

Journey of the Expedition under Colonel Woodthorpe, R.E., from Upper Assam to the Irawadi, and return over the Patkoi Range.

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Map, p. 68.

I propose this evening to read to you a paper describing an exploration made in the beginning of last year by a distinguished Fellow of your Society (Colonel R. G. Woodthorpe) and myself, from Sadiya, on the upper waters of the Brahmaputra, to the Kampti Shan country, on the western branch of the Irawadi, and to give you a brief account of the various tribes we met *en route*. The country through which we travelled lies between the north-east extremity of the province of Assam and the upper waters of the Irawadi.

As the mountain chains here lie in a general north and south direction, contrary to the Himalaya, which lie east and west, our route necessarily had to cross the ranges.

After leaving Sadiya, the route lay more or less through thick and tangled forests along the banks of the Dihing river for about 125 miles up to Kúmki (altitude 3600 feet). On leaving Kúmki, the country became mountainous, though still densely wooded, until we crossed the Chaukan range (altitude 9000 feet) and descended into the Bor Kampti valley, where we found a series of plateaus of a more open character, the hills, however, on either side of the valley continuing as thickly forest-clad as on the Assam side of the range.

The country through which we travelled being very sparsely inhabited (a week may elapse without the voyager coming across a habitation of any kind), there are of course no regular paths, and the route lies either along the rocky beds of mountain torrents, or, should these be impassable owing to heavy rains, in the tracks of elephants or other wild denizens of the jungle. A system of blazing the trees, by the hillmen, which obtains in these regions, enables the traveller to thread his way through the seemingly trackless forests. On leaving Sadiya, the most important link in the chain of frontier outposts on the extreme north-east of the province of Assam, the tribes we met were Kamptis, Singphos or Kakhyens (Singpho merely meaning "a man" in their language), Mishmis, Nagas and, in a valley of the Nam-kiu river, Kunnungs, famed for their skill in manufacturing sword-blades and in extracting silver from the ore which abounds in the country they inhabit, and various specimens of barbarous tribes, such as Meeros, &c., who are neighbours of the Kampti Shans.

The climate of the country through which our route lay is excessively moist. During the months of November, December, January, and February there is supposed to be a cessation in the constant downpour;

but this is only nominally the case, as even in the months mentioned we found that scarcely a day passed without rain, and I recollect that it rained in torrents, day and night, the whole of one week in January. The effect of this almost ceaseless downpour is, that an enormous quantity of water finds its way to the west of the waterparting of the Chaukan and Patkoi ranges into the Brahmaputra, via the Dihing and other rivers, and to the east into the Irawadi, via the Nam-lung and numerous other rivers, the drainage from the Naga Hills to the south being absorbed into the Kyendwen river which joins the Irawadi below Mandalay. Last March, a most interesting paper, on a journey he made up the Kyendwen in 1881, was read to you by Mr. Annan Bryce. Since our annexation of Upper Burma it is of course important that we should have as many friends as possible in the tribes of the far north, and although the Kampti Shans, whom we visited, are not a very numerous clan (I should say that the whole community does not exceed 12,000 souls), yet, owing to their superior civilisation—superior when contrasted with the semi-barbarism of their neighbours—they would prove of use to us; they certainly showed their willingness to be friendly in every way.

Before commencing the narrative account of our journey I must not forget to mention that we were not the first Europeans to visit the country of the Kampti Shans. In 1826, Lieuts. Wilcox and Burlton with an escort of twenty Kampti militia, visited Manchi from Sadiya. Their route coincided with ours, or rather ours coincided with theirs, for two days' march from the mouth of the Dapha river. From thence the travellers, probably not having been told of the somewhat easier and more direct route via Kúmkí and the Chaukan Pass into the valley of the Nam-kiu, turned their steps more to the north and crossed the Phungan range at a higher altitude than we did. Wilcox did not visit Padao or Langnu and Langdau (Mung Lung), as at that time (sixty years ago), the people of Manchi were at war with their neighbours. Wilcox's narrative teems with information of various kinds, and we (Woodthorpe and I) often wished we had known him and could compare notes. No man, except perhaps Woodthorpe, has done so much for the geography of the north-east frontier as Wilcox.

On the 19th of December, 1884, our party, consisting of Colonel Woodthorpe, R.E., Mr. M. Ogle (Survey Department), Mr. T. Digges La Touche (Geological Survey), Dr. D. Grant, and an escort under my command of forty-five men of the 44th (Gurkha Light Infantry) and twenty men of the Frontier Police, together with the usual complement of native surveyors, coolies, &c., left Sadiya and commenced operations by exploring up the Noa Dihing river. The whole of the party was in the charge of Colonel Woodthorpe, the survey officer on the north-east frontier.

The route from Sadiya to Indong, a Singpho village situated on the

right bank of the Noa Dihing river, and distant from Sadiya 54 miles, needs but little description. We were obliged to cut our way through the tangled jungle, and so free a passage for our elephants, carrying the provisions and baggage of our party. It took us six days to accomplish this journey. *En route* we passed several Kampti and Singpho villages, which we visited, chatting with the inhabitants, sometimes through the medium of an interpreter, and at others conversing in Assamese, which is more or less the "lingua Franca" on the British side of the frontier.

At one Kampti village I noticed that the inhabitants had decorated the graves of their relations with flowers and flags, and was informed that it was customary to do so periodically, like our neighbours across the Channel on All Saints' Day. At another village, of which the great majority of the inhabitants were Singphos (who are by religion spirit-worshippers), we found a Buddhist temple and school, which had been erected principally through the generosity of the head man, who was a Singpho; this was quite an exceptional instance of unsectarian conduct. On visiting the school we found about a dozen boys being taught by the yellow-robed Buddhist priest, who showed us over the temple. The priest informed us that the paper he used for writing on was manufactured out of a creeper, and also showed us a peculiar shaped fan which was used during prayer. In the early morning the "bápu" or priest, and some of his disciples, walk through the village beating a gong and calling people to pray, and also collecting provisions for the day's consumption. At this village (Mung Lung) we obtained through Mr. Needham (the Political Officer at Sadiya), who accompanied us thus far, the services of a Kampti interpreter, called "Deori," who subsequently proved of great use to us when we visited the valley of the Kampti Shans on the Irawadi. The Mr. Needham mentioned is the same officer who, with Captain E. H. Molesworth, made the adventurous journey to Rima on the Tibetan frontier early this year.

The chief of Mung Lung, a venerable looking man, arrayed in a gorgeous flowered Chinese robe, did the honours of his village to us in company with his newest and latest acquisition in the shape of a wife, for whom, we were informed, that he had just paid 80*l.*, 10 guns, 10 slaves, some buffaloes, and 200 beads, was present at a display of fireworks which we gave on the banks of the river in the evening. At this village, as indeed at all the others through which we passed, a Berthon's collapsible boat, which Woodthorpe had brought with him, created a good deal of wonder. This boat proved of the greatest service later on in ferrying our party and baggage over rivers which were too deep to be waded.

On Christmas Day we arrived at Indong. During our stay here the summits of two neighbouring peaks of 6000 and 7000 feet altitude were cleared for survey purposes and temporary houses, storehouses, and a

field hospital (where our clever and energetic young doctor dispensed physic and gave advice to all comers) were erected. We had a constant succession of visitors, comprising Kamptis, Singphos, Nagas, and Mishmis, who were all hospitably received by Woodthorpe and his party. Musical-boxes, wind-up toys, &c., were shown, tricks of various kinds, and occasionally fireworks. The prevalent disease seemed to be goitre, and a large amount of red iodide of mercury was given away; so fond indeed were the Singpho ladies of painting themselves, that their necks, unlovely objects to view at any time, soon became masses of blisters, and I should think most uncomfortable to their owners. It was sought to impress upon our semi-barbarian visitors the benefits which would accrue from vaccination; but they all "drew the line" firmly there, and "would have none of it." Several specimens of coal and of serpentine were brought in for the inspection of our geologist (who was called the "stone man" by the natives). The ash of the coal was rather coloured, but seemed of good quality; the prices asked by the Singphos for the serpentine appeared to us ridiculously large, 30*l.* was asked for a lump 5 lbs. in weight. The Singphos informed me that they had a good market for the serpentine on the Chinese frontier.

