

THE HIMALAYAN JOURNAL

RECORDS OF THE HIMALAYAN CLUB

EDITED BY
KENNETH MASON

CONTENTS

	Page.
I. ON ANCIENT TRACKS PAST THE PĀMĪRS. By Sir Aurel Stein	1
II. THE FIRST ASCENT OF KAMET. By Captain E. St. J. Birnie	27
III. AN EXPLORATION OF THE ARWA VALLEY, BRITISH GARHWAL. By Captain E. St. J. Birnie	35
IV. MY EXPEDITION IN THE EASTERN KARAKORAM, 1930. By Professor Giotto Dainelli	46
V. SKI-ING IN THE HIGH EASTERN HIMALAYA. By Ulrich Wieland	55
VI. BY SHONTHAR GALI TO RAMA, ASTOR. By Captain J. Barron	59
VII. THE SHYOK ICE-BARRIER IN 1931. By Captain C. E. C. Gregory	67
VIII. A FRONTIER TOUR. By Lieut.-Colonel J. R. C. Gannon	75
IX. HIGH ALTITUDE AND OXYGEN. By N. E. Odell	91
X. SUB-HIMALAYAN DIETETICS. By Dr. C. Strickland	96
XI. THE TSARAP VALLEY, EASTERN LAHUL. By Lieut.-Colonel C. H. Stockley	101
XII. PEAKS AND PASSES OF THE T'IENT'IAN SHAN. By Lieut.-Colonel R. C. F. Schomberg	112
XIII. THE FIGHT FOR KANGCHENJUNGA, 1931. By Paul Bauer	116
XIV. LHONAK, 1930. By G. B. Gourlay	123
XV. A JOURNEY IN UPPER KUMAUN AND GARHWAL. By Lieutenant Hugh Rose	135
XVI. EXPEDITIONS	141
XVII. IN MEMORIAM. General Sir Alexander Stanhope Cobbe, V.C. Lieut.-Colonel Henry Treise Morshead. Dr. Emil Trinkler	155
XVIII. NOTES	165
XIX. REVIEWS	185
XX. CORRESPONDENCE. The Word "Kangchenjunga"	198
XXI. PROCEEDINGS AND NOTICES	215
XXII. LIBRARY NOTICES	225

CALCUTTA

THACKER'S PRESS & DIRECTORIES, LTD.

6, Mangoe Lane

THE
HIMALAYAN
JOURNAL

RECORDS OF THE HIMALAYAN CLUB

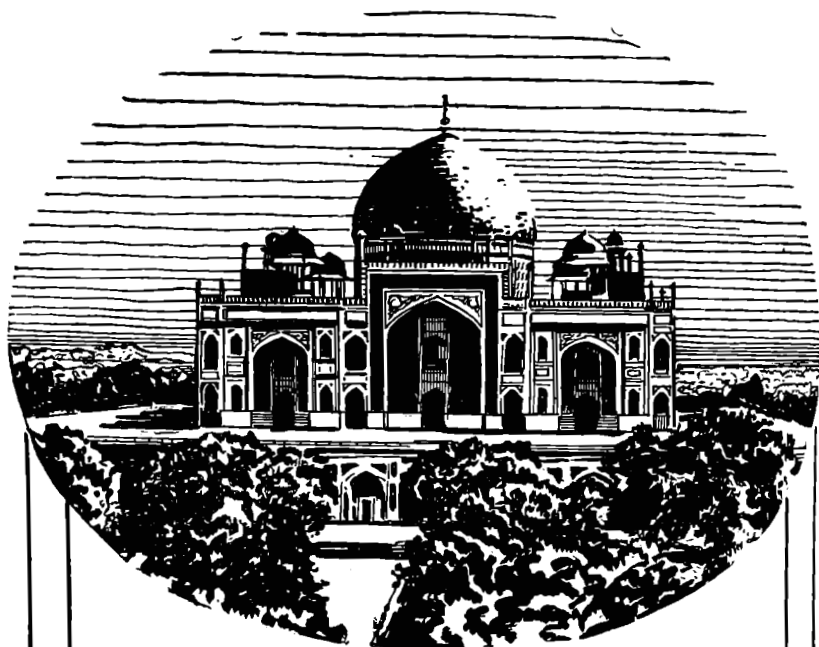
VOLUME IV, 1932

EDITED BY
KENNETH MASON

"To encourage and assist Himalayan travel and exploration, and to extend knowledge of the Himalaya and adjoining mountain ranges through science, art, literature and sport."



CALCUTTA
THACKER'S PRESS & DIRECTORIES, LTD.
6, Mangoe Lane



See India

The Land of Sunshine & Colour.

You can enjoy good sport on plain,
mountain or river.

Come and see

Her romantic cities and the teeming
millions of her peoples.

Private Railway coaches are avail-
able for those who wish to travel
in luxury.

Information from:

Manager, Indian Railways Publicity
Bureau, 57, Haymarket, London,
S.W.1.

Resident Manager, Indian Railways
Publicity Bureau, "Delhi House,"
38E, 57th Street, New York.

Chief Publicity Officer, Central Publi-
city Bureau, 26, Alipore Road, Delhi.

CONTENTS

	PAGE
ON ANCIENT TRACKS PAST THE PAMIRS. Sir Aurel Stein	1
THE FIRST ASCENT OF KAMET. Captain E. St. J. Birnie	27
AN EXPLORATION OF THE ARWA VALLEY, BRITISH GARHWAL. Captain E. St. J. Birnie	35
MY EXPEDITION IN THE EASTERN KARAKORAM, 1930. Professor Giotto Dainelli	46
SKIING IN THE HIGH EASTERN HIMALAYA. Ulrich Wieland	55
BY SHONTHAR GALI TO RAMA, ASTOR. Captain J. Barron	59
THE SHYOK ICE-BARRIER IN 1931. Captain C. E. C. Gregory	67
A FRONTIER TOUR. Lieut.-Colonel J. R. C. Gannon	75
HIGH ALTITUDE AND OXYGEN. N. E. Odell	91
SUB-HIMALAYAN DIETETICS. Dr. C. Strickland	96
THE TSARAP VALLEY, EASTERN LAHUL. Lieut.-Colonel C. H. Stockley ..	101
PEAKS AND PASSES OF THE T'YEN SHAN. Lieut.-Colonel R. C. F. Schomberg	112
THE FIGHT FOR KANGCHENJUNGA, 1931. Paul Bauer	116
LEONAK, 1930. G. B. Gourlay	123
A JOURNEY IN UPPER KUMAUN AND GARHWAL. Lieutenant Hugh Rose ..	135
EXPEDITIONS.—Sir Aurel Stein's Fourth Expedition to Central Asia, 1930-31. Kingdon Ward's Irrawaddy Expedition, 1930-31. Lieut.- Colonel R. C. F. Schomberg's Journey in Chinese Turkistan, 1930-31. Lieut. Oliver's Climbs in the Baspa Valley, 1931. Mr. G. B. Gourlay's Journey in Sikkim, 1931. Mr. L. R. Fawcus' Journey in Sikkim, 1931. Mr. F. Ludlow's Natural History Tour in Kashmir, 1931. The Haardt "Mission à travers l'Asie, 1931-32"	141
IN MEMORIAM.—General Sir Alexander Stanhope Cobbe, v.o. Lieut.- Colonel Henry Treise Morshead. Dr. Emil Trinkler	155
NOTES.—The Ephedra, the Hum Plant and the Soma. Colonel H. H. Godwin Austen, F.R.S. Seventeenth-Century Jesuit Missionaries in the Himalaya. Mount Everest and its "Native" Names. Surveys in Chitral and Gilgit. Mountain-Building. The Karumbar Glacier. The Kailas Range. Wapitis on the Flank of Nanga Parbat	165
REVIEWS.—Across Asia's Snows and Deserts (W. J. Morden). High Tartary (Owen Lattimore). Mount Everest and its Tibetan Names (Colonel Sir Sidney Burrard). Im Land der Stürme (Emil Trinkler). The Stormswept Roof of Asia (Emil Trinkler). Things Seen in Kashmir (Dr. E. F. Neve)	185
CORRESPONDENCE.—The Origin of "Kangchenjunga" (Johan van Manen, Rai Bahadur Lobzang Chhoden, Lieut.-Colonel F. M. Bailey)	198
CLUB PROCEEDINGS.—Annual General Meeting	215
CLUB NOTICES.—Appointments. The Himalayan Journal, Vol. V, 1933. Presentation of Books to the Library. Climbing Equipment	221
LIBRARY NOTICES.—Books added to the Library	225

—

Capt. Birnie's photographs are copyright by Messrs. Baird & Tatlock, London. The photograph of Lieut.-Colonel Morshead has been reproduced by Spottiswoode, Ballantyne & Co., London. All maps and all other illustrations have been reproduced at the Survey of India Offices, Wood Street, Calcutta.

THE HIMALAYAN CLUB

President.

HIS EXCELLENCY SIR MALCOLM HAILEY.

Vice-Presidents.

DR. L. L. FERMOR.

LIEUT.-GENERAL SIR KENNETH WIGRAM.

Honorary Secretary : MAJOR-GENERAL W. L. O. TWISS.

Honorary Local Secretaries.

Kashmir .. DR. ERNEST NEVE.
Chamba .. DR. J. HUTCHISON.
Kumaun .. CAPTAIN C. J. MORRIS.
Darjeeling .. LIEUT.-COLONEL H. W. TOBIN.
Calcutta .. MR. L. R. FAWCUS.

Honorary Editor : MAJOR KENNETH MASON.

Honorary Treasurer : COLONEL H. L. HAUGHTON.

Honorary Librarian : CAPTAIN F. R. GIFFORD.

Committee.

SIR EVELYN HOWELL. CAPTAIN C. J. MORRIS.
MR. W. ALLSUP. BRIGADIER R. H. THOMAS.
MR. H. W. EMERSON. MR. G. B. GOURLAY.
THE RAJA OF JUBBAL. LIEUT.-COLONEL J. L. R. WEIR.
MR. J. G. ACHESON LIEUT.-COLONEL G. D. OGILVIE.

Additional Members of the Balloting Committee.

COLONEL R. H. PHILLIMORE. MR. H. NEWMAN.
MAJOR H. R. C. MEADE. MR. C. R. COOKE.
MAJOR SIR S. HISSAM-UD-DIN. MAJOR D. G. M. SHEWEN.
CAPTAIN J. W. RUNDALL. MR. F. BLOMFIELD.
MR. J. S. HANNAH. LIEUT.-COLONEL C. F. STOEHR.

Auditors : MESSRS. A. F. FERGUSON AND COMPANY.

Bankers : THE IMPERIAL BANK OF INDIA, SIMLA.



Photos, Royal Air Force; Crown Copy right.

A WAPITI OVER THE FLANK OF NANGA PARBAT, 26,620 FEET.

THE HIMALAYAN JOURNAL

APRIL, 1932

(Vol. IV)

ON ANCIENT TRACKS PAST THE PĀMĪRS

SIR AUREL STEIN

THE KINDLY invitation which my valued friend, the Editor of *The Himalayan Journal*, recently addressed to me has come at a time when response is made difficult by manifold tasks claiming my attention in the short interval between travel in my old Central Asian field and a fresh journey on very different ground. Since I cannot spare time for something more original and more directly related to the Himalayan Club's sphere of interests I propose to offer here a brief survey, a bird's-eye view as it were, of ancient mountain routes beyond the Hindukush. I became acquainted with different sections of them on successive Central-Asian expeditions and hence could discuss them only partially in separate publications long out of print and now difficult of access.

Note.—Oriental names and terms, other than Chinese, have been spelt in accordance with the system of phonetic transliteration approved by the International Congress of Orientalists, as was done in the case of the local names in my *Maps of Chinese Turkestan and Kansu*, published by the Survey of India, 1923. No use, however, has been made of diacritical marks apart from length marks. Thus the transliteration agrees in essentials with the Hunterian system adopted for official use in India. In the transcription of Chinese names the Wade system has been followed.

The sketch-map has been drawn by the Honorary Editor. For convenience, all Sir Aurel Stein's footnotes and references have been collected together at the end of his paper.

It is true that none of these routes fall in a strict geographical sense within the Himalayan region. Nevertheless some special interest connected with the latter may be claimed for them; for they skirt or traverse that great 'Roof of the World', the Pāmīrs, which forms the northern buttress of the Hindukush range. They also aptly illustrate the important bearing which conditions created by history have had at all times upon the use of the mountain routes across that natural rampart of the Hindukush which protects India on the north-west.

If we look at the map it might well seem as if the mighty elevation of the Pāmīrs, with the high, rugged, meridional range forming its eastern rim, and with the vast drainageless basin of the Tārīm beyond it, had been intended by nature far more to serve as a barrier between the lands where flourished the great civilizations of ancient Asia, than to facilitate intercourse between them. Yet historical records which have come down to us both in the East and West show that through this remote belt of innermost Asia there led routes which for many centuries formed important channels for trade, travel and political enterprise between China on the one side and Iran and the Hellenized portion of Western Asia on the other.

I need not attempt here to describe the physical features of the Pāmīrs, those high plateau-like valleys drained mainly by the headwaters of the Oxus. The geographical aspects of those bleak uplands lying at elevations from about 11,000 to 14,000 feet and of the barren ranges dividing them have been analysed with masterly clearness by Lord Curzon⁽¹⁾. Before him Professor W. Geiger, that Nestor of Iranian studies, had furnished a very useful synopsis of the detailed information on the Pāmīrs as recorded by Russian explorers to whom most of the early geographical investigations are due⁽²⁾.

Nor is there any need here to give a systematic account of the great meridional range which divides them from the Tārīm basin. It joins the T'ien-shan, the 'Celestial Mountains' of the Chinese, on the north, to the snowy Hindukush on the south and was known already to classical geographers by the name of *Imaus*⁽³⁾. The imposing line of its great elevations, culminating in the ice-girt dome of Muz-tāgh-atā (24,385 feet) and in the still higher Kungur peaks rising to over 25,000 feet, has received due attention in the accounts of travellers, mainly British, who entered the Tārīm basin from India, ever since Sir Douglas Forsyth's Yārkand Mission. To the several routes leading across it I shall have occasion to refer further on.

The ancient lines of communication with which we are concerned, lead past or traverse the Pāmīrs in the direction from east to west. The trade and traffic which follows them nowadays is small and in parts may be called insignificant. But in ancient times they derived much importance from the fact that they formed the shortest connexion between the basins of the Tārīm and Oxus, both regions which then served as the natural 'corridors' for intercourse between China and Western Asia.

In my paper *Innermost Asia: its Geography as a factor in History* (4) I have fully explained the reasons which obliged the Chinese Empire, when, under the great Han Emperor Wu-ti in the last quarter of the second century B.C., it sought direct trade access to the civilized countries of the West, to secure it 'through-control' of the Tārīm basin. Situated between the high mountain ranges of the T'ien-shan in the north and the K'un-lun and Kara-koran: in the south, this great basin offered distinct advantages for the 'peaceful penetration' aimed at. The great mountain ramparts protected it from the dangers of nomadic migrations and invasions. The strings of oases fringing the huge central desert of the Taklamakān in the north and south would permit caravan traffic to pass over ground where it was comparatively easy to protect it. To the south of the basin the utter barrenness of the high Tibetan plateaux makes such traffic physically impossible. In the north beyond the T'ien-shan all routes from the side of China were exposed to attack by great nomadic tribes, like those of the Huns, Turks and Mongols.

In the west the Oxus basin with its great fertile territories of ancient Bactria and Sogdiana has always provided emporia for trade exchange. Bukhāra and Samarkand have retained this character down to modern times, and so did Balkh, the ancient capital of Bactria, until Chingiz Khān's Mongol invasion brought there devastation from which the land, the present Afghān Turkistān, has never fully recovered. Bactria lay nearest both to India and Persia and through the latter led the ancient trade-routes both to the Mediterranean and the Persian Gulf. These brief remarks will suffice to explain why the ancient routes to be described here had their main western terminus on Bactrian ground to the south of the middle Oxus.

It was chiefly the trade in silk which made direct access to the Oxus basin so important for China. Before and for centuries after the beginning of the Christian era, the production of silk was a jealously-guarded monopoly of China and its profitable export to

the 'Western Regions' was a great factor in the economic policy of the Empire. It is to this silk trade that we owe the early classical notice of the route followed by the caravans which proceeded from the Oxus to the land of the 'silk-weaving Seres', or China. It is to the northern of the two main routes with which we are concerned that the notice refers which Ptolemy, the geographer, has fortunately preserved for us from the account of a Macedonian trader whose agents had actually travelled along it. It led from Bactria, the present Balkh, past the northern rim of the Pāmīrs along the Alai valley, and thence down to Kashgar.

But before tracing its line it will be convenient to deal first with the other great natural thoroughfare which in the south leads up to the main headwaters of the Oxus. For this route lies close to the Hindukush and the passes by which valleys on the Indian side can be gained. Another reason is that our records about the early use of this route are more ample. In this case, too, we may start from the west and thus keep company with those early travellers who have left us the fullest account of this southern route.

Only the briefest reference need be made here to the ground over which the valley of the uppermost Oxus separating the Hindukush from the Pāmīrs is approached. A look at the map will suffice to show that the easiest and most direct approach to it from the side of Balkh and the rest of Afghān Turkistān must always have led through the fertile main portion of Badakhshān, formed by the valley of the Kokcha, or Vardoj river. Badakhshān, a territory favoured by its climate and provided with plenty of arable ground in its valleys and rich grazing-grounds on its mountains, formed part of ancient Bactria which, after its conquest in the first century B.C. by the Tokhari, a branch of the Indo-Scythians or Great Yüeh-chi, was known as Tokharistān down to the early Middle Ages.

It is under the Chinese transliteration of the name *Tu-huo-lo* that Hsüan-tsang, the great Chinese Buddhist pilgrim, mentions the several petty chiefships, including Badakhshān, through which he passed on his way back from India in A.D. 642 towards the Tārim basin and China. The description which Hsüan-tsang gives in his famous 'Memoirs of the Western Countries' ⁽⁵⁾ of the territory next entered to the east leaves no doubt about its being identical with the present Wakhān. This comprises the valley of the Āb-i-Panja, or uppermost Oxus, right up from the river's sharp northward bend to its sources on the Afghān Pāmīrs. Hsüan-tsang makes no exact reference to the route by which he entered the territory. But

considering the configuration of the ground this could be no other than the one still regularly used which leads from Zebak in the uppermost Vardoj valley across an easy saddle into the village tract of Ishkāsh̄m close to the bend of the Oxus.

More than a century before Hsüan-tsang's passage the route through Wakhān had been followed in A.D. 519 by two other Chinese pilgrims, Sung Yün and Hui-shêng, on their way from China with an Imperial mission to the Hephthalite or White Hun ruler of Kābul, and the north-west of India. Their narrative shows that, after reaching the uppermost Vardoj valley above Zebak, they made their way across the Hindukush, probably by the Mandal pass into the Bāshgol valley of Kāfiristān, and thence down to Swāt and the Peshawar valley⁽⁶⁾. It is similarly from the head of the Vardoj valley that Chitrāl is reached across the Dōrāh pass. This route provides the most direct and easiest approach to Indian territory from the side of Badakhshān and the Russian territories on the right bank of the Oxus.

Sung Yün and Hui-shêng's narratives agree in quite correctly describing Wakhān, or *Po-ho* as they transcribe its name, as a country "extremely cold; caves are dug out for quarters. As winds and snow are intense men and beasts huddle together. On the southern border of this kingdom there are great snowy mountains [i.e., the Hindukush]; the snow melts on them in the morning and freezes again at night. From afar they look like peaks of Jade". How closely this description corresponds to characteristic features still observed in Wakhān is shown by the accounts of modern travellers⁽⁷⁾.

The importance of Wakhān for traffic towards the Tārīm basin lies in the fact that it provides a line of communication unbroken by any serious natural obstacle for a distance of close on 200 miles right up to the watershed towards the drainage area of the Tārīm. Though the valley of the Oxus is narrow at its bottom it is singularly free from defiles except at the upper end of the sub-division of Ishkāsh̄m in the west and again above Sarhad, at present its highest village eastwards. Those two defiles, too, are short and practicable at all seasons for laden animals. Limited as the agricultural resources must always have been, yet the food supplies of Wakhān, supplemented by the flocks for which the side valleys afford ample grazing, are likely to have been always sufficient to meet the needs of traders and travellers following the route along the valley.

Permanent habitations are to be found on it now up to Sarhad and in earlier times existed also for two marches further up, as far as

Langar⁽⁹⁾. Thus shelter was assured all along for those using the route, an important consideration in view of the elevation at which the inhabited portion of the valley lies (from about 8000 feet at Ishkāshm to 10,500 feet at Sarhad) and the rigours of the climate during the greater part of the year. For the conditions of life and cultivation in Wakhān I must refer to the modern accounts already quoted⁽⁹⁾. The present population of Wakhān, divided since the Anglo-Russian Boundary Commission of 1895 into a Russian portion on the right and an Afghān portion on the left bank of the Āb-i-Panja, can scarcely much exceed a total of about 5000 souls. But that it must have been considerably greater in pre-Muhammadan times is proved by the number and extent of the ancient strongholds I was able to survey on my passage down the main portion of the valley in 1915⁽¹⁰⁾.

Hsüan-tsang's description of Wakhān which the Imperial Annals of the T'ang dynasty reproduce with some additions about its history⁽¹¹⁾, brings out clearly the great length of the territory in contrast to the narrowness of the habitable ground. It mentions wheat and pulse as the main crops ; the hardiness of the local ponies ; the icy winds. The dependence of the territory on the Tikhāra country, i.e., Badakhshān, which has continued to modern times, is duly referred to. Of the people we are told that they were " of a violent and coarse disposition ". The pilgrim's observation : " for the most part they have greenish-blue eyes and thereby differ from other people " is completely borne out by the physical character of the present Wakhīs. They have preserved the *Homo Alpinus* type of the Galchas or ' hillmen ' of the Oxus region in remarkable purity, and blue or light-grey eyes and fair hair are very common among them⁽¹²⁾.

Hsüan-tsang mentions ten Buddhist convents, each with a small number of monks, and refers to the capital of the territory by a name (Hun-t'o-to). This clearly places it at the present Khandut, situated on the left bank of the river and with its 50-60 homesteads the largest village of Wakhān. It is the track leading along the left bank which travellers on their way through Wakhān are likely to have ordinarily followed ; for by keeping to it, those coming from or proceeding to the Pāmīrs could avoid crossing the Āb-i-Panja at any point lower than Langar-kisht whence, after its junction with the stream from the Great Pāmīr, its bed becomes more confined and deeper.

After Hsüan-tsang's journey more than six centuries pass before we meet again with a traveller's account of Wakhān. We owe it

to Marco Polo, the greatest of medieval travellers, who about 1272-3 followed this route on his way to the Pāmīrs and thence to Khotan and China. "In leaving Badashan", so the great Venetian's immortal narrative tells us, "you ride twelve days between east and north-east, ascending a river that runs through land belonging to a brother of the Prince of Badashan, and containing a good many towns and villages and scattered habitations. The people are Muhammadans and valiant in war. At the end of those twelve days you come to a province of no great size, extending, indeed, no more than three days' journey in any direction, and this is called *Vokhan*. The people worship Mahomet, and they have a peculiar language. They are gallant soldiers, and they have a chief called *None*, which is as much as to say *Count*, and they are liegemen of the Prince of Badashan" (13).

It has been long ago recognized by Sir Henry Yule that "the river along which Marco travels from Badakhshān is no doubt the upper stream of the Oxus, known locally as the Panja. . . It is true that the river is reached from Badakhshān proper by ascending another river (the Vardoj) and crossing the Pass of Ishkashm, but in the brief style of our narrative we must expect such condensation". For the twelve days' journey which the Venetian records between Badakhshān and 'Vokhan' it is easy to account, I believe, by assuming that here, as in similar cases, the distance from capital to capital is meant; for the distance from Bahārak, the old Badakhshān capital on the Vardoj, to Kala Panja, the seat of the old chiefs of Wakhān and nowadays of the administration on the Afghān side of the river, is still reckoned at twelve marches. Marco Polo was right, too, in his reference to the peculiar language of Wakhān; for while Persian is spoken in Badakhshān, the Wakhī, spoken by the people of Wakhān, is a distinct language belonging to the Galcha branch of Eastern Iranian. The small size ascribed to the province of 'Vokhan', "extending no more than three days' journey in any direction", is still more readily understood if the portion of the valley about Ishkashm together with Zebak formed then, as it had done down to recent times, a separate small chiefship. It may in Marco Polo's time have been ruled over by a 'brother of the Prince of Badashan' (14).

Before following Hsüan-tsang and Marco Polo further to the Great Pāmīr across which their journey led it will be convenient to trace the route to the source of the Oxus and thence across the Wakhjīr pass down the Tāghdum-bāsh Pāmīr to Sarikol. We have no old traveller's account describing this route, but it offers distinct

advantages for caravan traffic and is regularly followed nowadays by traders proceeding from Chinese Turkistān to Chitrāl, or to Badakhshān. From Sarhad upwards I got to know it in 1906 on my second expedition and beyond the Wakhjīr pass I have become familiar with it on no less than four journeys. The Tāghdum-bāsh Pāmīr forms now the only approach by which travellers from India crossing the Hindukush can gain the Tārīm basin without touching either Afghān or Russian ground. In the same way the Tāghdum-bāsh together with the Afghān portion of the Āb-i-Panja valley has served, ever since the Pāmīr Boundary Commission's work in 1895, as a buffer between the territories of British India and Russia.

From Langar-kisht where a Russian post guards the junction of the Āb-i-Panja with that of the Great Pāmīr branch of the river, two easy marches past a succession of small settlements bring the traveller to the group of hamlets collectively known as Sarhad on the right bank of the river. Together with detached holdings on the opposite side they form at present the highest place of permanent occupation on the Āb-i-Panja. Sarhad is a point of some strategic importance, for opposite to it there debouches the open valley which leads at a distance of only some eight miles up to the broad saddle known as the Dasht-i-Barōghil. Lying at an elevation of only about 12,500 feet this easy saddle, which could readily be made practicable for wheeled vehicles, forms the lowest depression on the whole Hindukush range as far west as the passes north of Kābul. From the head of the Yārkhun, or Mastūj river, on the south side of the Barōghil, routes lead down the river to Chitrāl or directly southwards across the glacier pass of the Darkōt into the valley of Yāsīn and thus through Gilgit to the Indus.

The importance of this low crossing of the Hindukush was illustrated by an interesting historical event. In *Serindia* and in a separate paper⁽¹⁶⁾ I have had occasion fully to discuss the remarkable expedition by which Kao Hsien-chih, 'Deputy Protector of the Four Garrisons', commanding the Chinese troops in the Tārīm basin, in A.D. 747 led a force of 10,000 men from Kashgar across the Pāmīrs to the Oxus. The object was to oust the Tibetans who had joined hands there with the Arabs in Tokhāristān and in alliance with them were threatening the Chinese hold on the Tārīm basin. There is no need to set forth here the details of the great exploit by which the Chinese general, in the face of formidable physical obstacles, brought his troops across the inhospitable Pāmīrs and then, after signally defeating

the Tibetans where they barred his approach from the Āb-i-Panja to the Barōghil, led a portion of his victorious force across the glacier pass of the Darkōt (c. 15,400 feet above sea-level) down into Yāsīn and Gilgit. It was an achievement fully equal to, if not greater than, the great alpine feats of commanders famous in European history. Here it will suffice to mention only the points directly bearing on the topography of the routes with which we are concerned.

The biography of Kao Hsien-chih, contained in the dynastic Annals of the T'ang and translated by that great Sinologue M. Chavannes⁽¹⁶⁾, shows that before concentrating his troops in a place corresponding to Sarhad he had moved them in three columns from 'the military post of the Ts'ung-ling mountains', established at the present Tāsh-kurhān in Sarīkol. The main force was led by himself across the Pāmīrs to 'the kingdom of the five Shih-ni', i.e., the present Shughnān on the Oxus below Wakhān. To the route probably followed I shall refer further on. Thence it was moved up the main Oxus valley to meet at Sarhad a column operating from the opposite direction down the headwaters of the Āb-i-Panja. A third column which joined them from the north must be supposed to have descended from the side of the Great Pāmīr. On my visit to this, I obtained information about a track as yet unexplored which leads up the Shōr-jilga on the Afghān side and crosses thence the Nicholas range to Sarhad. It is clear that by bringing up his forces on convergent but wholly distinct lines and by obtaining a fresh base for his own column in Shughnān Kao Hsien-chih guarded against those difficulties of transport and supplies which would, then as now, make it physically impossible to move so large a body of men across the Pāmīrs.

The concentration having been effected on the appointed day Kao Hsien-chih led selected troops across the river. Though the month was August and the river in flood, the passage was effected without much difficulty. This is fully explained by the early hour of the morning at which, we are told, the crossing took place. Then the river's volume is reduced by the night's frost on the glaciers and snow-beds at the head of the Āb-i-Panja. It must be noted also that opposite to Sarhad the river spreads out its waters over a wide valley-bottom. On my visit to Sarhad in May, 1906, I ascertained that fording is always practicable provided the passage is made in the early morning.

The Tibetans were awaiting the attack at a point about three miles from the river where the valley contracts above the scattered

homesteads of Pitkhar. Their position which was defended with palisades was turned by Kao Hsien-chih who led his men up a precipitous rocky ridge on its western flank. This resulted in a complete defeat of the Tibetans who fled at night with a loss of 5000 killed, a thousand prisoners and "warlike stores and arms beyond counting". Pushing on at once after this victory, Kao Hsien-chih three days later gained the height of the Darkōt pass unopposed. Of the stratagem by which he succeeded in inducing his Chinese 'braves' to make the steep descent thence into Yāsīn an account has been given elsewhere.

Between Sarhad and the stage of Langar the valley contracts into a succession of defiles difficult for laden animals in the spring, when the winter route along the river bed is closed by the flood water, while impracticable soft snow still covers the high summer-track. All the same the route is never entirely closed here. Before reaching Langar I noticed marks of former cultivation in several places of the right bank, a point of some importance as proving that even here at an elevation of close on 12,000 feet travellers could at one time expect to find shelter. The remaining journey to the foot of the Wakhjir pass could readily be done in two marches leading over alluvial plateaux or along the wide river-bank, all easy ground used by Kirghiz camps for grazing.

At Bozai-gumbaz where we found a number of Kirghiz in their felt huts the route across the wide Little Pāmīr joins in. From here I visited Lake Chakmaktin near which lies, at a height of a little over 13,000 feet, the almost imperceptible watershed between the Āb-i-Panja and the Ak-su or Murghāb, the other chief feeder of the Oxus. For nearly fifty miles the view extended unbroken over this perfectly open elevated valley to where the eye rested in the distance on the range, at the time still snow-covered, which overlooks the Tagharma plain of Sarikol.

It is across the Little Pāmīr that Tāsh-kurghān can be gained by a route leading over the Naiza-tāsh pass, about 14,900 feet high. This is described as practicable at all seasons. But the distance to be covered on ground at a great elevation and without habitations is longer than on the route across the Wakhjir and down the Tāghdumbāsh Pāmīr. Since Russian territory has to be crossed between the Little Pāmīr and the Naiza-tāsh pass this route is now no longer followed by traders. Other passes further north are more convenient for smugglers carrying opium from the Badakhshān side.

The track to the Wakhjīr pass branches off to the north-east from where the stream fed by a series of large glaciers to the south-east debouches into the head of the open valley. Higher up at an elevation of about 14,700 feet this stream forms the true source of the Oxus, as first clearly recognized by Lord Curzon. The ascent to the pass is not steep, as may be seen in the photographs taken by me^(16a), and the descent on the Tāghdum-bāsh side, which I examined on the 2nd July 1900, is still easier.

But while on that occasion the whole of the pass was clear of snow, it was only after great exertions on the 27th May 1906, that the watershed at an elevation of about 16,200 could be gained by us. The difficulty of getting our baggage across, first on yaks and then by load-carrying Wakhīs⁽¹⁷⁾, was due solely to the soft condition of the snow. There had been an exceptionally heavy snow-fall all over the Pāmīrs that winter. As long as the snow remains hard the pass can be crossed with laden ponies, even in the spring, and it is certainly open to such traffic all through the rest of the year. Judging from what I saw of it in 1900 it would be practicable, too, for Kirghiz camels accustomed to the mountains.

Once across the Wakhjīr the journey down the Tāghdum-bāsh Pāmīr is easy and can well be covered in five marches⁽¹⁸⁾. Much of the first three of them lies past large ancient moraines which show the extent of the huge ice-stream which in a former glacial period descended the wide valley. At Kōk-tōrōk there joins in from the south the route which leads across the main Muz-tāgh range from the side of Hunza by the Kilik pass (*circ.* 15,800 feet). On the north the Tāghdum-bāsh Pāmīr can be gained by the Kōk-tōrōk pass from the side of the Little Pāmīr. Some 23 miles lower down there debouches the valley leading up to the Ming-taka pass which offers an alternative route towards Hunza and is regularly used for the British Consular Dak from Kāshgar to India. At Payik where there is a small Chinese Customs post, a well-known route is passed leading across to the Ak-su or Murghāb on the Russian side.

Some seven miles further down, the valley makes a marked turn to the north and there near Koshun-kōr, at an elevation of about 12,600 feet, cultivation has been carried on until recent years by Wakhī settlers. The point deserves to be noted; for, together with what I have recorded above about former cultivation near Langar, it shows that for travellers from Sarikol to Wakhān following the Wakhjīr route the distance where neither permanent habitations nor local supplies could be found was reduced about five or six

marches. It was an important consideration in favour of this old route, now again coming steadily into increased use by traders from the Yārkaṅd side.

Only about three miles further down, there rise the ruins of an ancient stronghold, known as Kiz-kurghān, 'the Maiden's fort', on the top of a high and very steep rocky spur above the river's left bank. I have shown its identity with the place of which Hsüan-tsang relates a curious local legend how a Chinese princess on her way to be wedded to the king of Persia was detained there while the roads were blocked through war. Visited there by the sun god she became enceinte and from her the royal family of Sarikol claimed descent⁽¹⁹⁾.

Six miles down the valley we reach the fairly large village of Dafdār with fields of wheat and barley extending for some miles down the right bank. Scattered patches of cultivation are to be met also on the two short marches leading down to Tāsh-kurghān, the chief place of Sarikol. That the once tilled area on this side of the valley must have been far more extensive in olden times is conclusively proved by the remains of an ancient canal, known as 'Farhād's canal', still clearly traceable from above Dafdār for a distance of over forty miles. It is also certain that the population of Sarikol was greatly reduced in modern times in consequence of frequent raids of those plucky hillmen of Hunza whose depredations only ceased after the Pax Britannica was extended to Hunza in 1891.

There can be no doubt that Tāsh-kurghān marks the position of the ancient capital of Sarikol. With its rubble-built homesteads it clusters round a small plateau above the left bank of the river, occupied by the modern Chinese fort and the ruins of a small walled town. The territory is duly described by Hsüan-tsang under the name of *Chieh p'an-t'o* and is often mentioned in the Chinese Annals of T'ang times as well as by other travellers⁽²⁰⁾. Modest as the resources of Sarikol must always have been—for here, at an elevation of about 10,000 feet, the local saying holds that there are ten months of winter and two of summer—yet this 'post of the Ts'ung-ling mountains' has always been a welcome place of rest for caravans and individual travellers. Thus we know from the scanty narrative left of Benedict Goëz, the observant lay Jesuit, who passed here in 1603 on his way from India and Kābul in search of fabled Cathay, that he and his large Kāfila of merchants from Badakhshān took a rest in the 'province of Sarcil', i.e., Sarikol. In the looks of the scanty inhabitants of its hamlets he duly noted a resemblance to

Flemings. Among the Sarikolis, who are of the *Homo Alpinus* stock of the Galchas and who speak a language closely akin to that of Shughnān, blue eyes and fair hair are common enough.

