EXPLORATION IN WESTERN CHINA.

By Captain C. H. D. Ryder, R.E.

(*From 'The Geographical Journal' for February*, 1903.)

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In November, 1898, I was fortunate enough to be attached by the Government of India to an expedition under Major Davies, of the Oxfordshire Light Infantry, to explore, carefully map, and report on the province of Yunnan, in South-Western China. After seven months' wanderings we returned to England, and again entered the province in November, 1899. This second year, having completely surveyed the more important portions of Yunnan, we extended our journey into the province to the north, Sechuan and Chinese Tibet, finally reaching Shanghai, down the Yangtse, in July, 1900, just at the time of the troubles in Northern China.

From a geographical point of view, the most interesting feature in Yunnan (*vide* map) is the extraordinary number of large rivers which flow through or take their rise within the province. Commencing on the west, we find many affluents of the Irrawadi, though the main river is situated in Burma; next comes the Salwen, entering from the unknown in Tibet, flowing nearly due south, until it enters Burma, and forming in places the boundary between Burma and Siam, finally reaches the sea at Moulmein. Then we have the Mekong, entering the province in a similar manner to the Salwen, also of great use as a frontier line first between Burma and China, then between Burma and French territory, and finally between the latter and Siam; it is a river which has a great fascination for French explorers, who have done much towards mapping its course. Thirdly, and most famous, flows

* Read at the Royal Geographical Society, November 21, 1902. Map, p. 18.

the Yangtse, at first parallel to the other two, but near Tali-fu it takes a great bend due east, then another due north, leaving room for the plateau from which the Red river of Tongking and the West or Canton river take their sources.

On this plateau lie the majority of the seventy-odd cities of the province, some in reality mere villages, others large towns, but all have the official rank of city, and all, with one exception, are walled. The exception is Li-chiang-fu; on my inquiry as to the reason it was not walled, I was told that it was because there was no high military official there. Now, each of these cities lies in a plain; in the east, where the plains are larger, two or more cities are found in one plain, but no city exists where there is no plain; the consequence is that these plains, although they do not bulk large on a map, are far and away the most important portions of Yunnan, both politically and commercially. They vary in size, a very common one being 8 miles by 2 or 3; and are entirely populated by Chinese, who have the faculty of keeping the best of everything for themselves, pushing the earlier inhabitants, such as Lolos and Shans, into the hills and into the deep and feverish valleys.

We made our start from Bhamo, and, marching up the valley of the Taeping river, crossed the frontier after two marches, and commenced surveying. On our first march in Chinese territory we had to pass several small stockades, and I was rather doubtful whether the Chinese soldiers might object to our surveying. However, I was soon relieved, as I found my Indian surveyor had put up his plane-table close to one of the stockades, and was calmly surveying, while the garrison of one man, armed with a pipe and a long spear, was gazing at him with awe and surprise.

Of the country before we went into it very little was really known; travellers there had been in plenty, but only a few of them, notably Captain Gill and Mr. Baber amongst English, and M. Garnier and Prince Henry of Orleans amongst French, had made any attempt at real surveying. Major Davies had, however, in 1895, done a lot of work in the western portion of the province. We also had a Chinese map, which must originally, as constructed by the Jesuits, have been a very good one, but many editions in the hands of the Chinese printers had gradually spoilt it, and, except in the matter of giving us the correct names of the towns, it proved worse than useless. The trouble we took over our surveying was always a source of wonder to the Chinese. The country had gone on very well for hundreds of years without maps, what was the good of them now? They thought us idiots, but let us survey without let or hindrance, so we did not trouble ourselves much about their opinion.

The villages in the Taeping valley are inhabited by Shans, and are so surrounded by bamboos that the houses are scarcely visible from

outside. This valley is thickly populated, and is a promising line for a railway as far as Momien, though it could never be extended beyond that town. We also met with our first chain suspension bridge, a kind of bridge of which the Chinese are very fond; they make them well, but do not keep them in repair.

In Momien we had our first reception from a hostile crowd. As soon as we entered the town late one evening, a mob collected; only insulting at first, they presently began stone-throwing, and we all got hit several times. Our baggage had arrived ahead of us, and we did not know where it had gone to. As the crowd got larger, the stones got larger too, and the matter looked decidedly serious, when, fortunately, an extra large stone hit Major Davies on the funny bone. This gave the necessary fillip, and away he went straight into the crowd, followed by Captain Watts Jones and myself. The crowd fled so fast we only could each get home with our sticks on one head; unfortunately for the owner, it was the same head in each case. As soon as we turned again the crowd reassembled; we accordingly had to execute two charges more before we finally got into a temple in the official's quarters. Two ragged soldiers then appeared. They did not look up to much; however, they represented authority, and the crowd dispersed.

Next day the town was quiet, and the official, in a fright lest we should report him, was very polite. We accordingly went out to see a very fine waterfall, over which the Chinese threw five hundred Mahommedan prisoners at the close of the Mohammedan rebellion. In considering the history of Yunnan, it really is unnecessary to go further back than this rebellion. For many years, while the Chinese Imperial Government were fully occupied by the Taeping rebellion, the Mohammedans made great headway, most of the province falling into their hands. When the Chinese got to work, they swept the Mohammedans out of the country, only a few escaping to Burma, where, under the name of Panthays and under our protection, they have thrived wonderfully; but to this day half-deserted towns and ruined villages bear silent witness to the devastation created by this rebellion. Yunnan has not yet recovered from its effects, though thirty years have passed since its close.

At Momien and four other towns where there were telegraph stations I was able to obtain accurate longitudes by time comparisons over the telegraph wire with another officer at Bhamo. This is work that requires great accuracy, any error in seconds of time being multiplied fifteen times in seconds of distance. The observations at my end were carried out under difficulties. I used to slink down at dusk to the telegraph office, in order to avoid attracting a crowd, only to find that the telegraph clerk had invited a select party of friends to watch the performance; they generally meant well, but it is

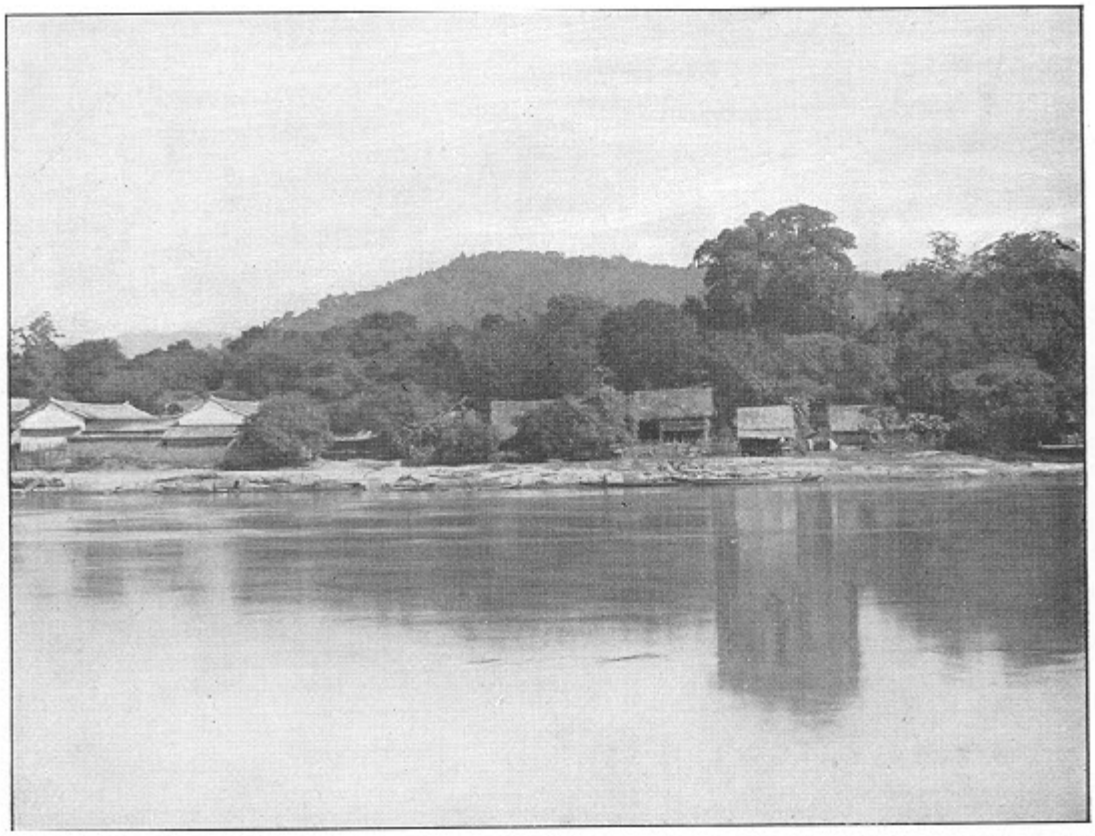
somewhat trying, while engaged on delicate astronomical observations, to overhear remarks on one's personal appearance which were never flattering.

