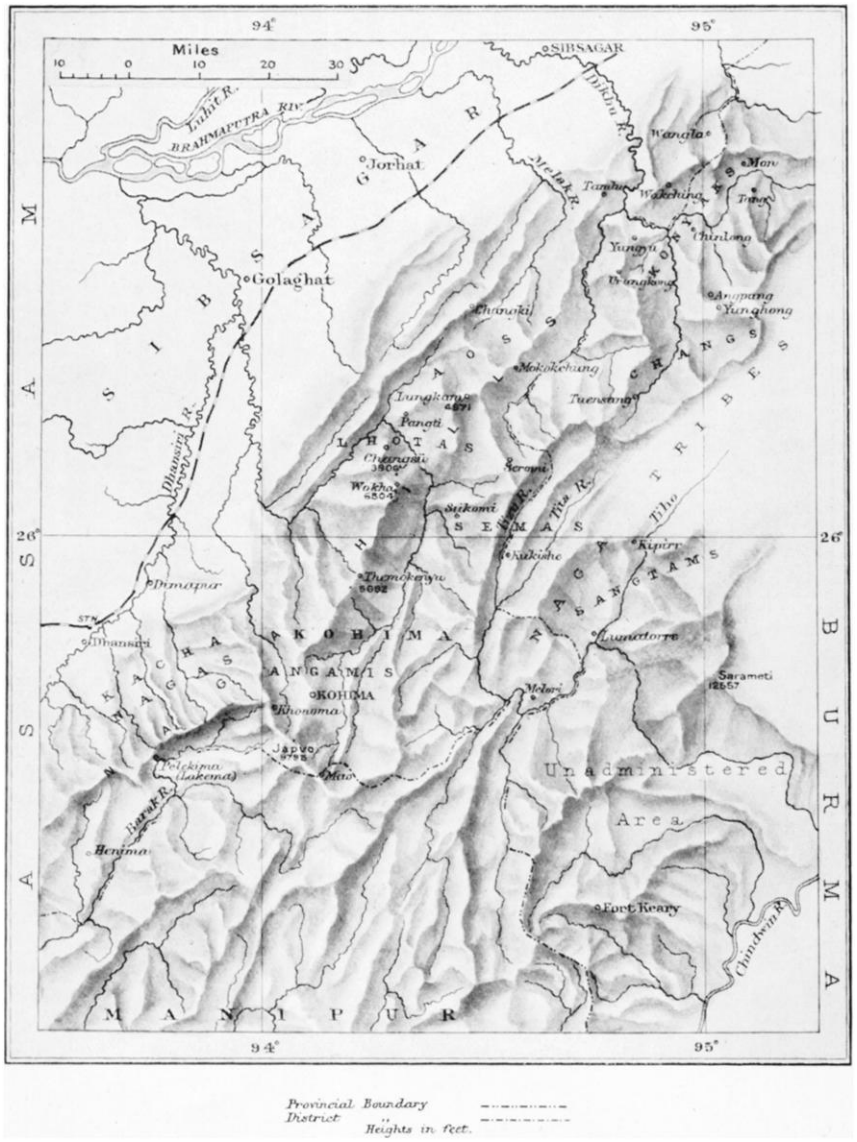
Of course a column *could* get through anywhere, but tribes with whom we have never been in touch would probably oppose us, more through ignorance and panic than for any other reason, and to use modern rifles against bows and spears would mean not only loss of life, but the loss of all hope of establishing friendly relations for years to come. This has never been our way. Instead, we sit in the administered area, a Deputy Commissioner at Kohima and a Subdivisional officer at Mokokchung (some 86 miles away) with a battalion of Gurkhas for use if need be, and slowly work to gain the confidence of the tribes on our frontier. Save when we have had to deal with the resistance of some village which we had set out to punish for raiding or some such offence, no column with which I have been has had to fire a shot, even when approaching some village to which no white man had ever been before.

Why are these hills so hard to penetrate? There are several reasons. The climate is bad for much of the year. The rainfall is one of the heaviest in the world, and mosquitoes, leeches, sandflies, and other pests abound. The Anopheles mosquito is plentiful, and many of them are infected. I do not think there was a single European official in the Naga Hills last year who did not have malaria. Transport is another difficulty. There are no bridle paths save in the administered area. Beyond that there are only Naga paths, very steep and so narrow that a column has to march in single file. All baggage has to be carried by men, who require a baggage guard in hostile country. Then there is language. Often one village cannot understand the language of the next, and this leads to interpreting through several mouths, with all its inconvenience and danger of serious misunderstanding. But the greatest obstacle to exploration is the warlike nature of the tribes. They are intensely suspicious of strangers. Yet one cannot avoid them, for the only paths are those which lead from village to village. One is therefore compelled to visit, and generally to pass through, the villages. Inside a village the path often becomes a narrow street between houses set so closely together that one is continually brushing past front posts and ducking under eaves. A column would be helpless to defend itself in such a situation. Even between villages the jungle is so thick that ambush, the usual Naga method of warfare, is always possible, and where there is any likelihood of attack a column can only move at a snail's pace with flankers hacking their way through on either hand. The very nature of the country, too, makes travelling difficult. Along the base of the hills runs a broad strip of heavy forest; then come heavily wooded and excessively unhealthy foothills. Further in, the mountains are often very steep

and run up to over 12,000 feet. All ranges lie directly across one's path as one goes towards Burma, and have to be crossed one by one, for there are nó tracks along the valleys. The rivers are swift, and are crossed only by a few precarious cane bridges. Usually one has to ford, and as they rise quickly one may easily be cut off.

But it is the Naga tribes who constitute both the chief interest of the area and the chief hindrance to exploration. Though their home is included in India, they are not Indians at all in the ordinary sense of the word.

We will begin our journey at the southern end of the district and pursue a tortuous course to the northern end. The first tribe we encounter are the Kacha Nagas. Like all Naga villages theirs were very strongly defended in the old days, and though this area has long been taken over the old defences still exist. Many of the villages are surrounded by a deep, impenetrable thicket of living cane, often reinforced by a deep ditch, which formerly bristled with "panjis"—sharp bamboo spikes which will go clean through a man's foot. The entrance is through a tunnel under the cane, which is held up by stakes, and across a single plank over the ditch. In the event of attack the stakes would be removed, allowing the cane to drop and block the tunnel, and the plank taken away. Such methods of defence are still in everyday use in villages in the unadministered area. What strikes a traveller in their country chiefly is their love of dancing. Their dances are pretty, and they are always ready to oblige with a performance. For a dance a man wears his ordinary dress of a black kilt ornamented with lines of cowries, and a white cotton belt, but for the occasion he whitens his legs up to the knee with lime and wears very artistic feather ear-ornaments. Girls, on the other hand, wear special skirts of dark blue, red, and white, and stomachers of dark blue ornamented with cowries and whorls of white dog's hair dyed red. The effect is most picturesque. But they are a backboneless people, and have long been under the dominance of the vigorous Angami, whom we come to next. It was his raids on the plains which first led us to take over the Naga Hills, and it was he who gave us most trouble when we had done so. In 1879 Khonoma villagers killed the Deputy Commissioner as he was approaching their village and took his head and those of most of his escort. They then rose and, joined by part of Kohima village, besieged Kohima fort with such vigour that they were within an ace of taking it. It was only after hard fighting that Khonoma was finally crushed, and it was there that Colonel Ridgeway won the Victoria Cross in 1880. The Angami in full dress is a wonderful sight. He wears a huge fan-shaped headdress of hornbill feathers, and highly coloured crossed baldricks over his chest. Like the Kacha Naga, he wears a kilt. The women are more plainly dressed. A girl keeps her head shaved till she is engaged, when she allows her hair to grow. Huge brass earrings are worn in some villages. The most remarkable thing



Provincial Boundary
District "
Heights in feet.

