THE GEOGRAPHICAL JOURNAL

PUBLISHED UNDER THE AUTHORITY OF THE COUNCIL

EDITED BY THE SECRETARY

VOL. LIII.—JANUARY TO JUNE 1919

LONDON

THE ROYAL GEOGRAPHICAL SOCIETY

KENSINGTON GORE S.W. 7

EDWARD STANFORD, LTD. 12 LONG ACRE W.C. 2

1919

PRINTED BY
WILLIAM CLOWES AND SONS, LIMITED,
LONDON AND BECCLES, ENGLAND.

CONTENTS

Authors are alone responsible for their respective statements.

No. 3. March 1919.

No. 6. June 1919.

and environment in the Spanish area of the Sáharan Desert. His maps of Muni on a scale of 1/200,000 and the Spanish Sahara 1/M were published in 1903 and 1914, supplemented by descriptive accounts, under the modest title of *Someras Notas*—rough notes, and *Breve descripcio*—short account, in the *Boletín* of the *Real Sociedad Geográfica* (vols. 44 and 56). They are highly instructive, and add important chapters to general knowledge regarding Spanish possessions and protectorates in Western Africa.

In later years Sr. d'Almonte devoted himself to an inquiry into the evolution of racial distinctions in Indonesia and Malaya, the first results of which display their author as an indefatigable ethnographer and philologist (*Boletín R.S.G.*, vol. 59 (1917), pp. 7–321, 398–478). While returning to the Far East in order to resume and extend those studies, his life was abruptly and prematurely brought to a close by the operation of a German mine in the vicinity of the Cape of Good Hope—a misfortune which has elicited genuine sympathy and regret in his native country, and must appeal to all geographers, irrespective of nationality. B. G. C.

CORRESPONDENCE

The Names of Himalayan Peaks.

I HAVE just read Dr. Kellas's note on the Nomenclature of Himalayan Peaks in the October number of the *Journal*. I fully admit the objections to the use of personal names, but I would make an exception in the single case of Everest. The name itself is such an uncommon one that the fact of its being a personal one is not forced on our notice as would be the case with that of any other of the pioneers in Indian geography. I doubt if the name Mount Hodgson or Mount Lambton, for instance, would ever have become established throughout the English-speaking world as has Mount Everest.

In cases where Tibetan or other local names can be found, the correct etymology should certainly, as suggested by Dr. Kellas, be determined by linguistic experts. The necessity for this is apparent from the two cases discussed by him. The corrêct spelling of the Tibetan word for "Lady" is Jomo, not Chomo; the name Jomolangmo means "The Lady of the Elephant." Another Tibetan name which Sarat-Chandra Das gives for Mount Everest is Jomogangkar, "The Lady of the White Snows," or "The Jungfrau of the Himalaya." The word Jomo appears also in the name Jomothari, "The Lady of the Holy Mountain," corrupted in maps into Chumalari.

The Tibetan for ice, or perpetual snow, is Gang; Gangri, not Kangri, is the correct spelling of the word, which means "Snowy Mountain." Jäschke gives Gangchenjenga, "The Five Kings of the Great Snows," or Gangchendzonga, "The Five Receptacles of the Great Glaciers," as the name of the mountain commonly spelled Kinchenjunga. The latter form is, I think, too well established to make a change desirable.

R. A. WAUHOPE.

Dehra Dun, 4 January 1919.

Lake Formation and Desiccation in Africa.

Referring to the note in the *Journal* of August 1918 on Lake Fagibini near Timbuktu: in the Sokoto province of Nigeria I found lake formation

new Serbia), that it is quite probable that they might prefer the domination or administration of Italy, in consequence of the very uncertain communications they maintain with their own people on the far side of the mountains. Thus eventually I have come to precisely the same conclusion as that which I was interested to hear to-night expressed by Commander Roncagli.

I will now ask you to join in thanking Commander Roncagli for his admirable lecture, and also Colonel Longmore for the illustrations he has been kind enough to show us. I must also add the name of Mrs. Dickinson Berry, who has kindly lent us some of the slides of Dalmatia which you have seen to-night.

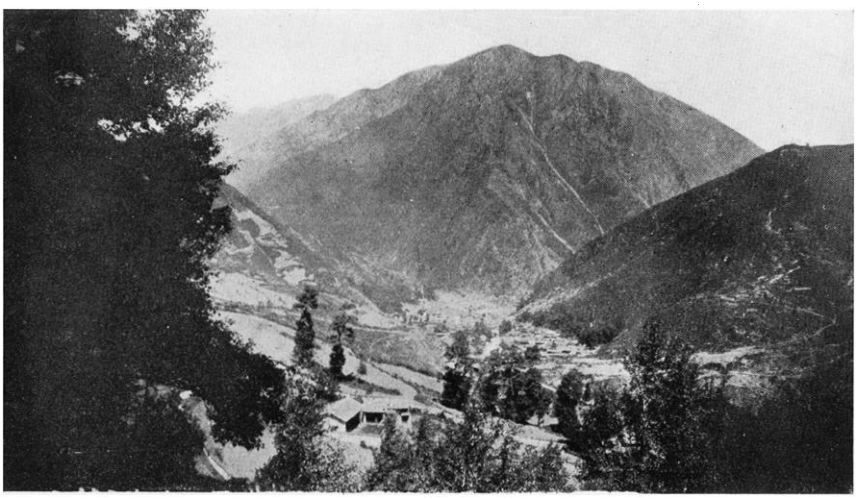
EASTERN TIBET

Oliver Coales

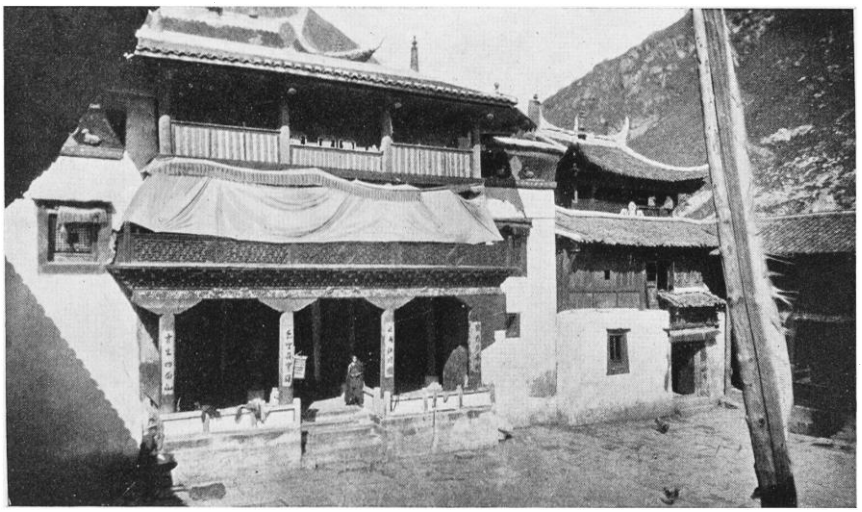
Read at the Meeting of the Society, 27 January 1919.

THE secrets of the central part of Tibet, so long the goal of many adventurous explorers, were unveiled by the British expedition to Lhasa in 1904. Lhasa, Shigatse, the seats of the pontiff rulers, and the course of the upper Brahmaputra, have now been laid bare by many books published since then, and by the surveys of British and other travellers. But eastwards of Lhasa and stretching to the Chinese frontier is a country of which we still know little, and where the map-maker is free to use his ingenuity in tracing the course of rivers and fixing the sites of towns. Reasons of policy and the hostile relations between China and Tibet have closed this country to the traveller, and little more is known of it, except for the explorations of Captain Bailey, than at the beginning of the century.

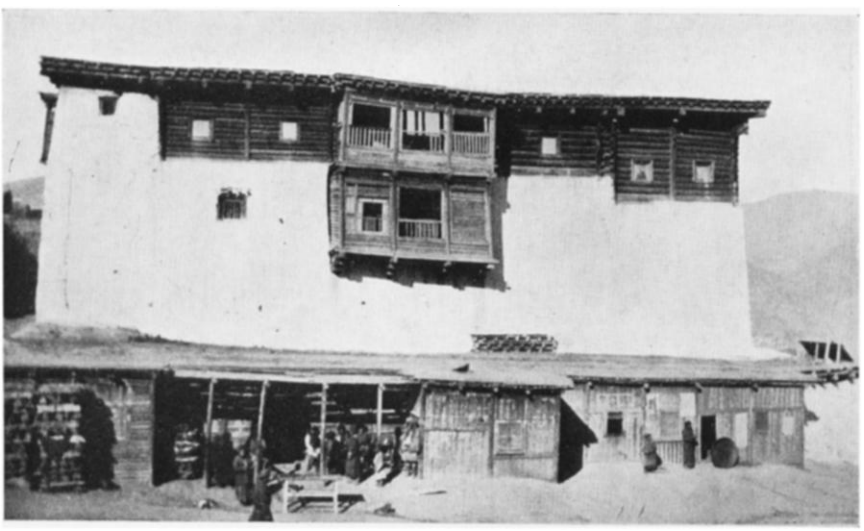
The northern half of Tibet, with which my paper has nothing to do, is, as other travellers have told us, an inhospitable plateau, inhabited only by a few scattered nomads. In the south, where the elevation is less, is the real Tibet, a country of long river valleys that enjoy a genial climate and support a settled population of farmers, and of broad upland pastures and mountain ranges where roaming herdsmen graze their herds and flocks. There are three traditional divisions of Tibet proper: in the west is Tsang, in the centre near Lhasa is U, and in the east is Kham. Of these Kham is the greatest in extent, stretching from the Tanta La, a high pass north-east of Lhasa, to the province of Szechwan in China. It is doubtful if Kham was ever a political division, the name being rather the appellation of a vague stretch of country; and though some Chinese writers refer to Ch'amdo as if it were the capital, it is probable that it never had a political centre such as Lhasa and Shigatse in the west. In the western part of Kham the upper waters of the Salween and other rivers drain eastwards, and eventually make their way south past the eastern end of the Himalayas. In the east we find the remarkable series of great rivers



TACHIENLU FROM THE SOUTH-WEST

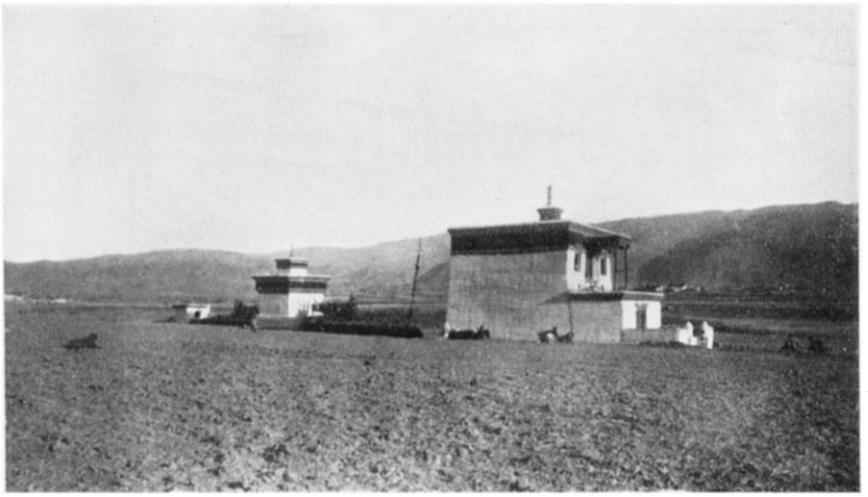


MONASTERY AT TACHIENLU

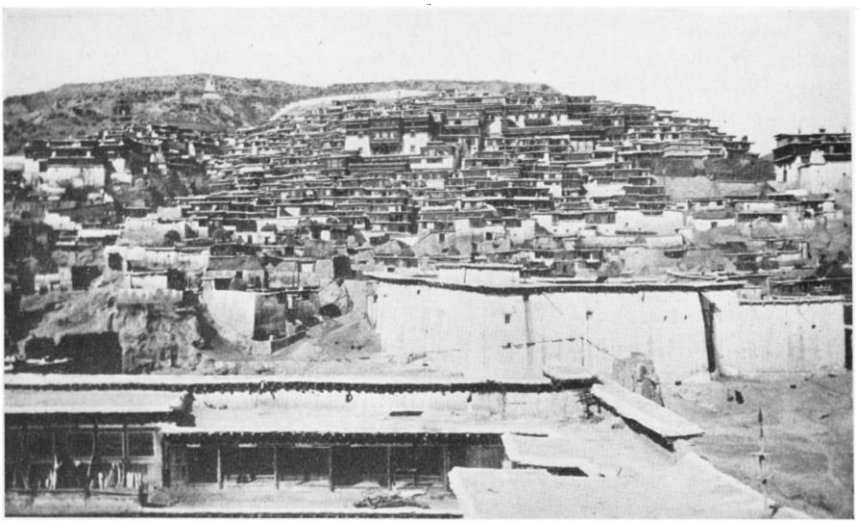


PALACE OF DRANGO

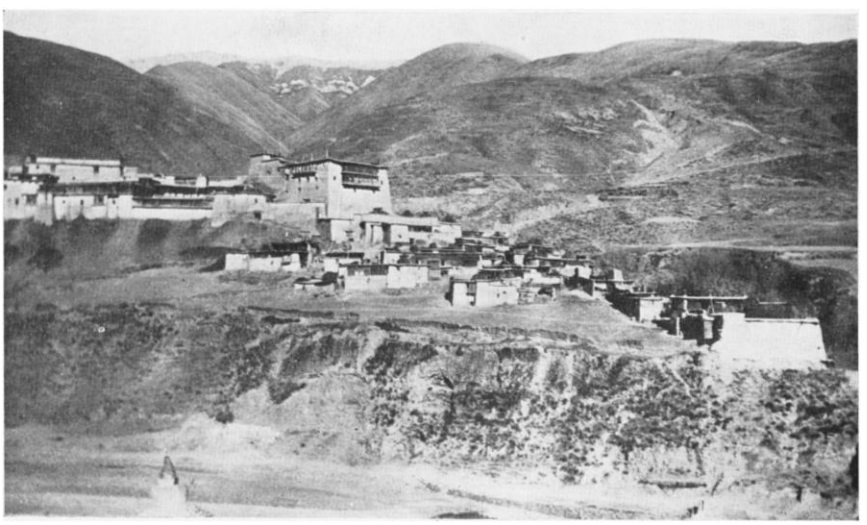
Phot. by L. M. King



ROADSIDE TEMPLE AND MANI IN RONGPATSA



MONASTERY OF KANDZE *Phot. by L. M. King*



PALACE AND VILLAGE OF DRIO (CHUWO) *Phot. by L. M. King*

flowing from north to south in parallel valleys, well known on maps of Asia.

The general elevation of Kham is well over 11,000 feet above sea-level, though the river valleys descend as low as 8000 feet. In the parts east of the Mekong, which are those known to me, there are no mountains rivalling the Himalayas, but many of the ranges intersecting the plateau rise to between 18,000 and 20,000 feet or more and the passes crossing them vary from 13,000 to 16,000 feet. The people of Kham are a comparatively pure race of Tibetans and show few marks of the occasional intermingling of Mongols and Chinese who have invaded the country. It is remarkable that the immigrants of these two races seem quite unable to preserve their national characteristics after the second generation, and we find that the people of Gyade in the north-west who claim to be of Chinese or Mongol stock are quite indistinguishable from Tibetans in appearance and language. It is true that in the south there are some aboriginal races, such as the Moso and Lissu, but they hardly count among the people of Kham. The language spoken throughout Kham is a purer Tibetan than the Lhasa dialect and has a large number of archaisms in pronunciation and vocabulary.

The history of Kham is meagre, and names occurring in the earlier Chinese accounts are now almost impossible to identify. Its modern history begins with the Manchu conquest of Tibet in the early part of the eighteenth century. At that time Kham was a congeries of lay and lama states which came under the domination of the Chinese Emperor at the same time as did the Dalai Lama. In the final settlement by which the Manchus confirmed the Dalai Lama in his supremacy over Tibet, the politic emperors resorted to a scheme of buffer states to protect the western frontier of China. The parts of Kham west of the Salween, with the exception of some districts administered by the Chinese Ambans, were given to the Dalai Lama. Three lama princes, who ruled along the course of the Mekong at Riwoch'e, Ch'amdo, and Draya, became direct feudatories of the Emperor, receiving seals and patents of office from him, but acknowledging more or less in spiritual matters the primacy of the Dalai Lama. One is reminded of the status of the former Prince Bishops of the Holy Roman Empire. Further south the district of Markham was given to the Dalai Lama. In the east the boundary of the Chinese province of Szechwan was brought, first to the line of the Yalung, and then to the watershed west of the Dre Ch'u or Yangtze Kiang. The Tibetan chiefs, who numbered about thirty-five, were confirmed in their fiefs and made subject to the Viceroy of the province. The more important were the Kings of Chala and Dege, the Debas of Batang and Litang, and the Horpa princes. The political system thus set up continued unchanged, with the exception that the Dalai Lama acquired Nyarong in the nineteenth century, until a few years ago.

Towards the end of the nineteenth century, owing to the decay of the

empire, Chinese control over Tibet gradually weakened, with the result that the Dalai Lama and the other native chiefs became practically independent. The prospect of losing even the vague suzerainty over Tibet that remained to it began to alarm the Chinese Government, which now decided to embark upon a forward policy. As a preliminary it was necessary to reduce to obedience the chiefs of Eastern Kham who openly derided Chinese authority. A pretext was given when one of the Chinese Ambans on his way to Lhasa was murdered near Batang with the connivance of the lamas of the monastery there. An able and energetic general named Chao Erh-feng was sent with a force of modern drilled troops to put down the rising. He carried out his orders successfully, but not without great difficulty, especially in the capture of the important monastery of Sampiling, which was only reduced after several months' siege. Chao's severity in the burning of this monastery and that of Batang, and in executing many of the lamas, was much criticized at the time.

He next turned his attention to the kingdom of Dege, where two brothers were struggling for the throne. He advanced along the north road, settled the dispute in Dege, and, on the pretext that the people of Nyarong were being oppressed by the Dalai Lama's governors, invaded that country and drove them out. The intentions of the Chinese Government now began to unfold themselves. It proceeded to reassert Chinese authority in Tibet and reduce the Dalai Lama to a mere religious pontiff. With this objective an army was despatched to Lhasa, and Chao Erh-feng went on with his troops to clear the way in advance. A few small battles in which the Tibetans were worsted enabled Chao to conquer the country as far as the Tanta La north-east of Lhasa. The army destined for the capital then made its way thither without further opposition, only to find that the Dalai Lama had fled to India.

