

Sir WILLIAM WILLCOCKS: I think many people who say that Mesopotamia is a poorly inhabited country all go down the Tigris in the steamers and see nothing. If they would only go down the Euphrates from end to end, they would see that the population is very numerous and very energetic and strong. As to the railway to Aleppo, I do not think, when Miss Bell said that was the ancient route, she was correct. Aleppo is the outlet for everything from Mesopotamia westwards; but from Baghdad westwards Tyre and Sidon have been from ancient times the outlet, and will be again. I think the road to Damascus is the best. I am very much obliged for the kind way in which you have received my paper.

### JOURNEYS IN BHUTAN.\*

By J. CLAUDE WHITE, C.I.E.

BHUTAN is a country hitherto almost unexplored, and I have been more than usually fortunate in making no less than five distinct journeys through it, and it is of these journeys I propose to give a short account this evening.

The first journey, in 1906, was when I followed the course of the Am-mo-chhu from Chumbi to the plains in connection with the proposed construction of a cart-road. The valley is densely wooded and practically uninhabited, and was interesting mainly on account of its fine vegetation and beautiful scenery. The second journey, also in 1906, was made from Gangtak *viâ* the Natu-la to Chumbi, and then *viâ* Hah, Paro, Tashichojong, and Poonakha to Tongsa and Byagha, on the occasion of the investiture of the Tongsa Penlop with the insignia of the Knight Commander of the Indian Empire. The third journey, in 1907, was along the boundary between Bhutan and British India, from the Jaldakha river to the Gadadhar, and from Doranga to the eastern boundary, and again from Doranga across the Dongma-chhu to Kenga, and a further two days' journey up the Kuru river. In 1907, from Dewangiri through Kheri, Tashijong Tashiyangtsi, across the Dong-la to Lingzi and on to Pangkha, Singi Jong and across the Bod-la to Lhakhang Jong in Tibet. From Lhakhang I followed up the western branch of the Lobrak river to Lhalung monastery, and crossing the watershed entered the Chomo-chang-thang lake basin, and thence to Gyantsi. In 1908, from Chumbi *viâ* Phari to Paro, and on to Poonakha by the route I followed in 1906, in order to attend the installation of Sir Ugyen Wang Chuk as Maharaja, and on my return journey I followed a new route from Paro *viâ* Bite Jong and Dungna Jong to the plains, which I entered at Jaigon.

I will pass at once to my second journey, as that through the

\* Read at the Royal Geographical Society, December 8, 1909. Map, p. 104.

Am-mo-chha valley calls for no special notice beyond that the scenery and vegetation were both particularly fine.

Throughout the whole length of the central zone of Bhutan, a well-aligned road runs from west to east, and crosses the ridges separating the various valleys by easy passes from 10,000 to 13,000 feet high, and it was along this road that I travelled in 1906. The road from Gangtok to Rinchingong has often been described, but from Rinchingong, where the old road crosses by a substantial bridge to the left side of the Ammo-chhu, no description has been given. The views down the valley were most beautiful, and the trees very fine. Crossing what was marked as the Lang-marpu-chhu, but is really the Kyunka, by a new bridge, we came to what is known as a cave, or rather two overhanging rocks, which lie in Bhutanese territory. Our old maps are wrong; the true Lang-marpu-chhu is more to the north, while the stream marked by this name is really the Kyunka. At the head of the former stream there is said to be a lake and also favourite ground for the shau, the great Sikkim stag, *Cervus affinis*. A narrow track through woods took us up the Kyunka, to our camp at Lhare, a somewhat confined glade close to the stream. Above this, as we ascended the Kyunka, the road improved greatly and the country opened out, though we were twice obliged to cross the stream by strong bridges.

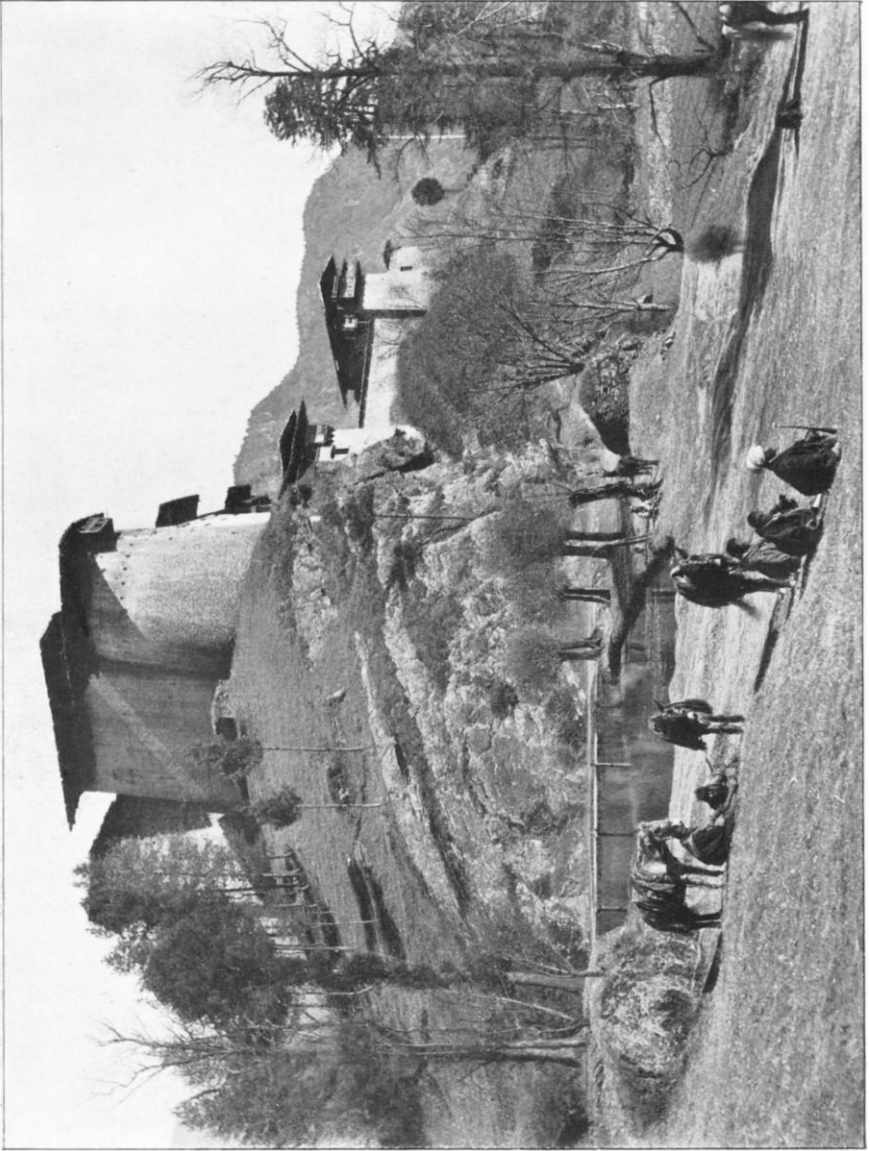
On the other side of the Chalu-chhu (one of the tributaries of the Kyunka) the valley widened out into most delightful glades and upland swards, forming rich grazing-grounds. Here grew in graceful abundance spruce, larch, silver fir, holly oak, various pines and rhododendrons interspersed by grassy meadows, while the view down the main valley had the appearance of a gigantic avenue, leading up to the snowy pyramid of Gipmochi. Out of this a somewhat steep ascent round a grassy knoll leads to the Dongma-chhu, up which runs another track to the head of the Lang-marpu-chhu, and thus by a northerly but difficult path to the Hah road. The main route leads across the Lungri Sampa up a steep and stony way to Tak-phu, a somewhat bare and extensive flat, well within sight of the Kyu-la. Timber was plentiful, and our camp was further protected by the walls of two parallel moraines; the valley, indeed, was full of lateral moraines, forming gigantic spur works to keep the modern river within bounds. At the same time, so far from these moraines being barren stony walls, they were luxuriantly covered by virgin forest right up to the top of the parent ridge. Snow fell, and in our camp, 13,400 feet above sea-level, we passed a very cold night, there being 18° of frost.

Passing through an extensive amphitheatre, bare and devoid of tarns, the Kyu-la, or rather the long ridge which forms part of the pass, was soon reached; but we had to proceed nearly half a mile along it before we could descend into the wilder amphitheatre of rock and snowfields which lies between the Kyu-la and the Hah-la (or Meru-la

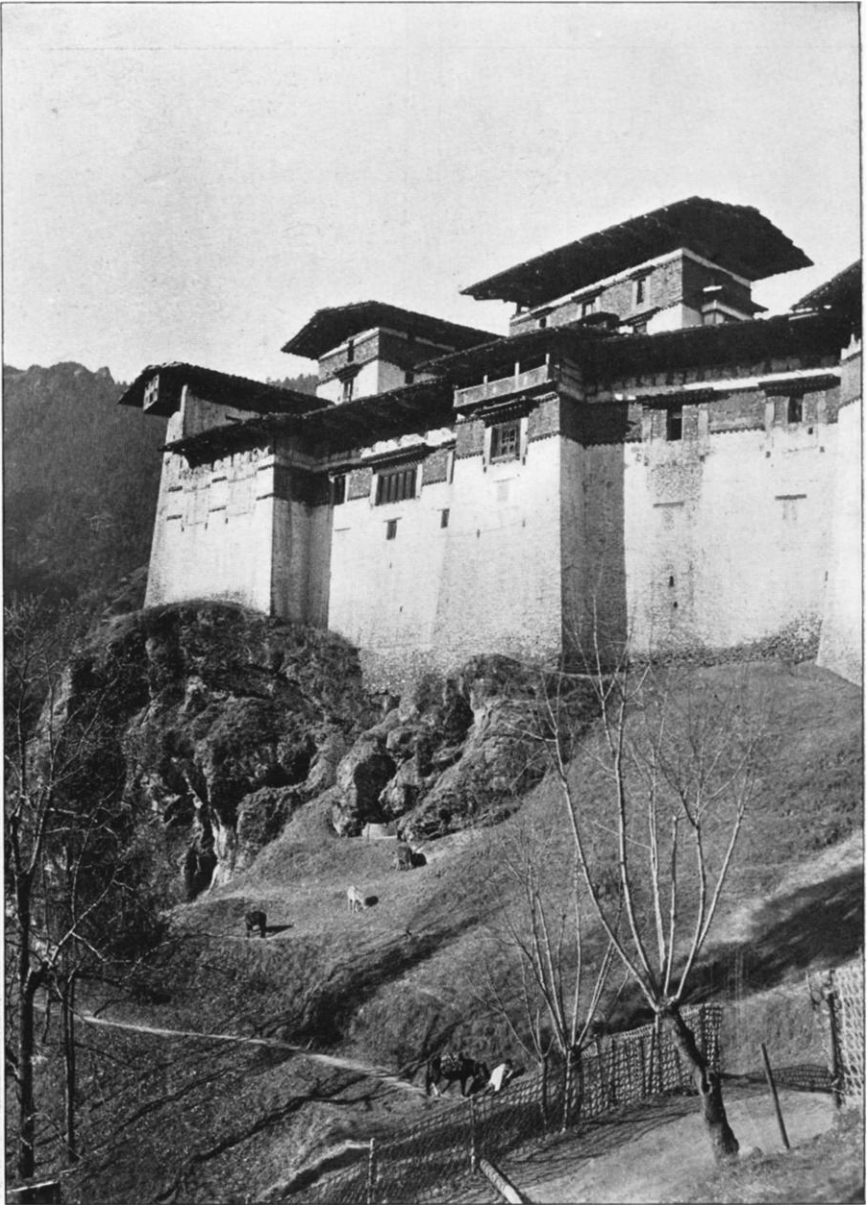
of our maps). This half-basin forms a veritable death-trap in bad weather, as there is neither fuel nor shelter to be found anywhere within its horns. The view from the Hah-la is magnificent; a particular feature in the panorama being a grand but unknown snowy ridge, which ends abruptly on the south-west in a tremendous precipice, where the Am-mo-chhu probably finds an outlet towards the plains.