Before I proceed to indicate the several routes through the meridional range to the east by which the plains of the Tārīm basin are gained from Sarikol, we must return once more to the uppermost Āb-i-Panja and the ancient route which leads from there across the Great Pāmīr to Sarikol. With it are associated the memories of those two great travellers, Hsüan-tsang and Marco Polo. The route starts from Langar-kiſht where the Āb-i-Panja is joined by the river draining the Great Pāmīr lake, and ascends to the latter, just as Marco Polo tells us, in three marches north-eastwards. His description of the lake which Captain John Wood, who re-discovered it on his memorable journey of 1838, has named after Queen Victoria, is so accurate and graphic that I may well quote it in full⁽²¹⁾.

“And when you leave this little country [Wakhān] and ride three days north-east, always among mountains, you get to such a height that 'tis said to be the highest place in the World! And when you have got to this height you find a great lake between two mountains, and out of it a fine river running through a plain clothed with the finest pasture in the world; insomuch that a lean beast there will fatten to your heart's content in ten days. There are numbers of all kinds of wild beasts; among others, wild sheep of great size, whose horns are good six palms in length. From these horns the shepherds make great bowls to eat from, and they use these horns also to enclose folds for their cattle at night. Messer Marco was told also that the wolves were numerous, and killed many of those wild sheep. Hence quantities of their horns and bones were found, and these were made into great heaps by the wayside, in order to guide travellers when snow was on the ground.

“The plain is called *Pamier*, and you ride across it for twelve days together, finding nothing but a desert without habitations or any green thing, so that travellers are obliged to carry with them whatever they have need of. The region is so lofty and cold that you do not see even any birds flying. . . .”

Ever since Captain Wood's *Journey to the Source of the River Oxus* Ser Marco's narrative has been recognized, in the words of Sir Henry Yule, as the great Venetian's 'most splendid anticipations of modern exploration'. The sense of this being 'the highest place in the world' strangely impressed me also as I camped on the 27th August 1915, by the shore of the great lake (*circ.* 13,400 feet above

sea-level) after reaching it from the Alichur Pāmīr northward. Marco's 'wild sheep', the *Ovis Poli* justly named after him, still have favourite haunts in the range above the lake. On crossing it we came upon plenty of horns and bones of those which, driven down by the winter snow, had fallen victims to wolves. The excellence of the pasture was attested by big flocks of sheep then grazing in the side valleys, while Kirghiz reports told of bears and panthers being frequent.

Hsüan-tsang, too, has left us a graphic account of the 'valley of Po-mi-lo' and its 'great Dragon Lake' which he passed on his way from Wakhān to Sarikol⁽²²⁾. "It is situated among the snowy mountains. On this account the climate is cold, and the winds blow constantly. The snow falls in summer and spring time....In the middle of the valley is a great Dragon Lake". As I looked across the deep-blue waters of the lake to where in the east they seemed to fade away on the horizon I thought it quite worthy to figure in the old traditional belief which the Chinese pilgrim's narrative reflects, as the legendary central lake from which the greatest rivers of Asia were supposed to take their rise. The clearness, fresh taste and dark-blue colour of the lake are just as he describes them. It is the same with the masses of aquatic birds swarming about the lake in the spring and autumn, and with their eggs being found in plenty on its shores. Nor can it surprise us that the imagination of old travellers passing this great sheet of water at such a height and so far away from human habitations credited it with great depth and with hiding in it 'all kinds of aquatic monsters' such as Hsüan-tsang was told of.

There can be no doubt about Hsüan-tsang having travelled across the Great Pāmīr to Tāsh-kurghān. "On leaving the midst of this valley and going south-east, along the route, there are neither men nor villages. Ascending the mountains, traversing the sides of precipices, encountering nothing but ice and snow, and thus going 500 *li*, we arrive at the kingdom of Chien-p'an-t'o". The direction and distance indicated, corresponding roughly to five daily marches, make it appear very probable that the route followed by him was the one leading to the course of the Ak-su river and thence across the Naiza-tāsh pass. It is more difficult to make sure of the exact route followed by Marco Polo's party from Lake Victoria to the 'kingdom of Cascar'; for no exact indication is furnished for this part of the journey. From the fact that it took the travellers forty days through a wilderness without habitations it might be conjectured that they kept to the Pāmīrs north-eastward and then descended through the gorges of the Gez river to the plain south-west of Kāshgar.

Leaving aside the Great Pāmīr and the Alai in the north which, as we shall see, served the silk trade-route, there are two more valleys which traverse the area of the Pāmīrs from east to west draining into the Oxus. But only one of these can ever have been used throughout as a line of communication. It is the route of the Alichur Pāmīr leading past the Yeshil-köl lake and beyond its western extremity continued by the valley of the Ghünd river in Shughnān. Along it leads the modern cart-road which connects the Russian fort of 'Pamirski Post' with the headquarters of the Russian 'Pamir Division' at Khōrok on the Oxus.

That this route has seen traffic since olden times is proved by what I have had already occasion to mention about Kao Hsien-chi's memorable expedition of A.D. 747. When he led his main force from the 'post of the Ts'ung-ling mountains' down to Shughnān he could not well have followed any other route but this. The same applies also to the itineraries, unfortunately very laconic, of two Buddhist pilgrims⁽²⁹⁾. One of them, Dharmachandra, an Indian monk, wishing to return from China to his home land travelled A.D. 747 from Kāshgar to the kingdom of 'Shih-ni', i.e., Shughnān, only to be forced by the disturbed condition of the region to retrace his steps to the Tārim basin where he died. The other pilgrim, Wu-k'ung, passed through Shughnān, both on his way to India from Kāshgar in A.D. 752 and on his return thence to China about 786. On his way out we are told that he reached 'the five Shih-ni' across the Ts'ung-ling or 'Onion Mountains' and the valley of Po-mi (Pāmīr), i.e., from the side of Sarikol.

It was by this route along the Alichur Pāmīr that the Khōjas of Kāshgar, fleeing before the Chinese who had reconquered the Tārim basin, endeavoured to reach Shughnān in 1759. By the eastern end of the Yeshil-köl they were overtaken by the pursuing troops and most of their followers killed in the fight. On my passage here in July, 1915, from the Sārēz Pāmīr I still saw at Sūmetāsh the large stone pedestal of the inscription which had been set up by the Chinese in commemoration of their victory, the inscription having been removed by the Russians to the Museum at Tāshkend. It was close to the same spot that another tragedy took place in June, 1892, when Colonel Yonoff's Cossacks on the way to annex Shughnān wiped out the small Afghān detachment which bravely held out to the last in a post guarding the route.

The valley of the Ak-su or Murghāb which lies to the north and contains the Sārēz Pāmīr could never have served as a line of

communication ; for from where the valley passes into the mountain territory of Rōshān it turns into a succession of very narrow gorges in which such tracks as exist are extremely difficult even for men on foot and quite impracticable for animals. In ascending in August, 1915, from Saunāb on the Rōshān side I found no water where the bed of the Murghāb had lain ; for the great earthquake of February, 1911, had completely blocked the valley higher up by enormous masses of rock brought down in a landslide and had converted a great portion of the former Sārēz Pāmīr into a big winding lake.

We must now turn back to Sarīkol in order to sketch briefly the several routes by which thence the great western oases of the Tārim basin can be gained. The shortest and most natural would lie along the course of the river coming from the Tāghdum-bāsh and draining Sarīkol. But this soon after breaking through the meridional range in a sharp bend below Tāsh-kurghān passes, for a great distance down to its junction with the Zarafshān or Yārkand river, through an almost continuous succession of deep-cut gorges very difficult even on foot and quite impracticable for laden transport, except during the short period of the winter while the river is hard frozen and its ice can be used as a passage. Already early in June, 1906, before the summer flood from the melting glaciers and snow beds had come down, my experienced travel companion, Surveyor Rai Rām Singh, of the Survey of India, an excellent mountaineer, found it very difficult to make his way down as far as the point where the stream of the Tangi-tar valley joins the river from the north. But it was then still possible for me for a shorter distance to follow the river with laden transport down to the mouth of the Shindī defile and then, by ascending this to its head on the Chichiklik plateau, to avoid the much steeper ascent to this over the Kōk-moinak pass above Tagharma.

Over the Chichiklik plateau leads the regular caravan route to Sarīkol both from Kāshgar and Yārkand, and here we find ourselves on ground for which interesting old accounts are available. The plateau known as the Chichiklik Maidān, lying at an elevation from about 14,500 to 14,800 feet, is situated between two great mountain spurs radiating southward from the Muz-tāgh-atā massif. Its position is such that it must be passed by all travelling from Sarīkol to the south of that great glacier-clad massif towards Yārkand and Kāshgar by whichever of the several passes they may traverse the more easterly of those spurs. The Chichiklik Maidān, owing to its great height and still more to its position exposed to bitter winds and heavy snow-fall, is very trying ground for travellers at most seasons of the year.

And to the troubles here often encountered by travellers we owe the interesting accounts which Hsüan-tsang and Benedict Goëz have left us of their experiences on the Chichiklik plateau at an interval of nearly a thousand years.

The narrative of the great Chinese pilgrim tells us that starting from the capital of Chieh-p'an-t'o, i.e. Tāsh-kurghān, he reached an ancient hospice after travelling for two hundred *li* (or two daily marches) across "mountains and along precipices" (24). The distance and the bearing alone would suffice to indicate that the two marches leading from the Tāghdum-bāsh river up the Dershat gorge to the Chichiklik Maidān are meant. The position of the hospice is described as a level space of about a thousand Chinese acres "in the midst of the four mountains belonging to the eastern chain of the Ts'ung-ling mountains".

"In this region, both during summer and winter, there fall down piles of snow; the cold winds and icy storms rage. The ground, impregnated with salt, produces no crops, there are no trees and nothing but wretched herbs. Even at the time of the great heat the wind and snow continue. Scarcely have travellers entered this area when they find themselves surrounded by vapours and clouds. Merchant caravans, in coming and going, suffer severely in these difficult and dangerous spots". According to an 'old story' Hsüan-tsang heard, a great troop of merchants, with thousands of followers and camels, had once perished here by wind and snow. A saintly person of Chieh-p'an-t'o was said to have collected all the precious objects left behind by the doomed caravan and with their help to have constructed on the spot a hospice, provided it with ample stores and to have made pious endowments in neighbouring territories for the benefit of travellers.

On my first passage across the Chichiklik, on the 4th June 1906, I was able to locate the old hospice to which Hsüan-tsang's story relates and which probably he saw already in ruins(25). At the head of the Shindī valley through which my approach then lay—on my third and fourth expeditions I reached the Chichiklik Maidān by the very troublesome ascent in the Dershat gorge—there extends an almost level plain, about two and a half miles from north to south, and over a mile across. Ridges rising about 2000-3000 feet higher and then still under snow enclose it on all sides except to the north-east where a broad gap gives access over a scarcely perceptible watershed to the head of the Tangi-tar valley. On a small knoll in the centre of the plateau I discovered the foundations of a square

enclosure, solidly built and manifestly of early date. The plan of quarters within showed it clearly to have served as a sarai for wayfarers. The spot is held sacred in Muhammadan eyes, decayed graves within the enclosure attesting here as so often elsewhere in Chinese Turkistān 'continuity of local worship' since Buddhist times.

From the Chichiklik plateau three different tracks lead to the valley drained by the Tangi-tar river. Two of them lie across the easterly mountain spur by the Yangi-dawān and Yambulak passes respectively. But these passes imply a considerable ascent and are liable to become closed by snow early in the autumn. Hence the usual route leads across the previously mentioned gap into the Tār-bāshi valley which is frequented by Kirghiz as a grazing-ground, and thence descends in an extremely confined gorge appropriately known as *Tangi-tar*, to the river of the same name. The passage of this gorge is distinctly difficult for laden animals and in places dangerous for the baggage as for about two miles deep pools of tossing water and big slippery boulders have to be negotiated between high and precipitous cliffs⁽²⁶⁾. The gorge is altogether impassable during the summer months when the flood from the melting snows fills its bottom, and traffic is then diverted to the two passes of Yangi-dawān and Yambulak. In spite of an unusually late spring I found the passage of the Tangi-tar gorge already very troublesome on the 5th June, 1906.

An adventure recorded in Hsüan-tsang's biography proves that it was the track down this gorge which he followed when on his way towards Yangi-hisār and Kāshgar⁽²⁷⁾. We are told there how the 'Master of the Law' on the fifth day from the capital of Chieh-p'an-t'o (Sarikol) "encountered a troop of robbers. The traders accompanying him were seized with fear and clambered up the sides of the mountains. Several elephants, obstinately pursued, fell into the water and perished. After the robbers had been passed, Hsüan-tsang slowly advanced with the traders, descended the heights to the east and, braving a rigorous cold, continued his journey amidst a thousand dangers. After having thus covered 800 *li*, he passed out of the Ts'ung-ling mountains and arrived in the kingdom of Wu-sha [Yangi-hisār and Yārkanđ]".

The time occupied in the journey from Tāsh-kurghān and the exceptional facilities offered by the Tangi-tar gorge for such an attack clearly point to its scene having lain there. In the late autumn, the time of Hsüan-tsang's passage, no other stream on the route could have held sufficient water to be dangerous to elephants, except that

of Tangi-tar which retains deep pools of water even in the winter. The eight hundred *li* or eight marches are a quite correct reckoning for the journey of a caravan from the gorge to Yangi-hisār. There can be no doubt about Hsüan-tsang having done it by the regular route across the Tor-art pass to Chihil-gumbaz where the road to Yārkaṅd branches off, and thence across the loess-covered spur of Kashka-su into the valley debouching into the plains above Ighiz-yār.

When I struggled across the bleak plateau of Chichiklik, still snow-covered early in June, 1906, and again in a snow-storm on the 28th September 1930, I felt duly impressed by the recollection of the trials which Benedict Goëz, the brave Jesuit, had experienced here on his journey to Yārkaṅd in the late autumn of 1603⁽²⁸⁾. After crossing the Pāmīrs—by what exact route we do not know—he and the large Kāfila of merchants to which he had attached himself had at the hamlets of the ‘ province of Sarcil ’, i.e., Sarikol, “ halted two days to rest the horses. And then in two days more they reached the foot of the mountain called *Ciecialith* [Chichiklik]. It was covered deep with snow, and during the ascent many were frozen to death and our brother barely escaped, for they were altogether six days in the snow here. At last they reached *Tanghetar* [Tangi-tar], a place belonging to the kingdom of Cascar [Kāshgar]. Here Isaac the Armenian fell off the bank of the great river into the water, and lay, as it were, dead for some eight hours till Benedict’s exertions at last brought him to. In fifteen days more they reached the town of *Iaconich* [Yaka-arik], and the roads were so bad that six of our brother’s horses died of fatigue. After five days more our Benedict going on by himself in advance reached the capital which is called *Hiarchan* [Yārkaṅd] ”.

It is clear that the route followed by Goëz was identical with the present main caravan track which, after descending the Tangi-tar gorge and crossing the Tor-art, as already referred to, diverges at Chihil-gumbaz towards Yārkaṅd. The accident which befell his faithful companion, Isaac the Armenian, obviously took place at one of the deep pools of Tangi-tar.

There still remains to be briefly mentioned the route which from Sarikol leads northward past the meridional range of Muz-tāgh-atā and Kungur and then turning the flank of the latter in the deep-cut gorges of Gez follows the narrow valley of the Yamān-yār down to Tāshmalik and thence across the fertile plain to Kāshgar. This route offers splendid views of the huge ice-crowned peaks of the range

along the foot of which it passes from above Tagharma and has often been followed by modern travellers⁽²⁹⁾. After crossing the easy saddle of Ulūgh-rabāt it leads over open Pāmīr-like ground past the lakes of Little Kara-kul and Bulun-kul as far as Tar-bāshi where the tortuous gorges of Gez are entered^(29a).

Whether it is owing to the difficult passage offered by the latter and the total absence of grazing there and for several marches lower down or owing to some other reason, this route to Kāshgar is not ordinarily followed by caravans, and I know of no early account of it. It has, however, been conjectured, not altogether without reason, that Marco Polo may have travelled at least over the lower part of it, after leaving the Great Pāmīr. He tells: "Now if we go on with our journey towards the east-north-east, we travel a good forty days, continually passing over mountains and hills, or through valleys, and crossing many rivers and tracts of wilderness. And in all this way you find neither habitation of man, nor any green thing, but must carry with you whatever you require"⁽³⁰⁾. The absence of any reference to the inhabited tract of Sarīkol might suggest that, for some reason we shall never know, the Venetian traveller's caravan, after leaving the Great Pāmīr, moved down the Ak-su river and then, crossing the watershed eastwards by one of the several available passes, struck the route leading past the Muz-tāgh-atā massif and on towards the Gez defile. The duration of forty days counted for such a journey is certainly much in excess of what an ordinary traveller would need. But it must be remembered that Goëz, too, speaks of the 'desert of *Pamech*' (Pāmīr) taking forty days to cross if the snow was excessive⁽³¹⁾.

I have had to leave to the last the tracing of that route leading past the Pāmīrs of which the earliest record has come down to us. I mean the ancient trade route skirting the Pāmīrs on the north by which the 'silk of Seres' was carried from China to the Oxus basin. The notice has been preserved for us in the 'Geography' of Ptolemy who wrote about the middle of the second century A.D. Short as it is, it claims considerable interest, be it only on the ground of its being the only Western notice of the channel through which passed in classical times the most important of the trade links between the Far East and the Mediterranean regions. This record has accordingly been much discussed by scholars even before there was adequate knowledge available of the ground through which the route led.

The notice is contained in an introductory chapter where Ptolemy takes occasion learnedly to discuss statements advanced by

the geographer Marinus as to the length of the inhabited world⁽³²⁾. With regard to a certain measurement as to the distances between Hierapolis on the Euphrates and 'Sēra the metropolis of the Sēres', i.e., of the Chinese, Marinus is quoted as having stated that "one Maēs, a Macedonian, called also Titianus, who was a merchant by hereditary profession, had written a book giving the measurement in question which he had obtained not by visiting the Sēres in person, but from the agents whom he had sent there". Marinus is known to have flourished about the close of the first century A.D. and the record of Maēs, a merchant probably from one of the Macedonian colonies established in Syria or Mesopotamia, being approximately contemporary, belongs to the period of the Later Han dynasty when the silk trade flourished and was favoured by Chinese control of the Tārīm basin.

Marinus' account of the route followed by Maēs' agents shows it to have passed through Mesopotamia, north-western Persia and the present Transcaspia to 'Antiochia of Margiana' or Merv, and so on to Bactria, the present Balkh, "whence it turns towards the north in ascending the mountainous tract of the Kōmēdoi. And then in passing through this mountainous tract it pursues a southern course as far as the ravine which adjoins the plain country". Subsequently after referring to certain assumptions as regards bearings on sections of the route and to detours made by it Ptolemy quotes Marinus as saying: "The traveller having ascended the ravine arrives at the Stone Tower, after which the mountains that trend to the east unite with Imaus, the range that runs up to the north from Palimbothra". Another passage of Ptolemy, derived from Marinus, places the station or Sarai 'whence traders start on their journey to Sēra' to the east of the Stone Tower and in the axis of Mount Imaus itself⁽³³⁾.

It is the merit of Baron Richthofen, the great geographer, and of Sir Henry Yule to have clearly demonstrated that the route followed by Maēs' agents must have led up the Alai and on to Kāshgar⁽³⁴⁾, and that by the 'mountains of the Kōmēdoi' is meant the long-stretched Kara-tegin tract in the main valley of which the Kizil-su or Surkh-āb (the 'Red River') draining the Alai makes its way to the Oxus east of Balkh. This location is definitely proved by the name *Kumēdh* which early Arab geographers apply to Kara-tegin and the position which Hsüan-tsang indicates for the territory of *Chü-mi-t'o*, this being the Chinese transcription of a similar form of the name.

In the summer and early autumn of 1915 Fate in the shape of the alliance with Imperial Russia gave me the long and eagerly

wished-for chance of following in person the greater part of this ancient 'silk route' from the Alai down to the submontane plain of the Hisār region, then under the Amīr of Bukhāra. Fourteen years before, on returning from my first Central-Asian expedition, I had been able to see the eastern portion of the route from Kāshgar right up to the western extremity of the Alai where it passes under the flank of Mount Imaus, i.e., the great meridional range forming the eastern rim of the Pāmirs. I am thus able to speak with some personal knowledge of the ground over which the route passed between Kāshgar and Hisār.

From Termez, where traffic coming from Balkh and its modern successor as a trade-centre, Mazār-i-Sharif, usually crosses the Oxus, an easy route up the Surkhan river brings the traveller to the wide and fertile plain in the centre of the Hisār tract. In this we may safely recognize 'the plain country' which the ravine mentioned by Marinus' authority adjoins⁽³⁵⁾. In the comparatively narrow main valley of Kara-tegīn, stretching for some 155 miles from Āb-i-garm where the regular road from the Hisār side enters it, up to Daraut-kurghān where the Alai is reached, there is more than one defile by the river. But it is practicable for laden transport, even camels, throughout and owing to its plentiful agricultural produce offers a convenient line of communication. Then below Daraut-kurghān, now the highest village on the Kizil-su, the valley opens out into the great Pāmīr-like valley of the Alai. It is in the vicinity of Daraut-kurghān, where cultivation is carried on at an elevation of about 8000 feet and where I found a Russian post in the place of a former fort, that we may place the 'Stone Tower' where, according to Marinus, the traveller arrives after having ascended the ravine⁽³⁶⁾.

It is there that those following the route now towards Kāshgar would have to take their food supplies for their onward journey. But I noted in 1915 patches of recent or old cultivation for fully 27 miles above Daraut-kurghān up to an elevation of about 9000 feet. The Alai valley in general physical character resembles a Pāmīr, being an open trough with a width at its floor nowhere less than six miles. But owing to its lower elevation, from about 8000 feet at Daraut-kurghān to not more than 11,200 feet at the Taun-murun saddle as its eastern end, and owing to a somewhat moister climate, the steppe vegetation is here far more ample than on the Pāmirs. In consequence the Alai forms, or, until the Soviet régime, formed, a favourite summer grazing-ground for very numerous camps of Kirghiz nomads.

With its open ground and excellent grazing, the great Alai valley seems as if intended by nature to serve as a very convenient channel for traffic from east to west such as the traders bringing silk from the Tārīm basin needed. Another important advantage was that, what with the cultivation at one time carried on above Daraut-kurghān in the west and still at present to be found at Irkesh-tam to the east of the Taun-murun saddle, the distance on the Alai route over which shelter was not to be found scarcely exceeded 70 miles or three easy marches on such ground.

The route remains open for eight or nine months in the year for laden animals, including camels. Even in the months of December to February when snow is deep, it would be practicable in the same way as is the trade route from Irkesh-tam across the Terek pass (12,700 feet above sea-level), provided there were enough traffic to tread a track through the snow. But such traffic between Kāshgar and the Oxus region as was once served by this ancient 'silk route' no longer exists. The trade of the Tārīm basin from Kāshgar now proceeds towards Farghāna, reaching the Russian railway at Andijān across the Terek pass, while what trade in sheep and cattle there comes up Kara-tegin from the hill tracts towards the Oxus is diverted at Daraut-kurghān towards Marghilān and the railway. However during the months of May and early June when the melting snow closes the Terek pass, the eastern end of the Alai sees some of the Kāshgar trade to Farghāna making its way across the Taun-murun to the easier Taldik pass over the Alai.

At Irkesh-tam, the present Russian frontier and Customs station⁽³⁷⁾, we may safely locate 'the station at Mount Imaus whence traders start on their journey to Sēra', as suggested long ago by Baron Richthofen. It is here that the Alai route is joined by another, much frequented in modern times and probably in antiquity also, which leads from fertile Farghāna across the Terek pass to Kāshgar. This location of the 'traders' station' at Irkesh-tam is strongly supported by Ptolemy's statements elsewhere which place it due east of the Stone Tower and at the north-eastern limits of the territory of the 'nomadic Sakai', the Iranian predecessors of the present Kirghiz.

At the period to which the information recorded by Maēs refers direct Chinese control is not likely to have extended beyond the watershed between the Tārīm basin and the Oxus. Thus Irkesh-tam, where some cultivation is possible at an elevation of about 8550 feet, would have offered a very convenient position for one of those

frontier control-stations which the Chinese administration has always been accustomed to maintain on the borders and which is still maintained here at present.

The trade route thence to Kāshgar leads down the valley drained by one of the main feeders of the Kizil-su. It has often been described and offers no difficulties. In June 1901 I was able to cover it with baggage on ponies in six marches though the large camel-caravans frequenting it naturally take a good deal longer. Far away as I am now from needful books, I can trace no early reference to this chief artery of the present day, and my survey of the routes past the Pāmīrs may hence close here.

There is abundant evidence in Chinese and other early records that Kāshgar was all through historical times the chief trade emporium on the most frequented road connecting Western Turkistān with China. But there those agents of Maēs, the Macedonian trader, found themselves still very far away from the 'Metropolis of Sēra', the Chinese capital of Han times which then stood at Lo-yang in the province of Honan. In the light of my experience of caravan traffic in these regions of Asia the estimate of seven months' journey to the Sēra capital from the Stone Tower which Maēs' plucky agents reported and which Ptolemy (I. xi. 4) doubted, could scarcely be thought much exaggerated.

(¹) See Curzon, *The Pamirs and the Source of the Oxus*, R. Geographical Society, London, 1898.

(²) See Geiger, *Die Pamir Gebiete*, Geographische Abhandlungen, edited by Dr. A. Penck, II. 1, Vienna, 1887.

(³) Cf. Ptolemy, *Geographia*, I. xii. 3; VII. xiii. 1.

(⁴) See *Geographical Journal*, 1925, pp. 377-403, 473-98.

(⁵) See the translations in Julien, *Mémoires sur les contrées occidentales*, i. pp. 201 sqq.; Watters, *On Yuan Chwang's Travels*, ii., pp. 279 sqq.

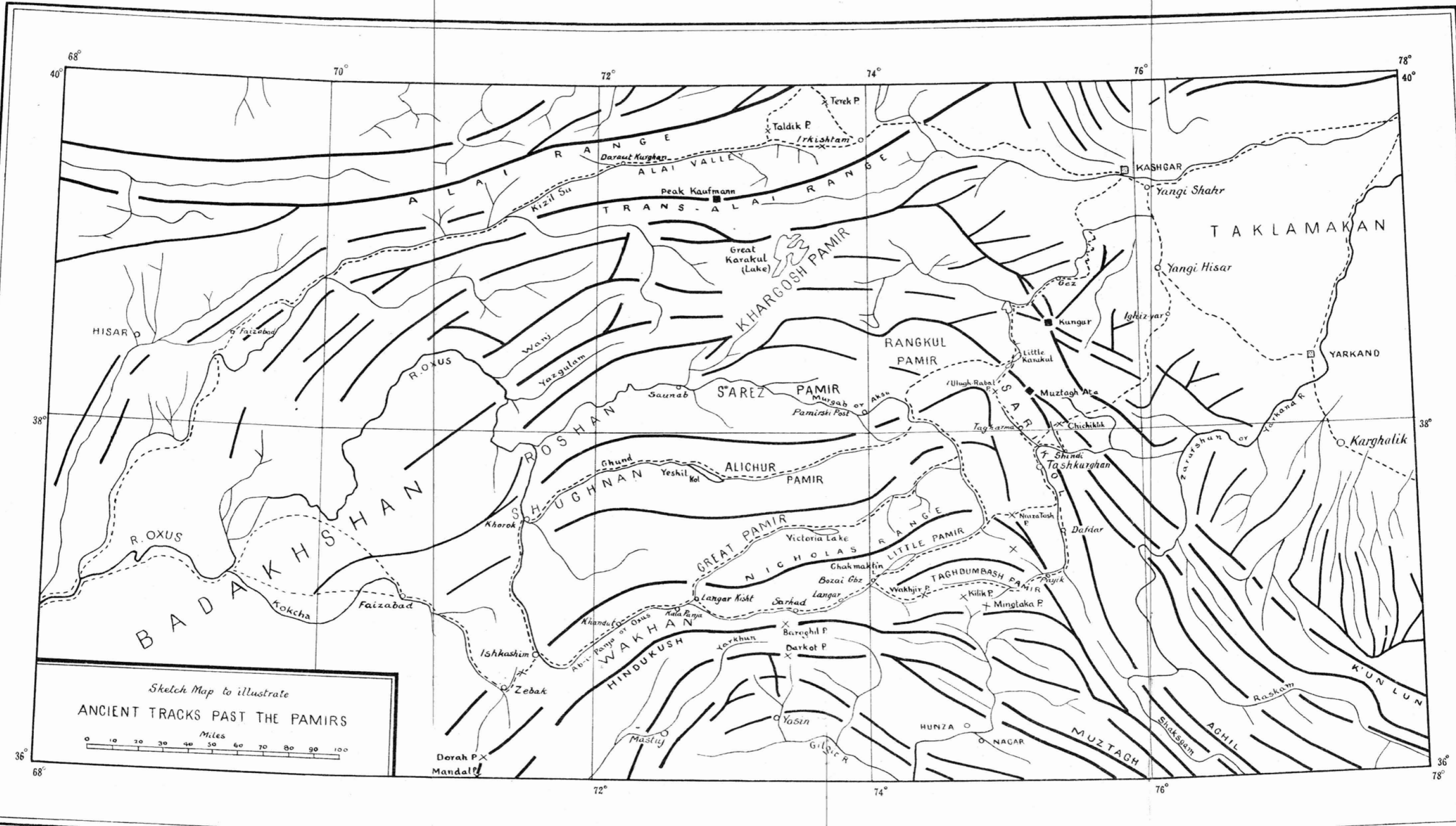
(⁶) Sung Yün's route has been fully discussed by me in *Serindia*, i., pp. 9 sqq.

(⁷) Cf. Wood, *Journey to the Source of the Oxus*, 2nd ed., pp. 208 sqq.; Gordon, *The Roof of the World*, pp. 135 sq.; Stein, *Innermost Asia*, ii., 865 sqq.; also Schultz, *Forschungen in Pamir*, pp. 139 sqq.; Olufsen, *In the Unknown Pamir*, passim.

(⁸) See *Serindia*, i., p. 70.

(⁹) See above, note 7.

(¹⁰) For accounts of the fortresses of Zamr-i-āṭish-parast and Namadgu cf. in particular *Innermost Asia*, ii., pp. 866 sqq., 872 sqq.



Sketch Map to illustrate
ANCIENT TRACKS PAST THE PAMIRS



(11) For an analysis of these records, see *Innermost Asia*, i., pp. 61 sqq. The Annals duly note *Hu-mi* as the Chinese name of Wakhān, by the side of the name *Ta-mo-hsi-l'ie-ti* of Hsüan-tsang which still awaits explanation.

(12) For an analysis of the anthropometrical records secured by me, cf. Mr. T. A. Joyce's Appendix C in *Innermost Asia*, ii., pp. 996 sqq.

(13) Cf. Yule, *The Book of Ser Marco Polo*, 3rd edition, i., pp. 170 sqq.

(14) Cf. *Innermost Asia*, i., p. 65.

(15) See *Serindia*, i., pp. 52 sqq., 66 sqq.; *Geographical Journal*, 1922, February, pp. 112-131.

(16) Cf. Chavannes, *Documents sur les Turcs occidentaux* (Imperial Academy of Sciences, St. Petersburg, 1903), p. 152 sq.

(16a) See *Ruins of Desert Cathay*, i., Fig. 29; *Mountain Panoramas of the Pamirs and Kwenlun*, R. Geographical Society, Panor. VII.

(17) Cf. *Desert Cathay*, i., pp. 83 sqq.

(18) For a description of the valley cf. *Sand-buried Ruins of Khotan*, pp. 59 sqq.

(19) Cf. *Serindia*, i., pp. 72 sqq.

(20) For an analysis of these Chinese and other early records of Sarikol, cf. *Ancient Khotan*, i., pp. 27 sqq.

(21) See Yule, *Marco Polo*, i., p. 171.

(22) Cf. Julien, *Mémoires des contrées occidentales*, ii., pp. 207 sqq.; Watters, *Yuan Chwang*, ii., pp. 282 sq.; *Innermost Asia*, ii., pp. 858 sqq.

(23) For references to these itineraries, cf. *Innermost Asia*, ii., p. 880.

(24) For translations of the narrative, see Julien, *Mémoires*, ii., p. 215; Watters, *Yuan Chwang*, ii., p. 285; also Beal, *Si-yu-ki*, ii., p. 303.

(25) Cf. *Serindia*, i., p. 77 sq.

(26) For a description, see *Ruins of Desert Cathay*, i., pp. 99 sq.; also *Serindia* i., Fig. 29.

(27) See Julien, *Histoire de la vie de Hiouen-Tsang*, pp. 274 sq., Beal, *Life of Hiuen Tsiang*, p. 200.

(28) For Sir Henry Yule's translation of Goëz' record, put together by Ricci from such notes as could be recovered after the devoted Portuguese lay brother 'seeking Cathay had found Heaven' at Su-chou, see Yule, *Cathay and the Way Thither*, ii., p. 562.

(29) For a description of it, see Stein, *Sand-buried Ruins of Khotan*, pp. 76-105.

(29a) *Sand-buried ruins of Khotan*, pp. 108 sqq.

(30) See Yule, *Marco Polo*, 3rd edition, i., pp. 171 sqq.; Prof. H. Cordier's notes, *ibid.*, i., pp. 175, 182; also Stein, *Ancient Khotan*, i., pp. 41 sq.

(31) Cf. Yule, *Cathay and the Way Thither*, ii., pp. 563 sq.

(32) Cf. Ptolemy, *Geographia*, I. Chap. xi; for a translation, see McCrindle, *Ancient India as described by Ptolemy*, pp. 8 sqq.

(33) See Ptolemy, *Geographia*, VI. Chap. xiii; McCrindle, loc. cit., p. 284.

(34) For references to Richthofen's and Yule's works, as well as to other publications dealing with the route of Maës, see my *Ancient Khotan*, i., pp. 54 sqq.; *Innermost Asia*, ii., pp. 849 sq.

(35) For a summary of the topographical facts supporting this tracing of the route, see *Innermost Asia*, loc. cit.

(36) I believe, we may recognize some evidence of the location of the 'plain country' reported by Maës' agents in the distance which the passage of Ptolemy

(I. xii. 8) undoubtedly on their authority indicates immediately before quoting the words of Marinus (*see* p. 21): "When the traveller had ascended the ravine he arrives at the Stone Tower", etc. Ptolemy refers here to certain bends in the route after it has entered the mountainous country of the Kōmādoi and then states that "while (generally) advancing to the east it straight turns off to the south and thence probably takes a northerly turn for fifty *schoeni* up to the Stone Tower".

I have already in *Innermost Asia*, ii., p. 350, hinted at my belief that the point where the plain country is left for the ravine has to be sought for near Āb-i-garm, a large village reached from Faizābād in the easternmost portion of the open Hisār tract, by one march along the caravan route leading to the main valley of Kara-tegin. Now from Āb-i-garm this route which from Faizābād has so far followed a north-easterly line across down-like country turns sharply to the south-east into a narrow valley in order to reach some four miles lower down the right bank of the Surkh-āb which it thence ascends in a north-easterly direction to Daraut-kurghān.