SKETCH-MAP OF NAGA COUNTRY

Note: This map is taken from the most recent materials available. The copies of the latest surveys have not reached England.

TIZU VALLEY FROM BAIMHO, SEMA NAGA

KHONOMA, ANGAMI NAGA

about his country is the way he has terraced the steep hillsides for irrigated rice cultivation. These terraces are marvellous works when one remembers that they are made without any surveying instruments whatever. Water is led in channels from streams, often for miles round the shoulder of a hill. It will irrigate a terrace perhaps half a mile long, be allowed to run down to the next terrace, and irrigate that, with a very gentle flow back to a point only 6 or 8 feet below where it originally left the artificial channel. Terraces of this kind are found in the Philippines, in Borneo, and in many parts of Eastern Asia, and the fact that they are found in the Naga Hills opens an interesting problem of migration. I shall have to mention later the way in which Naga tribes who do not practise terraced cultivation seem to be altering the face of their country, and the possible effects of this. The Angamis, by adopting this method of making terraces, seem to have stabilized things. The same terraces are used year after year, and there is very little loss of soil; they carefully conserve their forests too, so that the water supply, on which the success of their terraced cultivation depends, may remain constant. But the face of the country *is* changing all the same, though very slowly. The rock is a very unstable shale which will bear no weight. The result is that terraces sometimes go sliding downhill, and this winter some of Kohima station has gone.

From the Angamis we come to the Semas, a cheerful and very warlike tribe, most of whose territory lies on the Chindwin side of the watershed: for it is to be noted that the watershed between Assam and Burma has not been adopted as the boundary. Some of the tribe is administered, and some is independent. The Angami is a democrat, and every man does that which is right in his own eyes, but the Semas have very autocratic chiefs, each in his own village ruling his subjects with a rod of iron, and on the whole very justly. Probably no race in the world can boast a dress more picturesque and striking than that of a Naga warrior. Among the Semas, Lhotas, and Aos it is as follows. On the head is worn a deep fillet of bear's hair on a cane frame, which is decorated with the black-barred tail feathers of the Great Indian hornbill. One or sometimes two embroidered baldricks with deep fringes of scarlet goat's hair cross the chest and support behind a tail of human hair and scarlet goat's hair. This tail is really a glorified "panji" carrier. In front the warrior wears an apron of black cloth entirely covered with close lines of cowries, and on his wrists are cowrie gauntlets with scarlet fringes. Above the elbow he wears heavy ivory armlets. His weapons are a long spear with a shaft entirely covered with scarlet hair ending in a deep fringe, and a "dao" with a tuft of scarlet hair on the handle. Sema women as a rule leave the upper half of the body uncovered. Girls engaged to be married wear fillets of plaited scarlet cane and yellow orchid stalk. Peace has few charms for this vigorous people, and chiefs on the administered side of the Tizu envy their brothers across the

frontier who can still add spice to life by an occasional raid. A remarkable feature about the tribe is the way in which they increased about two generations ago, many of the chiefs having families of between twenty and thirty. The result was overcrowding and shortage of land. They expanded at the expense of their less warlike neighbours, but were eventually held on all sides, and the overcrowding still exists.

Their method of cultivating rice, job's tears, and millet is that known as "jhuming." The jungle is felled and allowed to dry. It is then burnt and the ashes dug into the soil, and the crop sown. The same area is used two years in succession, and is then abandoned until enough jungle has grown up for it to be used again—usually from five to ten years. Of course, the thicker the population the shorter the period of rotation before the same land has to be used again, and the less chance the jungle has of growing up. The less the jungle grows up the more the soil is denuded, and the less soil there is the less jungle there will be in future; and so on in a vicious circle. A secondary effect is that the less roots there are in the soil the less is rain held up, and the more quickly do torrents come down in flood.

The denudation is terrible. Once from a hilltop after some heavy rain I could count no fewer than thirty-six new landslips on the opposite side of the valley over which I was looking. Scores of tribes in Assam and Burma practise "jhuming," and what is going on in the Sema country is only an example of what is happening over a huge area. Vast quantities of soil are carried down the rivers, which deposit the silt as they slacken speed in the plains. One result has been the gradual growth of huge sandbanks at such places as the junction of the Brahmaputra and Ganges near Goalundo. These in turn hold back the water and cause floods, which do an immense amount of damage to crops in the plains. I do not mean to imply that sandbanks would not be caused in any case. But the amount of silt brought down by rivers flowing through virgin jungle is very different from that carried by streams fed from steep hillsides covered with freshly dug soil on which rain has been pouring at the rate of half an inch an hour or more.

Altogether, the problem is a difficult one. To forbid "jhuming" is impossible: it would condemn thousands of people to starvation. Moreover, "jhuming" by tribes who are not compelled by pressure of population to use the same land too often, and who leave a reasonable number of trees standing on the land, probably does no harm at all. It is in the crowded areas such as the Sema country that the harm is done. There we are trying two remedies with some success. We have been sowing quick-growing trees, such as Nepal alder and acacia, which will hold the soil, and we have been teaching Semas to terrace like the Angamis.

This "jhum" cultivation is one of the most primitive and probably one of the earliest methods of those employed by man, and must, it seems, have preceded irrigation. One wonders whether it was not one of the

causes of desiccation of large areas of the globe. Possibly hillsides which are now bare rock were once covered with forest. As this was "jhumed" denudation would set in, and the destruction of forests would cause a diminution of rainfall, and so eventually desiccation. It is interesting to think that in watching a hillman of Assam "jhuming" his land we may be watching an agricultural process which has had an incalculable effect on geography and human history.

East of the Semas one gets into little-known country, a striking feature of which is the fine pine forests which clothe many of the hillsides. In spring the pines and the young grass and the scarlet rhododendrons make a picture one can never forget. In 1924 I went as far as Kipirr, which had never hitherto been visited. We had an excellent reception, and I even had a friendly visit from some people from the east bank of the Ti-ho. The Saramatti range, which is covered with pine forests almost to the summit, was in full view only just across the valley, and I was able to see down the valley through which the Ti-ho runs as it makes a sudden turn towards Burma. It was quite clear that the land falls away quickly on that side towards the Chindwin. To the north I was able to obtain an excellent view of a portion of the little-known Yinitsung country. It is thickly populated, and nearly every commanding ridge was crowned with a powerful village. We have been little in touch with this tribe and know little of them. For one thing, they prefer to be left to themselves, and for another, embassies from them can only reach administered territory after a precarious journey through the Sema or Chang country. The Southern Sangtams, who inhabit the country round Kipirr, expose the heads of their enemies on poles. It is not mere lust of slaughter that impels a Naga to take heads. He certainly rejoices when he can bring home tangible proof that he has killed his enemy, but he also believes that by bringing home the head of an enemy he also brings home his soul, and so adds to the supply of "soul-force" in his village, thus increasing its fertility and prosperity. It is for this reason that the head of an enemy is placated with small offerings and it is urged to call its relations and friends so that they too may be killed. Head hunting still goes on in the unadministered area, but by definitely expressing disapproval of it Government is gradually causing it to cease, without taking over and directly administering the area. All villages being continually on their guard, the number of casualties due to head hunting is very small indeed.