The country round Indong was of a flat uninteresting nature, tangled forests and swamps reeking with malaria were the principal features. A few clearances had been made by the Singphos on any high ground which existed, for the cultivation of Indian corn and other articles of food. During the winter, the Dihing river only runs in narrow channels, and numerous grass-covered plains (locally called "Churs") exist several miles in length, forming large islands, inhabited by tigers, buffaloes, and innumerable deer; the last-named supplied our camp with fresh meat, while the river yielded us occasional *mahser* (the Indian salmon), obtained by the rod.

Before I proceed any further with my narrative, I will try and describe briefly the four principal tribes we came in contact with. Probably the majority of my audience know all about them; but some may not.

First, the *Kamptis*, otherwise Shans, probably originally came from China; they are by religion Buddhists. Their history is, that three Shan brothers founded settlements of the Shan race at Mogong in Burma, in Assam, and at Bor Kampti on the Nam-kiu river. The Kamptis come from the same stock as the Siamese, with whom I believe they are identical in language, religion, customs, and dress. The Kamptis possess a written character. Their language is monosyllabic, and very much accented. Words spelt the same may express half a dozen different ideas, according to the way they are pronounced.

Whilst among the Kamptis I compiled a vocabulary of about 600 words, and obtained a few specimens of their writing.

As I have before said, their religion is Buddhism, but in a somewhat modified and tainted form, constant association with their neighbours, who are spirit-worshippers, has imbued them with ideas foreign to the true tenets of Buddhism. The dress of the men consists of a species of kilt and a jacket, and that of the women of a petticoat and jacket, the kilts of the men and dresses of the women resemble Scotch plaids, and they possess, like the Scotch, a large number of patterns and checks. The hair of the women is worn neatly coiled up and fastened with silver and bone pins. Amber earrings are in common use with both sexes. Every male carries a sword in a wooden scabbard.

Secondly, the Singphos or Kakhyens belong to the Tibeto-Burman race and are spirit-worshippers. They have a tradition of a partial flood, in which all the bad people in the plains were drowned; but that one family was kept by a spirit at the top of a mountain, and from this family Singphos (men) re-peopled the plains, when the waters subsided, at the end of eight ages of a man's life (about 500 years). The Singphos have a tradition that in the very beginning, there existed on the earth an old man ("Tinglá") and an old woman ("Gúmgai"). In the skies dwelt two spirits ("Nats") called Mútum and Mutá. The terrestrial beings had a son and a daughter; the son wandered about the earth, but the daughter was taken up to the skies by the celestial beings who finally brought her down and married her to the wandering man. From this pair sprang all men.

The marriage customs of the Singphos are simple. A youth should marry his cousin, his mother's niece if possible. Should a cousin not be available, the maternal uncle should arrange for a girl of his class. Should he be unable to procure one, the uncle goes to another family and says, "If you give me a girl for my nephew, I will pay you back in kind when one of your family requires a bride." The father of the youth then gives a feast and presents to the girl's family. Should the bridegroom's father not be in a position to give presents, he gives or sells one of his daughters to the other family in lieu of presents.

A feast given by the parents of the bridegroom (differing from our own custom), ratifies the marriage contract. It is customary for the bride to prepare and serve out the food to the guests on this occasion.

The dress of the Singphos is almost similar to the Kamptis. The men wear kilts and jackets, and the women petticoats and jackets. Married women wear their hair tied on the crown of the head like the men, unmarried women wear theirs tied close to the back of the neck and fastened with silver pins. On the whole, the dress of the men is comfortable and picturesque, and that of the women modest and neat.

During the time we were out on the exploration, I set myself the task of learning the Singpho language, which I found very difficult. My principal instructor was an interpreter and he was far from being an enthusiastic tutor. I found him what children would call "very

trying," and I dare say I was the same from his point of view. However, I managed to collect a vocabulary of about 700 words, and to write a rough outline grammar.

The Singpho language is peculiar for its combination of consonants, which render its pronunciation difficult to a European. There are a quantity of onomatopœic words, principally the names of animals. Many ideas, positive to our minds, such as bad, brave, are rendered negatively in Singpho, as not good, not cowardly. The gender in the brute creation is denoted in a peculiar way, by cutting off the first syllable of the noun and adding *lá* for the masculine, and cutting off the first syllable and adding *ví* for the feminine, as *shirong*, a tiger. *Ronglá* a male tiger, and *rongví* a tigress. I generally found my instructors "childlike and bland," but the following little anecdote will show that the veneer of his civilisation was only skin deep, and the interpreter being scratched, the Shan appeared. One day whilst receiving my lesson in the language, I happened to pull out my little Deringer pistol with my pocket handkerchief. Deori pounced on the pistol at once, and went into raptures over it. On my asking him why the little weapon struck his fancy so much, he replied, "It would be so easy to cover it up in the palms of both hands, approach a deadly enemy in an attitude of prayer and reverence with outstretched palms and so quietly shoot him through the head!"

Thirdly, the Mishmis. Those whom we met belonged to the Meju or middle clan. They are a small, active, and very dirty people, of a Mongolian type, flat noses, almond-shaped eyes, &c. Their dress consists of a kind of kilt and a woollen armless coat; their hair is turned up and tied in a knot at the top of the head. The women were neatly dressed, and some of them wore a broad band of thin silver round their heads. The men are armed with a short sword, and either a bow or a spear, a few have flint-lock muskets. A pouch of the skin of some wild animal is generally carried over the shoulders, and contains a pipe, tobacco, flint and steel, also some poison (aconite), to put on their arrow heads. The Mishmis exchange poison and musk deer pods with the Tibetans (whose neighbours they are) for clothing, salt, and swords; and they barter indiarubber, ivory, beeswax, and ginger, for salt, opium, and clothing, with the inhabitants of Assam. The religion of the Mishmis is a kind of spirit-worship. As is often the case among barbarous tribes, the men are much vainer than the women; both sexes, however, distend the lobes of their ears with enormous silver earrings. I thought the men, especially the boys, had sweet and musical voices.

Fourthly, the Nagas. The few scattered hamlets of this clan are situated on the north-western slopes of the Patkoi range. The Singphos and Kamptis always spoke of these Nagas as being subject to them. These people (who are quite distinct from the powerful Angami and Lhota clans of Nagas to the south and west) are miserably poor and

wear hardly any clothing; their arms consist of spears, cross-bows, and hatchets; their religion is spirit-worship; they are tattooed on the face, legs, and arms; their principal trade is in indiarubber.

I now take up the thread of my narrative. On the 12th of January, having completed all arrangements for our depôt and got up necessary supplies, I moved forward up the Dihing river, passing several Singpho villages *en route*. At one of these villages I visited the chief at his house. I was shown over the dwelling, which was, like all Singpho houses, built on piles about five feet from the ground, the eaves of the roof coming down to the level of the platform which formed the floor of the house. There seemed to be a plentiful supply of cats, which the Singphos onomatopœically called "miau." In the house and below the raised floor, pigs, fowls, and dogs abounded. The front of the house was decorated with the horns of cattle slain for feasts. I was offered some of the Singpho wine, called "shiru," and out of courtesy tasted it, but found, as I had suspected from my experience of Assam frontier liquor, that it was very acid and most unpalatable unless one was extremely thirsty.

On the 22nd Woodthorpe, having completed his survey work in the neighbourhood, joined me on the right bank of the Dapha river, where I had established a camp. The Dapha valley was about five miles long and one mile wide; it was covered with short grass, and abounded with deer. A few tigers had also taken up their abode in the valley, a fact which came unpleasantly home to our coolies, two of whom, poor fellows, were carried out of camp at night by a man-eater, who was, I am glad to say, eventually shot. In exploring the plateau to the east of the valley I came across some wild elephants, who, luckily, were quite as much frightened at my appearance as I was at theirs, and saved me the trouble of running away by bolting with loud trumpeting into the neighbouring forest.

