

the north, brought about a great rising of the populations beyond the Yaxartes, who received aid from the Arabs. In a great battle fought in July 751, in the plains near Talas, Kao Hsien-chih was completely defeated by the Arabs and their local allies, and in the ensuing *débâcle* barely escaped with a small remnant of his troops.*

This disaster marked the end of all Chinese enterprise beyond the *Imaos*. In Eastern Turkestan Chinese domination succeeded in maintaining itself for some time amidst constant struggles until by A.D. 791 the last of its administrators and garrisons, completely cut off long before from contact with the Empire, finally succumbed to Tibetan invasion. Close on a thousand years were to pass after Kao Hsien-chih's downfall before Chinese control was established once again over the Tarim basin and north of the T'ien-shan under the great emperor Ch'ien-lung.

THE MOUNT EVEREST MAPS AND PHOTOGRAPHS

TWO maps are published with the present number of the *Journal* to illustrate the papers by Colonel Howard-Bury and Mr. Mallory, read at the joint meeting of the Society and the Alpine Club held at the Queen's Hall on December 20. Since both are preliminary and rather hastily made maps of hitherto unmapped country, it is necessary to explain, more fully than could be done on the face of the maps, the origin of each.

The survey party which, at the request of the Government of India, accompanied the expedition, consisted of Majors Morshead and Wheeler, two Indian plane-tablers, an Indian photographic assistant, and the necessary subordinates. Major Morshead and his plane-tablers mapped the whole country traversed by the expedition on the scale of 4 miles to 1 inch, with the exception of the area within about 10 miles of Mount Everest, which was reserved for photographic survey by Major Wheeler. A rapid triangulation was carried from the existing triangulation at Kampa Dzong (made by Col. Ryder on the Tibet Mission of 1903-04) as far west only as Tinki; from that place the plane-table sheets are based on intersected points determined by Col. Ryder. In the valleys to the extreme west of the area mapped, bad weather obscured all the summits and made plane-tiling impossible; the map in these districts depends on a rough time- and compass-traverse by Major Morshead.

Fair tracings of the plane-table sheets were kept up as far as possible during the progress of the work in the field, and were rapidly completed on the return to Darjeeling, so that within three weeks copies reproduced by the Vandyke process in six colours were available in Calcutta, and a

* Cf. Chavannes, 'Turcs occidentaux,' p. 142, note 2. M. Chavannes, p. 297, quotes the closely concordant account of these events from Muhammadan historical records.

large number have been received in England for the use of the 1922 expedition. The area reserved for photographic survey is marked by a red line, but within this line there is shown a great deal of detail which seems to have been sketched in by the plane-tables from without. A note states that this detail is shown only "with approximate accuracy." The photographs brought back by the expedition prove clearly, however, that this estimate is too high: the detail within the boundary should be neglected. In particular, the East Rongbuk glacier, which is the key to the position, is omitted; the main glacier is named the East Rongbuk glacier; and the name "West Rongbuk glacier" is in the wrong place.

The tracing of his first sketch-map from the photographic survey, which was covered by a letter received from Major Wheeler on December 12, was not itself received until December 28, having apparently missed a mail, and then gone all the way round by sea. For the meeting on December 20 it was necessary to produce some kind of map of the mountain area. Experiments made by Mr. Hinks showed that it was possible to measure approximately rounds of angles on the panoramas made by Colonel Howard-Bury with a 5-inch Panoram Kodak from a number of well-chosen stations east and north of the mountain. The positions of the stations could be re-sected from the few peaks whose places had been triangulated from the plains of India. When the stations were fixed, other points could be intersected, and a framework thus constructed. A careful repetition and extension of this process by Mr. Batchelor fixed the principal points east and north of the mountain. Mr. Frank Debenham, University Lecturer in Cartography at Cambridge, then kindly gave a few days' hard work to sketching the topography from the photographs; and Mr. Milne, from all this material, made the drawing which was shown on the screen at the meeting of December 20. The topography west of the mountain, for which there were no panoramas, was very doubtful.