On the east we looked down a well-wooded but somewhat deep and narrow valley, and through this we descended by a very rough steep track, which, however, improved greatly when a small open glade was reached. The road here turned slightly to the south, down the main valley. It is impossible to describe the beauty of the scenery: grassy glades, gently sloping, opened on a succession of broad valleys in the far distance; on either side, and at our back, was a deep fringe of fine trees of every age, from the patriarch of the forest to tiny seedlings. From the time we left Rinchingong, we had passed through forests without exception self-reproducing, thus showing that the Bhutanese understood the secret of combining in their forests self-reproduction and unrestricted grazing. A good road brings the traveller into the main valley, which greatly resembled an Alpine scene, of magnificent description, with a temple or a monastery on every commanding promontory. Ke-chuka, the first large village we came to in Bhutan, contained a fine sample of a Chuten or cube of prayer, its rectangular form marking a strong contrast to the cylinders of Sikkim and Tibet, while two flour-mills worked by water bore testimony to the prosperity of the villagers. At Kyengsa a road leads up a side valley direct to Duggye jong, which guards the road from Paro to Phari. Yangthang is a large long village situated on the left bank of the river, but numberless irrigation channels have tempted the Hah-chu to forsake its natural bed, and much stony barren land is the result. The formation of the hills is markedly of crystalline limestone, and there are several mineral springs to be met with. The large village of Tum-phiong, the chief station of the district, possessed twin forts of no particular strength or beauty; the houses have once been large and prosperous, but are now in a decayed condition. There are curious holes in the limestone formation on the left bank of the river, which seem to connect the river with some subterranean lake; the villagers place baskets at these outlets, and the rush of water at times brings out a number of fair-sized fish, though none are to be seen in the Hah stream itself. The Hah monastery is situate some way up a side valley and commands a magnificent view; it is in good order, but the Poisoners' Chapel, mentioned by Eden, was neglected, and appeared of little interest.

Our route was over a very good bridle path, rideable the whole way to the Chiu-li-la; but the weather, unfortunately, was very damp and misty, and we obtained only occasional glimpses down the Hah valley,



DUGGYE JONG.



DUGGYE JONG.

which runs fairly straight as far as Do-ri-kha, where Eden camped, and whose route in 1864 we were now supposed to be following. High up on the right was the nunnery of Kyila, built on the face of a very steep precipice, most difficult of approach. No male creature is allowed to remain within the precincts of the establishment, and it is said to contain sixty nuns; but as there were more than twenty-five houses, the majority quite large ones, this estimate of the inhabitants seems much too low. Cha-na-na, a small hamlet of some half-dozen houses in a ruinous state, was our halting-place. Our experience in crossing the Chia-li-la was so different in every respect from Eden's that I cannot but suspect that he was deliberately misled from the proper path on to some mere cattle track.

A little below Cha-na-na the path emerges on a well-wooded spur, with a grand outlook over the courses of the Pa-chhu and its affluents, running through a broad, well-cultivated tract of country which could under good management grow every description of temperate crops. On a distant mountain the monastery of Danka-la has been built in such a conspicuous position that it can be seen even from Poonakka; while Beila Jong, which we subsequently passed on our way from Paro, was visible eastwards. To the north lay Dug-gye-jong, dominating the main road to Phari, and deriving its name from a notable victory over the Tibetans; while at Gorina was the monastery which a former Shabdung Rimpoche used to make his summer retreat. Owing to the more favourable climate and country, the monasteries of Bhutan, unlike those in Tibet, are not confined to one huge building or close cluster of dwellings, but consist of houses scattered over the slopes of the hills, each one surrounded by a pretty garden. The chapel at Gorina was bright, clean, and decorated in good taste; while the frontal hangings, overlaid with an exquisite lacework of brass, were superior to anything to be seen in Lhasa. The chuten was a very fine one, having on one of its faces a large brass plate, with a Buddha deeply embossed thereon.

On the ridge below we were received with a salute fired from iron tubes bound or covered all over with leather, which are probably the leather cannons of which we heard so much in the Chinese Goorkha wars. The Paro Penlow's band and richly caparisoned mules were in attendance. Down to Paro the road passes over a deep red clayey slope, impassable in really wet weather.

What struck me most during the last march was the total absence of rhododendrons, and the change from gneiss first to crystalline limestone, sandstone, and dark shales; then to heavy red clay deeply impregnated with iron; and finally to a blueish-grey limestone.

The fort has been built on a limestone bluff overhanging the river; there is only one entrance from the hillside, and this the third story; the lower stories are only partially existent, as their walls seem in great

part to be a mere casing to the solid rock. A heavy bridge over the fosse separating the fort from the rest of the hill leads to a huge gateway, and within this a sharp turn to the left opens upon the eastern courtyard containing the smaller of the two citadels or towers, which is occupied by petty officials. Against the inside of the south and north outer walls are built a series of rooms and verandahs; on the west front directly above the river there is a covered verandah, one story only, from which the balista or catapult, which is still stored there, was worked. The Penlow's quarters are on the first floor in the south-east corner. The reception-room was large, airy, finely decorated, and its walls hung with arms of every description. The opposite corner of the enclosure has a larger suite of apartments reserved for the Deb Raja and other distinguished guests. On the first floor of the main citadel is the public temple or chapel, a very finely proportioned hall with two tiers of well-lighted galleries. All the decorations were good, a hanging lattice of open brasswork being specially effective. In the west corner of the main courtyard was the private chapel of the Ta-thsang or state monks, whose head lama Kun-zang accompanied the British Mission to Lhasa.

Three of the outlying forts, Tazo-jong, Donam-jong, and Suri jong, are existent, though in bad repair, but the very large one of Chubyak-jong is entirely in ruins. Dug-gye-jong is situated some 9 miles up the broad valley of the Pa-chhu, described by Turner "as a fortress built upon the crown of a low rocky hill, which it entirely occupies, conforming itself to the shape of the summit, the slope all round beginning from the foundation of the walls. The approach to the only entrance is defended by three round towers, placed between the castle and the foot of the hill, and connected by a double wall, so that safe communication between them is preserved, even in times of the greatest peril. Around each of these towers, near the top, a broad ledge projects, the edges of which are fortified by a mud wall, with loopholes adapted to the use of bows and arrows, or of muskets. On the north of the castle are two round towers that command the road from Tibet. On the east side the rock is rough and steep; and close under the walls on the west is a large reservoir.

The castle itself is a very substantial stone building with high walls, but so irregular in its figure, that it is evident no other design was followed in its construction than to cover all the level space upon the top of the hill on which it stands. The gateway at the foot of the walls which crown the hill opens upon a flight of a dozen steps, within a narrow passage leading to a semicircular platform, edged with a strong wall pierced with loopholes. A turn to the right leads through a second gateway and along a wide lane, with stables for horses on each side; and a third gateway opens into the interior of the fortress, which forms a large square, with its angles occupied by three suites of rooms.

In the centre of the courtyard is a square citadel several stories high, and containing temples or chapels. The whole place was very clean. The armoury is said to be the most complete in the country, and is contained in a fine room, with a large bow-window facing south, and affording one of the prettiest views in Bhutan. The inner court contained piles of large pine shingles, intended for the repairs of the castle roofs, which have to be done every five years.

The road running from Paro eastwards is very rough and steep up to the Tazo-jong, the curious rounded fort described by Eden as a building formed of two semicircles, one large and the other small, built up one against the other for about five stories high. So far the regular road had evidently not been repaired for many years, but farther on it was good and ascended very gradually to the pass near Beila-jong (8900 feet). On the other side a less gradual descent leads to Pemithang, the seat of a small official, or Penlow.

From Pemithang there are two routes to Tashi-cho-jong—a direct one across the hills *viâ* Pame-la, the other down the Pemi-chhu, and so round by the Tchin-chhu; we chose the latter. The road was good, and the valley thickly wooded and full of flowering pear and peach trees; but on turning eastward up the Tchin-chhu the whole aspect of the country changed to barren hills with sparse and stunted trees. Our camp was at Chali-maphe, not far from the fort of Simtoka. Here was the gigantic cypress, which Eden records as measuring six spans round in 1864. We found it to be 50 feet round the trunk at 3 feet from the ground.

Tashi-cho-jong, the summer capital of Bhutan, lies to the north, up the broad valley of the Tchin-chhu, but as our destination was Poonakha, the winter capital, we took the road leading up the Lhung-tso valley. A short distance above the junction of the two streams, Simtoka fort occupies a projecting ridge, separated by deep gullies from the main hill. The present fort was built by Shabdung Rimpochi in 1873, as the first one, completed in 1870, had been treacherously seized and burnt by his enemies; a scorched pillar belonging to the original building, now almost hidden by elaborate carving, is still pointed out as an object of reverence. In the chapel is the finest statue of Buddha to be seen in Bhutan. It is placed under a magnificently carved canopy, and supported on either side by a number of standing figures more than life-size. Round the plinth of the central tower runs, not a row of prayer-wheels, as is usually the case, but a number of square slabs of dark slate, carved in low relief, with pictures of saints and holy men.

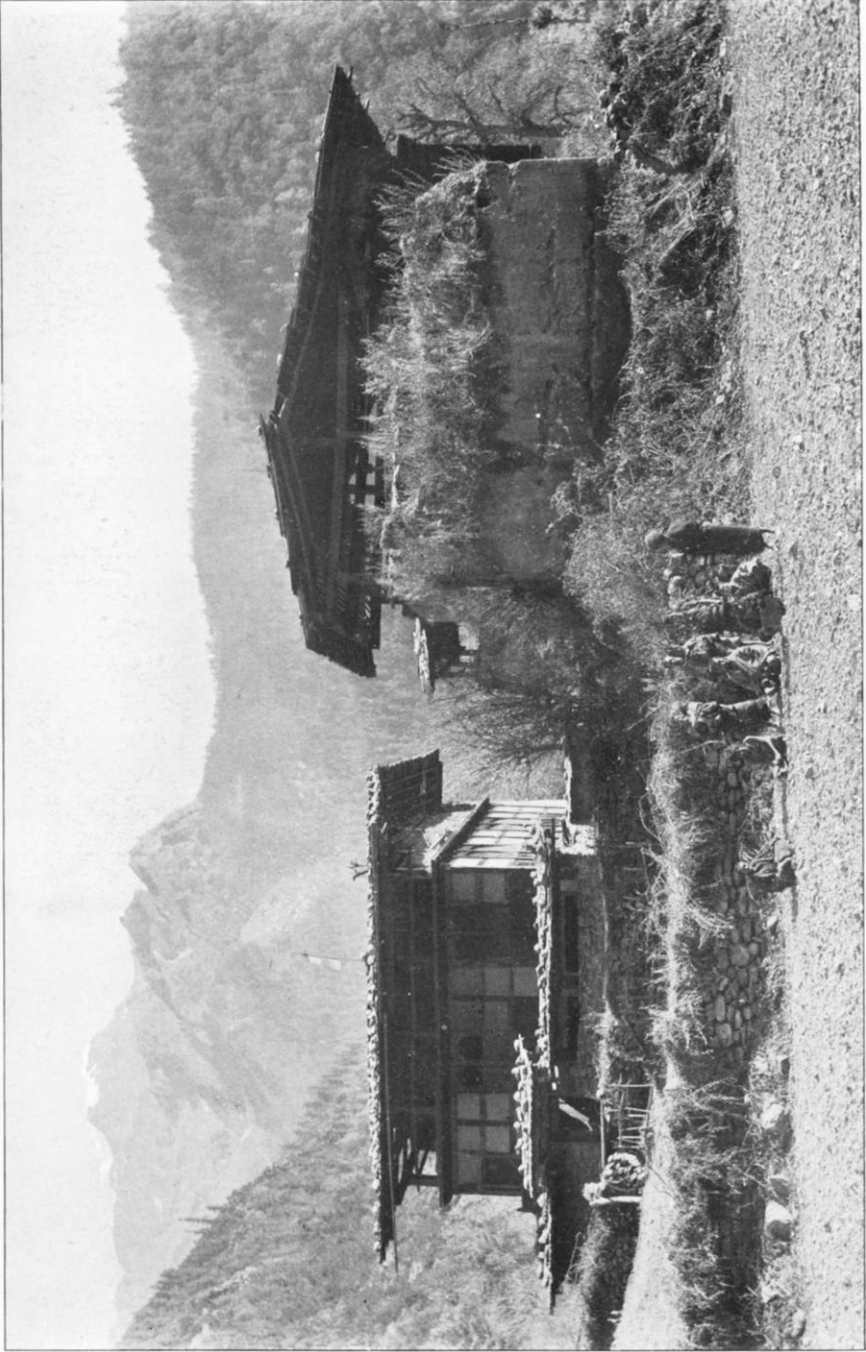
The road up the valley to the Dok-yong-la is a very good one, running through beautiful glades of oaks, willows, chestnuts, and rhododendrons, while on the higher slopes forests of *Pinus excelsa* reappeared, in pleasant contrast to the barren hills of our previous march. On the east of the Dok-yong la we entered a valley, which, in the dampness of