From this valley we had hoped to have made the ascent of a peak called Dapha Búm (15,000 feet), búm in the Singpho language meaning mountain, but the route was found utterly impracticable, and no guides were to be had, so the idea was reluctantly abandoned, and we again started eastward, crossing the Dapha river waist-deep just above its junction with the Dihing (or Diyúng as it is locally called). We toiled along the river-bed for three days, sometimes picking our way over boulders of all sizes, from that of a cricket ball to that of a small house, and at others climbing along the precipitous sides of cliffs, making ladders of creepers and trees, or cutting footholds in the rocks to enable our laden coolies (hill-porters) to get along. There had been such a constant downpour of rain for these three days that the river-bed became impassable, and we had to halt for the next three days on some ledges of rock just above the water. When the flood subsided we started forward again, road-making the whole way.

Our freedom from accidents on this as on many other occasions, was principally due to Woodthorpe's engineering skill, and the intrepidity of the Ghurkas of the escort, who would hang over the *precipitous* side of the dangerous places, assisting the coolies with helping hands and cheery advice as to the best disposal of their feet. The difficulties of these marches were greatly increased by the heavy rain which, flooding the river below, drove us to the cliffs above. Not to dwell too long on the discomforts and difficulties, which, after all, are inseparable from pioneering in a country such as the north-east frontier of India. I may mention that we arrived at a place called Kúmki on the 14th of February, and right glad we were to get on a bit of level ground and have a chance of drying our damp and mouldy clothes and bedding. In the valley of Kúmki, which is triangular in shape and about two miles in length by one in breadth, we found two large Singpho villages; these villages had never before been visited by Europeans, and at first their attitude was a very sulky one, though we did all we could to conciliate them; the largest of the two communities did not bring in the customary offering of a fowl and a handful of rice, so we stood on our dignity (a good plan to adopt sometimes when dealing with semi-barbarians), and refused to have anything to say to the people till the usual presents were brought in by the head man. This was done eventually, and then some red cloths were presented to the head men, the musical-boxes were set going, and a display of fireworks given. The inhabitants of this little valley, which is situated on the left bank of the Diyúng river in East long. $96^{\circ} 56' 4''$ and North lat. $27^{\circ} 17' 10''$ at 3600 feet above sea-level, seemed to have a great idea of the power and influence of the Kampti Shans on the Nam-kiu river, and very little of that of the English. I think, however, that before we finally left the valley their ideas underwent a considerable change, especially after they heard how well the Bor Kamptis had treated us. I mention this, as although Kúmki is only 125 miles to the east of Sudiya, yet the valley had never before been visited by English representatives; Wilcox in his journey in 1826 having taken a more northerly direction after leaving the Dapha river.

Whilst at Kúmki I inquired about the manufacture of gunpowder, and was informed that the proportion of the three ingredients was as follows:—in 100 parts—saltpetre 70, sulphur 15, and charcoal 15. The Singphos obtain their nitre and charcoal locally, the sulphur they get from Assam and Burma; the powder is not granulated, and the Singphos use enormous charges in their old flint-lock muskets. The survey officers mapped out the surrounding country and we made several excursions to peaks ranging from 5000 feet to 7500 feet high, and distant from one to four days' journey. (I reckon the distances in days and not in miles, owing to the extreme inaccessibility of the country. On one occasion it took us three days to cut our way to the summit of a

peak, from which the return journey to camp was performed in seven hours.)

One narrow ridge along which we had to climb had a sheer cliff on one side, and on the other a few bamboos, which were ornamented with rings of sharp thorns at intervals of every three or four inches up the stems; of course, when the choice lay between lacerating one's hands by holding on for support to the thorns on going down the precipice, it "goes without saying" that we preferred the thorny Scylla to the rocky Charybdis. In some places along these ridges the bamboo jungle was so dense and matted together by the weight of the lately fallen snow, that we had to cut our way with the Ghurka knife, often disappearing bodily, slipping between the tangled masses of undergrowth, fortunate if we found our arms left free to commence the work anew of cutting a way out. We noticed on some of the less precipitous ridges where the stunted oak and the gorgeous rhododendron abounded, that rhinoceros had travelled over them, probably when making their way to the salt-licks in the valley of the Turong (the source of the Khyendwen river). I have noticed the marks of wild elephants at even higher altitudes than 7000 feet, but never before those of rhinoceros so high.

Often when the survey officer has succeeded in surmounting all the difficulties of the route up to the summit of a peak, which he has cleared of its trees, he is foiled by the perversity of the atmosphere, which will not afford him the view for which he came. I remember how, in 1875, Colonel Godwin-Austen (who did such splendid survey work in the Sub-Himalayan ranges on both banks of the Brahmaputra), Mr. Ogle, and I remained one stormy week amid snow, sleet, and hail on Mount "Shengore," 7000 feet high, in the Daphla Hills, without getting a view. We were literally a week in the clouds.

On the 5th of March we were all back in camp at Kúmki, not sorry to have our feet once more on level ground. On going through a Singpho village on our return, I, being anxious to air the little knowledge of the language I possessed, called out to (what appeared to me) an ancient dame, addressing her as "Gúmgai," old woman; the lady was very angry, and shouted out, "I am no more an old woman than you are; if you want to see an old woman, I will show you one," and going into the house she produced from the fireside a little old wizened creature whom she pushed forward, saying, "Now, there is an old woman for you." I pacified the Singpho ladies with some tobacco, and retired, feeling properly snubbed for having been so ungallant as to allude to a lady's age.

On the 8th of March, having got up some supplies from our depôt on the Dapha river, we turned our faces eastwards again, and after five days' hard marching we arrived at the very head of the Dihing river, which was here, at a height of nearly 8000 feet, a tiny rivulet, being near its

junction with the Brahmaputra, over a mile in width. We had great difficulty in procuring a guide, and we had got two marches from Kúmki, when our guide announced his intention of returning. However, with the bribe of a gun, we persuaded him to accompany us. The man amused us much by sending off the gun by a slave to be placed with his Lares and Penates at his village, and on being interrogated as his reason, he replied, "Who knows what will happen to your party; *my* reward will at any rate be safe."

The second day's march from Kúmki we bivouacked for the night on a charming plateau, covered with short grass and dotted here and there with clumps of trees. This plateau about 100 years ago was inhabited by a race of men called Mulliks, probably one of the so-called Naga clans, who originally came from the neighbourhood of the Nongyong Lake, south of the Patkoi range. These Mulliks, who seemed to have been a most inoffensive people, were ousted from their lands which they had cultivated on the Diyúng river by the Kamptis and Singphos, particularly by the latter, and the majority had been either killed or enslaved.

Soon after leaving this plateau, which was 4300 feet above sea-level, we struck a track which our guide informed us led to the Khyendwen valley. On this march some of our coolies broke down, and one was not able to carry himself, much less his load, so Messrs. Ogle, Grant, and La Touche carried the sick man by turns; and I must mention that this was not the only occasion that sick natives were carried by the Europeans of the party, our young doctor especially being always well to the fore in helping to get sick men along. That night we camped at an elevation of 7500 feet. There was no level ground, so we had to scoop out holes to lie in on the mountain side and make the best of it.

The following day, tramping along through the damp rank jungle, we came suddenly on an old Kampti and his son. The old man was very weak and ill, and could not proceed. We got one of our men to carry him up and over the pass; but the poor man was too far gone, and died on the road. At the little stream where we found the dying Kampti my aneroid read 7100 feet, and it was from this place that the ascent of the pass began. A comparatively easy climb of 1200 feet brought us to the summit, up to which there was a considerable quantity of snow lying about in patches. It was hard work for our coolies, wading through the melting snow. We Europeans were so delighted to be up to our knees in snow, which reminded us of home, that we began to imagine we were schoolboys again, and tried our hands at snowballing. To all the natives, except our guides, snow was quite a new experience, and one Assamese youth amused us by announcing his intention of filling a bottle full and taking it back to Assam to show his friends what a strange thing he had met on his travels!