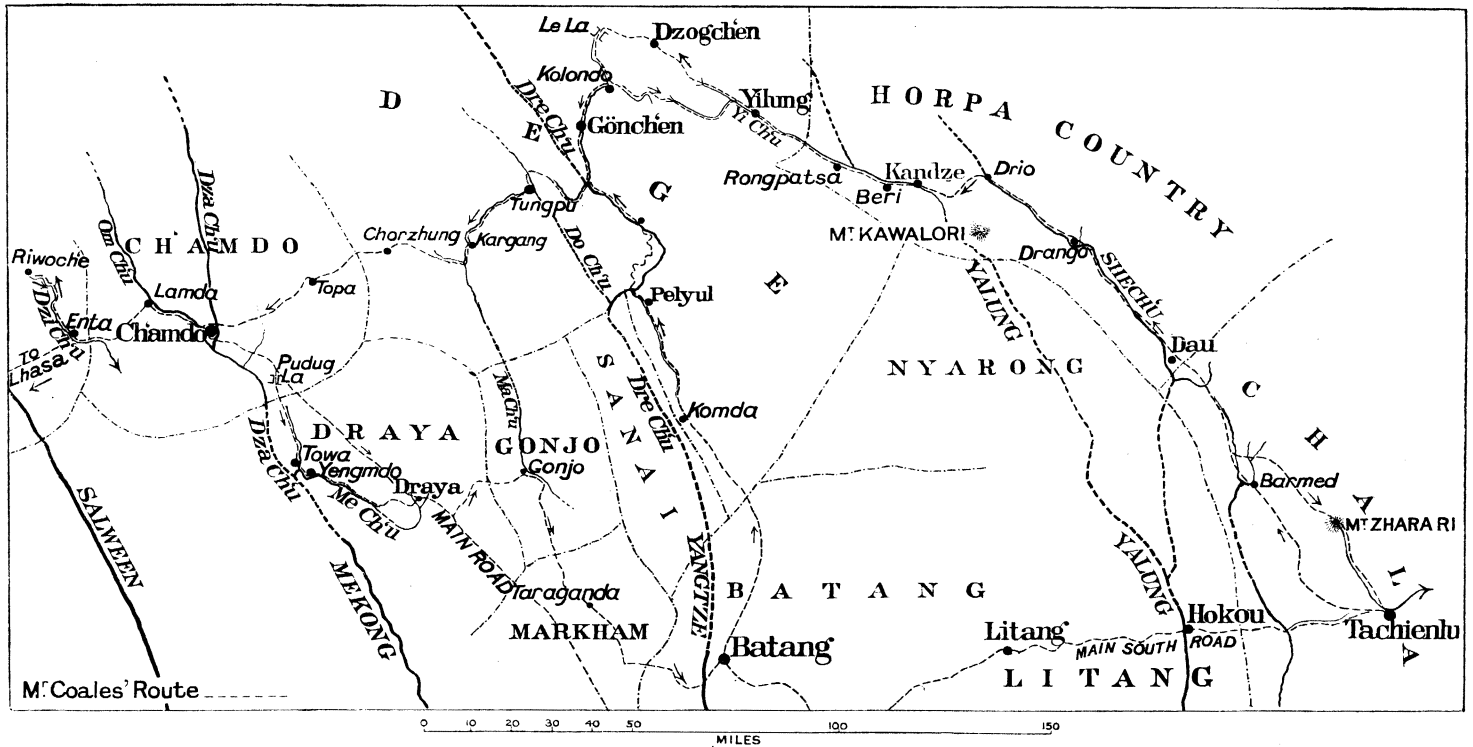
Chao now elaborated a scheme of resuscitating Kham as a Chinese province under the name of Hsi Kang. The country was to be divided up into circuits and districts under a Chinese Governor whose headquarters were to be at Batang. Fortune however decreed otherwise. In the autumn of 1911, just when the last steps were to be taken, the Chinese revolution broke out, and Chao, who a few months before had been elevated to the Governor-Generalship of Szechwan, fell one of the first victims to the insurgents. Profiting by the disturbances in China the Dalai Lama returned to Lhasa, where the Chinese army, cut off from all succour, quickly capitulated. A general revolt broke out in Kham, and all the parts west of the Salween fell into Tibetan hands. Draya also was captured, but Ch'amdo held out and was eventually relieved. The Chinese gradually recovered themselves, the insurgents in the east were suppressed, and Draya was recaptured. Fighting went on for some years, but the Dalai Lama was unable to establish himself beyond the Mekong, which, up to the time of my visit, remained the frontier between the opposing forces. At the instance of the British Government active

fighting ceased in 1914, and a conference of British, Chinese, and Tibetan delegates was convened at Simla. Though a convention was drafted, the Chinese Government at the last moment refused to ratify it, with the result that the attempt to make peace failed, and ever since relations between China and Tibet have been hostile. No active movement was made on either side until the winter of last year, when the Dalai Lama's forces, again taking advantage of China's troubles, attacked along the line of the Mekong, captured Ch'amdo and Draya, and now hold all the country west of the Yangtze.

The frontier town of Tachienlu, where I was stationed for nearly two years, is the gateway through which the teas and silks of Western China enter Tibet. Here, in a narrow ravine hemmed in by steep mountains whose summits are clothed with glaciers, converge the two highways which unite Lhasa with China, the official highway through Batang, and the caravan road through Jyekundo. The town has often been described by travellers, and I need say little about it. Once it was the capital of a Tibetan kingdom called Chala, also known as Minyag. The last king was deposed, but still resides in the town, where he leads a precarious existence, alternately oppressed and patronized by the Chinese officials. He is a shifty character whose continual intrigues bring just suspicion upon him. His subjects, whose property and womenfolk he took at will, hated him and do not regret his deposition. His figure is like a woman's, which used to puzzle me, till I found he wore a large Tibetan kau or charm-box on his chest beneath his clothes. When chaffed about it he would laugh, but nevertheless fully believed it protected him from an untimely death.

Tachienlu has a mixed Chinese and Tibetan population engrossed in the caravan trade which takes the teas and silks of Western China to Tibet. The streets resemble those of a Chinese town, but the lama monasteries and the inns where the native traders lodge provide a Tibetan element.

I had long wished to travel further into Tibet, but was prevented for nearly a year by the continued opposition of the Chinese officials. At length in December 1916 a change of governors gave me the opportunity. My object was to travel along the north road as far as possible and endeavour to reach Ch'amdo and Draya, places which had not been visited by foreigners for many years. The first official barrier broken down, I had no further difficulty, and not only reached Chamdo but went some days' journey beyond. I was able to make a compass traverse of the greater part of the route, which includes some hitherto unmapped roads, and to take several observations for latitude. I had with me a Tibetan interpreter, an invaluable man, three Chinese servants, and one Tibetan. My caravan consisted of seven ponies and mules of my own, and about fifteen other animals, mules or yaks, hired from stage to stage. As companion for part of the way I had Mr. Clements of the China Inland Mission at Tachienlu.



Sketch-map to illustrate Mr. Coales' journey from Tachienlu to Ch'amdo. A more complete map based on his observations will be published in a later number of the 'Journal.'

It was a raw misty day with snow falling gently when we set out from Tachienlu on December 2. We considered ourselves rather unfortunate, because the weather in winter is expected to be fine, the roads dry, and the passes free of snow. After a steady climb of 15 miles over a slushy and stony road we arrived late in the evening at the Cheto resthouse. On the next day the weather had not improved, and to add to our difficulties the Tibetan drivers had deserted, being kind enough, however, to leave their animals for us to load. We managed to start off at daybreak to ascend the last part of the Cheto pass. The fairly well-graded road made by the Chinese some ten years before had fallen into complete disrepair, and was most tiring to the animals. On the way up one catches a glimpse of the magnificent peaks and glaciers to the south-east of Tachienlu, the highest summits of which rise to over 17,000 feet.

The Cheto Pass, the gateway to Tibet almost always crossed by travellers from the east, is 13,500 feet above sea-level and 5000 feet above Tachienlu. The Tibetans call it by the curious name of Gyu La * or Pass of the Entrails, from a hunting story of one of the kings of Minyag. He is said to have wounded a deer in the bowels and to have followed it to the neighbourhood of Tachienlu, where a mountain spirit appeared to him and pointed the place out as the site of the future capital.

Just below the pass we parted from the Batang main road and turned north-west across a stony waste at the foot of a barren range of mountains trending in much the same direction. At its further end is a fine snow-capped peak called Zhara Ri † by the Tibetans. Among the tarns which lie at its foot is a beautiful turquoise lake fed by a waterfall issuing from a glacier. It is the haunt of spirits and is considered sacred by Tibetans, whose lamas often come to spend the summer in meditation in the lovely woods which surround it.

We arrived that night at Trampadrong, ‡ a hamlet in a cultivated valley, where we put up at a local chief's house. Tibetan houses hereabouts are usually square and lofty two-storeyed buildings with walls of undressed flat stones. A stable or cattle pen, in a state of indescribable filth, occupies the ground floor. In the upper storey are the living rooms, barely furnished with a few dirty woollen cushions, low tables and fire-pans. Staircases are rarely found, the usual means of ascent being a notched beam, loosely leaned against the side of a hole in the floor, which must be ascended as a monkey runs up a stick. The flat mud roof is firmly beaten down on bundles of brushwood laid on the roof beams. At the back is an open shed used as a granary, and near by is a little covered furnace where the morning and evening offering of burning juniper branches is made. Some of the better-class houses are painted internally

* Usually incorrectly written Gi La.

† In Chinese Hai-tzŭ Shan, "Lake Mountain."

‡ Chin. Ch'ang-pa-ch'un.

and have the lintels and posts of the doors and windows carved; and often there is a private chapel decorated with painted scrolls and images.

From Trampadrong to Dau we travelled along a series of narrow valleys and crossed some easy passes. There were many small villages and tracts of cultivation, but it was melancholy to find nearly half of them empty and the fields abandoned. This was the aftermath of frequent rebellion and official oppression. One hamlet of a dozen houses called Dronggo * was completely deserted, and in a lamasery near by only two of its forty lamas remained. The aspect of the country is pleasing; woods are rather scarce, but the mountains are low and grassy.

The weather had changed for the better since we had left the cold valleys about Tachienlu, and it was on a sunny afternoon that we arrived at Barmed, † a hamlet of half a dozen houses at a place where two or three open valleys meet and form an undulating cultivated plain. On a hill near the village is a monastery of red lamas peeping picturesquely out of a grove of trees. The only point of interest about it is a superstition that if the number of lamas is at any time allowed to exceed forty, sudden death will at once carry off those who are in excess. An old monastery called Lhagong situated in moorland pastures a few miles distant recalls an incident in ancient Tibetan history. A powerful king of Tibet who lived in the seventh century had compelled the Emperor of China to betroth his daughter to him. On her way to Tibet the princess rested at Lhagong. When she was about to leave the temple a large bronze image of Buddha which she was taking as a present to her husband was found immovably fixed to the ground. The lamas who were consulted ventured the opinion that Buddha was charmed with the seclusion of the spot and wished to remain there, and suggested that his reluctance to go might be overcome by setting up a replica. The image also is believed to have spoken. The advice was followed, whereupon the original image was removed with ease. The replica, which is made of earth, is still to be seen in the principal temple. A sacred relic of a kind not uncommon in Buddhist countries is also shown in this temple: a large footprint in a slab of marble, said to be that of Bashpa Rimpoch'e, a famous lama saint and friend of Kublai Khan, the great Mongol Emperor of China.

Two days later, crossing a wooded pass called Nag-t'ren-he-k'a or Sunglink'ou, we descended into the plain of Dau. We had now left Chala and entered the territory of five small states called the Hor-se-k'a-nga or Horpa clans, which extends along the valleys of two rivers called the She Ch'u and Dza Ch'u, the latter being another name of the Yalung, a tributary of the Yangtze. The names of the states are Drango, ‡ Drio, K'angsar, Mazur and Beri, and the prefix Hor indicates that they

* Chin. Chung-ku. † Chin. Pamei.

‡ Chin. Huo-erh Chang-ku, Huo-erh Chu-wo, Huo-erh K'ung-sa, Huo-erh Ma-shu, Huo-erh Pai-li.

are of Mongol origin. In the early part of the eighteenth century the country was governed by a powerful lama named Ngawang P'unts'o, who was sent by the fifth Dalai Lama to convert the district. He founded thirteen great monasteries, some of which we passed on this road. Ngawang was afterwards ousted by a Mongol intruder, probably one of the Mongol band who subjugated the whole of Tibet about that time. After this Mongol's death the country was divided amongst his sons, who are the ancestors of the present chiefs. They have now, of course, been deposed by the Chinese, who have installed Chinese magistrates at Dau, Drango, and Kandze.

The Horpa country is the most prosperous part of Eastern Tibet. The valleys of the two rivers have a genial climate and fertile soil which support a farming population probably the densest in Tibet. Here are produced crops of wheat, barley, beans, roots, and potatoes; and at Dau, where the elevation is below 10,000 feet, even maize can be harvested. In the extensive pastoral districts of the north and north-east, flocks and herds of innumerable sheep, cattle, mules and ponies are let out to graze. But the occupation which brings the greatest profit to the Horpa people is the commerce. The Horpa merchants, amongst whom are counted the ruling chiefs and monasteries, almost monopolize the caravan trade between Tachienlu and Lhasa. The profits are so great that one finds the common people living in houses that elsewhere only lamas could afford to build, and an example of what these people are able to spend on luxuries is shown in the case of the Kandze monastery, where in the past year a new gilded roof had been put on the principal temple at a cost of £5000.

Dau* is a small town lying in a plain, five miles long by one broad, gradually sloping southwards to the She Ch'u. The plain is extensively cultivated and, in order that the ground may be broken up earlier in the spring, irrigation is generally employed. The population of the town is two hundred families of Chinese, Tibetans, and half-castes. There is one main street full of Chinese shops and thronged with hawkers. Protestants and Roman Catholics have mission stations here, working mainly among the Chinese, and the Chinese tower of the Catholic mission is the most conspicuous building in the town. A little to the west is a great walled monastery called Nyimts'o,† where before the recent rebellions over one thousand lamas lived. Though the greater part has been burned down there still remain the principal temples and a great chorten or pagoda at the south-east corner.

Our road now led up the valley of the She Ch'u,‡ a river which Rockhill in his book, 'The Land of the Lamas,' erroneously calls the Nya Ch'u. It enters the Yalung a little to the north of Hok'ou on the Batang road.

* rDa-u; Chin. Tao-fu.

† gNyis-mTs'o. Rockhill's name Nin-ch'ung is wrong, probably a Chinese name.

‡ Sh'e Ch'u, locally called Dau Ch'u.

Shortly after the town is left the valley contracts and runs between broad-shouldered mountains, fairly well wooded. The many villages are generally found on the alluvial fans of lateral ravines where irrigation is possible. The valley has a prosperous appearance and in many parts is very beautiful. At Gyel-se-ch'u-k'a, a bridge over a small affluent is called by Chinese the General's Bridge,* in reference to Yo Chung-chi, a famous general who took a leading part in the subjugation of Tibet in the eighteenth century. After a high neck has been crossed the valley opens out into broad flat lands through which the river winds in several branches. In the upper part is to be found a remote station of the Roman Catholics, where a French father has gathered a colony of Chinese Christians engaged in opening up alluvial soil, neglected by Tibetans, who prefer the openings of ravines. The priest lives in a whitewashed mission house at the hill foot overlooking the fields and vegetable gardens of his flock. The passing traveller is sure of a hearty welcome.

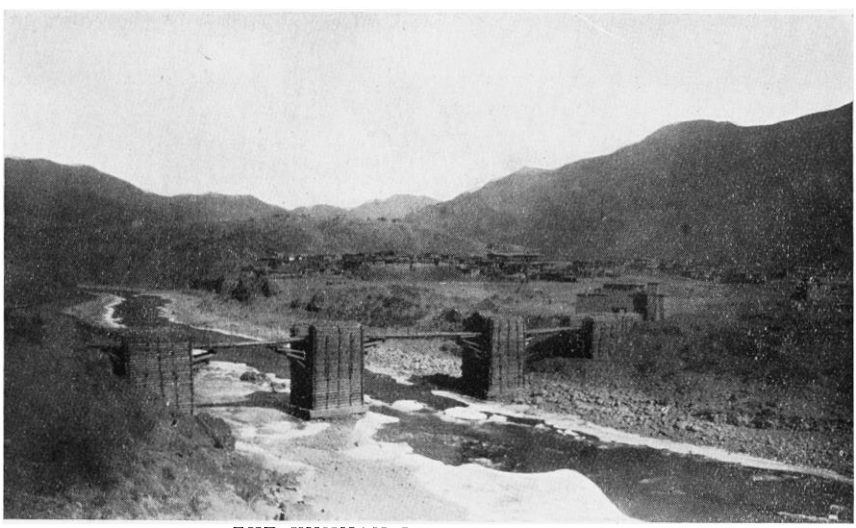
We crossed the river above the mission by a new timber bridge erected by the French father, and ascended a mountain-side to Drango,† a village of about a hundred families, on the north-east face. The river Nyi Ch'u ‡ runs in here. One of the Horpa chiefs formerly lived at Drango in an imposing but dilapidated palace of three storeys, now used by the Chinese magistrate. At the back of the hill is the great Drango monastery, the second in importance of the Gelugpa or yellow sect monasteries of the Horpa district. Secure behind a high and massive wall the lamas live in a maze of brown-and-white dwellings, amongst which rise conspicuously the two principal temples glittering with gilded roofs and pinnacles. These arrogant monks, whose quarrels are a constant source of worry to the Chinese magistrate, received us with very scant courtesy.

We went on for two more days up the She Ch'u. The great north road to Tibet by which we were travelling is full of interest. It is more frequented than the official road through Batang, because the passes are few and easy, accommodation and supplies abundant, and pasture unlimited. Not to speak of the varied succession of prosperous villages and splendid lamaseries, broad pasture lands and nomad encampments, the traveller is diverted by wayfarers of all sorts and conditions. Day after day long caravans of laden animals pass on their way to Tachienlu with wool, hides, medicines, or other merchandise, or return with the teas and silks of China. At one time black shaggy yaks jostle in the road with the long-horned hybrid dzo. At another one is blocked by a stream of laden mules and ponies carrying the merchandise of some monastery of Kandze. In herds of hundreds they crowd the road, urged on by the cries of wild-looking, skin-coated teamsters, armed with swords and guns. These caravans take their journey easily, breaking camp at dawn and stopping soon after noon in order to spare the animals and allow them to graze at will before

* Chiang-chün Ch'iao. † Brag-hgo ; Chin. Chang-ku.
‡ sNyi Ch'u ; Chin. Ni-pa Kou.

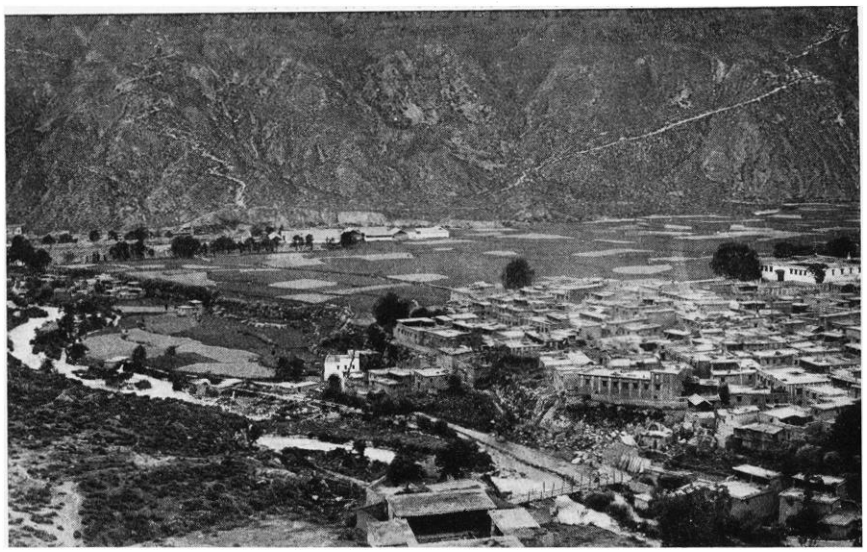
THE RIVER JUNCTION AT CH'AMDO

RUINS OF CH'AMDO MONASTERY

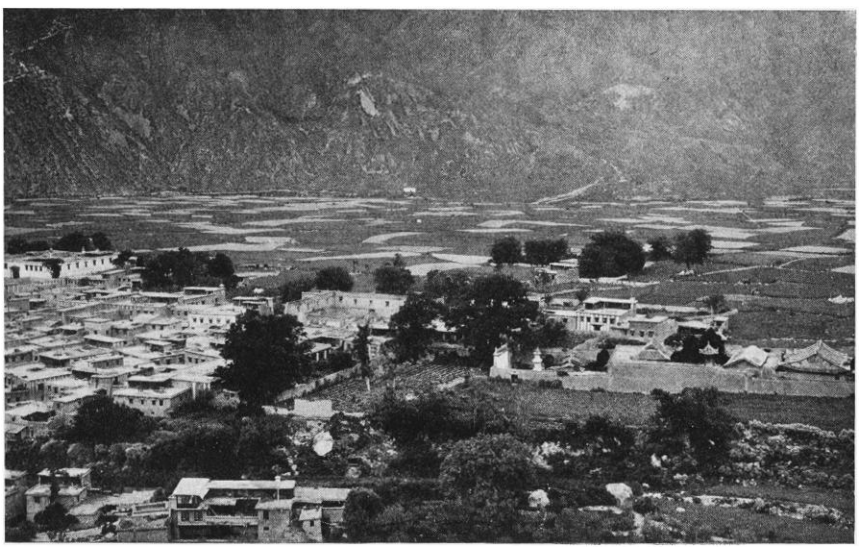


THE YUNNAN BRIDGE AT CH'AMDO

MONASTERY OF RIWOCH'E FROM SOUTH-WEST



BATANG I. Overlap



BATANG II.

the evening round-up. Occasional fellow-travellers are bands of lama novices trudging on foot to the seminaries of their order in far-off Lhasa. Living on the alms of the faithful, they sleep in the open or wherever hospitable shelter is offered in monasteries or farmhouses. Instead of a peaceful ringed staff, such as the early mendicants of Buddhism used to carry, they are armed with lances to protect them from the dangers of the road. One often meets a stream of country people clad in their gayest clothes returning from some monastery festival, or it may be a stately lama riding to some appointment in varnished hat and silken robes of yellow or maroon.

Passing Drio,* where from a high bluff the massive palace of a dispossessed chief commands this section of the road, we left the valley of the She Ch'u and made our way over the grassy downs separating it from the Yalung. Here was a small lake and a Gelugpa monastery called Joro Gompa.† The monastery is a neat walled village built on a hillside whence there unfolds a charming view across the lake to a jagged range of mountains rising on the further side of the river. Grazing on the surrounding uplands we saw the innumerable sheep and oxen of the Kandze people. Further on when we surmounted a low ridge there opened out before us the broad plain of Kandze, studded with villages and monasteries. To our left the silver stream of the Yalung wound round the foot of steep cliffs, beyond which rose an unbroken range of snowy mountains, culminating near at hand in a towering peak called Kawalori and stretching westwards to the far horizon. To our right was the sea of undulating grassy downs, and at the further end of the plain, to which we now descended, a bright spot on the hillside indicated the monastery and town of Kandze.