When on December 28 Major Wheeler's preliminary map from the photographic survey came to hand, it was seen at once that it could not be reproduced as it stood, and that there was no time to do it justice by completely redrawing it for reproduction in this number of the *Journal*. It was therefore put aside for the moment, and Map II. now published has been completed by Mr. Milne from the drawing made for December 20, with further study of the photographs, helpful criticism and explanations by several members of the expedition, and the use of a compass sketch of the Rongbuk district produced by Mr. Bullock. Nothing has been taken from Major Wheeler's map, and no comparison with it has been made up to the present, in order that Map II. should be available as an eventual test of what may be done from the rapid study of panoramic photographs.

Meanwhile Map I. on the scale 1/750,000, has been reduced from Major Morshead's map, extended east of Tinki from existing Survey of India maps, and completed in the reserved area by a reduction from

Map II. There has been no time to prepare a hill-shaded or hachured plate from Major Morshead's map; but this will now be taken in hand by Mr. Batchelor, and a fully hill-shaded map should be ready for the book on the Expedition of 1921, which will be published by Mr. Edward Arnold in the spring.

Within the last few days we have received, by the courtesy of the Surveyor-General of India, typed copies of the reports made to him by his two officers, and we hope to give some account of these reports in a future number of the *Journal*. To have surveyed 12,000 square miles of new country on the 1/4 inch scale in a single season, and published a map in six colours three weeks after the return to civilization, is no mean achievement. To what, asks M. Rabot, in *L'Illustration*, is this excellent result due? To the admirable invention of a French officer: photographic survey! The claim is characteristic, but ill-founded. The late Colonel Laussedat certainly wrote books about photographic survey many years ago, but he never persuaded his own countrymen there was much in it. The Canadian methods employed by Major Wheeler were developed by Mr. Deville, the Surveyor-General of Canada. Whatever merit they have, when applied to Mount Everest, remains to be proved, and will not be known for several months yet; there are those who think that only stereographic survey can be of much effect in such wonderful country. In any case, the 12,000 square miles of survey to which M. Rabot referred owed nothing to any photographic method, French or otherwise. They were done with the plane-table, whose proper use was discovered by the Survey of India.

In discussing the photographs published in former numbers of the *Journal*, we were compelled to use the unsatisfactory method of assigning arbitrary letters for reference, or of using English descriptive names, as the North Peak. It is now time to make suggestions for a more convenient nomenclature.

Mount Everest must, as an exceptional case, retain the European name by which it has long been known to us, though we are now sure that the Tibetan name is Chomo Lungma: the mountain is so named in the passport for the expedition issued by the Prime Minister of the Dalai Lama. But successive Surveyor-Generals have resolved, in full agreement with this Society, that no more European names shall appear on Himalayan maps. Last year's expedition has discovered a certain number of Tibetan names, Chomo Lönzo for peak N 53 of the Survey—not for Makalu, which is not conspicuous from the camping-grounds in the Kama valley—Cho Uyo for Pk. 5/71L (26,867), and Gyachung Kang for Pk. 3/71L (25,990); but no names are discoverable for most of the features which figure prominently in the narrative. Our best course is then to take convenient descriptive names and turn them into Tibetan. Colonel Howard-Bury and Major Morshead had already agreed that Pk. 8/71L (23,800)

at the head of the Kharta valley should be called Khartaphu; that the isolated peak in the gap between Mount Everest and Makalu should be called Pethang peak, from the camping-ground of Pethang Ringmo opposite; and the windy pass at the head of the Kharta glacier Lhakpa La. After consultation with Colonel Howard-Bury and Mr. Mallory, Tibetan equivalents for other peaks were suggested and submitted for criticism to Sir Charles Bell on his recent return to England from Lhasa, with the following results:

The south peak of Mount Everest (28,100)	Lhotse.
The north peak	Changtse.
The north col	Chang La.
Pk. 6/71L	Khartichangri.
The group of mountains at the head of the Rongbuk valley lying like an island between the Rongbuk and West Rongbuk glaciers in front of the north-west ridge	Lingtren.
The small peak west of this in the West Rongbuk glacier, referred to as the Island peak	Lingtrennup.
The white snow-peak climbed by Mallory on August 7, at head of Kama valley	Kartse.
The peak with the long ridge climbed on July 5 near the head of the Rongbuk valley	Ri-ring.
The peak north of the Kama valley and south of the advanced base in the Kharta valley	Kamachangri.
The fine isolated rock peak west of Mount Everest and south of the West Rongbuk glacier	Pumori.
The Pethang peak	Pethangtse.