This telegraph line was, however, a great friend of ours, as it was for months our only means of receiving news of the outer world. The clerks only knew a few words of English, but they knew the English letters. The line is never used for through traffic; the probable time it takes for a message from Rangoon to reach Shanghai is about ten days, as the line is continually interrupted.

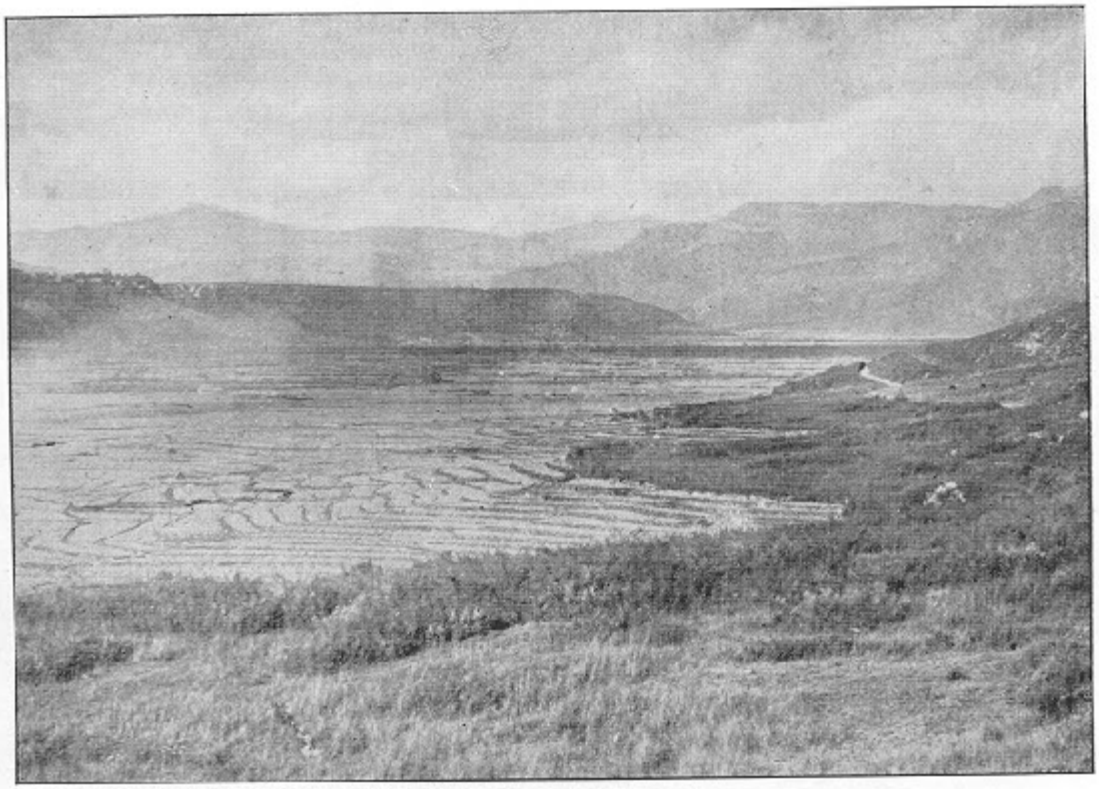
While Major Davies now kept up to the north of Momien, Captain Watts Jones and I went south to the Nam Ting valley to examine into the possibilities of a railway line. By surveying the main and side valleys it was soon obvious there was only one possible line; and this line, which Captain Watts Jones followed through up to Tali-fu and so on to Yunnan-fu, is the only through line into China from Burma that can ever be constructed.

In this matter of railway communication a great deal of hopeless ignorance of the country has been displayed, when we come to look at the various proposals that have been seriously put forward, and because our Government did not at once support these proposals, they (the Government) have been unwisely criticized. The first suggestion made was for a railway up through Siam and up the Mekong valley. This may at once be dismissed as impossible; the Mekong is a river which runs in deep gorges, with no inhabitants but those in a few miserable hamlets. When we come, however, to consider the question of a line from the Kunlong ferry up the Nam Ting valley, we once more enter the regions of possibility; and the Yunnan Company did a very public-spirited action in originating our expedition, while the Government of India showed their anxiety to obtain more reliable information, and getting the country well surveyed by attaching to the expedition several good native surveyors as well as myself. Any railway experts who discuss this question with our maps and reports before them are, at any rate, basing their opinions on reliable data. In a paper before a Geographical Society, it is, I consider, out of place to discuss the advantages and disadvantages of building this line. As the French are at present constructing their line from Tongin to Yunnan-fu, this question of railways in Yunnan becomes a political one.

There is no doubt a great future lies before the whole of China, in which Yunnan will not be behindhand, owing to its proximity to English and French possessions, to its richness in minerals, and to the fact that, while Burma and Tonkin are low and feverish, Yunnan rejoices in a splendid climate, due to the high elevation at which most of the towns lie. There is, however, every variety of elevation. In the north-west corner the three large rivers flow at a height of 7000 feet above sea-level, with ranges of 20,000 feet and upwards intervening;



FIRST STAGE ON BHAMO-TALIFU ROAD.
(From a photograph by Capt. Ryder.)



REMAINS OF ANCIENT LAKE BED PLAIN, NAN-TIEN VALLEY.
(From a photograph by the late Capt. Watts-Jones.)

they leave the province at elevations nearer 1000 feet. The cultivated plains all lie between 5000 and 8000 feet above sea-level.

Every one who has travelled in China finds the curiosity of the Chinese inexhaustible. It forms, perhaps, the most unpleasant part of a traveller's experience. In any of the town inns it is almost impossible to secure privacy, even in one's own room; sometimes a crowd would be insulting, but more often simply curious.

Until reaching the neighbourhood of Tali-fu, the only Chinese town of any importance is Yunchau, still mostly inhabited by Mohammedans; we therefore had quite a cordial welcome. It was one of the last towns to hold out in the rebellion; and my interpreter, whose old home it was, when twelve years of age, had escaped to Burma with his father when the town fell into the Chinese hands. He had only one failing, and that was drunkenness. He had three different stories of how he escaped, no one bearing the slightest resemblance to the others, and I could always accurately gauge his degree of drunkenness by asking him how he escaped from Yunchau, and waiting to see which story he would tell me. In other respects he was a splendid fellow.

In the matter of cultivation the Chinese generally are past masters. They display a wonderful amount of ingenuity in terracing their fields, and in their aqueducts and irrigation channels. Two crops are grown annually in Yunnan on most lands: the first, taking advantage of the rainy season, is usually rice; the second, wheat, opium, and peas or beans in about equal proportions. There are, of course, other crops, but these are the most important. In the neighbourhood of every village are numerous vegetable gardens, even the poorest mule-driver or labourer insisting on some vegetable with his rice, if he cannot afford pork. Should a railway be constructed connecting Burma with Yunnan, a large trade would arise in food-stuffs, crops preferring a cold climate such as exists on the uplands of Yunnan being exported to Burma, while rice would be sent up from the low-lying lands of Burma into Yunnan. At present no such trade exists, owing to the very expensive means of transport. A few rough carts exist in the eastern portion of the provinces, but the roads are bad and only exist for short distances; the bulk of the carrying-trade travels on the backs of mules, which is, of course, a method not suitable for the transporting of bulky food-stuffs over any but very short distances. Should there be, therefore, a failure of crops, a famine arises, and the inhabitants of that particular district have to shift for themselves.

Salt is the one article of food which is carried long distances. It is supplied from several salt-mines in different parts of the province; each mine is told off to supply certain districts, and very heavy are the punishments dealt out should the inhabitants of any district be found dealing in salt other than that from the district mine. Salt

forms one of the largest sources of revenue to the provincial government, and hence also to the officials. Any appointment connected with salt is therefore eagerly sought after, and the pockets of the officials connected with the mines must be protected even if it entails on the wretched villager the necessity of importing his salt from a distant mine instead of a near one, thus paying double or treble what he would otherwise have to do.