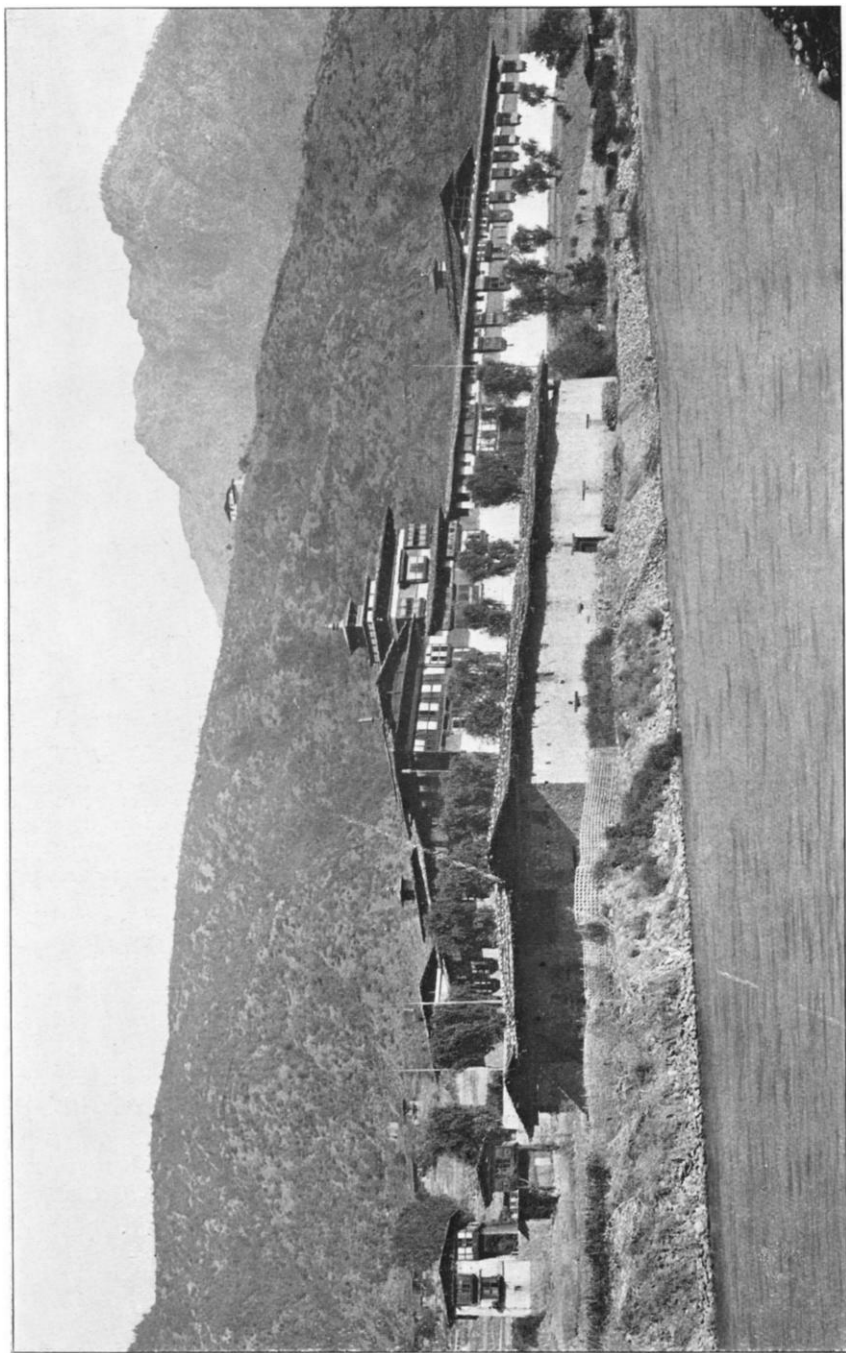
its climate, was suggestive of Sikkim rather than of Bhutan; the path to our camp at Lungme-tsa-we and on to the Teo-pa-rong was steep and slippery, and only redeemed by the beauty of a species of rhododendrons and huge pear-trees. From our camp at Jon-chung-dorong, the mission, headed by a picturesque procession of musicians, dancers, gunners, gaily caparisoned mules, etc., started on April 20, with the intention of making a triumphal entry into the capital of Bhutan, in spite of the difficulties caused by the heavy rainfall and the clayey road. The mission remained at Poonakha until May 2, to enable me to carry out the duties for which I had been sent. The Durbar, at which the Insignia were presented to Sir Ugyen Wank-chuk, was most interesting, but a description of the ceremony would be out of place in a geographical lecture.

The castle of Poonakha looks best from a distance, occupying as it does the whole narrow promontory between the Pa-chu and Ma-chu immediately above their junction. It has the usual towers and courtyards, and was built by the first Shabdung in 1577, and designed to hold six hundred monks: their number has increased since then, and the body ecclesiastic now occupy the whole of the southern third of the building. The two rivers are spanned by fine cantilever bridges of the same style as that at Paro. The earthquake of 1897 was felt here very severely, and the destruction then wrought has not been wholly repaired.

The Ta-lo and Norbugang monasteries are situated high up on the mountain to the west. The track, if it deserves even this name, must be absolutely impracticable during rain, as it runs entirely through clay. As far as Norbugang, about two hours journey up, the hillside was bare and uninteresting, but afterwards the path improved and ran through several pretty glades, where the pear and clematis blossoms were beautiful. After three hours of hard climbing, the monastic colony of Ta-lo was reached: small, well built, two-storied houses, with projecting verandahs and painted fronts, were scattered all over the hillside, each in its little garden of flowers and trees, with here and there a chapel or a picturesque chozten, to break anything like a monotony of houses. The great temple above stood sharply out against a sombre background of cypress and pine: while higher up the small but beautiful retreat of the late Dharma Raja formed a fitting crown to the whole group of buildings. In the great temple were many chapels kept scrupulously clean with, strange to say, glass window-panes. The principal objects of interest were the two large choztens containing the ashes of two of the Shabdung Rimpoche's: they were of silver, highly chased and jewelled, the stones being mostly turquoise of large size but little value. The ceremonial implements used by the late Dharma Raja were fine examples of the best Bhutanese metalwork. The carving of the pillars and canopies was excellent, but so much overladen by open metal scrolls that it was difficult to follow in detail. There was a



FARM HOUSES, PARO VALLEY.



TASHI-CHO-JONG: THE SUMMER RESIDENCE OF THE BHUTAN GOVERNMENT.

magnificent collection (both here and at Norbugang) of banners of embroidery and applique work, and before one of the altars an elephant's tusk measuring  $8\frac{1}{2}$  feet.

About  $2\frac{1}{2}$  miles up the Mo-chhu above Poonakha are the ruins of a small fort called Sona-ga-sa, mentioned by Turner under the name Zemri-gatchi, and formerly containing the great printing establishment of Bhutan and a fine garden house for the Deb Raja. It was totally destroyed by fire about eighty years ago during one of the many local civil wars, and all the records unfortunately lost, and only a few flowering plants remain to represent the garden. Not far off is a sort of cave or arched recess, which has been formed by percolations of lime bonding together the pebbles of a bank, and in which, nearly three hundred years ago, Nagi-rinchen, a saint from India, is said to have lived. The river here is full of fish, and the resort of many cormorants and gulls. The road up its course into Tibet divides, above into two branches, guarded respectively by the forts of Ling-zi and Ghassa. It is rumoured that gold has been found on the mountain ridge between the Mochu and Pacho.

The Bhutanese Government removes from Poonakha to Tashi-cho-jong at the end of April, so after finishing my work I left Poonakha on May 2, in order to visit Sir Ugyen Wong-chuk's seats at Tongsa and Byagha in the east. The road to Angduphodang is on the left bank of the river and close above it, and the descent is very gradual, not more than 25 feet in a mile, through a valley which is well cultivated, and once must have been thickly populated. The abutments of at least two chain suspension bridges not only betoken much former traffic, but also show how long these mountain streams keep to one channel, for no alteration appears to have taken place since Turner's visit to Angduphodang 130 years ago; and yet there are no sufficiently solid rocks nor guiding spur works to restrain the current. When in full flood the river looks very fine. Turner's picture of the bridge and fort holds good up to the present time. The channel which brings water to the upper fort is nearly 6 miles long, and clearly demonstrates the skill of the Bhutanese in irrigation works. The road eastwards runs just below this channel until it joins the Ba-chu near Chapakha. Up to this point the scenery was poor, and the road hot and narrow, but, on crossing the Ba-chhu, a stiff climb brought us to Satengong, a very picturesque flat overlooking both the Ba-chhu and Tang-chhu, and distinguished by a clump of pine trees, a small lake, and beautiful flowers.

The road eastwards was most excellent, and rendered interesting by the constantly changing scenery on the isolated island hill between the neighbouring rivers. The ascent continued gradual up to Tsha-za-la, and then an equally gentle descent led to a curious deeply cut ravine, where the main range begins. The Tang-chhu is crossed at the village of Ra-tso-wok, a name which betokens its Indian origin, and a good and

very pretty path is lost at Ridha in a fine open space with plenty of flat ground, above which the village houses are clustered on a knoll. There were fine views up to the snowy range whence the Tang-chhu takes its rise to traverse many miles of a rich valley. The march hither was one of the most beautiful which we made during the tour, for the rhododendrons were in flower, and the oaks, chestnuts, and walnuts, with their young foliage, made delightful colouring in the scene. In every direction there was evidence of better cultivation and more prosperity than in any valley we had traversed. Unfortunately, the inhabitants are said to be very quarrelsome, and constant litigation (which means heavy bribes to the officials called in to decide their cases) has tended to keep the villagers more impoverished than they ought to be. Judging from our experience of the Pele-la, both in going and returning, the main ridge here must be the focus of a wet zone, extending as far as Tongsa, damp being drawn up from the plains through the narrow gorges of the Madu-chu: certainly we had worse weather here than anywhere else in Bhutan. The road, though well aligned, paved in many soft places and corduroyed in others, was, owing to the wet clay, very difficult to traverse. The country on both sides was a succession of wide open glades affording excellent grazing stations, and timber was abundant.

On the eastern side of the Pele-la were several large villages at Rokubi and Chandanbi. Not far from the latter place is a charming patch of sward covered with beautiful cedar pines, and situated in a gorge of the ravine, where the Siche-chhu is joined by another mountain torrent. On this tongue of land thus formed were two mendongs (walls of prayer) and a fine chorten, a copy of the Swayambunath in Nepal. From this spot the road ran at the same altitude through oak, magnolia, and rhododendrons for some miles before emerging at Tashiling on more open country, which continued as far as Tshang-kha, high above the raging torrent of the Madu-chhu. Here we camped. Beyond Tshang-kha the road almost immediately enters very rough country, the gorge through which the river flows narrowing considerably, and being flanked on either side of stupendous precipices. As it descends the road becomes a series of steep zigzags, mostly made up of stone steps, and this kind of path continued to within a short distance of the cantilever bridge, which crosses the Madu-chhu some 900 feet below the castle of Tongsa. Another steep zigzag with many flights of stone steps leads up to a small door in an outlying bastion of the walls of the castle, which blocks the way and overhangs the cliff up which the road runs. Passing through a large stone-flagged courtyard, the traveller emerges through another gateway to the east on a narrow path above a second ravine. It will thus be seen that Tongsa castle completely covers a ridge between two steep ravines, and effectually bars all progress from east and west. We camped for a couple of days on a pretty knoll, which, being clothed in

fine trees and provided with an excellent stream of water, running over cascades into a fish-pond, is the pleasaunce of the Tongsa monks. The fort consists of several courts, but suffered from the great earthquake, and the eastern citadel had not been completely restored at the time of my visit. A women's choir formed part of the procession sent to play us into the castle—a curious performance which is mentioned in Pemberton's report.