Kandze‡ is the most important town of the Horpa country and the third largest in Eastern Tibet. The cluster of three or four hundred houses, intersected by winding roads cut deeply into the loess soil, lies at the mouth of a shallow valley. A gateway in the form of a pagoda stands at the entrance, and near by are two other lofty buildings, the palaces of K'angsar and Mazur chiefs. On the face of a bluff above the town rises the great walled monastery, with tier upon tier of crowded dwellings, and, high above them, the temples and palaces of the abbots, resplendent in white and brown and gold. In former times this monastery was second only to Ch'amdo, and now, since that has been destroyed, is the first in Eastern Tibet for wealth and size. Thirteen hundred lamas find a home in its walls and many more in the dependent priories. It is extensively endowed with landed property, but also derives a great income from its activities in the Lhasa tea trade. We were taken round the monastery by

* Dri-o ; Chin. Chu-wo. The district Dau marked on our maps near here does not exist.

† Jog-Ro dGön-pa ; Rockhill is incorrect.

‡ dKar-mDze, "White and Fair" ; Chin. Kan-tzŭ.

a crowd of interested lamas and shown the interiors of the temples full of images, frescoes, and illuminated scrolls, and kept in excellent repair. In Kandze I met the young K'angsar chief, the wealthiest Tibetan in the Marches, and also the King of Dege who was passing through. The latter was accompanied by his queen, a handsome and intelligent lady from Lhasa, who, as is so often the case in Tibet, was plainly the master spirit of the two.

I separated from Mr. Clements at Kandze and left the town on December 22. We descended by a road sunk in the loess down to the River Yalung. This river in its course above Kandze is generally known among Tibetans as the Dza Ch'u,* and further down where it turns south as the Nya Ch'u.† This double appellation has caused some confusion on European maps. Near Kandze the river in winter is a deep stream flowing 3 to 4 miles an hour, 50 yards broad at its narrowest, but broadening out to 70 yards at the winter ford. We crossed the river in the skin coracles commonly used in Tibet, fragile bowls with incurved edges, made of ox-skins stretched on frames of withes. The coracle, which holds five people, is propelled by a single paddle and waddles across the river like a duck walking. Animals, of course, have to swim across unless the water is low enough for the ford to be used. The Chinese have attempted to build a timber cantilever bridge at this place, 210 yards long. The summer freshets always wash the central pier away, and in the annual repairs the Chinese magistrate finds a useful source of private income.

We proceeded up the populous and cultivated valley, past Nyara‡ Gompa, a beautiful monastery of the Sakya sect, visible from a lofty hill for many miles, past Beri§ where a Horpa chief dwells in a ramshackle palace overlooking another great monastery, past some alluvial flats where the winding river affords some excellent duck-shooting, to Dargye Gompa.‖ Dargye was the first of thirteen great monasteries founded by the Ngawang P'unts'o I have already mentioned. Its name is generally misspelled and confused with the kingdom of Dege, which is quite a different place. Dargye is remarkable only for a grand portico ornamented with frescoes which is used as a congregation hall, but its delightful situation on the southern slopes of some rising ground at the side of a little brook bordered by a poplar grove gives it an air of repose and affluence. A little further on is

* rDza Ch'u.

† Nya Ch'u. Rockhill in his 'Land of the Lamas' gives this name wrongly to the She Ch'u, mentioned above. From Nya Ch'u is derived Nya-ch'u-k'a, the Tibetan name of Hokow, at the crossing on the main road to Batang; also, Nya-rong, the district south of the Horpa country, called Chan-tui by the Chinese. Nya-rong, which means "Valley of the Nya," has given the Chinese name of the river, *i.e.* Ya-lung. From the other name, Dza Ch'u, are derived Dza-ch'u-k'a and Dza-k'o, names of districts near the river north of the Horpa states.

‡ Nya-Rag.

§ Be-Ri. Neither from the local chief nor at the monastery did I get Rockhill's spelling Berim. Chin. Pai-li.

‖ Dar-rGyas dGön-pa.

a fine mani mound of a type not unusual in these parts. These mani walls are piled with slabs of stone inscribed with the mystic charm "Om mani Padme Hum" or with figures of deities. It is the rule of the road that they must be passed on the right hand, for otherwise bad luck will be brought on the caravan, and Tibetan animals are so trained to this that they do it as a matter of course. Some of these mani mounds are adored in themselves, and often women may be seen in the act of knocking their heads on the stones in the hope of obtaining some material benefit such as relief in childbirth.

We left the Yalung valley at Rongpatsa,* the wealthiest district of the Horpa states, and crossed a low pass into the valley of the Yi Ch'u, a tributary of the Yalung. Our road had followed the northern flank of the range of mountains which came into view near Kandze, and, looking back from this pass in the clear atmosphere of evening, we were gladdened by a magnificent perspective of the mighty range of granite peaks culminating in Kawalori with the rosy hues of sunset on its snows.

We had now entered the kingdom of Dege and were in pastoral country among the black-tented nomads. On Christmas Eve we were at Yilung,† where a petty chieftain has a solitary residence and levies toll on all the tea caravans that use the north road. The weather was fine, and Christmas Day was so warm that my Tibetans stripped to the waist as they walked along. In these high altitudes the temperature falls quickly after sundown, and on Christmas night, which we spent in a Tibetan tent, it fell below zero. A Tibetan tent is not a comfortable abode in winter, and it is strange that the people have not adopted the snug felt house of the Mongols, with whom they have had much intercourse. The loosely woven yak-hair canvas admits air and cold which do not invite one to stay up late. Our host this night was seventy years of age, and his mother an aged crone of ninety, unusual ages in Tibet.

The next day on the way up to the Muring‡ pass we skirted a narrow tarn amidst desolate mountains, lying, it would appear, in the break between limestone country of the north-east and the granite of the range to the south. The difficult Muring pass is 14,700 feet above sea-level. The greatest danger in crossing any of these high passes is the huge sheets of ice which the numerous small springs and leakages from the rocks gradually form during the winter. Some of them are glassy slopes 50 or 100 feet across, and are especially dangerous in the spring when they are disguised by a thin covering of snow.

At Dzogch'en,§ where we arrived the same evening, one of the principal lamas was a relation of my interpreter, and I was warmly welcomed and entertained in a house belonging to a high official. The monastery, which

* Rong-pa-ts'a; Chin. Lung-pa-ts'a.

† Yi-lung; also called Lha-ru Ga-t'o; Chin. Yü-lung.

‡ sMug-Ring La; this appears to be correct, though Rockhill gives Muri La.

§ sDzog-Ch'en; Chin. Chu-ch'ing. Usually spelled incorrectly Jogchen.

belongs to a little-known sect of lamaism, is one of the most important in Eastern Tibet. It lies at the northern end of a dry lake facing the high rocky and snowcapped peak of Norbuyukyal,* in the recesses of which many lama hermits dwell in retreat. As in most of the monasteries of the Red or older sects of lamaism, the principal deity in this monastery is Padmasambhava, the most honoured saint and magician of the earlier Lamaism. The images and chortens or miniature pagodas in this monastery are magnificent specimens of Tibetan work in gilded bronze and silver, richly carved and decorated with a profusion of precious stones. Three huge images of Padmasambhava were recently cast and gilded at a cost of £5000, a pretty large sum considering that the population round Dzogch'en is entirely nomad and numbers only a few thousands.

From Dzogch'en our road led over the range to the south and down into the watershed of the Dre Ch'u or upper Yangtze Kiang. At the pass which we crossed, the Le La, 15,000 feet, the rock was all limestone, showing that the eruptive granite only extends as far as Dzogch'en. We had now left the great north road, and the character of the country had completely changed. We descended into the narrow and densely wooded ravine of the small river Zi Ch'u. Shortly after passing Kolondo,† a small monastery and hamlet, the river enters a profound gorge and for 5 miles flows between vertical limestone cliffs rising 1500 feet above it. So narrow is the chasm that the midday sunshine scarcely finds its way to the bottom, and a general gloom and chill reigns throughout the day. Occasional rifts in the walls afford glimpses of still higher crags and precipices towering to the sky. The narrow road finds a precarious footing along the river-bank, and blocked by precipices crosses and recrosses by flimsy bridges or climbs steep slopes of fallen rock. The gorge ends abruptly, the mountains now bare of forest slightly recede, and when a final corner is turned the pagoda and temples of Gönch'en come into view.

Gönch'en,‡ or the Great Monastery, the capital of the King of Dege, lies in a narrow place where two ravines meet, surrounded on all sides by high mountains of which only the lower slopes rising steeply to 2000 feet are to be seen. Consisting of one great monastery, two palaces, and scarcely half a dozen houses, it is a remarkable capital for a large state, and has given rise to the statement that the king was a lama. The monastery belongs to the Sakya sect of lamas, who are very powerful in Dege, and their well-known custom of painting the houses in broad vertical stripes of red, white, and blue gives the place, which is built in terraces, a bizarre appearance. There is a legend that the site was once a lake, and that a great Tibetan magician and bridge builder named T'angtong Gyalpo turned it into dry land by covering it with his cloak. The miracle is commemorated in one of the temples. The royal palace,

* "The Turquoise Jewel." Rockhill gives another name which I could not trace.
† Chin. K'uo-lo-t'o. ‡ dGön-ch'en ; Chin. Te-ko or Kêng-ch'ing.

with fine carved doorways and internal decorations, is occupied by a Chinese official. The large temples, in which Padmasambhava is the principal deity, contain some magnificent images and miniature pagodas of gilded bronze, encrusted with turquoises, corals, and other precious stones. These works of art, executed by workmen from Ch'amdo, are certainly the finest in Eastern Tibet.

A small temple called the Park'ang, or Printing House, holds the Gönch'en edition of the Tibetan Canon, the Kangyur and the Tengyur. The lamas claim that the blocks were cut by orders of the King of Dege some hundreds of years ago, and that it was envy of a petty king having forestalled them that caused the lamas of Central Tibet to set about making the Narthang edition now used at Lhasa. There are two other sets of blocks in South-Eastern Tibet, those at Dzogch'en and Litang, and, if its history is to be believed, the latter is the earliest printed edition of the Tibetan scriptures. It was originally prepared by a King of Sadam, a native dynasty which reigned at Lichiang in Yunnan, and spread over a large part of Eastern Tibet during the middle ages. The work was executed by Chinese block-cutters, and for this reason every page bears its number and title in Chinese as well as Tibetan. On the fall of the dynasty the blocks were removed to Litang, where they now remain. As the Tibetans learned block-printing from the Chinese, the story is not unlikely.

The old kingdom of Dege,* usually misspelled Derge, was the largest and most powerful state in Kham. It extended from the Horpa states in the east to Ch'amdo in the west, and from the Koko Nor district in the north to Batang and Draya on the south. It included the upper course of the Yalung, and the Dre Ch'u or Yangtze Kiang traversed it from north to south. Except in the north and north-east the country is a maze of precipitous limestone and sandstone mountains seamed by tremendous gorges draining into the Dre Ch'u. A scanty population of fifteen thousand families is scattered over the whole country, cultivating the alluvial fans of ravines or the lower alpine slopes and grazing the open country of the north. There are no villages or towns of any size, the largest not counting more than a score of houses. In certain parts there are a few workers in metal, carrying on a trade handed down from generation to generation. The articles they produce, such as sword-blades and scabbards, and brass and copper teapots, are of fine workmanship, and highly prized throughout Tibet.

The kingdom came to an end in 1910, when after a fratricidal war lasting for more than a quarter of a century the Chinese stepped in and deposed the king. He was exiled to Batang and granted a pension, while the other claimant fled to Lhasa. The country was then divided into five districts under Chinese magistrates. Throughout Dege the red or older sects of lamaism prevail, the principal being the Sakyapa and the Nying-

* sDe-dGe, "The Happy Land"; Chin. Tieh-erh-ko-t'ê.

mapa, but in the north are some monasteries of the Bônpa or black lamas. The Dalai Lamas never succeeded is establishing a single monastery of their own order in the country.

I left Gönch'en on 1 January 1917, following the Zi Ch'u down to where it falls into the Dre Ch'u. I had last seen the Yangtze nearly 2000 miles lower down where it forces its way through the famous gorges between Hankow and Chungking. Here at an elevation of 10,000 feet were the same limestone precipices, the same tortuous channel, and the same wooded heights, but how different the other details of the landscape! No fleets of junks, no sweating trackers, no busy villages, but a solitary Tibetan hamlet, a pair of flimsy coracles, and a turquoise blue stream flowing between ice-bound rocks. The river's breadth in winter is 80 yards, and the summer rise about 15 feet.

For two days after leaving the Dre Ch'u we traversed the limestone country, threading our way through gloomy chasms and crossing a high pass. At T'ungp'u,* a tiny hamlet where a Chinese magistrate ruled in solitary state, so great an event was the arrival of a traveller that the whole garrison of fifty men turned out to receive us. Then followed three days in the open grass country amongst the wandering nomads, the subjects of the petty chief of Lhato, now pensioned off by the Chinese Government. At the Lazhi La, 14,500 feet, we crossed over into the watershed of the Dza Ch'u, the upper waters of the Mekong, the great river of Indo-China. The next pass, the Japed La, 15,700 feet, was the highest and most difficult we had encountered. It crosses an abrupt ridge of towering limestone bluffs which have been thrust through the overlying sandstones. The ridge follows the line of the Mekong valley, running southwards and south-south-eastwards towards Draya and Gonjo. It contains the highest summits between the Mekong and the Dre Ch'u, rising to about 19,000 feet, but is not the water-parting, being crossed by streams flowing into both of these rivers. To the east of it are grey sandstones broken by occasional outcrops of limestone; to the west the uniform red sandstones of the Mekong valley. On January 9, descending from the Tama La we turned the corner of a high spur, and the massive ruins of Ch'amdo at the confluence of the Dza Ch'u and Om Ch'u came into view. At the bank of the river we were met by some Chinese and Tibetan officials, and after a short interview crossed the Mekong by the Szechwan bridge and rode on into the town.

The important town of Ch'amdo †—the name means "The Meeting of the Waters"—lies on the spit of land between the Dza Ch'u ‡ on the east and the Om Ch'u on the west. They are both large rivers, the one being

* Chinese name; in Tibetan, Rang-sum.

† Ch'abs-mDo; Chiamdo is incorrect; Chin. Ch'ang-tu or Ch'a-mu-to.

‡ sDza Ch'u. This is the upper Mekong. On some maps the course of the Mekong below Ch'amdo is called the Om Ch'u or Omu Ch'u, but this is incorrect, as the Om Ch'u or western branch is far the smaller. Om Ch'u appears to be the correct spelling of this river's name.

60 yards and the other 32 yards broad in winter. Cantilever bridges in the Tibetan style cross both rivers, the more important, that over the Dza Ch'u, being 81 yards long and having three spans. They are known as the Szechwan and Yunnan bridges, and the fact that the former is the lowest bridge over the Mekong gives Ch'amdo its strategic importance. The town is a poor place containing perhaps a couple of hundred houses, Chinese temples, and yamens. Abbé Huc in his entertaining travels says, "Its houses, constructed with frightful irregularity, are scattered confusedly over a large tract, leaving on all sides unoccupied ground or heaps of rubbish. The numerous population you see in the different quarters is dirty, uncombed, and wallows in profound idleness." One may add that the rubbish heaps are a hunting-ground for innumerable mangy dogs, pigs, and fowls. The one narrow street has a few miserable shops where a ten-pound note would corner the market.

Behind the town on a broad platform 150 feet above it are the extensive ruins of the once great monastery of Geden Jampa Ling,* the glory of Ch'amdo and Kham. This famous monastery, the largest and wealthiest in all Tibet east of Lhasa, excepting only Kumbum, is a thing of the past, and its gaunt walls contain not a single inhabited dwelling. Since its destruction every foot of ground had been turned and returned by Chinese in search of treasure, so that though I visited it several times only a few clay images rewarded my search. Scarcely half a dozen Europeans enjoyed the privilege of seeing Ch'amdo in its days of prosperity. It was then the seat of the Grand Lamas or Reincarnations, who ruled over an independent state the size of Wales in area. I have already mentioned in my introduction how the Manchu emperors confirmed the Lamas in their dignity. As in the case of the Dalai Lamas the succession was regulated by the statutes of the Manchu dynasty. When a ruling reincarnation died search was made among the male children born about that time. The names of those likely to have reimbodied the deceased saint were sent to Lhasa, and there, with appropriate religious ceremony and in the presence of the Dalai Lama, the Manchu Amban or Resident made selection by lot from the Golden Urn provided by the Emperor for the purpose. As they grew towards manhood the reincarnations would go to study at Lhasa, and be ordained into the priesthood by the Dalai Lama, but otherwise, in political and religious matters the grand lamas were quite independent of him. In religion they belonged to the Gelugpa or orthodox sect of lamaism.

The huge monastery with its crowded houses and great temples glittering with gilded roofs and pinnacles must have been an inspiring spectacle from the surrounding heights. The three thousand lamas, accounted the haughtiest and most insolent of ecclesiastics, ruled the common people with an iron hand, and even the representative of the Emperor was impotent to cross their will. Attracted by the wealth of

* Dge-lDan Byam-Pa gLing.

the lamasery, artists in water-colours, gold- and silversmiths, and workers in bronze and copper settled in the town to supply the wants of the lamas and founded a Ch'amdo school whose works are highly prized through Tibet. The country, however, was drained to supply the capital. The scanty population of four thousand families was poorer than in other parts of Kham, and the lesser monasteries few and far between.

The ruin of the monastery took place in 1912, after the Chinese revolution. When the Dalai Lama had recovered western Kham Tibetan emissaries came to the monastery to stir up a revolt, promising the assistance of the army which was then on the banks of the Salween. The Chinese had some 240 officers and men stationed in the district of Ch'amdo under a Colonel Peng Jih-sheng. They had taken no precautions, and the stores of grain for the troops remained in the granaries of the monastery. One day in June Peng sent a party of seventy men to draw out grain, only two of them being armed. Just as they were entering the gates the lamas made a sudden attack, killed those who had entered, and drove off the rest. Peng immediately called in his outlying detachments, and with a force of less than 200 men prepared for trouble. He was cooped up in an untenable position, below the monastery with an overwhelming force of several thousand lamas and Tibetans threatening him.

As the lamas did nothing for the next few days except to strengthen the fortifications of the monastery, Peng decided to take the initiative. One night he despatched a force of thirty men up the bank of the Mekong below the monastery with instructions to attack and set fire to it on the further side. At the same time he was to attack from the front. The sortie party got round safely and succeeded in setting fire to some outbuildings, which soon spread to the interior. In the resulting confusion they forced their way in burning and shooting. Peng attacked on his side, and the lamas, thinking Chinese reinforcements had arrived, fell into a panic and fled. The whole of the monastery was burned down and some 150 lamas killed.

Having gained the monastery Peng was able to organize a defence, but for three long months he was beleaguered by the Tibetan army which came up and occupied the mountains round, whence they could search the whole of Ch'amdo with their gun-fire. But the Chinese were eventually relieved by an army from Dege, and the Tibetans were driven back beyond the Salween. In the fighting last year Ch'amdo was again besieged, and the gallant Peng, left in the lurch by his government, was obliged to capitulate to the Tibetans.

At the time of my visit the Chinese had withdrawn from the crossings of the river Salween, but still retained Enta and Riwoch'e, two places beyond the Mekong and west of Ch'amdo. I took the opportunity to visit them. The valley of the Om Ch'u, up which we travelled, is well cultivated and has many small villages. The river cuts a tortuous way

through the red sandstone, exposing a series of remarkably contorted strata. Dividing the Om Ch'u from the Dzi Ch'u, a river to the west, is a pass called the Namts'o La, 15,200 feet, which is accounted one of the worst on the road to Lhasa. The road up is a narrow track ascending through a dense forest of the finest timber I had seen in Tibet. The descent is a long scramble down a slope of loose stones and through a gap in a wall of limestone crags which break through the sandstone. The Dzi Ch'u * is a large river flowing south, marked on some maps as entering the Salween and in others the Mekong. I was told it joined the latter. Enta,† a hamlet of twenty houses, is an old Chinese post station where we parted from the main road to Lhasa. There is a Chinese magistrate here, most of whose district is occupied by the hostile Tibetans. With only two hundred families to care for he should not find his duty of being a father and mother to the people a difficult matter, but I fear the only part he acts is that of an unfeeling tax-gatherer.

To remind us that Tibet and China were at war we learned at Enta of an encounter which had taken place the day before between some Tibetan marauders and Chinese soldiers on the road we were going, but it was taken as a matter of course and we were allowed to proceed.