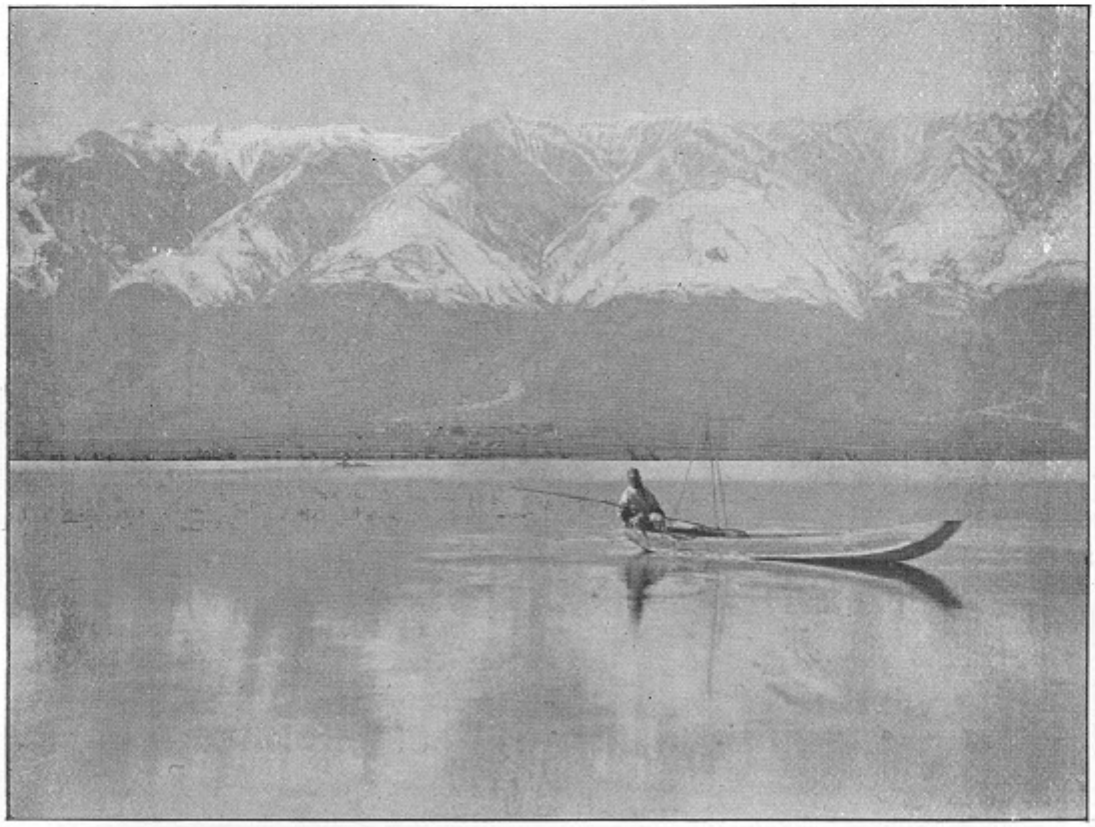
To follow my journey once more. I had to cross the Mekong by a ferry, and, crossing a wild mountainous tract of country, reached the town of Ching-tong-ting. Here I first met English missionaries, and it is not out of place to record here my warmest thanks for many a kindness and help I received from them throughout my journeys. People may differ in opinion as to the value of their work, but I maintain that they are doing a very great and noble work, and are of the utmost use in the matter of accustoming the Chinese to European customs and ideas.

Proceeding northwards towards Tali-fu, we passed amongst Lolos. It is difficult in any country to decide who are the real aboriginal inhabitants; it is more than likely that the Lolos may claim to be so for South-Western China. They have now been driven by the Chinese into the hills; but in parts of Sechuan they are still quite independent, and no Chinese dare enter their villages. They are much handsomer to our eyes than are the Chinese. On my arrival at Tali-fu I met Captain Watts Jones, and together we travelled north to the Yangtse. Many travellers have described Tali-fu. The lake is some 30 miles long, and 5 to 7 miles wide. On the eastern shore low reddish hills rise straight from the waters, but on the western side a slightly sloping and well-cultivated plain runs back a couple of miles to a very fine range, which reaches a height of 14,000 feet, the lake itself lying at an elevation of just under 7000 feet. Snow is found all the year round in sheltered spots on this range, while in winter it falls and lies down to the level of the lake. There is very good duck-shooting, particularly at the northern end, which is somewhat marshy. I cannot conceive a more ideal hill-station or sanatorium for fever-stricken Europeans from Burma or Tonking; but Yunnan abounds in such spots. The plain at each end of the western side of the lake is closed by an old line of fortifications, which are now, of course, useless. The lake drains into the Mekong by a rapid-running river, which in one fine gorge is jammed into a width of 3 yards; what the depth is no one knows.

As we went northwards the general elevation of the country increased, and the country became more Tibetan in character. We were on the main road to Batang and Tibet, the road that Captain Gill had travelled over. It was here we passed by a very fine canal constructed during the Ming dynasty, and also several very fine stone

CANAL NORTH OF TALIFU, CONSTRUCTED DURING THE MING DYNASTY.

(From a photograph by the late Capt. Watis-Jones.)



A SIDE LAGOON, TALIFU LAKE.

(From a photograph by the late Capt. Watis-Jones.)

bridges. They were much more level than usual, and easier to ride over; an ordinary Yunnan stone arch bridge being so high in the centre that to ride across one is much like riding up one side of the roof of a house and down the other. All these bridges are built either by private individuals, as a "work of merit" to be put to their credit hereafter, or by the various guilds of merchants who use the road. The Chinese Government never troubles itself about such trifles as roads and bridges, or public works of any kind; and no official would push through any necessary work unless he saw thereby a means of obtaining a satisfactory squeeze.

This Chinese idea of a "work of merit," though sometimes misplaced, as when they spoil a good path by paving it with cobbles and then never repairing it, is undoubtedly one of the best points in the national character. I shall always remember one instance I met with. On a path which I had to cross in the early winter, on the range between the Shweli and Salwen, I came across a small hut in which were two old men. We had been struggling up through the snow, which lay over 2 feet deep, and were fairly exhausted when we reached the top. We gladly accepted the invitation of the two old men to enter their hut and enjoy a cup of tea and a warm by their fire. There had been four of them, but two, who had given a bowl of rice and a pair of grass sandals to passers-by, had died. We offered payment, but it was refused—they would only accept our thanks; and we hurried downhill into a warmer valley with a grateful corner in our hearts for our two old hosts.

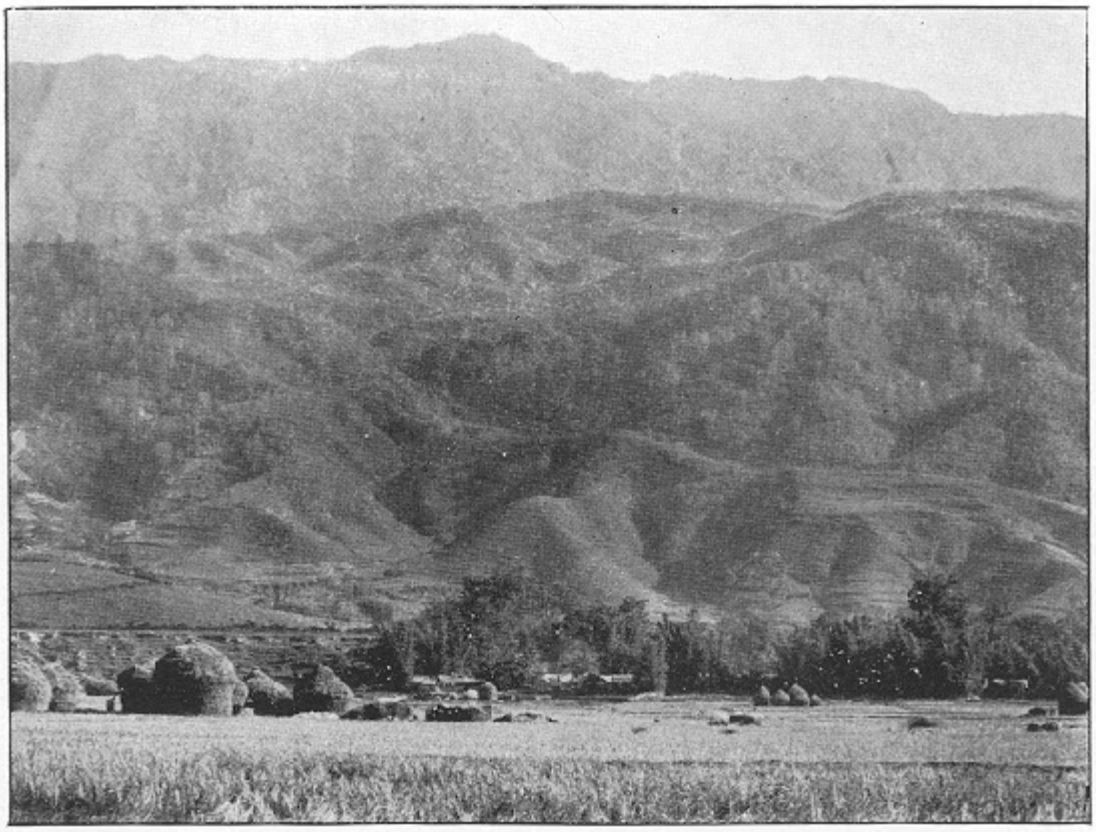
We reached the Yangtse at Shih-ku, where Gill left it. There is a very fine stone drum here, put up to commemorate a Chinese victory. Turning east, we passed through Lichiang-fu, leaving a magnificent snow range to the north. In order to get round this range the Yangtse makes a great northern bend. The Chinese maps had placed the northern limit of this bend some 60 miles too far south. Mr. Amundsen, a missionary, and M. Bonin, a French traveller, had noticed this, but the sketch-map which Mr. Amundsen gave Captain Davies was so inaccurate in other points that I for one did not believe that the bend extended so far north, till the following year I camped at the top of the bend myself, observed a latitude, and was satisfied. This is a good example of the value of accurate surveying.