It is near Āb-i-garm that I believe we must place the point where the 'plain country' adjoins the ravine. For this assumption there is support in the distance which is mentioned between this point and the Stone Tower. Measured on the French General Staff's 1 : 1,000,000 map of Asia (*File* 40°N. 72°E) based on the Russian surveys the distance from Āb-i-garm to Daraut-kurghān is about 155 English miles. Accepting the equation of 30 stadia to the *schoenos* (*see* VI. xi. 4) and reckoning the stadion at 606½ English feet or approximately one-eighth of an English mile, this brings us close enough to the measurement of circ. 190 miles recorded by Maēs' agents, if due allowance is made for the necessary excess of the marching distance in hilly country over the map distance.

I may add that the meaning of Ptolemy's passage in McCrindle's translation is somewhat obscured by the too literal rendering of some of the words, unavoidable at a time when the configuration of the ground could not yet receive adequate attention. What must be regretted most is that Ptolemy has not preserved for us throughout the actual text of his predecessor.

(³⁷) Cf. Stein, *Sand-buried Ruins of Khotan*, p. 495.



PHOTO, CAPT. E. ST. J. BIRNIE.

KAMET, 25,447 FEET, (TELEPHOTO FROM CAMP IV).

THE FIRST ASCENT OF KAMET

CAPTAIN E. ST. J. BIRNIE

IN VIEW of Mr. F. S. Smythe's projected expedition to climb Kamet many details of previous attempts on that mountain have already appeared in *The Himalayan Journal*⁽¹⁾; it is therefore unnecessary for me to describe these attempts or the reasons which caused their ultimate failure to reach the summit. It is sufficient to say that practically every approach to the mountain had been carefully explored. To Mr. C. F. Meade must be given the credit of finally establishing the route up the East Kamet glacier and of proving the summit to be accessible, provided that a camp could be established on the col dividing Kamet from Eastern Ibi Gamin and that sufficient stores could be dumped there to allow for adverse weather delaying the attempt. Smythe accordingly selected this route for his attack and was enabled to get much valuable advice in London on the conditions prevailing in Northern Garhwal from General the Hon. C. G. Bruce and from Mr. Ruttledge who had served for many years in that district.

After months of organization the party was completed as follows : Mr. F. S. Smythe (leader), Wing-Commander E. B. Beauman, Mr. R. L. Holdsworth (who is probably better known as a ski-er than as a climber), Dr. Raymond Greene, Mr. E. E. Shipton and myself. All except myself had considerable experience in the Alps and Shipton had made the first ascent of Mount Kenya in thirty years. Because I was the only Urdu-speaking member of the expedition, the general arrangements of the porters and transport were allotted to me ; Greene had his hands full with his medical work ; Holdsworth was our botanist, while Shipton had the very thankless task of mess president.

By the 17th May we were all assembled at Ranikhet. Ten of the Darjeeling "Tigers" had been summoned to accompany us⁽²⁾. These men, all of whom had fine records with other Himalayan expeditions, were to act as our personal servants and later were to be employed

⁽¹⁾ *Himalayan Journal*, vol. iii, pp. 122-125.

⁽²⁾ Lewa, Achung, Nima Tendrup, Nima Dorje, Nima, Ondi, Pasang, Ang-Nerbu, Nerbu, and Dorje.

as porters at the highest camps. In addition, two Gurkha lance-naiks, Randoj Kan and Budibal Guru, were lent to us very kindly by the 3rd Gurkha Rifles to assist in the general supervision of the camps and transport. Their smartness and splendid sense of discipline proved of the utmost value. The well-known Everest porter Lewa acted as our *Sirdar*.

Kamet is situated in the northern extremity of British Garhwal in the United Provinces of Agra and Oude and about a hundred and fifty miles from the hill-station of Ranikhet. After motoring fifty miles we spent fourteen days marching through the most beautiful valleys, the hillsides being covered with flowers. Crossing the Kuari pass on the 28th May, we obtained a magnificent view of the Badrinath range; Kamet, a splendid rock peak when viewed from this side, now stood out as the king of all these monarchs. Two deep gorges pierce these mountains, the Badrinath gorge, through which flows the Alaknanda river, most sacred of the Ganges tributaries, and the Dhauli gorge. Our route lay along the latter.

The nature of the valleys now changed completely. Huge rock cliffs, devoid of any vegetation, rose for thousands of feet above the track which skirted first one and then the other side of the river, sometimes on a level with it and sometimes perched hundreds of feet above the torrent. On the 2nd June we reached the mountain village of Niti, the last on the route to the East Kamet glacier. Changing all our porters here, and substituting yaks for many of them, we left Niti on the 5th and two days later established our base-camp on moraine below the junction of the East Kamet and Raikane glaciers at a height of approximately 15,350 feet. The wood level was about three hundred feet lower. Beauman and Shipton now busied themselves with a complete reorganization of the stores. Food for the porters and all the loads for the higher camps, consisting of tents, personal equipment, climbing and cinema apparatus, etc., were made into loads of approximately fifty pounds each. Six of the local porters^(*) were selected to strengthen our "Tigers" for the high camps and were issued with woollen cardigans, Balaclava helmets, gloves, ice-axes and snow-goggles, in addition to woollen climbing-suits and properly nailed Alpine boots.

On the 8th June the organization for the attack on the mountain was completed. Smythe, Holdsworth, Greene and Shipton left to

(*) Kesar Singh, Naitar Singh, Kalu, Gian Singh and Thelu, from Bompas Gamsali and Malari near Niti; and Chouu from Mana village.

establish Camp I at approximately 16,800 feet. There was still a good deal of snow at this height so that an easy, though devious, route was found through the mass of moraine hillocks which form this lower portion of the glacier. Beauman very generously stayed behind with me as I was unwilling to start until the last of the loads for the higher camps had left the base. That evening twenty-five porters returned with the news that Camp I had been established. Smythe had kept twelve of the equipped men and pushed on the next day to Camp II, the site of which proved to be a long way up the glacier which becomes very narrow between these camps. To the south runs the long ridge which culminates in the beautiful Mana peak. Its precipitous cliffs are plastered with enormous ice walls which overhang the glacier and from these walls ice avalanches thunder almost continuously throughout the day. A very careful study of the ground by Smythe and his party resulted in a safe route being stamped out for the porters.

On that day Beauman and I were faced as we were leaving the base-camp with four or five cases of impending snow-blindness amongst the porters. These cases appeared to be confined to a certain section of the men who had already attempted to spread disaffection and I was very glad to have the excuse to dismiss them at once. With these men gone we were now left with as fine a body of local porters as any expedition could wish for. On the 10th June Beauman and I joined the rest at Camp II at a height of 18,600 feet. Smythe considered this to be a suitable altitude at which to acclimatize, for already some of us were feeling the effects of the height and suffering from sharp headache and loss of sleep at night. The porters were equally affected so that it was decided that we should spend some days here. There was, however, plenty to do, and this period enabled the lower camp porters to bring up an ample amount of juniper fuel and to stock Camps I and II with sufficient food to last them for a fortnight. As most of this had to be taken higher, Camps I and II would later have to be replenished from the base. In the meantime the route to Camp III at 20,700 feet was reconnoitred by a party under Smythe and on the 13th all members of the expedition started for the site of this camp on the higher Kamet glacier, which was connected with the lower glacier by a very steep though not difficult snow gully. After accompanying the rest for half the distance I returned to Camp II in order to continue the supervision of relaying loads to Camp III.

The weather now changed for the worse; thick mists covered the mountains and snow storms became frequent. On the 14th I joined the others at Camp III. I started in a blizzard and the storm continued throughout the day. In the thick mist and driving snow I missed camp, climbing several hundred feet above it. A temporary clearing of the mist disclosed its position and I was soon surrounded by our wonderful Sherpa and Bhutia porters, who pulled off my boots, rubbed my chilled feet and hands and supplied me with hot tea so that all discomforts were forgotten in a few moments.

We were now faced with a thousand-foot wall of rock capped by an ice dome of some three hundred feet in height. Although Meade had eventually found a route up this rock face, it was the inability to carry loads up it which had primarily caused his failure to conquer Kamet. It was now therefore our task to establish a route suitable for load-carrying men.

Smythe wished first to reconnoitre the snow couloir south of Eastern Ibi Gamin but soon found this route too dangerous, consisting as it did of about a foot of avalanche snow on ice. Splitting into two parties on the 16th June, we made a second reconnaissance of the rock face, both parties eventually emerging on to the steep snow just below the final ice dome. Neither route, however, was considered practicable for porters, but on the downward journey an easier way was found and we set to work immediately to hammer pitons into the rock and place fixed ropes on all the most dangerous pitches.

We returned that evening well satisfied with our day's work. On the 17th Smythe, Shipton and Lewa climbed to the top of the rock cliff and commenced the laborious work of cutting steps up the steep ice dome. I was deputed to take four men up the same route to deposit four rucksacks of food as near as possible to Camp IV. The men very quickly gained confidence in the handling of the rope and we eventually dumped our load of food on the rocks at the foot of the ice slope. Sending three of the porters down I waited with the Sherpa Nima for Smythe and Shipton to reappear, and then scrambled down ahead of them with Nima. Shipton unroped and passed us into camp at a great pace. This was a most enjoyable day of mountaineering, but we were beginning to feel the strain of climbing at these heights.

Casualties amongst our Sherpas now caused some anxiety. We had only sufficient men to allow Smythe and Shipton to establish Camp IV at the top of the ice dome at approximately 22,000 feet on the 18th June. Holdsworth, who had been temporarily a little unfit,



Photo, Capt. E. St. J. Birnie.

MANA PEAK, 23,860 FEET, FROM NEAR CAMP V, 23,200 FEET.

gallantly carried a load up for them, returning that evening to Camp III. Smythe and Shipton were also carrying extra weight. On the same evening, however, I was able to replace two sick men by fitter men from below, and with porters Dorje and Ondi fit again our position was greatly improved.

Beaman was unfortunately feeling the altitude considerably, but made a very fine effort on the 19th in reaching Camp IV with the rest of us. At the first fixed ropes we found the two local porters, who had replaced the Sherpas, nervous and refusing to go on. Holdsworth and I roped up with them and they were soon going along splendidly and eventually returned alone to Camp III. This was the turning-point with the locally recruited porters, who after a rather shaky start now gave sterling work to the expedition.

On the 20th June Smythe, Shipton and Holdsworth reconnoitred the route to Meade's Col and established Camp V just below it at 23,300 feet on a large snow-field. The final plan of attack evolved at Camp IV was that, weather permitting, these three would retain only Lewa and Nima Dorje and with them would attempt the summit on the following day. While this attempt was being made Beaman, Greene and myself, with the two Gurkha N. C. O's and five porters, would move up to Camp V in support, the whole party camping there on the 21st. The second attempt by the rest of us would be made if possible on the 22nd.

A heavy snow storm at Camp IV delayed our start, but the climbing party above us were able to get away by 8 A.M. Smythe chose the north-east edge of the north face for his attack. Half concealed and deep crevasses lie across this face, but otherwise as far as a point four hundred feet below the summit no great technical difficulties are encountered.

At about 11 A.M. the clouds cleared a little and a thrilling sight was revealed. Two thousand feet above us five small dots appeared, seemingly stationary, so slow was their progress. Through glasses we could see that they were roped in two parties. By 2 o'clock they had reached the rock point four hundred feet from the summit ridge; here Nima Dorje, carrying the cinema apparatus, collapsed. He had done splendidly but was too tired out to continue further. Lewa took up his load. The final pitch called upon the last reserves of the climbers; the slope steepens considerably and was covered with a thin layer of snow on ice; practically every step had to be cut, a great strain at that altitude. The consequent lack of oxygen was now beginning to hamper the party seriously. Taking the lead in turn,

the climbers at last surmounted the summit ridge after two-and-a-quarter hours from the rock. The highest point of the ridge still lay a hundred and fifty yards to the west. This ridge to the summit is extremely narrow with only just enough width to walk singly along its knife-like edge. To the north the slope falls steeply to Meade's Col, but the southern slope falls quite gently for some thirty feet to the topmost rocks of the magnificent southern rock precipice of Kamet. After spending twenty minutes on the top taking photographs Smythe, Holdsworth, Shipton and the porter Lewa commenced their downward journey. Their difficulties were far from over. After negotiating the difficult topmost pitch, they found that the hot sun had melted the snow to such a condition that with every step they sank into the snow up to their knees. Lewa eventually was forced to abandon the cinema apparatus which Smythe then carried for some distance, but was himself forced to leave it in a position about a thousand feet above the camp. It was a very tired but jubilant party that returned to camp that evening. After a few cups of hot tea all but Lewa recovered immediately; he, poor fellow, was exhausted and badly frostbitten. Every endeavour was made to restore the circulation to his feet and finally he was given a sleeping-draught. It was all we could do for him. The stars were out that night, clear and bright with Kamet's snows pale against the deep sky. Kamet was conquered at last, but had already left her mark on one man, the hero of expeditions to still greater giants than herself.

There was no question of a further attempt on the mountain the next morning; we were all too busy attending to Lewa's evacuation. The porter Dorje put up a splendid performance in voluntarily retrieving the cinema apparatus after repeated attempts to persuade the other porters to do so had failed. Seeing Lewa's condition they were now convinced that the God of Kamet was determined to wreak his vengeance on anyone daring to violate the sacred snows lying on his summit. According to local tradition a golden castle existed there in which he lived. That day Kesar Singh, one of the locally enlisted porters, arrived in camp unexpectedly with some letters. We determined to take him with us on the second attempt which was now arranged to take place on the 23rd. Another perfect night was followed by a brilliant dawn.

Greene, the porter Kesar Singh and myself started at 6-45 A.M. on our attempt. Beauman, though far from well, had reached Meade's Col, but was unfortunately quite unfit to go further. Our route followed exactly that of the first party, the steps they had made



Photos. Capt. E. St. J. Birnie.
RECONNAISSANCE OF ROUTE BETWEEN
CAMPS III & IV.



DR. GREENE ON SUMMIT OF KAMET.

being of great assistance to us. As we rose above the Ibi Gamins, the most wonderful view was disclosed. To the south-east only those peaks of approximately twenty thousand feet and over broke through the ocean of clouds, but to the north and north-east the vast plateaux of Tibet, brown in colour, proved an attractive contrast to the snows around us. Far away to the north-west a magnificent range of snow-covered mountains, the Karakoram, came into view.

The summit was reached in approximately the same time as that taken by the first party. Greene achieved a great personal effort in getting there as he was far from well at the start, though he recovered *en route*. On returning, Smythe and Holdsworth met us some way above camp with a very welcome bottle of rum and some chocolate, and assisted us into camp.

It blew a gale that night, but it mattered little; our retreat was now inevitable, our objective had been reached and our rations at the highest camps were exhausted. In three days the whole party was again concentrated at the base-camp, all loads from the high camps being evacuated there on the fourth day. Deterioration had certainly set in, but four days' rest in perfect weather at the base recovered us all and we started back for Niti fit for the six weeks' exploration of the Badrinath range which we had before us.

Looking back on the period spent above 15,000 feet (18 days), on the East Kamet glacier and above, it is interesting to note that owing to our slow advance none of us were ever very seriously affected by the altitude; one or two of us failed to sleep for the first two or three nights for want of breath, but this soon passed off, and for the sixteen days we were above 18,600 feet we slept perfectly. Breathing while climbing was also much easier than I had expected. Above 24,000 feet it was found that two long breaths to each step were sufficient to keep us going steadily. The effects of altitude, of course, became increasingly difficult for every thousand feet above that height, as was experienced by the Everest parties. The most impressive thing was the incredible decrease in one's pace. This varied as to whether we were on a ridge or on a glacier or snow-field. In the latter two cases (as, for instance, the approach to Meade's Col) we found that glacier lassitude practically stopped us dead. This lassitude is caused by the atmosphere, resulting from a hot sun beating down on a snow-field, and has a most demoralizing effect. Although the early mornings would find our tents covered in frost and our boots frozen, yet our warm sleeping-bags never gave us a cold night.

The use of ski by Holdsworth was fully justified. As far as Meade's Col he was able to use them throughout practically the whole route, with the exception of the rock face between Camps III and IV and by ski-ing at 23,500 feet he must surely have created a record for high-altitude ski-ing. Furthermore, on the descent he was able to take his frostbitten feet in one day from Camp III to the base, whereas others similarly affected, but not so fortunate, were compelled to drag them down in two rather long and tiring marches.

Lewa was with difficulty carried to the base-camp and later evacuated to Joshimath where he was splendidly looked after in the excellent little hospital there. Although he has since had all the tops of his toes amputated, those who know him will be delighted to hear that he will almost certainly be fit to climb again.

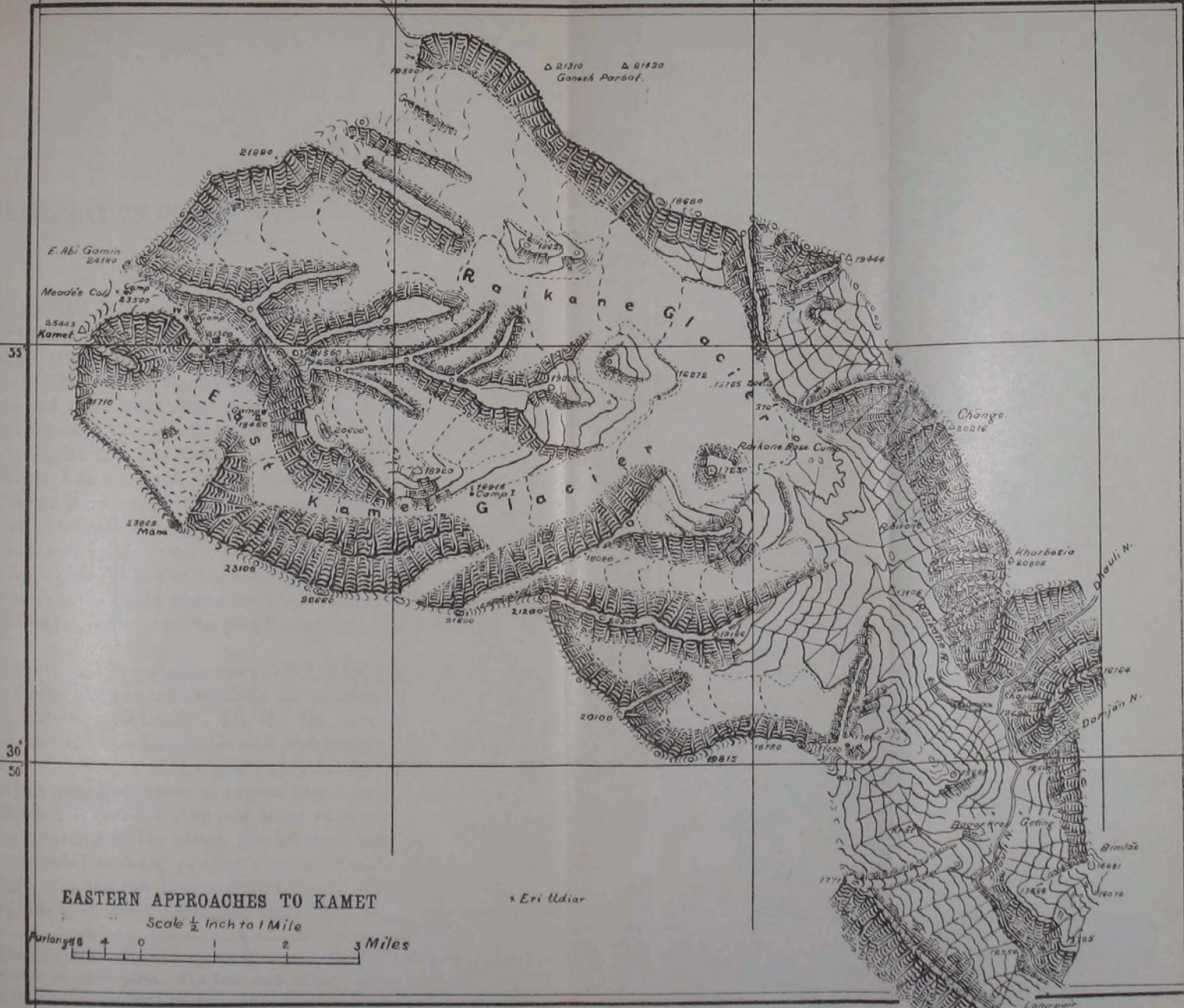
The success of the expedition was due in no small measure to the great help we received from all our friends in Ranikhet, and especially from Mr. Stiffe, the Commissioner, who was untiring in assisting us. In addition we were fortunate in that our objective lay in the Province of our President, H. E. Sir Malcolm Hailey, who showed the greatest interest in our attempt. As usual Colonel H. W. Tobin worked hard behind the scenes in selecting our "Tigers" for us, and Mr. G. B. Gourlay, though himself forced to refuse an invitation to join the expedition, was invaluable in the assistance he gave us in the preliminary preparations in Calcutta.

79° 35'

40'

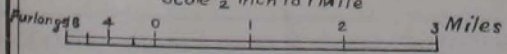
45'

50'



EASTERN APPROACHES TO KAMET

Scale 1/2 Inch to 1 Mile



x Eri Udjar

AN EXPLORATION OF THE ARWA VALLEY, BRITISH GARHWAL

CAPTAIN E. ST. J. BIRNIE

THE ASCENT of Kamet, the chief objective of the Expedition to the Himalaya led by Mr. F. S. Smythe, having been attained, the party, after a short period for recuperation at the base-camp, proceeded to the village of Gamsali, a few miles below Niti in Northern Garhwal, and spent three days in reorganizing stores and supplies. Although we still had a month in hand before we need start on our return to Ranikhet, it was decided to send a large proportion of our heavy kit to Joshimath and remain equipped only for high altitude work. Accordingly twelve loads were despatched to Joshimath in charge of Lance-naik Randoj Kan. Eighteen, under L.-N. Budibal Guru, were sent by the lower Dhauli gorge to Mana, there to await our arrival, while the rest of the expedition left Gamsali on the 5th July to explore the Banke glacier for a high route across the range to the Mana valley, indications of a pass having been noted by Mumm in 1907.

On the second day a camp was pitched at Eri Udiar within sight of the Banke glacier; unfortunately an accident to Smythe now delayed matters considerably. On the 7th July Holdsworth and Shipton climbed a very formidable rock peak north of Eri Udiar with a view to getting a sight of this pass; they did not, however, see any place which gave them cause to suspect that a route could be found. Actually on this occasion they just failed to reach the summit, but Shipton, returning to the attack the following day with the porter Nima, succeeded in doing so after some excellent and difficult rock climbing*. On the 8th Beauman and Greene ascended the Banke glacier. Lack of time prevented them from going far, but they

* The old Survey of India map, 53 N, showing the glaciers south of Kamet is inaccurate in these parts. The best map of the Banke glacier at present existing is that accompanying Dr. Longstaff's paper in the *Geographical Journal*, vol. xxxi, 1908. The actual summit climbed is difficult to identify, but it is possibly the one shown with a height of 19,815 on Longstaff's map, which I have put on the map accompanying Captain Birnie's paper on the Kamet ascent, and which is situated at about lat. 30° 50', long. 79° 44'.—Ed.

reported that there was no chance of crossing the range as far as they could see. Greene, however, reports that the ridge leading northwards to the Mana peak dips considerably before joining that mountain. It was impossible to see round the corner, but this depression may possibly be the pass indicated by Mumm.

As the exploration of the tributaries west of the Mana valley was now our chief consideration, Smythe decided not to continue the search for the pass, but to make directly for Badrinath and Mana, crossing by the Bhyundar Khanta pass to the Thiapap-ka-bank glacier. The pass is reputed to command a magnificent view of Gauri Parbat and Hathi Parbat, but a biting cold wind, driving snow and mist prevented any view and sent us quickly over. The pass presents no difficulties, but under the circumstances the route down to the Thiapap-ka-bank glacier was not easy to find. We now descended into the beautiful valley of flowers already described by Longstaff and spent the second day in camp at Bhamini Daur surrounded by flowers of every description*. No better place than this could be imagined for a Himalayan holiday, providing as it does what is so rare in the Himalaya, the combination of grassy glades and streams with the rock, snow and ice of giant peaks in close proximity.

Before leaving the valley we discovered that a shepherds' track exists, running from the Bhyundar Khanta pass along the range north of the Thiapap-ka-bank valley. The first camp is pitched close under the ridge at over 17,000 feet. The next day it is necessary to make a long march of approximately ten hours to reach the Mana valley after crossing the ridge. As we had already descended into the valley we took the very obvious pass to the west and camped on a small grassy plateau a thousand feet above Hanuman Chatti, reaching Badrinath and Mana the next day. I must mention here that down the gorge of the Bhyundar stream, mentioned by Longstaff, there is now a goat-track running due south from Bhamini Daur, passable for coolies and eventually leading to the Badrinath pilgrim-route some seven miles north of Joshimath.

* "The hillsides were snowy with anemones, like the narcissus fields about the Lake of Geneva. There were countless potentillas, yellow nomicharis, king-cups with single and double flowers, the beautiful Himalayan blue poppy, geraniums of two kinds, forget-me-nots, pale blue borage, mauve polemonium, crimson orchids, rosy-coloured cypripedium, dwarf larkspur, and clumps of great purple asters. Holdsworth, our botanist, discovered no fewer than ten varieties of Alpine primula, among which were the tiny stemlets of *primula reptans* and *primula denticulata*, *primula involuceata*, and *primula androsace*".—F. S. Smythe. in *Geographical Journal*, vol. lxxix, January, 1932.—Ed.

After two days' rest at Mana we started on our journey to visit the glaciers west of the Mana valley. Smythe had decided that as the Alaknanda glacier valley had already been visited to its head by Meade, it would be more interesting to try and establish a crossing of the Great Himalayan watershed into Tehri-Garhwal in the entirely unknown area at the head of the Arwa valley*. We accordingly pitched camp on the opposite side of the river to Gastoli on the main route to the Mana pass on the 15th July. Turning westwards up the Arwa valley on the following day we soon found ourselves in uncharted regions, the glacier shown on the Survey of India map some three miles from Gastoli being non-existent. It was not till the next day at a point about seven miles from Gastoli where the valley takes a direct turn to the north that we found ourselves faced by the snouts of five glaciers flowing into the valley in a semi-circle. Being now above the wood-limit we formed our base-camp at a very excellent site selected by Smythe, directly opposite the snout of glacier "3", as shown in the accompanying sketch and map. This camp was situated at a height of 16,300 feet† and was conveniently central for the exploration of all the glaciers around us. Here we dismissed the majority of our porters, keeping only fifteen for high-camp work and twelve to maintain the wood supply and communications between the lower camps.

On the 18th July Smythe, Shipton and Greene climbed a peak of 19,300 feet to the east of camp in order to sketch the country and to look for a likely pass. Meanwhile Beauman, Holdsworth and I ascended glacier "5" to a height of approximately 19,000 feet from where we obtained a close view of the 20,000-foot pass to the west, which we eventually used in the first crossing of the range; we were also able to sketch the four glacier-systems, "5", "6", "7" and "8". On our return we compared the sketches and observations with the result that Smythe decided to form Camp I on the rock ridge we had reached between glaciers "5" and "6". It may be mentioned here that this camp was on a level with glacier "5", while "6" was eight hundred feet below, down a steep slope.

Camp I was established on the 19th July. Holdsworth on ski accompanied the porters up the glacier, while the rest of us climbed

* Above Mana the valley leading to the Mana pass is known as the Saraswati. From this village the name Alaknanda is applied to the enclosed tributary which drains the Satopanth peaks of the Badrinath range and enters the main valley from the west.—*Ed.*

† The height 18,200 on the sketch-map is a misprint.—*Ed.*

the ridge dividing the two glaciers, a route not to be recommended owing to a steep and very tiring scree slope, but we were able to take many photographs and to check and improve our map. That evening we witnessed the most glorious sunset. To the east the sky turned a beautiful turquoise blue, light-rays were thrown out as if the sun were setting in the east instead of in the west; these rays slowly rose higher and higher as the sun sank, the sky changed to purple and mauve, to the south a lovely storm cloud showed up salmon-pink in colour. Then the clouds rolled back and for a short time Kamet and the Mana peak in the east stood out still catching the sun's rays, after all the other peaks were wrapped in dusk.

On the 20th Smythe, Holdsworth, Shipton and myself started early for the col a mile and a half west of the camp. We found the snow hard and reached the foot of the col in an hour. We now had an anxious half-hour until we reached the crest, for we were not certain that this was the boundary between Tehri and British Garhwal. However we were not mistaken, for on breasting the col we saw a long glacier (No. "11") running practically north and south. At its southern end this glacier turns sharply to a point slightly north of west and must join the Gangotri glacier after a short distance. Holdsworth returned to camp on ski, while Smythe and Shipton decided to climb the peak (20,800 feet), the southern ridge of which rises directly from the col*.

Taking Dorje with me I crossed the watershed and descended to glacier "11". The route is steep with occasional ice and a bergschrund to cross some five hundred feet below the crest, but it is quite practicable for laden porters if roped. After continuing my survey from the centre of this glacier we turned northwards to reconnoitre a col over which appeared to be a route leading back to the westerly branch of the two glaciers leading down to the Arwa valley (No. "6"). Unfortunately it started to snow, and thick mist made it impossible to see any distance. Reaching a snow ridge overlooking glacier "6" we descended a steep rock rib which would be impracticable for laden porters; it was somewhat dangerous also, owing to the overhanging ice-falls above it.

When we were down the arête the weather cleared and we saw what appeared to be an easy snow route over the glacier leading to the Gangotri about half-a-mile north-west of the point where we had crossed. This col has since been seen from both sides and appears

* 20,500 feet on the sketch-map.—Ed.

easy, but it requires further reconnaissance. The walk down to a point on the glacier, eight hundred feet below camp, was quite tiring in the soft snow, and the final climb up a steep slope of rock and scree was an unkind end to an otherwise very interesting day.

The weather now turned from bad to worse. However, on the 22nd Smythe and Shipton, with the porter Nima, started at 7-10 A.M. for the head of the glacier, to attempt the beautiful peak which we afterwards named "Avalanche Peak" and the height of which we assessed by aneroid to be 21,600 feet. I followed an hour and a half later with Dorje as I did not wish to expose my feet to the cold too early. As we crossed the glacier I could see Smythe's party making its way up the very steep corniced snow-slope in the re-entrant directly east of the peak. Simultaneously Beauman, Greene and Holdsworth were leaving camp to climb the rock peak (20,300 feet) west of camp, the ascent of which proved to be quite easy.

Arrived at the foot of the snow-slope we found the most amazing ladder of steps up it; however, as the snow was firm and held well, nothing could have been nicer. Cutting through the cornice at the top we found ourselves looking down at the upper portion of glacier "4", to which we were forced to descend for about two hundred feet before turning north-west towards another corniced snow-wall which Smythe had again taken straight. There was another excellent ladder of steps which came as a great relief after plodding through the now softened snow of the glacier. On the ridge I found some sardines left for me, so taking off my boots I warmed my feet and partook of lunch while awaiting the return of the climbers. Soon their voices could be heard through the mist and snow which had now begun to fall. They did not bring very encouraging news, for where they had been able to kick steps on the ascent, the sun had melted the snow and they had found dangerous ice on their return. As, however, it was now snowing again and getting colder, I decided to make the attempt, after promising Smythe to turn back if the conditions proved dangerous. He and Shipton insisted on staying on this col until they should learn by a pre-arranged signal that all was well.

Starting with Dorje I very soon came across the ice conditions reported. However, we cut great "soup-plates" across the icy parts and tried not to look down the A. P. slope to our left, for a slip here would have carried us down two thousand feet. Twice we nearly turned back, but the continued snow and cold convinced me that the descent would be easier and safer later. After an hour and a half of

very steep climbing the slope eased off, and a short walk brought us to a summit well worthy of the mountain, for it fell away sharply on all sides and must give one a distinctly airy feeling on a clear day.

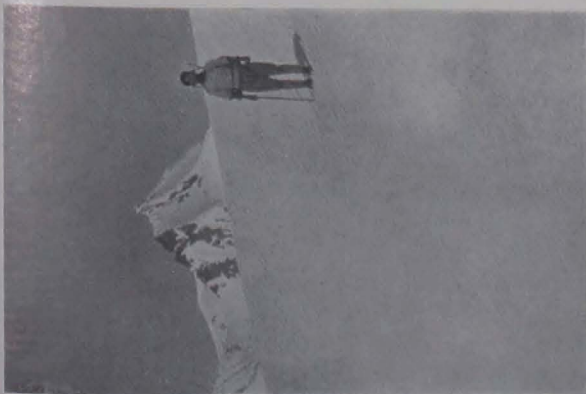
It was now snowing hard, so we started the descent, immediately finding the conditions greatly improved. The snow lay thicker and held firmly on the steep ice. An avalanche was the chief danger to be feared and we tried to avoid it by keeping as close as possible to the corniced west edge of the ridge. In spite of this I think the top six hundred feet of this climb under these conditions are certainly amongst the most sensational that I have undertaken. The porter Dorje was steadiness itself throughout all the trying pitches and used the rope intelligently.

It was a long trudge to camp through the softened glacier snow. On arrival there I learnt that in descending the last steep snow-slope Smythe had started an avalanche while glissading and was carried down the slope and flung across the bergschrund. Almost immediately a second avalanche started by Shipton had descended on him. Smythe had been completely swamped by it, and when extricated was extremely lucky to escape with only a fractured rib. He had an unpleasant journey getting into camp.

It was now decided to split up into three parties of two each. Holdsworth and Shipton were to base themselves on Camp I in order to climb and report on the country north of glacier "6", Beauman and Greene were to return to Mana and proceed up the Alaknanda glacier valley, and Smythe and myself were to cross the watershed into Tehri-Garhwal and attempt to find alternative routes back; if time permitted we would search for a return route to Mana via the Alaknanda glacier valley.

Accordingly Smythe and I started on the 24th July with nine porters and rations for seven days. Unfortunately we had barely gone a mile before Smythe found that his fractured rib was giving him such trouble in breathing that there was no alternative for him but to return to Camp I. I afterwards heard that he had suffered considerably and was carried down to the base-camp, where he joined Beauman and Greene.

Continuing with six porters I found the pass with great difficulty owing to thick mist and snow which was driving down on us with a bitterly cold wind. It was a most unpromising day on which to start the exploration of a new area, but as we had had six days of continuous bad weather it was hoped that a change would now favour us. We built a cairn on the pass and started a direct descent of the



Photo, Capt. E. St. J. Birnie.
AVALANCHE PEAK, c. 21,600 FEET.



SATOPANTH PEAKS AT THE HEAD
OF THE ALAKNANDA.

far side by a route which Dorje said he had reconnoitred while we were building the cairn. This ended with twenty feet of ice falling sheer to the bergschrund below, into which the last four porters went headlong. We dug them out unharmed and continued down the glacier in thick mist and snow until we found ourselves completely surrounded by crevasses and seracs. Luckily now, at four o'clock, the mist cleared and we were able to pick our way through the intricate ice-falls of this glacier to the moraine, passing a beautiful ice-cave and lake *en route*. We camped where the glacier turns westwards and is joined by another from the east. While tents were being pitched (Camp II) and dinner prepared Kesar Singh, who had previously accompanied Greene and me on our ascent of Kamet, surveyed this glacier (No. "10"). We could see a snow ridge at its head, which Kesar Singh insisted was a double pass (by local superstition only), with a descent north-eastwards to the Arwa valley and south-eastwards to the Alaknanda.

The beautiful twin summit of Satopanth (23,240 feet)—incidentally the only triangulated peak in this area—being now directly south of my camp and also almost exactly west of this ridge suggested that there was every possibility of there being some foundation for this story. I therefore decided to remain based on Camp II and to reconnoitre the circle of mountains surrounding the glacier on the 25th July.