Up to this (12th March) we had generally travelled together, but as

Woodthorpe and I had made up our minds to visit the Kampti Shans and the valley of the Nam-kiu river (the western branch of the Irawadi), and also to return into Assam viâ the Turong river (the Khyendwen), crossing the Patkoi range near the Nongyong Lake.

We therefore separated from the rest of the party, taking with us four Gurkhas, and travelling very light. As we were all short of rice, we only took enough to last us into the Kampti country. Messrs. Ogle, La Touche, and Grant, were all anxious to accompany us, but we could not manage provisions for the whole party, so they returned viâ Kúmki to our depôts at Dapha and Indong. Of course our guide said it was utterly impossible to go on, and that he would not answer for the consequences; however, when he was informed that we intended to go on with or without him, he waived his objection, and off we started. After a dreary march in the pouring rain, we camped that night at a place called Mokoshat (7500 feet). I may mention, once for all, that it poured with rain night and day, all the six days' journey to Bor Kampti.

At Mokoshat, our interpreter said that the downpour was owing to our party burning bamboos, which, being filled with water, exploded, and he was continually calling out, "Don't make a noise, or the Deity will send more rain." Frank Hatton mentions that the same idea obtains among the Dyáks in North Borneo. My companion (Woodthorpe), who had been more or less ill all day with fever and a bad sore throat, became very ill during the night, and I was very anxious about him; however, the next morning he was a little better, so we commenced to climb the Mokoshat mountain (one of the spurs running down from the Phungun range). Having attained a height of close upon 9000 feet, we descended, and making way through the melting snow, bivouacked at a height of 7500 feet. It had been so stormy the whole day, hail, sleet, and incessant rain, that unfortunately we got no view whatever, and it was the same on our return. Our guide informed us, that on a clear day, the Brahmaputra to the west, and the Irawadi to the east, can be seen from the Mokoshat mountain. Owing to the intense cold, and the driving hail and sleet, which caused the track, which we with difficulty made out by the "blazing" of former travellers, to be very slippery, our progress was very slow, and we had to halt on the hill-side without water, except what we got from the skies above. Darkness came on, and our guide ensconced himself in a hollow tree from which he could not be persuaded to budge. Seated cross-legged in his shelter, with a fixed and vacant look on his stolid countenance, he reminded me of a picture I have seen somewhere of "Saiambu," a Hindu deity, called the self-existent and self-complacent one.

On the sixth day, after leaving the bulk of our party, we arrived at the stockaded town of Langnu. There had been a dreary sameness about all our marches; tramping along through the damp rank jungle, all

sodden under foot, had a depressing effect, and we almost imagined that we were being gradually absorbed into the mass of decaying vegetation which existed above, below and around us; it was almost a relief when the route, as it often did, lay along the rocky beds of mountain streams.

Thunderstorms were very frequent. I always think they are grander and more impressive at high altitudes, the crashing among the trees and the awaking of a thousand echoes on the mountain sides, has a greater effect when one is out in the open, especially at night. Apropos of thunder, the Singphos have rather a poetical way of expressing it—for it thunders, they say, “*mou sigadé*,” the cloud is calling out. On our way to Langnu, the site of a Kampti bivouac was pointed out to us where ten Kampti traders on their way back from Assam had been recently surprised and massacred by Singpho robbers, and we were warned to look out on our return journey. The Kamptis afterwards told us that if it were not for fear of Singpho robbers there would be much greater intercourse between the valleys of the Irawadi and the Brahmaputra.

Our great anxiety on arrival at Langnu was on account of food for our coolies and our four Gurkhas, so Woodthorpe and I walked into the town to interview the raja; we were conducted to the town hall, a thatched house with a raised platform, in the centre of which was a fireplace, and after a long delay the raja came in state with Burmese gilded umbrellas carried over him and his brother; gongs were beaten and occasionally a musket was discharged. Among the retinue a conspicuous figure was an individual called the Tongnu, who was dressed in a kilt, a black goat-skin coat and a Burmese red lacquered helmet (somewhat like a fire brigade man's hat); this man's duties are of various kinds, he seemed to combine the office of master of the ceremonies with that of chief of the police. The Kampti Raja said that if he had known we were coming he would have gone to meet us; but I think this was only “a manner of speaking,” our sudden and unexpected descent on the valley probably saved us the mortification of being turned back had the Kamptis got wind of our intention. On the whole we had an amusing and satisfactory interview; rice was promised us and the promise was handsomely redeemed. After the interview we were shown over the stockaded town; the stockade was a double one, 11 feet high with a banquette of earth about four feet high; we were told that the slaves had built the stockade, and were also informed that all the slaves would gladly go to Assam if they could; this I do not believe, as the slaves (so called) seemed perfectly happy and contented. With the exception of a few cases of goitre, the Kamptis seemed a healthy people; a few old people complained of rheumatism, for which we gave them some vaseline, the rubbing of which would do the affected parts no harm (and I am afraid not much good).

A few wild, uncouth-looking Singphos from the adjacent hills

came fully armed into our camp, and the Kamptis seemed much relieved when they had taken their departure. Some Kunnungs came to have a look at the two white men; they inhabit the country to the north-east of the Kampti valley, and are an extremely gentle, pleasant-looking people, small in stature, rather fair in complexion, with their hair cut short in a fringe over the forehead; they had melodious voices and pleasant smiles. I wrote down a few words of their language, which to a certain extent resembles the Singpho, about five per cent. of the words being identical. The Kunnungs are famous for their "daos" (short swords), which they manufacture from iron extracted by them from the ore found near the Nam-Tisán river. They also extract silver from ore which they obtain eight days' journey to the north-east of Langnu. We brought back a small lump of silver ore, which, when assayed at the Bombay mint, was found to yield $12\frac{1}{2}$ ozs. to the ton. Afterwards, when we visited the chief raja of the Kamptis at "Padao," he said if we would visit his country again he would send us to the silver mines; and he seemed anxious to obtain the services of men who could extract the silver from the ore.

On the 20th March we started for the western branch of the Irawadí, called by the Singphos M'Li-kha ("Kha" being Singpho for river), and by the Kamptis the Nam-kiu ("Nám" being Kampti for river) (the Singphos and Kamptis respectively describe the Irawadi during its whole course to the sea as M'Li-kha and Nám-kiu).

After crossing the Nam-lung river by means of canoes formed out of hollowed trees, we kept along the left bank of the river for six miles, until we came to a large stockaded town called "Langdao." The people objected to our going through their lands to the river; but after an interview with the raja, with whom we shook hands (somewhat to his astonishment), we were allowed to proceed, and three miles further on we struck the Nam-kiu, the western branch of the Irawadi just *above* where it is joined by the Nam-lung. Here we found the river about 85 yards wide, and not deep, in no place more than five feet. The mouth of the Nam-lung is in E. long. $97^{\circ} 38' 30''$ and N. lat. $27^{\circ} 15' 30''$, and 1630 feet above the sea-level.