Separating from my companion, we each made for Yunnan-fu by different routes. I crossed the Yangtse again by a fine suspension bridge. The roadway of planks was, however, in a very bad state—many planks were missing, and others rotten; I went across in fear and trembling, and was glad to get across. I was followed by two little Chinese boys, who chased each other as they came across, showing that their heads were better than mine. My mules picked their way across in a wonderful manner, encouraged by the shouts of their drivers

and the tinkling bell on the neck of the leader, who headed the procession across the bridge. We all met again near Yunnan-fu, where we had a snowstorm at the end of March. While the rest of the party went northwards towards the Yangtse, I waited for a month, trying to get a telegraphic longitude with Burma, but entirely failed. When the telegraphic line was not broken, the instruments would be out of order; when they were repaired, a clerk at some intermediate station would absent himself, and disconnect all the wires. Mr. Jansen, a Dane, who had actual charge of the telegraphs in the province, must have had a most trying time. The real head was a Chinese official, who had, of course, no knowledge whatever of telegraphs. His two previous appointments were district judge and in charge of the arsenal; of this latter job he also, of course, knew nothing. I hope he was a good judge. This is a good instance of how Chinese officials are appointed for their own advantage, and not for the good of the country. After leaving Yunnan-fu, I surveyed as much country as I could in a month, reaching the French frontier just as the rainy season commenced. During this season, from the end of May till September, trade is at a standstill, as most of the paths are impassable, and it is a very good time for travellers to quit the country; in October the country is still recovering from the rains. We entered Yunnan early in November, as soon as the roads were open and the cold weather had commenced. The hot weather commences generally in March, but we never found the heat oppressive except in the valleys. The greatest cold I registered was 17° Fahr. below freezing-point, in February, at an elevation of 7000 feet.

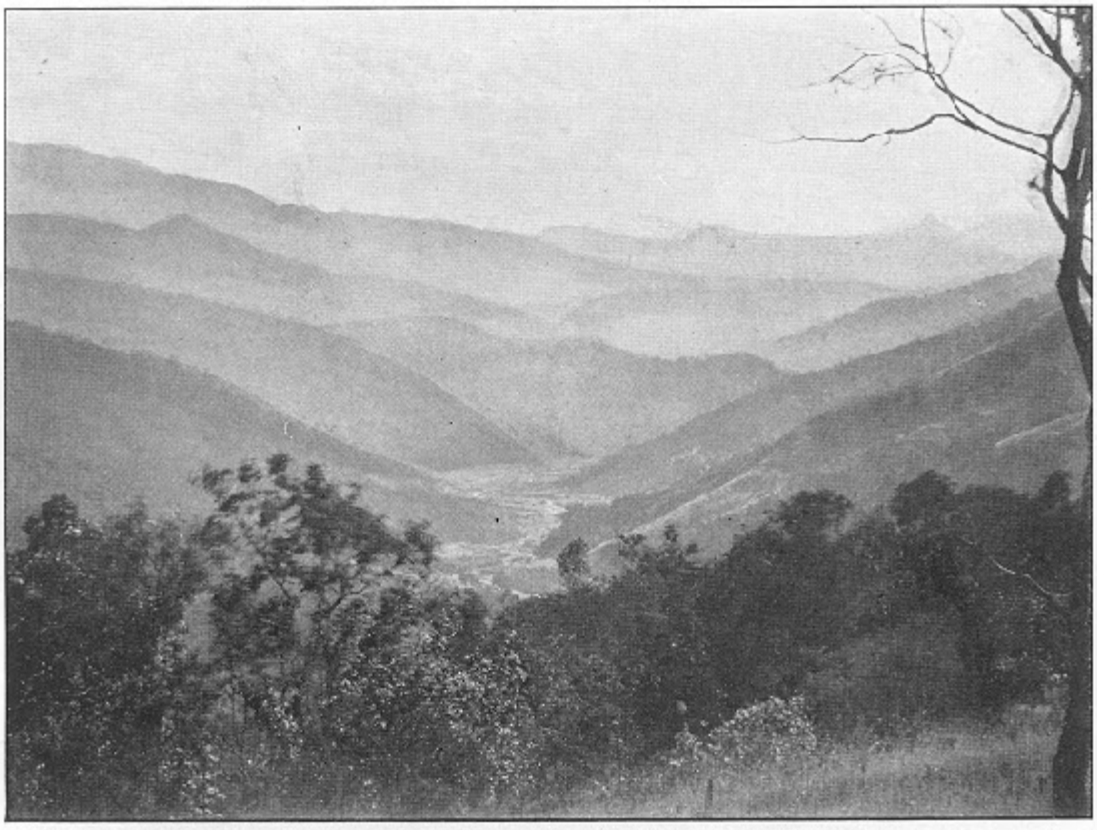
Having completed our season's work, I came out down the Red river through Tongking, with nothing worth recording except the great kindness and hospitality I received from French officers wherever I stopped on my way down.

Although we had accomplished a good deal of work, much still remained to be done. Accordingly, Major Davies and I started again in November, 1899, and for three months we surveyed the remaining important routes, avoiding as far as possible going over roads which we had already surveyed, but connecting with our previous surveys whenever we could manage it. One incident, though I laughed at it at the time, seems curious now by the light of later events. One day, on the march, I met a Chinese coolie whom I had employed to carry my theodolite the previous year. We entered into conversation through my interpreter, and presently I dropped out of the conversation, and the two conversed in low whispers. When they had finished I inquired what the man had been saying. "Sir," he said, "take my advice —get out of China as quick as you can. This year will be a bad year for foreigners in China." This was in January; the troubles in North China commenced in May.



CHINESE SHAN VILLAGE IN TAEPING VALLEY.

(From a photograph by the late Capt. Watts-Jones.)



THE NAIN TING VALLEY.

(From a photograph by the late Capt. Watts-Jones.)