After a very cold night we woke to a perfect morning, but it was some time before I could thaw my boots. As Dorje was now in charge of my cooking, I decided to take with me the local porter Gian Singh, whose home was at Gamsali, and who had proved himself the steadiest of the local men. We used a yak-hair rope instead of an Alpine rope and found it absolutely satisfactory and much lighter. In fact for all work not entailing serious rock climbing it is to be recommended*.

We found the snow in wonderful condition and making rapid progress we reached the base of the ridge in two and a half hours. This proved to be much too steep to climb, but making a detour towards the peak north-eastwards we forced a way up a very steep snow-slope above a big bergschrund and struck the ridge some two hundred feet above the col and just below a place where there is a cornice fully thirty feet thick. It was disappointing to find that this route led to glacier "3", which quite obviously swung back into the

* It depends on the yak-hair rope. There are yak-hair ropes and yak-hair ropes! As editor of this Journal, I do not like to see this remark in print without emphasizing that only the best Alpine rope is good enough for the Himalaya and such rope is unobtainable in India.—*Ed.*

Arwa valley. Moreover, though it would be quite possible to descend to this glacier, the descent on both sides of the ridge must certainly be classified for climbers only. A party of porters lightly laden and well supported by experienced climbers would, no doubt, also be able to effect a crossing, though it cannot be recommended. Before returning to Camp II we visited the ridge dividing glaciers "10" and "4". The ascent from glacier "10" is an easy walk on snow; the descent to glacier "4" is steep, but several routes could be found. In fact, a crossing of the watershed by this route would probably be the best and shortest from the Arwa valley to the Gangotri.

I had meanwhile sent Kesar Singh and a porter called Chonu down towards the Gangotri glacier, but found them rather vague in the information they brought back. On the 26th we continued westwards towards the Gangotri glacier over rock-strewn hillocks of moraine. The easier routes at the foot of the mountains were so dangerously overhung with ice-falls that it was necessary to keep at a safe distance from them. Moreover the mountains to the north were composed of a dark red rock which peeled off in an almost continuous bombardment as soon as the sun had risen. After a mile a large glacier (No. "9") joined in from the south. From the map it appeared that any crossing of the watershed south of the Satopanth peak must lead to the Alaknanda glacier valley. I therefore decided to ascend glacier "9" to its head and attempt a passage, though I realized that if a crossing existed it would not be the one by which Meade had once ascended from the Alaknanda valley. Looking westwards from the point I had reached I could see the moraine of the Gangotri glacier coming in from the south some five miles away.

Turning now up glacier "9" we were soon clear of the tiring moraine and swinging eastwards with the glacier soon perceived an easy col south-east of the Satopanth peak. We pitched Camp III on a rock rib almost directly south of this peak, surrounded by an amazingly beautiful circle of others*. We had now reached the

* Colonel Sir Sidney Burrard writes: "When Captain Hodgson and Lieutenant Herbert visited Gangotri in 1817, they named four prominent snowy peaks standing near the head of the glacier, St. George, St. Andrew, St. Patrick and St. David: these names have now fallen into disuse and it would be a pity to revive them: the four peaks of Hodgson and Herbert can be identified with the group, known to modern geographers as Satopanth". (*A Sketch of the Geography and Geology of the Himalaya Mountains and Tibet*, page 138). It seems probable, though without access to the writings of Hodgson and Herbert it is impossible to say for certain, that these peaks mentioned by Captain Birnie are identical with those referred to by those travellers more than a hundred years ago.—Ed.

furthest point to which we should go, for Camp I and the base-camp were now being evacuated to Mana, and after the next day's reconnaissance we would have only three days' rations left. These would only be just sufficient if the crossing failed and we had to retrace our steps to the base-camp. I had arranged for a box of 20 lbs. of *ata*, rice and *sattu* to be left on a rock for our return journey from there to Mana. A similar amount of food was being carried up the Alaknanda valley in case we succeeded in forcing that route. There are two beautiful snow peaks directly south-west of Camp III, which I believe to be those seen from Mana at the head of the Alaknanda.

Again selecting Gian Singh to come with me I started on the following day to reconnoitre the col to the south-east. We soon found the route steeper than we had expected and the snow was so hard that we had to cut some two hundred steps. Much dodging of seracs and ice-falls was required, and half-way up a large crevasse was encountered which luckily was safely bridged.

This is a most imposing route. Tier upon tier of snow ledges, connected by steep winding snow-slopes, each terrace edged with an ice precipice, form a gorgeous foundation for the Satopanth and other lovely peaks which rise above it. We reached the col in four and a half hours, the final gently sloping snow-fields at the top giving rise to great hopes of an easy descent to the Alaknanda. But we were again disappointed. The gentle slopes ended abruptly at an almost perpendicular snow-slope of quite two thousand feet leading to a glacier (No. "2") which again swung round into the Arwa, after being joined by glacier "3". To the south we looked down into the Alaknanda, which was separated from us by only four hundred yards of precipitous rock and ice. Peering over the cornice I found eventually what looked like a practicable, though very steep, route down to glacier "2", but it would be necessary first to cut through fifteen feet of the cornice to a snow ledge below, and all would depend on the absence of ice on the descent. I spent some time throwing snowballs down the slope and as most of them fell firmly into the snow I decided to attempt the crossing on the following day.

Pledged to return to Mana by the 30th July, there was no time for further reconnaissance, so we signalled to our camp below and soon saw it start on its way to a small snow hollow about three hundred feet below the col. This had been selected for the site of Camp IV and was practically the only place on the route safe from falling ice. The day was perfect and the panorama from the col, which is approximately 20,500 feet above sea-level, is magnificent and certainly equal

to that from the Kuari pass. The whole of the Kamet group is viewed from its south-western side and presents a splendid spectacle. I spent the five hours waiting for the camp in mapping the area, and joining my sketch of this with the portion I had already contoured. The Sherpa porter Dorje was splendid; carrying the heaviest load he arrived half an hour before the others, pitched my tent and theirs on their arrival in addition to cooking me an excellent meal.

The 28th proved again a perfect day. We started late and reached the col in half an hour. Kesar Singh went down on his knees at his first sight of Kamet since his ascent of it. I was anxious to get the porters safely down the two thousand feet of steep descent to the glacier, so quickly lowered them one by one over the cornice to the snow ledge fifteen feet below. Roping here I found that two men, Kalu and Gian Singh, had left their ice-axes behind at Camp I, while another, Thelu, was shod in the local blanket and rope shoes. This was certainly a poser; I suppose I should have noticed it before; the men had all kinds of excuses. The snow however seemed to be in a thick firm condition and I decided to continue the descent. Placing the culprits where we could best hold them in case of a slip, we proceeded slowly down the almost precipitous snow-slope and reached the glacier below in three hours. The greater part of the way was absolutely safe, but there were occasional patches of ice which we carefully avoided, after I myself had shot down a couple of them; I was well held by Dorje.

Looking back, our route certainly appeared most sensational and I doubt whether it would have been considered practicable from the Arwa side; yet this pass would always be passable for porters laden up to 40 lbs., provided they were properly equipped and roped and that great care was taken throughout the route. The condition of the snow should, however, be carefully reconnoitred first. These remarks refer only to the route taken in the Gangotri-Arwa direction. I do not think the reverse way practicable, for the highest camp that could be pitched would still be too far from the col.

We camped on the first moraine rocks at about 17,000 feet. The porters behaved splendidly throughout the crossing. It took us four hours of scrambling on moraine to reach the Arwa valley on the 29th. There we met four porters going up to the base-camp to bring down the last loads and learnt that Holdsworth and Shipton had passed through the day before. They had climbed three more peaks, two of them over 21,000 feet, and that portion of the map north of

SKETCH MAP OF GLACIERS AND PEAKS AT HEAD OF THE ARWA VALLEY AND ACROSS THE WATERSHED IN TEHRI GARHWĀL



Scale 1 inch to 2 Miles Approximate
Furlongs 8 6 4 2 0 1 2 Miles

From a sketch survey by Captain E.S.J. Biswiz
Sam Browne's Cavalry Kamet Expedition 1931.



- Routes ————
- Passes Reconnoitered =
- Peaks Climbed +
- Camps Δ
- Boundary between Garhwāl District and Tehri Garhwāl State - - - - -
- Contours 250 Feet

glacier "6" has been completed from sketches and data supplied by them. I have unfortunately no record of their climbs. Their routes to the two peaks north of glacier "6", and the one peak between glaciers "4" and "5" are marked on the map. From their descriptions some splendid climbing was encountered, Holdsworth partially using ski. The porters Nima and Ang-Nerbu accompanied them in turn*.

Returning to Mana on the 30th I found everyone assembled there except Shipton, who with his untiring energy had found some other peak to climb. Smythe and Greene had started up the Alaknanda valley, but an accident which involved the loss of nearly all their rations had forced them back.

At the request of His Holiness the Rawal of Badrinath Temple we moved camp to Badrinath on the 31st, and after a day during which he received us most hospitably we started on our return to Ranikhet, parting with great regret at Joshimath with our six local porters who had done us so well among the snows of Kamet and Badrinath.

* For brief accounts of Holdsworth's and Shipton's explorations between the 25th and 30th July, see *Geographical Journal*, vol. lxxix, January, 1932.—*Ed.*

MY EXPEDITION IN THE EASTERN KARAKORAM,
1930

PROFESSOR GIOTTO DAINELLI

MY TAKING part, as geographer and naturalist in the De Filippi Expedition of 1913-14,—the expedition of longest duration, widest organization and largest programme of scientific research ever made to the Karakoram—had left in me such a strong desire to return, that one fine day I worked out a programme for an expedition of my own.

Of course, there was not only my longing to see again those magnificent mountains. There was also the wish to fill in some blanks in our knowledge of the whole region, which had remained with me ever since those long months of travel, when, with the absolute and most complete freedom of action granted me by my chief, De Filippi, I had been able to traverse all the valleys from Skardu in Baltistan as far as the Pangong lake and the high plateaux of Aksai-Chin, and to reach many of the large glaciers of the Karakoram.

But one valley, in particular, had remained outside the area of my travels: the Nubra valley. And at its head there is the gigantic tongue of the Siachen, the largest glacier of the whole range. Nothing was known of the geology of its immense basin, and this gap in our knowledge was of no small importance for the reconstruction of the geological structure of the Karakoram and for the history of its formation and upheaval. There was still the connexion to be made between my researches further east, in the upper Shyok valley and in the Rimo basin, and those made towards the west by an old pupil of mine, Dr. Ardito Desio, in the basin of the Baltoro glacier and in the Shaksgam valley⁽¹⁾, and by myself in the Kondus and Saltoro valleys. As regards the vicissitudes of a recent geological past, upon which the shape and peculiarities of existing mountains essentially depend, I wished to have, also for the Nubra valley, confirmation of the reconstruction which I had already traced for the entire region

⁽¹⁾ *Geographical Journal*, vol. lxxv, p. 404; *Himalayan Journal*, vol. iii, p. 102.



Photo, Giotto Dainelli.

PEAK 36, HEIGHT 25,400 FEET, WESTERN SIACHEN.

between the Kashmir basin and the main range of the Karakoram. Moreover, in the Nubra valley there lives a population which I supposed to have different characteristics from those of the remaining inhabitants of Ladakh; and, by means of anthropometrical measurements, I wished to bring a new contribution to the ethnical knowledge of the region, which was already founded on a solid basis by my former measurements, which amounted to four hundred and fifty. I believed also that there might be some difference in the manifestations of life in general, for instance, in that essential element which is given by the characteristics and type of dwelling.

These were therefore the chief lines of my programme: to which evidently the geographer and naturalist traveller would impose no definite limitations, since everything on such occasions is to be collected: minerals and rock specimens, fossils and plants, anthropometrical measurements and meteorological observations. There was another part of this programme which exercised a special attraction. The Siachen glacier could not be called unexplored; but unknown was still its actual connexion with the neighbouring Rimo glacier.

I may be allowed to recite briefly the history of Siachen's discovery and exploration. The upper Nubra valley itself had seen few European visitors and was known to be difficult of access, on account of the numerous fords. Of the old travellers only Moorcroft, in 1821, had reached it, followed by Vigne in 1835, Thomas Thomson and Henry Strachey in 1848, and Drew a few years later*. Then we come to recent times, signalled by some unsuccessful attempts, and by two successful ones: those of Longstaff in 1909 and of the Vissers in 1929.

Of the old travellers only Strachey ventured on to the glacier, but even he turned back after about two miles on account of the difficulties encountered on the way. And since his time till Longstaff's visit the Siachen was shown on maps with very modest dimensions, since it appears to anyone approaching from the head of the Nubra to be cut short by a large rocky wall.

It was in 1909 that Dr. Longstaff, coming from the Saltoro valley and ascending the Bilaphond glacier to the top—the Bilaphond La or Saltoro pass—descended another glacier on the far side and discovered that this joined an immense glacier, hitherto unknown. At the time he could not see the end of it and found it difficult to ascertain

* The upper Nubra valley was first surveyed, though only approximately by Mr. E. C. Ryall, Survey of India, in 1862.—*Ed.*

its general direction. Following Sir Francis Younghusband's suggestion, Dr. Longstaff ascended the Nubra valley a few months later—as soon as the river allowed him to do so—and reaching the Siachen snout, ascended the glacier for a few miles, to a point whence he could recognize in the distance the great mountains which he had seen, a few months before, enclosing the head of his unknown glacier. Thus the immense size of the Siachen was first discovered; Dr. Longstaff made a sketch-map of it on the scale of 1 : 500,000, which, considering the rapidity of his travels and the huge area of the glacier, is astonishingly accurate in its topography⁽²⁾.

Dr. Longstaff's tracks from the Saltoro valley were followed in 1911 by the Workmans, who considered the Siachen glacier worthy of a whole expedition. They returned by the same route the following year, 1912, remained on the glacier less than a month and a half, made a good map of it on the scale of 1 : 175,000, and left it again towards the west⁽³⁾. They affirmed, however, the inaccessibility of the glacier from its tongue, and attempted to find a pass eastwards to the Rimo. Though they were unencumbered by a caravan and had excellent Alpine guides, Rey and Savoye, they were driven back by the difficulties encountered, which they described as insurmountable. In 1929 the Vissers ascended the glacier from its tongue for some five miles and then left it to explore a large valley draining into the Siachen from the east⁽⁴⁾.

Thus I was induced to include in my programme some real exploration, liable to present some difficulties: I planned to climb the entire Siachen glacier from its tongue and to quit it towards the Rimo by way of its affluent, the Teram Shehr, and by that unexplored pass at the head which the Workmans had attempted but failed to reach, taking with me my entire laden caravan.

I should here mention the fact that my expedition was organized on my personal initiative: I did not ask for, nor did I have, any help from societies or special committees. The knowledge which I had gained of the region and of the people allowed me to do without caravanbashis or interpreters—as I have always done without them—and I managed my men myself. According to my original programme my companions would have been three; Miss Ellen Kalau, a strong alpinist and ski-runner, belonging to a family of travellers and

⁽²⁾ *Geographical Journal*, June 1910, p. 622; map p. 744.

⁽³⁾ *Geographical Journal*, February 1914, p. 117; map p. 148.

⁽⁴⁾ *Himalayan Journal*, vol. ii, p. 109; vol. iii, p. 13.

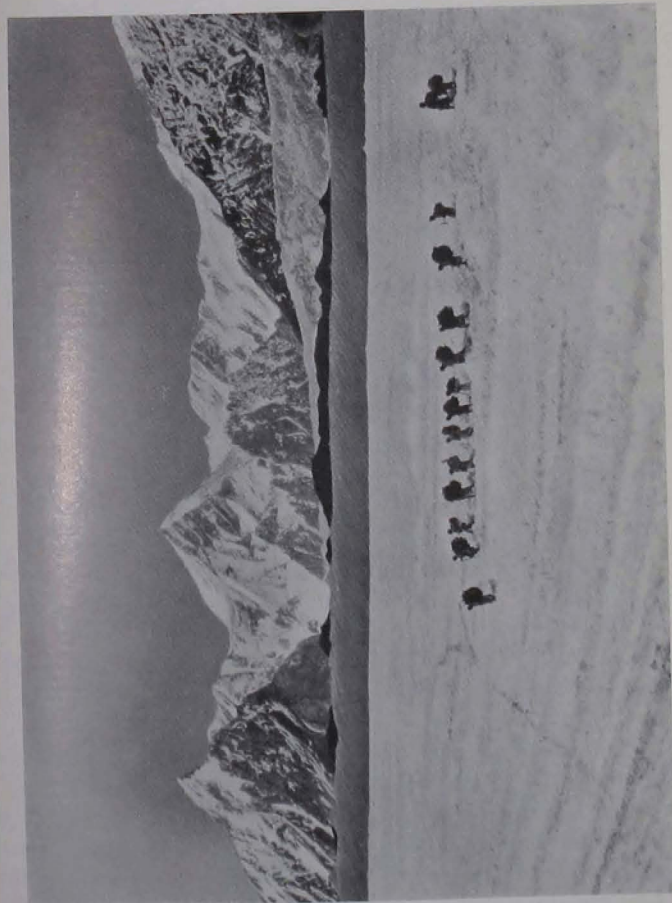


Photo. Grotto Dainelli.

CROSSING THE UPPER SIACHEN GLACIER

PEAKS 45 AND 44, HEIGHTS 22,360 AND 23,630 FEET, IN BACKGROUND.

naturalists, and to whom I intended to entrust the following tasks : secretarial work, the domestic management of the camp, so to speak, and botany ; Dr. Desio, my former pupil, who was already acquainted with the region, and to whom I would have entrusted the geological researches, under my guidance ; and Hashmatullah Khan, formerly Wazir-i-Wazarat of Ladakh, an old acquaintance of mine, who would help me particularly to make the necessary supply arrangements for the coolies, whose food had to be brought up in the shortest possible time. At the last moment Dr. Desio's duties in Italy obliged him to renounce joining the expedition. Hashmatullah Khan showed himself a perfect helper in the tasks entrusted to him ; and Miss Kalau revealed qualities even superior to expectations, guiding flying caravans to the food and fuel depot on the Siachen, often doing two and even three stages in one day when necessary, without accident or incident along itineraries absolutely new to her.

One characteristic of my expedition was indeed the extreme rapidity of its advance. I left Florence on the 9th of April, 1930, with all my baggage, personal equipment and camp outfit ; at Bombay we picked up the provisions, which had been sent ahead from Italy to the Army and Navy Stores, already systematically distributed in boxes on a plan I had worked out. Everything travelled with me to Srinagar. There we halted for a few days to prepare the 180 loads for the coolies. The Zoji La (pass) was officially closed ; recent snow-falls and avalanches had blocked it, and no caravan had passed as yet. Mine was the first to do so : and on the 9th May—exactly one month after my departure from Florence—the pass was crossed by my small company and by all the loads. It was by no means an easy matter.

After the crossing, the rate of travel did not diminish. The summer season, suitable for glacier exploration, is short. The Siachen had to be reached before the melting of the snows caused too great a rising of the Nubra waters. Rapid marches, therefore, were made towards Leh, with only one deviation to Timosgam, where I hoped to find some of my old and faithful coolies of sixteen years before, and where indeed I engaged forty permanent coolies for the summer campaign, partly from Timosgam and partly from Tia*. At Leh, a few days' halt to give the final touches to my caravan : trustworthy men were sent ahead into the Nubra valley to buy wheat and barley

* The porters of Timosgam (Timis) and Tia have been found to be the hardiest and most reliable for glacier and mountain travel in the whole of Ladakh.—*Ed.*

flour, fowls and eggs. At Leh I bought tea, butter and salt, and on the second day I started sending the bulk of my loads to the Chang La, which was still under heavy snow. After five days at Leh I left with the camp and crossed the snow-bound Digar La on foot and under bad weather conditions. In the Nubra valley I picked up the provisions previously ordered there, thus reaching the Siachen tongue, with all my baggage, a caravan of seventy coolies and six-and-a-half tons of food for the men, carried by an additional caravan of ponies and supplementary coolies. On the 9th of June—exactly two months after my departure from Florence—I was heading for my first depot up the glacier. I hope my English colleagues will appreciate this rapidity of execution, which I consider a record !

Progress on the glacier was naturally slower : indeed I could not augment my means of transport, and my loads, especially those comprising provisions for the caravan, were very numerous. I kept on bringing forward the camp, and sending back the men, on the same day, to the preceding camp ; on the second day the men came up again with other loads and returned immediately ; on the third day they arrived again with other loads. On the following day I advanced with the camp. Thus three days were needed for every stage ; but I was able to bring along with me the greater part of my loads, although some had to remain in depot at the mouth of the glacier.

In fifteen days I thus covered about half the glacier, reaching the place where its main affluent, the Teram Shehr, enters from the east. On the junction spur, at a spot well sheltered from the wind but well exposed to the sun, and on ground unusually covered with abundant vegetation of grass, flowers and *burtse*, I established my base-camp, which was to remain there for nearly two months. Thirteen coolies were immediately sent back to the Nubra, in order to diminish the number of mouths to be fed ; I retained fifty-seven.

There was no lack of work at my base-camp. Flying caravans, led by me or by Miss Kalau, had to make depots of food and fuel on the upper Siachen, and as soon as I had any men to spare, I sent them double-marching down to the snout of the glacier to fetch more loads up by normal stages. On their way up they gathered juniper : old dry trunks of this fuel exist as far as my second camp, fifteen miles from the mouth of the glacier, but only on the better-exposed left slopes.

The base-camp was in a particularly favourable position : at about half-way up the Siachen and near the place where the Teram



Photo. Giotto Dainelli.

CROSSING THE TERAM SHEHR GLACIER.

Shehr flows in from the east and the Lolophond glacier joins from the west, this last affluent descending from the Bilaphond La. Climbing the rocks behind my tents for about a thousand feet, I dominated the greater part of the glacier and more completely still its mountain circle, from which K^o, Twin Peaks, Ghent, Hawk, Group of King George, Rose, and the Teram Kangri stand up like real giants, with a beauty never to be forgotten*.

I have already spoken of the advantages coming from the position of my base-camp: plenty of sun, perfect shelter from the wind, spring water, abundance of *burtse*, and an extremely rich Alpine flora, which gave Miss Kalau the opportunity to make an ample botanical collection, certainly the largest that has ever been brought back from the higher regions of the Karakoram. I had already made a collection of Alpine flora during the De Filippi Expedition, but this one is certainly much more abundant and more interesting, because it represents a real oasis of vegetation, completely isolated amidst the surrounding glaciers. The fauna was also extremely rich, both of invertebrates and of vertebrates; amongst the latter the most numerous were the Ibex, which approached our base-camp every day, sometimes in herds of several dozens.

This favourable situation owes its existence to a kind of small inward curve of the mountain ridge, where it descends suddenly just before the Teram Shehr junction. A lateral tongue of the Teram Shehr glacier, in fact, projects into it. This abrupt inward curve of the slope had caused the formation of a small lake between the rocks of the slope and the ice-flow of the Siachen. This small marginal lake was most interesting to watch. Shortly after my arrival its level began to rise. It rose for nearly a hundred and thirty feet, obliging me to move my tents higher up the slope. Again it grew for a while; then it began to fall as if by leaps, until, on the very last day of my stay, it suddenly emptied itself completely, accompanied by crashing falls of ice-masses, thus abruptly deprived of the support offered until then by the water.

My life at the base-camp became somewhat less free from anxiety during the second part. I had established a service of mail-runners, who were to descend every week to the first village in the Nubra

* These names will be found on the Workmans' map in *G. J.* for February 1914, p. 148, and on the one in their book, 'Two Summers in the Ice-Wilds of the Eastern Karakoram'. With the exception of Teram Kangri, they are not accepted officially.—*Ed.*

valley in order to keep me in touch with the outer world. From the Nubra, where I had left Hashmatullah Khan, I had also arranged for further provisions to be sent to the mouth of the glacier where they could be picked up by my men. But the mail-runners who left on the second week found the Nubra river so swollen and impetuous that they risked their lives when trying to swim it. They returned to the base-camp without clothes, and covered with bruises and wounds. Thus I was definitely shut off from the world, in the middle of the Siachen, and a period of uncertainty began for me.

To return by the tongue of the glacier was now impossible; to quit it by the affluent leading to the Bilaphond La—the route of Longstaff and the Workmans—was against my wishes. To succeed I must make the crossing to the Rimo, a detail in my programme which remained an uncertainty, since the pass had been unsuccessfully attempted by the Workmans without a laden caravan and with excellent Alpine guides.

All useless loads were now sent back to the mouth of the glacier. Flour and fuel were sent ahead on the Teram Shehr. On the 7th August I moved camp towards our exit from the Siachen. As I had to bring over a ton of *burtse* fuel with me, there were about three loads for each man, and I was forced to repeat the marching tactics by which each stage required three days. These were later reduced to two, as supplies diminished.

I will here quote what the Workmans wrote about their ascent of the Teram Shehr glacier and their attempt to reach the watershed between the Siachen and the Rimo.

“Seen from the Rose [that is, the Siachen] this glacier [the Teram Shehr] appears to rise gradually for miles, but in reality its higher part was composed of three slopes broken by short snow-terraces, and its whole upper area was cleft by crevasses of a size and depth not met with on the Rose or its other large affluents. A wide plateau was finally reached lying at over 18,000 feet. This white sea is cut up by *schrunds* and *chasms* running in all directions. Leading the caravan cautiously in and out of this maze, we advanced slowly, until Savoye said the responsibility for him was too great, as the caravan might at any moment become engulfed in this vortex of seemingly bottomless chasms. We had wished to reach the end of the plateau, now quite visible, and see if any possible passage existed leading towards the Nubra and Rimo glaciers, but this was no smooth lustrous expanse, such as are some elevated plateaux in Himalaya, but a mountain-devil's snow-continent set with death-traps to entice unwary men into their pitiless jaws” (*).

(* *Two Summers in the Ice-wilds of the Eastern Karakoram*: Fisher Unwin. London, 1917, page 187.



Photo, Giotto Dainelli.

ON THE WATERSHED BETWEEN THE TERAM SHEHR AND RIMO GLACIERS.
(THE ITALY PASS, *c.* 20,100 FEET.)

Added to our uncertainty regarding the route, was the bad weather. For nine days we had snow, thick fog and tempests of wind. But it was necessary to advance all the same, the rise in the Nubra river having left me with limited provisions. Nine days, therefore, we spent trying to avoid, amidst the fog, the more dangerous and crevassed slopes of the glacier, seeking spots where the tents would be least violently shaken by the wind. Yet not the slightest incident occurred, although I could allow my men no day of rest. Through this perseverance came my best reward when, on the tenth day, having arrived just below the pass and overcome every difficulty, the fog lifted and was replaced by perfectly serene and peaceful weather.

The skis we had worn till then brought us nearly to the top of the pass at about 20,100 feet. From there the Rimo descended. I recognized its large basin and the slopes of black schists and pink dolomites. We made a rapid descent down the Rimo and crossed to the northern tongue, whence the Yarkand river rises. Sixteen years before I had found this tongue flattened and easy; now it was swollen and ended in a vertical wall some hundred feet high. On the evening of the 20th August, when I arrived there, I could find no line of descent, and the whole of the next day was spent in finding a way down, by no means an easy matter, especially for a laden caravan.

The difficulties of the journey were thus over. Near the Karakoram pass I found Hashmatullah Khan with ponies and provisions. Two weeks' marching, across the Depsang and the Saser La, brought me again to the Nubra valley. Here I had to stop a few days until all the loads, including those deposited at the snout of the Siachen, were collected. I returned to Leh by the Khardung La and, after a few days' halt, started back by the Stakalung La, the Lachalung La, the Baralacha La and the Rohtang pass, arriving after some twenty marches at Sultanpur in Kulu. In spite of the difficulties met with, not the slightest incident occurred to the caravan, nor did I lose a single animal or leave behind me a single load.

Briefly these are the results of my expedition. I determined the topography at the head of the Rimo near the Karakoram watershed: topography which I supposed to be different from that represented on existing maps. The long glacier assigned by the Indian map as an affluent, from the right, of the Northern Rimo, really forms the chief feeder basin of the Central Rimo; the glacier which, according to De Filippi's map, runs from the south into the head of the Central Rimo, is in reality an affluent of the Siachen, and the pass between

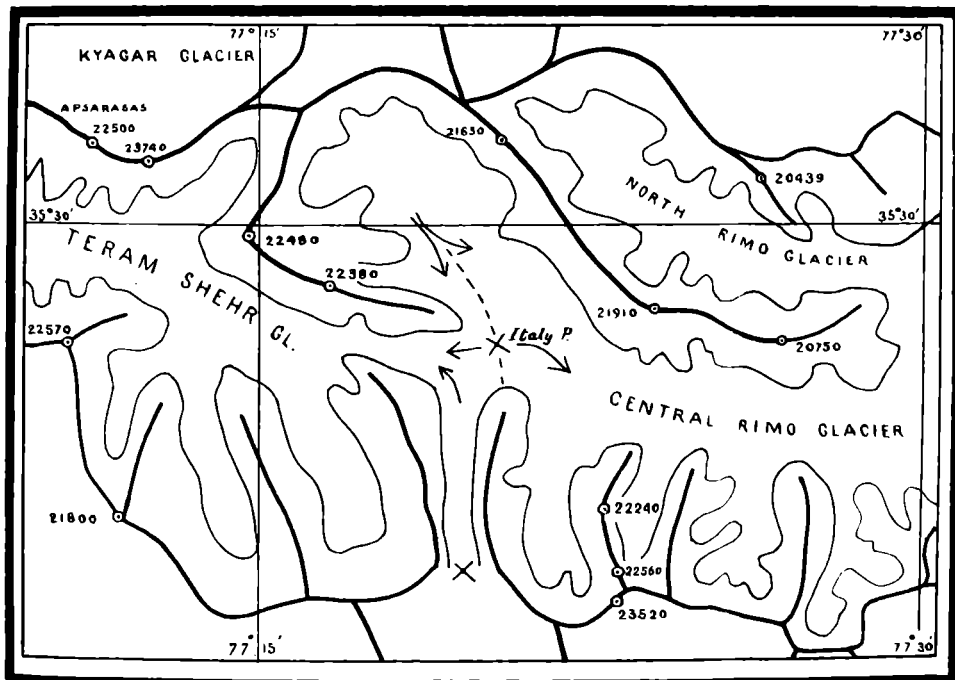
the Siachen and the Rimo is about three-and-a-half miles further east than shown on the Indian map ; the glacier, which the De Filippi map represents as the largest western feeder of the Central Rimo, flows partly into the Rimo and partly into the Siachen, as it descends right on to the broad watershed ; the long and narrow glacier assigned by the Indian map to the south of the preceding one, with a direction from north-west to south-east, does not exist : there is only one glacier and a far shorter one, directed from north to south, and flowing towards the Siachen.

I have collected elements—by which I mean observations on rocks and fossils—for the determination of the geological constitution and structure of the Siachen basin : fossils certainly of the Cretaceous, Triassic and Carboniferous periods. I have enlarged the observations on morphology and on the Glacial Period in the Nubra valley and in that part of the Shyok which was still unknown to me. By means of instruments, I have collected elements for the study of the daily course of temperature, humidity, and atmospheric pressure at the base-camp, at a height of 15,800 feet. And thanks to Miss Kalau, I have been able to bring back a collection of about four hundred and fifty specimens of Alpine flora of the Karakoram.

I have measured a hundred and fifty individuals, in order to extend our anthropological knowledge of the region, already founded upon my previous work ; and I have brought back plans of houses and observations on human geography.

If Dr. Desio had been with me, I would have certainly obtained greater results : because the direction of such an expedition, with all the anxieties it entails, takes up a lot of time and energy. But I cannot declare myself unsatisfied, since I only had the help, though most valuable, of Miss Kalau, and of Hashmatullah Khan.

To the pass between the Siachen and the Rimo, reached and crossed for the first time by my expedition, and nameless until now, I have given the name " Italy Col." I hope that the Survey of India will accept it, in recognition of the contribution made by Italian travellers and scientists to the knowledge of the Karakoram.



HEAD BASINS OF TERAM SHEHR AND RIMO GLACIERS

SKI-ING IN THE HIGH EASTERN HIMALAYA

ULRICH WIELAND *

THE MEMBERS of the International Himalayan Expedition of 1930 did much ski-ing on their way round Kangchenjunga. One pair of ski and sticks for each Sahib had been brought from Europe. At first this part of our equipment caused some transport difficulties. The porters disliked intensely the long wooden boards, which were so awkward to carry on their backs through thick jungle. The sticks, on the contrary, were in great favour, because such handsome straight poles with such fine leather handles could be found nowhere else in Sikkim. The trouble was that the stick was too long for the small people ; also the object of the snow-ring attached to it was not obvious to them ! It was characteristic of our porters that they had their own ideas about everything connected with the expedition, and most of them followed out these ideas with striking persistence. Their aversion for the ski and their liking for the sticks therefore called for our constant attention. The ski were always in danger of being abandoned, and the sticks of being cut short. Fortune was with us, and the whole outfit reached its destination safely, not least owing to the high ability of our transport masters and the otherwise perfect qualities of our porters.

The first opportunity of using ski was as early as our passage of the Kang La. This 15,000-foot pass was still buried deeply under winter snow when we crossed it in April. The first party to cross unfortunately could not use ski, because the leaders had to stamp a track for the heavily-laden coolies. I was lucky to be with the second party and could enjoy ski-ing to its full extent. On reaching the summit of the pass I had to return, and so had a perfect run down on the Sikkim side. When we crossed the pass finally the following day the run on the Nepal side was equally satisfying. I may mention that the difference between the time of descent and that of ascent is considerably greater here than in the Alps. The reason is, of course, that one climbs more slowly at Himalayan altitudes than in the Alps,

* See map opposite page 77. *Himalayan Journal*, vol. iii, accompanying Professor Dyhrenfurth's account of this expedition.

but travels as fast downhill. Snow conditions were otherwise very similar to those we were accustomed to.

One great difference in the Himalaya lay in the behaviour of the spectators. The impression that the swinging and rushing down made on our porters was far from what we had expected. It was one of neither admiration nor fright! The men simply regarded us as perfectly absurd—so ridiculous, in fact, that they sat down and laughed at us, making no effort to hide their gaiety.

Between Tseram and Khunza we had to cross several ridges at an elevation of about 13,000 feet. After climbing to the highest point of this route over rather steep slopes we found the following part quite fit for ski, except the last descent to Khunza, which was as steep as the first ascent from Tseram. Here there was not much use for ski, because the snow showed unexpectedly difficult qualities. It had a very deceptive hard crust above absolutely rotten snow-dust beneath; the crust was so thin as to break at any time, whether we were on ski or not. The snow-dust had almost no bottom, which resulted in a very deep fall from which it was difficult to emerge. Sudden frequent falls on ski at this altitude are very exhausting and we therefore preferred to walk on foot. Similar snow conditions prevailed at only two other places on the whole journey, on the Jonsong peak, and on the Lhonak-Zemu pass, close to Tent peak. However, there were only short stretches of this difficult snow; we can therefore speak of good snow conditions on the whole.

During our attack on Kangchenjunga, ski proved very useful as a means of communication after a good track had been stamped for the porters. From the Base Camp to Camp I the glacier rose very little, but just enough to afford a pleasant slide. From Camp I to both the Camps II, the steep east and west slopes and ice-falls had to be overcome before the large snow-basins above, which were well fit for ski-ing, were reached. The first part of these routes called for some practice and experience in glacier ski-ing, while the surroundings of Camp II in particular formed excellent ski-ing grounds. "The Mouse", a point of 19,000 feet on the ridge connecting Kangchenjunga and Ramthang peak, was climbed entirely on ski; on Ramthang peak itself ski could be used as high as about 20,000 feet with great advantage. The proof of this is the fact that all climbing members of the expedition returned from the neighbourhood of Camp II direct to the Base Camp within a few hours—a two-days' stage normally.