One considerable advantage of these names is that they will mean something to the Tibetan coolies, and will be convenient in giving instructions.

It is not proposed for the present to give special names to the various features of the mountain: we shall speak of the summit, the north-east shoulder, the north-eastern and northern arêtes which meet at the north-east shoulder, the summit ridge from the north-east shoulder to the summit, the north-western and western ridges enclosing the western cwm. The northern arête, which is the chosen route for the assault, is very obtuse, hardly more than a slight bend in the northern face, and for the time being it seems convenient to speak of the whole, nearly flat face between the north-eastern and north-western arêtes as the north face, although the northern arête divides it into two parts slightly inclined one to the other. The triangular face below the north-eastern arête will be called the north-east facet.

From the admirable collection of photographs brought home by the

expedition we have chosen for reproduction this month a series that illustrates pretty completely the topography of the mountain; they have, in fact, formed the principal material for the construction of Map II.

The Lingtren group (Plate 1) stand at the head of the Rongbuk valley in front of Mount Everest, but quite detached from it. Between this group and the end of the north-west ridge just appearing over the crest is a glacier pass reached by Mr. Bullock, connecting the south-western head of the Rongbuk glacier with a southern branch of the west Rongbuk, seen on the right in Plate 3.

The northern ridge (Plate 2) descends sharply to the eastern bank of the Rongbuk glacier, straight and nearly unbroken from the Changtse to the exit of the East Rongbuk glacier (Plate 9). But behind it lies the long unsuspected East Rongbuk glacier, the key to the whole problem, shown in Major Wheeler's photographs (Plates 10 and 11). This East Rongbuk glacier must have a larger basin than the main Rongbuk: many tributary glaciers descend to it from the high plateau eastward (Plate 11); it drains a large basin north of Changtse and east of the north ridge (Plate 10); and it has a broad head between the Lhakpa and the Chang La under the northern face of Mount Everest (Plates 18 and 21). Yet its glacier torrent, which runs for a mile or so under the lower end of the main Rongbuk glacier, was relatively small at the end of June, and did not in the least suggest an important glacier just out of sight round the corner.

The very interesting photograph No. 3 was taken from somewhere on the peak in the left foreground of No. 4, and is the only picture we have showing nearly the full extent of the north-west ridge, that here forms the watershed. The long narrow glacier in front of it is an affluent of the West Rongbuk: beyond it lies the deep and sombre western cwm, whose glacier drains into Nepal. Mr. Mallory reached the glacier pass looking into this cwm (beyond the end of the north-west ridge in Plate 4) and took the photograph No. 6, which shows the glacier after its exit from the cwm flowing away south into Nepal. The photograph from the same point looking up the dark western cwm at sunrise is hardly strong enough for reproduction.

The watershed crosses the pass and rises to the beautiful Pumori (the Daughter peak), whence it evidently runs along the range shown in Plate 5. But its further course is at present quite uncertain. Major Morshead in his report to the Surveyor-General makes it run through Gyachung Kang. This is difficult to reconcile with the panorama No. 10 of the December *Journal* and with other photographs more directly looking up the West Rongbuk glacier, which seems to lie south of Gyachung Kang and Cho Uyo. The glacier is described as coming from a pass leading into Nepal, but this does not help to determine the question. On discussing the matter with Mr. Bullock, it was agreed that there is nothing at present to exclude the possibility that the head of the

West Rongbuk is not far from the Khombu pass, in which case Gyachung Kang and Cho Uyo would seem to lie altogether in Tibet.

To return eastward, the approach to the Chang La from the eastern head of the Rongbuk glacier (Plate 7) looks steep and difficult: there is every reason to prefer the East Rongbuk route, which has, according to Major Wheeler, an easy medial moraine, perhaps as far as the glacier junction shown in Plate 11. The ridge to the left of Changtse in Plate 10 is the same as that seen on the right of Changtse in No. 14. The three photographs, Nos. 10, 11, 14, show between them the whole extent of the glacier, and no clear evidence of any serious icefall. The glacier seems steepest in the centre of No. 10, not far from its snout. Just above the snout, to the north, is a fine rock peak (Plate 9) which is almost certainly the "light rock peak flecked with snow" shown in Dr. Kellas' now famous photograph from the Kang La (see *Geog. Journ.*, April 1921).