The beautiful monastery of Riwoch'e,‡ which was the farthest west I attained, lies in a spacious valley at an altitude of 12,600 feet on the sunny side of a wooded mountain. Like Ch'amdo it was the capital of a lama state ruled by an abbot, owing allegiance to the Emperor of China, but in practice independent. It is a stronghold of the Kargyupa, another of the older sects of lamaism. A quarrel between the abbot and one of the other reincarnations led to the latter taking refuge with the Dalai Lama, while the abbot sided with the Chinese. There are half a dozen large temples in the monastery, badly knocked about by the Chinese soldiers who came to protect it. One of them, a four-storey building, contains an interesting collection of ancient weapons and armour, which were captured by the Chinese in their campaigns against the Mongols in Tibet in the eighteenth century, and were presented to the monastery by the general. A miserable village of a few stone hovels is attached to the monastery. I thought it was a beggars' camp till, finding that the monastery was full of soldiers, I had to go and stay there. The haughty lamas objected to any secular buildings which might spoil the appearance of the monastery, so any lay people who wished to live near at hand had to burrow underground, not allowing their roofs to project more than two or three feet above the surface. Being ill at the time I spent two miserable days in a cellar lit by a skylight. I had the good fortune however to witness a religious dance in honour of the Tibetan new year.

* Dzi Ch'u or Dze Ch'u. I am not sure which, though Dzi Ch'u was given me.

† Chinese name. Rockhill gives Nyulda as the Tibetan name. My informants gave Nge-mda (Snge-mdaa).

‡ Ri-bo-ch'e ; Chin. Lei-wu-ch'i.

I returned to Ch'amdo by the same road, and, having stayed there a few more days, set out on the return journey to Tachienlu. As the main road to Batang had been done by several Europeans, including Abbé Huc, General Bower, and Mr. Rockhill, I decided to take a route nearer the Mekong, which was quite new and indicated to some extent the course of the river. I could not follow the river itself, as it was the frontier between the Chinese and Tibetans. We left Ch'amdo on January 29, and followed the main road for two easy stages as far as Paotun,* where we found ourselves once more in a limestone region. A climb over a short but steep pass, however, brought us back to the Mekong valley, where we emerged on a mountain flank high above the river. A broad expanse of country now opened out before us. From our feet the mountain-side, broken into alternate spur and gully, fell away to where far down a gleam of silver 4000 feet below showed where the Mekong forced its way round some impeding cliff. Near at hand patches of tillage, woods, an occasional farmhouse, or a small monastery graced the gentler slopes, while on the far horizon rose a massive hogsback of high mountains seamed with innumerable ravines and black with dense masses of forest. Beyond it was the valley of the Salween.

The road now ran along the face of the mountain for some miles to a village called Shingk'a. One notices here that agriculture is practised at the remarkable height of nearly 14,000 feet above sea-level in a district well within the temperate zone, and that the villages are fully as prosperous as those in the lower country. I suppose this is accounted for by the heated air of the Mekong valley rising up the mountain-face instead of ascending directly to the sky.

We left the Mekong valley by another pass, and for two days descended the valley of the Ja Ch'u to the hamlet of Towa, where it joins the Me Ch'u, the river of Draya. The Mekong was only a few miles from the confluence, so I went down with a Chinese escort to see it and communicate if possible with the Tibetans on the other side. The Me Ch'u† runs down to the Mekong through a gloomy cañon in the sandstone, which is the only east and west route for trade across the river, but is very rough and often impassable when the river is high. The Chinese were somewhat reluctant to go down, as they said the Tibetans would shoot at sight; but though the latter were very suspicious and would not come near for a long time, we were at last able to hold a parley across the river. They were a rough lot of men armed with rifles, but with no sort of uniform. The river runs through a deep gorge between steep mountains, leaving scarcely any space for the track which follows it. The Tibetans had taken away the ferry-boats or coracles, so there was no means of crossing to the western side.

* Chinese name. Rockhill gives Tibetan Pungde. My informants, the headmen, Spom-sde = Pomde.

† rMe Ch'u.

We returned to Towa and went on to Yengmdo,* a monastery and village on the Me Ch'u. Yengmdo, which had never before been visited by Europeans, was the chief monastery of the state of Draya and original seat of the lama princes. It is now a complete ruin, having been destroyed by the Chinese, and its thousand or more lamas have been dispersed.

Draya is two days further up the populous valley of the Me Ch'u. Before it reaches the town the road crosses a pass called the Ge La, which cuts off a bend in the river. On the way up we spent a night at Bika Gompa, which was overcrowded by lamas from Yengmdo and Draya. Jealously guarded in a private courtyard was a young man who was a reincarnation from one of the monasteries east of Tachienlu. The Tibetans, like other Buddhists, believe that after death people are reborn as men or animals or in other forms again and again, being only able to escape the revolutions of the wheel of life by attaining to Buddhahood. The highest state of re-birth is that of the Bodhisats, the saints who, having attained that state, of their own freewill decline the Buddhahood in order to assist suffering mankind to follow in their footsteps. The Tibetans believe that the Dalai Lama is the reincarnation of one of these Bodhisats. But Lamaism has added to this creed by asserting that lesser saints are also reborn to carry on their good works in successive ages. As in our own religion it is the privilege and power of the saints to work miracles, prophesy, and generally assist mankind, so Tibetan reincarnations are credited with similar gifts. The cult of relics brought much wealth to the monasteries in the middle ages. In Tibet, while the use of relics is not excluded, a live saint is a far more lucrative possession, and it is not surprising that a degraded priesthood took advantage of it. So we see that the cult of reincarnations, which was comparatively rare in the sixteenth century, has spread over the whole of Tibet and Mongolia, and every monastery, large or small, tries to possess one or two reimbodied saints to attract the offerings of the credulous. If they cannot exalt one of their past abbots to the dignity of a saint and pretend that he is reincarnated, they do not hesitate to appropriate those of other monasteries. This was the case of the young man I have just mentioned. He had been travelling towards Lhasa to join the schools there when his guide and tutor died at Draya. A benevolent lama took compassion on him and brought him to Bika, where he is now permanently appropriated, bringing spiritual comfort to the surrounding villagers and a flow of wealth to the treasury of the monks.

The next day we arrived at Draya,† or Jamdün ‡ Draya, a small town lying in a plain where three rivers meet to form the Me Ch'u. The place suffered greatly in the rebellions of 1913 and 1914, and the great monastery was almost completely burned down. It was the most southern of the three buffer states, being ruled by an abbot and two other reincarnations,

* dbYeng-mDo ; Chin. Yen-tai-t'ang.
† Brag-gYab ; Chin. Ch'a-ya. ‡ Byam-hDün.

whose territory extended on both sides of the Mekong. There are about 150 families in the town and a Chinese magistrate. The name Draya means "Rock Shelter," and is an allusion to a lama missionary who lived in a cave and evangelized the country.

I was laid up again at Draya for about a week, and when I was half through the illness my Tibetan interpreter became anxious and went to consult a lama astrologer. The lama performed some sort of a divination and pronounced that my illness was not serious and that I would be well in three days. Sure enough the sickness, which was mainly due to charcoal fumes, passed off in three days, and my interpreter acquired a still deeper belief in the miraculous powers of the lamas.

From Draya to Batang we took a route somewhat to the east of the main road, passing Gonjo,* where on a precipitous crag a formidable dzong or fortress, formerly occupied by an official of the Dalai Lama, overlooks the Ma Ch'u. This river flows northwards into the Yangtse. We then turned south-eastward across nomad country and down the long and beautiful valley of a river which joins the Yangtze near Chupalung. Two high and difficult passes, both over 15,700 feet, still separated us from this river, and, as the winter was now wearing on and the first snows had fallen, the passage was extremely arduous. At Shisongong, on a cultivated slope below the second pass, we rested before crossing the river. The next day our road zigzagged down the face of a tremendous precipice, 3000 feet down to the ferry, and opposite at Nyugu rose a similar mountain wall, a striking illustration of the profound gorge through which the Yangtze Kiang flows.

At Nyugu † we rejoined the main road, and 7 miles further on arrived at Batang.‡ This town has so often been described that there is no need for me to say much about it. It is a busy place, with a mixed Chinese and Tibetan population. It was here that the rebellion took place which led to the Chinese attempt to bring Tibet under their control. Since then the native chiefs have been deposed, the monastery destroyed, and Chinese officials introduced. Catholic and Protestant missions have establishments here, and I stayed with Dr. Shelton of the American mission. Evangelization amongst the Tibetans is found to be most difficult, and success seems only attainable by adopting and educating young children. Dr. Shelton tells an interesting story illustrating the credulity of Tibetans. One night when travelling in the country he was sitting with his followers round the camp fire. The conversation turned on the subject of the kau or charm-boxes always worn by Tibetans on their chests. They contain pieces of writing from the scriptures, small images, and other charms which are supposed to protect the wearer from death. Dr. Shelton challenged their efficiency, and in the ensuing discussion laid a wager that if he fired at a man who was wearing one and did not kill

* Go-hJo ; Chin. Kung-chueh.
† sNyu-Gu ; Chin. Niu-ku.
‡ Chinese name. Tibetan is hBa.

him he would pay a thousand rupees. No one, however, had faith enough to take the wager. The story got about when they had returned to Batang, and shortly afterwards a deputation of Tibetans whose minds were disquieted waited on the doctor and re-opened the discussion. They suggested that the experiment should be tried on a goat instead of a man. Dr. Shelton had no objection to a goat or any other animal, so the bargain was closed. On the day fixed the Tibetans brought out a goat with a large charm-box attached to its neck. They were very particular to examine the rifle to make sure that there was no trick or magic about it, and having satisfied them the doctor fired, killing the goat and smashing up the charm-box. The believers in charm-boxes were struck dumb, and went away discomfited. A few days after, however, another deputation waited on the doctor and explained the reason of his success. The charm-box which had been used had been blessed by the two reincarnations at Batang. One of these was a saint in acts as well as in name; the other led a notoriously immoral life, and obviously his blessing had acted as a curse and neutralized the blessing of the other. No one knows what the goat had to say about it.

At the time of my visit the main road to Tachienlu was infested with robbers, and I decided to return by the north road and incidentally map the little-known route from Batang to Dege. A long journey of six days lay between Batang and Gönch'en. The road runs on the whole in a northerly direction, following a line of valleys east of the Dre Ch'u. The whole country is densely wooded and thinly peopled. The spring was now coming on, and with it the seasonal snow which rendered the two passes to be crossed before Pelyul very arduous. We reached Pelyul,* two-thirds of the way to Gönch'en, without incident except that we had to stay one night in a village where every house had a case of small-pox, a disease which decimates the Tibetans. Pelyul has a picturesque lamasery built in tiers on the summit of a rocky pinnacle.

We avoided the main road here and took an easier and slightly shorter road down the river of Pelyul to the Dre Ch'u 4 miles distant. Once more we crossed the river, and ascending the heights on the further side skirted the river at a height of 2000 feet. It was a surprise to find that the upper Yangtze made here a broad right-angled bend not shown on the maps, turning from south-east to south-west and then, at the place where we crossed, to north-west, though how far it went in that direction I cannot say. The river's further course down to the neighbourhood of Batang is still unknown. We recrossed to the eastern bank, and following the river up rejoined the road by which we came just below Gönch'en.

From Gönch'en we retraced our steps to Kandze, taking the slightly shorter main road, and from Kandze went on to Tachienlu, where we arrived at the end of March after just under four months' travelling.

* dPal-yul; Chin. Pai-yü.

The Geographical Journal

Vol. LIII No. 5 May 1919

A JOURNEY TO TASHIRAK IN SOUTHERN TIBET, AND THE EASTERN APPROACHES TO MOUNT EVEREST.

Major J. B. Noel, M.G.Corps

Read at the Meeting of the Society, 10 *March* 1919.

ATTENTION during the last few years has been focussed more and more upon the Himalayas; and now that the poles have been reached it is generally felt that the next and equally important task is the exploration and mapping of Mount Everest. It cannot be long before the culminating summit of the world is visited, and its ridges, valleys, and glaciers are mapped and photographed. This would perhaps have already been done, as we know, but for the war and the lamented death of General Rawling. This piece of exploration has been his life's ambition. May it yet be accomplished in his memory!

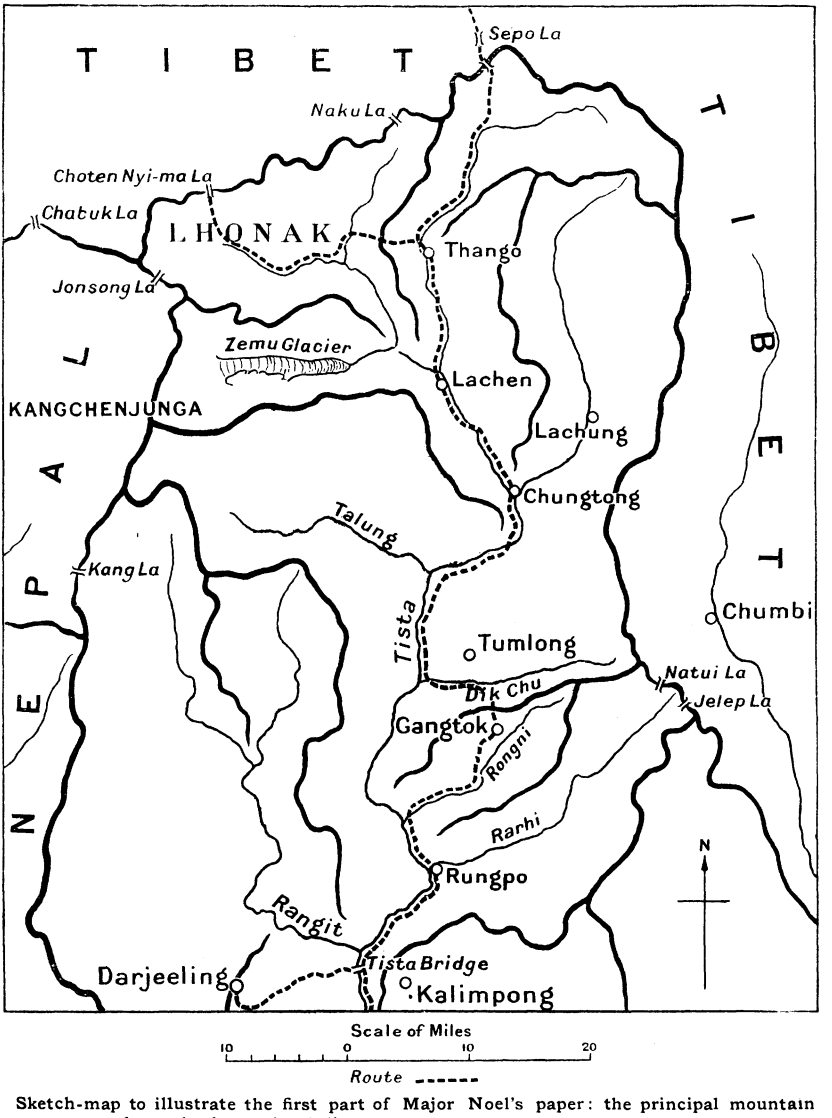
Being a member of General Rawling's proposed expedition before his death, and having studied the problem of reaching Everest, I give the following brief account of a journey to Tashirak undertaken in 1913 for the purpose of reconnoitring the approaches to Everest beyond the Sikkim frontier in Southern Tibet.

Excluding the idea of reaching the mountain through Nepal by the Kosi Valley (the shortest route) on account of the political difficulties, which are not likely to be removed, the only approach lies through Sikkim from Siliguri or Darjeeling by the Tista Valley to the Sikkim–Tibet frontier, thence from Kampa Dzong, making a right-angle turn to the west behind the main range of the Himalayas, taking Mount Everest from the east from Tashirak, or from the north from Tingri.

A photographic survey by aeroplane is also possible, because a direct flight and return could be made from the plains of India without the necessity of landing in the mountains. The difficulty of landing urged against the aeroplane does not in the case of Mount Everest exist, since the mountain is so very close to the plains. A greater difficulty is found in the high winds of Tibet. A development of air work in connection with Tibetan travel that suggests itself is the use of man-lifting kites. These are portable, and with the strong steady winds of Tibet could raise

an observer 500 feet in the air, a height which would give good observation over the plains.

The line of approach for an expedition through Sikkim is comparatively easy. The distance to the snows is short compared with other parts of



Sketch-map to illustrate the first part of Major Noel's paper: the principal mountain ranges are shown by heavy black lines

the Himalayas, where the mountains have much greater depth. A road, practicable part of the way for bullock carts and the rest for pack-animals, leads from the foothills through the entire length of the country to Kampa in Tibet.

The excessively heavy rainfall turns many travellers away from Sikkim, but this disadvantage does not apply to the northern districts of the country, which enjoy the typical dry climate of Tibet. The monsoon clouds have generally deposited their moisture after passing the line of the Zemu glacier–Pawhunri–Chumalhari.

Transport and supplies are a somewhat difficult problem unless the conditions of travel in Sikkim are known by previous experience. More than one expedition led by competent travellers has come to grief in that country. The difficulties can be diminished firstly by avoiding Darjeeling and its officialdom at all costs and taking the Siliguri–Tista valley road, and secondly by purchasing and owning one's transport animals instead of relying upon coolie hire from stage to stage. Bullock carts can be used as far as Gangtok, and ponies or mules from Gangtok to Kampa Dzong. Thence onwards in Tibet the road is good everywhere for yaks.

The entry into Tibet can be made either from the upper Lachen Valley by the Sepo La, 16,500 feet, the easiest but longest route, or from Lhonak by the Choten Nyima La, 18,500 feet, or the Jongsong La, 20,000 feet, through the corner of Nepal to Tashirak: the shorter and far more interesting although the more difficult route.

The approach to Everest from the north would be best made from Tingri, a route practicable for yaks but requiring, of course, the sanction and co-operation of the Tibetans. The approach from the east would lie through Lhonak by Tashirak and the Arun valley. An intricate mass of lofty mountains, hitherto unmapped, intervenes between Lhonak and the Arun valley; and it is the geography of these mountains that is the subject of special interest to the explorer who wishes to approach Everest from the east.

Lhonak, that country that Hooker had never been able to reach, and that he had left blank on his map, was first visited by Mr. White in 1897, who entered it by The La, 17,400 feet, from the Zemu glacier. Lhonak, so different from the rest of Sikkim, is indeed a delightful and beautiful valley. To feel the charm of Lhonak, to become imbued with that wish to return again and again that it particularly inspires, one must have first undergone the discomfort of the long journey through the heat and steam and torrential rains of the jungles of the foothills; one must have felt the disappointment of the views of the snows hidden so persistently in cloud and mist; one must have scrambled through the deep ravines of Sikkim with their dense forests and rampant leech-infested bamboo thickets. Then, after these days of hard travelling are over, one crosses the pass over the dividing range and steps in one moment into a totally different land. A high plateau-land of broad open valleys and rounded snow-capped hills, a land of luxuriant pasturages, of yaks and sheep and perpetual sunshine—that is Lhonak.

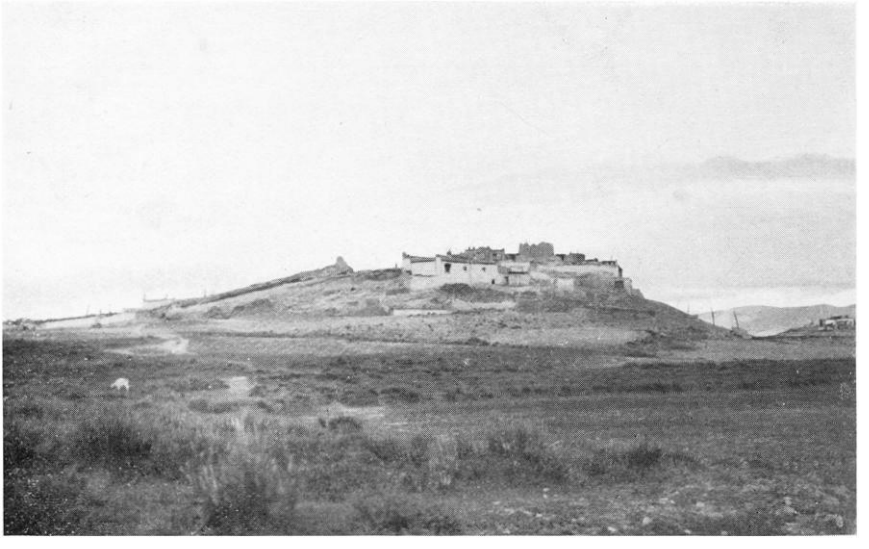
Lhonak can also be reached by the ravine of the Zemu river from

Lachen, some two days' march up a rough path; and it is only on reaching Teble, where the two main valleys of the Langpu and Naku join, that the typical Lhonak scenery of open broad valleys and rounded hills is first met. From Teble, generally the site of a Tibetan encampment, one can survey both valleys. In the Naku valley one looks over beautiful pasture land, where most of the yaks are to be found, up to the broad, bare saddle of the Naku La. On the right rise the fine snow peaks of Chumiomo and Lackenkang, throwing some large broken glaciers down into the valley below. The Langpu branch leads up to the horseshoe of giant mountains of Kangchen and Jongsong. At the head of the valley lies Zanak, the furthest point to which the Tibetan encampments extend at the threshold of the snows beneath the Jongsong Pass. The pass, the only link between Lhonak and Nepal, looks a stiff proposition indeed; and one can well sympathize with Sarat Chandra Das, the first explorer to have crossed this way, in his difficulties described quaintly and delightfully in the volume of travels: 'A Journey to Lhasa and Central Tibet.'