For crossing the Jonsong La, ski were once more a great help, although they could only be used half the distance. The glaciers

descending to the Kangchen and Lhonak valleys are in their lower parts covered with all kinds of rock, from rubble to gigantic boulders. Such a surface makes even walking difficult. But from 16,000 feet to over 18,500 feet and down again to 16,000 feet the snow was very fine and the ski-ing conditions excellent. On the Sikkim side of the Jonsong La ski proved very useful, too, except on the first steep slope.

Later on, when climbing the Jonsong peak, the Dodang Nyima peak, and when crossing the ridge between Lhonak and the Zemu, we could have used our ski with further advantage had there been no transport problem. This factor also prevented us from using ski on the Nepal Gap climb although the ground is very suitable on both sides of the pass.

I may conclude with the following observations drawn from our experiences.

There is no doubt that ski are of great value for an expedition like ours. They facilitate crossing snow-covered areas, thereby saving time and shortening distances. They also add a great deal to the pleasures of the journey. At present, however, their use is very much limited by the fact that the porters cannot run on them. A trained ski-runner alone can enjoy all the advantages of ski-ing. The high regions of the Himalaya will never be training-grounds, and experience and practice must be gained beforehand. This applies both to porters and Europeans. The problem is not difficult for Europeans, because they have their training-grounds in the Alps and elsewhere, and nowadays a mountaineer cannot be considered fully efficient unless he is also a good ski-runner. But the training of native porters presents more difficulties; and as long as a party includes a single man who cannot ski, the rate of progress depends entirely on that man. As on our expedition, a track has to be stamped for the man who cannot ski, and this may be a reason to renounce ski entirely.

The problem can only be solved by teaching the porters, or certainly the "Tigers", how to ski, and this I strongly advocate. As soon as these men are trained, a climbing party will be far more mobile in glacier regions than at present. The fact that the Himalayan Club is about to build a hut somewhere in the Eastern Himalaya—for the training of ski-runners I would prefer the upper Lhonak valley—will aid this task considerably. Ski and sticks may be stored there and need not be carried backwards and forwards through the Sikkim jungles. There is no reason why the inhabitants of the

Himalaya should not produce as good runners on ski as the Tyrolese or Swiss mountain peasants to whom ski-ing was brought by men of the plains. At first they objected, then they became interested, and now they are the best ski-runners on earth, having surpassed their former teachers. Why should not the same development take place in the Himalaya ?

Summarizing, I might say that one can enjoy high mountain ski-ing in the Himalaya as much as in the Alps. The upper Lhonak valley should become a great training-centre for ski-ing and for ski-touring. Moreover there is a suitable landing-ground for aeroplanes in the vicinity !

BY SHONTHAR GALI TO RAMA, ASTOR *

CAPTAIN J. BARRON

IT WAS on the 21st May 1931 that my wife and I left Srinagar by car for the Lolab valley. I had sent my servant and the bulk of my kit three days ahead, by lorry to Sopor and thence by ponies. There is a *pukka* road as far as Sopor (30 miles), whence a *kachha* forest-road, in wet weather passable only with considerable difficulty for motors with chains on the wheels, leads to Khurhom, a distance of 38 miles. This road passes Handawor and follows the beautiful Lolab to a forest bungalow at the foot of the hills in the north-east branch of the valley. We were lucky to have a few days' fine weather before starting, which restored the surface to a decent condition after recent heavy rain. Except at one or two places in the shade, the road was good, though at times somewhat narrow. We carried our luncheon with us and arrived at Khurhom in comfortable time for tea. The bungalow is delightfully situated at the foot of a spur dividing two re-entrants, which descends precipitously from the pine-clad hills. It stands at a height of about 6200 feet above sea-level and affords a splendid view down the Lolab of paddy fields and grassy walnut-groves against a sombre background of deodar-covered slopes.

Next morning I went on with my servant and seventeen coolies over the Nao Gali (10,867 feet) to Matsil. It is about six miles to the top of the pass, the last two being very steep, but not difficult, over a rough track. The local coolies are evidently not used to carrying loads, for they carry them on the backs of their heads, holding them with their hands raised above their shoulders in front. I was unable to persuade them to carry them on their backs. Though none of my loads exceeded sixty pounds, yet it was not till 5-45 P.M. that eleven coolies reached the pass: they had started at 9 A.M. The rest were not even in sight. I decided to go on with these eleven loads, which included my tent and bedding.

* Survey of India Maps 43 J and I; for details on a larger scale of 43 J, see Maps 43 J/7, 6, 5, 9 (1 inch to a mile). The region of Rama has not been surveyed on the one-inch scale.—*Ed.*

For two-and-a-half miles the snow was old and hard. We went straight down the middle of the steep valley, eventually reaching some grassy slopes and pine-forest four miles from the pass. Here I bivouacked and sent two men back to help the rest. They returned an hour later to say that the others could be neither heard nor found. So perforce I lay down to sleep dinnerless.

Next morning about six o'clock my servant and the rest of the coolies arrived, having passed the night about half a mile up the valley, and having failed to see our fire owing to a bend in the gorge or to hear our shouting owing to the thunder of the torrent. We proceeded down the pleasant valley to Matsil, two miles away. Here I had breakfast and changed coolies. I expected to reach the Bandapur-Chilas road at Dudi, two miles further on, but found that this had fallen into disuse since the disaster to the Kashmir troops on the Razdiangan ridge in September 1928*. There were portions of the old road here and there, but in many places it passes through precipitous gorges, and there was nothing left of it at all. That night I camped in delightful weather at the pretty scattered hamlet of Ring, ten miles from Matsil.

Next day I was away early, but it soon commenced to rain and continued solidly until evening. The gorge became narrower and the pine-clad hillsides steeper below Dhakki. In places it was necessary to hang on with fingers and toes. I had increased the number of coolies to nineteen for this march. In fine weather it would have been glorious but as it was we all arrived thoroughly wet and miserable at the confluence of this nullah with the swift snow-fed waters of the Kishanganga. Crossing just below the junction by a good cantilever-bridge, we reached the Chilas road, which now follows the Kishanganga by Folowai and Taobat.

Soon the lofty village of Kel was viewed, almost blocking the valley. There is a curious knoll here, rising straight up in the middle of the nullah, and on the top of it is a long straight tree-trunk, absolutely bare save for a tuft half-way up and another at the top. It gives the impression of a mast at some coastal signal-station. Here the Barai tributary flings its waters into the Kishanganga; and it

* This road, known as the Tragbal-Chilas Convoy Road was only completed in 1922, and a scheme for rest-houses was sanctioned. The disaster mentioned above caused a change of policy, the route was abandoned, and convoys now descend the Tragbal pass by the Gilgit road to Kanzalwan, whence a good road has been constructed down the Kishanganga. Route 39 of *Routes in the Western Himalaya*, 2nd Ed., 1929, is therefore already out of date.—Ed.

was up its right bank that I now turned, encamping at a pleasant spot in the adjoining village of Kalalot, near the stream. Luckily by the time my kit arrived the rain had ceased.

The inhabitants of Kel are a hardy, cheerful, obliging lot of Gujars, talking Punjabi and originally coming from the Punjab. They had been warned of my coming and I was helped to pitch my camp by *chaprassis*, *chowkidars* and about a hundred coolies, who provided maunds of grass and scores of tent-pegs. I feel they must have been very disappointed to find that I was only travelling with one double-fly 40-pounder and two servants' pals.

I now had six more consecutive wet days, when it either rained, hailed or snowed for most of the day and night, yet each day I was luckily able to pitch my camp during a fine spell. For a few minutes that evening the sun came out and I thought what a very pleasant place Kel was. The Barai nullah is much more open than the Matsil, and next day the road was moderately easy to Lilam (13 miles). The Chilas road follows the Barai nullah to the Barai pass. We left it and turned up the Shonthar nullah to the right. I arrived at Lilam, which is about a thousand feet above the stream, after a steepish final ascent, some time before my coolies. Here I had to take shelter in a foul and filthy house, in which the family had spent a bitter winter with their dogs, cows, sheep and goats, and probably a pony or two as well. While I was here it hailed, snowed, thundered and lightened. Some of the flashes were quite close and caused the wooden beam I was sitting on to vibrate.

I had left Kel late owing to the rain, otherwise I should not have stopped here, but would have continued for the next six miles to Shontharmarg. The country was becoming considerably wilder and all the surrounding hills were covered with snow. We were on the right bank. Opposite, an extremely precipitous and now unused track leads over the Chittakatha Sar round the Hari Parbat peak (17,699 feet)* into the head of the Chandbili nullah.

Next day continuing round the contour to the junction of two nullahs, we took the eastern one. Up the western leads a very difficult and little-used track over snow and glacier into the head of the Rupal nullah. Gently rising over snow-bridges I had a grand view of the Shonthar Gali (14,973 feet), which at the moment was clear of cloud and appeared very close: very different from what it

* Some of these peaks would afford very interesting climbs. As far as I have been able to ascertain, they have never been attempted.—*Ed.*

turned out to be five days later, for I was destined to be held up here for four days by foul weather. I camped on the only patch of dry ground, just free of snow, below the last habitation, the bleak hamlet of Kotri, where the valley broadens and is fed by three or four small side-streams. In this forbidding spot snow fell heavily the first night, after which I had snow all round my tent and had to keep the outer flaps free by shovelling.

There were some very obliging snow pigeons which kept offering me rights and lefts as they flew around. During my stay here I also explored the main Shonthar nullah for some distance. It apparently carries on for some ten miles, its upper end being blocked by a glacier from which there is no exit. Each night before turning in, and each morning, I looked forth hopefully for signs of a clear day, yet it was not until the fifth evening that any hope could be entertained. One of my guides, with unnecessary pessimism I thought, informed me that he had once waited for his *moqa* for fifteen days, and had had to turn back in the end!

On the fifth evening the moon rose clear and I gave orders to be called at two in the morning. On rising I saw the moon about to set and a thick mist arose obscuring vision at about fifty yards. I waited till it began to grow light at five o'clock, when the mist cleared and we started. I was accompanied by two local Gujars who possessed a hamlet in the Mir Malik valley beyond the pass and who knew the route well. They cross even in winter when the weather is clear. The last sahib to cross took ponies over in July, and lost one, complete with brand-new Sowter saddle, in a crevasse. I had increased my coolies to twenty-five, to make my loads as light as possible; it was lucky I did so, for we had several feet of new soft snow the whole way. The climb of 4600 feet in about six miles would have been arduous without the soft snow, into which we sank knee-deep and sometimes hip-deep at almost every step. About half-way up the brilliant sun shone down on us from a perfectly clear sky, necessitating the use of snow-goggles, a pair of which luckily each coolie possessed. We lunched short of the pass, which we reached about one o'clock, closely followed by the coolies. Snow now fell and continued for about three and a half hours. The descent was incredibly steep straight down through avalanche snow for the first mile or so; the snow was too soft and sticky for a glissade, so this too became tiring after a time.

We joined the Chandbili nullah by the giant rock of that name about two and a half miles from the summit, and continued down

to its junction with the Dobin nullah (10,500 feet), about six miles from the pass. This was the first ground clear of snow that we reached, and very relieved we were to see it. Here the Kashmir Mountain Battery, stationed in the Gilgit Agency, spends a month or two in the summer, grazing its mules. The place is named Steanemarg after a certain Special Service Officer, who first introduced it to the Battery. Here also the Kel Gujars possess a hamlet which they call Sheondas. The coolies were all in by seven o'clock, but my bearer did not arrive till ten; once again I went to bed dinnerless. The ponies from the village of Mir Malik were grazing all around and below my camp, so I paid off all the coolies, who started back for Kel before I awoke next morning.

My first day at Steanemarg was a glorious one. After killing two rock pigeons with one barrel, I was basking in the sun before my tent, when one of the Gujars rushed up and pointed out a red bear not half a mile away across the main nullah. I got out my rifle, put on my boots and followed him. He was making his way up the opposite hillside. Soon we reached his tracks, and eventually, after about an hour and a half, found him rooting under some rocks on a grassy maidan. Here I was able to get in a shot with my .470 at about 180 yards, which caused him to slither and slip down the snow slope and into the stream below. I hit him again as he was falling. We followed as quickly as possible and found that he had been washed over a waterfall and had fallen about fifty or sixty feet into a pool by a snow bridge. Luckily he was too far gone to get under the snow. Here with one more shot I finished him off. He was a grand male in full winter coat: a fitting reward for a tiring journey in foul weather.

I may mention that near the top of the Shonthar Gali, on the Kel side, is a very difficult path into the Chichi nullah, sometimes used by shikaris and *kuth* thieves. At Chandbili the alternative route from Lilam, mentioned above, joins. And from Steanemarg there is a rough track leading up the Dobin nullah, over the Sarewali Gali (14,000 feet odd), to Folowai on the Kishanganga.

Next day I spent looking after the bear's skin, and the following day pushed on to Rattu, where I slept in a bungalow once more. At Rattu I reached the main route from Gurais to Astor, via the Kamri pass. Two miles from Astor I was met by the Raja and his brother, who with characteristic politeness escorted me to the Rest House, conversing the while of polo and shikar.

This route is an unusual one for the journey to Astor, and could never be used throughout its length by pack ponies, without

considerable work being done on it, yet in fine weather it affords a most beautiful and pleasant trek. The actual distance on foot from Khurhom to Astor is 101 miles, 14 miles shorter than that from Bandapur to Astor by the normal route. Nine days, excluding halts, were taken from Srinagar to Astor, but the Ring and Lilam stages could easily be omitted in fair weather, whereas eight are required for the journey from Srinagar by Bandapur and the Kamri. There is only one difficult pass, the Shonthar Gali, against two which can be most unpleasant on the normal route, the Tragbal and the Kamri. Ponies and cattle are regularly taken over the Shonthar Gali from the middle of June to the middle of October in fine weather by the local people.

From Astor it usually takes about an hour and a half to reach Rama, the delightful summer residence of the Gilgit garrison. In the summer the valleys of the Indus and Gilgit rivers become extremely hot, sometimes registering a shade temperature of 110 degrees Fahrenheit. It is then that the Political Agent and other officers of the Agency frequently take their wives and families to Rama, a miniature Gulmarg at over 10,300 feet above sea-level. It is about four miles from the old Astor fort and tahsil headquarters, which are situated on a conglomerate cliff above the Astor river at a height of about 7600 feet.

In order to reach Rama it is necessary to climb steeply up the fertile valley between two swiftly-flowing mountain torrents. The waters of one of these are beautifully clear, because they have their origin in the lake, sacred to the fairies of Nanga Parbat, which is contained at a height of about 12,000 feet between the large glacier descending from Nanga's third peak (over 22,000 feet) and the mountain-side. The other torrent, with waters of a muddy reddish colour, gushes forth from beneath the glacier itself, whose enormous dirty snout overlooks Rama.

The last mile rises steeply through a forest of spruce, deodar and pine, until, on surmounting the final crest, the picturesque wooden bungalow of the Political Agent and the marg of Rama burst on one with comforting suddenness. A babbling brook is crossed on the marg, on which is the polo ground, about 160 yards long and 40 yards broad, bordered by felled tree-trunks. Rama also boasts a small golf-course and a badminton court. In July or August it is a mass of blue gentians and edelweiss, completely surrounded by pines and firs, above which, on one side, rises the glacier with its terminal moraine.

A roam through the pine-woods may produce anchusa, orchids, king-cups, blue and yellow violets, dwarf primula, the true edelweiss, four-leaved clover and other plants of interest to lovers of nature, as well as Alpine strawberries and currants. A pack of wolves lives on the mountain-side near the snout of the glacier. These prey on the local ponies and cattle which come up to graze on the luscious grass. Sometimes they take a pony or cow from the very precincts of the Political Agent's bungalow. Though they are most elusive by day I have several times seen them across the glacier, whose snout is about a mile and a half wide. Unfortunately the glacier here is covered with rocks and debris, and much intersected by crevasses, which render the crossing lengthy and arduous. Usually by the time one has crossed there is no sign of any wolves until a shikari spots them on the side from which one has just come.

There is a rough track up the mountain-side to the sacred lake. To reach this it is necessary to ford the torrent and cross various snow and mud avalanche slopes, which takes about an hour and a quarter from Rama. The local people firmly believe that Nanga Parbat is inhabited by fairies and evil spirits, who vent their wrath on any who attempt to invade their icy solitude. During the only attempt to scale the peak, Mummery and two Gurkhas lost their lives. That was in 1895. Not very long ago an officer of the Gilgit Agency brought out a light out-board motor boat for use on the Indus. This was a complete innovation, for the Indus is very swift, and its waters, as they swirl over hidden rocks and rapids, are bitterly cold. The boat arrived at Astor when this officer was at Rama, and he had it carried up to the sacred lake in order to try it. Unfortunately that particular summer was very wet and the local crops were largely spoilt by torrential rains. Whereupon the local people put their troubles down to the fact that the fairies had been provoked by the desecration of their lake, and petitioned the Raja, the Naib-Tahsildar and Wazir-i-Wazarat to restrain the officer from plying his boat on the lake. He propitiated them by giving them a goat for sacrifice and shortly afterwards left with his boat for Bunji, on the Indus.

Soon after the tragic sequel occurred. The officer was floating down the Indus in his boat, when it became jammed between two partly submerged rocks. There was no chance of getting it off undamaged, so eventually, removing his clothes, he swam for the shore, a distance of fifty or sixty yards. He was carried down the river by the icy current, and in spite of being a strong swimmer failed to

reach the bank. His body was found a month later washed up on some rocks several miles lower down.

As with many other great mountains of the Himalaya, the neighbourhood of Nanga Parbat is the home of many myths and legends. The mountain is said to contain mysterious grazing-grounds, never yet found by mortal man, and the following fable explains the origin of the belief :

Once upon a time there was a village on the lower slopes of Diamir, on the higher margs of which ponies used to graze during the summer months. In a certain year the animals had suffered much from lack of grass, scanty grain and hard work. In very bad condition they were sent up higher under the charge of a lad, who spent his nights by the side of a scrub fire under a rock. One morning, when he awoke, to his horror he was unable to see a single pony. One and all they had disappeared into thin air. After searching everywhere he sadly returned to the village, where he was received with angry words and suffered much bodily punishment at the hands of the head-men ; but in spite of further search the animals could not be found.

Some months later, when the winter snow-storms were commencing, the same youth was up the mountain-side collecting wild onions. When he reached the rock where he had spent the fatal night, he suddenly saw all the ponies back there grazing, as though nothing had happened, but they were bursting with fat and leaping about with energy and good spirits. He rounded them up and drove them down to the village, where they were all received with great rejoicing.

Diamir—the local name for Nanga Parbat—in spite of its many folk-lore stories and superstitions, inspires ambitious dreams, yet her upper slopes are so precipitous that something more than mere mountain equipment will be required before man conquers her virgin snows !

THE SHYOK ICE-BARRIER IN 1931

CAPTAIN C. E. C. GREGORY

MY ORIGINAL intention was to spend some time shooting in the Hanle district of Ladakh and then go on to Phobrang and cross into Chinese Turkistan by way of the Aksai Chin. With this object I left Srinagar on the 12th April, and when passing through Leh arranged with Bishop Peter of the Moravian Mission to send my porters and supplies for the Changchenmo-Aksai-Chin crossing, to Phobrang. On arrival at the latter place I received word that my passport for Central Asia had not arrived, and it looked possible that I might not get one at all. I therefore went off to shoot round Dakpo Karpo and the Changchenmo; on my return again to Phobrang I learnt by wire that the passport had been despatched from Nanking on the 29th May and I judged that it should reach Leh by the 5th July at the latest.

I now decided to return to Leh and travel by the shorter and quicker route by the Karakoram pass. I left Leh on the 23rd June, having given instructions for the passport to be forwarded to me by special runner, and spent some time mapping the Chong Kumdan glacier and the Shyok lake. Having completed this work I pushed on to Daulat-Beg-öldi, close to the Karakoram pass, but after waiting some time for the passport, my supplies began to run short, and, though I tried to persuade my caravanbashi to go on to Suget for more, he refused to do so and I was forced to return. This short paper therefore is merely a brief summary of my observations of the Chong Kumdan glacier-dam*.

It was on the 28th June that I left Takshai, the last village in the Nubra valley. Up till that date no one had crossed the Saser pass that year and the inhabitants of Nubra stated that it was still deep in snow and unfit for pony-transport. I had three permanent porters with me and collected six more at Takshai (pay Re. 1/-a day). In the Thulan-buti defile I met the first of the Yarkandi caravans.

* Previous articles dealing with the Shyok Ice-barrier have been published in *Himalayan Journals*, vol. i, pages 4-28, vol. ii, pages 35-47, vol. iii, pages 107 and 155-157.—*Ed.*

Their news was not very hopeful ; they had stayed at Saser Brangsa, north of the pass, till their food was almost exhausted, and had then tried to force it, with the result that they had had to abandon their baggage on the pass after losing two ponies and three asses.

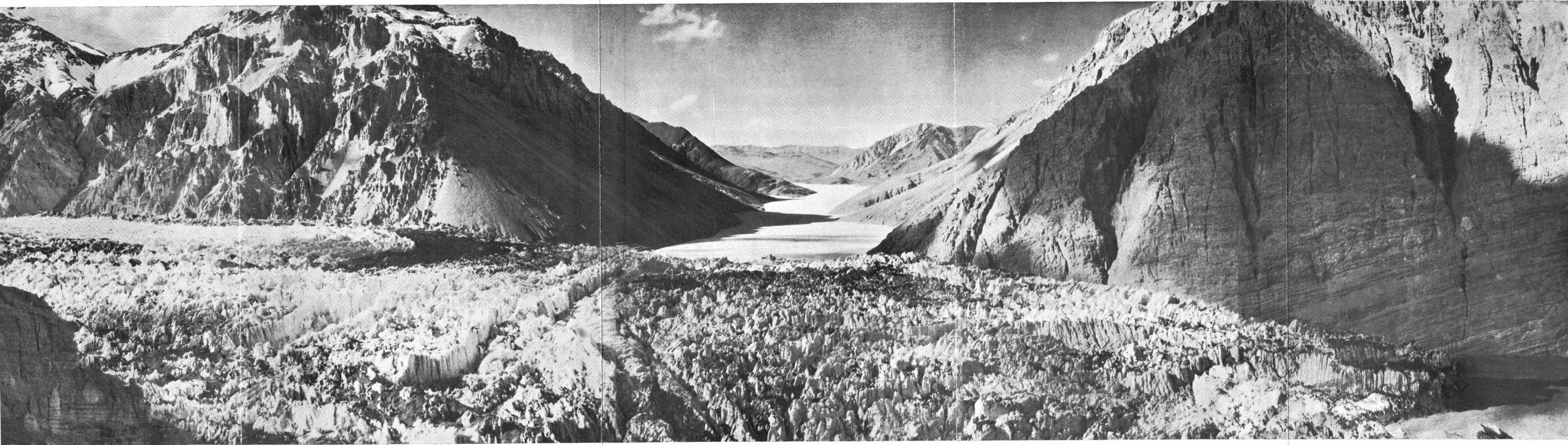
I therefore left my own animals at Skyangpo-che and moved up towards the pass with my coolies only, halting that evening at the first of the lakes. I intended to start at 5 A.M. the next morning, cross the pass and reach Saser Brangsa that day, but at midnight, when I looked out, the snow was frozen hard and the moon full, so that I felt it was an ideal opportunity to cross. I went over to the porters, but they were not for it, saying that it was too cold and that in their local boots they would get frostbitten, but that they would start at five. At five the next morning it was snowing hard and we were forced to remain there all day. It was again snowing at 5 A.M. on the 3rd July, but an hour later the sky looked better, the snow had stopped and the porters agreed to make a move. Fortunately for us the sun hardly came out all day and the eight miles to Saser Brangsa were covered in eight hours.

On the 4th July I moved the camp up the Shyok valley to the Kichik Kumdan glacier, from the terminal moraine of which I could see the snout of the Chong Kumdan glacier lying across the valley like a bar of silver. There was very little water in the Shyok, and at the Saser Brangsa ford it was only about a foot deep.

On the 5th I went up to the Chong Kumdan. The point from which the best view can be obtained is about a thousand feet above the main valley bottom on the right bank of the Shyok. From here the Shyok lake can be seen stretching away to the north, beyond the three miles of glittering ice-pinnacles of the Chong Kumdan glacier almost immediately below. The panorama published with this paper gives some idea of the magnificence of the spectacle.

The lake at that time was ten miles long and varied from a mile to a mile and a half wide. Later when I went round and camped at the north end of it, I found that its level was rising at a rate of from six to seven inches a day. Above the surface-level on the hillsides at the edge of the lake were to be seen previous marks caused by water-erosion. In July the lake was from thirty-five to forty feet below the highest erosion-mark* from which fact I concluded that by the beginning of the winter of 1931 the surface would be at its

* On the 1st August 1928 the lake-surface was about 100 feet below the highest erosion-mark. See *Himalayan Journal*, vol. i, p. 6.—Ed.



C. Gregory.

CHONG KUMDAN GLACIER SURFACE AND LAKE FROM RIGHT BANK SHYOK VALLEY.

high-water level. As regards percolation through the ice-barrier, three hundred yards downstream of the snout of the glacier the Shyok river-bed was dry. On the 5th July there was very little water coming off the Chong Kumdan, and though on the 6th there was more, there was still less here than was issuing from the Kichik Kumdan glacier.

The Chong Kumdan glacier descends from a broad trough in the mountains. Standing at the snout it is up the Chong Kumdan valley and not up the main Shyok valley that one looks*. The Chong Kumdan glacier and lake, in fact, form the upper branches of a "Y", the tail of which is the Shyok valley below the snout. Unless this is realized, the map, which shows a "T" lying on its side, is misleading. At the time of my visit the width of glacier against which the waters of the lake were resting was about 1500 yards, the same as that of the valley bottom immediately below the snout. The ice of Chong Kumdan, or left branch of the "Y", extended for a distance of 1100 yards below the point where the eastern edge of the lake met the ice.

The height of the ice at the snout was about ninety feet; where it was holding up the lake it might be as much as two hundred. Here it was a mass of pinnacles and it was difficult to judge the height. These pinnacles extend for a distance of three miles up the glacier and are due, I think, to the effect of the warm dry wind blowing up the main valley. They and their attendant ice-walls make climbing on the glacier difficult and crampons, ice-axe and rope are essential. I did not come across any bad crevasses, but the surface was badly cracked, and there would have been danger of an accident with laden or inexperienced men. The height of the pinnacles was from sixty to eighty feet. Once the sun reached the glacier surface, stones and ice started to fall; for this reason it was unsafe to be on the glacier after eight o'clock.

A curious feature of the Chong Kumdan glacier was the complete absence of dead lateral moraine. The valley out of which the glacier

* See *Himalayan Journal*, vol. i, illustration opposite page 8. The valley seen on the left is the Chong Kumdan; the Shyok valley enters behind the steep cliff on the right. The Shyok valley may be seen beyond the glacier in the illustrations in vol. ii, opposite pages 36 and 42. Of the two small side glaciers shown beyond the glacier and downstream of it in the illustration opposite page 38 of vol. ii, the left-hand one joins the Chong Kumdan at the snout, its right (orographical) edge in 1931 being almost in prolongation with the snout-face. These points are clearly shown in the two panoramas published in the present volume.—*Ed.*

emerges has steep cliffs on either side and the glacier ice reached right up to these cliffs. The terminal moraine consisted of a small pile of stones, out of all proportion to the size of the glacier. The channel cut in the ice by the escaping waters in 1929 could be clearly seen and acted as a central drain for the surface ablation of the glacier. Should the lake overtop the glacier, its waters would use this channel and probably open it up so rapidly that a flood would follow. If the barrier actually breaks, it seems to me probable that it will do so in August 1932, this being the month that it has usually burst before. With the water up to the high-water level and the old scar in the glacier, with the almost complete absence of percolation, I consider that the lake is almost certain to overtop the barrier or burst it in 1932.

Should anyone think of going up to the ice-barrier in 1932, I would suggest that, after halting at Saser Brangsa, they move up the right bank of the Shyok to just short of Kichik Kumdan, using porters only from Saser Brangsa onwards. The next camp should be pitched near the snout and the party should start the next morning very early, pass the two side glaciers on the right bank of the Chong Kumdan, and cross the main glacier just above where it is joined by the lake. Should there be a break, in all probability this route will be above it and will remain. On the north side of the glacier a camp could be pitched on the spur on the west edge of the lake, just above the point where the lake meets the ice. This would save the long detour by the Depsang plains. Also, the two metal boats left by Gunn in 1929 at the mouth of the Chip-chap have now been removed.

I ought perhaps to warn people against attempting to climb the cliffs on the left bank of the Shyok just below the glacier. Though it is possible to do so and to reach the lake by this route, the chimneys that have to be traversed form dangerous stone-shoots. I would also recommend that any party moving on the glacier itself should be clear of it by 8 A.M., when the sun may get on to it and render it dangerous from falling ice and stones.

Note by the Editor.

Thanks to the courtesy of Captain Gregory and Messrs. Ludlow and Gunn, we have now some forty photographs of this glacier, taken from various points during the last four years. Much as I should like to do so, it is not possible to publish all these, though a careful examination makes clear some very interesting conclusions. In addition to the photographs and accounts of these observers, we also

have a report by Mr. P. C. Visser of his observations in July 1930.

The photographs taken in 1928 and 1929 from below the snout are very similar. The larger series of 1929 show some definite features that led me then, in spite of Gunn's report, to doubt whether the glacier had begun to retreat, and I then foretold that the channel cut by the lake would heal during the winter of 1929-30, and that another lake would be impounded*. These features are very marked when the 1929 photographs are compared with Captain Gregory's beautiful series taken in 1931.

In 1929 the upstream photographs show a vertical, and in places an overhanging, dam face holding the lake. The ice at the edges of the lake showed cracks and the ice-pinnacles emerged almost directly from the water's edge. The ice itself showed intensely white in the photographs, and even from a distance little englacial or medial moraine could be observed. These features may be seen to some extent in the two photographs in the *Himalayan Journal*, vol. ii, opposite pages 38 and 46. A complete series of fourteen photographs by Ludlow emphasizes them.

In 1931 there was a marked change. The lateral pinnacles were much reduced in size and became more degenerate; masses of medial moraine were being carried to the edge of the ice and were falling into the lake.

* "In my opinion the normal seasonal advance and regeneration in the coming winter will almost certainly close the narrow transverse channel that has been cut, and by next spring this should have completely healed. I believe that another lake will almost certainly form next spring, but since the seasonal retreat next summer will now be assisted by periodic retreat, the dam will definitely degenerate in height and strength. It may be that the lake so formed will drain away by percolation, or it may gradually wear away a channel, taking several days to drain (as happened in the last of a similar series with the Khurdopin glacier). If the healing is so complete as to prevent either of these two courses, I believe the dam will break again in August 1931, the month of maximum inflow to the lake, and the month of maximum degeneration of the ice. Under no circumstances can the dam impound a lake in the next few years of the same magnitude as that liberated in 1929. In my opinion there is no danger of a serious flood for many years to come, while the present danger of a complete block and a minor flood will be over at latest in 1932, after which there will be nothing to worry about till 1969. There will then be an eight-year scare-period".—*Himalayan Journal*, vol. ii, p. 46. With the exception that I did not foresee a healing so complete that the dam would hold throughout 1931, this forecast has been accurate and I see no reason to modify the prediction for the future.

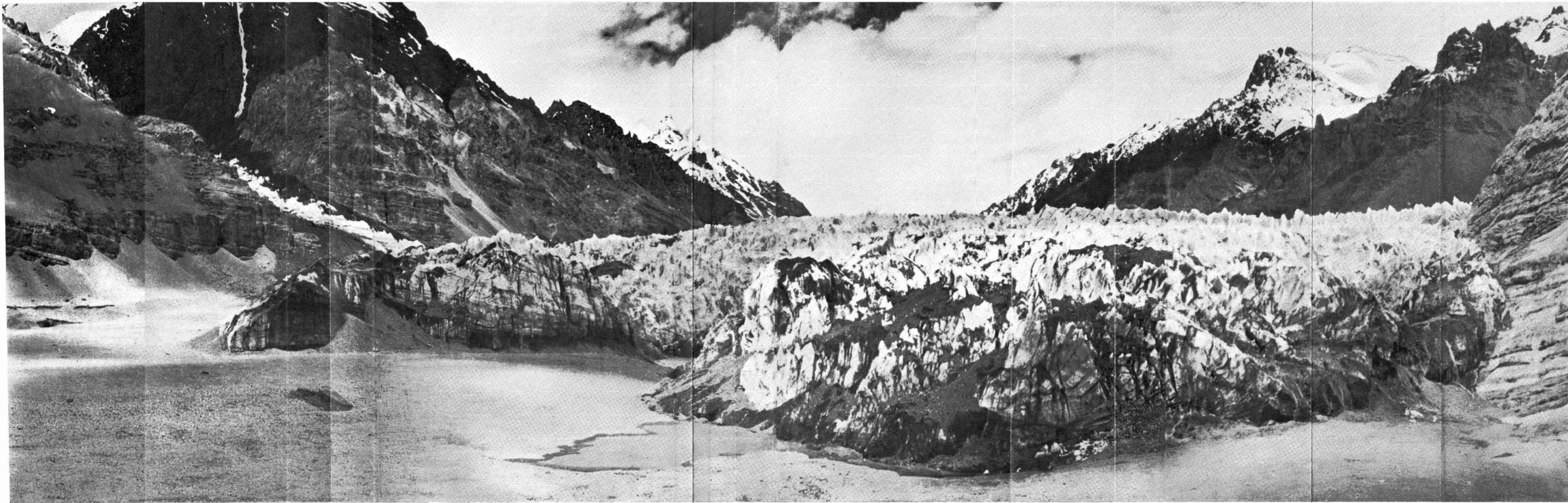
In 1929 the lake edge of the dam had a marked convex bulge into the lake, probably owing to pressure against the rock wall opposite. The 1931 dam showed a straight, almost a concave, edge to the lake.

Downstream of the glacier, the 1928 photographs show a protuberant tongue, possibly due to snout-spread, in the centre of the Shyok valley. There is little difference in 1929, both before and after the burst. The edges in both 1928 and 1929 were vertical (slightly more so in 1928 than after the burst in 1929, probably due to seasonal ablation in August). In 1931, as shown in the illustrations in this volume, not only the snout-tongue, but the whole snout-face was breaking up into detached ice-pinnacles very much interspersed with englacial and surface moraine. In pinnacled glaciers such as this, moraine-banks are only left as isolated terminal moraines when the ice-pinnacles are dead*. 'Retreat' is most irregular, and, as could be seen in the neighbourhood of the Kichik Kumdan glacier in 1928, much dead ice is left below the living snout.

If further proof were required that 'retreat' and degeneration has now set in, it is to be found in the pictures of 1929 and 1931 which give a longitudinal profile of the glacier surface. Ludlow's and Gunn's photographs of 1928 and 1929 show that of the portion of the glacier lying across the Shyok valley, the highest point lay then towards the left bank of the Shyok, which indicates that the ice had been forced up by pressure against the wall. The panorama looking up the Shyok across the glacier, published in the present volume, shows that the highest point in 1931 was where the glacier enters the Shyok valley. From here the height tailed off towards the left bank, indicating a relief from pressure. This panorama also shows very distinct signs of pinnacle degeneration, particularly towards both edges and the opposing wall.