Coming back through the Semas we strike the Lhotas, a tribe which centres round Wokha Hill, a fine isolated peak of over 6500 feet, which is a landmark for miles around. Under it the Semas, Lhotas, and Aos believe the Land of the Dead to lie, and on the east face of it is a conspicuous line of white rock, which they regard as the Road of the Dead. North-east of the Lhotas lie the Aos, a large and important tribe, living in huge villages on the tops of the ranges which run through their country.

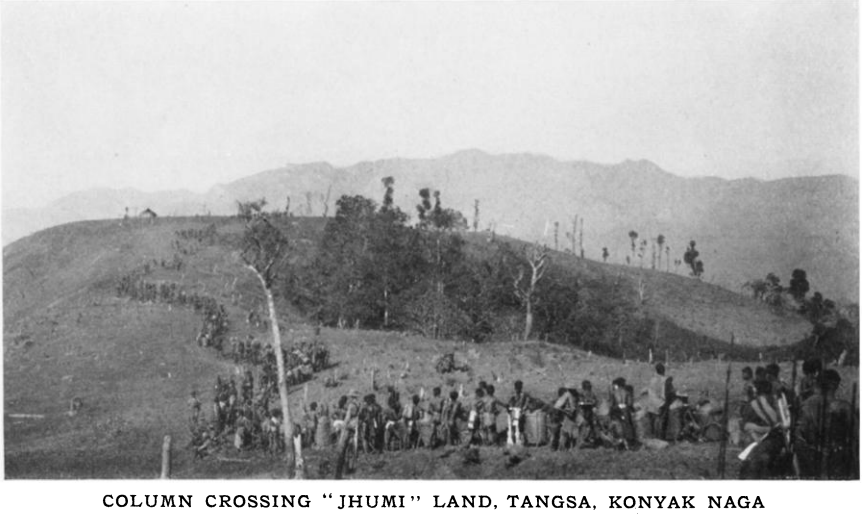
They are an interesting people, and among their curious customs is that of exposing their dead on platforms instead of burying them. These platforms are arranged in rows flanking the paths up to the villages, which are thereby rendered very unpleasant to approach at times. The workaday dress of the men both among the Lhotas and Aos consists of a strip of cloth pulled up between the legs from behind and tucked through the belt so that it forms a flap in front. Over the shoulders they wear a cotton cloth. There is an enormous variety of these, varying in pattern with the status of the wearer and the number of Feasts of Merit he has given. Similarly the skirts of Ao women vary in pattern according to their status and clan. Woe betide a lady who sports a skirt of a pattern to which she is not entitled! All well-to-do women wear magnificent strings of cornelian beads, even when working in the fields. The Aos leave large numbers of trees standing on the "jhumed" hillsides, and this method of cultivation as practised by them does not seem to cause any abnormal denudation of the soil.

The peculiar characteristics of the country are particularly well shown in the portion inhabited by the Aos and Lhotas. You have a series of very long, straight ranges, running parallel with each other and with the Brahmaputra. The streams therefore have to run for many miles at right angles to the course they must finally take to reach the Brahmaputra, and eventually only escape through gorges cut through the ranges. The impression one gets is that the streams have great difficulty in getting out of the hills at all.

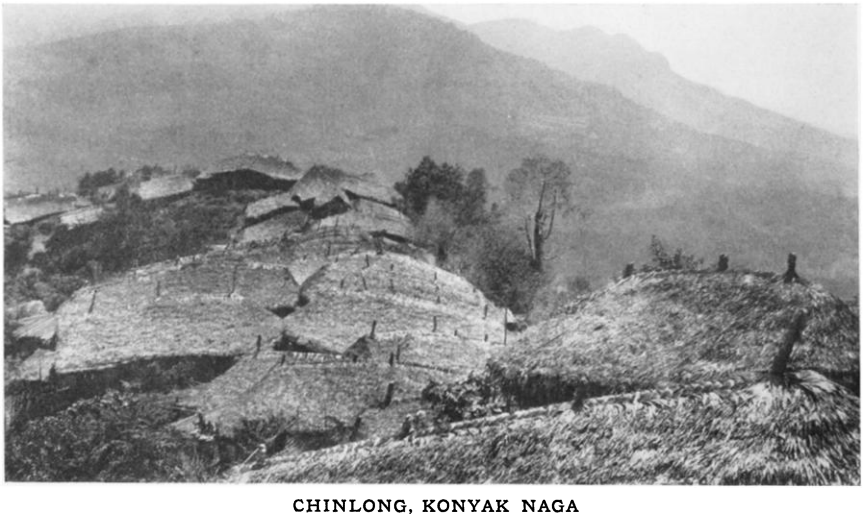
Another characteristic is the levelness of some of the valleys. Some of the valleys have no heads, if one may put it that way. Instead you will find a stream flowing out at either end, the watershed dividing the two sources being so low as to be hardly perceptible to the causal observer. These valleys are a great snare to the unwary geographer who tries to make maps from the tops of the ranges without going down to the valleys to see which way the streams really run.

I will not deal with the Changs, who lie to the east of the Aos, as I was laid up with leech-bites and unable to accompany Dr. Hutton when he toured in the country in 1923, visiting many villages to which no white man had ever been. North of the Aos are the Konyaks. This term covers what is really a number of different tribes, but they extend an unknown distance to the east, and we do not yet know enough about them to be able to subdivide them properly. Only a small number of their villages lie in administered territory. The tribe which is giving the Burma Government so much trouble with its human sacrifices belongs to this section of the Naga race. The Konyaks differ markedly from all the Naga tribes I have hitherto described in this paper. The staple diet in most places is taro instead of rice; their costume is distinctive in its scantiness; their artistic sense is very high; and, while all other Naga clans are strictly exogamous, they possess an endogamous