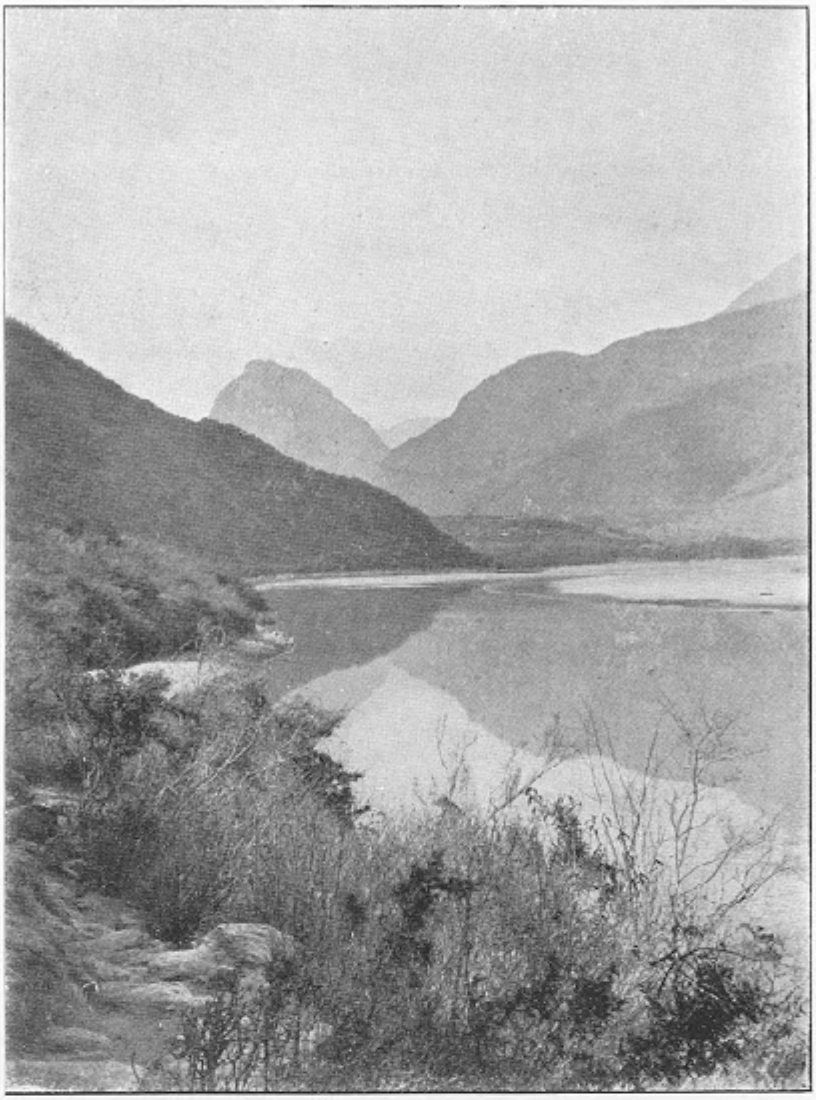
I arrived in Yunnan-fu on the same day that Major Davies reached Pu-eh-fu. This was by arrangement, in order to connect these places by a telegraphic longitude; then, while Davies moved up to Yunnan-fu, I marched by a roundabout way to Tsu-hsiung-fu, which was the last telegraph office I had succeeded in connecting with Burma the previous season. By simultaneous observations at these two places we completed our longitudes. We then by separate routes crossed the Yangtse into Sechuan, and headed north-west into Chinese Tibet. The officials, after protests that they had never heard of the places we wanted to go to, and that there were no roads there, and anyhow the roads were infested by robbers, let us go on our way. Our escort gradually dwindled away, then finally disappeared, and we were allowed to find our way westwards as best we could. There is little or no sign of Chinese authority in these semi-independent states. From Yunning a young lama was sent to guide me to Chungtien; even with his help I did not find the inhabitants very hospitable. Our lama would arrange for us to put up in a headman's house; the owner would say, "Stay, by all means, but there is a much better place a mile or so further up the valley, which will just suit you." On we used to go, to find no house at all of any kind. Having been tricked twice in this way, I knew better, and stayed in the best place I could find towards evening. Major Davies and I had agreed to meet on March 27 at Atuntzu. We had not expected that the snow would lie so deep on the passes, and on the 26th, when 22 miles from Atuntzu, I found myself blocked by snow, after making only 4 miles progress in two days. I was also in difficulties as to foot-gear, the most important part of a traveller's equipment. I had started with three pairs of boots, but some scoundrel had stolen a bag the day I left Bhamo, which contained, amongst other things, two right-foot boots. In two months I had nearly worn out my one pair, and then took to wearing Chinese sandals; these were, however, utterly unsuited for snow, and later on we all wore Tibetan boots. On the 27th, thinking Major Davies might be waiting in Atuntzu, I got a Tibetan guide, and with one of my Chinese coolies, by starting at 5 a.m., reached Atuntzu at 7 p.m., only to find Major Davies not there. I put up in a little house, where I was made most comfortable, rested the following day, as my men were suffering from snow-blindness. Returning to my camp in two marches, I met Major Davies on my arrival. He had met with worse snow than myself. Fortunately, a caravan went up the pass that day and trod down a path, which we followed next morning, and with great difficulty and the loss of two mules we managed to reach Atuntzu, where Major Manifold, I.M.S., joined us a few days later, and completed our party. We now sent back to Burma our spare baggage, surveyors, and Chinese followers, and started for the headwaters of the Irrawadi, following at first Prince Henry of Orleans' route. We were, however, stopped by the

snow in the pass leading from the Mekong valley to the Salwen; and as all passes westwards were in a similar condition, we spent a month usefully in marching up to Bat'ang and then down south again to Yerkalo, where we made our second attempt. This time we were stopped in a more exciting manner: our hovering about had put the Tibetans across the frontier on their guard. We reached the Mekong late one evening at the site of a rope bridge. These bridges are simple. A single rope runs each way across the river, the starting-point being higher than the point of arrival; on this are small wooden runners, to which the passenger or baggage is attached. On letting go, one's own weight carries one across.

We secured four small runners, and crossed ourselves, two servants, three Gurkhas, and some of our baggage; unable to obtain larger runners, we could not cross our mules, so left our remaining four Gurkhas to guard them. On our bank there was a small house, from which the hillside went towering up above our heads. We did not anticipate any trouble, as we were in Chinese territory, but while we were having dinner, we heard shouts from the further side; running out to see what was up, we went straight into a band of about twenty lamas, who had crept down and cut the rope by which we had been crossing. After a short rough and tumble they cleared, leaving, however, one of our Gurkhas very badly wounded—his head laid open with a stone, and a gunshot wound in his mouth. We had an exciting watch that night; expecting an attack, we made a barricade of sacks of salt. However, no attack was made, though we heard talking most of the night on the hillside.

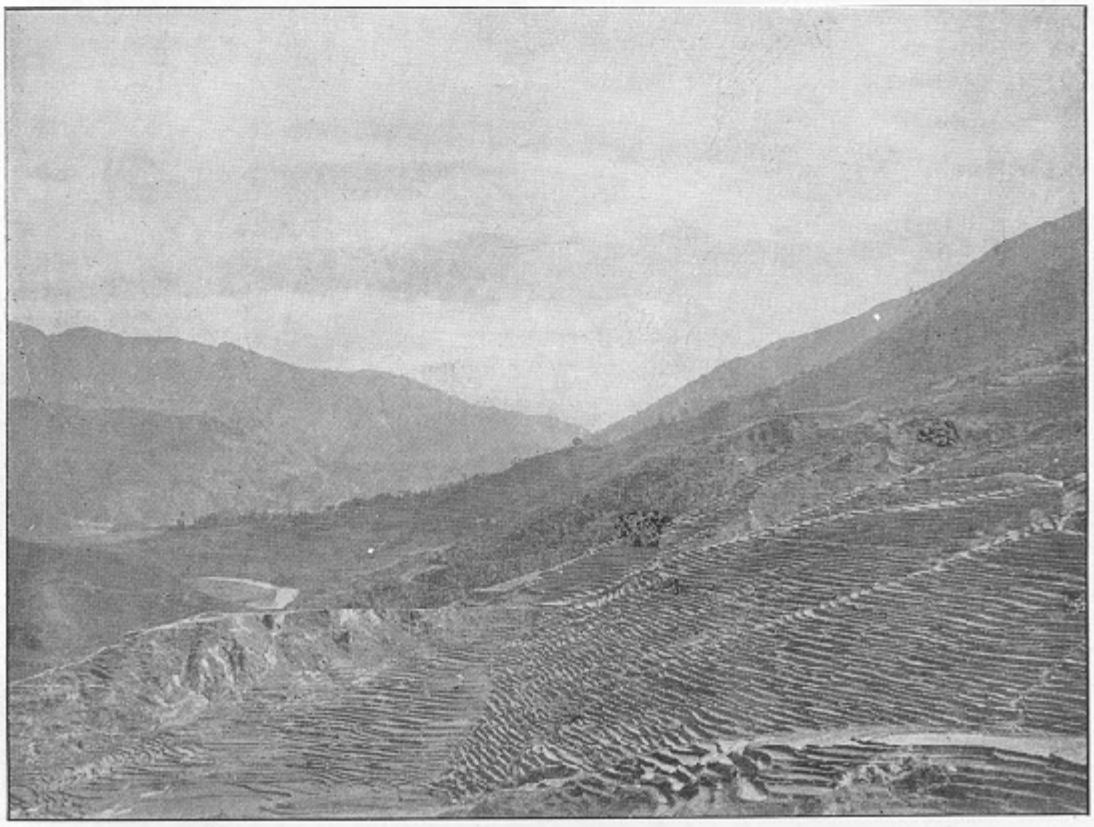
Next morning, while we were trying to get one of our mulemen across to act as interpreter, the Tibetans, numbering about 400, lining the hillside above us and the spurs in front and behind, opened fire. This did no damage, and after firing an hour, to which we made no reply, a deputation was sent forward asking us to retire across the river. Encumbered by our wounded Gurkha, and unable to get our mules across, this was the only course open to us. As soon as we agreed, they came forward and, in a most friendly way, helped us to get across. Major Manifold's bedding fell off the rope in mid-stream, but the Tibetans fished it out of a backwater.