A steep ascent leads to the outlying fort, which commands the castle itself. A good and easy road runs onwards over the Yo-to-la and down to Gya-tsa, the Faisa of Griffiths, who notes that it is "a good-sized village, comparatively clean, and with houses which were, he thought, better than most he had seen." The country through which we marched had again changed from a system of narrow gorges into a series of broad valleys, the upper ones grazed over by hundreds of yaks, the lower rich with barley, buckwheat and mustard fields. Dotted in their midst were erected temporary huts to shelter the cultivators during their stay in these higher elevations at the time of ploughing, sowing, and reaping, while down in the valley more substantial permanent dwellings proved that the district was better governed and more prosperous than any other we had seen. An easy road leads over a saddle on the Ki-ki-la and down into the valley of Chamka-chhu, where at different elevations are the castle of Byagha in the middle, Sir Ugyen's private house above, and his sister's below at Angducholing. Dr. Griffiths wrote, "The country was very beautiful, particularly in the higher elevations, but we saw scarcely any villages and but very little cultivation." Within the last thirty years this state of things has been remedied, and under the present more stable government conditions have greatly improved. The fort of Byagha was totally destroyed in the great earthquake, and has been rebuilt on a smaller scale—a remark that also applies to the residences of Sir Ugyen and his sister.

The route to Lhasa past Kulha Kangri lies up the valley of the Pumthang, and in a subsequent journey my baggage had to go by this route, as the direct route from Tashiyangtsi up the LobraK was not passable. The site of the Sindhur Raja's palace is shown 2 miles above Angducholing. This prince was converted to Buddhism by Padma Jungne early in the eighth century of our era; the saint's resting-place is held sacred, and the depression in the rock, where he leant against it, has been roofed in and made into a gorgeous shrine.

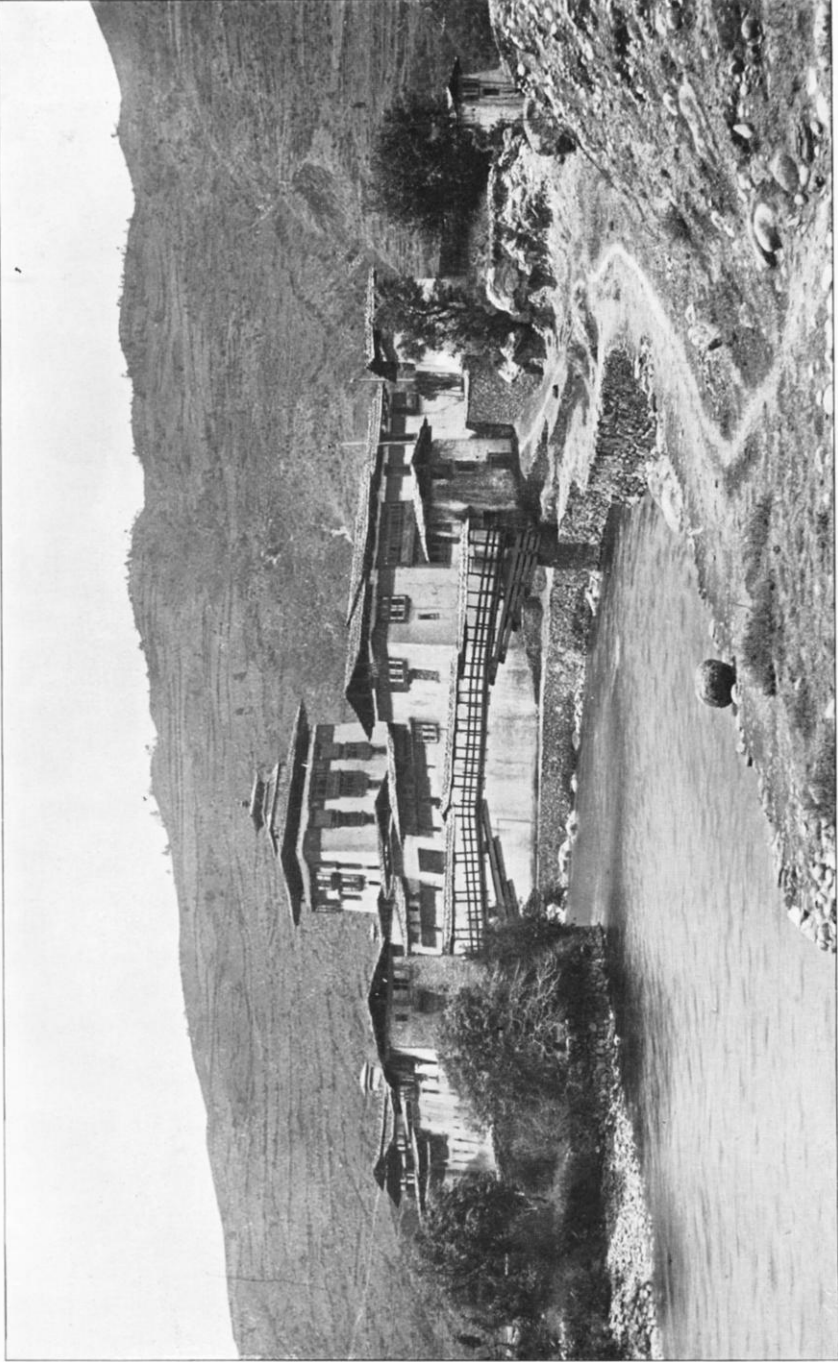
On our return journey to Simtoka the scenery appeared even more lovely owing to the immense number of flowers in bloom—three kinds of yellow roses, clematis, wild pear, and rhododendrons were in wild profusion, while the meadows were literally carpeted with blue-and-white anemones, yellow pansies, and countless primulas. The giant Sikkim primula was in magnificent bloom, some plants having as many as six tiers of flowers. Each day brought out new kinds—a large

white rose, a white and a mauve iris, and the giant white lily appeared for the first time. Orchids were abundant, and it seems a pity that the *Cypripedium Tibeticum* does not figure more in our shows, as the flowers we gathered were, as a rule, larger and finer than that figured in 'The Orchids of the Sikkim Himalaya.'

At Simtoka we crossed the Lhung-tso and proceeded up the broad valley of Thimbu-chhu or Tchín-chhu to Tashi-cho-jong, passing *en route* the knoll of Changlingmethang, where, in May, 1885, the then Poonakha Jongpen was killed, Aloo Dorzi defeated, and the supremacy of Ugyen Wangchuk's party so firmly consolidated, that there has been no revolution or internecine strife in Bhutan for the past twenty-four years.

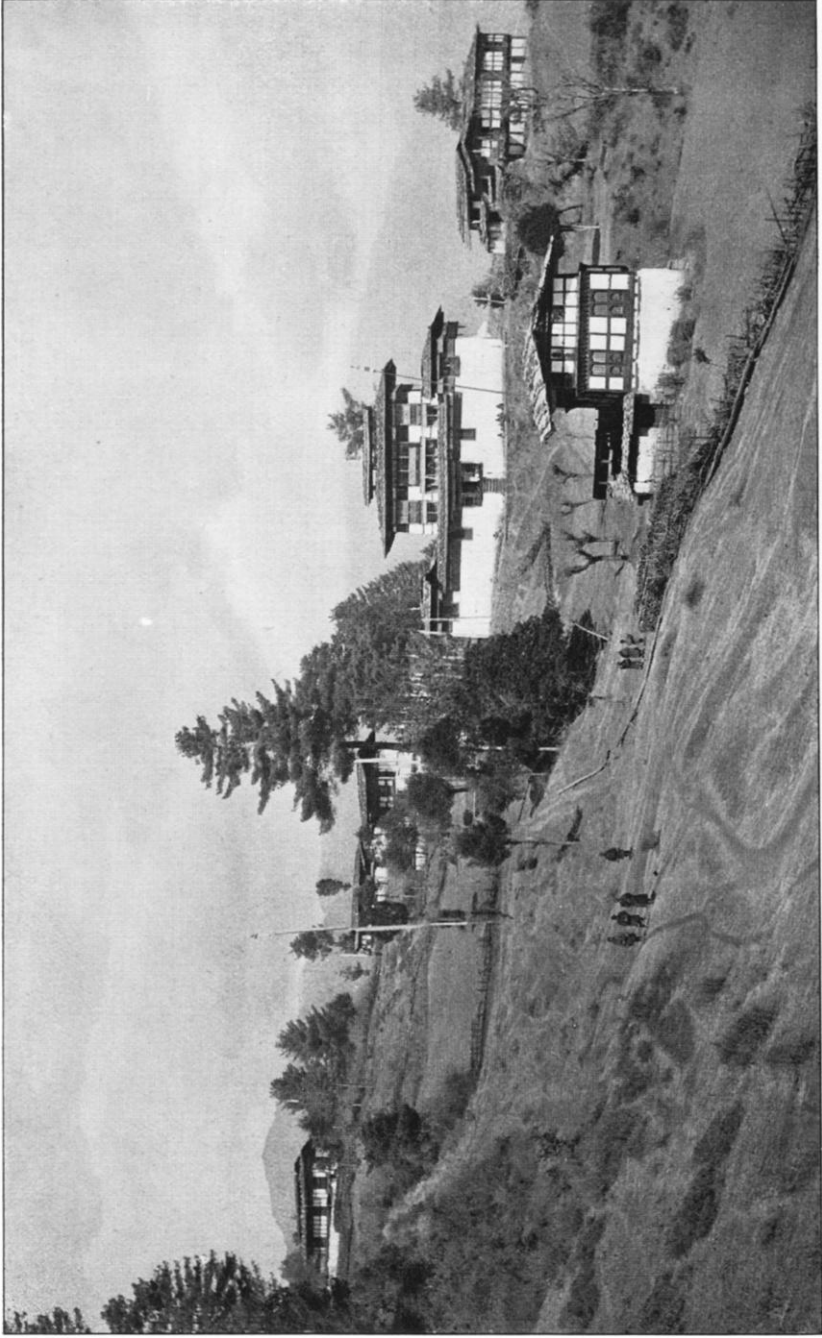
Unlike other Jongs, the present Tashi-cho-jong has been built on the plain; it differs also from other forts in having two large gateways and in being protected on the west and north by a wide fosse filled with water. The bridge across the Tchín-chhu is not connected with the castle, as at Paro and Poonakha. The interior is arranged in a succession of courtyards, as in other castles; the northern portion being set apart for the monks. The main tower was destroyed by the earthquake; the new one was carelessly built on the old and shaken foundations, and already shows signs of serious subsidence. The original castle stood on a spur about a mile away near Dichen-Phodang; but having been damaged by fire, Deb Jidhur, at the end of the eighteenth century, removed the materials to the present site and rebuilt them there. We found the Deb Raja and his court comfortably established for the summer, having completed their annual migration from Poonakha.

After taking formal leave of our hosts, we marched north up the Tchín-chu valley, which for some 3 or 4 miles was open and well cultivated. Turning over a steep bluff, we entered an entirely different country as the valley narrowed considerably, and, being beautifully wooded, was picturesque to a degree. Our destination was Chari, the first monastery founded by the great Shabdung Rimpoche; it is terribly difficult of access, being perched on overhanging rocks, so that to get from the lower to the higher chapel it is necessary to climb up very narrow, rough stone steps, squeeze round the corner of a precipice, and descend other steps to the platform of the temple, which is literally clinging to the cliff. No wonder the Shabdung's enemies attacked it in vain. We now entered the narrow gorge that leads from the middle zone to the upland pastures. At first there was no road along the stream, but our path took us high up the hillside, where we had to round cliff after cliff, all well wooded, until we slightly descended to a small open side valley, in which the fort of Barshong is situated. From this place for some 10 miles the road was close to the stream, which had to be crossed and recrossed about six times before it emerged



POONAKHA: WINTER RESIDENCE OF THE BHUTAN GOVERNMENT.





VILLAGE OF NORBU-GANG.

on to the open uplands below Byaradingka. The gorge was almost filled by the Tchin-chhu, and bordered by stupendous cliffs of most weird shapes. These cliffs appeared to be formed of horizontal strata of sedimentary rocks, consisting of layers of limestone, sandstone, slate, or shale of a dark blue colour, and quartzites, and were cleft in many places from top to bottom, thus leaving narrow slits or fissures, often more than a mile long.