RAIDERS RETURNING TO SAKHALU, SEMA NAGA



COLUMN CROSSING "JHUMI" LAND, TANGSA, KONYAK NAGA



CHINLONG, KONYAK NAGA

MUNGCHEN VILLAGE, AO NAGA

WEALTHY COUPLE AND HOUSE, KICHILIMI NAGA

clan called Angs from which their sacred chiefs are drawn. In the southern and western portion of their country the men constrict their waists to an amazing smallness with cane or bark belts. In some places this is the sole garment worn, while in other places it is supplemented by an apron. Women in some places wear a skirt reaching halfway to the knee, while in others they wear only a very narrow strip of cloth encircling them low down below the buttocks. Both men and women are elaborately tattooed. Further to the east the men wear crested hats of cane and yellow orchid skin, and very handsome belts covered with cowries ground square and sewn close together. The women have their heads clipped in a peculiar way, save those of servile clans, who have them cropped quite short all over, lest a hair should fall into their master's food while they are cooking. The Konyaks are exceedingly warlike, and possess a highly developed social system. The villages are ruled by sacred chiefs, and a striking feature is the huge " Morungs," which the men of the villages use as their club houses. It is in them that the warriors assemble before and after a raid. They are of great size, and remind one strongly of the *ravi* of New Guinea. The posts are covered with elaborate carvings in high relief of human beings, heads, tigers, elephants, hornbills, and so on. Even larger are the houses of the chiefs in some villages. One I measured was 123 yards long inside. Probably the owner himself did not know how many people lived in its many dark rooms. While in some villages the houses are scattered, in others they are so close together that self-defence would be impossible if one were trapped in one. The gates are well defended and guarded by the " Morungs," from which sloping ladders run to look-outs in trees, so that a man can keep watch from a look-out well beyond the gate and retreat to safety within the fence without coming to earth. The ground round the village is thickly studded with " panjis," which are practically invisible among the dead bamboo leaves. In some places branches are laid across the path to trip up any one running away. Of the warlike character of the Konyaks there can be no doubt. It was they who wiped out an outpost many years ago at Naginimara, where the Dikhu river emerges from the hills ; it was they who once killed almost the whole of a survey party and took an English head, a feat which has only been equalled by Khonoma ; and it was they who ambushed one of our columns some twelve years ago, stampeding the carriers and neatly removing some of their heads as they rushed them. In 1923, Dr. Hutton, Deputy Commissioner of the Naga Hills, and I were fortunate enough to be able to make a tour in the unadministered country to the east. To some of the villages we visited no white man had ever been before. Others had been visited by Colonel Woodthorpe, R.E., about 1875. His visits were vividly remembered, and we were even told, quite casually, in some places how many eggs and chickens had been given him. I only hope he got better eggs than we did. Twice the eggs given us for our breakfast

in the morning were too quick for us; they were put down too near the fire, and hatched the evening before!

We were able to go nearly as far as the main Patkoi range. No one has ever been to the top in this area and looked over the other side; we, unfortunately, could not do so without exceeding our orders. This was especially disappointing, as we received some particularly tempting challenges. We were considered to be a most unpleasant colour, and doubt was expressed as to whether we should bleed if cut; there was some feeling that the experiment ought to be made. From what we heard, however, it seems quite clear that the country between the top of the Patkoi and the Chindwin consists of low jungle-covered hills, apparently sparsely inhabited. One of our great difficulties was transport. Colonel Woodthorpe took his own carriers with him, but we, for various reasons, decided to pick ours up as we went. We had some trying hours persuading more than semi-hostile Konyaks to carry our loads. Sometimes they would march for an hour or two, and then suddenly put down their loads and refuse to go on, on the ground that the village they were approaching was hostile, and would ambush them on their way home, even if they did not attack as we advanced. For instance, between Yunghong and Angpang we had great trouble. The previous evening Yunghong, who did not in the least desire our presence, had tried to lead us through and right away from their village, intending that we should camp in the jungle and be unable to get carriers in the morning. We saw through the plan, however, and camped close to the village, while the inhabitants looked sullenly on. In the morning we got them to supply carriers with extreme difficulty, and set out. As soon as we reached the stream which divides their land from that of Angpang, their enemies from time immemorial, they put down their loads and collected in the high grass by the side of the path. They flatly refused to enter hostile territory, and things began to look awkward. Eventually we got them started again, only to be met halfway up the hill by a crowd of Angpang, who were very angry that we had brought Yunghong men on to their land. We therefore formed our escort into a cordon between the two angry crowds and sent Yunghong shouting home. Angpang picked up our loads and went up the hill singing of their valour and the cowardice of Yunghong and the rest of the world in general. In the morning they refused to supply carriers on the ground that they had carried the day before. Firmness and persuasion put an end to this objection, however, and once more we set out. Day after day of this sort of thing was wearing, but we got through at last, and had an excellent reception from the Northern Konyaks. From there we regained administered territory, and out troubles were at an end.

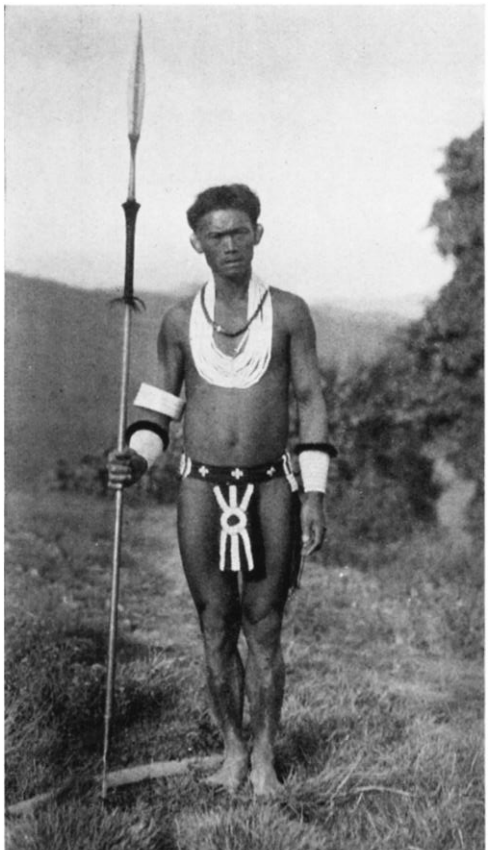
For all its malaria, mosquitoes, and leeches the country must be one of the most beautiful in the world. It is hard work, toiling up the hot steep slopes, but one is rewarded on the heights with unsurpassed views

of green mountains, shading into blue, with a cloudless sky above, while away to the north one can often see the snowy ranges of the Himalayas. The people are primitive—long may they remain so—but they are exceedingly picturesque, cheerful, brave, and loyal. When the call came for men for the Naga Labour Corps for France, they came forward with wonderful readiness. Many who came were independent—just friends of the British Raj, ready to help, not subjects. All these men knew nothing of the sea, nothing of any land but their own. Yet they faced the unknown, and went. Some never came back to their green hills.

Before the paper the PRESIDENT (Dr. D. G. HOGARTH) said: To-night you are to have the pleasure of listening to Mr. Mills, of the Indian Civil Service, who has been governing one of the extreme corners of our Empire. He is to tell us about a range of mountains which, though included within the Empire, contains people over whom we, apparently, have little authority and about whom we have even less knowledge. Mr. Mills is singularly well qualified to speak to us about those people, because not only has he been an Administrative Officer, but he is keenly interested not merely in the geography of the country but also in the anthropology of the tribes, a rather rare combination; it is only fair, however, to remember that in recent years our Government in various parts of the world, not only upon the fringes of the Indian Empire but also in the Sudan and other places, has encouraged anthropological study. We need not say how laudatory that is and how very much the power of Administrative Officers to administer properly their districts is enhanced, if they set themselves to work, as Mr. Mills has done, from the first to gain a knowledge of the peculiar customs and the peculiar ideas of their peoples. It is certainly strange, and I think you will agree it is so when you have heard Mr. Mills, that there should be within such comparatively easy reach and between two such well-known and such thoroughly administered provinces as Assam and Burma, a range of mountains sheltering a number of tribes in the extremely primitive state, both technologically and psychologically, in which these tribes are. Without delaying further, I will ask Mr. Mills to read his paper upon the frontier between the provinces of Assam and Burma.