The river up stream was very pretty, and Woodthorpe made a charming sketch of it, with its "couch of snows," the lofty Nam-kiu mountains to the north as a background. On inquiring, we were informed that to the east, three days' journey off, a river called the Nam-Tisán flowed parallel to the Nam-kiu, joining it lower down. Between the Nam-kiu and the Nam-Tisán we could see a mountain range which was called by the Singphos T-chet Búm. To the east of the Nam-Tisán (or Disán), and five days' journey from that river, another range existed called the Nogmún or Noikon (from this range the Kunnungs obtain the silver ore), to the east of which flowed the Nam-Dumai or Phungmai. This river the Kamptis said was the same size as the

Nam-kiu, that it was formed by three streams which had their origin in the Nam-kiu mountains, which we saw to the north and north-east of the place where we stood (viz. on the right bank of the Nam-kiu, just above the mouth of the Nam-lung). The Kamptis told us that all the branches of the Irawadi have their origin in the snowy range to the north and north-east. The Kamptis said that sometimes a trading party went to China (which they called "Khé Moung"), that the journey took them one month and eight days, that they had to cross in boats two big rivers (after having crossed the Nam-kiu, the Nam-Tisán, and Nam-Dumai). The traders bought opium in China at the rate of 10s. 6d. a pound, but they said it was not so good as the Assam opium, which they could obtain after a journey which only took them half the time it did to go to China; the opium of Assam cost them, however, about 30s. a pound. The Kamptis are not such inveterate consumers of the juice of the poppy as the Singphos. We found that the drug answered very well in the place of money when we bought rice for our party; but, of course, it was very sticky stuff to cut up and divide into small particles, as each individual only brought us a few pounds of rice, and we had to pay each person separately at the rate of a penny a pound; it was a tedious business, and as the people would only transact business with the two white men personally, we were not sorry when the day's bartering was over. We found the Kamptis strictly honest in their dealings, and if we paid a person for ten pounds of rice and only received five pounds at the time, he or she would go back to the town, and bring us the balance without fail later on.

After we had visited the Irawadi we returned to Lungnu very tired, as the day had been excessively hot, and I suppose we felt the heat more, having recently been travelling at high altitudes, between 7000 and 9000 feet; the descent to 1600 feet was somewhat trying. At night we were disturbed from our slumbers by some armed men who came yelling into our camp. We turned out, weapons in hand, thinking that the Kamptis had changed their minds about us; but discovered that our midnight visitors were messengers sent by Lukún, the chief raja of the Kamptis, and that he invited us "to repair to the metropolis." To pay Lukún a visit at Padao was just what we wanted. So we started off the following morning, taking two Ghurkas with us. After being ferried over the Nam-lung our route lay along a level valley covered with short grass and dotted here and there with clumps of trees; the valley is divided into three plateaus, Langnu being on the most southern, and Manchi on the most northern. In the old maps Langnu and Lang-dao were put down under the names of Mung Lung, and Padao (which is now the capital), was called Mung Kampti (the meaning of which is simply the Kampti country). The extreme length of the valley is 25 miles, and the average breadth about 12 miles; and the height above sea-level varies from 1500 to 1800 feet. The number of inhabitants does not

exceed 12,000, and they are divided amongst 13 villages, the most powerful of which are Padao and Manchi. The soil of the valley is very fertile, and very large crops of rice are grown, the rice being stored in excellent granaries. Blood feuds between members of different communities are not unfrequent, and the Kamptis seem to have a lively dread of the surrounding Singphos; otherwise the Kamptis lead a quiet, peaceful life, and are certainly the most intelligent and best behaved people on the north-east frontier. The Kunnungs, who inhabit the lower ranges in the vicinity of the valley, are nominally the vassals of the Kamptis, to whom they pay tribute.

After a nine mile walk, we found a large crowd of armed Kamptis awaiting our arrival, and the nephew of the raja who had brought a couple of ponies for our use. The carved wooden saddles were most uncomfortable, and stirrups very tiring (probably made to fit the naked big toe of a Kampti); however, as our friends evidently intended to do us honour, we mounted, and in noisy procession went to Padao. Muskets were discharged, gongs beaten, and banners and gilt umbrellas were waved overhead by an enthusiastic escort. *En route* we passed some small Buddhist temples with gilt domes, under which were enshrined the usual images of Gautama. Arrived near the capital we were met by the raja's two sons, who informed us that their father was at his country residence on the Irawadi, that he had given orders for us to be well received and that he would visit us. We tried to get a little rest, but closely surrounded as we were by a dense crowd of about 2000 people of both sexes and all ages, rest was impossible. I was very unwell, the sun having affected me the previous day, so crept into our little tent to lie down, whilst Woodthorpe, with his usual good nature, tried to draw the crowd off me by getting out our stock in trade of toys, &c.

Amongst our toys, we found that a dancing doll with golden hair, who (when she was wound up) fired off a pistol, was the prime favourite, the Kampti ladies being very curious in examining the various items of the doll's dress; a growling bear, and a jumping frog were also in great request.

We paid several visits to the town of Padao, which was surrounded by a strong stockade. The raja's dwelling was inside an inner stockade, and at the time of our visit, a new palace (save the mark!) was being erected for the potentate.

On the day following our arrival the raja was brought in with great pomp from his residence on the Nam-kiu river. He was a fine-looking shrewd old fellow, with a certain amount of natural dignity, and seemed to have considerable authority over his people. Before our departure Woodthorpe made a capital sketch of the chief and coloured it; the raja asked that it might be presented to our Queen concerning whom we had told him, dilating on the immense power she possessed, and trying to

give him an idea of the vast extent of country she ruled over in all parts of the world.

The open air darbar which was held in our honour was a pretty and curious, if not a very imposing, spectacle. The chief raja sat cross-legged on a curious carved wooden couch, which was flanked by gilt representations of dragons and covered with a crimson cloth. All the people were decked out in their bravest apparel. Numerous large Burmese gilt umbrellas were held aloft over the inner circle, which consisted of Woodthorpe, myself, our two little Gurkha soldiers, and the raja's party. We were surrounded by over a hundred Kamptis, armed with flint-lock muskets, behind whom stood dense rows of spearmen. The master of the ceremonies, who was gorgeous in a Chinese dress, resplendent with dragons' heads and flowers, amused us very much. Armed with a long stick, he went round during the time the darbar lasted, tapping with no light hand the heads of the front rows of spectators, making them sit down so that those behind could see. The "long stick in waiting" did not seem to discriminate between the bondmen and the free in the force of the blows he administered, but I must do him the justice to say that he "lightened his hand" considerably when tapping the neat, prettily decorated head-dresses of the Kampti ladies who were mixed up with the warriors. Presents were exchanged, and questions asked on both sides. We asked again about the rivers to the east, but the Kamptis only gave us the same information they did near Langdao. The raja said if we could stop he would send us with guides to the silver mines, which he said were eight days' journey to the north-east. Unfortunately we could not stay, as we knew it would be very difficult to get back to Assam as it was.

Our intention was to start at once and carry out our original intention of striking south from Kúmki, and crossing the Patkoi range into the Khyendwen valley, and re-crossing the Patkoi range into Assam, near the Nongyong Lake. This programme we carried out, but with great difficulty, owing to the lateness of the season and the consequent increase in the size of the rivers. Had we remained any longer in the Kampti country we should have had to remain there for another eight months. The Kampti chiefs treated us most kindly, and said they would always be glad to see us again. We returned to Langnu, and on the 25th March commenced our return journey. Before our departure the Buddhist priest, with two of his acolytes, came to wish us God-speed, bringing with them rice and flowers, which they scattered before us, and chanted prayers to the effect that we might have a safe and speedy journey back, that Singpho robbers might not molest us on our path, and that our sick coolies might recover. We were both much pleased with this attention on the part of the Buddhist priests. The Raja of Langnu insisted on sending his brother and half-a-dozen musketeers to accompany us for the first three marches to protect us

against the Singphos, who, the Kamptis asserted, were always on the watch to waylay travellers. With the exception of having our camp invaded by a herd of wild elephants one night, and the usual difficulties of crossing flooded rivers, &c.—difficulties which Woodthorpe's engineering skill and the good work of our Gurkhas soon disposed of—we arrived, on the ninth day after leaving the Kampti country, at Kúmki again. We were most fortunate, just in time in crossing the Diyúng river, as an hour after we had crossed, the river, which was seventy yards wide, became unfordable, and, I believe, remained so for three weeks. On arrival at Kúmki we found, as had been previously arranged, that the bulk of the Survey camp had gone down the banks of the Diyúng to Indong, a small guard with some supplies being left for us. The Diyúng being in a very flooded state, the party, under the able leadership of Mr. Ogle, had (we afterwards learnt) a very rough time of it, and all the three Englishmen of the party, Messrs. Ogle, La Touche, and Grant, had vied with each other in helping the sick coolies over the dangerous places on the route.