From Byaradingka an hour's gradual ascent led to the Yakleh-la, whence the road descends somewhat sharply to the Pinnakme-chhu, a stream which joins the Mo-chhu below the fortress of Ghassa. A few miles down the valley, Lingzi-jong suddenly appears in sight on a hill that seemingly blocks the valley; we had, however, to round several ridges before reaching our camp some way below the Jong. The fort was totally destroyed by the earthquake, and has not been rebuilt. The road rounds several ridges before making the final ascent to the Phew-la ridge, which separates Bhutan from Tibet. At Gangyul, a little village on the Tsango-chhu, the view of the Chumolhari glaciers is magnificent. A fair bridle-path leads along the left bank of the Tsango-chhu to a small but flourishing side valley, blocked at one end by a gneiss cliff, extending from side to side in a perfect level, over which poured a very fine waterfall. This little valley was well cultivated, and possessed many large juniper trees. The path brought us at an easy gradient to the top of the cliff, which we then discovered was the lower edge of another long level valley. In this way we progressed by a succession of steps, until we came to the last tread of the stairway, which was an almost precipitous slope of stones and rocks, up which our yaks and mules struggled slowly but surely, the zigzag, as far as alignment went, being very good. Above this was a small roundish flat, in the centre of which were the walls, still good, of the fort built by the Tibetans during our late troubles. A short incline leads to the pass, 16,400 feet, whence is obtained a magnificent view of the plains and hills of lower Tibet. The contrast between the fertility of Bhutan and the barrenness of Tibet is startling.

On my third journey along the boundary of Bhutan I traversed a great part of the outer range of hills, and was enabled to judge of the suitability of this ground for Nepalese settlers, of whom large numbers were entering the country, and also of the extent of the forests as well as the amount of damage said to be done by the cultivation of the outer and very wet slopes causing landslips, and consequently raising the river-beds in the plains, and, by altering the old courses, making them overflow the lands on either bank.

These extensive landslips are certainly taking place, and causing very considerable damage to low-lying tea-gardens, but the cause is not cultivation, but the excessive rainfall, which is literally washing away these hills, composed as they are of very soft strata, much shattered and

faulted. The worst damage was being caused in most places in the valleys which did not run far into the hills, and in which there were no settlers or cultivation. I also found much excellent land suitable for the cultivation of tea, which would benefit the Bhutan Government to a very large extent were they to allow European capital into the country for the purpose. There are magnificent forests also in this part of Bhutan, but the difficulty of transport would prevent their ever being a source of revenue to the State. I also found a considerable amount of coal in the lower hills, but it was of an indifferent quality and very much crushed.

From Dorunga I travelled with Sir Ugyen, and we went a short way up the Kuru river. Our first day's march took us through a very narrow gorge with perpendicular quartzite rocks on either side, and a hard climb brought us to the top of the pass, where we stayed for the night. The next day we dropped down into the valley, and after two days' march, came to the Dongma-chhu. It is difficult to judge of the relative size of the two rivers, the Dongma and Kuru, without scientific observation, but I am inclined to think that this branch of the Monass, the Dongma, is as large, if not larger, than the Kuru or Lobrak. I saw both rivers on this journey in the cold weather, when the water was at its lowest, and I again saw them on my fourth journey, in the rains, when they were very much swollen, and I was therefore able to judge fairly well. After crossing the Dongma-chhu, the surrounding rocks changed to manganese limestone, and the vegetation lost all its sub-tropical luxuriance, and was chiefly *Pinus longifolium*, of which there were some magnificent forests. On the outer slopes of the hills there is hardly a habitation, but on coming into the Kuru Dongma-chhu river-basin villages became more plentiful, and there was a considerable amount of cultivation. The houses were well built, and the people looked prosperous and contented. My return journey was made by a slightly different route, which brought me out at Dewangiri.

I started on my fourth journey in May, 1907, in the middle of the hot weather, and until I reached Dewangiri the heat was excessive. The track leading from the plains to Dewangiri passes through narrow ravines in the sandstone hills, and a sudden thunderstorm coming on, I was nearly washed away with my baggage. The river rose with extraordinary rapidity. On leaving Dewangiri I followed Pemberton's route *via* Tashigong to Naylamdang opposite Lhuntsi Jong, but from thence I turned to the north, following up a tributary of the Kuru river. I was unable to follow the Kuru itself owing to the lateness of the season, for the river was already in flood and had washed away all the temporary bridges thrown across it to make a cold-weather road along its banks.

My route took me past Singhi Jong and over the Bod-la into Tibet. The road is fair all the way to Singhi Jong, and I was able to ride

most of it; but soon after leaving Singhi I had to abandon my mules and walk, and transfer my baggage to coolies, as the track crosses some magnificent but almost impassable rocks. The views near the pass were fine, but the weather was very wet for the most part, though in crossing the pass I left the rain behind me and had magnificent weather. The scenery also changed, becoming more rugged and barren, though some of the slopes were still well wooded. On descending the valley I soon realized I had entered Tibet, as the mountains opposite on the other side of the eastern branch of the Lobrak had not a tree or, to all appearance, a blade of grass on them, owing to the monsoon current having been stopped by the southern watershed of the great Himalayan range. I camped at Lhakhang Jong, where the Tibetan officials did all in their power to make me comfortable, and where Sir Ugyen met me. From Lhakhang my journey took me entirely through Tibet, and hence does not come within the scope of this paper, and I will only add that I went as far as the head of the Lobrak Chhu, crossed into the Chomo-Chang-tang lake-basin, and thence into the Neylung valley and on to Gyantsi, from whence I returned by the ordinary route *viâ* Kala Tsho and Phâri.

My fifth journey took me practically over the same ground as in my second journey, with the exception that on this occasion I entered Bhutan from Phari *viâ* the Temola, following the route *viâ* Duggye Jong, and returned to the plains from Paro by a hitherto unknown route *viâ* Bite Jong and Dongma Jong, entering the plains at Jaigaon. This journey calls for no special mention, and as my paper is already a very lengthy one, I will pass it over with the remark that on the journey from Paro southwards I passed some magnificent forests of pine of all kinds, and on the outer slopes of fine oaks and chestnuts, which ought in the near future to be of value to the Bhutan Government, and which I have advised them to conserve most carefully, as they are within carrying distance of the large tea districts in the Doars and the prospective tea industry along the Bhutan subhills, where there are most valuable tea lands, regarding which the Bhutan Government is at present negotiating with the British Government.

I hope I have said enough to show what an exceedingly interesting and beautiful country Bhutan is, and hope that under Sir Ugyen's rule it will soon be opened up and become a prosperous and enlightened State.

*Geographical Position.*—Bhutan is bounded on the south by Assam, on the east by the state of Towang, subject to Tibet, on the north by Tibet, and on the west by Sikkim and the British district of Darjeeling. It lies entirely within the Himalayas, between  $26^{\circ} 30'$  and  $28^{\circ} 30'$  N. lat. and  $88^{\circ} 45'$  and  $92^{\circ} 15'$  E. long.

*Mountain System.*—The mountain system may be most easily described as a series of parallel ranges running, in a more or less southerly

direction, from the main ridge of the Himalayas, where they attain an altitude of from 24,000 feet to 25,000 feet.

*River System.*—The drainage runs from north to south, following the mountain system. The main rivers are—

(1) The Ammo-chhu, known as the Torsa in the plains, which takes its rise in the western slopes of Chomolhari, and drains the Chumbi valley.

(2) The Wang-chhu or Tchin-chhu, known as the Raydak in the plains; its main tributaries are the Ha-chhu and Par-chhu, as well as many small rivers.

(3) The Mo-chhu or Poonakha-chhu, which becomes the Gadadhar in the plains. Its main tributaries are the Tang-chhu, Po-chhu, and Mo-chhu, and it drains a very large area, some of its tributaries taking their rise on the south side of the Wagya-la, at the head of the Neylung valley.

(4) The Karu-chhu or Lobra-k-chhu, known in the plains as the Monass. This river, as well as its large tributary the Gongmachhu, takes its rise in Tibet on the northern slopes of Kulu Kangri, and in a snow range to the east of Towang. It has several other large tributaries, amongst them the Pumthang-chhu and the Mati-chhu. The Monass drains the whole of eastern Bhutan, and has cut a deep gorge from its source to its inlet in the plains, passing through the main range at an elevation of 10,000 feet.

*General Division of Country.*—Bhutan may be roughly described as consisting of three distinct zones rising one above another.

1. The outer hills, which rise abruptly from the plains of Bengal to a height of between 3000 to 4000 feet.

2. The central temperate valleys, running up to a height of 9000 feet.

3. The high grazing-lands and snowy ranges.

1. The first zone is about 30 to 40 miles wide, where the rivers run with great swiftness through deep-cut ravines. The rainfall varies from moderate to excessive, and the vegetation is luxuriant. Owing to the prevalence of fever, habitations are few and far between, tenanted principally by Bhutanese bearing a bad character, and by Paharias, who have migrated from Nepal along the foothills. The climate is indifferent, but on the uplands of Sipchu in the west the Nepalese emigrants have cleared off the forests and are increasing rapidly, in a manner which shows that in their case they find nothing to complain of.

2. The central zone covers from 20 to 25 miles, and is a series of wide valleys parallel to each other, running in the same direction as the mountains. The slopes are not nearly so precipitous as in the outer hills, and, owing to a more moderate rainfall and cooler climate, are clothed with the vegetation of more temperate regions, such as firs, pines, junipers, oaks, etc. These valleys lie at elevations from 4000 feet to 9000 feet, and are sometimes over 2 miles wide, as at Paro and

Byagha. In my opinion, these flats appear to be beds of old moraines which have not yet been scoured out into the deep-cut V-shaped valleys which characterize the lower hills. The rivers, owing to their broader channels and diminished rainfall, are not so swift or so subject to floods, and in consequence the range of fluctuation in their levels does not exceed a few feet.

3. The third or northern and highest zone consists for the most part of narrow gorges opening out into wider valleys, hemmed in by high bare rugged mountains, and as the greater part of it lies above the limit of tree vegetation, it is but sparsely inhabited.

During the summer months, when the higher slopes are covered with luxuriant grass, a limited number of families, with their herds, which are not very numerous, consisting mostly of yaks, migrate to these uplands to take advantage of the splendid grazing. Sheep are conspicuous by their comparative rarity, but game is plentiful, Burhel, *Ovis Hodgsoni*, shau, and takin being found in these parts.

*Climate and its Effect on Vegetation and Scenery.*—Lying in the position it does, and with such differences in altitude, naturally the climate of Bhutan varies enormously, and with it the vegetation, which graduates from sub-tropical in the deep-cut lower valleys to arctic in the higher regions. Consequently the scenery is very varied and most beautiful. In the lower valleys, with the excessive rainfall and the hot moist atmosphere, the vegetation is luxuriant, palms, ferns, canes, and bamboos growing in wild profusion, changing gradually as one ascends to groves of chestnuts, oaks, alder, fir, magnolia, and birch, the highest of all birch and juniper, close to the snow-line. Between 4000 feet and 15,000 feet, the whole of the higher hills are clothed with most beautiful rhododendrons, of which there are no less than thirty-three known varieties, and which, flowering in masses, make a blaze of colour, while the magnolia blossoms stand out pure white and pink on the huge trees in the midst of dense forest. In the forests themselves, above 7000 feet and up to 10,000 feet, the trees are festooned with trailing masses of moss and grey lichen often 4 feet to 6 feet in length, and have every appearance of a fairy scene, more especially when after rain everything sparkles with dew-drops in the brilliant sunshine. At these high elevations, too, are the enormous pine forests into which the glaciers descend, and still higher, stretches of magnificent grazing-grounds studded with alpine flowers, surrounded by some of the finest snow-peaks in the world.