Mr. Mills then read the paper printed above, and a discussion followed.

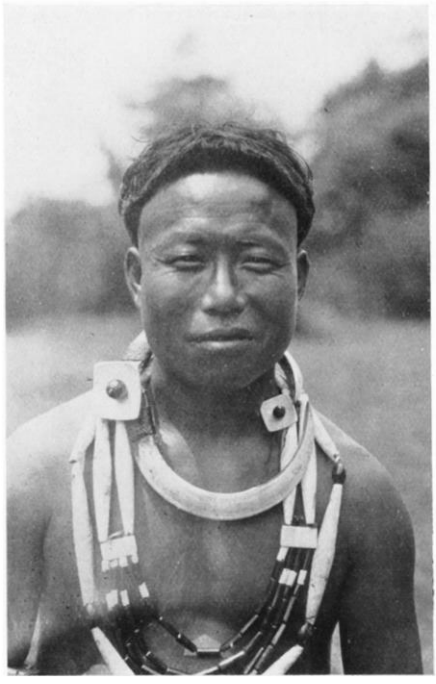
Mr. F. KINGDON WARD: I know the Naga Hills only from the point of view of the visitor; but although I have met Mr. Mills to-night for the first time, I heard of him no less than eight years ago, when I spent a short holiday in those hills, and I came here to-night in the hope of hearing something of the botany of that country, because I have long looked longingly at the Patkoi range to which Mr. Mills referred. The lecturer spoke of the possibilities of a railway, and perhaps in years to come we may look forward to such a railway. He said the reason why it probably would not be made was because it would not pay. I do not think that economic questions of that sort enter into the question of frontier railways in India. It is almost entirely a strategic question. If there was any danger of invasion on the north-east frontier of India, at whatever cost, I think a railway would be built immediately. But, as we have seen from the photographs, it is a country in which there is no fear of invasion from beyond the border on a big scale, and we may wait very many years before any railway is built.



SAKHALU, CHIEF OF SAKHALUNAGAMI, SEMA NAGA

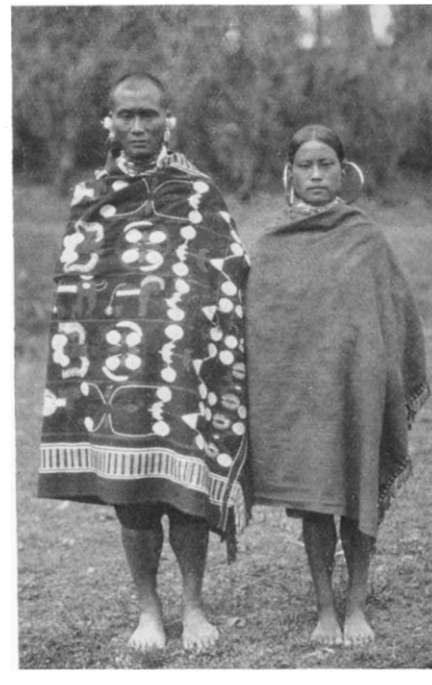
MEN OF WANGLA, KONYAK NAGA

MAN IN FULL DRESS, MOKONGTSÜ, AO NAGA



MAN AND GIRL OF LONGCHANG VILLAGE, AO NAGA

DAUGHTER AND NIECE OF CHIEF OF BAIMHO, SEMA NAGA



MAN AND WIFE, CHADUMI VILLAGE, E. ANGAMI NAGA

There was one point to which the lecturer referred on which I am bound to say that I join issue with him. He suggested that as the forest is cleared away the rainfall naturally ceases. Personally I have always learned that where there is a heavy rainfall there is heavy jungle. Mr. Mills rather wants to put it the other way, and he says if the forest is removed the rainfall will cease. I should like to ask him on what ground he draws that conclusion. I have heard if forest is cleared away the rainfall is apt to become a little less, but I do not think that such an almost world-wide phenomenon as the Monsoon would cease because the jungle was removed! My own knowledge of the Naga Hills is confined to what one might call the absolute fringes of it, to Kohima, the administrative centre, where I spent a short holiday in trying to climb Japvo, a mountain about 10,000 feet high—a very simple matter. It is only four days from Kohima, but in climbing up the steep jungle-clad side of the mountain one got some idea of the immense difficulties which officers on the frontier have to overcome.

I have been very much struck, if I may say so, by the youth of the lecturer, because when I heard of him eight years ago I always heard him referred to as a very seasoned officer who had done extraordinarily good work on the frontier, and one thought of him rather as a veteran. We owe these officers a great deal, when we consider the extraordinary difficulties which they have to overcome.

I happened to be in Kohima when the Naga coolies came home from France. I think they were about 1000 strong, and a great festival was held in Kohima, to which all the tribes sent their warriors to dance. I have no doubt that Mr. Mills, who was then at Mokokchung, sent in some of those contingents. It was a very fine display. We saw Angamis, Aos, Semas, Lhotas, and others doing their dances dressed in full war paint, and it was really an extraordinary thing, which gave one some insight into the work done by these frontier officers, that these people should be willing to come in and give such a magnificent display. I remember that several of the warriors who had come home from France joined in the dance wearing German helmets, which they had picked up on the field of battle.

I am a little disappointed that Mr. Mills has not told us something about that mysterious mountain, Saramatti, which he mentioned once or twice, and which he saw. It is a goal on which many of us who are, like Mr. Mills himself, naturalists, have had our eyes for many years. I hope that on some future occasion Mr. Mills will reach the top of Saramatti and tell us something of its flora and fauna.

The PRESIDENT: Would any one else like to add anything, or to put any questions to Mr. Mills? If not, I should like to ask Mr. Mills if he could tell us in two or three words something about the racial families to which the people referred to belong. To me they seem singularly unlike what I expected to see, and I was very much intrigued about possible connections with the South Sea Islands. Will he say whether we have a Polynesian race in these hills, and, if so, how it came there?

Mr. J. P. MILLS: I had a good look at Saramatti. It is clothed with Khasia pine nearly up to the summit, which is shale. It has snow on until about the end of April. I have not been up it. No one ever has, so far as I know. There is a question whether it has any takin on it. I got a takin's head from an abandoned Kuki village during the rising, and I heard indirectly —I could not get hold of the owners, naturally—that it had been killed on Saramatti. I got a certain amount of confirmation, but no one I ever saw had

himself killed a takin there. But I kept the head in case one ever got there again. The question formerly was whether there was sufficient area at over 10,000 feet to hold takin, but since that head was obtained takin have been found flourishing at 5000 feet in the Mishmi country.