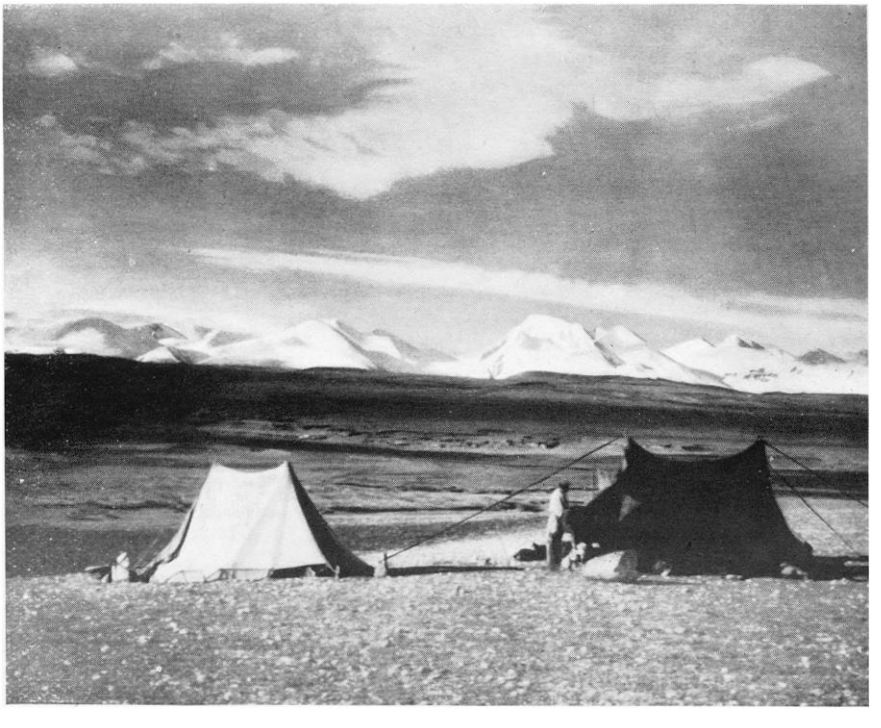
From the Jongsong peak a high range branches off in a westerly direction, sending south the spur that separates the Tambar from the Arun Valley. Little is known of these mountains, and only one pass and a difficult one, the Chabuk La, is known to cross them. The Nepalese traders use only the Jongsong–Choten–Nyima or Jongsong–Naku La routes to reach Kampa Dzong in Tibet, which adds to the belief in the height and difficulty of crossing this branch range and frontier barrier between Nepal and Tibet. Several travellers, including Sir Joseph Hooker, have thought Mount Everest was visible from the tops of the hills in the upper Lachen Valley, but this is not so, because the lofty peaks beyond the Jongsong effectively mask the view of Everest.

Beyond the point where the Kanglachen Tipta La spur is detached to the south the range was crossed by Sarat Chandra Das in 1881 by the Langbu La. He reported the general direction of the range to be north-west to south-east, the hills only low, and the Langbu La to be free from snow in the summer. But the Langbu La is a long way west of the Jongsong La, and a great barrier of mountains intervenes. Sarat Chandra Das, giving unfortunately only a rather vague account of his journey, described seeing "the lofty Pherugh mountains" from the summit of the Langbu La, and Pherugh is the district of Mount Everest.

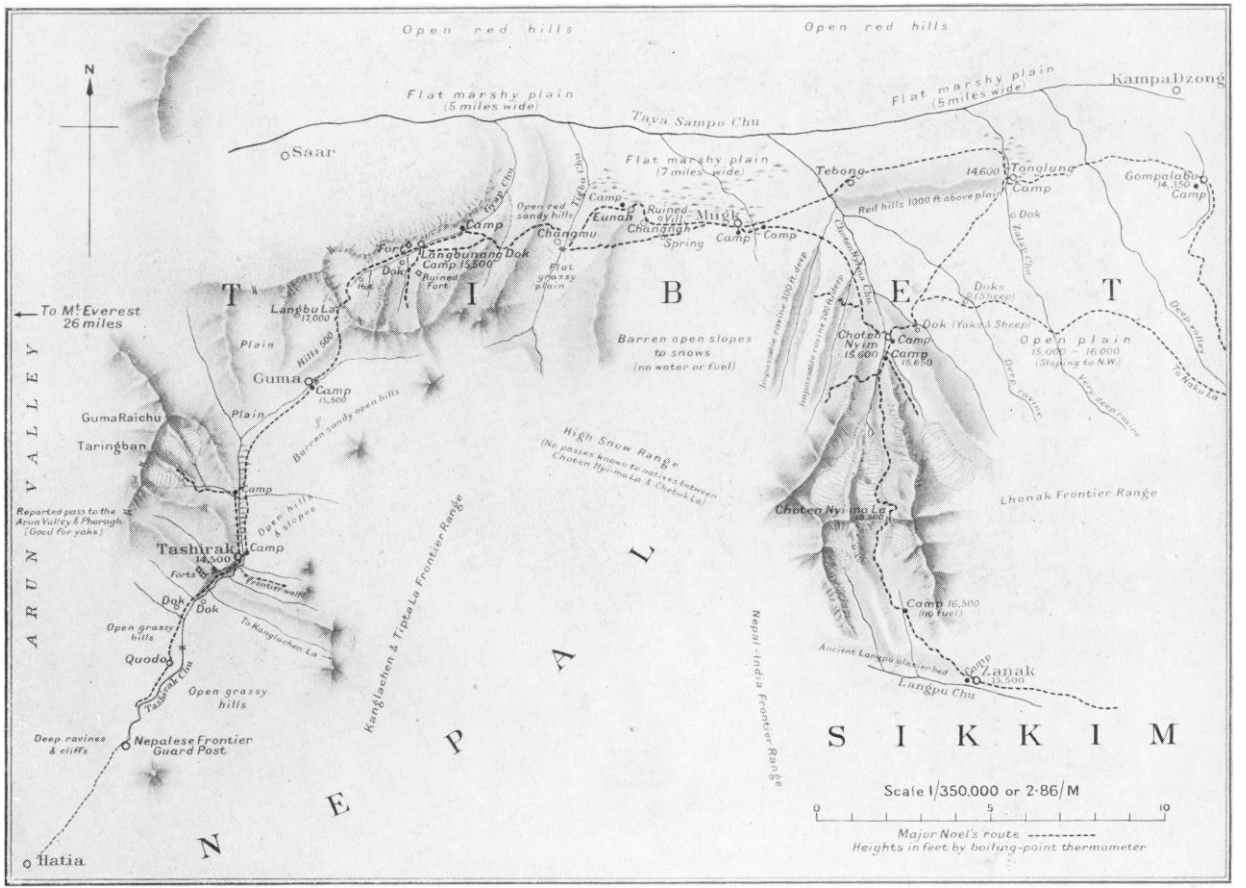
Thus it would appear that in order to reconnoitre the eastern approaches to Everest, the best plan would be to make for the Langbu La from Lhonak. Then, according to the Indian Government map of Nepal, one could proceed by Tashirak down into the Arun Valley, and crossing the Arun, proceed directly west up the valleys leading to the foot of Everest. But these surmises, based on Sarat Chandra Das's account and also on the map of Nepal, proved quite wrong. Instead of the Langbu La giving access to the Arun Valley, I found that it was separated from that valley



MUGK VILLAGE, TIBET



CAMP AT MUGK



SKETCH-MAP OF EASTERN APPROACHES TO MOUNT EVEREST

by yet another mountain barrier. Our knowledge of the country further west is even more scanty, because such Pandit travellers as have been there journeyed only up the two valleys of the Arun and the Kosi, and were unable to ascend any of the branch valleys that lead up to the glaciers of Everest.

The country north of Everest is drained by the Tingri River, which flows for a considerable distance east until it empties into the winding Arun. The Arun itself appears to occupy a narrow defile at the Tibet–Nepal frontier, when it cuts through the main chain of the Himalayas between Everest and Kangchenjunga.

The valley of Tingri and Shekar Dzong had been traversed in 1708 by the Capuchin Friars, who had established a mission at Lhasa and who communicated with that place from their Nepalese headquarters at Katmandu by Nilam, crossing the mountains by the Thung La. However, no mention has been made by any of them of their having seen Mount Everest. Even the explorer M. H., who came through Nepal by the Dudh Kosi Valley and the Pangu La, 20,000 feet, and followed a line along the limit of habitation, did not approach near enough to observe even the glaciers of Mount Everest.

At the conclusion of the Lhasa expedition, Rawling and Ryder passed by Shigatse and surveyed the Tsampo Valley and the mountains forming the watershed between the Tsampo and the Tingri rivers. But owing to the lateness of the season and the length of the journey they had to accomplish to Rudok, they were unable to deviate sufficiently far to the south to reconnoitre the Tingri plain and the northern approaches to Mount Everest.

Owing to the impossibility of obtaining permission to travel by the open, easy road *viâ* Kampa Dzong, I decided to enter Tibet from Lhonak *viâ* the Choten Nyima Pass, and to march unobserved as far as possible, avoiding the villages by a high-level route to the Langbu La and Tashirak. The spring of 1913 was spent in arranging plans with my two Bhutia servants, Adhu and Achum Bhutia, and learning something of the Tibetan language. I started from Siliguri, where I was met on July 5 by Adhu, who had come down from Gangtok with two mules. We packed the kit on the mules and set off the same day for Sivook, a hot march through the Terai forests at the foot of the Himalayas. We carried two small A-shaped tents, blankets and bedding, a small tin box of necessary instruments, a camera, a few medicines and arms and ammunition for the party. Otherwise we were entirely free of impedimenta, obtaining supplies locally.

Gangtok is reached after a six days' hot and tiring trek through the steaming forest of Lower Sikkim. Nor can one enjoy the beautiful scenery during this monsoon period, when the clouds and mists hang low and the rain pours incessantly. After resting two days at Gangtok we pushed on rapidly for the pleasant and healthy elevations of Lachen in

Upper Sikkim. The plan was now to continue the journey with yaks. The yak caravan would carry a month's supply of satu (barley meal) and tea, etc., for the party, and had orders to proceed to Tebong in the Taya Sampo Valley in Tibet, which, according to Sarat Chandra Das's account, lay near the exit from the Choten Nyima Pass. It was to wait there without attracting the attention of the Tibetans while I crossed with a few coolies by the Choten Nyima Pass to Tebong, thus avoiding Kampa and Tinki Dzong, where the Tibetan officials resided. The mules accordingly were sent back to Gangtok, and we started for Thango. Here two men with the yaks and supplies struck out for the Sepo La at the head of the Lachen Valley, while I branched off to the west, crossing the Lugnak La into Lhonak.

The ascent to the pass is easy, although snow covered except in the months of August and September; and one is cheered on the ascent by the prospect of crossing the mountains into the delightful Lhonak Valley. A rapid descent down a stony couloir from the bleak windy crest of the pass brought us to a pretty little emerald lake, whose banks were overgrown with luxurious grass on which a number of yaks were grazing. A short way beyond we reached the camping-ground of Chabru, where a cave formed by a huge overhanging rock made a comfortable shelter for the night. Next morning we proceeded down the valley, fording the Naku Chu and camping at Teble, a delightful spot commanding unequalled views of the broad open valleys, walled by rounded snow-capped summits. The sky is ever a clear blue and the air is cold and crisp and dry.

The road hence up the Langpu Branch of the Lhonak Valley reveals particularly grand scenery. Soon after leaving Teble and traversing the extensive plain that stretches some miles to the west, a defile is passed where an ancient moraine from the south encroaches and forces the river to impinge against the northern hillsides. Then a bend to the north-west immediately brings to view a remarkable panorama of the Zemu mountains and the high peaks that rise at the head of the valley and form the central knot where the Tibetan, Sikkim, and Nepalese watersheds meet.

The countryside is broad, open and sandy, and the stream trickles over a wide bed, breaking up into small channels with many boulder-strewn islands between. The elevation is some 15,000 feet. The vegetation is scanty, while the hillsides are bare and smooth. A peculiar charm pervades the scenery. All is so different from one's accepted ideas of mountain landscape, different from that idea of crags and pine forest-clad ravines that the words "the Alps" instinctively suggest. Here is a vast stretch of open basin and undulating hills, with the distant peaks forming a broken rim to the bowl. It is like some lofty secluded plateau surrounded and guarded by great walls of snow, or it might be some hidden nook deep in the heart of undiscovered lands. The monotonous, featureless hills, the breadth and distance, the absence of life, strike a feeling of awe and sometimes of depression, but yet they attract. One

can feel here the majesty of giant mountains, and at the same time the particular power and fascination of Tibetan scenery, that every traveller in Tibet has felt and described in the same way; an horizon of vast rolling plains, silent, bleak and inhospitable, with ever a cloudless sky above and a wonderful sunshine that sparkles and burns in the thin, crisp, freezing air.

From Zanak, 16,200 feet, to the Choten Nyima La is a long march, and it is best to make a preliminary camp on the shelf below the pass before crossing it. Our camp at this point commanded a superb view to the south of the giant mountains of Kangchenjunga. From here also a part of the Nepalese side of the mountain could be seen. Next morning the camp was astir early as the night had been intensely cold, and also there was a long way to go over unmapped ground on the Tibetan side of the pass. The ascent is tiresome and difficult unless the snow is firm, on account of the slippery loose rock and shingle underfoot. After crossing the pass we scrambled down the rocks on the north side over the névé down to the glacier below. There were some crevasses, but we kept well to the right and avoided them.

The valley, which takes a direction about due north, is barren, desolate and forbidding. A glacier, clinging closely to the western precipitous wall, is itself smooth with no visible crevasses below its névé. It would make a fine ski run if one had skis. At its end, however, the glacier breaks into seracs and terminates in an ice wall at whose foot lies a frozen lake 150 yards broad and 300 yards long. We passed along a shelf high up on the right side of the valley, and after some hours came to the junction of this and the next valley to the east. We now descended to the stream and camped—a long march, but necessarily so, as here was the first firewood to be met. We passed just before this point a stone hut, I expect the identical one mentioned by Sarat Chandra Das as the Tibetan guard-post in the old days of the rigid exclusion of foreigners.

The site of the camp, about 15,600 feet, was particularly desolate, surrounded by bare red gravel and sand slopes, covered in places with the thinnest grass. A few *Ovis ammon* were about. Next morning we set out to discover the position of Choten Nyim, which we had been unable to locate the day before. As it happened we were only three-quarters of a mile away; and we came on the place unexpectedly, as it is hidden beside the banks of a stream which flows between steeply escarped hillsides. Choten Nyim is a collection of cattle enclosures with a temple where three ani (nuns) reside. The temple, dark and gloomy inside, contains a number of idols arranged in rows on shelves round the walls. The place is deemed very sacred, and is visited by Nepalese, Chinese, and pilgrims from Turkestan who travel many hundreds of miles. It is perhaps the weird desolation of these barren plains at the foot of the snows which strikes awe and veneration into the minds of the simple Tibetans.

Here we got the bad news that the yaks had been discovered and stopped at Tonglung, and their advance to the prearranged meeting-place at Tebong had been prevented. We had therefore to set out in a north-easterly direction for Tonglung, which was of course losing ground, since our correct route lay north-west and west.

The country on the north side of the Lhonak mountains is a lofty undulating sandy plain at an elevation of about 15,000 feet, with a slight slope to the north-west. A violent wind sweeps the plain from day to night. On the road about 5 miles from Choten Nyim a magnificent view opened of the lofty snow-peaks of Pherugh, one of the highest being in a bearing 278°. But the Everest group itself is not yet visible because it lies farther south. A high peak was observed at a bearing 322° in distant Central Tibet, 100 or perhaps 150 miles away.

Tonglung village stands on the banks of the stream flowing from the Naku La. Our approach over the satu fields surrounding the village caused much excitement, and the first people we met fled precipitately on seeing us. After an excited discussion in the village, a dwelling was finally prepared for us; and this after further cleaning made a comfortable and warm quarter. The baggage had been seized and locked up, while the yak driver had fled back to Sikkim. Adhu, however, outwitted the Tibetans and got the supplies back. To increase difficulties, the coolies were unwilling to proceed further, with the exception of Tebdoo, a most excellent and stout fellow from Lachen; and they left the next day for Sikkim.

After two days' waiting, the Dzongpen arrived from Kampa Dzong, and an interview was arranged in some yak-hair tents, which had been erected for the purpose outside the village. The Dzongpen was a small man with an effeminate face. He was well dressed in Chinese costume, but wearing a European felt hat. After an exchange of compliments and presents, a discussion ensued lasting about an hour. The Dzongpen was on the whole friendly, and even invited me to visit him at Kampa. He explained as regards the journey to Tashirak that he would facilitate the journey anywhere within his province, but that he could not provide a guide or transport beyond Tebong, which was the boundary of his province. Beyond Tebong the road to Tashirak passes through the province of Tinki.

Some pack-animals having been procured, we started the same day for Mugk. From Tonglung the road crosses the plashy marshes to the hamlet on the far side, and then, bearing to the right along the foot of the hill, enters the broad open Taya Sampo Valley. Proceeding over sandy plains for some hours we passed a low hill, guarded by a fort on its summit, and eventually arrived at Tebong, a ramshackle and deserted place surrounded by the usual walled enclosures. There were ruins of former dwellings. Evidently the place has declined since the days of Sarat Chandra Das's visit.

Tebong is the frontier post of the Shigatse province ruled by the Shigatse Lama. The province is undergoverned by the Dzongpen of Tinki, a small town on the opposite side of the Taya Sampo Valley and visible from Tebong. The Taya Sampo Valley is a remarkable stretch of country 6 to 7 miles broad, but narrowing to the west till beyond Saar the river is said to pass through a defile. The ground is sandy and stony and covered with a low-growing bush which when dried makes excellent firewood. The middle of the valley is marshy.

We changed ponies at Tebong and completed the tiring march over the stony plains to Mugk, a little fort-like village perched on a low hill and surrounded by marshes and barley-fields. Our approach caused intense excitement, and was the signal for barricading the village; not that we wished to enter, for we pitched our tents outside. The pony driver, however, entered the village to stable his ponies, and we learned next day that he and his ponies had been locked up. That evening two horsemen were observed leaving the village and trotting off in the direction of Tinki, evidently to report us. Next day the assistant Dzongpen arrived with his party, the Dzongpen himself being away at the time. This man was very different in his manner from the Dzongpen of Kampa, and he would give neither transport nor supplies. He would only repeat again and again the same old formula: "For what reason have you come to Tibet? You must return immediately by the way you came."

As a result of the interview I saw that it would be impossible to continue the journey under the present conditions of total dependency upon the natives for transport from stage to stage, and against the stubborn resistance of the Dzongpen. I decided therefore to abandon the attempt. I would return to Sikkim, reorganize the caravan, and make a fresh attempt with half a dozen selected men, carrying nothing but a tent and a few blankets and food for as many days as possible. We should then be independent of the officials and natives, and could travel where we wished as long as our rations lasted. After a search through the village Adhu seized four small donkeys, and packing our kit on them, we set off back to Tonglung. From Tonglung by a long and dreary march we retired back to Sikkim by the Naku La into the Lhonak Valley.

Lhonak is a hospitable and delightful land after the bleak plains of Tibet; and at Muguthang on the green swards by the banks of the stream I fixed up a permanent camp, retaining Achum while sending Adhu and Tebdoo back to Lachen to get six men and supplies for a fresh attempt to reach Tashirak. After six days the men came back over the Lugnak Pass from Lachen; and, breaking up the pleasant rest camp at Muguthang, we started again on August 4 for Tibet. Crossing the Choten Nyima Pass once more we arrived at Choten Nyim on the third day. We did not show ourselves this time, but camped in a concealed nullah near by.

From Choten Nyim we made in a north-westerly direction for Mugk,

about 14 miles distant. One cannot strike a direct line, but one is obliged to travel round the arc of a circle bearing always to the left on account of some peculiar sunken watercourses which form an impassable barrier. We encountered one of these, and found ourselves on the edge of a cliff at the bottom of which lay the bed of a glacier stream, dry at this season. We descended to the bottom of the gully by sliding down a conical inclined tunnel about 200 feet long and filled with loose stones, which slid down with us in rather an alarming fashion, raising much dust and noise. In order to avoid these gullies one must go due north almost as far as Tebong before turning west to Mugk.