In 1929 the waters of the lake cut a channel approximately five hundred feet wide. The channel apparently commenced from near

* The terminal moraines left by the Chong Kumdan when the pinnacles have melted cover a very wide area, as may be seen in the photographs opposite pp. 200, 202, Chap. xx, vol. ii, of Professor Giotto Dainelli's *Picchi e Genti del Caracorum* (Firenze: 1924). These photographs were taken in 1914, about thirty years after the previous year of maximum advance. It appears to have been impossible then to determine how much of this moraine was on ice. It is well worth while comparing Dainelli's photographs of this glacier in its degeneracy with those of the last few years taken since its rejuvenation.



Photo, Capt. C. E. C. Gregory.

SNOUT OF CHONG KUMDAN GLACIER FROM LEFT BANK SHYOK VALLEY.

the right or western shore of the lake, took a course towards the centre of the glacier and emerged near the left or eastern side of the Shyok valley. In July 1930 the Vissers reported that the channel had completely healed and that there was no sign of it, though traces of the burst were still to be seen below the snout. In the same month, in 1931, though there was still no percolation through the glacier and no water issuing from beneath the ice, the channel had again opened out and acted as a central drain for surface water from the glacier. These facts again point conclusively to a release from pressure.

Estimates of the height of the ice at the snout and of the depth of the water at the dam are difficult to compare. In the snout observations we do not know whether the observations were made at the same spot. Ludlow's estimate in 1928, from some distance away was, "at its snout it could hardly have been less than 200 feet high". Gunn gives the height in August 1929 as "about 500 feet". Visser does not mention it, but in July 1931, Gregory gives it at about 90 feet. A few days before the burst in 1929 Gunn gives the depth of the lake at the dam as about four hundred feet; in July 1930, when the re-formed lake had reached a length of three miles, Visser calculated the depth at the dam to be 133 feet; in July 1931, Gregory thought that it might be as much as 200 feet. Too much reliance must not be placed on these figures; it is notoriously difficult to make such estimates. But even assuming that Ludlow was liberal, that Gunn was radical, and that Gregory was conservative, these figures do bear out the conclusions given above from examination of the ice-formation in the photographs.

The two points of human interest are: Will the dam burst catastrophically? And if so, when? The second question may be answered first. There can only be a catastrophe if the dam bursts when the river is at or near normal high summer-level. This is between mid-July and October, inclusive. Damage from scour and isolated accidents from drowning may occur at other periods, but villages and grazing should be above the flood level. The point is: Will the dam hold till then? In my opinion, though there was no percolation in July last year, degeneration had set in to such an extent that in all probability there was a good deal of leakage before the winter. By October I believe the glacier may have been too degenerate for any substantial recuperation during the winter, and that spring and summer ablation in 1932 with normal periodic decline will relieve the lake of much of its water. It is an opinion that I hesitate to put

forward, for observations of the little glaciers of other parts of the world are of no value for comparison. Of one thing I feel certain. I still maintain that after 1932, there will be no further danger of a block for over thirty years.

The above Note was sent to Captain Gregory, who comments as follows :

Now that I have had time to examine carefully the state of the glacier snout as shown in Gunn's photographs, I too think that degeneration has set in ; but at the same time, though I do not know very much about the subject, I shall be very astonished if so great a volume of water can be carried away by percolation. It may be of interest to mention the following facts which may affect the percolation question. In 1931 on the 7th and 8th July there was no percolation at the snout when I was there. On the 12th July I crossed the Shyok at Saser Brangsa ; the water was then knee-high as against about eight inches on the 4th July, say ten inches higher. On the 17th and 18th July I was at Yapchan when the lake was rising at the rate of six or seven inches a day. On the 22nd I again crossed the Shyok at Saser Brangsa ; the water was now up to the men's hips, say 2 feet 10 inches at midday. The crossings on the 12th and 22nd were made at the same time of day, and the difference of level may have been merely seasonal. When I crossed the Shyok at Khalsar, about 135 miles downstream of the barrier, there was a good deal of water and a Yarkandi had been drowned the day before, but the men at the ferry did not say anything about the water being particularly high. I wonder whether percolation set in just after I left the Chip-chap.

A FRONTIER TOUR

(Being Extracts from a Diary written during a journey made with H. E. Lord Rawlinson, C.-in-C. in India, through Dir, Chitral, and the Gilgit Agency, in 1923)

LIEUT.-COLONEL J. R. C. GANNON

(Continued)

THE SIXTH of August was our last day in Chitral. It was pretty hot and the mosquitoes and a long cipher kept me busy. During the day I went to Bowers' house and saw his trophies. He has some splendid heads, his best markhor, 53 inches, being the second best shot in Chitral; ibex and leopard good; he had shot two snow-leopard during the year. Later we watched polo and a nice incident occurred when a player broke his stick. His varlet dashed into the middle of the game on foot with a new stick, only to get taken at right angles by another player coming full split the other way. The varlet went for six, and pony and player went head over heels. None of the three seemed to mind, nor did the game stop.

Tuesday, 7th August. Koghozi. I was very sick last night; must have been poisoned. Rose this morning pale and putrid, but cured, to resume the march at 6 A.M. We say good-bye to Stewart who has done us well and we are sorry to lose him. As we go down the road, guns go off all over the place and I'm damned thankful when we get away from it. After a mile we cross over a Chitrali bridge to the left bank, and after a mile or two turn right-handed up the Mastuj river where it runs into the Chitral river. This soon becomes like one of Gustav Doré's pictures of Dante's Inferno, a roaring rushing torrent below and huge precipitous cliffs of rock reaching up and up on both sides. The rock is evidently hard, for the width of roadway varies between two and three feet only, and in some places has only been cut out high enough for a horse's head to pass under. Part of it we walk in consequence and I am not pleased. Luckily a short march of 15 miles, and we are in by 9-30 to a nice rest-house with a lovely group of chinar trees outside, under which I put a bed, hire a small boy to keep the flies away, and fall into a disgruntled sleep till half-past one.

Wednesday, 8th August. Reshun. Feeling stronger and even cough at a lightly-boiled egg at five o'clock before starting. I ride my second string, a stuffy little Badakhshani stallion about tuppence high and known as the 'Guinea Pig'. He tripples along rather comfortably, for which I bless him—he has evidently done this sort of thing all his life. But why, when the road is a yard wide and there is a clear drop of 150 to 200 feet into a very boisterous river, must he always walk along the extreme outside edge, so that my outside leg hangs in space with the aforementioned river bubbling below it? I watch him at one place, and for five yards or so he even has a small portion of shoe over the edge.

Same magnificent hills but very barren and rocky; we are rather shut in by them, but we pass through the most delightful villages, along lanes with stone walls about five feet high, the tops covered with wild dog-rose, blackberry and other creepers; little fields under cultivation with barley, rice, beans, etc.; houses rather hidden by chinara and walnut trees. All very fresh and green. Fig-trees, vines, apple-trees, all over the place, and we are always met with smiles and salutations and kindly offerings of apples, grapes, little figs and apricots.

We pass the big village of Barennis at about the 14th mile and halt for a cigarette. We have been steadily on the rise and it is much cooler. It is more open here and ahead it narrows again, but round that bend lies Reshun, where in '95, before Kelly's force came along from Gilgit, Edwardes and one other British officer started out for Chitral. They were attacked immediately and forced to turn back. After a three days' siege, the Chitralis pretended to make friends, got the two officers down to a polo match, then suddenly knocked them down behind the wall and went for the men. Those who were not killed outright got their throats cut. It was a Sikh regiment. The two officers, after a bad time, eventually rejoined the British at Drosh.

We reach Reshun and find another nice rest-house with a group of chinars over a stream running down into the river. A steady breeze is blowing and all is well. We breakfast, and Bowers, who accompanies us, tells us how in one place up in the hills there is a ridge where the markhor can only pass one at a time, past a bush, and how the local inhabitants tie a man to the bush, and have the markhor along the ridge. As the animals pass, the wag the bush kicks them over the precipice! I retaliate by telling them how I have slightly strained the collar-bone I broke last

Christmas, while being ill the other evening. Both stories true! but it's enough for the Chief, who goes off sketching.

Thursday, 9th August. Sanoghar. Kit got in latish yesterday. One of my baggage mules, having overdone the edge business, was deposited down in the river quite suddenly, poor brute, breaking his back. My homely *chilamchi*, or English tin basin, seemed to have taken most of the shock, so I shan't be able to wash any more. Sponge and tooth-brush stood the strain well. Chief and I watched a polo match for a little in the evening. An astounding ground: about 150 yards long and only 30 yards broad. The main and sunken road crosses it in one place and a stream in another. However, they played very vigorously, seven a side, and the chukker lasted an hour and five minutes, during which some coolies arrived along the road with kit, and an odd person did a sword-dance in the middle of the polo ground, the players not taking the slightest notice of either. The losers of the match were made to dance at the end. They shuffled round rather solemnly, so were funny.

Started at 5-30 this morning. Once out of the village the road runs through the usual rocky, barren hills, and we reach the gorge where Ross got into difficulties in '95. He was trying to get to Chitral and had come through the narrow pass from the Sanoghar end. They let him get some way along and then rolled down stones and rocks from the heights, opening fire at the same time. He was forced to retire towards the entrance and took shelter in some caves right under the bank of the river. Some of the sangars he built on the way remain. He was killed under the precipitous entrance to the gorge. His subaltern, Jones, and 17 men, ten of whom were wounded, got away back to Mastuj, the headman of Buni assisting him on the way.

Once out of the gorge we come into a fine open valley, two or three miles across; villages and cultivation all over the lower hills on the right bank with snow-capped hills behind them. Clouds screen our view of Tirich Mir. The river opens out into a wide expanse of water dotted about with islands; patches of tamarisk bush in bloom. It is a great spot for the returning duck in the spring. After cantering across some open country, we strike the left bank of the Mastuj river again, and the road runs up to a long strip of the worst and steepest shale khud we have seen. Bowers, who is behind, mumbles something I do not hear. He is an Irishman who talks very indistinctly in a very low voice and after five years in Chitral has, I think, got his languages a little mixed. It is sometimes difficult to tell whether he is talking Chitrali or English—they both seem

strangely alike when coming from him and equally untranslatable. Apparently he was suggesting that we should dismount, but the Chief and I are into it before he can make any understandable noise, so they all follow on. The shale ridge lasts for about a mile and a half, the pathway at best $2\frac{1}{2}$ feet wide, at worst one foot, winding in and out of the spurs and projections of the ridge on an average of five or six hundred feet above the river, the slope at an angle of a fire-escape. We plod firmly along, Bowers every now and then breaking the silence by announcing in his low soft voice, "Here so and so fell down and was killed", or, "Here three mules fell down and were washed away by the river". At a sharp bend he suddenly says, "This will make a grand photograph", slides in some mysterious way over his pony's tail and turns round to take a photo. We all ride stallions and Glen is the first of the protesting cavalcade which has to stop and be photographed, while the unruly stallions squeal, bite each other from behind and make damn fools of themselves in general, on the narrowest part of the path. The Chief and I ride on hoping for the best and gradually get down to level again. We wonder how our baggage will fare. We reach Buni, 14 miles, and sit down in the shade to breakfast. We have been rising steadily and the first poplars are here; hawthorn and blackthorn; there are also button-holes of coreopsis and yellow daisies for us, and the head of the village comes forward with a letter from Gurdon dated '95, thanking his father for helping Jones and his weary men and commending him and his progeny to the gentle notice of all Englishmen for ever and a day.

Another eleven miles to Sanoghar, mostly uphill. After a steep climb we reach a village called Miragram. To the right is an open gorge in the near hills, and through the gorge is a snow-covered mountain, Buni Zun, very close, with a sheer rock-face towards us. The villagers bring fruit and bundles of a leafless pink flower that they have picked for us off the mountain, growing by the snow. No one can tell us its name, but the villagers call it *Kunar*. Out comes the Chief's haversack and he settles down to sketch, while most of us jog on to Sanoghar. A nice little rest-house at 7500 feet. It is really cool at last. A rippling grass lawn in front and the shade of walnut-trees. Mulberries are also dotted about on it. A chair under a tree, a drink, a pipe, and I settle down to deal with a post.

Friday, 10th August. Mastuj. Spent quiet afternoon at Sanoghar and did some work. Post hasn't missed a day yet. Had a topping sleep and am quite fit again. Up at 4-30 and off as soon as it is light. As it is only a short way to Mastuj, we are going on to Charpati,

another 7 miles, to ease the long march to Miragram. The road starts off up the left bank winding round a bad rock cliff, then descends sharply to the river—a really nasty bit with sharp zig-zag turns. I am on “Ginger”, a biggish C. B. pony. He is so long and angular that I have to put him into reverse at some corners to get round. Thank goodness after a bit the Chief dismounts and we walk down. Ginger not a good goat. At the bottom we cross the river over a suspension-bridge. Very narrow gorge and a fine mass of water tearing down. Road on far side bad with continual steep climbs up and down spurs. We are soon in sight of Mastuj, a green spot with a large mud fort on the far bank, but we have to struggle on up and down some nasty places for two miles before we get down to another and rather wobbly suspension-bridge, which we cross and turn back to Mastuj. Distance about four miles as the crow flies, but we must have done ten—the longest way of going from one place to another I’ve ever done. Before the English came, it took two days to get from Mastuj to Sanoghar.

On the way, when we stop to walk down a steep bit, the ponies afford light relief. One man lets his stallion go, in order to rush forward to hold the Chief’s horse. The loose one promptly makes a most sudden and unplatonic attack on Hissam-ud-din’s pony when he is half dismounted. Over goes Hissam-ud-din and sits heavily on a sharp stone. Two or three other men let go their horses to assail the combatants, further squeals, snorts and kicks ensue, all within a few yards of a drop of three or four hundred feet into the river. Peace at last restored.

In a garden below the fort we breakfast in the shade. Glen and Bowers go on to erect a camp at Charpari. I send off some telegrams from this, the northernmost telegraph office in India. To the south the Laspor river goes through the hills to Sor Laspor and the Shandur. Our valley runs off north-eastwards up the Yarkhun river. Below the fort is a fine jheel, which is full of snipe in the winter. A terrific shale hill on the right, and up the valley a snow-covered range blocks the way. Somewhere on this range, round a bend right-handed, we have to clamber up to the Thui or Mashobar pass.

Charpari. An easy ride along the valley, past some ripping little hamlets. Apples and apricots everywhere, but we are too high for grapes. No bungalow, but camped in a heavenly apricot and walnut orchard under a hill. A small village and good crops. Quail were calling as we came in, and Hissam-ud-din and I propose to tickle

them up after tea. Chief is going up a hill to have a look round with a telescope.

Saturday, 11th August. Miragram. The quail shoot not a great success, for there were very few quail. Having pranced through crops for over an hour and collected three quail, we turned to the hill behind the camp and got on to a small covey of chikor and after much labour and climbing we slaughtered two brace. It was a nasty hill and very steep, so we got good exercise.

After dinner when the Chief had gone, I asked Bowers if I had not better give a general tip to square up any damage done, and to pay for the apricots eaten by our entourage. However, this was not advised as the headman would be hurt. But it was suggested that a drink would do him no harm, so he was sent for.

An old boy with a beard and a wizened face, in a dark choga turned up. He is seventy years old and most cheery. A Mulais, one of those odd Muhammadan tribes up here who are directly under the Agha Khan and still steadfastly pay him tithe. They look on him as little removed from God and will make deep and reverent obeisance to his picture. There are many Mulais between here and Hunza; in fact, some of the Agha Khan's income comes from these parts, as he has little land in India.

Bowers mixes the old boy a drink before his arrival. It is a tumbler consisting of two-thirds port and one-third whisky. The Mulais sits down and drinks it like a labourer puts down a pint of ale on a thirsty day. He only licks his lips and professes complete satisfaction. He and I then indulge in polite conversation through the medium of Bowers and Nasrullah Khan. He is in great form and laughs delightedly. I give him a bottle of port and his joy knows no bounds. At this moment a storm, which has been hanging round all the evening, bursts quite suddenly. Out go our never-blow-out candle-lamps and we all bolt for our tents, leaving the Mulais alone in his glory. I don't know how he passed the night, but at 5 A.M. this morning he was neither on the table nor under it.

Left at 5-30 and on up the left bank of the Mastuj, now called the Yarkhun river. The so-called road is now out of the hands of the Military Works, but the Mehtar has been having a go at it. After a sharp climb above the river and down again, we have a delightful ride along the river bank to Brep. It is a glorious morning, not a cloud in the sky. Malo Zom raises its snowy head behind us. Grass everywhere and cultivation in patches. I see a few hollyhocks growing by one hut and we pass a pool fed by a hill spring, as clear as crystal,

with small snow-trout darting about in it. The same barren, rocky hills each side of the river which now runs less boisterously and would take a boat in safety. At Brep in an hour and a half—only nine miles. Breakfast of hot sausages and buttered eggs in the shade of some trees. There is an amazing shale slope across the river, which I photograph.

On in half an hour. We now have to climb quite two thousand feet up the rocky hills. The road is a great credit to the Mehtar's engineers, who are probably only local lads, and turns and twists with repeated zig-zags. We go up and up on a well-made path about four feet wide. Occasionally the slope is 45 degrees and even less, and the stout little ponies are soon puffing and blowing, and have to be rested frequently. At last the top. It is a fine sight looking down. Now we have the fun of repeating the same process down to the river bank, and most of it has to be done on foot. I am some way behind the Chief, but catch him up at a long bend by shinning down the khud. The Guinea Pig follows protesting, but without a mistake. Now along the river bed again at a canter. The tamarisk bushes are wonderful, all in bloom. Curiously enough there seem to be two kinds of flower on one bush, one a light pink and the other a strawberry-red in colour; the latter predominates. We canter out of the river bed into Miragram.

The usual pleasant smiling welcome and presents of fruit. A camp is already standing, sent on by the Mehtar, in a grassy sloping orchard, with the river running by below. At 8300 feet it is delightfully cool, though the sun is still hot. Settle down to an apple, some apricots and the English mail which came in last night.

Sunday, 12th August. Shah Janali, 12,700 feet. There are three Shah Janalis in this district, and the name indicates "King of Polo-grounds". Some wag must have named this place, where the stones have been scraped off a flattish bit of ground on the edge of a dry, stony nullah for our camp, and the next flattest spot is a huge glacier crawling past on the other side of the nullah. There is one tiny hut against the bank of the nullah: all else is mountains and snow.

At lunch at Miragram yesterday we noticed a large bird's-nest in the tree under which we were sitting. It had been turned into a big hotel by sparrows who had built quarters all round it and inside it. Just after lunch Hissam-ud-din said, "Look! there is a snake in the nest". The spadgers were giving tongue most vociferously and under the nest were showing about six inches of snake, his head

evidently in the nest. The baggage had not arrived and we had no guns, but Bowers produced a .450 Colt and took a shot. It was about 24 feet away and he grazed the snake with the very first shot. The snake wriggled and squirmed, but always showed some part. Bowers went on shooting, once breaking his tail. After about eight shots the dirty marauder's tail hung lower and lower, till he came down "wump" on the ground, and lay there squirming his life out. An amazing bit of shooting. He had one hit on the head, a lucky one, a graze high up and another lower down. His back was broken with a clean hit a foot from the end of his tail and again three inches from the tail. With the first shot the spadgers hopped it, including one brave little fellow who had been violently pecking at the snake's tail, but half an hour afterwards they were all back bucking over the day's adventure, nineteen to the dozen. Suppose no one will believe this in spite of four witnesses.

In the evening Glen, Bowers and self went down to the river to a local bridge. It consisted of three thin ropes of stick and twig to walk on; supposed to be tied together but were not. Two ropes as hand-rails, being joined to the walking-ropes by strips of twig twisted round and not even tied. I essay the bridge, which sinks down to within a foot of the torrent. It is not difficult, yet if one looks down long enough into the water, one imagines that the bridge has a terrific swing on. Glen and Bowers both have a go. The bridge broke last year, drowning an old man and a girl who were crossing.

Off at 5-30 this morning. We get our feet wet at the start when riding through a hill stream. It is running pretty fast and it is all the ponies can do to get over. On up the left bank, an easy track along the river edge. Most of the nearer hill-tops under snow and between them we get glimpses of snow-clad peaks. At Warsam, 9 miles, we breakfast in an orchard. The apricots and crops are still green here. Opposite Warsam the Yarkhun river bends off left-handed upstream through a magnificent rocky gorge. This is the great defensive *Darband* of the Chitrali against the bogy Bolo, Afghan or Badakhshani. Indeed, with a little preparation by a Sapper and Miner Company, stone-shoots, fougasses and other tricks, a few determined soldiers with a gun or two could hold up an army. There are the usual stories of terrific battles in the past, of countless bones of men in the river bed; of the great fight in the *very* dim past when the Chitralis killed 50,000 of the invading hordes within sight of where we stand. Cut off three of the noughts and one probably gets the real total of killed and wounded in this particular engagement.

Our road turns right-handed up a stream and we rise steadily toward the apparent dead-end of everything, rows of snow-clad massive peaks. Among the lower, though very sharp needle-summits, is the Thui pass. As we go on there is a change in the trees. Apricot, willow and walnut give way to silver birch and juniper. Some of the lower slopes are covered with coarse grass, with masses of pink and yellow flowers. A kind of dog-rose is in bloom everywhere. We come in sight of glaciers descending to the nullah and presently ride over a portion of one, though it is scarcely recognizable as such, as it is covered with stones and mud. The ponies go slowly and are given frequent halts to puff and blow, for we are now at 12,000 feet. We reach camp in a nullah which is about half a mile wide. It is worth having come so far alone to see this for all round rise hills and mountains of black rock and white rock with a few green slopes dotted about. They rise in every shape and formation, the heights and crevices filled with snow, and glaciers coming right down. Not a cloud in the sky and the sun is hot. Ahead is a huge black rock formation with a perpendicular cliff round which, high up, is a snow-field and the peaks between which we must find our way to the pass.

We look round, inspect the yaks and have a trial spin. Weird-looking creatures, apparently quite unambitious and without much sense of humour. A rope through the nose is all there is to guide them. They are feeling the heat, poor dears! The Chief settles down to sketch them.

Monday, 13th August. Shah Janali. A day's rest and very welcome to all, including the transport ponies and mules, who, free from care, wander about precipitous grass slopes, eating and fighting to their heart's content. Yesterday evening Glen, Bowers and self thought we would walk across the glacier to see if there was a way up the hills on the far side. It looked about five hundred yards across and proved to be a mile and a half over the worst going imaginable. The glacier here is covered with the debris brought down off the mountains by avalanches and storms, and is a mass of rocks, boulders and stones. Every now and then a crevasse yawning down to an icy stream at the bottom shows the solid ice and snow. It is all in an amazing formation of hills, hillocks, hollows and little valleys. It is stiff work crossing it. Little avalanches of stones go on all the time and we have to choose our line carefully. The big rocks are the safest and the goat-like Bowers leaps over them like a damn markhor. On the far side, off the glacier, grass and lovely flowers. A veritable

rock-garden and a rock wall almost perpendicular, running upwards for 4000 feet. We decide to return and get back just as the sun goes down and it is getting cold. The moment the sun has gone it gets pretty bleak, so into a bath and to dinner in fur jackets and Gilgit boots.

This morning breakfast at eight. Oh! Blessed repose. But it ain't much good, for I have acquired bad habits and am awake with the dawn. Rise lazily and go for a stroll well wrapped up. After breakfast we go up the valley riding to see the big glaciers. Rough going for three miles and we are well opposite two glaciers; one comes down from some snowy peaks about 22,000 feet high, and is about a mile across at the base, and solid ice up to the snow-fields. The other is smaller but is a perfect gem, cleaner and whiter than the big one. The Chief settles down to sketch and the rest of us clamber along to the smaller glacier, getting at last right up to it on the snow immediately below. It is an awe-inspiring sight, the last eight hundred feet of it a perpendicular drop of frozen snow and ice twisted into a weird shape. We have to go warily as if we get on to snow over a crevasse we may go to glory rather suddenly. The crevasses themselves are amazingly beautiful, and with the sun shining into them, the ice sides turn a wonderful pale blue. We go back beside a roaring torrent of snow water, which ends over a waterfall down into a deep black hole under the glacier over which we ride "through caverns measureless to man". Back to lunch about two and then a spot of work.

To-morrow we cross the Thui pass where we say farewell to this hospitable land of Chitral, and climb down the far side in the Gilgit Agency. No one can tell us who was the last white man to cross the Thui; it doesn't seem to have been done for very many years. It is certainly an unfrequented and pretty unknown spot. These colossal heights which close around, some of them over 20,000 feet, are unnamed and unmarked upon the maps.

Tuesday, 14th August. Ramach. Oppressingly hot at Shah Janali last evening and could only get sleep with one blanket on. At four o'clock it began to rain, the steady pattering on the tent being occasionally broken by a rumble and a roar as rocks and stones rolled down some steep mountain side. When we started at 8 A.M. it was raining steadily with all the peaks in cloud. We go well encased in mackintoshes, along the glacier and moraine, past the two glaciers we saw yesterday, till we reach the foot of a snow-field. Here we mount yaks and struggle slowly up the steep slope. We leave the

snow-field for another glacier, covered with enormous boulders and rocks, then round a cliff right-handed, and the pass comes in sight up a steady, steep slope, half snow and half shale. A rough path has been cut in the shale, zig-zagging up and up, and the yaks crawl slowly but very safely along it, with halts every now and then to puff and blow. At the top is a large gathering of the men of Gilgit, chiefly from Yasin, headed by Colonel Lorimer, the Political Agent of Gilgit. There is a good fire and hot tea. The rain has stopped and the clouds have lifted, but the peaks are crowned with mist. We can, however, see down both sides of the pass. Just below the pass on the Gilgit side is a small pool of water in the snow, bright blue in colour, but no one can account for it. We bid farewell to the Mehtar's three sons and to Bowers, and start down through the snow. For the first two miles we descend over snow and shale, but it is easier than on the Chitral side. To the left the high peaks are further off and the country more open. To the right massive rocky mountains rise sheer from the glacier at the bottom. There are magnificent snow-fields and glaciers feeding this main one, which is mostly covered with debris from the hills, and rocks from the size of omnibuses to pebbles, hurled down at some time or other by avalanches. We go down the valley, sometimes on moraine, sometimes on glacier, and occasionally on snow at the sides. We pass a waterfall on the left, which crashes down a chasm under the glacier.

Presently the Chief stops to sketch, and I ride on to camp with Lorimer. We come at last to the end of the glacier, where it feeds a rushing torrent of snow water so fast that boulders are carried along the bottom with a noise like gunfire in the distance. At two o'clock we reach camp, at a delightful grassy spot with silver birch and other trees around us. It has taken us six hours to do about eleven miles and we have done well. Hissam-ud-din and I have both sat down suddenly going over the ice, but no damage done. The Chief has seen some ibex on the further side of the impassable river on the top of an enormous unclimbable mountain of rock and watches them through a telescope. They are small and unshootable—no sour grapes. He gets in about five o'clock to tea, and the baggage, carried on the backs of coolies arrives an hour later, many of them breaking into a trot for the last hundred yards to show that they are not tired. Tents are soon up and we settle down.

Wednesday, 15th August. Harf. Rain came down again in the evening. Glen and I shared one tent to save trouble and pushed the spare tents on to Harf. At Yasin there is a bungalow. Off

comfortably after breakfast at 7-30, leaving Hissam-ud-din to wrestle with the new transport. Cloudy and cool but no rain. Good path for a few miles through a forest of silver birch, juniper, and a sort of stunted poplar; then along down the bare and rocky left bank of the Thui river. We have left the snow now. At about seven miles we cross the river by a Gilgit bridge and then go down the right bank into a heavily cultivated valley. Wheat, beans, lucerne, etc., with poppies and the blue wild chickory flower growing in the corn. A local headman in a blue choga makes his bow, and shortly afterwards we reach a walled-in apricot orchard where our camp is. Height here about 9500 feet. Still cloudy and cold enough for a thick suit. An easy march.

Thursday, 16th August. Yasin. Glorious clear sky when we started this morning at 7-30 along the right bank down the Thui. Several miles more good cultivation, then some narrow gorges with the inevitable narrow track cut in the hillside. Later down to the river-level where it opened out into a huge stony bed about three miles across, with the river split up into innumerable rivulets all over it. A dromedary squats in the foreground; it has brought two nice old gentlemen from over the way with a dish of ripe apricots which are gratefully accepted.

Chief pushes on at a great pace. The river bed closes in again and rich fields with the elegant poplars and apricot trees take the place of stones. Ahead is a stony ridge. More apricots from hospitable Yasinites. We canter up the rise and there is a long gentle slope down, of waste stony ground, and at the bottom, under a hill lies a large green oasis, Yasin.

The good men of Yasin give us a great welcome. The pipes wail, guns are shot into the air, and an energetic gentleman in a leander-coloured silk choga raises a positive yell of greeting at the last moment with the aid of a long whippy stick. There is a bungalow, outside which all is prepared for "shooting the popinjay". Several of them are successful at the game and then we retire into a pleasant coolness of the well-appointed little bungalow, for we are down again to 7000 feet and the sun is hot. Only twelve miles from Harf and good going. A mail and some telegrams come in, we settle down peacefully, and Lorimer goes on to Gilgit.

Friday, 17th August. Gupis. In the evening at Yasin we rode down to the polo-ground, about a mile and a half off, and watched a game. Eight one side and seven the other. The players hit the ball extraordinarily well, considering the size and state of the ground

and the number of people on it. Afterwards some dancing, the sword-dance being better than anything we have seen.

On getting back to the bungalow I got the Governor of Yasin to show me Hayward's stone. It was about five hundred yards from the bungalow. There was a small wall round it, built, I believe, by Sir Armine Dew when Political Agent, Gilgit. On the rock is carved $\frac{C.W.H.}{69}$. The 69 was very faint. He was in the geographical survey and had been a good deal in these parts, for there is a house at Chitral still called after his name. However he came up here and the old Governor tells me that at Yasin his troubles began, for the Mehtar rode down to meet him and dismounted, while Hayward forgot to do so, a terrible *faux pas* in these parts. While at Yasin he carved his initials as described and then went on towards the Darkot pass, north of Thui. Doubt exists as to who ordered his death, Kashmir or Yasin. Out in the Darkot pass they did him to death. They sat all round his tent at night till he could keep awake no longer; then at dawn they rushed him and took him. He asked to be allowed to see the sun rise from the top of the Darkot. This was allowed. Then he came down again and was murdered.

Some ascribe the murder to plunder. It is also said that if he had stayed up the Darkot ten minutes longer they would have let him off, thinking him a holy man. Possibly the insult referred to had something to do with it. Newbolt has written a poem about this incident.

Off at 7 A.M. this morning getting a good view of the Darkot pass forty miles away, up the Yasin valley. The Thui river, which we had come down, flows into the Yasin a mile or two above this place, at Mir Ali. The Nasbar also runs into the Yasin here, coming from the pass of that name. A good road and the Chief makes a good pace. We do the first twelve miles in an hour and a half, having crossed the river by a good suspension-bridge below Yasin.

Usual high rocky hills, but there is a grand swamp under a bluff where there must be many duck in the winter. Four miles out of Gupis we are met by the local king of Gupis, his son and some of his benchmen. Raja Murad Khan is a benevolent-looking old gentleman. The fort lies on the right bank and below it we cross a good suspension-bridge and get a welcome from a pipe band and the firing of rifles. Leaving the fort on our right we pass down a lovely avenue of poplars to a small rest-house.

Saturday, 18th August. Gakuch. At Gupis yesterday evening the Chief had a look at two platoons of the Third Kashmir Regiment

on parade outside the fort. Mostly Gurkhas and well turned out. Afterwards examined the fort rebuilt by Tim Shea when up here between '12 and '16. A well-built and well-arranged affair to hold 200 men, but would take more. At present there are about a hundred.

The Posts and Telegraphs surpassed themselves for we got our last post via Chakdara and Chitral at Yasin, and our first one via Kashmir and Gilgit at Gupis. Telegrams arrive any moment of the day.

Up at 4-30 and off an hour later as we have 24 miles to go. Raja Murad Khan accompanies us a little of the way. A nice old man, very interested to hear of Tim Shea, to whom he is devoted. Just above Gupis the Shugar river, coming in from Shandur way, joins the Yasin and they together become the Gilgit river. We ride down the right bank for seventeen miles, enclosed by rocky hills, and there is nothing of much interest save the river itself which is pretty full and a fine sight at some of the rapids. The sun rises right in our faces. At the 15th mile we have breakfast on a grassy bank under some pomegranate trees beside the river. For the last few miles the river runs into a broad valley. Into the left bank flows the Ishkuman river, and far up its valley we see some snow-covered heights which are the haunt of ibex. We canter along the Gilgit valley beside the river edge to a small bungalow well shaded by big walnut-trees. The village of Gakuch is on the plateau above, and local hosts bring us fruit and a nice fish caught this morning. They say it is a snow-trout, which it isn't. Must have a go at the fish this evening. They say here that Manners Smith was the last white man to cross the Thui pass, as long ago as the early 'nineties, but that he lost a man who slipped and fell into one of the snow-water rapids and was carried under a high glacier immediately. They say that his body came out in the stream in three or four months.

Sunday, 19th August. Gulapur. Hissam-ud-din and I tried the river for fish. There was a beautiful bit of water, but nothing doing. It was as thick as pea-soup. But it was a gorgeous evening and I enjoyed it.

Off at 5-30 this morning. Into a fine rock gorge at once, with the biggest suspension-bridge we have seen yet. We remained on the right bank, road good. Had breakfast two miles beyond Singal and were in by ten o'clock—23 miles. Not much view as we were enclosed by hills all the way. Gulapur thickly treed and cultivated. Met by Raja Anwar Khan and a "furious joy". Anwar Khan a great polo player in these parts.

Monday, 20th August. Gilgit. A hot afternoon at Gulapur. Flies the very devil. Towards evening took a chair and sat under a tree to read *Adventures in the Near East* by the Chief's brother—an extraordinary good book. A curious evening: dead still. Looking up the river a heat haze made even the near mountains look all one grey colour, as if cut out of cardboard. Below, the river winding down like a silver streak. Not a leaf stirring, and from somewhere in the valley the local muezzin calling to prayer. After dinner we see the new moon—new to us, but already five days old, for we have not seen her earlier dainty appearances owing to the gigantic hills.

In early to Gilgit. Breakfasted after climbing slowly over a hill that was evidently a big thing in landslides, the local story being that underneath it lies a village that once gave a passing holy man, a Pir, wine to drink, and would not give him water. Therefore on leaving, he hiccoughed horrible curses on the village, and down came the landslide and wiped out the bibulous community. A 21-mile march, very enclosed and stuffy. Shortly after leaving Gulapur we pass into Kashmir territory and are met by a voluble *tahsildar* dressed in English clothes. A few miles before Gilgit the hills open out and form between them a goodly valley. We cross a mountain river from a nullah on the right: absolutely clear water. Below Gilgit a band begins playing and under an arch of welcome the Chief is met by Colonel Lorimer, by the Wazir-i-Wazarat, who is Kashmir's representative, other notabilities, Major Erskine who is military adviser to Kashmir troops, and Captain Edwardes, the Commandant of the Gilgit Scouts. After introductions on up the hill to Colonel Lorimer's house, a guard of honour, then the blissful coolness of a real house.