The panoramas Nos. 13 to 16 were the foundation of Map II. Chomo Lönzo, Makalu, the point to the right of the big cirque south-east of Mount Everest, the summit, Khartaphu (No. 13), and Khartichangri (No. 15) were all fixed many years ago from the south. A few trials verified the identifications, and the camera stations were resected. They are shown in red on the map. Pethangtse, Changtse, Lhotse, and the unnamed peak beyond the camp on the Lhakpa La (No. 14) were then fixed by intersection, and the rest followed. It would have been easier if the panoramas had included the whole 360° instead of falling generally a little short, and this will be rectified in the next season. It would not have been difficult to determine approximate heights from these panoramas if one were certain that the camera was carefully levelled; but time has not allowed any experiments in this direction.

Plates 12 and 20 were taken from nearly the same point, just above the 20,000-foot camp on the stony terrace above the left bank of the Kharta glacier. The first is a tele-photograph, with all the curious want of perspective that is inherent in such pictures. If it were not for the cloud that has happily filled the cirque one would scarcely realize that the knife-edges, with their magnificent snow fluting, are far in front of the mountain. They are actually the rims of the great cirque at the head of the Kama valley (EL and EM of Plate 12, December *Journal*). The peak away to the right in Plate 20 is not Changtse, but the sharp peak beyond the camp in No. 14.

Plate 21 shows in profile the north arête which is seen much foreshortened in No. 19—a combination of two photographs taken with a V.P. Kodak looking right up the northern face, with the north arête to the left. It joins the north-east arête just above the pinnacles of the north-east shoulder, at about 28,000 feet. The slope from the Chang La to this shoulder is a little more than 30° ; from the shoulder to the summit a good deal less until near the end, which is steep. The arête is broad, with room to circumvent obstacles. It happily avoids the nasty-looking

horizontal band of steep rock on the north face ; and one could hardly expect to find a better way. But the gales of September 1921, whose effect is seen in plate 20, absolutely forbade any further progress beyond the end of the footprints seen in No. 19 in the left-hand corner.

On the way home to Kharta Colonel Howard-Bury, Mr. Wollaston, and Major Wheeler made a *détour* through the Kama valley, descending by the snow pass north of Kartse : the peak climbed by Mr. Mallory on August 7. Plate 8 shows that he was fortunate in approaching this peak from the east. Colonel Howard-Bury crossed the horribly ugly Kangshung glacier early one morning and climbed to a point on the snowy ridge immediately to the right of Makalu in No. 13, from which he took the most instructive panorama No. 20 and other excellent pictures of the inside of the Makalu and Chomo Lünzo group. Comparison with No. 3 of the December *Journal* will show how unexpectedly thin is the mass that looks so imposing from below the Langma La.

The panorama No. 17, showing the whole extent of the upper Kama valley from the south, was taken lower down on the way back to the camp at Pethang Ringmo, from which Mr. Wollaston obtained two photographs of Chomo Lönzo that are technically the finest of all the pictures taken this year. Enlargements from these plates were shown at the Alpine Club Hall exhibition, and are in the photograph room of the Society : it is not possible to do justice to them in the small page of the *Journal*.

In choosing the photographs here reproduced we have kept close to Mount Everest : the many beautiful pictures taken further afield and on the way back down the Chumbi valley have been set aside for the moment, with one exception. It is necessary to close this series with a mountain 35 miles west of Mount Everest, much inferior in height, much superior in beauty : Gaurisankar. Many years ago two Germans mistook it for Mount Everest ; and though the error was soon detected, and the Survey of India took special pains to dispose of it, the name Gaurisankar appears as alternative to Mount Everest in one of the best and most recent atlases, and is still frequently used in certain countries of Europe. There have even been applications from persons abroad to join the Gaurisankar Expedition !

REVIEWS

EUROPE

Catalogue des Guides-Routiers et des Itinéraires Français, 1552-1850.— Sir

H. George Fordham. Paris : 1920. Pp. 47. *Maps*.

Ditto : *Illustrations Supplémentaires*.— Cambridge. 1921.

The Earliest French Itineraries, 1552 and 1591.— The Same. Oxford University Press. 1921. *Facsimiles*.

THE catalogue of Road-books and Itineraries of France is a valuable addition to the author's publications in carto-bibliography. The period covered commences with the work of Estienne, 1552, and closes with the change in