I must relate one incident, showing what real good men Gurkhas are. A non-commissioned officer of the 44th Regiment (Gurkha Light Infantry) who had been sent with three soldiers in charge of some rice for us, to await our return on the Assam side of the Chanka Pass, the man thinking something must have happened (we were a few days overdue), took his little party over the snowy pass, and was on his way into the Kampti country to aid us when we met him.

On the 5th of April, Woodthorpe and I left Kúmki and crossed the Patkoi range at an altitude of 5500 feet. For a week we marched down and along the banks of the Turong river (the head water of the Khyendwen); the route was a very bad one, principally owing to the flooded state of the river, which compelled us either to wade waist deep in the torrent, or else to clamber over the huge slippery boulders and cut footholds along the face of steep cliffs. Each day the rain descended in greater torrents and the leeches became if possible more ravenous. We noticed that there were hardly any birds in this region, and the only living things we saw were a couple of tigers, several deer, and some enormous pythons; there were a great quantity of indiarubber trees, some of which bore signs of having been recently tapped by Nagas. At the end of the seven days we came to a small collection of Singpho hamlets, the inhabitants of which seemed very much astonished at seeing us.

We hurried on, as we were short of food, and could surmise what a flooded state the country in front of us was in. On the third day after leaving the Singpho villages, which are situated on the right bank of the Turong river, just above the mouth of the Loglai river (which we had to bridge), we crossed the Nongyong river, partly by swimming and partly by wading, and passing by a piece of water three-quarters of

a mile long and half a mile broad, called Nongyong Lake (which has been fully described and accurately sketched by a Mr. S. Peal, who visited it some years ago), we crossed the Patkoi range at 2860 feet above sea-level, and once more were in Assam.

For the next three days we waded down rivers when we could, and cut our way through the dense cane jungle when we could not, till we were brought up with a round turn by a deep rapid river about 60 yards wide; as we had no food left, and no immediate prospect of crossing the river, a Gurkha swam across to bring us assistance from our party, who were at Indong, a day's journey off. After the departure of our messenger we set to work to make rafts of plantain trees and bamboos, and the next day we crossed our party without losing a man. Woodthorpe (who worked one of the rafts backwards and forwards himself) was as usual most indefatigable; even our phlegmatic old interpreter bestirred himself (seeing that starvation was imminent), and took the whole morning to make a raft for himself, which he capsized as soon as it was launched! The following day we were glad to meet our Gurkha messenger, who was accompanied by Dr. Grant with supplies of food, and on arrival at the Dihing river, which was now about half a mile wide, we found the other members of our party ready to help us to cross with canoes lashed together. The river rose so rapidly that night, that we were not able to cross for three days. After crossing the river Dihing we retraced our steps to Sadiya, and arrived there the end of April, after having been travelling for four months and a half.

The distance from Sadiya to Padao, the capital of the Kampti Shans, is 197 miles, and now that the route is known and surveyed, the journey could be performed in three weeks. Owing to the sparsity of inhabitants on this route and the physical difficulties of the country, I should not think that it would ever do as a possible trade route to China; however interesting it might be to revisit the Kamptis with a view of acquiring more geographical knowledge of the country to the north and east.

The distance from Sadiya over the Patkoi range and *viâ* Nongyong to the mouth of the Loglai river (i. e. where it joins the Turong) is 103 miles, and the journey could be performed in ten days; from the Loglai river to Mainla *viâ* Bisa is about 150 miles. In the dry season the journey from Sadiya to Mainla could be performed in three weeks. On this route there are very few inhabitants, but the country is said to be easier to travel over than the route to the Kampti country. The distance from Mainla to Bhamo is about 130 miles, and the journey can be made in native boats down the Irawadi. Mainla is a Shan town, situated on the left bank of the Phungmai river (the eastern branch of the Irawadi) at its junction with the Nam-kiu (the western branch).

In conclusion, I must express my regret that my old friend Colonel Woodthorpe, who has only just returned to India with the Gilgit Mission,

was not able to write and read you a paper on the journey we took together; he would have been able to give you a much more interesting account of the country and people we saw. I cannot do better than finish by quoting and heartily endorsing the words of Col. Godwin-Austen, in the paper read before the British Association at Aberdeen last year:—"Col. Woodthorpe possesses all the qualifications that make the successful explorer. Great powers of endurance and observation, zeal for his work, brave but cautious, a talented draughtsman, and last, but not least, the tact to make himself liked by the people of the country"; and I may add, by all those who have had the pleasure of travelling with him.

After the reading of the above,

Colonel YULE said he was delighted to hear the testimony which Major Macgregor in his interesting paper had borne with regard to his fellow-traveller, Colonel Woodthorpe; an officer with whose remarkable enterprises the speaker had been much impressed for the last seven or eight years. Colonel Woodthorpe had made several remarkable journeys to the north-east of India, but his explorations had not been confined to that region. He had just returned from a journey in the extreme north-west, beyond the British frontier, through passes which had never before been trodden by any European. Of all geographical problems in Asia which had been dealt with by the Society for many years past, no two had interested him (Colonel Yule) more than those relating to the sources of the Irawadi and the sources of the Oxus. Colonel Woodthorpe had been an explorer in both those regions. The result of his last exploration in the Oxus region had not yet been published, and he believed there were political difficulties in the way of their publication. He was glad also to hear how Major Macgregor had spoken of one whose name perhaps was not very familiar to this generation, but who deserved the highest honour—Lieutenant Wilcox. Sixty years ago there was no more promising explorer or British traveller in existence, but his career was short, and he had been almost forgotten by those who were not specially called upon to study the results of his travels. But every man who had occasion to examine the many problems connected with the sources of the Irawadi must be familiar with the name of Wilcox. Some years ago, when the everlasting question of the source of the Irawadi was discussed at a meeting of the Society, a gentleman who took the heterodox view spoke disparagingly of Wilcox, because apparently Wilcox's facts were contrary to his theories. On that occasion he (Colonel Yule) was called on to speak, and he said a few words on the subject which he might appropriately quote now. "Wilcox was not a man who ought to be treated as this gentleman had treated him. He was one of the most intelligent and competent of writers on geographical subjects, as well as a great traveller. No one could read his papers in the 'Asiatic Researches' without being struck by his acuteness and accomplishments." He was therefore glad to hear how thoroughly Lieut. Wilcox had been appreciated by the most recent travellers in that region. There was another point more personal to himself which he should like to call attention to. Major Macgregor had spoken of the excessive moisture of the region through which he travelled, and the enormous discharge of water which that must send down not only towards the valley of Assam, but also towards the Irawadi. On the occasion to which he had alluded, dealing with some of the assumptions that had been put forward, he (Colonel Yule) said, "It was vain to assume quantities of rain in a country about which there were no data. It was very possible that the rainfall near the sources of the Irawadi was very excessive, the position being like the end

of a great funnel. Colonel Prejevalsky had ascertained a fact which was entirely new to geographers and physical philosophers. Where the Hoang-ho left the mountains forming the north-west boundary of China, he came suddenly from the dry steppes of the north upon a mountain country of the most extraordinary moisture; and further south Abbé David, who went up the Yang-tsze-kiang into the eastern part of Szechuen, came upon a continuation of the same country. He stated that if a man fired a gun he brought down a heavy shower of rain! The supposition of excessive rainfall north of Kampti was very probable, from what was known of the Kasia Hills, where the rain was most excessive. He thought it very possible that the key to the extraordinary discharge of the Irawadi might be that there was an extraordinary rainfall among the hills. But the question might be considered from another point of view. The Mogoung river-mouth was the highest point on the Irawadi that had been reached by any European travellers from Burma. Colonel Hannay, Dr. Bayfield, and others were all obliged to leave the Irawadi there, and to go towards the Assam hills. They were all struck by its magnitude at that point, as was also Dr. Griffith, who was perhaps the best observer among them. But many years ago he (Colonel Yule) calculated the basin of the Irawadi above that point, and he found it to be about the same as that of the Rhine at Cologne. And it was easy to imagine what a tremendous flood the Rhine would be if it were fed by only one-half the rainfall of the Kasia Hills! "That was a long shot, and he was rather pleased to learn from Major Macgregor that it hit the mark.