* * * * *

We are now on well-trodden ground and perhaps my Journal may end here. To me, and I am sure to the others of the party, the energetic days that followed were of scarcely less interest than those I have already described. From Gilgit we went to Hunza and on to Nagar, through the difficult country which saw that brilliant little campaign of '91, past the most superb views of Rakaposhi, or Dumani as this wonderful peak is known locally. Everywhere we were received most hospitably by the delightful inhabitants of these once warlike and predatory states. We saw that wonderful view of Rakaposhi from the Mir's castle at Baltit, crossed the rope-bridge between Hunza and Nagar and played polo, "shot the popinjay"

and tent-pegged among those fine sportsmen of Nagar. We were back at Gilgit by the 27th of August, after which we broke up into two parties, the Chief with Glen going up the Naltar nullah, while Hissam-ud-din and I were given the Jotial nullah. I like to think that cloudy and often thoroughly wet weather prevented us from doing much more than merely going through the motions of shooting ibex and markhor, for all of us returned empty-handed, but we had a grand time. At Gilgit we encountered the traditional hospitality of that outpost. No traveller has ever been known to pass it by without recording it.

On the 2nd September we left Gilgit and travelling by Astor and the Kamri pass reached Tragbal, overlooking the Vale of Kashmir on the 8th. From here we passed on immediately to Bandapur. It was getting dark when we reached the boats that were moored by the river bank ready to take us in to Srinagar. Here we completed our riding and walking tour of 756 miles in 32 travelling days. Perhaps this record may close with one last extract from my diary :

“Awakened at 4 A.M. by horrible noises of shouts and groans. They had started paddling us over the Wular lake, and each humble Kashmir mariner was, according to his wont, encouraging his neighbour with loud shouts to row harder, so that he might row less hard himself. The noise was nicely regular and I dozed again ”.

And so to Srinagar.

HIGH ALTITUDE AND OXYGEN

N. E. ODELL

AT THE British Association Centenary Meeting held in London in September last, Professor J. Barcroft, F.R.S., addressed Section I on "The Limits placed by Altitude to Physical Exercise", which was followed by a discussion of the subject, to which both Dr. Raymond Greene, who was one of the party to reach the summit of Kamet last year, and myself, who took part in the Mount Everest Expedition of 1924, contributed. As nothing about this problem has appeared in *The Himalayan Journal* as yet, it may be of interest to give a summary of the views expressed.

Professor Barcroft pointed out that the work of Italian researchers had shown that man can live at an atmospheric pressure of about 110 mm., if he breathes, not air, but oxygen. At that pressure he can do little or no work. More recent researches by Barcroft, Douglas Kendal and Margaria have, however, shown that at 170 mm. pressure, breathing oxygen, man can step up a thousand feet in an hour. As the test consisted of stepping on to a box, it was incidental that he stepped down as often as he stepped up. One hundred and seventy millimetres is a much lower pressure than that at the top of Everest. It follows therefore that, given a supply of oxygen into the respiratory passages, the feat of climbing at the highest altitudes of the earth's surface is not impossible, and that, apart from unknown difficulties of terrain, the problem of climbing Mount Everest is less one for the mountaineer than one for the engineer. Not the engineer in general : but a particular sort of engineer, one who specializes in the apparatus of respiration, such, for instance, as the diving engineer, or those of the technical chemical defence departments of the National Armée.

The amount of oxygen necessary is about a litre and a half per minute. If an ascent of five thousand feet is to be made in five hours, the oxygen actually absorbed by the climber would be 450 litres. Suppose he breathed half that amount on the descent, some seven hundred litres would be required, or say thirty cubic feet, for the whole journey. The problem then may be subdivided thus :—

1. How is man to carry 30 cubic feet of oxygen ?

2. If he 're-breathes' it, how is he to get rid of the carbonic acid ?
3. How is he to cope with the incidental difficulties proper to the use of the apparatus, such as the occurrence of water vapour, which freezes in inconvenient places ?
4. How much margin over and above the theoretical quantity is necessary for safety ?

Seven hundred litres weigh approximately a kilogram, so that the weight of the oxygen itself is trifling, but the weight of an ordinary cylinder which would carry 30 cubic feet of compressed gas is too great. What therefore are the lightest cylinders into which it can be compressed ? Were the problem one for providing a supply of air for a diver or a respirator for a soldier, a competent authority would sit down to face it on a basis of exhaustive experiment and extended drill. In the end, said Professor Barcroft, he had little doubt that the problem would be solved with less expenditure than is entailed in the equipment and expenses of successive expeditions to the Himalaya—expeditions which not only cost money but a toll of valuable lives.

I have been unable to get hold of a copy of Dr. Raymond Greene's contribution to the discussion, but an article which he sent to *Nature* and which was published in the issue of that paper for November 28th, 1931, gives the substance of his earlier discussion. In that article Dr. Greene gives the views of both the oxygen school and the no-oxygen school. He sums up by saying: "If, then, the oxygen school believes in the usefulness of oxygen for high climbers, whether acclimatized or not, and the no-oxygen school believes in its usefulness for the unacclimatized, a method of attack in conformity with both points of view appears at first sight to be obvious. It should be possible to eliminate the necessity for acclimatization by using oxygen from a low level on the mountain and climbing it at alpine speed. But here two great problems present themselves. It is very difficult to construct an apparatus which will without waste deliver the required quantity of oxygen while the climber is eating and sleeping and it is impossible at the moment to find an apparatus which can be trusted never to go wrong. The failure of his oxygen apparatus near the top of Everest would mean death to an unacclimatized mountaineer".

My own contribution to the discussion was as follows :

Following the second expedition to Mount Everest, which was the first actual assault above 23,000 feet on the main summit, opinions

differed as to the actual value of an artificial supply of oxygen. Finch and Geoffrey Bruce had reached 27,200 feet using an oxygen apparatus all the way from 21,000 feet. But Mallory's party of four climbers had also attained almost an equivalent altitude, namely 26,900 feet, entirely without oxygen equipment, and relying upon their own inherent powers of acclimatization.

The third expedition of 1924 was equipped with apparatus of an improved kind, including three cylinders of a specially light alloy ("Vibrac" steel), and a total capacity of 1605 litres, or about 57 cubic feet, of oxygen. This amount at the prescribed continuous consumption of two litres per minute was to provide for a thirteen hours' climb, ascent and descent. The total weight was about 33 lbs.; but it was later reduced to 22 lbs. by discarding one cylinder and modifying the breathing apparatus.

Owing to various defects in the apparatus, to some extent consequent upon rough handling on the outward journey across Tibet, considerable delay was occasioned by the necessary repair work before a sufficient number of apparatus was available for use on the mountain. In the meantime high camps were pitched and plans laid for attempts on the summit without breathing apparatus. And these very efforts of the climbing party were the means of bringing about a degree of acclimatization never before attained by previous climbers. Geoffrey Bruce, who had depended on oxygen in 1922, now found no perceptible relief when using it. I myself carried on one occasion an apparatus up to 27,000 feet, and as I was getting no benefit at 26,000 feet, I turned off the supply of gas and continued climbing with no noticeably enhanced fatigue. By living at an altitude of not less than 23,000 feet for eleven days a very high degree of acclimatization had been acquired.

It must not be supposed, as Raymond Greene has suggested, that the failure to find relief or advantage when using oxygen was due to some inherent defect in the apparatus and its supply of oxygen to the lungs¹. On the contrary, every apparatus eventually repaired was in perfect gas-tight condition, and by practice a suitable habit of

¹ "The second occasion was at 27,000 feet, when Odell discarded oxygen and felt better without it. With the deference due from one who was not actually present, I suggest that the fault may have rested with the apparatus, and that the improvement in Odell's condition may have been due to the discarding of useless weight and possibly partly to the euphoria usually associated with *anoxæmia*".—*Dr. Raymond Greene*.

inhaling from the mouthpiece of the supply-tube had been acquired by the users.

Acclimatization to an altitude of 27,000 feet has been demonstrated, and there seems no valid reason why it should not be possible to over 29,000 feet, or the top of Everest. In their record-making ascent to 28,000 feet and over, without oxygen supply, Norton and Somervell were admittedly reduced to extremely slow upward progress, but it must be remembered that neither of them were fit men at the outset, largely owing to their having taken part in an exhausting rescue expedition not long before. Mallory and Irvine set out on their last tragic climb with breathing apparatus, but we may never know what benefits, if any, they derived from it. In any case, there is nothing to warrant Raymond Greene's recently expressed views that their failure to return was due to a breakdown in the apparatus².

Our general conclusions regarding the use of oxygen were long ago stated in *The Fight for Everest*, 1925, page 329, wherein it was maintained that for a mountain of exceptional altitude, such as Everest, a future climbing party might advisably be provided with a light form of apparatus supplying sufficient gas for the last few hundred feet of the mountain. It was strongly recommended, however, that such apparatus should be considered an emergency measure only, and acclimatization to the highest altitudes should be resolutely aimed at. In practice such altitudes on Everest would be about 27,000 or 28,000 feet, the height of the highest camp, and one to which carrying parties must ascend, unhampered by the extra individual load of breathing apparatus. For in this connection it should not be forgotten what a high percentage of available portorage can be worn out, as it was on the Mount Everest expeditions, in carrying up the oxygen supply for the summit-climbing parties.

With these considerations in view a lightened and simplified apparatus was devised in 1925, and trials of its suitability for mountain use were made in Snowdonia. The equipment provided for about fifteen cubic feet of gas and its weight was not more than 12 lbs. Thus the load involved becomes a manageable one and from the experience

² "There is a note by Mallory, written from Camp VI, telling Noel to be on the look-out with his cinema at 8 A.M., when he expected to be at the foot of the final pyramid. This suggests that Mallory expected to make, with oxygen, very rapid progress. . . . The appearance of Mallory and Irvine, still below the final pyramid at 12-50, four and a half hours late, may have been due to a breakdown of the apparatus".—*Dr. Raymond Greene*.

gained thus far it should provide ample oxygen for emergency purposes, if due regard has been given to acclimatization.

The problem of the engineer, as conceived by Professor Barcroft, would, therefore, appear to have been already largely solved by the mountaineer, though not without the earlier advice of the former. Moreover both engineer and physiologist may be reminded that among many mountaineers the opinion prevails that, if Mount Everest and other high Himalayan peaks are worth climbing at all, they should be ascended without such artificial aids as may reduce a sport to a mere laboratory experiment. If however, in the interests of physiology the opportunity should not be missed, where, it may be asked, can this important problem of acclimatization be better studied than under actual mountain conditions? It would seem to be as important of study as the mere duplication of experiments carried out in the pressure chamber, where it has been shown already that man can survive, when primed with oxygen, at a pressure much below that obtaining at the summit of Mount Everest.

Note by Editor.

To Mr. Odell's and Dr. Greene's contributions to this subject, we may perhaps be permitted to add some conclusions to be drawn from Paul Bauer's last determined assault on Kangchenjunga. Bauer's party was composed of young men in the fittest possible training before the task was undertaken. It took this party sixty-eight days to reach an altitude of 26,000 feet from Camp VI at 16,800 feet. Acclimatization was forced on them by the supreme difficulty of the actual climbing, so that when they reached 24,000 or 25,000 feet, at which Colonel Norton has said "the difficulties imposed by altitude only begin to be really serious", acclimatization had been attained to such an extent that no inconvenience was felt and it became possible to advance six hundred feet in an hour at 25,000 feet through deep snow over otherwise easy slopes. No oxygen was necessary nor was its want felt. The possibility of moving at this rate without oxygen would have been ridiculed a few years ago. It was not lack of oxygen that defeated Bauer, but dangerous snow, such as might defeat any other wise man at Alpine altitudes.

That the general conclusions arrived at after the last Everest expedition are sound has been fully borne out by Bauer's recent experience. Acclimatization is possible up to any altitude that has so far been attained; it cannot be hurried and it appears to be unwise to adopt "rush tactics" until complete acclimatization has been acquired and then only for a short distance. With Bauer himself, probably one of the fittest of the party and the hardest worked, but, I believe, the oldest at thirty-four, it was a near thing. Though fully acclimatized, he almost collapsed from overstrain. Oxygen, even in small quantities as an emergency measure, would surely have been invaluable in his very critical condition during the night spent at Camp X, when he no longer had the strength to continue the descent and almost froze to death.

SUB-HIMALAYAN DIETETICS

DR. C. STRICKLAND

IN THE *Fauna of British India*, Vol. I (Distant, 1902), is to be found a record, attributed to O'Gorman of the I.M.S., regarding a certain bug rejoicing in the scientific name of *Aspongopus nepalensis* Westwood (1837), to the effect that there are some natives of Assam who are accustomed to eat the creature pounded up with their rice. This report is referred to by Maxwell Lefroy in 1909, who says that probably the insect gives "a powerful aromatic flavour" to the diet of the natives. Any drabness in the diet would doubtless be at least neutralized.

As most bugs—the word is used in a zoological, not in a Himalayan Club or heretical sense—are provided with a secretion that leads one to believe them to be devoid of a sense of smell, a secretion that has for instance led to some representatives being given the name of 'Bengal violets', one can well believe that the curry of the *indigènes* must derive a flavour, though to describe it as aromatic appears to be somewhat of a euphemism, and one might as well conversely refer to the subtle scents of freesias and frangipane along the Riviera as hemipterine.

In the matter of scents and flavours I have had an interesting note on the point from Mr. Furze, the Inspector of Police and Political Officer of the Sadiya Frontier Tract, who sets up a rival to the aromatic flavour theory in forwarding the statement that the 'heart' of these bugs when tasted is very hot, like chillies. But there is one other possible reason why the aboriginals use this creature as a sambal to their curry, for apparently the insect's popular name is the 'cinnamon beetle'. This fact may indeed have been the origin of the custom among less-favoured mortals of using the spice cinnamon in their curry, because the proper article, the beetle, was, with the growth of civilization, not procurable.

I have been unable to find out whether O'Gorman pursued his subject further, and the matter lay apparently unnoticed until Dr. O'Connor of Upper Assam sent me on the 10th February 1930 some of the reputed beetles, with the following note :

"I send herewith a beetle which was found in one of the Assam Frontier Tracts. It lives under large stones in the Lohit river and appears to be of an edible type. The Mishmis eat it, but before doing so they remove two little red bags which they say contain poison. These bags appear to lie between the thorax and abdomen. On mentioning this matter to a gentleman, whose name I have unfortunately forgotten, he informed me that he knew of it and that if perchance the natives forget to extract the poison glands they get paralysis of the neck, from which they inevitably die". These bugs turned out to be *Aspongopus chinensis* Dall (1851), a first cousin of the *A. nepalensis* mentioned above, but one apparently equally acceptable to the gourmets of Assam.

Since that record, Dr. Hutton, I.C.S., lately Deputy Commissioner, Naga Hills, has kindly sent me the following information on the subject: "Nagas eat a species of wood-bug, brown and malodorous, which they normally search out from under the stones of riverbeds, but which are sometimes taken in huge flights. I have seen a cane-bridge covered with them and their pursuers. I have not heard of the paralysis that follows a meal off the wrong kind, but am making enquiries and will get specimens if they can be tracked down.

"I append a list of some other unusual food-stuffs which occur to me off-hand. There must be many others: Large green and grey spiders; a species of large, smooth, black and yellow caterpillar found in colonies at the tops of trees; dragon-flies; stag-beetle and hornet grubs; winged termites; big grasshoppers; water-snails; water-boatmen (I think when taken along with other water besticles); large tree-frogs and their roe; rock pythons, hamadryads and probably other big snakes".

Dr. Hutton has also sent me this further information: "I am very sorry not to have let you have any news as to the paralytic bug, but I am writing again to see if my friends in the Naga Hills have found out anything. Earthworms and leeches are definitely not eaten, but I had a friend across the border who made a self-glorious practice of experimenting in every sort of animal and insect food. I know that he tried earthworms and pronounced them uninteresting. I do not know whether he sampled leeches or not, but he killed himself in the end, it was reported, by eating some species of snake".

Regarding annelids in general as articles of diet, Professor Moore, of Pennsylvania University, recently in Calcutta, has told me that

he has seen Italian railway-labourers make soup of earthworms: he believed, however, that spaghetti had no zoological connexions! As for leeches, Dr. Domenicone of Calcutta tells me that certain Nepalis have a custom of picking up these annelids engorged on the blood of animals and frying them like sausages, though Colonel Weir, Political Officer of Sikkim, Bhutan and Tibet, had never heard of any such report.

Mr. Mills, Dr. Hutton's successor as administrator of the Naga Hills, has subsequently told me that "there are no tribes in these hills who extract the poison-glands from bugs. . . Mr. Needham of Upper Assam however tells me that the Abors and Miris on the north bank of the Brahmaputra eat a certain beetle which they find under stones. Before eating it they extract a small red gland from the neck in the belief that if eaten this gland affects the brain".

On my pursuing the matter further Mr. Furze, the Political Officer of the Sadiya Frontier Tract, has sent me much interesting information. He writes: "Abors, Mishmis and some Nagas eat insects, the Mishmis in great variety, the Abors and the Nagas being more selective. It would take a long time to list the varieties eaten. I certainly recollect hearing a well-authenticated tale of a beetle eaten by some hill-tribes, which is believed to cause paralysis, but I cannot remember what tribe it was Abor witch-doctors frequently concoct healing balms and medicines from insects as well as from herbs". Mr. Furze also mentions slugs and beetles as being eaten as delicacies or for lack of other food. The latter is probably the compelling cause with the Mishmis, as they live in a precipitous country where the supply of other food is at a discount.

My final source of information has been Mr. Dundas, late Inspector-General of Police, Assam, who sent me on the 12th January 1931 the following note: "The only insect I know of as being eaten alive by hill-people is that flat one found under stones and boulders in the river-beds. People not accustomed to eating it are apt to get violently sick, as some of our coolies did at Nizamghat at the time of the Debang survey in 1911. I never heard, however, that any were paralysed".

On this Mr. Furze commented on the 4th February as follows: "The flat insect referred to by Mr. Dundas is, as far as I know, a 'cinnamon beetle'. It is known in the Abor language as *tare*, and has, in an internal part, near the head, a small red spot which is said to be very poisonous and to cause madness. All hill-tribes known to me

eat this beetle turning over the boulders in dry river-beds to find them, but up here I have never heard of paralysis resulting from eating them, though symptoms of poisoning result if they be eaten by individuals not so accustomed . . . As regards the paralysis business, I am writing to one more fellow . . . I am sure that I have heard of this and probably in respect of some Kuki tribe ”.

I am much indebted to Mr. Furze for a collection of some of these bugs, with which I have made the experiments described below. In forwarding them, Mr. Furze wrote : “ If you open up the body of one of these you will find that the heart—or what the Abors consider to be the heart—of the insect is bright red . . . It is said that if this heart be applied to the skin for a short period a painful rash results. The heart itself is very hot, rather like chillies, to the taste. This is Abor information and I have not tried any experiments myself ! Some Abors say that occasionally an exceptional beetle (‘ one with a spirit ’) is eaten, which causes the unfortunate one who has indulged to experience all the symptoms of paralysis, but that this occurs very rarely ”.

Now the beliefs and superstitions recounted above have been the subject of a few experiments carried out at the School of Tropical Medicine at Calcutta, utilizing the ample material so kindly sent me by Mr. Furze.

In the first place, the so-called poison-gland, *alias* the heart, was found to be the stink-gland, a scarlet bilobed median sac lying between the thorax and abdomen. One can easily demonstrate the sac on the ventral aspect of the creature by fracturing the insect at the joint between the divisions. However, to remove it without unduly spilling its reputedly poisonous contents on to the succulent fat and flesh beneath would seem to present some difficulty, and one can only wonder how the natives do it.

The bug may be paralytic to man, but it is not so to monkeys, as we found that the organs of five insects produced no effect on either of two monkeys. Nor was there any effect noticed on the normal functions of respiration and the heart action of Calcutta cats on which the gland-contents were tried ; but probably nothing would kill them !

As for the reputed action of the secretion on the skin, I could obtain no evidence of there being any. Not only was the juice direct from the gland smeared on the arm of a volunteer, but an alcoholic extract of numerous bugs was also tried. There was no reaction or sensation whatever to the person experimented upon. Not even the

whole gland, when dissected out and bound to the skin, did any harm.

We are compelled to conclude then that, in spite of the popular belief to the contrary, the stink-gland, *alias* the heart, has none of the properties attributed to it, and it only remains for the origin of the idea to be surmised by ethnologists. There is also the question whether the theory that only those who unluckily pick on "an exceptional beetle *with a spirit*" become afflicted by a palsy is any the more correct.

So much for the *bonnes-bouches* of the Himalayan hills of which I have had reports, while our Honorary Editor informs me that in China they eat fried cockroaches and new-born mice in honey—but that is in China. It is in another category that one may, in concluding, mention the boat-loads of pie-dogs, ravished by the Miris from the tea-gardens of the plains and transported into the hills up streams such as the Subansiri, to undergo their apotheosis to dog-pie.

In sum, therefore, members of the Himalayan Club, travelling in the hills, can be reassured that if the worst ever befall their commissariat, they can for a while lead a Swiss Family Robinson existence.

THE TSARAP VALLEY, EASTERN LAHUL

LIEUT.-COLONEL C. H. STOCKLEY

IN AUGUST 1911 I passed along the east side of the range dividing Lahul and Rupshu, and crossing the Lachalung La forded the Tsarap river at the crossing of the Leh-Kulu road. I was unable then to obtain any information from the local nomads about the upper part of the Tsarap, and a short climb at the mouth showed nothing but a narrow and tortuous valley with an unfordable stream rushing down between barren slopes of scree.

Subsequent enquiries were unproductive, and it appears that the Tsarap had been unvisited by Europeans except Stoliczka, who made a geological traverse across the Pangpo La in 1865 and who seems to have returned by the same route. The valley is referred to by Hayden in his "Geology of Spiti" (*Memoirs of the Geological Survey of India*, 1904), but he does not seem to have personally visited the valley; and by Lydekker in a previous memoir, which only refers to the ground round the Lingti-Tsarap junction close to the Leh-Kulu road.

The old Atlas Sheet No. 46 is dated 1873, but the survey was probably made some years previously. The new Survey map, 52 L, which covers the same area is not as accurate and seems to have been compiled from the old sheet with no new material to account for the changes, which are for the worse. Here then was a large valley apparently quite unvisited by Europeans for sixty years or more, and probably of great zoological interest.

Accordingly, in August 1931, I made a trip to the valley, accompanied by Mr. P. H. J. Tuck, R.A., who collected the greater number of the plants and fossils which we brought back, and whose photographs were invaluable; my own being ruined by an unsuspected leak in the bellows of my camera.

We had a wet journey up and reached the mouth of the Tsarap, via the Rohtang and Baralacha passes, on the 26th August, pitching Camp 1 a quarter of a mile above the Leh-Kulu road bridge, at an altitude of 14,100 feet on the left bank. The right bank is quite impracticable. The tents were placed on the middle one of the three

very distinct beaches which indicate old river-levels all the way up the Tsarap. For the first nine miles above the bridge the valley is narrow and great slopes of unpleasantly sharp scree stretch down from the cliffs to the middle beach above the river, a hundred feet above its present level. In places this beach has been obliterated by scree slopes, as has the lowest beach, where the scree extends to the water's edge. The highest beach (3) was rarely visible in this lower nine miles, but all three were conspicuous in the upper two-thirds of the valley.

Here and there the lower five hundred feet of the hillside have been weathered away forming a steep chute of hard sand and pebbles, and there are also similar chutes in the scree. The angle of these chutes and the indifferent foothold made them very difficult for our ponies, so that routes had to be reconnoitred a day in advance and a track scraped across the more difficult sections. Progress was therefore slow for the first ten miles.

The country being uninhabited, even by nomads, precludes the employment of porters, while the grazing is excellent. Fuel is plentiful, although there is no *burtse*, that useful standby of the Tibetan traveller; its place is taken by *dama*⁽¹⁾ or Tibetan gorse. This dark-green low-growing bush flames up with a roar if a match be put to the green part, and the living root usually gives a nasty smoky fire, but in the Tsarap valley there is much dried *dama* root lying on the bank and in the river-bed, having been torn out higher up and cast up here by floods. There is very little vegetation except on the beaches and on their connecting slopes, the upper slopes throughout the valley being almost completely barren except in a few favoured spots. Besides the *dama*, there is another more loosely growing bush with a woolly seed, and a few stunted willows near Lama Guru, but no other trees or shrubs.

We left Camp 1 early on the 27th and it was at once apparent that the relative positions of the side nullahs do not correspond with those shown on the map. Nullah "A" is correctly placed if a second, non-existent bridge be eliminated from the map, but Nullah "B" is shown as being above the mouth of the Lungun, whereas it is actually 1200 yards lower down.

Between the two nullahs there are numerous springs which gush out from the hillside on to Beach 2, and which seem to indicate some large lateral fault; for the snow-cap behind is small and its water

¹⁾ *Caraqana pygmaea*.

seems fully accounted for by the flow in the two nullahs. A small pond had formed by one of these springs and round its edge were numerous clumps of the curious golden *Pedicularis tubiflora*. The flowers grow in groups of up to a dozen or more blooms, the yellow tubes standing up four inches above the close-growing leaves. I had never seen it before.

The mouth of Nullah "B" was of interest. The actual outlet to the Tsarap is now through a narrow gully worn deep in the rock. The old outlet was about a hundred and fifty yards further south where Beach 2 is broad with clumps of *dama* growing on it. Behind is a thirty-foot bank evidently thrown up by the stream across its own mouth, until the water eventually cut its way down behind a big rock outcrop to its present channel, leaving Beach 2 with the dam behind it. On Beach 2 we found a large solitary limestone rock with a smooth channel, ten inches deep, worn in it on a curve in the line of the old flow, the trough being evidently the work of water and pebbles. We called this "Trough Rock".

Beyond Nullah "B" was a difficult bit of going, but our ponies turned out perfect marvels at negotiating bad traverses; they were even better than the average Himalayan pack-pony, which is saying a good deal. Camp 2 was made on Beach 2, with the other two beaches, here very wide, above and below.

A day's halt was spent by the pony-men reconnoitring, while Tuck explored Nullah "B" for game and I tried to catch some fish for the British Museum. We both failed completely, though half an hour with the telescope showed me four good bharal rams on the plateau north of Tsarap Station. The pony-men having found a way, we pushed on again on the 29th. The first mile was a difficult scramble across a big slope, down to the river and up over a big rock, to descend to a pleasant little flat of sand and grass; then a mile and a half along the foot of the cliffs by the water's edge, over loose rocks which gave some of the ponies nasty cuts. This last stretch would be impassable with a high river, and ponies would have to be taken over the big spur above. We camped by the mouth of Nullah "C" which had perennial water in it.

Beyond this nullah there was no way below the cliffs, so, the river being unfordable where the gorge narrowed a mile higher up, we explored the slopes above and found a possible but very difficult route which would need much improving before it could be used. On these slopes was a herd of nine ibex, with only one small buck, which had spent the morning close above camp the previous day.

Leaving the pony-men to improve the route, Tuck and I climbed 3500 feet next morning to the snow-line on the west ridge of Nullah "C". Here we took bearings to Tsarap Station and Lanka peak, but while the first agreed approximately with its position on the map, Lanka peak was several degrees out. We were unable to reconcile Nullah "C" with any nullah on the map, and the main dividing ridge appears here to be actually further west than shown.

The first mile of the march on the 31st was a teaser. About five hundred feet ascent to a slope of particularly unpleasant scree, to cross a deep chute (leading down to a big drop to the river); then half a mile of level traverse, where were the remnants of an old, roughly-paved track almost obliterated by the scree; afterwards a nasty little gully where a pony fell down thirty feet, and was not only not killed but miraculously unhurt. Then came a descent across a very big sandstone slope where a track had to be dug the whole way and where the ponies had to be led singly to a stony gully at the bottom. Here the leading man 'yanked' the pony's head round a rock at the critical moment, while a second braked on his tail, in order to prevent the whole outfit sliding into the river.

It was three and a half hours before all the ponies were down at the river's edge, having earned my eternal admiration. Our transport troubles were practically over, although we did not know it; for on climbing to the top of the ridge of big rocks, which here pushes out to overhang the river, and which I named "Boulder Ridge", we saw that the valley opened out until a mile further on there were wide flats covered with *dama* on our bank of the river, while still higher up the river-bed was over two hundred yards wide.

On "Boulder Ridge" there were also traces of artificial improvement of the track and we found our way down the far side by old guide-posts made of small rocks placed on top of each other on conspicuous boulders. Crossing a second smaller ridge of large scree, one of the very few accumulations of this type which we saw, we reached some flats and camped at the mouth of Nullah "D" in time for a late lunch. This place is the Lama Guru of the Survey maps, and evidently takes its name from a solitary *Om! Mani padme Hum!* carved on a smooth rock. We made the elevation 15,000 feet.

At Camp 3 there had been a small wall built as a wind-break between two rocks and some cooking stones in threes; here at Lama Guru we found a few more. All these were long disused, the carbon having been completely weathered off them. There were no traces of man below Camp 3.

In the evening Tuck went up Nullah "D" to look for game, and next day the shikari explored some miles further up it. The nullah proved barren and devoid of game, though Tuck picked up a fine pair of bharal horns near the mouth and also a *Turritella* in dark grey limestone. I went up the left bank of the main valley looking for a ford and found a mile-long flat covered with vegetation, including fine patches of grass, but I was astounded by the lack of animal life. We saw one solitary marmot on arrival at camp, but although there were many recent holes, the colony seemed to have vanished, while there were no traces of voles or pikas. Plenty of old tracks of bharal and ibex, and very fresh tracks of a wolf in the sand on the river bank, showed that a few weeks earlier there had been plenty of game. Now all the mammals had disappeared. There were large numbers of Hoopoes about, also Black Redstarts and a few White Wagtails, one or two Rose Finches, a pair of Tibetan Ravens and some Yellow-billed Choughs; these were all the birds.

The presence of so many hoopoes should have indicated abundant insect-life, but this seemed to be nearly absent, except for a few bumble-bees and a cricket, though I took a few moths at the light that night—all Geometers and Noctuids. I may say that I had hoped to take plenty of interesting butterflies in the Tsarap and was much disappointed. It is true that we were unlucky with our weather and that it was late in the season, but the vegetation was abundant on the lower flats and on the slopes between the beaches, which, opposite Lama Guru and for a couple of miles up-river, were covered with greenery. I had had every hope of getting at least two species of the very hardy Parnassidæ, but we saw none. The only butterfly of which we saw more than half a dozen specimens was *Argynnis adippe pallida*, which did not seem to be quite the same as those I took on the upper Shyok in 1929 and may turn out to be a new race. Besides seven of these, the total bag from the Tsarap was one *Colias edusa fieldi*, five *Maniola pulchella*, three *Polyommatus eros stoliczkana* and a solitary *Heodes phloreas* taken near Camp 2 on the return journey; this last was a surprising catch on that side of the main range. All these butterflies were smaller and paler than usual, probably the result of the severe climate.

The way up the left bank was blocked a mile above camp by a projecting vein of hard grey limestone, which slanted down into the river from the higher cliffs, the water washing its foot and being unfordable. I named this "Barrier Rock", as it forms an insuperable obstacle to ponies, its north edge being vertical or overhanging;

and while the river is unfordable, unless there is some way over the unpleasant ridge between the Unmak and Nullah "D" further progress would be impossible except with porters⁽²⁾. On the 31st with a falling river there were difficult but possible fords opposite and half a mile above camp, but the water fell another six inches that night and a further four inches the night after, so that we crossed on the 2nd September easily in the strong current with the water a little over knee-deep. Above this point there is a practicable way up the right bank, while the river-bed is quite usable, though the several channels of the river had to be constantly forded.

We covered eight miles on the 2nd, making Camp 5 on the middle one of three well-marked beaches at the mouth of the Tinglung nullah. We started in fine weather, catching a few butterflies and putting up the first hare that we had seen, but after eleven o'clock we were treated to several bursts of hail and rain. One of the men killed a vole on the way and they caught three more among their gear that night. I got seven specimens of this vole, which I take to be *Microtus cricetulus*, but it is impossible to say definitely until the skulls have been cleaned and subjected to expert examination.

A little above camp, round the mouth of the Kurriaber (on map, Kurparuberu),⁽³⁾ and on the opposite bank of the river, were some remarkable examples of weathering; a flat stone usually forming the crown of each of several scores of pinnacles, from whose sides the earth had been gradually worn away. Eventually the whole affair collapses into the river-bed and the process begins again with the next stone which weathers out behind it. Such pinnacles had been prominent round Camp 3, but not as numerous as here.

The next day's march was most interesting. Two miles above the Kurriaber the valley is again constricted by a ridge pushing out from the west side to narrow the gap through which the river flows, from 200 yards to only 50 yards wide. On topping this ridge (Tsongdum Kirri) there was a grand view up the valley. While the hills on the west slope almost directly down to the river, though with three very clearly marked beaches at their foot, those on the east are well back from the river-bed with level flats and small rounded hillocks between, all being covered with dark green *dama* and grass. These flats stretch right up to the Malung-Lunghyr junction, these two

(²) The Unmak is spelt Umnak on the map. *Umnak* and *Gumbak* were both used by our Lahulis.

(³) Kurriaber is the spelling on the old Atlas map. I could discover no reason for the change.

rivers forming the Tsarap and being backed by a ring of black snow-capped peaks of remarkably even height, most of them just about 20,000 feet. About five miles away, on the east, is the opening of the nullah leading to the Pangpo La, with a small round hill immediately south of its mouth; the way to the pass is over the col behind the hill and not directly up the nullah.

Judging by the evidence of the beaches on either side, it would appear that the Tsarap has had three distinct levels, held up by this Tsungdum Kirri ridge and "Boulder Ridge". Probably there was a shallow lake above each of these points, and this was borne out by our finding flat thin pieces of shell marl and petrified mud containing fossil molluscs, on the flat ground of the highest beach. The river-bed below the ridges shows signs of a great rush of water, by the presence of large water-worn boulders not found in the more open parts of the valley. There would appear to have been three distinct periods of Himalayan uplift in this valley, with subsequent breaking down of the ridges after each.

As a far from expert geologist I may be putting up skittles for the expert to knock down in making this suggestion; but the same process seems to be going on now in the Yunan Tso on the north side of the Baralacha La, and at about the same level of 15,500 feet. There the depth of the lake has undoubtedly decreased greatly since I was there in 1911. Where there was then water, there is now showing a wide gravel-bottom; the decrease in depth would seem to be due to the stream cutting a deeper channel through the barrier ridge which holds up the lake four hundred feet above the level of the Kinlung Serai⁽⁴⁾.

We camped about a mile and a half above the Tsungdum Kirri ridge, on the second (middle beach), picking up a number of fossils around my tent, the first ammonite among them. The weather was not good, but though we had several squalls of sleet and hail, it was decidedly worse at the head of the valley, where we could see storm after storm sweep across from east to west, to leave the hillsides temporarily white with snow.

Next morning I went up the right bank to prospect for our next camp. Crossing over the low hills on the east, I found our ponies glutting themselves on wonderful grazing, then crossed flats to the south, finding three more miles of flats without a single animal to be

(4) Most travellers spell this word *Kenlung*. I think the correct spelling is *Kinlung*, from *Kin* (=ibex) and *lungpa* (=valley).

seen on them. There were numerous tracks of bharal and ovis ammon and we found heads of both species; but all tracks had been made when the snow was melting from the slopes above and when water was running through the surface soil, producing fresh green grass. These flats must then be full of game, probably in June.

Crossing two ravines which had cut fifty-foot channels in the flat, we hit the Pangpo nullah too low down and had to walk half a mile up to where it emerged from the main slopes before we could descend and cross it. We then followed a small ravine to the upper levels, and crossed some marshy ground where a couple of Little Stints were feeding and round which game tracks were very numerous; some of those made by bharal being quite fresh and those by ovis ammon being about ten days old.