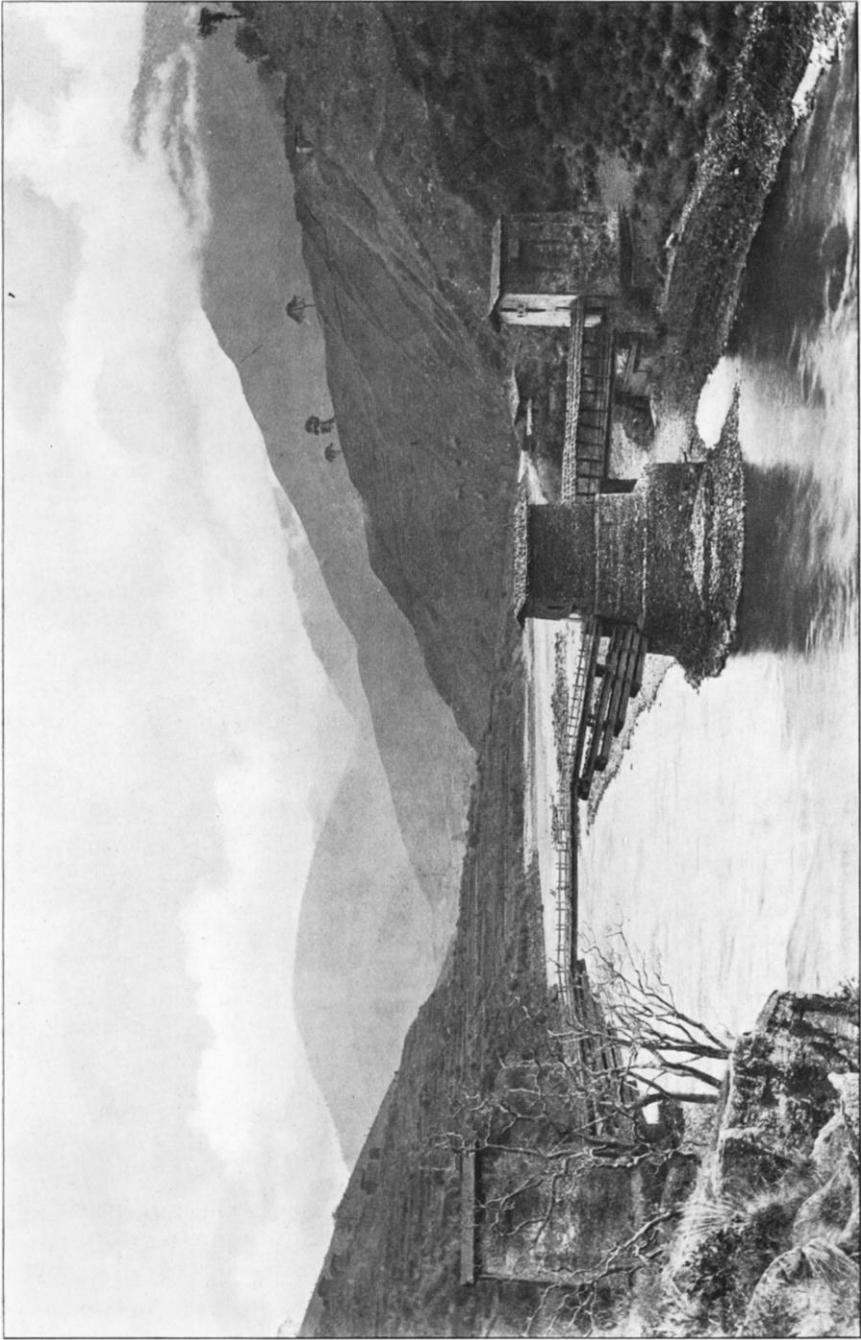
Every kind of scenery is to be found, from the lower valleys with masses of tropical vegetation growing in the soft damp atmosphere, full of brilliant soft colouring, with their great swift rivers running past, and glimpses of the distant snows, to the higher valleys and mountains with more temperate vegetation, their forests, and crags, with mountain torrents rushing through narrow gorges and wonderful waterfalls, and

wider views of the snowy mountains, still with the peculiar softness due to the damp atmosphere; and, highest of all, magnificent snow-peaks and glaciers standing out sharp against the sky or shrouded in cloud and mist, grim and forbidding. It is impossible to find words to express the beauty of the scenery and its varied character, and I fear my lantern views do but bare justice to their subjects.

*History.*—To explain some terms in my lecture a very brief history of Bhutan seems necessary. In the eighth century of our era the country was inhabited by people closely connected with India, and governed by small princes, of whom the Sindu Raja was the most powerful. This monarch, with his subjects, was converted to Buddhism by the Indian Saint Padma Sambhava some time prior to the saint's visit to Lhasa. The kingdom, however, was overthrown in the latter part of the ninth century by Lan-darma, the apostate King of Tibet; and again two centuries later the country was overrun by people from the north of the Himalayas; but no one appears to have had any authority, until we find in the thirteenth century a powerful lama, styled Lapha, who in his turn was ousted by Lama Fago Dugom-Shig-po of Ralong, with whom came five lamas belonging to rival sects. I mention this, because Lama Apha, after his defeat, handed over the Chumbi valley, hitherto Bhutanese, to the ruler of Tibet. In 1557 A.D., another Ralong monk, Dujom Dorji, entered Bhutan, and after continuous warring with the successors of the five lamas mentioned before, made himself master of the whole country; several invasions from Tibet were successfully repulsed, and his kingdom firmly established. He is best known by his title of Shab-dung Nawang-Namgyel-Rimpoche, or the Dharma Raja of Bhutan. He introduced good government, appointed local governors under the titles of Penlops, Jongpens, Zimpens, etc., and established a central council, with a deputy or Deb Raja as president, and to them entrusted the executive or civil administration, while he devoted the latter days of his life to religious duty. He died in 1592, aged fifty-eight.

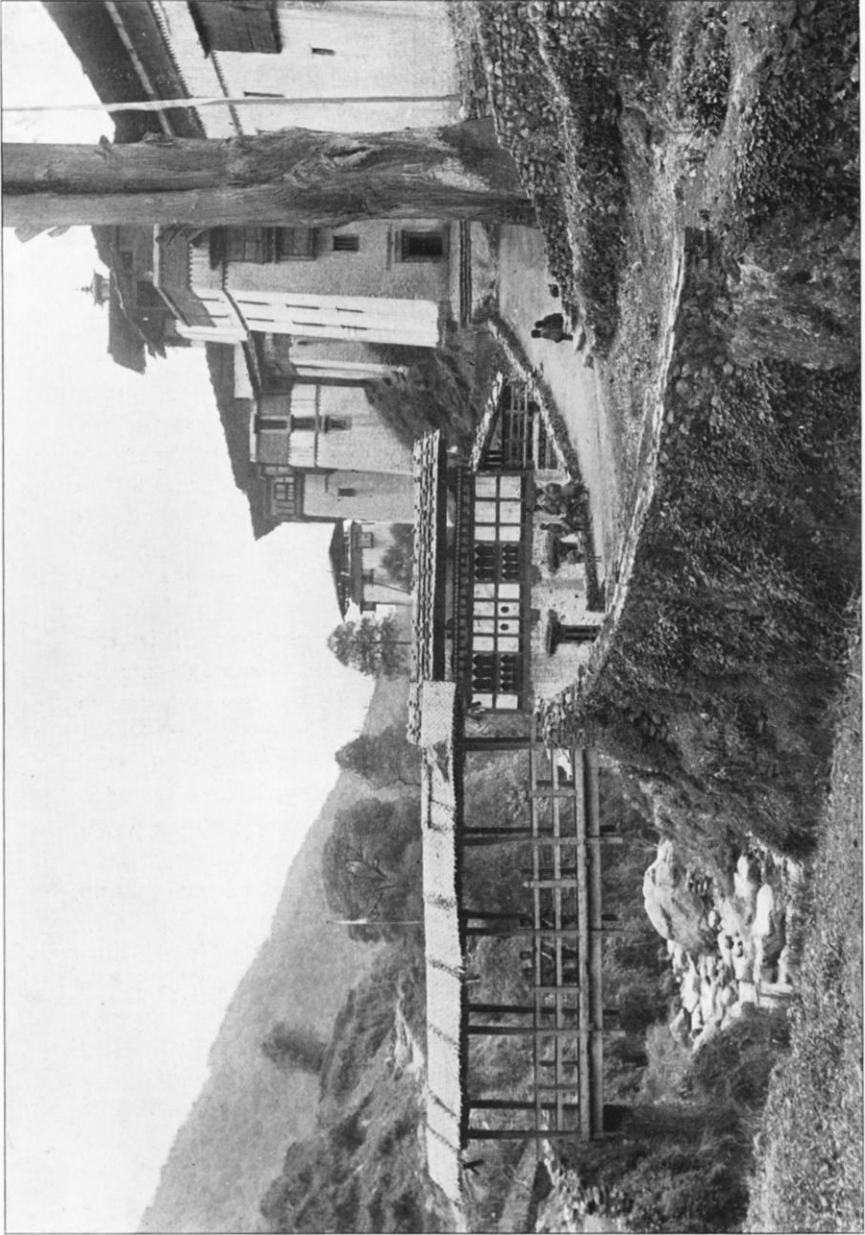
After his death a triple reincarnation arose. His body reappeared as the Dharma Raja, his voice as the Chole Tulku, and his mind as Thi Rimpoche; and these incarnations have been continuous to the present time. The late Dharma Raja died some four years ago, and his successor has not yet been recognized, the late Deb Raja was the Chole Tulku, while the Thi Rimpoche has committed grievous sin and will not again appear.

The office of Deb Raja was an elective one, and lasted nearly 350 years; but on December 17, 1907, the lamas, officials, and laymen of Bhu'an unanimously abolished the office, and proclaimed Sir Ugyen Wangchuk Maharaja or Gyelpo, and declared the office to be hereditary in his family. This was done with the consent and approval of the Deb Raja, who has now retired to a life of seclusion and religious meditation.



BRIDGE AT ANGDUPHODANG.





TONGSA JONG.

The proximity of Bhutan to the route finally adopted for our military expedition to Lhasa in 1904 rendered the attitude of the Bhutanese Government toward us a matter of considerable importance. Fortunately, the Durbar decided to follow the precedent of 1888, and refused to join Tibet. They moreover sent the Tongsa Penlop, Ugyen Wangchuk, as their representative to accompany the mission, to give every assistance in his power. As a recognition of his valuable services, Ugyen Wangchuk was honoured by a Knight Commandership of the Indian Empire, and in March, 1905, I was despatched by the Government of India, at the head of a mission, to convey to Sir Ugyen the Insignia of the Order.

Our knowledge of Bhutan has been chiefly derived from the somewhat restricted reports of previous missions. Bogle in 1774, and Turner in 1783, entered the country from the plains of India at Buxa, Captain Pemberton with Dr. Griffiths at Dewangiri, while Eden crossed from Darjeeling *via* Dumsong and Sipchu in 1864. There was also the military expedition in 1864-5, which resulted in our seizure of the eighteen Docars and the Daling Subdivision territory, which has proved of enormous value to the Government of India, and which brings in a large revenue.

*Ethnography.*—It would be impossible to classify or trace the origin of the many different types of people found in Bhutan, without long and careful study, but I would point out that people from China, Ladakh, and Europe have found their way to Bhutan, as well as Khampas, Duphlas, and other nearer races. We came across two or three men who, in fairness and texture of skin and hair and in feature, were indistinguishable from English or Germans, while others were low animal-looking negroids; but among the better classes there certainly are three distinct types: first, one in which the men, like Sir Ugyen Wangchuk, have broad pleasing faces, somewhat French in character; second, a Semitic type, with features resembling those of Cabulis; and a third type, in which the facial characteristics are oval and refined.

A curious fact differentiates the Bhutanese from all their neighbours, *viz.* the hair on their faces. It may be noticed that the Dharma Raja is usually depicted with a long pointed beard, and many, like Sir Ugyen, wear moustaches.

*Morals.*—It is possible that eighteen years' freedom from internecine strife, and a firmer and juster administration, as well as a complete cessation of slavery, when the slaves were recruited from the scum of the plains, may have brought about a change in the moral qualities of the Bhutanese; but my experience in no way bears out Dr. Griffith's strictures that they were "immoral, indecent, dirty, wanting in courage, and given to drink; while the higher classes were utter strangers to truth, greedy beggars, rapacious, and crafty in working evil." I will not finish his remarks, as they are utterly inapplicable at the present

time. On the contrary, we were well received and welcomed everywhere. Nothing immoral or indecent ever came to the notice of myself or the members of my missions either time, or in any of my travels. The men are not nearly so dirty or offensive as they have been represented, nor do I consider them idle and drunken. Certainly they do drink much *chang*, but not so much as their Sikkim neighbours. Besides, the strength of *chang*, or *murwa*, is less than half of the mildest of ales, and it is impossible for even a weak-headed person to become at all elevated by drinking it.

On the outer hills bad characters undoubtedly swarm, and so acquire a bad reputation for the bulk of the people; but in so far as personal experience goes, I can hardly speak too highly or gratefully of the friendly reception I met with everywhere, the warmth of their welcome, and the desire of all classes to show me hospitality.

Physically, the Bhutanese are a fine, robust people, who compare very favourably with their neighbours in Sikkim, Tibet, and the plains. They are active and capable of enduring hardships; good walkers, and able to cover immense distances in their own hills. On the other hand, the Bhutanese are rather wanting in energy and initiative, and at the same time are inclined to bluster. Those who live in the intense cold of the higher altitudes, in tiny huts full of smoke, are dirty in person and habits; but we ourselves did not always insist on having a morning tub when at 13,000 feet. All the people who formed the immediate *entourage* of the officials were clean and respectable in their outward appearance, while the officials themselves were always immaculate in their brocades and silks.