General J. T. WALKER, R.E., said it was a great gratification to him to hear such an interesting account of the expedition, and to find that Major Macgregor had written so kindly and enthusiastically of his old friend, Colonel Woodthorpe, who was one of the ablest and best officers in a Department which contained many able and excellent men. It would have been a great pleasure to Colonel Woodthorpe to have read a paper on the subject himself to the Society; but he happened to be one of those willing horses whom Governments were very glad to have an opportunity of riding, and no sooner had he returned from his expedition to the Upper Irawadi than he received a telegram asking him if he would be willing to accompany Colonel Lockhart's expedition from Gilgit to the Hindu Kush range and Afghanistan. The authorities knew all he had gone through, and they had some qualms of conscience as to whether it was quite fair to him to send him off immediately on another arduous expedition; so they telegraphed to inquire whether he felt up to going. Of course, he replied that he was quite ready to go, and he joined the expedition very speedily; but I have been told that on his arrival Colonel Lockhart, seeing how worn and wan he was, said he was afraid a mistake had been made in asking him to come. However, it turned out that so far from being a mistake, it was a good thing for Colonel Woodthorpe. The bracing climate of Afghanistan and the Hindu Kush did him a great deal of good, and was as good for him as a visit to his native country. He had done admirable work on that frontier. Twice he had crossed the Hindu Kush, and although political reasons prevented the immediate publication of his work, it was to be hoped that it would be published eventually. No sooner had he returned to Simla than he volunteered to go to Assam and explore the proposed line of railroad down to Bano in Upper Burma. The Government decided on postponing that undertaking for the present, but they gladly availed themselves of his services, and sent him to Burma, where he now is.

The line of country through which Colonel Woodthorpe and Major Macgregor passed was not an easy one in which to carry on a continuous survey, but the position of the Irawadi and its distance from Sadiya were fixed by Wilcox sixty years ago within two miles of the position recently determined by Woodthorpe. A year and

a half ago Mr. Gordon read an elaborate paper to the Society in which he endeavoured to prove that the Sanpo river of Tibet came down into the Irawadi, and was in fact the upper source of that river. He carried it over a course which was almost precisely identical with a range of mountains indicated on the wall-map illustrating Major Macgregor's paper, and then down into the Irawadi, crossing the course of the Lohit Brahmaputra, as given by Wilcox from native information. Mr. Gordon said he was quite ready to accept everything that Wilcox had done personally, but not what he got from native information. Only a very few weeks elapsed before Mr. Gordon's conjectures were conclusively negatived. Lieut. Needham travelled from Assam up to Rima, and showed that the eastern branch of the Brahmaputra flowed continuously from Rima into Upper Assam. It was therefore perfectly impossible that any river could cross this region and pass into the Irawadi. A second corroboration was obtained by the work of Colonel Woodthorpe and Major Macgregor, who had reached Mr. Gordon's Irawadi, and found it only 60 yards broad, and not more than five feet deep, rising in hill ranges immediately to the north, and not a continuation of the Sanpo, which rose 1500 miles away in Western Tibet. These were very valuable geographical facts, and he was glad to find that his old friend Colonel Woodthorpe had been able to throw some light on the question of the sources of the Irawadi.

Dr. G. WATT said that Manipur, through which he had travelled, was a small valley surrounded by a series of mountain ranges, and to reach it from Cachar nine ranges had to be passed over, crossing in most cases the same river, which flowed backwards and forwards in a most circuitous way. In the valley of Manipur the rainfall was only about 39 inches, or the average of Great Britain, but 17 miles off on the mountains which formed the north-east ranges, the rainfall was as much as 120 inches, and towards the Naga country to the north it became greater and greater in certain limit tracts. In the Khasia Hills 600 inches might fall in one place, and 20 miles off only 50 inches. Such transitions were very frequent. The word Naga was applied to many of the races along the north-eastern frontier of Assam. From some of the things exhibited to the meeting he fancied that Major Macgregor and his party had got into one or two of the extreme ends of the Naga country proper, probably a branch of the Angami Nagas. The kilt on the table was an Angami one—the symbol of a triple murderer. When a man took the head of one enemy he was allowed to wear one row of shells on his kilt; when he killed a second he might wear two rows, and when he killed a third he might wear three rows, but after that no more rows of shells were added to the kilt. Another specimen on the table was the "V.C." of the Angami Nagas, which was worn by their heroes. It differs very little in style from that met with in the south-west, the head-quarters of the Angamis. The country of the Angami Nagas was a little to the south-west of the Singpho country. One of their peculiarities was the social system which prevailed in their villages. A village was divided by one or two walls into different sections, or *khéls*, and each section was occupied by a distinct branch of the Angami Naga family, often speaking different dialects, never intermarrying, and knowing nothing of each other, but occasionally fighting with one another, and still they were only divided by walls. A common house was erected at the meeting points of the wall, and there the young men of the village watched night and day what the members of the other *khéls* were doing.

One point with regard to the rainfall was worthy a passing remark. Nothing in Manipur struck him as a botanist more than the remarkable transition of vegetation in that small region. Major Macgregor had alluded to the oak and the rhododendron, but he (Dr. Watt) gathered twelve or more species of oaks, many of which were new to science, and ten or twelve species of rhododendron in Manipur

alone. It would be extremely interesting to know what particular oaks and rhododendrons the recent expedition came across. One of the rhododendrons in the Naga Hills was found in the Himalayas by Sir Joseph Hooker, and it was named after a distinguished officer, *Rhododendron Falconeri*. This species was nowhere met with in the immense tract of country between the Naga Hills and Sikkim. There was also the *Rhododendron Dalhoussei*, an epiphytic rhododendron which grew on a hill 30 miles north of Darjeeling. When he went up to the Naga Hills he found these species throughout the whole country, at an altitude of about 6000 to 8000 feet, and these rhododendrons never occur in Sikkim below 10,000 to 13,000 feet. There were many instances of plants falling in their altitude as the traveller passed to the east and south-east from Sikkim, until at Moulmein a rhododendron was found growing near the sea, a circumstance which was not met with in any other part of Asia. Primroses showed the same tendency to falling in their altitude in the direction indicated. He was inclined to think that there was something in that region which, apart from pure geography, was of vital interest. Sarameti, which was under 13,000 feet high, the natives said had snow all the year round, whereas on the Himalaya the lowest point on which snow occurs is 17,000 feet. He himself was on the shoulder of Sarameti in May, and it was then covered with snow, and in April, when he went to the top of Japvo, in company with the Chief Commissioner of Assam, he enjoyed snowballing with one or two companions at an altitude of 9000 feet above the sea. In Manipur the whole valley, 3000 feet high, was covered with hoar-frost in December. He thought this was a point of very great importance, and one which should be thoroughly investigated; what was the cause of this falling of altitude in the vegetation? Major Macgregor had travelled with Colonel Woodthorpe and Mr. Ogle; with the latter gentleman, he (Dr. Watt) had had the pleasure of sojourning for three or four months in the Naga country, and the officers of the Burma Manipur Expedition, so ably conducted by Colonel J. Johnstone, had obtained a good deal of information, but much still remained to be done, not only in settling the head-streams of the Irawadi, but in exploring the many other points of interest in that region.