We camped that night near Mugk at a spot where there was water and firewood. The great difficulty in concealing oneself in these regions is the lack of water and fuel, which obliges one to keep down in the flats of the valley where the villages are situated. Next day we passed Mugk but took no notice of the villagers, who, surprised to see us again, tried to interfere with our advance. We followed the track down the valley, travelling in a westerly direction till we reached the village of Eunah near the mouth of the valley coming down from the Chabuk La. The Taya Sampo valley had here narrowed down considerably. The hillsides had become steeper; and there was some difficulty in locating our position in relation to the Langbu Pass. Two youths, however, who were quite friendly, visited the camp in the evening; and Adhu, by bribing them, obtained some useful information concerning the road to the pass. They said, "Go to Changmu to-morrow—bridge to cross. Go a short way down the river and you will see three chortens. Then, looking up between high stones, go up, and a short way you will find yak paths."

Next day, about 2 miles beyond Eunah we entered a broad, flat valley, flanked by rounded red hills; and, crossing the plain in a diagonal direction, we reached the curious rock-hewn village of Changmu, consisting of about a hundred cave dwellings cut in the face of the cliff. Remembering the boys' directions, which proved quite correct, we crossed a bridge, followed down-stream, and found the chortens and the yak paths among the rocks leading up into the hills.

Continuing to climb we followed good tracks, until, after about 2 miles of ascent, we breasted the spurs and found ourselves looking down into the narrow valley of the Gye River. We were relieved to see a well-marked track winding along the valley, for this showed we were evidently on the right road to the pass. After having marched in all some 11 miles from Eunah we reached a sheep dok, uninhabited, and camped at a height of about 15,000 feet.

A short way above the camp the valley branched, the right branch leading to the Langbu La and the left into the snow mountains to the south and south-west. Next morning, by climbing about 1500 feet up the hillsides, I observed an easy-looking snow col at the head of the valley. It would be interesting to cross this pass, because it would

probably give direct access to the Knagbachen valley in Nepal somewhere near the foot of the great Kangchen glacier. Thus a back door would open to Tibet from Lhonak by the Jongsong Pass, which would be easier than the Chabuk La route described by the natives as being extremely difficult and seldom used. Again, by descending this valley and skirting the foot of the Langbu La direct access could be obtained to Saar village in the Taya Sampo valley. The ascent to the Langbu La is gentle and easy over the barren boulder-strewn ground. In the final climb to the pass, however, the track zigzags steeply 300 feet up a rock wall.

The all-important question was, "Could Everest be seen from the pass?" What were the "lofty Pherugh mountains" that Sarat Chandra Das had described? Were they the Everest group or not? The day was bright and clear, and on breasting the pass a splendid view was revealed. In front towered a magnificent chain of lofty snow-peaks. The centre peak of the range rose a glittering spire of rock, its flanks streaked with snow; and a fine tumbling glacier lay beneath. Behind the sharper and nearer summit rose a higher peak twisted like a hooked tooth, a precipice on the north side and a *névé* on the south. To the left of this again was a long ridged peak, whose winding crest was fantastically corniced—one of the finest specimens of mountain architecture to be seen. The mountains would be about 23,000 feet in height. I have named the peaks, one Taringban (long knife), and the other Guma Raichu (Guma's tooth).*

Presently, while watching the panorama, the shifting of the distant clouds revealed other mountain masses in the background; and directly over the crest of the peak Taringban appeared a glittering spire top of rock fluted with snow, which, according to its magnetic bearing, could be none other than Everest itself. Some 1000 to 1500 feet of the summit was visible.

Although this panorama was in itself a fitting reward for the efforts of the journey, still it was in a sense a disappointment. That wall of mountains was an impassable barrier. Tashirak was near, one had only to descend the valley to reach it; but it was plain that Tashirak offered no open road to Mount Everest. The map upon which the hopes and plans of the journey had been based was incorrect. This mountain range was not shown. The Tashirak River rising in the Langbu La did not flow west into the Arun, but almost due south, while this high mountain range divided the Arun from the Tashirak River.

After remaining an hour on the summit of the pass, during which time the men said copious prayers and built a chorten to which they attached strips of coloured cloth taken from their clothing, we descended into the

* It is to be regretted that the photographs of these mountains were not very successful owing to the high wind blowing over the Langbu pass, which prevented proper exposures being made.

broad desolate valley below. Bearing always to the left we followed the track which brought us to Guma Shara village, where we camped for the night.

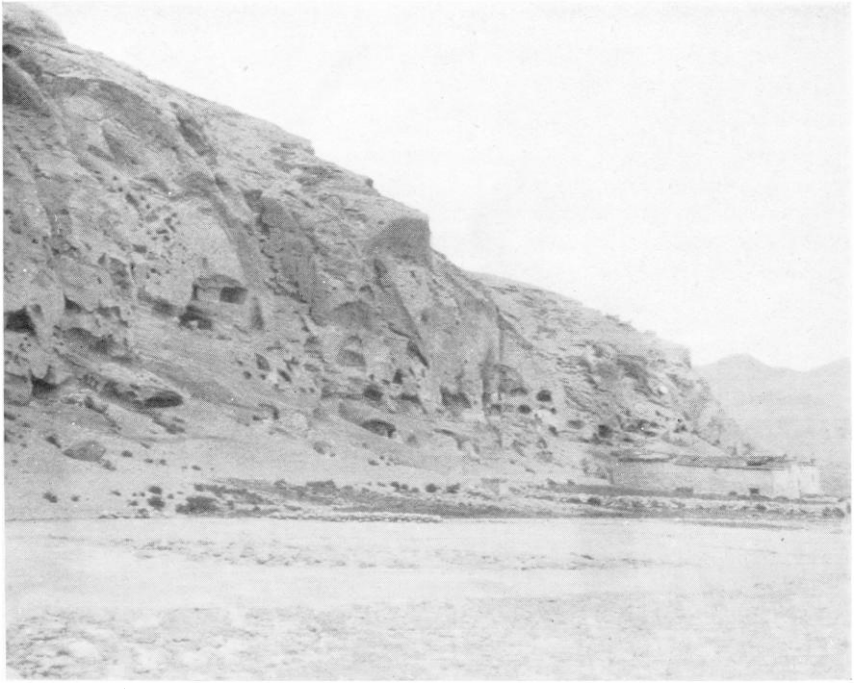
Sitting out that evening, admiring the panorama of mountains that dominate Guma from the west, we were visited by two lamas who were friendly and who volunteered some interesting information. The lamas said the only way to reach the Pherugh and Tingri district from Tashirak was by the Nila La and Saar. There was, however, a high-level yak road from Tashirak to the Arun Valley, passing a certain monastery situated on the crest of the dividing range between the two valleys. This monastery was connected with the worship of the mountain "Kangchen-Lembu-Geudyong," of which it commanded an open view. From their account Kangchen-Lembu-Geudyong appears to be the Tibetan name of Mount Everest. They recognized two sacred mountains, Kanchenjunga and Kangchen-Lembu, the former being the more sacred owing to its five heads, while the latter (Everest) has only one head. (The Tibetans would be obviously unaware that Everest was actually the higher peak, owing to the small difference in height, while Kangchenjunga is probably more massive and therefore has the more imposing aspect.) Kangchen-Lembu signifies Kangchen's minister. The mountain is said to contain an interior lake, the word Geudyong being used to signify its crater formation. Pilgrimages are made from Tingri to the neighbourhood of Kangchen-Lembu, where there are a number of shrines dedicated to the worship of the mountain.

The Tibetan pronunciation of Kangchenjunga is Kangchenzeungar.

These details are interesting as regards the native names of Everest, but how far they are correct, or if there are other names, I cannot say because, owing to the hostility to my journey, I was unable to speak with many of the Tibetans whose information could be considered reliable. The Tibetans whom I questioned did not seem to know the name "Makalu," which I believe is a Nepalese name. Makalu, which can be well observed from Indian territory, is known to hold a curious glacier-filled basin on its summit, and so it is quite possible that the Tibetan name I have given may refer to Makalu and not Everest. On this account the information concerning the native names of the mountain should not be accepted as anything more than a report until such time as the complete exploration of Everest is undertaken and this information verified.

From Guma Shara we followed the valley next day to Tashirak. We passed several caravans on the road, mainly Nepalese traders coming from the Kanglachen Pass and proceeding to Saar and Shigatse. There are some small villages in the valley. Tashirak is the frontier guard post, and a fortified wall blocks the valley. The Dalai Lama's rice-tax collector with a guard of soldiers resides there. The officials console themselves with innumerable wives, but besides that there are no other residents.

The Tibetan officials were hostile and wished us to return immediately



THE ROCK-HEWN VILLAGE OF CHANGMU, TIBET

CHOTEN NYIM MONASTERY, TIBET

TASHIRAK, SHOWING FRONTIER WALL. VALLEY ON LEFT LEADS TO KANGLACHEN LA

Taringban. Guma Raichu.

VIEW FROM LANGBU LA LOOKING WEST TOWARDS PEAKS (22-23,000 feet) BETWEEN TASHIRAK AND EVEREST, DISCOVERED AND NAMED BY MAJOR NOEL 1913

the way we had come. We were confronted also with supply difficulties, because our satu and tea had almost given out, and our meat supply had been exhausted some days back. We, however, managed to get a little from the Nepalese caravans who were encamped also at Tashirak and who were quite friendly, and so we were enabled to continue our journey next morning. We struck camp in the early dawn, and, by fording the river, we avoided the bridge and thus passed by Tashirak before the officials had wind of our departure.

Below Tashirak the valley narrows and the scenery becomes alpine with trees and pretty green meadows of moss and luxurious grass. The valley is enclosed by high mountains, and the summits of snow-peaks show themselves high above the mists and clouds. We proceeded as far as the large Nepalese–Tibetan village of Quodo, a short distance beyond which is the Nepalese frontier post and Nepalese guard.

The Tashirak River took a direction almost due south and showed no signs of turning west to join the Arun. A Nepalese, moreover, at Quodo informed us that the Tashirak river joins the Arun at Hatia another two marches down. It was thus useless to proceed further, so we retraced our steps and camped in a side valley about 3 miles below Tashirak. Here we were situated behind the Taringban mountain, and could see the south face of the peak. A ruined fortified wall blocked the valley mouth, and this spot is said to have been the site of a battle in the Tibetan–Nepalese war. It is up this valley that the yak path lay to Pherugh and the monastery, as explained by the lamas of Guma Shara. Therefore it would be interesting to proceed up the valley next day.

An unpleasant surprise, however, came to interfere with our plans, for we had scarcely pitched camp and settled down for the evening when a mounted party of six men rode towards the camp. This was none other than the Tinki Dzongpen himself and his followers. They rode shaggy Tibetan ponies bridled in shining brass and silver-ornamented bridles, and saddled in coloured numdahs. Each pony carried on either side a bulky leather sack and blankets, and, from the general appearance of the party, it was obvious that they had travelled far. We learnt later that the Dzongpen, hearing of our presence, had ridden about 150 miles to meet us, covering the distance in three days.

An interview was arranged which lasted fully two hours and was carried on for some time in rather a heated manner. The Dzongpen, afraid of incurring the displeasure of his superiors lest he should be accused by them of allowing a possible spy (for they mistrust all foreigners) to enter the sacred Lama land, continuously urged that we must return immediately by the road we came. He would listen to no argument and was suspicious of every reason, saying, "No foreigners ever come to Tibet. For what reason do you come?" I complained that I had received only discourtesy and opposition while in Tibet, whereas all Tibetans coming to India were free to travel where they wished, and

were always received as welcome visitors. This was a disgrace to the Tibetan civilization and the Tibetan culture. The whole party became very excited at this juncture, and all started to talk and shout together. The Dzongpen said, "Show me the man who has crossed you?" I answered that it was not any particular man, but that all the villages had been ordered to shun us and refuse us food. At length, after many discussions, I informed the Dzongpen that I would return to India; and finally he and his party took their leave and rode off to Tashirak.

Next morning Adhu came to the tent to say that the Tibetan captain and guard were outside. They said they had been sent to prevent us following the upper road to Pherugh. I went down with my men and, forcing the captain to dismount, we asked him what he meant by posting soldiers on us as if we were common thieves. His soldiers, standing some distance away, were armed with long smooth-bore guns, with rough wooden stocks and folding bipod legs to support the weapon when taking aim. This was the old pattern of arm, totally inaccurate and useless, and very different from the new Lhasa rifles with which the Tibetans fought the Chinese. The soldiers started to crowd round in an insolent manner, but when we made pretence of taking to our arms the captain jumped on his pony, and with him the whole party fled. From a distance behind some rocks they fired two shots. We immediately fired back, aiming over their heads, and finally they cleared the field.

Being discouraged by continuous opposition and having almost come to the end of our food supplies, I decided to discontinue the journey and return to Sikkim. The journey had revealed that there was no open approach to Everest from Tashirak. High snow-peaks and the deep and difficult valley of the Arun intervened and rendered approach from the east very difficult. It would have been interesting to reconnoitre the upper road to Pherugh and visit the reported monastery which was said to command a view of Kangchen-Lembu, but we were at the end of our tether. We had no proper food to eat. The coolies, moreover, on account of their long marches and hardships had been grumbling, and it was only by doubling their pay that I had been able to keep them in hand during the last few days and get them on as far as Tashirak. Accordingly I gave orders to pack up the camp. Slipping by Tashirak without meeting the Tibetans again, we set out for home.

For the return journey we followed the route Langbu La, Mugk to Choten Nyim, where we rested two days; thence to Gyabra camping ground, the Naku Pass into Lhonak, and over the Lugnak Pass once more back to the pleasant and comfortable bungalow at Thango in Sikkim on August 24, there to enjoy four days' rest after the fatigues and hardships of travel in Tibet.

In order to profit by the splendid September weather I refitted the caravan, and, taking fresh coolies, set out on August 29 to visit Kangchenjunga and the Zemu glacier, travelling by the Lugnak Pass to Teble

in Lhonak, thence by the The La, 17,400 feet, and Tangchung La, 16,000 feet, to the Zemu glacier, camping at Green Lake at the foot of Kangchenjunga on September 2. That wonderful and gorgeous mountain panorama at the head of Zemu glacier has already been so well described by Mr. Freshfield and Dr. Kellas that no description of mine can add anything. After securing a most fortunate set of photographs of these unique mountains, I returned down the glacier and the forests of the Zemu glen back to Lachen, thence down through Sikkim to Darjeeling and India.

Some day the political difficulties will be overcome, and a fully equipped expedition must explore and map Mount Everest. The journey must be undertaken from the Tingri or northern side, proceeding by Kampa Dzong and the Taya Sampo Valley. While at Saar it would be most profitable to send a detached party by the Nila La to Tashirak to climb the Taringban peak, and so get a direct panorama of the eastern slopes of Everest and Makalu rising from the deep Arun Valley.

NOTE ON THE SPELLING OF NATIVE NAMES.

In this paper and in the sketch-map the spelling of names is made to conform with the Survey of India. Though I have not made a special study of the pronunciation of Bhutia and Tibetan words, still I have noticed a marked difference between certain names given by the Survey and the native pronunciation of them.

Survey Name.	*Native Pronunciation.*
Kinchinjunga	Kangchenzunga
Kampa Dzong	Kamba Jong
Choten Nyim	Chorten Nyim
Tingri	Dingri
Thango	Tangu
Jongsong	Jonsong
Tista (river)	Teesta

Before the paper the PRESIDENT said: A good many of you, no doubt, like myself, will be very pleased to be back again in the old happy hunting-grounds of the Himalayas. To me it will be a great pleasure to re-visit that historic country, even if it is only for one evening. It is many years since a project was formed for approaching the highest peak of the Himalayas, Mount Everest, with a scientific expedition, and it is six years since the lecturer of this evening, Major Noel, made an adventurous journey over the borders of Tibet in an attempt to reach Mount Everest from the north-east. Apropos of that scientific expedition, which we now hope to see realized, what Major Noel has to tell us ought to be of the very greatest interest. There may be divided views as to which really is the best method of approaching Mount Everest, but we shall hear all that there is to be said about one of them to-night. I will ask Major Noel to begin his address.

Major Noel then read the paper printed above, and a discussion followed.

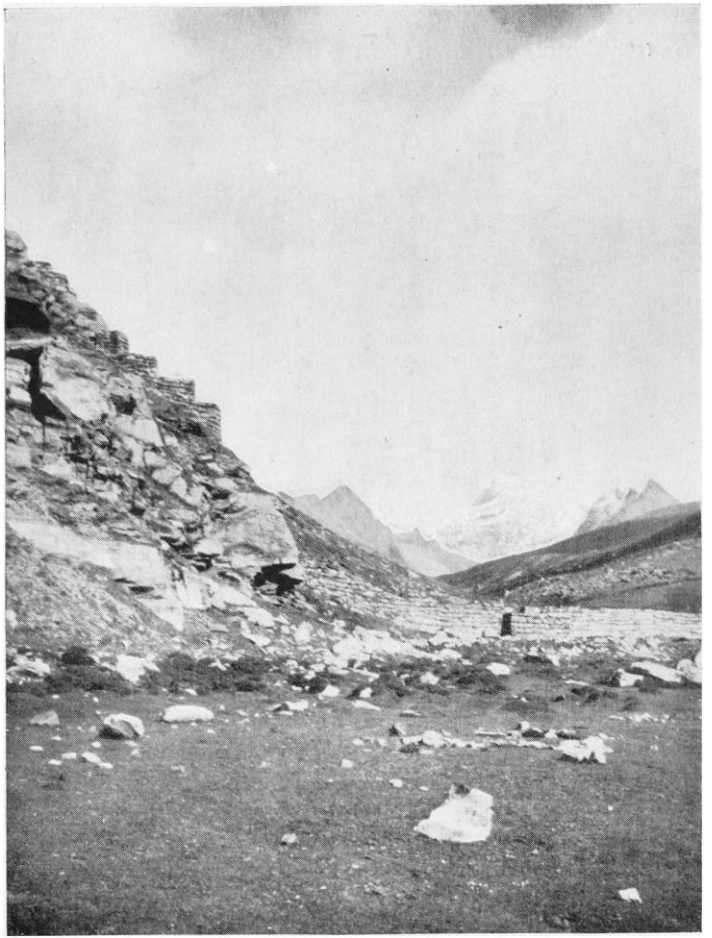
Mr. DOUGLAS FRESHFIELD: I hoped we might have had an interesting discussion, but the hour, I am afraid, is against it. I may perhaps shorten my

remarks if I put them under heads. First, with regard to Western Himalayan exploration in general. Is it realized that Darjeeling is only a night's journey from Calcutta ; that people go up there for a week-end ; that within that very short distance of what was lately the capital and still is the greatest city in India we have a playground of unrivalled beauty? Yet in order to travel but a few miles north of Darjeeling into "independent Sikkim" a special permit is required. There were good reasons in the past for such restrictions, but there are now stronger reasons for their abolishment. I hope that the district will soon be thrown open to all travellers. But I would ask for something more positive. If a few more horse-roads were made in Sikkim, if, for instance, one was made from Jongri to Pemionchi, visitors to the snows would be able in a fortnight's round tour to approach the great peaks, camp among the native shrines at the base of Kangchenjunga, and return by the Singalela ridge, after having seen what is certainly, as far as I know, the most magnificent scenery in the world. The other path I plead for is one through the few miles of jungle from Lachen to the great Zemu Glacier and the Green Lake Plain. Here and also at Jongri stone huts or bungalows might be built, similar to those erected in the Alps for the shelter of travellers. In that way the Western Himalayas might be made a playground for India. I was personally interested in the very vivid and truthful description that we were given of Lhonak, where the Tista has its sources. The features of this upland district offer a singular contrast to that of the lower valleys and gorges of Sikkim. They exhibit in the most striking fashion the protective power of a cloak of ice as contrasted with the erosive action of water, of rain and torrents. The traveller moves among smooth hillspurs and shallow valleys, in which he can trace the relatively recent retreat of the glaciers by the remains of the moraines they have left behind them. In our days geologists may wonder how de Saussure failed to realize that erratic blocks had been carried not by floods but by glaciers. A hundred years hence physical geographers will, I believe, equally wonder at those among us who allege that glaciers have done more in erosion than in conservation. This is, however, I am well aware, for the moment a controversial forecast.