It is impossible to estimate the population of Bhutan exactly, or even to decide whether the true Bhutanese race is diminishing; but there can be no question that the outer hills are being overwhelmed by a flood of Nepalese immigrants. The general appearance of the country, the evidences of the abandonment of houses and terraced fields, and the decay of irrigation channels, all show that there were more cultivators formerly, and that there is ample scope for regeneration and immigration. I can safely predict that a little assistance and encouragement from the Government of India, which has benefited so much by the annexation of the Bhutanese Duars, would secure a return of prosperity throughout the country, which at present probably includes a population of at least 300,000.

*Religion.*—The religion professed by the people of Bhutan is Buddhism or Lamaism, *i.e.* they follow the religion of Lhasa, and though they have their own particular saints, they look up to the Delai Lama as the head of their Church.

*Industries.*—In handicrafts the Bhutanese used to be exceedingly clever, but the increasing poverty of the state is producing its natural effect, and good workmen are becoming very scarce. Good specimens of

metalwork are still made for the monasteries, but the open work, so conspicuous on the older sword-handles and dagger-sheaths, has almost become a lost art, and the same may be said of the work in applique and embroidery. Casting of bells and other articles is still carried on at Paro and Tongsa and other large forts. Weaving is pretty general; the factories are maintained by the wealthier officials, and the weaving-room at Byagha was very noticeable. Cotton, wool, wild and domestic silk are all freely used, but, unfortunately, the introduction of aniline dyes has spoilt many patterns. Matwork is very good, the work in many of their baskets being so fine as to be watertight.

Sword-blades are much valued, and good ones are regarded as heir-looms, and handed down from father to son. These blades, by dint of continual heating in charcoal, have been made into excellent mild steel, and are kept beautifully bright and polished. Their price varies from £2 to £50, though to a casual observer one is just as good as another.

Wood-carving and painting are still in demand for the monasteries, and, though scarcer than formerly, show no signs of deterioration. Clay images and ordinary articles of domestic use are turned out, but the potter's art is at a low ebb.

As architects and builders, the Bhutanese are no mean workmen. The houses are either built of stone set in clay, or clay empese. Under the latter process, clay mixed with small stones is placed in a wooden frame or mould and trodden down until it is consolidated into a block; this, on exposure to air, quickly hardens, and in course of some years acquires nearly the solidity of stone. This preparation is used either in blocks made on the ground and employed like huge bricks, or in layers made on the actual wall. The outer side of the walls has a slight inward slope, but the inner side is perpendicular. The houses consist of three or four stories, with generally a balcony or two, and sliding shutters to let in light or keep out cold. No ironwork is used, the doors turning on wooden pivots. The frames, beams, etc., are all fitted together on the ground, before being set up in the building itself, and kept together with key-pegs. Timber being plentiful, the ceilings are supported on numerous heavy beams, and are well planked, the highest being always covered with a coating of pounded clay to help keep rain out. The roofs are gently inclined, and formed of pine shingles from 4 to 5 feet long, which are kept in place by heavy stones, as in Switzerland. There are no chimneys, and ladders take the place of staircases. In laying out buildings, set-squares and a skirret and line are used. Wedges and heat are employed in splitting the stone slabs (many of which are of great size) used in paving the courtyards.

The cantilever bridges are very strongly made, and some are as much as 170 feet in span. The chains for suspension bridges are made of wrought-iron links, but of late years the construction of this kind of bridge seems to have been abandoned, whilst previously existing ones

have been allowed to rust and decay. I did not notice any cane suspension bridges such as are common in Sikkim.

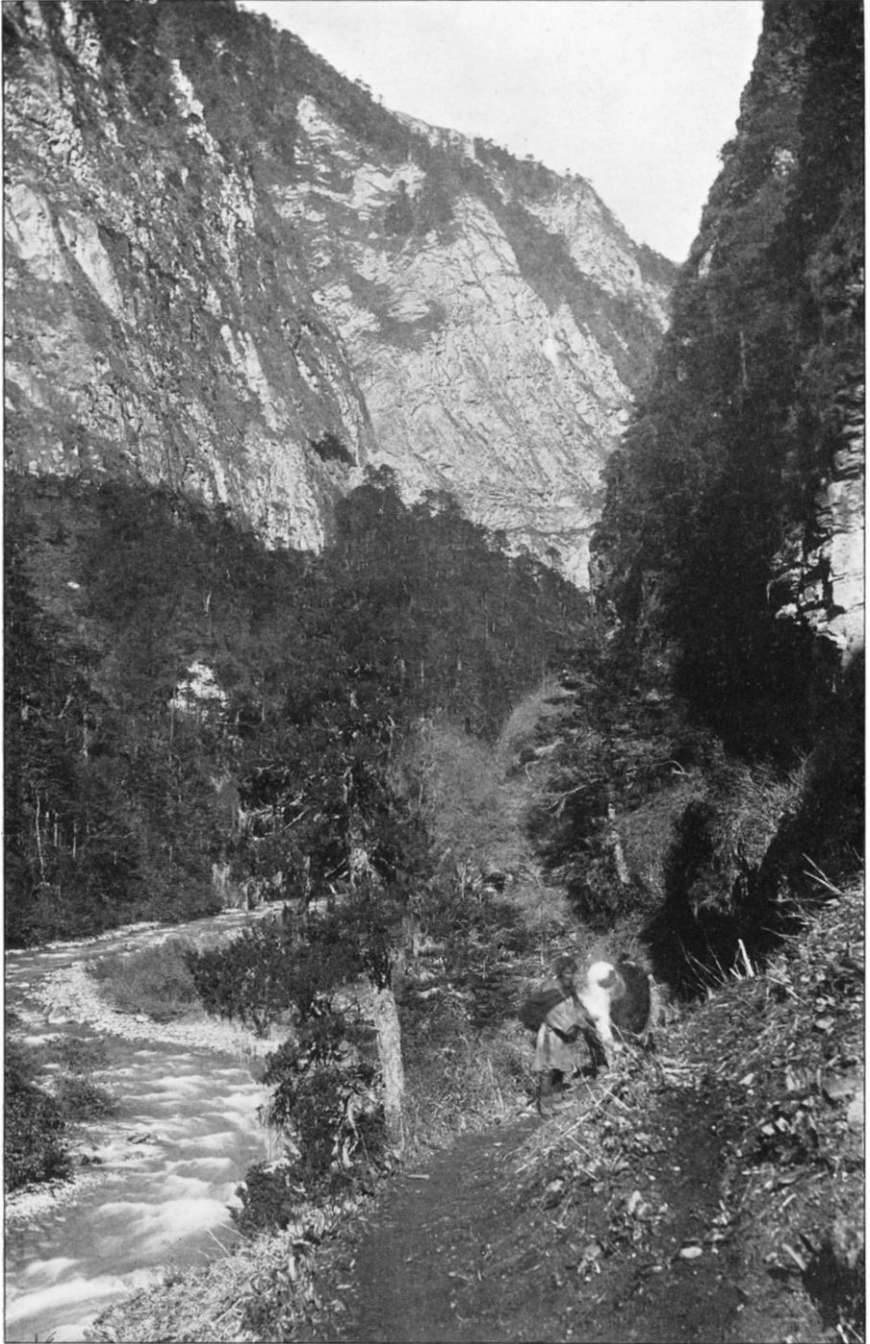
*Geology.*—I regret to say I know very little of geology, but, speaking generally, the extreme outhills are formed of soft sandstone, which contains veins or strata of coal. This series is the same as the Damuda series, and the coal is of the same formation. Where I have seen the coal, it is much crushed, has often been forced up by enormous pressure into lintel-shaped pockets, and is usually much faulted, and in many places inverted. The sandstone does not extend the whole way along the foothills, and has in several places been denuded.

Above these come mica-schists and quartzites. It is in the former that most of the minerals are found, but with the exception of copper, none have been found of any value. Iron is found in places, and is still worked by the Bhutanese. Above the quartzite magnesian limestone appears in several places, such as the Kuru river at Kenga, on the road to Tongsa from Dewangiri, and at Buxa. Above them comes gneiss, which forms the bulk of the rocks right up to the snows. This, however, is not invariable, as thick beds of limestone and shale are met with—limestone up the Tchinchhu, at Poonakha, Rokhbi, and in the Chumbi valley; and shale in the Tchinchhu and Chumbi valleys. Some of the very highest peaks are composed of granite, as the horn of Chumulhari. Beyond, *i.e.* to the north of the very highest peaks, come shale and limestone containing fossils. This tract is, however, in Tibet. A piece of gypsum was found in the river-bed close to the Dung-ma-chu.

*Botany.*—We had a professional plant-collector with us, who succeeded in finding some 150 or 160 new species; the collection has not yet been systematically examined, so I cannot give any definite information as to the net result. This, however, is of little consequence in view of the magnificent collection made by Dr. Griffiths; and I can add nothing to Dr. Anderson's short note of 1865.

*Zoology.*—As regards animals, the habitat of the Takin (*Budorcas taxicolor Whitei*) was ascertained. Also news of several herds of shau does in the Chumbi valley was brought in, but none of stags, so they were left severely alone. Burhel were plentiful; in north-east Bhutan, *Ovis Hodgsoni* was common. Elephants were numerous in the outer hills, but most of the tusks we saw were said to have been obtained from elephants that had been dead for years. In the Tongsa Jurisdiction quail were very plentiful.

Among their domestic animals, the cross between the hill cattle and the wild mythun (*Bos frontalis*) is a very fine animal; the plough oxen in the Pumthang valley would earn a high place at our agricultural shows. So highly valued is this breed, that the Nepalese Government constantly send over to Bhutan for pure and half-bred mythun; a yearling calf which was offered to me was said to be worth at least £20 on the spot.



VALLEY ABOVE PASHI-CHO-JONG.



INTERIOR, TONGSA JONG.

Pigs also are good, English and China stock having been imported. Many of the fowls were fine birds, and pigeons swarm everywhere.

The once celebrated Tangun pony, mentioned by Turner and others, had entirely disappeared some twenty or more years ago; a mysterious disease broke out and swept the stock away. Mr. Paul seemed to have possessed one of the last; it was a very powerful skew-bald about 13 hands high at the outside, with a silky coat remarkable in a hill pony. At present the ponies are not equal to the mules, but Sir Ugyen has now imported an Australian stallion. The best mules, however, are brought from Tibet. Altogether horse-breeding is at a low ebb, as railways and cart-roads have put an end to the trade in ponies with the plains.

*Revenue.*—The second Deb Raja Migyur Tempa made a very good cadastral survey and record of rights, which is the basis of the present revenue system. The rent rolls are issued under the seal of the Deb Raja, and counter-sealed by the local Penlop or Jongpen. The position, size, and nature of each man's holding is carefully entered, and all increases or decreases, and any change of ownership, are noted under seal; the ryots only pay for what they actually possess; in consequence the state revenues vary, and are declining. The old village boundaries are still retained, and consist of natural features, such as rivers, streams, and ridges.

*Agriculture.*—Griffiths records, "Of the agriculture of Bhutan little is to be said, as so very large a proportion of the supplies is derived from the plains. The stage in which the little agriculture that is carried on is, argues as little in favour of the amount of agricultural skill they possess as the uncultivated state of the Duars does in favour of the numerical extent of their plains subjects." Probably the loss of these Duars has compelled the Bhutanese to pay more attention to agriculture. The Bhutanese cultivator lays out his fields in a series of really beautiful terraces, levelled from the side of the hill and often supported by strong revetments of stone, sometimes of considerable height. The fields are usually carefully protected either by stone walls or by fences of young pine trees and pine staves. In the main valleys further protection to the crops is afforded by planting rows of willows and other trees across the general direction of the violent winds which rush up from the plains.