Mr. J. ANNAN BRYCE said his experience of those regions was at a lower level than that described by Major Macgregor. But there were one or two points with regard to which he thought some information was desirable. He wished to ask Major Macgregor, if it ever became necessary for the Government of India to have a railway from Assam to Burma, at what point his experience would suggest that it should be constructed. Another question he desired to ask was whether he thought a trade would ever be developed between the upper regions of the Irawadi and the valley of Assam? Reference had been made to the Singybos trading in indiarubber, and he would like to know if that and the other articles produced in the upper valley of the Irawadi at present found their way down to the lower reaches of the river, or across the Patkoi range into Assam. Mr. Gordon in his theory with regard to the sources of the Irawadi entirely underestimated the actual facts. The river Linwin rose to an enormous height during the rainy season, to 40 and 50 and 60 feet above the dry season level, and yet Mr. Gordon in his discussion of the question assumed that the rainfall on the Linwin was *nil*.

Major MACGREGOR said it would be very difficult to construct a railway from Assam to Burma, but from Makum, where there was now a station, it was not impossible to make a railway over the Patkoi Pass via the Nongyong Lake to Mainla. It was not impracticable to do that, but at the same time he considered it very difficult. He did not consider that the Kamti Shan country would be a good trade route to China. The only trade route that could be established would be over the Patkoi range, which could be crossed at 3000 feet, and so on to Mainla, from whence

he believed a fortnight's journey would take the traveller into Yunnan, where there might be some trade, but he was not sufficiently acquainted with that region to say whether there was much trade or not. Most of the country through which the railway would pass was very desolate. With reference to Mr. Bryce's question about the destination of indiarubber and other articles produced in the upper valley of the Irawadi, Major Macgregor stated that at present all articles were taken into Assam where there was a settled government and a good market, and were shipped via the Brahmaputra and Dhubri line of railway to Calcutta.

Mr. HOLT HALLETT said that Mr. Colquhoun and himself had proposed the connection between India and Burma, so as to join the Indian with the Burmese railways, and did not propose the construction of a railway over the terrible hills, to the east of the Upper Irawadi, into China. Their route to China lay in a north-east direction, starting from Maulmain, a seaport at the mouth of the Salween river. The Burmese railways were now being constructed to Mandalay, from thence they could be extended to Bhamo, and they certainly would be before long. From Bhamo they propose that the line shall be extended through the Tsenbo defile, which lies five miles to the north, and is 20 miles in length. This defile narrows the river Irawadi in one place to 50 yards, and could be easily crossed at some convenient point by the railway. From the north end of the defile the line would be continued up the basin of the Mogoung river into the Hookong valley. Officers who had passed over this route stated that between Mogoung and the Hookong valley they did not pass over mountains, but only among small spurs or hills. Proceeding from the Irawadi there would be no heights to cross between the Hookong valley and the Nongyong lake, which lay near the Patkoi Pass, as the Nongyong was a tributary of the Turong, which is a branch of the Khyendwen river that passes through and drains the Hookong valley. The Patkoi Pass, according to the paper, was only 2860 feet above the sea, considering that Bhamo was 430 feet above the sea, and that the Brahmaputra at Makum was at least the same height, the rise to the crest of the pass would not be 2600 feet. Such an obstacle was inconsiderable when it was remembered that Burma now formed about one-fourth of our Indian possessions, and that the railway was intended for the connection of our neighbouring Indian and Burmese provinces. He was glad to hear that the Government of India intended as soon as possible to carry out the survey, and that Mr. Colquhoun was about to be appointed Deputy-Commissioner of Mogoung. He knew that gentleman well enough to be certain that he would not rest satisfied until a feasible route, as they had every reason to believe theirs to be, was traced out through the small tract of country which at present separated and blocked our Burmese and Indian railway systems.

The CHAIRMAN (General R. STRACHEY, R.E.) said that before proposing a vote of thanks to Major Macgregor for his extremely valuable and interesting paper, he wished to make a few remarks on some apparent peculiarities of the climate of the region. There appeared to be a very curious lowering of the general temperature there, which was shown by the fact that though the latitude was only about $27\frac{1}{2}^{\circ}$ N., snow was found on the ground in April and May, at an altitude of 9000 or 10,000 feet; whereas far up in the north-west, in latitude 30° N., no snow would be found at that time of the year at a similar altitude. He should consider that the peculiarities of the vegetation of Manipur compared with Assam, to which allusion had been made by Dr. Watt, were connected with this. It was to be noted that the valleys which Major Macgregor had visited were at a comparatively low level, only 1500 or 1600 feet. Bhamo was only about 400 feet. Immediately to the north rose abruptly what was really a permanently snowy range. There could be no doubt that the warm currents of air coming up the valleys of the Irawadi and the Salween and meeting these snowy mountains

produced an enormous precipitation of rain, which during the winter fell as snow. The consequence seemed to be that there was snow there at a very much lower level than in the mountains further to the north. That an immense quantity of rain fell on the upper portions of the valley of the Irawadi there could be no question. The rainfall at Sadiya was upwards of 100 inches in the year, and for a succession of months from May till September it was not less than 15 or 16 inches on the average, and even in the dry months, which Colonel Woodthorpe and Major Macgregor selected as particularly practicable for their purposes, there were four or five inches per month. If it had been a rainy year they might have had double that quantity. Such a rainfall seemed in itself quite sufficient to account for the large volume of water that was drained off by the lower portions of the Irawadi, and anybody who knew what the climate of Tibet was must be perfectly aware that even with a course of several hundred miles in Tibet, the river would pick up but a small quantity of water, which would have but little effect in swelling the stream in the lower parts of Burma, in comparison with the enormous volumes which were collected from the rain which fell in Upper Burma. He had roughly calculated that a monthly fall of rain of 18 inches over a square degree would mean 65,000 cubic feet per second for the whole month. That would give some idea of the enormous quantity of water supplied by the rainfall, though of course the whole of it was not carried off by the rivers, a considerable part of it being absorbed. Major Macgregor mentioned that at an elevation of 8000 feet the snow weighed down the bamboos. That was a very peculiar feature of the climate. With regard to communication between India and Burma, he confessed that the very last way in which he should ever dream of attempting to connect India with Burma, would be through Assam over the mountains at the head-waters of the Irawadi. He would not say it was impossible, but he should be very sorry to be a shareholder in any company that put its money into such a concern. In conclusion he returned the thanks of the meeting to Major Macgregor for his paper.

Journey of Mr. J. T. Last from Blantyre to the Namuli Hills.

We have received the following letter from our traveller, Mr. J. T. Last :—

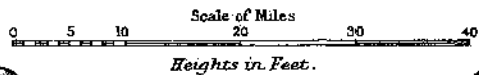
FOOT OF MOUNT CHALI, NEAR NAMULI PEAKS,
August 5th, 1886.

I LEFT Blantyre on the 12th of July, and reached this place near Namuli on the 3rd of August. I have camped at the foot of Mount Chali, which is a little to the south of Namuli, instead of at Namuli, because my coast men would not be able to bear the continuous cold at the high elevation.

On leaving Blantyre our path lay past the Scotch Mission station, then by a road to the east we went on to the foot of Ndilandi Hill. Here we camped for the night, and the next morning we crossed over a pass on the east side of Ndilandi and went along the plain to Mount Kiladzulu. The country traversed is undulating, with large marshes and bogs here and there. The rivers Lunzu, Ikimguni, Muombezi, and Nangoma were crossed during the day. They are all small now, but during the wet season they have a considerable flow of water. I was delayed four days at Mount Kiladzulu, owing to difficulties with the local native porters. On starting again we crossed the wide plain which lies between Kiladzulu on the west and the Milanji range of mountains on the east. We reached the hill Macheмба, at the north end of the Milanji range, on the morning of the third day.

COUNTRY BETWEEN THE BRAHMAPUTRA AND UPPER IRAWADI

illustrating the route of the
Expedition under Colonel Woodthorpe, R.E.



28

27

Headwaters of Kyendwen R.

Longitude East of Greenwich