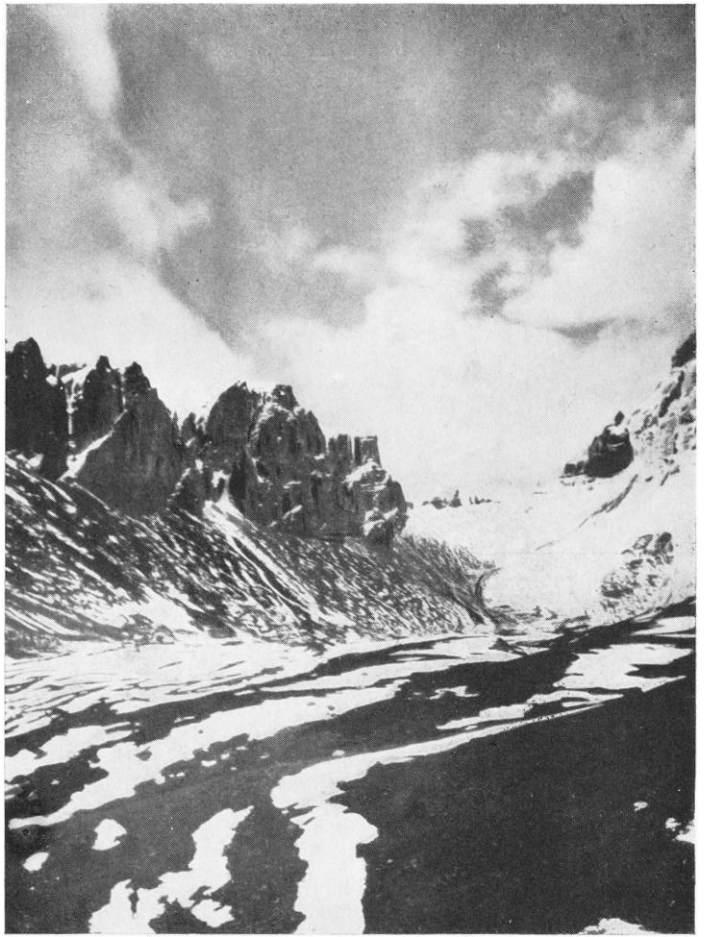
Next as to climate. I am afraid Major Noel may have led his hearers to believe that the climate of Lhonak is like that of Homer's Islands of the Blest, that it never rains or snows there. I can show you photographs taken by my companion Signor Sella that will prove that it can snow in Lhonak even more heavily than last week in Derbyshire.

With regard to the character of the scenery I venture to differ from Major Noel. I admit that when one comes up from the depressing atmosphere of Sikkim, from the heat and rain of the outer hills into this dry frosty climate, it is like going up to the Engadine from the Lake of Como. One feels so exhilarated that one is ready to admire everything. But so far as my own feelings go I cannot say I thought the Lhonak scenery either really beautiful, or fantastic, or sublime. The bare shallow valleys, the rounded slopes and moderate peaks and glaciers contrast poorly, to my mind, with the forests, the ravines, and the majestic towers, spires, and precipices of the Outer Himalayan range.

With regard to the main subject of the lecture, the eastern approaches to Mount Everest, I think we have got thus much forwarder to-night ; we realize that there are two routes to the mountain, one from the east, and one from the north-east, and that the eastern route, through Tashirak, is the more direct. The best route, however, is doubtless the more northern one from Kampa



VALLEY BELOW TASHIRAK LEADING TO SOUTH SIDE OF PEAK "TARINGBAN," TIBET



THE CHOTEN NYI-MA LA

NORTH-EAST GLACIER FLOWING FROM MOUNT EVEREST

MOUNTAINS NORTH OF MAKALU (27,790) TO SNOUT OF NORTH-EAST MOUNT EVEREST GLACIER

From photographs lent by Dr. A. M. Kellas

Dzong through Tibet, and then south along the track which is known to exist and has been crossed by a pundit, which leads over the western spurs of Mount Everest. A party would not need to cross the frontier of Nepal, and therefore need not get leave from Katmandu. I do not know that there is anything more that I can add in the time allowed me. I must leave Dr. Kellas, who has been far on the same track as Major Noel, to supply any further details with regard to the main subject of the lecture. Dr. Kellas has photographs which I hope he will show, for they seem to represent the view Major Noel describes of two rock peaks with a spire behind. If this is so, the peaks are probably all parts of the Makalu group.

Dr. KELLAS: I have listened with very great interest to Major Noel's account of his adventurous expedition and have admired his magnificent photographs. The problem of the approaches to Mount Everest attracted me when I first visited the Himalayas about twelve years ago, and since then I have studied the matter rather closely, and come to the conclusion that the route described by Major Noel is one of the best from many points of view. The distance from Siliguri to the foot of Mount Everest is probably nearly 300 miles, about 170 miles to Kampa Dzong, and thence about 120 to Mount Everest. The best route is certainly along the Tista Valley, then to Kampa Dzong* and westwards to near the village of Saar, which is on the direct north and south route between Tinki Dzong and Nepal. From Saar this route leads to Tashirak, over the Nila La, a little to the west of the direction taken by Major Noel, who crossed the Langbu Pass. From Tashirak there is a good track to Hatia (or Hatiya) which is just within the Nepalese border, and I believe that boats can be obtained near the village to cross the Arun River. From Hatia the distance to Mount Everest is about 25 miles direct. The route leads northwards up the Arun River, and then to the west. I have been able to get one or two photographs of it not taken by myself. When I first started to study the problem I tried to keep along the side of the dividing range between Nepal and Tibet near the snow-line so as to avoid disturbing the equanimity of the Tibetans or the Nepalese, and a few slides give an idea of the nature of the problem. I tried to go as far as possible along the glacier leading westwards, but the route was not so easy as it at first appeared. There is a great gap a few miles on, the glacier being projected against another with which it has no real connection. The phenomenon is common in photographs of Himalayan scenery and a good example was shown this evening. The peak in Mr. Freshfield's last photograph, which seemed to form the northern part of Mount Everest, is really about 10 miles to the north-east of Everest. These photographs show that the scenery of the Mount Everest group is of a very high order.

There are variations of the route which might be advisable under certain conditions. For example, if one were not allowed to get into Nepal at all, one could not go by Hatia, which is within the Nepalese frontier, and I do not know of any bridge near Tashirak to the west, or any means of getting across the river, which is somewhat difficult at that part. But one could from Kampa Dzong follow a route to the north-west and pass near Tinki Dzong to the north of the Phungtu Chu, which is the name given to the west branch of the Arun River, which rises west of Tingri. The Phungtu Chu is crossed by a hide-rope bridge, and the road then proceeds south along the Arun River to Kharta, whence there are various routes to Mount Everest.

* In discussing routes with the late General Rawling, that *viâ* the Tista and Sepo La had been provisionally agreed upon as far as Kampa Dzong.

There is another variation of the route described by Major Noel which might be useful. It is more direct than that *viâ* the Phungtu Chu. One could proceed from Kampa Dzong almost due west to Saar. If one keeps straight to the west from Saar one can cross the mountains, which Major Noel found barred his way, by an easy pass called the Tok-Tok La. Proceeding west from this pass one can reach the village of Kharta previously mentioned on the west side of the river. From Kharta there is a route which leads west for about 10 miles to the Langma La, and that takes one out to the foot of the north-east glacier flowing from Mount Everest. I think that would be the shortest route of the three so far mentioned.

I might add notes of other two routes. There is a route which could be followed from Siliguri or Darjeeling * to the north-west. Instead of going due north along the Tista one could proceed north-west by various routes into the Tambar Valley. At the top of the Tambar Valley there is a good route which was followed by Sir Joseph Hooker in 1849, when he reached the Wallanchoon Pass, a few miles to the south of Tashirak, which is, so far as I can learn, 45 miles in a straight line from Mount Everest, the Wallanchoon Pass being about 50 miles.

There is a third route. One could proceed from Khanwa Ghat on the Kosi River due north along the Arun to Hatia. The direct distance from Khanwa Ghat to Mount Everest is only 110 miles, and the length of this route would be much less than that of the others, approximately 160 to 170 miles in all. It would also be possible, starting from Khanwa Ghat, to attain the south side of Mount Everest: the Hatia route takes one to the north side. About 30 miles north of Khanwa Ghat one can turn to the north-west along the Sun-Kosi River, and then about 40 miles further on, proceed northwards up the Dudh-Kosi River. Part of the eastern headwaters of the latter stream drain the south side of Everest.

Those are the chief routes as far as I have been able to work them out, but there are several other variations of these routes which are of interest, but need not be described.

Captain J. P. FARRAR (President of the Alpine Club): The Alpine Club naturally views with the keenest interest this proposal to attempt the ascent of Mount Everest. Moreover, it seems to me that this attempt now commands chances of success not previously available. The main difficulty hitherto has been transport of equipment and provisions, requiring unmanageable relays of native porters. This has led to great delay, aggravating the unavoidable discomfort and exposure to the European leaders, upon whom the final victory depends, tending to lower their enterprise and powers of work. You have in the modern airship a means of supply which ought to eliminate in a great degree the difficulties that have baulked previous travellers. I think, therefore, that the expedition has every chance of success, and the Alpine Club is prepared not only to lend such financial aid as is in its power, but also to recommend two or three young mountaineers quite capable of dealing with any purely mountaineering difficulties as are likely to be met with on Mount Everest.

Sir FRANCIS YOUNGHUSBAND: It is now twenty-six years ago since our

* I must venture to dissociate myself from Major Noel's remark regarding officials at Darjeeling, as I have invariably found them courteous and obliging. The coolies I have obtained there have always been satisfactory, and some, especially the Sherpa-Nepalese, have been of exceptional merit (cf. *Geog. Journ.*, September 1912, p. 257).

old friend Captain Bruce—now General Bruce—made the proposition to me that we should go up Mount Everest. It did not come to anything then, but years afterwards, in 1903, when I was in Kampa Dzong in Tibet, I had for three months a magnificent view of Mount Everest and Makalu right across the great plain of Tibet. The lecturer hoped that it would be an Englishman, or at any rate a Scotchman, who would first climb Mount Everest. I need only say I think we are all determined that it shall be a British expedition. Our own Society is interested in the project, and we have heard the President of the Alpine Club say he has magnificent young mountaineers ready to undertake it, and it must be done. I dare say there will be one or two attempts before we are successful; and the first thing we shall have to do is to get over the trouble with our own Government. When I went to Tibet in 1903 to 1904 I did get permission for travellers to go to certain places in Tibet. I also got a thing which the Government threw away, and that was the right for an officer to go to Lhasa. Our Government itself has prevented English travellers from going into Tibet and have refused to make use of the privileges which we have obtained. Not only English travellers but others as well have been prevented from going into Tibet. I know French travellers, especially, who wanted to go to a place to which we had a permit for Europeans to go. It is not the Indian Government who are to blame; it is the home Government. But after all, our Government are reasonable if they are approached properly and by societies like this and the Alpine Club. If a reasonable scheme is put before them, and it is proved to them that we mean serious business, then they are reasonable and will do what one wants. But this is a big business, and it must be undertaken in a big way. Most excellent reconnoitring work has been done by our lecturer, Major Noel. We know something of how Mount Everest may be approached from outside Tibet. I suggest that it would be a good thing if, instead of going from the outside, from the Indian side into Tibet, it would be better if we went from inside Tibet itself towards the frontier. I think it better if the head of the expedition made up his mind to go to Gyantse, where we have a permanent official, and get in touch with the big Tibetan officials, and then from the interior proceed towards Mount Everest on the frontier. There are some arguments we can easily put forward. We can point out that the Tibetans are allowed to travel about India as they like, and that this Society itself has a certain claim upon them, because it was Mr. Reeves of this Society who trained a young Tibetan sent over by the Dalai Lama to learn survey work. It would be a graceful act on the part of the Tibetans if they allowed us to make use of their country for climbing Mount Everest.

The lecturer has referred to aeroplane work. I think the Survey of India might be approached to take this up seriously and from the aeroplane get a good photographic survey of the country round Mount Everest. As I say, I am pretty certain that the Government, if they are approached properly by societies such as this, and if a reasonable scheme is put before them, would be quite ready to take it up, so I hope something really serious will come of this meeting. I should like it to be an Englishman who gets to the top of Mount Everest first.

The PRESIDENT: I am afraid it is time to close the discussion. The interesting paper we have heard read contains a great many points for discussion, but unfortunately we cannot continue it now. I have admired more than I can say the wonderful series of photographs which Major Noel has shown us, and I have followed his most adventurous and plucky journey with

the deepest interest. But I venture to think that when any expedition succeeds in reaching Mount Everest it will not be either from the east or north. My own impression is that far the simplest and shortest way is through Nepal. I am quite well aware that if political authorities were asked as to whether it was possible to go through Nepal we should hear at once that it was frankly impossible. I believe myself that this is the way in which finally Mount Everest will be reached.

I have only to ask you now to join in a vote of thanks to Major Noel for his very interesting and attractive lecture, and I hope at some time not very remote we shall be able to hear more about the proposed expedition to Mount Everest.

THE ADMIRALTY TIDE TABLES AND NORTH SEA TIDAL PREDICTIONS

Commander H. D. Warburg, R.N.

Superintendent of Tidal Work, Hydrographic Department, Admiralty.

Read at the Afternoon Meeting of the Society, 17 February 1919.

THE Admiralty Tide Tables were first published for the year 1833, and then contained the times of high water only for the four principal ports in the United Kingdom. By the year 1912 the information had increased to predictions for 54 ports, 26 in the British Islands and 28 in foreign countries and the Colonies: times and heights of both high and low water were predicted at 28 ports, 7 of which were in the British Islands, the times and heights of high water only being given at the remaining 26 ports. The Hydrographic Department does not undertake the calculation of all predictions given in the Admiralty Tide Tables, the present general rule being that predictions for ports in the British Islands and foreign countries are calculated in the Department, those for colonial ports being supplied by the authorities concerned.

The aim of the Tide Tables is to supply, by means of tidal predictions for standard ports and tidal differences for secondary ports on the standard ports, information which will enable seamen to make use of any port in the world independently of information obtained locally.

This aim was far from adequately fulfilled in the tables for 1912, the greater portion of the world being entirely unrepresented in the standard and secondary ports.

Although there had, between the years 1833 and 1912, been a great increase in information, there had been no corresponding increase in accuracy, so far at least as the ports predicted in the Hydrographic Department were concerned, the method of calculation being the same in the latter year as in the former; predictions for colonial ports, however, supplied by the colonial authorities, were in 1912 mostly calculated by the harmonic method. The method used in the Hydrographic Department was that introduced by the late Sir John Lubbock in about the

on March 26 the Council were represented by Sir Maurice de Bunsen and Colonel Sir Henry McMahon.

CORRESPONDENCE

The South Magnetic Pole.

As an observer who has carried out in the past a very large number of magnetic observations in Antarctic latitudes and as a student still of terrestrial magnetism, I have read with considerable interest Mr. E. A. Reeves' ingenious paper appearing in last month's *Journal* on "A Transformation of the Magnetic Dip Chart" and the discussion in connection therewith. In the report of the discussion on page 164 Mr. Hinks states, no doubt inadvertently, that Professor David had fixed the position of the south magnetic pole to within a few miles, and that he had some claim to be considered as an authority as "he is the only man who has made observations near it" (the magnetic pole). I think this statement is liable to be a little misleading.

Professor David, as we know, is a very eminent geologist, and he was probably in command of the small sledge party (Sir Ernest Shackleton's Antarctic Expedition) which set out towards the assumed direction of the south magnetic pole, but Douglas Mawson was the physicist of the party and the actual observer who carried out a series of magnetic observations near or in the approximate area of the south magnetic pole.

L. C. BERNACCHI.

Admiralty, 18 March 1919.

I am obliged to Lieut.-Commander Bernacchi for calling attention to the slip which I made in the discussion of Mr. Reeves' paper. Not only was Sir Douglas Mawson the magnetic observer with Professor David's party on the Shackleton expedition, but on his own expedition in 1911–13 a further important contribution to the determination of the south magnetic pole was made by a sledge party in charge of Mr. Kidson, with Mr. Eric Webb as magnetic observer; and this should also have been mentioned.

A. R. H.

The Names of Himalayan Peaks.

Colonel Wauhope's letter is of considerable value as a contribution to the above problem, but one trusts that the names of the first and second mountains on the world's surface as regards altitude, will be reconsidered within the next few years, before a final decision is reached.

The name "Kinchenjunga," given by Colonel Wauhope, is an improvement on the Kinchinjunga appearing on maps after 1906, but in 1903 the name Kanchenjunga was used, so that the etymology has been obscured comparatively recently. Perhaps one might point out that Kang is the spelling of the Tibetan word for snow given by Mr. C. A. Bell, I.C.S., one of the best known British authorities on the language, but if "Gang" is more correct, it might be considered.

As regards Mount Everest, one ventures to hope that the name will not be definitely fixed until after the exploration of the group of mountains of which it is chief.

A. M. KELLAS.

7 April 1919.

projection you must know the focal length of the lens used in taking the aeroplane photograph, and you must also understand fairly thoroughly the principles of perspective, and so on, on which it is based. So that in the hands of anybody who does not know exactly what he is doing it may go wrong. With the enlarging camera apparatus I do not think you can make a mistake; provided you get your four points to agree exactly, you have a correct projection, and your print will be absolutely correct. The difficulty of focal length, I feel sure, is only a difficulty because we have not had time to work out the best methods of making the adjustments. With the French camera devised by Commandant Roussilhe, they say it takes four hours to make the adjustments for a single photograph, and I gather from this pamphlet that they have to do a good deal of preliminary calculation. I feel sure that four hours can be reduced a great deal. With our rough-and-ready method we found that by letting the focus go we were able to adjust each photo in about five minutes, but we never used any photographs which were not nearly vertical. If they were very distorted we rejected them and asked the Flying Corps to take others; they were very obliging in that way, and the quality of the photographs was, I consider, wonderful. I feel sure the difficulty of the focal length can be got over, and if it can I myself prefer the enlarging lantern as both quicker and more accurate than the camera lucida and entailing far less strain on the workman, which is an important consideration.

The CHAIRMAN: I think you will agree with me that we are indebted to Colonel MacLeod, not only for an extremely interesting paper, but for originating a very instructive discussion. I will ask you to pass a hearty vote of thanks to him.

A RECENT TRIP INTO THE CHUMBI VALLEY, TIBET

Lieut.-Colonel Sir Walter Buchanan, K.C.I.E., I.M.S., Calcutta

THE following account of a recent trip through the Chumbi Valley of Tibet describes this part of Tibet as it now is, and shows the changes that have taken place since the days of the Mission-Expedition of 1903–4, mainly due to the entire disappearance of Chinese influence.*

Up the Chumbi Valley to Phari Dzong.

The journey has not been done (except by the few Sikkim officials on duty and by a Calcutta artist) since the close of the Tibet Mission-Expedition under Sir Francis Younghusband and General S. R. Macdonald in 1903–4.

We arranged to go into Tibet by the Natu Pass (14,400 feet), to go up the Chumbi Valley to Phari, and come out by the well-known trade route over the Jelep La. We decided to take pack-pony or mule

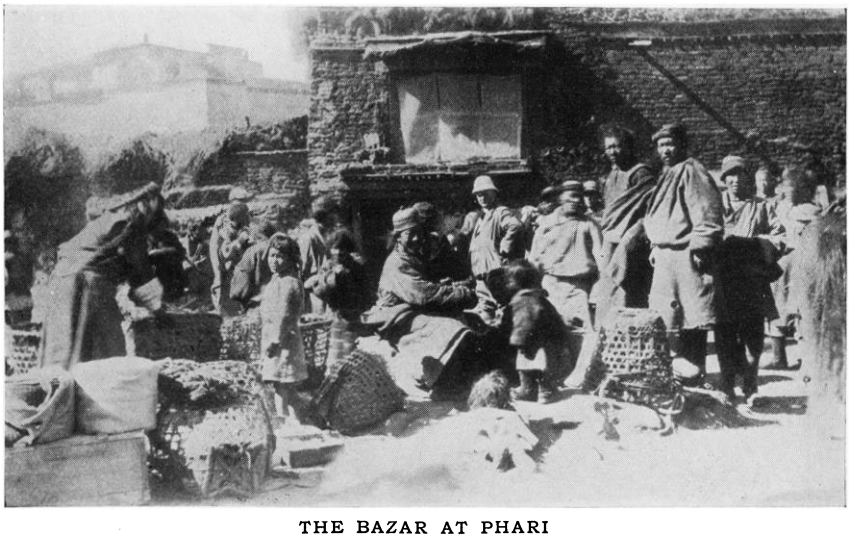
* For the Expedition, see admirable books by Colonel Waddell, P. Landon, and E. Candler; all are good, but for this portion of the way to Lhasa that of P. Landon is the fuller.

transport with us, and we found it on the whole much more satisfactory than coolies, whom we had employed on many trips through Sikkim.