As to the racial affinities of the Naga, that is a question which no one has ever settled with any satisfaction. They certainly have a Mongolian basis. They are chiefly Mongolian, with possibly a little Negrito blood in them, and they also certainly have affinities with some of the South Sea people. There are similarities of custom; even similarities of words. You can trace some words straight down from the Naga Hills as far as New Zealand. What seems to have happened is that a lot of people came through from the north somewhere and left an offshoot in the Naga Hills, and as they went along left more offshoots in Borneo—the people who made the terraces—and on right through the South Sea Islands. That is the theory which I am inclined to hold, but until we have far more evidence it is not a question we can settle with any certainty. I think I have answered all the points, and I thank you for listening so long.

The PRESIDENT: We have had a singularly interesting paper to-night which has touched on more different aspects of a country than usual. I think I need say no more, because your ready response to the half-sentence I have uttered has already shown how keenly you have all appreciated the interest of the paper. I have not the smallest doubt that you will give to Mr. Mills evidence of your keen appreciation and of your real gratitude to him for what he has told us to-night.

THE ALPS AND WEGENER'S THEORY

Prof. Leon W. Collet, Hon. Corr. Member R.G.S., Dean of the Faculty of Science and Professor of Geology in the University of Geneva.

Read at the Afternoon Meeting of the Society, 14 December 1925. Folding Plate following p. 304.

FROM north to south the principal subdivisions of the Western Alps are as follows:

(1) *The Pre-Alps*, a very distinctive zone stretching from the Lake of Thun to Lake Geneva and the River Arve.

(2) *The High Calcareous Alps*,* which with their greater height and accompanying glaciers are readily distinguished from (1). South of them rise the following crystalline Hercynian massifs (3) and (5).

* The principal peaks which belong to the High Calcareous Alps are, from south-west to north-east, the Range of the Fis, the Mont Buet, the Peak of Tenneverdze, the Mont Ruan, the Tour Sallière and the Dents du Midi, the Dents de Morcles, the Diablerets, the Wildhorn, the Wildstrubel, Balmhorn, Doldenhorn, Blumlisalp, Gspaltenhorn, Jungfrau, Mönch, Eiger, Wetterhorn, Titlis, Urirotstock, Pilatus, Tödi, Glärnisch, Churfirsten, Säntis.

From a geological point of view, the High Calcareous Alps belong to the Helvetian Folds. These represent the sedimentary cover of the Foreland which has been folded owing to the travelling northwards of the pennine recumbent folds (see Figs. 11 and 13).

language as the peoples of Uhu and its neighbourhood. The migration, then, would seem to have taken place previous to the visit of the Spaniards. The *ware ni hau* was found commonly among the peoples of Big Mala as far as the dividing channel.

The Marau man taken to Ulawa had relations at Uki. This would point to a long residence on the part of his people at Marau Sound. A picture showing several *ware in hau* appears in my 'Dictionary of Sa'a and Ulawa Languages,' published by the Carnegie Institution of Washington.

With regard to Gallego's statement that water was found on the Three Sisters, the Ulawa people have a salutation which would seem to show that the water there has always been brackish.

THE BIAFO GLACIER

Capt. B. K. Featherstone

THE Biafo glacier, one of the largest in the Himalayas, is about 30 miles long and runs from the Hispar pass (17,475 feet) south-easterly to the valley of the Braldu river. The Geological Survey of India made a preliminary survey of glaciers in the Kumaon, Lahaul, and Kashmir regions, as reported in the 1907 Records of the Geological Survey of India. Unfortunately, the area covered did not include either the Biafo or the Baltoro glaciers, so that we are dependent on previous travellers for their records. These reports cover a period of over sixty years, and it will be of interest to recall their notes before giving the result of my own observations.

The first European to leave any record would appear to be Godwin-Austen, in 1861, who reported that the glacier was wedged against the opposite bank or left flank of the Braldu valley. The Braldu river, formed by the emissary streams of the Baltoro and Punmah glaciers, was entirely covered, and flowed under the Biafo glacier through a tunnel. Sir Martin Conway in 1892 took observations on July 31 and September 5, which enable us to determine the average daily movement of the glacier between these dates. These observations clearly show that the glacier had retreated since 1861, and was in active process of doing so.* The Braldu river in 1892 flowed in open daylight, the foot of the Biafo glacier being about a quarter of a mile short of its old position in 1861. It is reasonable to infer that in 1892 the glacier must have been shallower than in 1922, when I saw it, as Sir Martin Conway estimates that during the month of August the extremity receded a further quarter of a mile, leaving uncovered a wide moraine of earth and vegetation. By 1899, according to the Workmans on the occasion of their first visit, the Biafo

* The rate of recession comes out about 36 feet a day: sufficiently remarkable to invite inquiry whether anything like it has been observed elsewhere.

glacier had so shrunk that it barely reached the outlet into the Braldu valley at all. During the next three years this shrinkage in volume must have been arrested and an increase set in ; for Guillarmod in 1902 reported that the glacier had again advanced as far as the right bank of the Braldu river, driving before it a low frontal moraine. He further states that the ice was 600 feet thick, and that the Braldu river was being squeezed into a narrow bed. Six years later, the Workmans on their second visit in 1908 found it practically in the same position as in 1899, and it must therefore have shrunk again. In 1909 the Abruzzi expedition recorded that the steep front of the glacier showed no trace of frontal moraine, and that the river was flowing through a narrow gap between the valley wall and the steep front of the glacier ; this obviously indicates an increase in volume between 1908 and 1909.

In 1922 I made as complete a reconnaissance as possible in the circumstances. Proceeding directly from the rock at Korophon to the river's edge, I found the glacier abutting thereon, but of no great height. I climbed on to it and made my way in a westerly direction across it, keeping parallel to the river. It was impracticable to pass between the glacier and the river except in a few odd places where the river did not wash the edge of the glacier. About halfway across I reached two large pools of foaming water, some 20 feet in diameter, adjoining the river ; there was a ring of shallow water except in the actual centre, where it was impossible to judge the depth. From the middle of these pools the water rose in foam some 2 or 3 feet, like a fountain, indicating clearly the junction, with the river, of two streams flowing from the body of the glacier. These two streams were the same water which I had previously crossed, flowing in places on the surface, when I was making my way eastward to Korophon, some distance north of the river. They had found their way under the surface of the glacier until they joined the river in the manner described ; these holes were distinct outlets, and a considerable volume of water was issuing from both of them.

When about three-quarters of the way across I sighted the main snout and decided to make a bee-line for it, the ice looking practicable. Up to this time I had been picking my way fairly near to the foot of the glacier, and had met with no difficulty, but my short cut proved a very different proposition. The surface was wholly broken up into hillocks, which were separated by deep depressions of varying shape and size according to the intensity of the causative pressure. Now and then there would be caves with walls of dark-green ice, whose size it was impossible to judge owing to darkness. The hillocks are generally covered with detritus consisting of immense boulders or rocks or sharply broken fragments of rock *débris ;* at times it is so thick as completely to conceal from sight the ice beneath. It has sometimes incorrectly been claimed that the formation of these hillocks is due to unevenness in the glacier-bed, but the Workmans, amongst others, have shown that they are

caused by pressure of an affluent stream of ice joining the main trunk. Once formed they are carried downward for many miles, not changing their order, and even after some 15 to 20 miles they are just as thickly covered as when they were newly formed. In this case particularly, owing to the widening of the Braldu valley, the irregularities in the glacier-bed, and the pressure due to the entrance of several tributary streams, the hillocks were broken up into a confused mass without order, with deep crevasses here and there.