It being now too late in the year to make any further attempt to get across into the Salwen valley, owing to the imminence of the rainy season, we made up our minds to strike across Tibet to Tachien-lu, and so on to the Yangtse. The first part of our journey took us about a month, and a very rough time we had. Each pass we crossed cost us the lives of some of our mules, one of our Gurkhas was drowned in the river at Litang, and we were all fairly worn out when we reached Tachien-lu. The Gurkha who was drowned had been with me for over six months; they had all served us, as Gurkhas always do, faithfully and



YANGTSE RIVER AT SHIH-KU.

(From a photograph by the late Capt. Watts-Jones.)



RICE TERRACES, SHUNNING FU VALLEY.

(From a photograph by the late Capt. Watts-Jones.)

well. Stolid little men! On the evening of the death of his comrade, the havildar came and saluted to make his nightly report, "All correct, sir, except one rifle, twenty rounds of ammunition, and one private soldier lost in the river." Another man, Maidan Singh, did me good service. One night I had dropped off to sleep, after having had fever all day, when I was awoke by a frightful row in the inn yard. Stepping out to see what was up, I found my mulemen engaged in an ugly fray with some other Chinese. Maidan Singh was standing by my side. "Maidan Singh," I said, "I had just got to sleep, when these scoundrels woke me with their noise." "Sahib," he said, "it is a very great shame." With that he went straight at the Chinese with a short heavy stick in his hand, knocked one senseless into the pig's trough, and drove the others out of the yard. Shortly after, as I was going to sleep again, I heard Maidan Singh alternately cursing the man in Hindustani for disturbing me, and, in very broken Chinese, trying to persuade him to drink some water, and soothing him.

Six very rough marches brought us to Yachau, meeting continuous streams of coolies carrying enormous loads of tea for Tibet, one man particularly carrying at least 350 lbs. and doing daily marches. We then floated 60 miles down stream on a raft to Chia-ting-fu, where we changed into a boat. Just as we were leaving, we received a message from a missionary at Yachau that he had received a telegram to the effect that the legations at Peking were being besieged, and that there was a general massacre of Europeans going on throughout China. This was cheerful news; we were nine armed men, and had some 1800 miles' river journey before we could reach Shanghai. Five days in this boat took us to Chungking, the only noticeable incident being that news of our coming had evidently been sent on by the officials, and at each town we passed, where our escort of two Chinese soldiers was changed, a boat was waiting in mid-stream, enabling us to change our escort without having to land, obviously to keep our passage down river unknown to the general populace. We approached Chungking, an enormous town, with an unpleasant doubt as to our reception. However, we found the situation there fairly satisfactory. The English Consul thought that we might escort the women and children down river, but after several days' delay, only two families could be persuaded to come. We reached Ichang down the Yangtse gorges without mishap, and from there our journey by steamer was simple.

Our journeys in China differed from most previous ones in that we were primarily surveyors; we have, therefore, been able to produce accurate maps of nearly the whole of Yunnan. We have so surveyed and examined the province that in future any one interested in the subject of railways in that part of the world can bring forward proposals based on better information and with more detail than the well-known consul in *San Toy*, who applied to a Chinese official for a

concession for a railway with a school atlas in his hand, saying, "Your Excellency, we propose to build a railway from here to there, with a tunnel here and a bridge there, a viaduct here and another tunnel there."

Before the reading of the paper, the PRESIDENT said: We have with us this evening one of the members of the survey party who has been exploring the province of Yunnan in China, a very interesting and valuable piece of work, and I feel sure that the paper he is about to read to us, with its illustrations, will be interesting. I now call upon Captain Ryder to read his paper.

After the reading of the paper:—

Major DAVIES: Having had the pleasure of being associated with Captain Ryder in two years' exploration work in Western China, I should like to say how very much our expeditions are indebted to the work done by Captain Ryder and by the native surveyors of the Survey of India who worked under him. I should also like to say a few words about the proposed Yunnan railway which Captain Ryder referred to. I think it is a scheme about which there has been a good deal of misapprehension, and on which a great many hasty judgments have been passed, based on very insufficient information. There have been several travellers in Yunnan during the last thirty years, many of them very clever and capable observers, and their opinions have been naturally much sought after by those interested in this subject; but I think it must be remembered they did not go out to Yunnan primarily for the purpose of investigating railway schemes, and it was not their special business to test the feasibility of a railway line through Yunnan. Also in some cases they have expressed opinions which have been very widely held, which really have nothing whatever to do with the proposed line. For instance, Mr. Baber of the Chinese Consular Service, whose writings combine in a marvellous manner the amusing and the instructive, makes two remarks which have been very much quoted. Speaking of the very high range between the Salween and the Shweli, he says, "If British trade ever adopts this track, I shall be delighted and astonished in about equal proportions." Further on, when discussing the subject more generally, he says, "By piercing half a dozen Mont Cénis tunnels and erecting a few Menai bridges, the route between Burma and Yunnan Fu might doubtless be very much improved." These two remarks, I think, have had great influence on people who have not studied the subject very deeply, and have induced them to think that the railway scheme is quite impracticable. I quite agree with the truth of both these remarks of Baber's; the only thing is, they do not apply to the railway at all—they refer to the road which goes westward from Momien through Ta-li-fu, whereas the present proposed railway comes into Yunnan from quite a different direction. Indeed, only half a page lower down Baber himself recommends as a probable line for a railway the very route which has now been adopted. To quote another instance of a rather poor argument against this railway. In a book, published as lately as last year, which devotes a chapter to the subject of railway extension from Burma into Yunnan, I came across the astounding statement that no coal has been found in Yunnan. Now, as a matter of fact, coal exists almost all over the province, and there are many large districts of Eastern Yunnan in which hardly anything is used for fuel but coal, which is all obtained from local mines. Of course, I quite understand that there may be differences of opinion as to the commercial value of a line through Yunnan, but I hope, in future, opinions will not be based upon misapplied quotations or upon such very inaccurate information as that which I have just quoted.

As to the work we did in Western China, the most important part of it is undoubtedly the preliminary railway survey which was carried out by Captain Watts Jones and Captain Hunter, both officers of the Royal Engineers. Captain Watts Jones, I am sorry to say, lost his life afterwards in the cause of exploration in China. The line they surveyed certainly presents great difficulties, but it is a practicable line that could be made. Besides the actual survey, the other members of the Expedition split up and took different routes, so as to get in as much work as possible, and made a fairly thorough exploration of the province of Yunnan. Of the eighty-four official cities of Yunnan, we visited all but three; so I think we may claim to have some knowledge of the province and of its resources. As to the mineral wealth of Yunnan, I do not think there has ever been any doubt. We certainly came across mines everywhere, and all sorts of mines—gold, silver, lead, tin, iron, copper, zinc, coal—and even with the present poor appliances that the Chinese have for working these mines, they make them pay. To give an instance of the sort of way in which they work their mines, one of our party who visited a gold-mine found them crushing the quartz with a sort of large wooden instrument, which is used in that country for husking rice. This was the only appliance they had for crushing gold quartz. The agricultural resources of Yunnan, too, are not to be altogether despised. Earlier travellers saw the province when it was just recovering from the effects of the Panthay rebellion, and I think all the members of our expeditions have at different times remarked to me that the poverty of Yunnan has been much exaggerated. As to whether this line will pay, it will be still rather an open question; but I think the Yunnan company, with the assistance of experts on matters of this sort, will now be able to decide whether it can be made as a commercial speculation or not. I regret that I cannot enter fully into the pros and cons of the Yunnan railway, as the question is largely a political one which cannot be discussed before this Society. There is, however, one suggestion about railways that I should like to make, and that is, that, as a beginning of railways in Western China, a line should be made from Chung-king or some other point on the Yangtse up to Ch'êng-tu, a very large city, the capital of Sechuan. This is a line that was originally proposed and surveyed by Captain Watts Jones, who had a high opinion of it, and thought it was a line that would pay at once. His opinion has now been endorsed by Major Manifold, who, with Captain Hunter, has lately been making some very thorough surveys through the whole of Central and Eastern Sechuan, and, if I might be allowed to suggest, I should say that would be the line that should be the first to be made of the railway lines in Western China. That once made, I think extensions of it would follow very easily. Sechuan is nothing like as hilly a province as Yunnan, and it is a very rich province. It is certainly the largest and most populous province in China; it is also considered the richest. I think, by beginning there, it would give the promoters of the scheme an idea of what railways in Western China would turn out like. And eventually it might be carried from there backward through Yunnan. The Yunnan railway is a very large business, and its construction may be delayed, but I cannot help thinking that a line which makes a great highway between India and China will eventually become an accomplished fact.