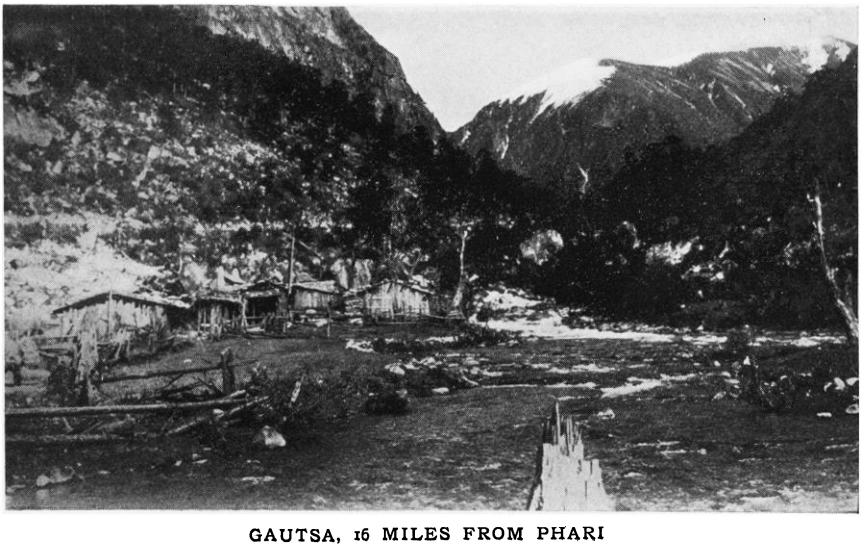
The road to Tibet starts from the rather shabby rest-house. After 5 miles we reach a small village called Lagyap, near which in the days of the expedition of 1903–4 a difficult pass had to be negotiated. This Lagyap Pass is not now used; a decent bridle-path now runs round the hill, and then on to the place (9500 feet) called Karponang, consisting of only a mule camping-ground and a small whitewashed rest-house (Karpo nang, "the White House," in Tibetan *). Next day we set out on a short march of 10 miles to Changu (12,600 feet). The first 3 miles are very rough, though possibly not so bad as in the Expedition days, when the "10th to 13th" mile were proverbial for badness. In several places the road has been cut out from the rocky cliff, with deep *Khuds* or precipices on the outer side, especially at a point between mileposts 13 and 14 (from Gangtok). This passed, we turn up the Changu Valley, which soon widens out till near the 15th milepost it divides into two, of which we take that on the right hand or east, and after crossing a log bridge keep along the left flank of this valley, parallel with the Changu torrent. The sides of the valley are lofty and rocky, while the river and the hills for several hundred feet up are densely covered with rhododendrons of all varieties—a sight which in the month of May must equal in beauty, or possibly surpass, the famous 30 miles of rhododendrons on the better-known tourist route from Tonglu to beyond Phallut, on the Nepal Boundary road. Near the 17th mile we see before us a ridge blocking the head of the valley, and a stream tumbling over it to form the Changu River. The path zigzags up to this ridge, which we find to be the end of a splendid lake, 1 mile long and 600 feet broad, bounded on the west by bare rocky hills, and on the east by a steep hill covered with rhododendrons to its summit. The road runs along the west bank to a small draughty wooden bungalow at the north end of the lake (12,600 feet). We had snow and sleet that afternoon, but next morning was fine and frosty. Starting early we soon reached the ridge beyond the lake, and got a close view of the Cho La (the "Chola Pass"), formerly the great route into Tibet, from which the Dikchu River (Ryott of Hooker) takes its rise. In early days, when the Sikkim Raj had its capital at Tumlong, the Rajas used to keep this road over the Cho La as their nearest way into the Chumbi Valley of Tibet, where they preferred to live and (like our early King Georges) treated it as a sort of Hanover. Near this pass Hooker and Campbell were captured by the Sikkimese in 1849. The road then runs over a level upland or alp and round a huge bay or amphitheatre (2 miles long); then on turning the corner the passes lie above us, and the road runs on the left side of a very deep gorge

* The name was given, it is said, by Landon, the *Times* correspondent. It has remained, though in strict Tibetan it should be *Nang Karpo*, cf. *Ta Karpo*, *Chorten Karpo*.

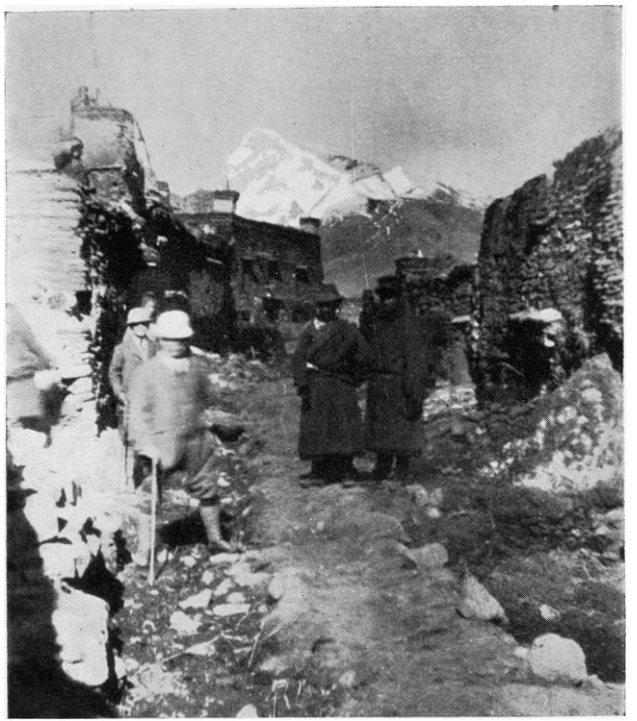
KAGIN MONASTERY ABOVE CHUMBI VALLEY ON WAY DOWN FROM NATHU LA



THE BAZAR AT PHARI



GAUTSA, 16 MILES FROM PHARI



THE MAIN STREET OF PHARI: CHUMALHARI IN DISTANCE

ON ROAD TO PHARI NEAR ANUNO: CHUMALHARI IN DISTANCE

which receives the drainage from the Natu Pass and the neighbouring hills (all about 14,000 to 16,000 feet). The way lay along the side of this deep gorge for about 2 miles, then zigzagged down to a small picturesque lake at the foot of the pass, at a place called on the maps Sherab or Sherabthang, a camping-place in Expedition days. From here a broad transverse stony valley runs along at the foot of the passes till it meets the road to the Jelep, 4 miles to the south-east. We keep up towards the Natu Pass, and soon reach a new signpost showing the way to Kapup (which is 2½ miles from the top of the Jelep Pass), and the way up the hill to the Natu. The better road, which existed in the expedition days, has been neglected, but a fair bridle-path exists which soon led us up to the milepost (G. 26 N.O.), which also for us marked the beginning of the deep snow. For a while the path was clear enough, till we reached a point from which we could see the cairn on the top of the pass. The road was now obliterated with snow, but two of us had been up twice before and knew that we could safely steer for the cairn at the top. From the pass could be seen part of the Chumbi Valley and Mount Chumalhari, beyond Phari in Tibet, and to the south the plains of Bengal and its winding rivers. On the Tibet side no road was visible till below the snowline several hundred feet down; but the snow was firm, and we stumbled, slid, and glissaded over it, now and then sinking up to our armpits when we got too near a rhododendron bush buried in snow. Our animals followed us laboriously, but an hour's time saw us on the clear track below the snow. The road descends rather rapidly, so soon we reached the pine forests, and 5 miles from the top of the pass we came to the picturesque Swiss chalet-like wooden bungalow of Champithang (about 13,000 feet alt.), an excellent rest-house with plenty of fuel for the fires. We were in Tibet and beyond the rain, fog, and mist of monsoon-drenched Sikkim.

Below us lay the Chumbi Valley and the River Amochu; to the south-east the huge snow-covered ridge which divided us from the neighbouring pass, the Jelep.

From Champithang to the Chumbi Valley the road runs downhill, at first in easy gradients. About a mile below the rest-house we had a grand view of the pyramidal peak of Chumalhari, and on looking back a fine view of the Natu Pass from the Tibet side. Further down we see in a deep valley on the right, the ruins of the houses and barracks which once were *old* Yatung. *Old* Yatung was the place where Sir Francis Young-husband's Mission, after crossing the Jelep, met with a feeble show of resistance. It is a very narrow part of a valley, quite unsuitable for a camp or place of residence. The old Chinese barracks still remain, roofless and ruined. The name Yatung is *now* given to "New Chumbi," the residence of the British Trade Agent situated 6 or 7 miles up the Chumbi Valley, in a fine open space to be described below. "Old Chumbi" is the name of a small village in the valley, on the Amochu and close by the *present* Yatung.

About 3 miles out we pass over a bad landslip, and a mile further on we reach a point with a magnificent view of the Chumbi Valley and of the bright green sparkling waters of the Amochu River, as it makes for the pass into Bhutan, which it traverses to become, in the Duars, the Torsa River, and join the Bramaputra in the plains of Bengal. This is the destined line of the locomotive should time ever lead to the necessity of another expedition into Tibet. Looking back from here we can see the two great passes, the Natu (over which we have come) and the Jelep by which we were to return, both snow covered (October 21). A few minutes later we catch sight of three *Chortens* on a ridge above the important monastery of Kajui (or Karjui). We are now well out of the forest, and leaving pines and junipers we descend over bare grassy hills to the Kajui Monastery, where we were hospitably entertained by the Lamas to the inevitable salted tea, and shown over the buildings. The Buddha statues were very good, as also were the pictures on the temple walls.

Very soon after leaving Phema (or Chema) and crossing a bridge we came to the remains of what was till recently a flourishing Chinese town called Pibitang. It is practically deserted and in ruins; all trace of China is gone, except for some Chinese characters still clinging to the walls and a few coloured drawings of fearful Chinese warriors in mail armour, with moustaches as fierce as their daggers!

Leaving this bit of old China, we rode along a level but rough stony road and passed through "Old Chumbi," a few houses, among which are the remains of what was once the palace of the Rajas of Sikkim. On passing old Chumbi the valley opens out, the road still keeping close to the Amochu River. We pass a tiny village known as Eusakha, and in a few minutes are in New Yatung, the headquarters of the British Trade Agent.

Most of modern Yatung lies on the east bank of the Amochu, which runs clear and glittering through the town. The valley here is wide, and there is ample room for the small bazar, the offices and residence of the Trade Agent, and for a row of barracks for his guard and escort. Supplies are available from a Commissariat overseer, who keeps them for the use of the few officials going on to Phari, and to our small garrison at Gyantse, where another British Trade Agent resides.

The altitude of (new) Yatung is 9780 feet above the sea-level. The minimum temperature in the end of October was only 42° Fahr., but it falls to 20° Fahr. in the winter. In the summer the climate is superior to anything in the Darjeeling Hills or in Sikkim. European vegetables of all kinds can be grown and many kinds of fruit (especially apples). There is a British Post and Telegraph Office, a dispensary, and even a long-distance telephone to Gyantse. Half a mile beyond Yatung the valley divides; one branch, the Kambo Valley, leads up to some hot springs, which are locally celebrated for their virtues, even by the never-washing Tibetans.

We keep up the main valley (to the right) following the Amochu River, past a small bridge leading to a little Gumpa or temple across the river. Soon the valley narrows; on the left are high precipitous rocks, 1000 feet above us, on top of which is another *Gumpa*, not unsuitably named Gab-Dzong (or the Vulture's Fort), and round the corner a place famous in the Expedition days, called Chortenkarpo (the white Chorten). The road and river wind through a narrow gap, "where half a hundred might well be stopped by three," and indeed a half-hearted attempt was made to stop Sir Francis Younghusband's party at this place. A wall with a gate used to run down to the river on both sides; now both are gone, only a few bits of the walls remain, with the remains of the Chinese barracks, on the right, where once a Chinese garrison guarded the pass. All is now in ruins; the stone houses stand; the woodwork has been removed, but on the walls of the chief house are still to be seen pictures of painted emperors and fierce armour-clad warriors.

Close by the big prosperous village of Galingka we passed a long string of mules and pack-ponies coming down with wool from Lhasa, and stopped to have a talk with a traveller (a well-known man and a "Khan Sahib") who was journeying from Lhasa back to Ladak, and found it easier to return *viâ* Chumbi, Darjeeling, India, and Kashmir than to face the long trek across Tibet to his home in far-off Ladak. Galingka is well situated and is a typical Tibetan village. Many of the houses are substantial, stone walled, and roofed with shingle, held in place by huge stones. The long flat Lingma plain (Lingmathang), described by all writers on the Expedition of 1903–4, was covered with thick long grass, and as we went up was absolutely deserted; on our return a few days later the whole was covered with black yak-hair tents (we counted 150), and hundreds of people were cutting the grass and carrying it away on mules and ponies; a busy harvest scene, which we did not expect in this austere land. At this point upper "Tromo" or *upper* Chumbi begins; Lammergayers (*Gypaetus barbatus*) flying aloft, like small aeroplanes, to use a very modern simile.

At the north end of this flat plain the valley is blocked by a huge rock, the "Ta Karpo" of the Expedition, a bare conical mass. The Amochu, recently so swift and smooth in the plain, becomes again a fierce torrent. We cross a bridge to the other bank (right) and go up a long rocky defile or canyon to the rest-house at Gautsa, "the plain of gladness," an open short valley where the river divides to flow round some jungle-covered small stony islands, some of which were even cultivated by the few inhabitants of this small village. Gautsa is an important halting-place for the wool-laden pack-mules, and on this day's march we happened to count the animals carrying wool down to the railway and mart near Kalimpong. They numbered as many as 360.

The road for Phari ascends at once after leaving the village and reaches another deep black canyon. It is so rough that only a mule or

a "Bhutia" pony could be ridden over it or carry a load. After some 3 miles we leave the canyon, the valley widens, the road runs on the right bank high above the river which roars in a deep gully below. We rapidly descend to a small flat plain (13,300 feet), called Dotag, an earlier formation on a smaller scale like the Lingma plain below. Across the plain is the "Frozen Waterfall" of the Expedition. It was not frozen when we passed it (October 25 and 29), but the bare hills all round were snow-covered. In the winter days of the Expedition this otherwise admirably flat camping-ground was known as the "coldest spot in Asia"!

Riding for some 3 miles through a widening valley we are at Kamparab and on the edge of the great plains of Tibet.

We have left Himalayan scenery behind, and the Chumbi valley. We soon caught sight of Phari with its dzong or fort, and were at first puzzled by the long rows of black lines around the walls of the fort. These on nearer view were found to be the black walls of the turf-sod houses which comprise the town of Phari, the highest (altitude 14,570 feet), the most dirty and the quaintest town in the world, higher by some hundred feet even than the villages in the higher Andes.

We arrived at an auspicious moment in the middle of a "harvest home." All round the dzong and the town were loose heaps of earless barley-straw; dozens of men, women and children were busy packing up huge bales of straw and carrying them to be stacked on the flat roofs of their turf-walled houses, these being the only places where the valuable fodder could be stored safe from the numerous mules, ponies and yaks which were grazing round the town. This earless barley is useless as a human food, but it is much needed as fodder for the mules and ponies which carry the wool from Lhasa to the Indian market. The people obtain their grain for food mainly from Bhutan over the neighbouring pass, the Tremo La. It was over this Bhutan Pass (Tremo La) that Warren Hastings' agents, Bogle and Turner, as well as the eccentric Manning, entered Tibet.

The Phari fort is a strong stone square building on a slight elevation above the town, which surrounds it more or less, and especially on the south. Manning, who arrived at Phari in the same week in October, 1811, as we did in 1917, described it in his disjointed diary in four words, "dirt, dirt, grease, and smoke," and it cannot be said that the passage of one hundred and six years has rendered this terse description any the less applicable. The fort is said to be of Chinese origin; it has been repaired since the Expedition of 1904, and the inside has been (to judge by the descriptions of 1904) considerably altered. The town is very quaint; the dirt of ages lies around, and snow persisted since the previous winter in many corners. The floors of the black sod-huts are generally below the level of the ground, and are entered by a couple of steps from the road. This may be due to their being warmer by being so made, though most travellers have attributed it to the raising of the

road outside by the accumulated filth of ages. There are generally no windows, the door and the smoke-exit in the roof sufficing for ventilation, but two or three of the more important houses had a window covered with China paper. In spite of all these sanitary defects (as we would call them) the people generally are healthy and sturdy. Goitre is very rare, and this in marked contrast (we were told) to its prevalence in the neighbouring Bhutan valley of Paro. Sore eyes were very common among the bright and intelligent children, but adults seem to have outgrown that trouble, which is, of course, produced by dirt and the irritating smoke of the yak-dung fires.

The views from Phari are splendid. The plain is surrounded by distant low hills, mostly snow-topped. The grand mountain of Chumalhari (23,960 ft.) on the north-east towers 9000 feet above the fort and town, like the Matterhorn above Zermatt, and is quite close (some 6 miles off). As we stand with our backs to Chumalhari, there lie before us the northern aspects of the great Dongkya Peak (as Hooker always calls the great hill known on the maps as Pawhunri) and part of Chomiomo. To the south through a gap in some lower hills we saw the snow-covered Bhutan Mountains (Masongchongdrong). Due north across the plain we see the small monastery, Chatsa, and beyond it the open smooth pass called the Tang La, 15,200 feet, on the way to Gyantse and Lhasa, near which was the first unexpected fight with the Tibetans in 1904. To this spot some of our party rode during our stay at Phari; it is about 9 miles off, and on reaching it the syces raised the well-known cry "*Ki ki so so Cha Gyal lo*" as they topped the pass. From here in the distance could be seen herds of the kyang or untamed wild ass of Tibet (*Equus hemionus*). One of these kyangs captured while young was purchased for £25 by one of our party, who is President of the Calcutta Zoo. The animal was safely brought to Calcutta, and after one year there through a Calcutta hot weather, is fat and flourishing, though its *habitat* is 14,000 feet and over. Having spent three days in this fascinating place we had to return, and in two days reached (new) Yatung again.

The road from old Yatung up to the Jelep rises 5000 feet, and is extremely bad. It is extraordinary that so bad a road can be used as the main trade route from Tibet to India. No wonder we were told of the short lives of the mules that have to carry heavy loads up it. We can only attribute this to the "forbidden land" policy, which still governs our dealings with Tibet, with Bhutan, and with Nepal. About halfway to the pass is a Tibetan rest-house, where we halted till our laden mules and servants got up. Just as we reached the cairn which marks the top of the pass and re-entered Sikkim we were met with a cold deluge of snow and sleet, which turned soon to rain and thoroughly drenched us before we reached the new but small uncomfortable two-roomed bungalow, 2½ miles from the Jelep, at Kapup (altitude 13,000 feet). All Sikkim bungalows have beds and accommodation for four travellers. It is strange

that this *new* bungalow should have only two small rooms and two beds, a very weak link in a chain of excellent rest-houses.

A mile or so past Gnatong begins the very steep rough causeway which runs down the side of Mount Lingtu to Sedongchen. In a few days we reached Rikyisum, a beautifully situated bungalow with a glorious view of the snows, 12 miles from Kalimpong, and here ended the best short holiday we have had in India.

POPULATION CHANGES IN THE EASTERN PART OF THE SOUTH WALES COALFIELD

A. E. Trueman, D.Sc., F.G.S., University College, Cardiff

THE eastern portion of the South Wales coalfield, including parts of Glamorganshire and Monmouthshire, has developed during the past century from an almost exclusively agricultural region into one of the busiest industrial regions in the country, the population of Glamorgan increasing from 70,879 in 1801 to 1,120,910 in 1911. This rapid development was at first due to the iron trade, and later to the expansion of the coal export trade. These were affected in a very striking manner by the facts of mineral distribution, but also by the relief and the facilities for communications. These factors have exercised a marked influence on the rate of development of the various parts of the area, causing remarkable difference in the population even in adjoining parishes, so that while the district dealt with is generally considered to be a densely populated industrial region, several agricultural areas of scanty population also occur. It will be convenient to consider first the leading geographical factors which have influenced the changes in population, the development of the district will then be best treated historically.

The district represented on the map (Fig. 1)* falls naturally into two divisions, the coalfield on the north (*Blaenau Morganwg*), and the area outside the coalfield on the south (*Bro Morganwg*). The coalfield consists of a plateau of Pennant Sandstone, reaching to an average height of 800 feet in the south and 1500 feet in the north, deeply trenched by the parallel valleys of the rivers Rhondda, Cynon, Taff, Rhymney, Sirhowy and Ebbw.† The southern rim of the coalfield is marked by several escarpments through which the rivers have cut steep-sided gorges, like those of the Taff at Tongwynlais, the Rhymney at Machen, and the Ebbw at Risca.‡ Before the development of the coal and iron trades, the

* This district is included in sheets 248, 249, 262 and 263 (1-inch) of the Ordnance Survey.

† A. Strahan, "On the Origin of the River-system of South Wales," *Q.J.G.S.*, vol. 58 (1902), p. 207.

‡ See F. Dixey and T. F. Sibly in *Q.J.G.S.*, vol. 73 (1918), plate 13.