After climbing with difficulty over the uneven and rough surface, I found myself on a ridge of ice about 100 feet high, just above the main snout. At first sight it looked as though ropes would be required, but my porter went ahead, and we managed to find a way down with the aid of our alpenstocks. The descent was rather dangerous owing to loose rocks, and we did the last 10 feet or more on our sides and elbows. It is curious to note how rocks have a way of remaining fast on steep icy slopes such as this without sliding to the bottom, as one would have thought that the ice, being melted by the sun, might release them. It has been suggested that these rocks have been pushed up from below, but examination of those on the Biafo glacier shows this to be hardly possible. If they had been forced up from below they should be rounded and polished by friction, but the moraine on all the glaciers I saw was of rough, uneven, and splintered rocks, obviously having undergone no friction whatsoever. They must therefore have been deposited on the surface of the glacier, and not have been forced up thereto.

The snout or end of the glacier was a large irregular cavity formed by the glacier on one side and a wall of rock on the other, which was part of the side of the valley. A considerable volume of foaming water dashed out, and the inhabitants said that there was an excessive quantity of water that year, which might tend to show that the glacier was advancing. From this point down to the river stretched a moraine-like surface, over which I picked my way until the western extremity of the glacier was reached ; I then retraced my steps, past the two pools, to Korophon.

To sum up, at the date of my visit in 1922 the Biafo glacier was advancing, its end being right up to the Biafo river, and according to the natives it had been so for two years. They also stated that the glacier was forcing the river to cut into the opposite bank, causing great landslides ; in the event of a landslide on a sufficiently large scale, temporarily to block the river, the adjacent villages in the Braldu valley would be too high to be affected by the resulting flood, but those in the Shigar valley might suffer. I am inclined to the opinion that it is quite possible to ascribe some of the apparent variations in the observations of this glacier to their having been taken from different points. In front of the main outlet of the glacier to the river was a stretch of about 300 or 400 yards of the moraine-like surface, and the remainder of the glacier abutted directly on the river.

The latest reference to the Biafo glacier is taken from the 'Additions and Corrections to Routes in the Eastern Himalayas, Kashmir, etc., vol. 1, no. 1, January, 1925,' published by the Survey of India, and is as follows: "Mr. R. O. Egeberg of Indiana reports that in 1923 the Biafo stream could be crossed below the snout of the glacier, owing to the retreat of the glacier, by two enormous boulders and along the new moraines." It is difficult to draw any definite conclusion as to the glacier from this report: as regards the crossing of the Biafo stream, this would depend to some extent on the hour of the day.

SOUTH-WESTERN ANDALUSIA AND THE TARTESSOS PROBLEM

Südwest Andalusien. Beiträge zur Entwicklungsgeschichte, Landschaftskunde, und antiken Topographie Südspaniens, insbesondere zur Tartessosfrage.— Otto Jessen. (Ergänzungsheft 186, *Petermanns Mitteilungen.*) Gotha: Justus Perthes. 1924. 11 × 7½, pp. 84. *Illustrations.* 7.60 *M.*

THE first appearance in the long series of Petermann supplements of a monograph on a purely Spanish subject is an event of some importance to the student of Western Mediterranean geography: it would have been of still greater importance had the motif of the monograph been more purely geographical.

Dr. Jessen tells us in his Introduction that he went to Spain first in the summer of 1922 in the company of Professor Schulten in order to make a geomorphologist's contribution to the determination of the site of Tartessos, and it appears from a remark on p. 54 that he returned to Spain in the same company during the summer of the following year. The Tartessos problem thus furnished the initial stimulus of this monograph, of a considerable section of which it forms the leit-motif; it directed Dr. Jessen's inquiries, too, into a channel which made it natural that, when he moved out of the immediately relevant area, he was still principally attracted by one type of geological phenomenon. As a corollary to his preoccupation with a coast-line in which there are considerable breaches of continuity, his monograph is divided into separate and somewhat water-tight sections.

So far as the Tartessos section is concerned we must distinguish carefully between Dr. Jessen's contributions to our knowledge of the morphological development of the area, which have a value of their own apart altogether from the problem of Tartessos, and that body of evidence, totally distinct in nature and in value, which is adduced by scholars from the texts.

In the former category we have an admirable account of the tract of coast lying between the Huelva Bar and the mouth of the Guadalquivir, which the student of dune formations will read with interest, and which must be taken as superseding entirely Mr. Bonsor's somewhat popular description published in the Hispanic Society's monograph 'Tartesse.' Professor Schulten's hypothetical (and *a priori* most improbable) north-western arm of the Guadalquivir, entering the sea at Torre del Oro, is shown to have had no existence, while the confirmation of Mr. Bonsor's north-western arm, marked to-day by a line of lagoons reaching inland from the curious summer settlement of Matalascañas,

thoroughly investigated by workers from various lands, and the results have appeared in several periodicals and not a few large monographs.

In this volume Prof. Macalister has very successfully summarized the broad results of all for the benefit of those who are more concerned with them than with technical detail. He has classified these results in four chapters—Topography, Political History, Cultural History, and Religious History—and no one reading his pages can fail to be impressed with the total result. Naturally the latest work of the Palestine Exploration Fund, which is new to most, receives specially full treatment. It must be admitted there is little indeed of a showy kind. The number of actual inscriptions is small and the level of culture revealed is surprisingly primitive when we consider the enormous influence upon the world of thought of the literature which has arisen in so small and so little cultured an area. Every year, however, continues to add to our knowledge, and there can be no doubt that when an actual century has been spent in field work in Palestine the contribution of excavation to our knowledge of the Archæology and History of this land—and to our understanding of the Old Testament—will be vastly greater.

It only remains to add that the illustrations, many of which are new and original, greatly add to the understanding of the text and also to the attractiveness of an unusually fascinating volume. E. W. G. M.

Peking to Lhasa: George Pereira.— Compiled by **Sir Francis Younghusband, K.C.S.I., K.C.I.E.** London: Constable. 1925 [1926]. 9 × 5½, pp. x. + 287. *Maps and Illustrations.* 18*s. net.*

In compiling the narrative of the last journeys of General George Pereira in the Chinese Empire, Sir Francis Younghusband has been well advised to adhere very closely to the plain record of events contained in the traveller's diary. To have attempted to do more would have been to fail to present a true picture of the man and of his journeys. Pereira would never have travelled for the purpose of writing a book. If he could have been persuaded to write an account of his explorations, he would certainly have despised anything of the nature of a popular style and would probably have been quite indifferent as to whether any one read his book or not.