Sir Thomas Holdich: It is little that I can add to this interesting paper that we have heard to-night about a country in which, unfortunately, I have never travelled myself. But I am glad of this opportunity to welcome an officer from the department with which I was so long associated in India, who, more fortunate than his brother officer and survey comrade, Captain Watts Jones, has returned here to England to tell us the story of what he did in that distressful country,

China. There are one or two points that have struck me in relation to his work. In the first place, the extent of it, and, in the next place, the energy with which it was carried through. I think that if we remember back not so very long ago —well, within my memory—as to how much we knew of those countries which lie beyond the borders of India, we shall be struck at once with the immense extent in late years of those geographical surveys which have been carried out on scientific lines in the same manner that Captain Ryder with Major Davies have carried out their surveys in Western China. I can remember the time when the rugged line of frontier hills beyond the Indus not only bounded our horizon in that direction, but was absolutely at the time the limit of our geographical knowledge. We knew a little of what lay beyond them, but of what was in them we knew nothing. We knew something of the passes and the roads that ran through them, but of the hills themselves and of the villages we knew nothing. All that country where the present campaign is being carried on was an absolute blank. And now, how is it at present? We have carried these geographical surveys well into Eastern Persia, we have carried them to a junction with Russian territory on the north; and now, thanks to Major Davies and Captain Ryder, they extend well into China on the east. And yet, as Captain Ryder has told you, there is a very large future before us. We cannot say that we are within anything like measurable distance of the end. There is a large future for work of this nature; but the success of such survey work—the success of Colonel Rennie Taylor and Captain Ryder lately in another field in China, and of Major Close and Captain Jansen in the Transvaal, and of other officers whom I could mention in other parts of the world, all working on the same system—should, I think, at least assure us that that system is a sound one, and may safely be commended to the consideration of those many half-developed institutions which are rapidly springing up in England in the cause of geographical education. We were all much interested, of course, in hearing what Major Davies and Captain Ryder had to say about the chances of the connecting link between Burma and China in the matter of railways, and it is quite clear, I think, from what they have said, that, in their opinion at any rate, the engineering difficulties are not insurmountable. But they have said nothing about that larger question, which probably will interest the public very much in the future, as to whether it is not rather competition than construction which will bar the way to that connection ever being practically useful; whether the great waterways of China, which you have seen pretty well shown in the map which Captain Ryder has placed on the screen, whether that magnificent system of waterways and the easy possibilities of traffic which exists thereby, will ever be ousted or competed against by railway traffic—that is a very large question, perhaps too large for one to enter on here. But I would merely point out that, for a matter of that sort, it is well to turn to history, and I think it will be found that under similar circumstances elsewhere, at any rate so far as I have been able to see, wherever there has been competition between water carriage and railway carriage, under those circumstances the railway has invariably won. Well, gentlemen, I add no more; I merely wish to offer my congratulations to Colonel Rennie Taylor, to Major Davies, and to Captain Ryder for the splendid work that they have done in China, and to Captain Ryder for his most excellent paper to-night.

Mr. Fred. W. Carey: As I have only lately returned to England from that part of China which Captain Ryder has just described so clearly to us, I am able to say that his impressions of the country through which he travelled are what one would expect from an unprejudiced observer. My own journeys in Yunnan, during the last seven years, were confined to the southern and extreme south-

western portions of that province, *i.e.* the neighbourhood of Szemao and the Chinese Shan States; and I notice that Captain Ryder has said little or nothing about the extraordinary number and variety of hill tribes one meets with in Yunnan. During my stay there this was a subject that interested me very much. In every little market, as one travels along, one sees different tribes of hill people, wearing curious costumes and speaking each their own dialect. The Chinese, with their characteristic contempt for all alien races, can give no account of these numerous tribes. They distinguish each by some more or less opprobrious nickname, and are content. I remember the indignant answer I received from one Chinese gentleman when I asked him if he could speak the Shan language. "Do you take me for a wretched barbarian?" said he, or words to that effect.

I quite agree with Captain Ryder that the question of railways in Western China is a political one; and I think those who clamour for the construction of railways in China are apt to forget that it does not form part of the British Empire, and that such undertakings cannot be peacefully carried through until the Chinese themselves are convinced of their utility and necessity. That day, I venture to predict, is not so very far distant. Good roads are sadly needed in Yunnan, but road-making under official supervision would mean heavy taxes on the inhabitants and passing traders, and of the two evils the people at present prefer bad roads. With regard to the opium cultivated in Yunnan, I should like to make a few remarks. Many people in this country still hold the opinion that Indian opium is being forced on the Chinese against their will. They even believe that the cultivation of opium is prohibited throughout the Chinese Empire—indeed, I saw a statement to this effect quite recently in a well-known paper. This is not true, for in Yunnan, at any rate, the cultivation of the poppy has been encouraged by the officials for fiscal reasons. Chinese tradition states that opium-smoking first took its rise in that province, and one account says that opium has been produced there since the year 1760. The annual output at present is not far short of 5500 tons, whilst in the neighbouring province of Sechuan it is considerably more. As Indian opium (none of which ever finds its way into Yunnan) is handicapped by an exceedingly heavy import duty, it is not too much to expect that in a few years' time the native will oust the foreign article from the Chinese market. The opium question, as far as England is concerned, will then die a natural death. The opium bowl used by the Chinese originated in Yunnan, and even now the bowls manufactured at Linan, Mengtsz, and Semao are in great demand all over the south of China. Nearly every woman in Yunnan can spin cotton, and in every village one sees the old-fashioned wooden loom at work weaving cotton cloth, with which all the poorer classes clothe themselves. Before the Panthay rebellion the province was the centre of a big silk industry. Now, however, only a very little silk is produced in Yunnan. The Yunnanese are essentially of a most peaceful disposition, and I am sure Captain Ryder will bear me witness when I say that, as a rule, Europeans are treated with friendliness and respect. The country people I always found most hospitable, but particularly so when I was unaccompanied by any Chinese soldiers, who, when acting as escort to Europeans, in their zeal are apt to be too overbearing.

Dr. Logan Jack: Having recently come from pretty nearly the same country which was traversed by Captain Ryder and his companions, I should like to say first, that it is impossible to overestimate the value of such accurate observations as have been made by these gentlemen. There is nothing to be compared with them so far in the history of the exploration of China. In the adjoining room, I would invite the attention of members of the Society and visitors to a Chinese map of that district, especially of the province of Sechuan, and it will be seen

what a very great difference there is. That map is a mere diagram showing the relations of the principal rivers to one another, and showing them accurately, in so far that each river falls in on the right or left bank of the principal river as it ought to do; but a matter of 50 or 100 miles error is nothing whatever in Chinese maps. I do not think that this map we have seen to-night can be the one to which Captain Ryder has referred as that to which people who venture in future to discuss Chinese railway projects must turn, because in this map (which may, perhaps, only be an unfinished proof) not even the author's route is laid down. But that map is, no doubt, available. It is, I suppose, in the hands of the Indian Government, and also in the hands of the Yunnan Company, and will be issued in the course of time. When it is available, we shall have made an immense advance on anything which has hitherto been in our hands. I am aware that the question of railways from India to China is a question which becomes a political one, and therefore is not open to discussion in this Society; but the question of the practicability of railway construction is an academic one on which we may form our opinions, and we may be aided in forming such opinions by the surveys of Captain Ryder and his companions, when they are in our hands. I gathered from his remarks that there is at least one practicable, though difficult route, for a railway, and I gather from other sources that the railway being constructed by the French towards Yunnan is by no means deficient in engineering difficulties, and possibly they are as great on that line as they will be on the proposed line from the Irrawadi, which may be completed some day or other. I believe, for my part, that the Chinese themselves in that district are fully aware of the value of that trade-route to them. Again and again, in the last two or three hundred years, they have attempted to get what the Scotch lairds used to call "a grip of the sea;" that is, they have attempted to secure a port at Irrawadi at the head of the navigation. It was only a very few years before the British occupation of Upper Burma that the last attempt on Bhamo was made, and the Chinese actually held the town for some time under very romantic circumstances. As to the amount of traffic along those lines, I think it has been considerably underestimated. I met, in the course of a journey from Chengtu and up by the Tibetan border, down the Yangtse and across the Mekong and Salwen to the Irrawadi, enormous trains of mules and packers, hundreds of them two or three times a day, and each mule will carry at any rate a couple of hundred pounds. Ten of them will carry a ton, and that traffic is carried on in the face of all the difficulties which are inseparable from the indescribably bad condition of Chinese roads. These roads were paved hundreds of years ago in some instances, have been washed away and never repaired, and are carried without grading, by means of flights of steps, up and down the mountain-sides. In spite of all that, Western and American produce, in the shape of cotton, tobacco, condensed milk and kerosine, find their way over long distances into the interior of Sechuan, and if these difficulties were lessened —if a railway existed—then I have no doubt the volume of the trade would be enormously increased. As to the population, Yunnan was almost depopulated during the Mohammedan rebellion, and there are traces of that depopulation on every hand. But it is patent to every traveller who passes through the country that it is being repopulated by immigration from other provinces and by the natural increase in a country where there is plenty of room to spread out. Captain Ryder has told us that among the lamas he met with a great deal of hostility. I must confess that surprised me considerably, because my experience amongst the lamas, where I was often a guest of the priests, was very much more pleasant, and I found them extremely courteous and amiable. It has just struck me as possible that the display of a foreign armed force in this expedition may have had

something to do with the hostility which Major Davies and Captain Ryder and their party met with. At all events, in my case the lamas were exceedingly kind and courteous, and nothing could exceed their hospitality. I do not wish, at this late hour, to trespass further on your time, but I am glad to have had this opportunity of thanking Captain Ryder for this most interesting paper, and I am sure we shall all especially welcome those maps when we do ultimately see them.