To the excellence of their irrigation works I have already borne testimony. Both hoe and plough are used; the latter being larger and stronger than that of the plains. The principal crops are rice, wheat, barley, maize, buckwheat, turnips, and peas; as well as mustard and castor-oil seed and sugar-cane in small quantities. Oranges of excellent quality are grown on the outer hills, and very good walnuts are indigenous. Madder and rubber are not properly cultivated, but are found wild. Paper of very tough quality is made from the daphne plant,



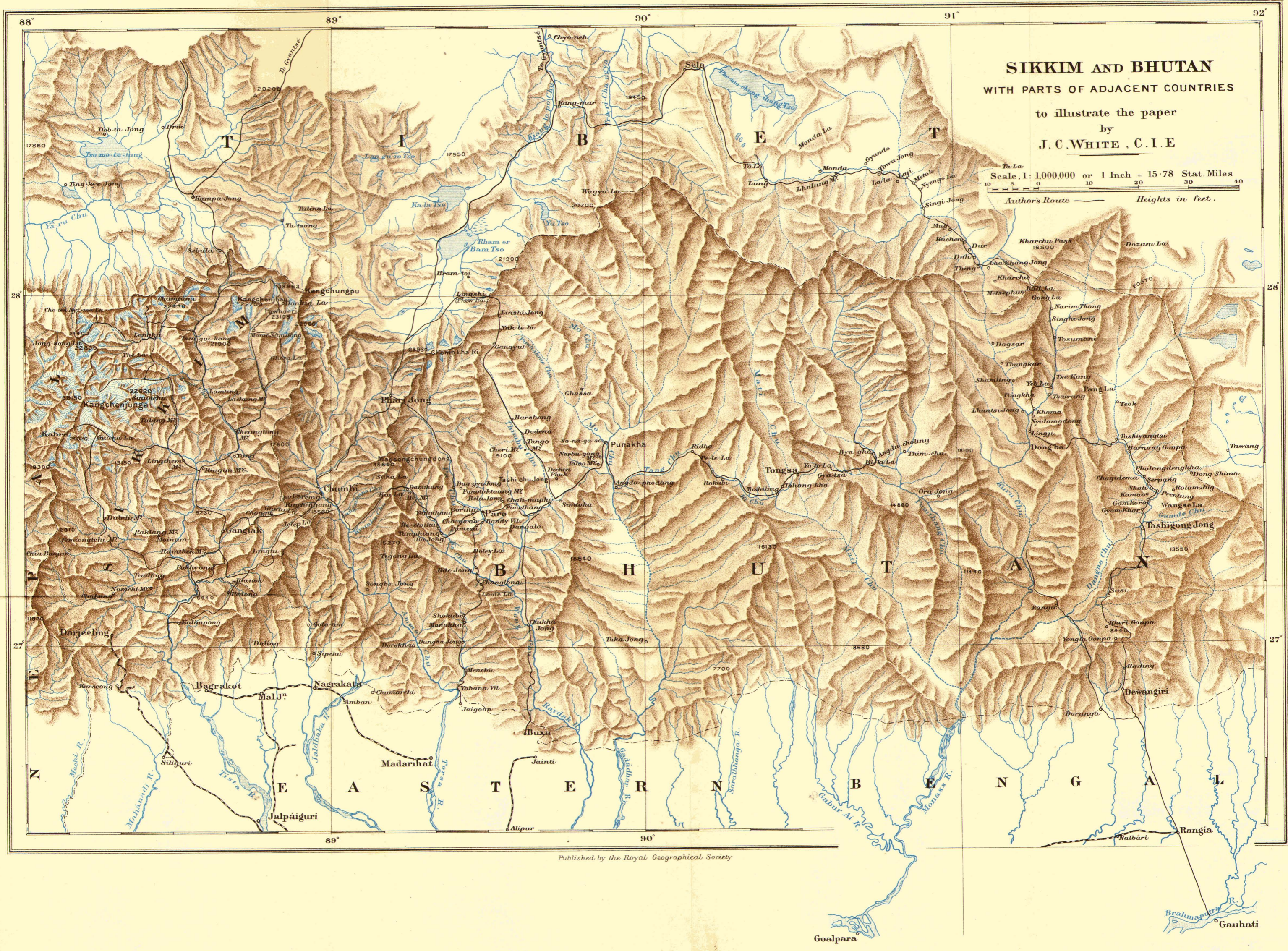
which also grows wild. No attempt has been made to grow mulberry plants, because the cocoons, from which Endi or Erhi or Tussar silk is made, are collected in their wild state from the jungles inhabited by the insects which produce them.

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The PRESIDENT (before the paper): Mr. White, who has kindly consented to lecture here to-night, is an engineer by profession, and, in the course of his professional duties, he has visited a great many parts of India. During the last twenty years he has been chiefly employed in Sikkim and in connection with the Tibetan border, and he has thus had the opportunity of making a number of interesting journeys into Bhutan, a region which is very little known. It is the results of those journeys which he is kindly going to describe to us to-night.

After the paper, Sir JAMES BOURDILLON: I was not aware that any discussion would take place, but I should like to say a few words which occur to me with reference to Mr. White's lecture. I wish first to draw attention to a matter which would certainly never have been mentioned by Mr. White himself, and that is the great debt we all owe to his untiring endeavours, and to his personal qualifications for carrying out the expedition he has described. He was stationed for a long time in the Eastern Himalayas, and gradually acquired a unique influence and authority among the people of those regions. Thus has grown up gradually, and by almost imperceptible degrees, the great power he displayed in carrying through this expedition. Bhutan, for a long time, has been an absolutely closed country to Europeans, and, if we look back to our official relations with that country, the review is one which cannot be regarded with satisfaction. Our envoys have been insulted, and our efforts towards friendship have been frustrated again and again; so that it is a most remarkable achievement on Mr. White's part that he has been able to carry out this expedition, and to turn what was a hostile foreign state into a neighbour closely allied in friendship with the Government of India. Mr. White has not been able, in the short time placed at his disposal this evening, to say much about the manufactures and the beautiful artistic work accomplished by the people. The Bhutanese have long enjoyed a very remarkable civilization. The metal work, the weaving, the embroidery, are all of the highest character, and not only very beautiful, but possessed of very distinct characteristics of their own. In conclusion, I will only ask you to express your satisfaction with the lecture we have heard to-night, and in doing so, never to forget how much is due to the great personal influence of Mr. White himself.

General Sir RONALD MACDONALD: My first acquaintance with Mr. White was just at the start of the Tibet Expedition. I had then the feeling that trusting to a single line was perhaps rather hazardous, and I asked Mr. White whether he could run an alternative line from Sikkim. He at once undertook to do so, and, thanks to his influence in Sikkim, he was able to put on something like 1500 men, who worked all through the winter and assisted our advance. When we got into the Chumbi valley in the winter, we very soon found that Mr. White had a great reputation among the Bhutanese, and when the Tongsa penlop, who is now the Mabarajah Bhutan, came to visit us, he was already predisposed in Mr. White's favour; but this rapidly ripened into confidence and friendship, which has enabled Mr. White to achieve the great results of which we have just heard. We have heard how Mr. White was a welcome and honoured visitor in the exclusive country of Bhutan, and I will mention one little incident at Lhasa. When we arrived there, the Tibetan representatives asked us that we should prevent any of our officers or men entering any of their sacred places. After consulting Colonel Younghusband



**SIKKIM AND BHUTAN**  
WITH PARTS OF ADJACENT COUNTRIES  
to illustrate the paper  
by  
**J. C. WHITE, C.I.E.**

Scale, 1: 1,000,000 or 1 Inch = 15.78 Stat. Miles  
Author's Route ————— Heights in feet.

Goalpara

Gauhati



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17550

28°

22400

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Ya ru Chu

Hampa Jong

Tuling La

Ka la Tso

Rham or Bani Tso

Chumungo

Kangchenjunga

Kangchungpu

Linashi

Cho-ta Nya-mo-sha

Lentaka

Tsen-gua-Kang

Mome-Sam-dang

Chowd Lha Ri

Jong-song-lan

Kangchenjunga

Lam-leng

Phari Jong

Kabra

Talana M<sup>t</sup>

Cherangtang M<sup>t</sup>

Massongchungdong

Lingthem M<sup>t</sup>

Chingpa M<sup>t</sup>

Chumbi

Cheri M<sup>t</sup>

Drabdi M<sup>t</sup>

Raklang M<sup>t</sup>

Changtak

Chambing

Dug-gye Jong

Pantongchu M<sup>t</sup>

Moinam

Linglu

Yangthang

Ke-chikak

Tendong

Namchi M<sup>t</sup>

Chenok

Tegong La

Hue Jong

Chakang

Chalupong

Pedong

Songbe Jong

Choaglena

Darjeeling

Chalupong

Daling

Gata-tan

Shokabi

Burseong

Chalupong

Sipehu

Dorekha

Dungna Jong

Bagrakot

Chalupong

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Nagrakata

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Jaigoan

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# SIKKIM AND BHUTAN

WITH PARTS OF ADJACENT COUNTRIES

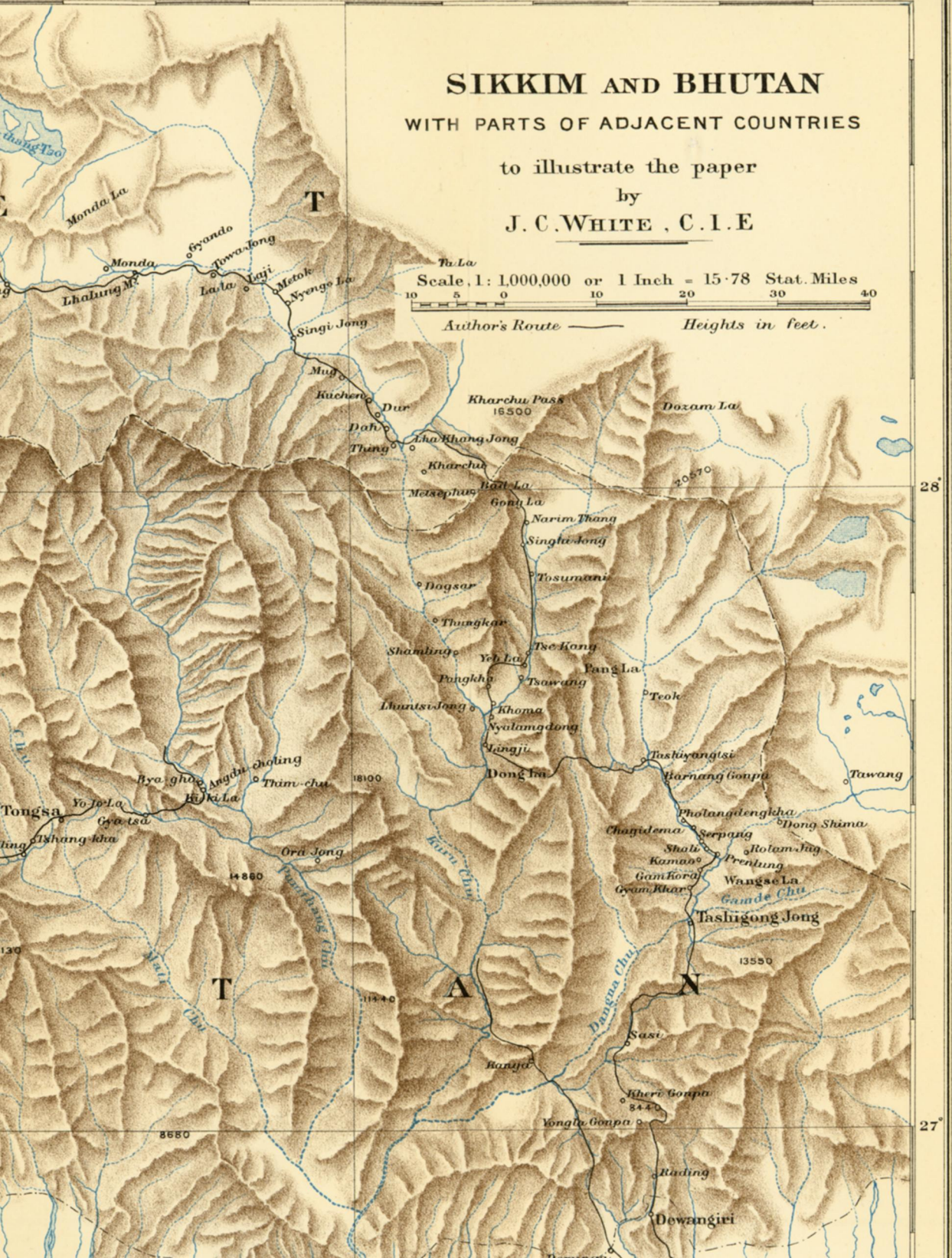
to illustrate the paper  
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J. C. WHITE, C. I. E.

Scale, 1: 1,000,000 or 1 Inch = 15.78 Stat. Miles



Author's Route ————— Heights in feet.



28°

27°





Published by the Royal Geographical Society

Goalpara

Scale 1:1,000,000 or 1 inch = 15.75 Stat. Miles

Author's Route ————— Heights in feet.



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Goalpara

Gauhati