He could, indeed, relate to those who he knew would be interested incidents of his journeys, told with that unfailing sense of humour which was somehow different from anybody else's sense of humour. His power of seeing the amusing side of things was undoubtedly a great help to him in times of difficulty, but he always kept before him also the duty of a traveller in remote places to observe and record with conscientious accuracy everything worth noting in the country and the people. Probably he would have added something from memory to this narrative if he had written it himself, but as he did not live to do this, those who knew him will be grateful to Sir Francis Younghusband for producing a book which they will feel tells the tale almost in Pereira's own words.

If a small criticism of the compiler of the book can be made, it is that he has not been entirely successful in surmounting the difficulties of printing and proof-reading where Chinese names are concerned. Some of the mistakes are of no great importance, but on p. 267 there is a confusion between Shensi and Shansi which makes the passage unintelligible. The first of the two provinces mentioned here should evidently be Shansi. It may also be suggested that in a book which will doubtless be read by many who are unacquainted with China, it would have been useful to explain some of the Chinese terms used

in the diary. For instance, the general reader will probably not be aware that " hung-hu-tzu " means " brigand," and will certainly not know that " pu-sa " is " an image," while even a lifelong resident in China might not realize that the Lolo " horn " is a peculiar style of hair-dressing.

The story told in the diary is that of a great traveller who had probably travelled more widely in the Chinese Empire than any one else who ever lived. It is an account only of his last three journeys, but it is a wonderful tale of courage and perseverance. The journey from Peking to Lhasa, nearly 6700 miles, would be trying enough to a young man in good health, but Pereira was fifty-six when he started, was permanently lame, and by no means physically strong. To these disabilities must be added the constant anxiety that he would be stopped by Chinese or Tibetans from fulfilling the purpose of his journey—a fate that had befallen every European traveller who had in the past eighty years attempted to reach Lhasa from the east. However, Pereira's attitude towards these difficulties may be summed up in the words of his diary: " I would rather have died in attempting it than have chucked it up from funk." As it turned out there was no real opposition from the Tibetans, but the hardships and fatigues of the road to a man not in good health would have been enough to deter a less resolute traveller. " A frost-bitten foot—quite played out—dog tired—not well and walked only 2 miles—by a very great effort walked 10 miles—very painful cramp in the left leg—feel very limp—a bad touch of sciatica—very weary each day—had to be lifted off my horse on arrival." Such are a few of the entries in the diary that make one realize the conditions of health under which he marched. No wonder that when he at last arrived in Lhasa " with my white beard, very weary but happy," he exclaimed, " I would not make the return journey for a million pounds." For the moment he was thoroughly weary of travel and never wished to see Tibet again.

But this frame of mind did not last long. In Calcutta he was laid up in hospital with clots of blood in his leg. This alone would have made most men think twice before starting on another arduous journey, but on Pereira the enforced inaction had the opposite effect. His old irresistible desire to be on the move again had returned to him. Starting off as soon as he was well enough to leave hospital he went to Burma, and from there traversed Yün-nan from west to east and went on down the Yangtze to Shanghai. Returning by sea to Tonking he again crossed Yün-nan, this time from south to north, passing through the semi-Tibetan northern part of this province to Batang. From Yün-nan Fu he had been accompanied by Dr. Gordon Thompson, and the two travellers went on together into the entirely unexplored country to the north-east of Batang. Their route led through a region infested by brigands and under no settled government, so that they had to write letters to the magistrate at Batang absolving him from all responsibility in case of any harm befalling them. It was only on this condition that the magistrate would let them go on. They were not attacked by brigands, but the journey was a very hard one, and the weather very cold with constant falls of snow. Pereira had not been really well for a long time, and now became seriously ill. Scarcely able to take any food, with no shelter at night from gales of wind and snow but an indifferent tent, he struggled on for six more days, feeling very ill, but still to the very last keeping up his survey and plotting it every evening. On the last day of his life, 19 October 1923, he collapsed by the side of the road, and it was only then for the last 4 miles into Kanze that he consented to Thompson doing the observations for him. He died in the early morning of the next

day. He had gone on to the very end, till he could go no farther. This is what all who knew him would have expected him to do. He lies now in the cemetery at Ta-chien-lu, the gateway between China and Tibet, a fitting resting-place for the greatest of travellers in China. H. R. D.

AFRICA

The Northern Tribes of Nigeria.— **C. K. Meek.** Oxford University Press: Humphrey Milford. 1925. $8\frac{1}{2} \times 5\frac{1}{2}$, pp. vol. 1, xviii. + 312; vol. 2, viii. + 277. 122 *Illustrations and three Maps.* 36*s. net.*

This is an ethnographical treatise of unusual dimensions and uncommon interest, which, by the diligence of the author and with the support of Sir Hugh Clifford, has grown out of a Census Report. Since, indeed, the Report occupies (as Part II.) only 95 out of some 600 pages in the book, it may almost be said to have been relegated to an appendix. Although it contains much that is of value, and is lacking in the prosaic reliability of a civilized census, most of us prefer manners and customs to numbers and percentages; but the undertaking must not be dismissed too lightly, since it represents a vast amount of devoted work, carried out under difficult conditions, and, as the author points out in his preface, it may serve as a foundation for more precise records in the future. The census, taken in 1921, deals with Area, Population, Race Statistics, Age, Sex, Occupations, Civil Conditions, Religions, and Education. Attention can be given here to a few points only. The total population of the Northern Provinces was approximately ten millions, divided amongst over 250 tribes, and the total area some 250,000 square miles. Density of population ranged from 116 persons per square mile (in Kano Province) to under 7 (in Kontagora). Most numerous were the Hausa (over 3,000,000) and Fulani (nearly 2,000,000). Of the whole population, over $4\frac{3}{4}$ millions (male and female) were agricultural workers; spinners and weavers follow in point of numbers (640,000), and traders and brokers were also numerous (317,000). We may note that there was only one fortune-teller, who shared his isolation with a sail-maker. Goats head the list of livestock, followed by cattle and sheep. The only mule was in Kano, but he may have since multiplied, by accretion.

It would have required a monumental treatise to do ethnographical justice to the peoples and tribes of Northern Nigeria, and Mr. Meek's book must be judged by its achievements rather than by its limitations. In culture the population ranges from head-hunting negroid cannibals to relatively civilized Muhammadan peoples, with historical records going back some hundreds of years. Even the great accumulation of observations that the author presents to us must be regarded as little more than a blazing of the trail. An army of investigators would be required to occupy and establish the positions to which Mr. Meek has shown the way, and to unravel the complexities which are too numerous and too involved for incidental solution. It is to be feared that no such army will be sent, but the spirit that ensured the publication of this book will help greatly to render any other kind of army unnecessary.

The preliminary description of the Northern Territory, with its geology, hydrographic system, climate, fauna, flora, and other general matters, is followed by chapters on Ethnological Types, History and Tradition, Economic Life and Industries, Social Organization, and Government and Law. These subjects occupy volume 1, and volume 2 deals with Religion, Language and Lore, Ethnological conclusions, and the Census Report. There are maps of Nigeria, of the Northern Provinces, and a language map. The illustrations