Mr. JOHN HALLIDAY: I did not expect to be asked to speak this evening, and I really have very little to add to the able address which Captain Ryder has given us, and which Major Davies has also given us, and Dr. Jack. I suppose I am called upon as I have something to do with the Yunnan Company, which is practically one of my babies, and it has paid all the expenses of this Expedition, and even the wear and tear of the survey instruments which were used. I would impress upon the audience that they should not take their ideas of Yunnan from those photographs. You will have observed the terraces were as precipitous as the mountains all round the valleys, showing that the photographs do not do justice to the country as a railway country. The surveys which we have from Captain Watts Jones, in which he has delineated the superficial and the horizontal outline of the country, show no very bad country whatever, except a few miles between Yunnan-fu and the Yangtse valley. It is not more difficult than the railways in the Rocky mountains. There are no impracticable engineering problems. The biggest mountain which stands in our way at present is the Chinese Government, for they have never confirmed the concession which our Government imagined they had secured. Four or five years ago, when this company was started and the survey began, the Foreign Office, the War Office, the India Office, and the Burma Railways, all combined to encourage us to make the survey. But I am afraid there is very little chance of any railway being made for many years. The trade, however, is increasing very largely, and if we could even get a cart-track—a practicable road—the increase of trade would be enormous. At present, as Dr. Jack has told us, the mules have practically to go up and down stairs—up the one side of the hills and down the other. It is a wonder they get along at all. I have only to thank Captain Ryder and Major Davies for their interesting address, and I also thank you, Mr. President, for asking me to say a few words.

Captain RYDER: There are very few points in the discussion that want answering, as everybody seems much of the same opinion. I should like to mention, with reference to what Dr. Jack has said about the map, that it was only intended absolutely and entirely as an index map to give any one who attended here an idea of what I was going to talk about. It is not a map as we would call it; it is a guide. Our maps, as we survey them, I suppose, would cover the whole of this green cloth. And about our routes being marked; if we had marked our routes—well, I travelled 4000 miles, and the other officers did much about the same—as our routes crossed and recrossed, if we had marked them, there would not have been room for anything else much on the map. Besides the maps that the Government of India are publishing of our surveys, the Geographical Society here are reducing our surveys to a fairly workable scale, and I hope they will be published soon. With regard to the remark by Mr. Halliday about the expenses of the Expedition, I think it right to say that, so far as I was concerned, my expenses, and the expenses of those under me, were entirely paid by the Government of India. So I think they should receive some credit for the results of our expeditions.

The PRESIDENT: Now, it only remains for us to express our thanks for the

interesting paper we have listened to this evening. For more than thirty years back we have had accounts of this most interesting part of China from such men as Lieut. Garnier and poor Captain Gill, and Cooper and Colquhoun, and, above all, from Mr. Baber; and I think it is a very remarkable thing that the whole of these pioneers were most distinguished geographers, and six of them were Gold Medalists of the Society, so that at intervals during that long period we have had our interest aroused in Yun-nan by very capable and very able geographers. Now at last we have received a scientific survey of the greatest value and importance, and we have certainly to thank the Yunnan Company for its liberality, and also the Indian Government. Through their means, Major Davies and Captain Ryder have executed this admirable survey. I am sure you will all wish to vote your thanks to Captain Ryder for his paper, which has given rise to such an interesting discussion, and also for the admirable way in which he has illustrated it.

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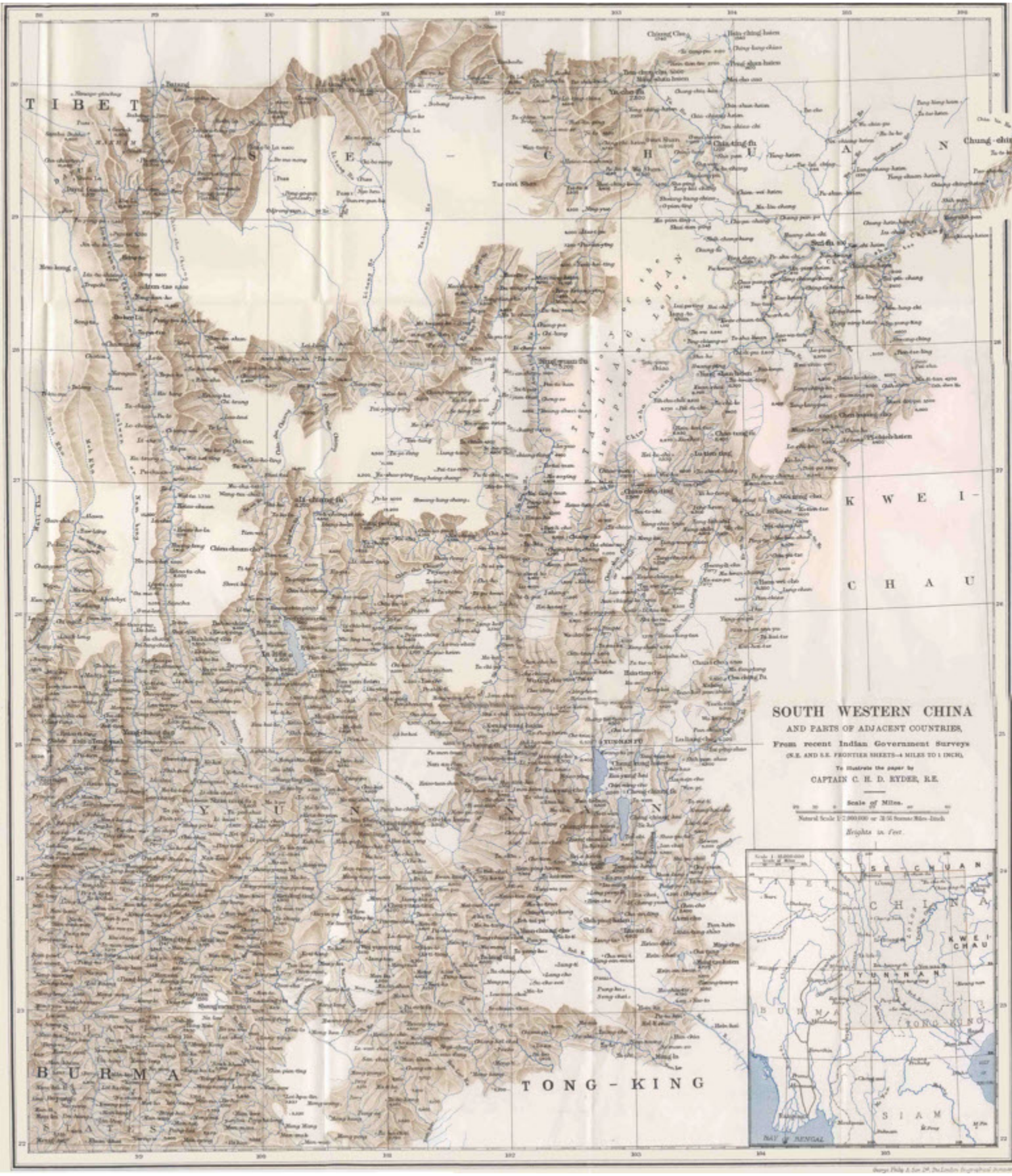
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SOUTH WESTERN CHINA
AND PARTS OF ADJACENT COUNTRIES,
From recent Indian Government Surveys
(N.E. AND S.E. FRONTIER SHEETS—4 MILES TO 1 INCH),
To illustrate the paper by
CAPTAIN C. H. D. RYDER, R.E.
Scale of Miles.
Heights in Feet.