Over the neck at the head we found a pleasant little grassy valley with a stream running down it and flocks of Mountain Finches sheltering from the wind⁽⁵⁾. From its head a stretch of dark rich soil extended up to the col behind the round hill, and on it grew much gorse and several large patches of grass. After twenty-four hours stormy weather we camped here on the 5th September at 16,100 feet, finding a lot of fossils, mainly belemnites and ammonites differing from any we had found before, right up to the crest of the col.

On the 6th, to the north of the col, we stalked and failed to get on terms with a herd of nine bharal rams, with two fine heads among them, but found an ammon head on the far side and a large colony of marmots all round the crest, at a little over 17,000 feet. This last was decidedly interesting, for, as at Lama Guru, there were many fresh marmot holes on the low hills opposite Camp 6 at 16,000 feet, but without a single living occupant. Here, a thousand feet higher, there seemed to be an unusually crowded colony, and it appears to be evidence of local summer migration, for 17,000 feet is decidedly above the normal elevation for this species (*M. caudata*). I have not

(5) I have received a very interesting letter from Mr. Hugh Whistler. I sent him a single specimen of what I took to be some bunting from mixed flocks of two species round Camp 7. He says it is Brandt's Mountain Finch, and that the other species, which I described to him, must have been Adam's Mountain Finch. They are *Montifringilla brandti hematophygia* and *M. nivalis adamsi* and are the highest passerines known. [Specimens of Brandt's Mountain Finch were taken on Forsyth's Second Yarkand Mission 1873, the Pamir Boundary Commission 1895, during the Indo-Russian Pamir Triangulation 1913, and during our Shaksgam explorations (head basin of the Yarkand river) 1926, where from July to mid-September they were common up to altitudes of 17,500 feet on bare hillsides (*Records, Survey of India*, vol. xxii, p. 111).—*Ed.*]

met with this before in Ladakh or other parts of the Himalaya. We took a panorama of the head of the valley and searched in vain for traces of the original track up to the Pangpo La.

Round this Camp 7 we found many trios of cooking-stones, but all disused for many years, which is surprising when the fine grazing all round the head of the Tsarap and near Lama Guru is taken into consideration. It seems probable that there was once a regular trade route through the Tsarap from the Tibetan provinces of Chumurti and Tso Tso ; such a route would be shorter than the Lachalung one and easier than the Parang-Spiti road. If so, the river was probably flowing on the east of its present bed at Lama Guru, it being forded above the Unmak junction. The Unmak would then have been forded separately and the main river-bed followed down to Lama Guru. If the river later on shifted over to the west bank right up against Barrier Rock, as at present, then the valley would be closed below that point from June to the end of August, the busy season of the year. It seems certain that there was such a regular well-used track, judging by the artificial improvements on and near Boulder Ridge, while we had found similar traces a little above the Tinglung junction. Then the long-disused cooking-stones at Camps 3, 4 and 7, taken with the inscription at Lama Guru, all point to a suddenly interrupted use of the valley.

Birds were plentiful round Camp 7, mainly Mountain Finches on migration ; also a Common Teal, Himalayan Blue Rocks, Black Redstarts, Yellow-billed Choughs and several Tibetan Ravens. We also saw an Owl on the hill behind the col on the 6th, which looked like a reddish-brown Scops and was a remarkable occurrence, not only on account of the elevation, but also because no owl of this type seems to be known from this area. Hares were numerous and some leverets looked very small to be about to face a severe winter. I obtained three specimens, male and female adults and an immature male ; I would have assigned them to *Lepus oiostolus*, but for the fact that Wroughton's key gives the difference between this species and *L. hypsibius* as being that the ear of *oiostolus* is " longer than the hindfoot with the tarsus ", and not longer in *hypsibius*. In the Tsarap specimens the ear is exactly equal in length to the foot and tarsus, and in dried specimens would probably be shorter through shrinkage. Descriptions of all the Tibetan hares need revising with fresh material.

I was very pleased to have five fish brought to me at Camp 7, as the British Museum particularly wanted high altitude fish. They

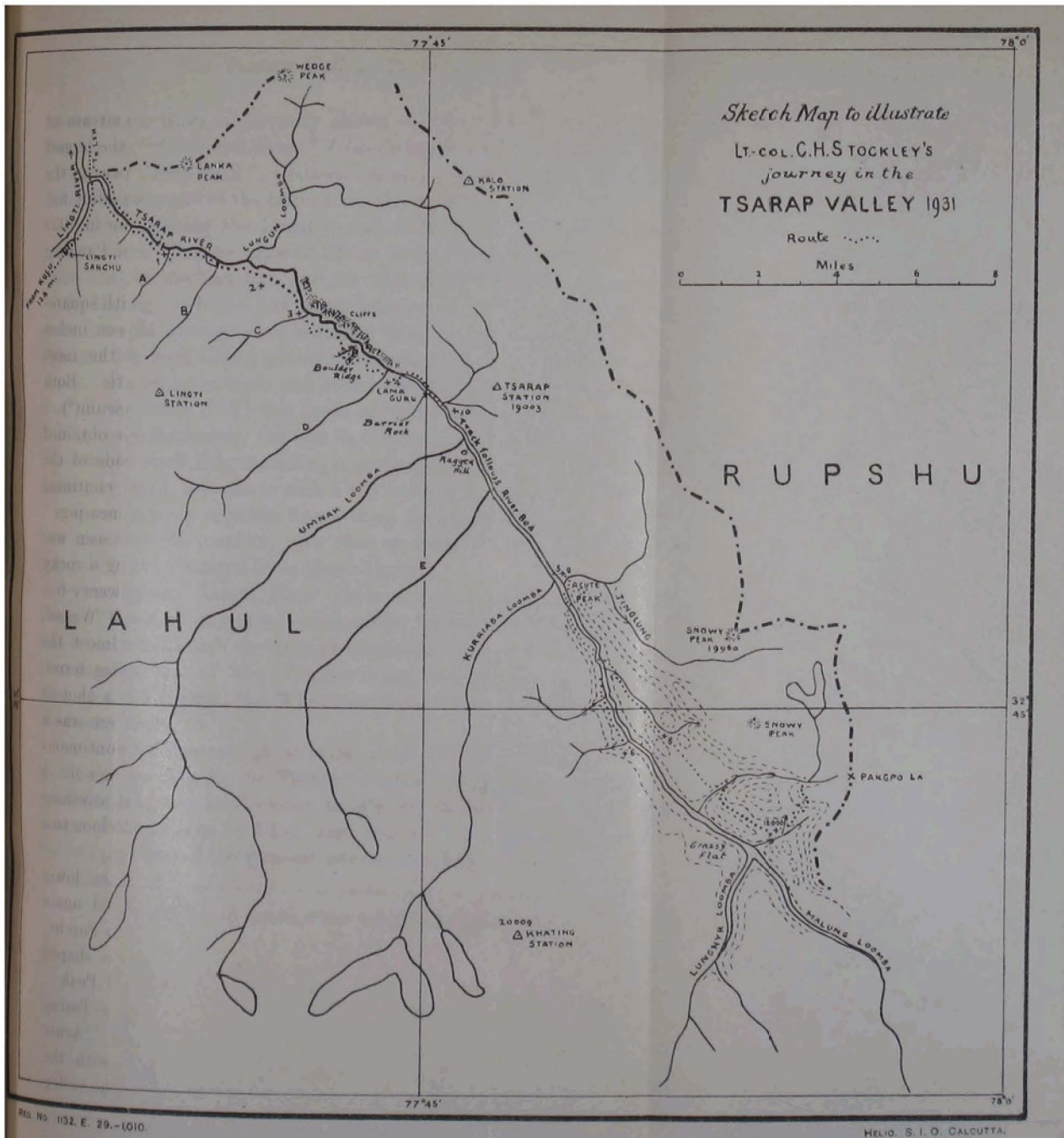
seemed to be a species of Barbel and came from the Pangpo stream at about 15,700 feet. Two of them were females full of ova, the largest some nine inches long. They had evidently run up to spawn, so the ova must remain in ice all the winter. I think that the adult fish must also, in some cases, be frozen in during the winter, for in 1929 I caught many fish at 14,800 feet in streams north of the Pangong lake with no outlet to lower levels.

Another curious capture here was that of two worms with square-faced heads, thinner than a knitting-needle and about fifteen inches long. They were red in colour and tied themselves into the most amazingly involved knots on being placed in the spirit bottle. Both they and the fish are under examination at the British Museum⁽⁶⁾.

There was a surprising absence of voles and pikas. We obtained specimens of the latter on the return journey on either side of the Baralacha La, probably *Ochotona wardi*, but in spite of continual watch for them I never saw one of these pretty little "guinea-pigs" anywhere in the Tsarap valley. The only other mammal seen was particularly notable. On the way to Camp 6, when crossing a rocky spur, I suddenly saw, sitting up behind a stone about twenty-five yards away, what I took to be a very large White-nosed Weasel, but with the white on the face including the eyes, and almost the entire lower half of the body white. It seemed as large as a big ferret, three-quarters of it being in view above the stone. I had a shot at it with 'fives' and knocked it over; but unfortunately there was a hole just behind it, and an hour's hard labour, guided by continuous traces of blood and a strong pole-cat smell, failed to extract it. I was very sorry to lose this specimen, as I have never seen anything of its type in that part of the Himalaya. It would seem to belong to a very large race of *Mustela camigula*.

I have mentioned before the difficulty of reconciling the lower part of the valley with the Survey sheets and this occurred again here. There is a conspicuous peak bearing 39° from Lingti-Sarchu, north-east of the Tsarap-Lingti junction, the top of which is shaped like Exeter cathedral, and which I had named "Cathedral Peak". There is also a peak immediately south of the Tinglung-Tsarap junction which I named "Acute Peak". Bearings on "Acute Peak" from Lama Guru and Camp 7 plot out identically with the position on the map and it is evident that the general lie of the valley

(6) The British Museum identify the fish as *Diptychus maculatus* and the worms as *Gordius villoti*.



above Lama Guru is correctly shown on the Survey sheets ; but a bearing on " Cathedral Peak " from Camp 7 was half a degree *west* of that of " Acute Peak ", while on the map this peak is shown bearing several degrees *east* of the latter from this point.

After exploring the Lunghyr and Malung nullahs with negative results, there being no signs of life in either except a small covey of Snow Cock in the Lunghyr, and no other fossil found but an *Ostraea* in the Malung, we began our return journey on the 8th. We had had clear but cold weather since reaching Camp 7, and the nights of the 8th and 9th were bitter, entailing chopping up ice for the morning water. We collected seeds and rootstocks for Kew as we went down, but all the latter died ; the seeds survived and have been planted, half in early November, the rest in the spring. We also obtained a dozen more small fish, including a second species, but they were all caught by hand, my efforts with a rod being quite unsuccessful(?).

From a camp opposite Lama Guru we reached Lingti-Sarchu in two marches with comfort, now that we knew the way, making our last halt in the Tsarap a little above Camp 2.

Crossing the Lingti Plain we were accompanied by flocks of Desert Wheatears migrating southwards, but no Mountain Finches ; and it looks as though the lines of migration of these two species are here parallel, that of the Finches being over the Pangpo La and then up the Lunghyr, the Wheatears taking the Lachalung-Lingti-Baralacha route.

I have written enough to show what a tremendous lot of work remains to be done in the Tsarap, whether geographical, geological or zoological. Our collections hardly do more than indicate the nature of the gaps to be filled ; and, above all, a competent geologist will find problems of the greatest interest awaiting solution.

(?) This second species of fish was *Nemachilus gracilis*.

PEAKS AND PASSES OF THE T' IEN SHAN

LIEUT.-COLONEL R. C. F. SCHOMBERG

THE T' IEN SHAN, or "Heavenly Mountains" of Chinese Turkistan, are very little known to Europeans, although they are not difficult of access and lie close to the main routes of the country. Speaking generally they have been neglected by the traveller and climber, little though they deserve such neglect. It is an easy journey of three weeks from Kashgar, and even less from Yarkand, to the mouth of the Muz-art valley which leads to the very heart of the Khan Tengri massif on the Russo-Chinese frontier. The Muz-art valley is on the main pack-route from Kashgaria to the Ili valley, and the Muz-art pass at its head is open all the year round, except after severe storms; there is, however, nothing to be gained by crossing it in the winter.

Merzbacher has explored a great deal of the Khan Tengri region, although more on the Russian than on the Chinese side of the frontier. There is however much still to do, especially towards the south, and west of the Muz-art river. For instance, instead of going straight up the main track to the pass, a visit should be made to the valleys parallel to and west of it and to the vicinity of Kizil Bulak, where there is much little-known ground. The difficulty would be due to the narrowness of the valleys and to the water in the streams*.

Three marches due north of Aksu is the shrine of Sultan Karamish, behind which, running north-eastwards, is the delightful valley

* Sheet 5 of Merzbacher's map, scale 1 : 500,000, published in 1928 after his death, shows the areas of the T'ien Shan, including the Khan Tengri massif, more especially visited by Merzbacher, whose route surveys are the basic authority for the detailed topography. For parts of this area there are also fairly reliable Russian maps and surveys. Sheet 10, Series V, of the 10-verst map, dated 1925, was uninfluenced by Merzbacher's work in the Khan Tengri region and gives the height of Khan Tengri as 6996 metres (22,939 feet). Merzbacher accepted an earlier approximation of 7200 metres, by Alexandrow-Ignatiev. This is a description of the Russian survey in 1913 in the *Records of Topographical War Survey Sections of the Russian General Staff*, Vol. 70, 1916, where the height of Khan Tengri is fixed as 6980 metres. Saposhnikow's corrected trigonometrical value was 6950 m., and this figure is entered on Sheet 5 of Merzbacher's map side by side with the other and older approximation. It seems therefore that the whole T'ien Shan range is under 7000 metres. The neighbouring heights on Merzbacher's map are estimates only. They are shown as

leading up to the Khan Tengri massif. This area is known as Saghebchi, the Sawabzi of Stieler's map (No. 62). There are many Kirghiz settlements here, fine forests of spruce and some ibex shooting. The district is a most attractive centre for exploring an almost unknown region with good climbing and superb views. It is better not to attempt to travel by the upper route from Uch Turfan as the passage of the river at Sultan Karamish will prove very difficult and is usually impossible, unless the expensive precaution of sending up boats from Aksu is adopted.

The western limit of the T'ien Shan is really the Khan Tengri massif; west of this point the range loses in interest and grandeur. It is well to remember this, as little is to be gained by exploring the mountains to the south-west, an offshoot of the T'ien Shan, but an unworthy one. As the range also forms the Russo-Chinese frontier there are apt to be political difficulties as well; there is no need whatever to go west of Saghebchi, for there is ample scope for climbing, shooting and exploring in the neighbourhood with few transport or supply troubles. Saghebchi has another advantage which should appeal to all who know the T'ien Shan: it is not so wet as most parts.

Another interesting and fairly accessible area lies at the head of the Kucha river, where the Muz-damas pass, a little-known one which opens late and closes early, adjoins the twin peaks of the same name which are such a feature in the landscape of the south-east T'ien Shan, just as Khan Tengri is in the west. Here the central T'ien Shan is more accessible from the south than from the north, as the route from Ili (Kulja) is complicated by the tiresome detours necessary for crossing the Tekes, Kok-su and other rivers which constitute at once a great obstacle and a great waste of time during the flood season in summer.

Much of the Kucha valley is unmapped and almost unknown. It is also possible to visit it in winter, but the Muz-damas pass is then impassable and all travel would be confined to the river and its neighbourhood. To the east of the Muz-damas there is a route to the

Nikolai-Michailowitsch and Semjonow peaks; the trigonometrical observation were a failure.

Merzbacher's map shows the two Inylchek, the Kaindi, the Koi-kaf and the Ukur glaciers in considerable detail. The snout of the combined Inylchek glacier appears to be at about 9100 feet.

I am indebted to Lieut.-Colonel C. M. Thompson, Survey of India, for his translation of a note on the compilation of Merzbacher's map, from which I have abstracted the above details. The area south-east of the Russo-Chinese frontier is shown in broken lines on the map and is evidently guesswork.—*Ed.*

Yulduz by the Kirghiz Art and Kara-kul, most picturesque and comparatively well known.

In the northern T'ien Shan, the great mass of snow and ice between the Kash and Manas rivers, which comprises the Manas peaks, probably the highest in the country, has never been properly explored. It is remote, not easily accessible and a very difficult region in every respect when reached. The deep canyon-like valleys with their swollen impassable torrents always embarrass a traveller in the more distant uplands of this mountain system. In the neighbourhood of the Manas peaks the difficulties of the actual ground are very great. The best route to this region is from Manas itself and not from the Yulduz nor from the head of the Kash, and any other line of advance might lead to loss of direction in the maze of gorges, defiles and unfordable rivers.

The Manas peaks offer a fine field for exploration and a very wide one. They, too, are noble summits, worthy of every effort of the mountaineer and are visible from far away on the Zungarian plain to the north.

To the east of Urumchi, the capital of the province, is the Bogdo Ola, with its sacred mountain Bogdo San and its temples, lake and forests. The central peak is not very high, but it is an isolated mass of rock which is a conspicuous and impressive feature in the landscape for miles. This is the best-known part of the T'ien Shan and is in truth very lovely, well repaying a visit. There is a good track from Urumchi, right up to the lake which can be reached comfortably in two days.

The eastern T'ien Shan deteriorates somewhat as it reaches Hami. The Barkul mountains are practically unknown, but though pleasant enough in their interior are not impressive and lack interest. Mr. Douglas Carruthers has explored the Karlik Tagh⁽¹⁾, the extreme eastern limit of the T'ien Shan, above Kumul, but the remoteness of this place makes travel difficult, especially as recently the whole of the principality has been disturbed.

Turning again to the west, the T'ien Shan near Ili (Kulja) is not of great interest, for it lacks the one asset so necessary to every mountain system, namely, a great culminating massif which by its beauty and dignity acts as a magnet to every traveller. Visitors to Ladakh will remember how the want of a central feature is much felt; the same is needed in the mountains near Kulja. If only there were a Khan Tengri or a Manas group to dominate and control the

(¹) See Douglas Carruthers: *Inner Mongolia*.

landscape, how far more beautiful would be the jagged, lofty, serried peaks that lie to the north of that town.

From a purely academic standpoint the curious mountain system between the Ili river and its tributary the Tekes merits exploration. From afar these mountains are not very interesting, but on being scrutinized they offer many points of attraction, and some unusual features are encountered when they are approached.

A traveller to the T'ien Shan may be reminded of a few points. The maps are all bad. Merzbacher's map on the scale of 1 : 500,000, published in Munich in 1928 and compiled from material found among his effects after his death, is the best but leaves much to be desired and is absurdly dear. Stein's maps only touch the southern fringes of the range. The T'ien Shan is outside the area compiled by the Survey of India. With inadequate maps guides become more necessary; they are non-existent, or frauds. The shooting is disappointing, except for the ibex. The present time (1932) is politically unfavourable for travel in Chinese Turkistan. It would be most mortifying to find, after elaborate preparations and a long expensive journey, that all plans were frustrated and that the sole alternative were to clear out. This has recently happened to travellers. All transport is by pack-animals. Loads must be small. Coolies are absolutely non-existent and cannot be 'improvised'.

And last: the climate! I believe the T'ien Shan has been neglected by travellers because of the incessant rain. No one can conceive what this is like until it has been experienced. It is torrential and unceasing. Never can one rely on a fine day, and it is said locally that if it is fine for two days it will be wet for five. This is no exaggeration. The difficulties thus caused can be imagined; one of them is the effect on the supply problem, always awkward in the T'ien Shan.

I have been in different parts of these mountains at all times of the year, winter and summer, and I have never enjoyed a spell of settled weather such as can be counted on with some confidence at certain seasons in the Himalaya. Entrancingly lovely is the T'ien Shan, with its dancing vistas, its dazzling flowers and its glorious forests; but the weather goes far to mar the pleasure and peace of mind of the traveller. The uncertainty hurries and flurries him. What can he do when for days on end, as in June 1931, the rain pours down and black mists blot out all views?

Great is the vexation of spirit, meagre indeed the results of a journey among the Heavenly Mountains!

THE FIGHT FOR KANGCHENJUNGA, 1931

PAUL BAUER*

WHEN in 1929 the Germans reached their highest point for that year on the North-east Spur of Kangchenjunga, they saw nothing between them and their goal but a series of vast, smooth slopes and the uppermost portion of the North Ridge. It was only natural that on their return they were inclined to ascribe their failure to reach the summit to the unfavourable weather that had forced them to retreat; and their belief that the route, which they had discovered and followed to a considerable height, was practicable remained unshaken. Many authorities agreed that the north-east side offered the most likely chance of success. When, therefore, in 1930, the International Himalayan Expedition made it almost certain that there was no reasonably safe way other than that by the North-east Spur by which the precipitous zone, from two to three thousand metres high, engirdling Kangchenjunga, could be overcome, it stood to reason that those who had taken part in the experiences of 1929 should pit themselves once more against the mountain⁽¹⁾.

Paul Bauer, the leader and organizer of the 1929 expedition, gathered a party of nine mountaineers who were ready to venture a fresh attempt on Kangchenjunga. Five of them had belonged to the team of 1929: Dr. Eugen Allwein, Peter Aufschnaiter, Julius

* I am uncertain who is the author of this account. My friend Paul Bauer promised it, but it came from Peter Aufschnaiter, who in a covering letter says he "only received it yesterday", but not from whom. He adds that he has translated it as well as he can, and the translation bears the names of Hans Hartmann and Peter Aufschnaiter. There is also a pencil note added: "Good Luck! E. Allwein". The splendid team-spirit displayed before, during, and after the expedition becomes embarrassing to an editor, who has therefore inserted the name of the leader, Paul Bauer, at the head, though he feels certain that the tributes paid to the leader have been added by his comrades. The extreme modesty of the account hides an amazing achievement.—*Ed.*

(¹) *Himalayan Journal*, vol. ii, pp. 13-20. See also sketch-map opposite page 77, vol. iii.

Brenner, Wilhelm Fendt and Joachim Leupold. To these were added four young climbers: Hans Hartmann, Hans Pircher, Hermann Schaller and Dr. Karl Wien. All were members of the Academic Alpine Club of Munich, in whose hard mountaineering school they had been trained.

At the end of May 1931 the main party set out from Europe, two members following in the middle of June. Owing to the careful preparations and the minute organization on the part of our leader, and the thorough assistance given us by the Himalayan Club and the Indian authorities, it was possible to reduce the time required for final preparations in India to a minimum. Lieut.-Colonel Tobin had done so much preparatory work that Mr. E. O. Shebbeare was able to start from Darjeeling only a few hours after Bauer's arrival, with 77 men to carry the porters' food up to the base-camp on the Zemu glacier. On the 28th June the last column of porters left Kalimpong and on the 6th July the stragglers, Allwein and Hartmann, joined the main body at Lachen, having covered the distance from Bombay to Lachen in six days.

In the base-camp, situated on the Green-Lake plain, 4370 metres above sea-level, a large depôt of provisions was established. Of the two hundred porters employed up to that point, thirty were selected and equipped for the high camps, twenty were chosen for transport duties between Gangtok and the base-camp, and the rest were paid off. On the 13th July, among the moraine boulders of the Zemu glacier, at 5140 metres, Camp VI was established. This was the advanced base for the region of operations: the North-east Spur of Kangchenjunga.

On the 14th July the attack on the mountain began. A track was beaten over the ice-fall leading to the upper Zemu glacier. The attainment of Camp VII, to be placed in the rocky flank of the North-east Spur facing the Zemu glacier, presented many a difficulty, the walls—owing either to the early monsoon precipitation or the abnormal warmth prevailing this year till late August—being much subject to falling stones and avalanches. A post was formed to watch the wall by day and night; from the observations made it became evident that it would only be practicable to ascend to the Adlerhorst, or "Eyrie", the site of Camp VII, between five and eight o'clock in the morning.

At a very early hour on the 19th July we moved into Camp VII at 5560 metres. Three days later Allwein and Pircher set foot on

the level portion of the North-east Spur at about 6000 metres*. The continual danger of falling stones prevented us from scaling the upper part of the wall, between the Eyrie and the ridge at a later hour than 10 A.M., and we had to establish on one of the precipitous rock towers set upon the ridge a temporary camp, which would form a base for the rest of the way over it. Heavy sleet and even rain were softening the bosses and ribs of névé which covered the ridge; again and again a hard day's labour was brought to nought. In the continual wet weather both sahibs and porters caught cold. Allwein fell ill with ischias, the porters with quinsy. It became imperative to retreat to Camp VII for a three days' rest.

Then work commenced again. On the 1st August Bauer and Hartmann ascended to the ridge camp; they were followed two days later by Schaller and Wien. On the 8th we had progressed so far with the work that the route to Camp VIII was practicable for porters. The following day we moved forward.

Hartmann and Wien had already attained the terrace of Camp VIII when a hundred metres lower Pasang the porter fell. He swept down the steep ice-couloir, dragging our Schaller behind him over the precipice. The advance was suspended and after a bivouac on the ridge at 6200 metres we hurried down as fast as possible. Our first sad duty concerned our fallen comrades. On a rock island in the midst of the upper basin of the Zemu glacier, an island surrounded by ice, we laid Hermann Schaller and the porter Pasang to their last rest. The mountain to whom they have sacrificed their lives keeps guard above their heads.

It was not till the 24th August—fifteen days after this accident—that Bauer, Hartmann, Pircher and Wien with three porters again definitely attained Camp VIII. In the meantime the route had for the most part decayed. The bosses, cornices and other ice-formations, that had been fairly safe in late July, were now, owing to the exceptionally warm weather, changed to treacherous masses of rotten snow that could only be made accessible with extreme patience and caution. The porters, some disabled by illness, some strongly dispirited by the accident, had almost without exception become unfit for the perilous ground of the North-east Spur. After much persuasion and stimulated by the quiet reasoning of our

* The illustration of the North-east Spur accompanying this paper is reproduced from a photograph sent from the Eyrie on the 7th August to the Editor. The panorama was taken on the 1929 expedition.—Ed.

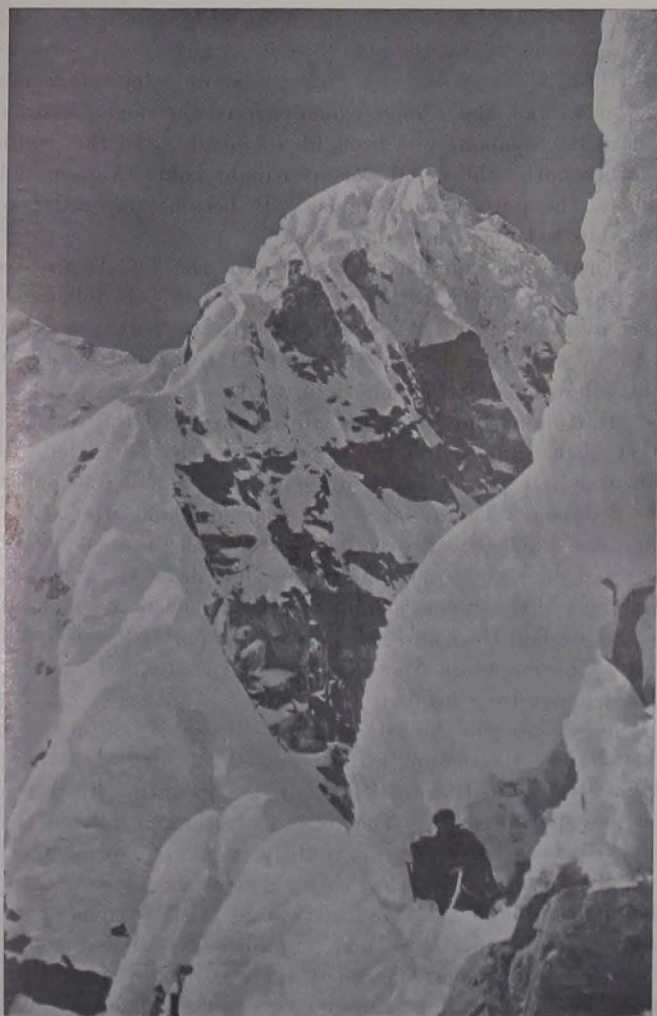


Photo. Bavarian Expedition.

THE NORTH-EAST RIDGE OF KANGCHENJUNGA.
FROM THE ADLERHORST.

cook Tenchadar, three of them, Kami, Kitar and Pemba, declared themselves ready to follow us to the higher regions. In spite of our endeavours to gain new forces, no others could be persuaded, and these three alone remained to follow us during the rest of the ascent.

Thus progress became very slow. The succeeding portion of the ridge with its towers of ice took us eight days of hard labour. In early September it snowed for five consecutive days almost uninterruptedly, though we were not prevented from carrying on our daily work. On the 4th we climbed over the ice-towers to Camp IX; on the 10th we managed to pitch Camp X at 7200 metres. Bauer, who, accompanied by his bearer Kami, had descended to Camp VI to check supplies and bring up reinforcements, re-joined us at Camp X on the 12th September. Allwein and Aufschnaiter arrived with him. Allwein's health had improved in Camp VI and Aufschnaiter was no longer indispensable at the Eyrie; he had been in charge of this section of the lines of communication and had had for weeks the difficult task of leading parties of laden porters almost daily to the ridge camp. During this period Allwein and Brenner had from Camp VI made an excursion to the "Sugarloaf" (6500 metres) and obtained valuable photographic results.

Six climbers, Allwein, Aufschnaiter, Bauer, Hartmann, Pircher and Wien, together with the three porters, Kami, Kitar and Pemba, were now gathered at Camp X. Although only these three porters had been willing to go above 6000 metres, we now stood ready in Camp X, at a height of 7200 metres, complete with equipment and supplies for a good fortnight. Though our rucksacks had sometimes seemed all too heavy and the porters had occasionally sighed under their gigantic loads, both we and they had a right to be proud that the precipitous zone of Kangchenjunga, with all its difficulties, lay behind us and that everything was ready for a final and decisive dash for the summit.

On the 15th September we pressed on to Camp XI, after the last bulwark, a steep ice-step, had been made accessible by Allwein and Pircher. The following day Hartmann and Wein ascended with their equipment. A small ice-cave was excavated at 7650 metres and formed our habitation; from Camp IX onwards we had used such ice-caves, for with increasing height and diminishing temperature they proved more and more useful. At Camp XI, where the temperature fell to -30° centigrade at night, such a cave was almost indispensable.

On the 17th we started from Camp XI and in four hours proceeded over vast slopes of deep powder-snow and over the highest crest that for many hundreds of metres runs horizontally to the steep névé summit of the North-east Spur, which is nearly 8000 metres above sea-level⁽²⁾. The North-east Spur ends in a slope that descends from the North Ridge. At the point of their junction there is a depression, the lowest point of which is some sixty metres below the summit of the North-east Spur. From the summit we had a good view of the final rock pyramid, and seen from so near a point its structure does not seem to offer any serious obstacles.

But immediately before us the steep snow slope descending from the North Ridge was in an extremely unfavourable state. A layer of powder-snow, some twenty inches deep, lay loosely upon the solidly-frozen névé. At many spots this had already slipped, at others it threatened to avalanche at any moment. It was now too late and too cold for further investigation and we had to return. We had a last glimpse of the surrounding mountains and could see through a gap over the North Ridge the green pastures of Nepal; then we plugged back to Camp XI, where, in the meanwhile, Allwein, Aufschnaiter and Pircher had arrived, with the three porters. Bauer had, owing to a failure of his heart, been obliged to stay behind at Camp X.

On the 18th September Allwein, Pircher and Wien set out for a closer examination of the route and to excavate an ice-cave for Camp XII. They returned with the bad news that the slope which formed the only possible access to the summit ridge of Kangchenjunga was, for the time being, unassailable owing to its great danger of avalanche. It made our hearts heavy to think that the mountain should defeat us when we could see our goal so near at hand, after we had conquered so many and so great difficulties. No doubt the unfavourable state of the snow was temporary; but unfortunately at such a time there was no prospect of it improving, for every day it snowed for several hours. There was also now the constant menace of a great snow-fall such as had two years before forced upon the expedition a most hazardous retreat demanding the utmost exertions. The issue of a second retreat over deeply-snowed-up slopes and ridges from those high altitudes could not be foreseen. Moreover, one cannot live at a height of 7500 metres for any length of time. Although our leading party had had six weeks to get fully acclimatized to the high

⁽²⁾ Height by aneroid measurement on two different days: 17th September, 7940 m.; 18th September, 8000 m.

altitude and our speed of ascent up to 8000 metres had not sunk below half that customary in our native mountains, yet it must be remembered that we had carried our heavy rucksacks for forty days almost without a single day of rest and had carried out some very trying ice-work which had set a great strain on our reserves of strength. We might have ventured a final assault in which all was staked on a single card, but even so we must have waited; and a long wait at those heights, if it is possible at all, demands fresh forces. In consequence of these considerations, we felt that there was no option but to renounce final success. An immediate attack on the slope would have been senseless and inexcusable.

From a point six hundred metres below and at a horizontal distance of 1800 metres from the summit of Kangchenjunga we commenced the retreat. On the 19th September, Allwein, Aufschnaiter and Pircher arrived at Camp IX where they told Bauer the bitter news of the failure to conquer the summit. A day later Hartmann and Wien also left their ice-cave at Camp XI, in which they had passed four nights. All members were now in retreat. On the 22nd the whole attacking party had re-assembled at the Eyrie and two days later met, in Camp VI, the occupants of the lower camps. For them, of whom some had been seriously ill with malaria and para-typhoid, a time of anxious waiting had ended.

On the 27th September we ascended once more to the rock island of the upper Zemu glacier to fasten to the grave of our fallen comrades the memorial plate that had been sent up to us by the kindness of Mr. Gourlay and Mr. Fawcus from Calcutta. Then we bade farewell to Kangchenjunga and to our friends who remained with him.

The expedition now resolved itself into several smaller parties which returned to Darjeeling by different routes. We all wanted to see as much as possible of that marvellous country of Sikkim which we had seen for so many weeks spreading out of the wilderness of ice and snow like some kind of paradise. Leupold and Aufschnaiter with three porters crossed the Podon La and marched back to Chungthang (Tsuntang) along the Tibetan frontier and over the Lungnak La, Dongkya La and the Lachung valley. Allwein and Pircher with another three porters crossed the Simvu saddle on the 1st October for the first time and descended in a south-easterly direction down the Passanram valley, some 25 km. long, which had never before been trodden by any European. For seven days they struggled with the jungles, and in these seven days they covered no more than fifteen

kilometres. In Mangen they rejoined the main body, which had wandered out through the autumnal Zemu valley.

Only Karl Wien, with his faithful porter Pemba, remained yet for sometime in the neighbourhood of Green-Lake Plain. From here he made journeys for his photogrammetrical survey of the Zemu glacier and the surrounding regions. The fine sunny weather facilitated his work and lasted until on the 19th October we were all re-assembled at Darjeeling.



Photo. J. Brenner.

TWINS GLACIER. ZEMU GLACIER.
 VIEW NORTH-EASTWARDS FROM CAMP VIII (20,737 FT.) KANGCHENJUNGA.

NORTH-EAST SPUR
 TERRACE OF CAMP VIII.

CAMP VI UPPER ZEMU GLACIER.

LHONAK, 1930

G. B. GOURLAY

THAT mountaineers have at last come to recognize the Himalaya as an entrancing field, worthy of their greatest skill, is proved by the increasingly frequent expeditions which come to India. These expeditions, many of them comprising picked climbers, generously equipped and with ample time at their disposal, are apt to mislead us into regarding the Himalaya as a field only for the expert with a large organization behind him. This is not so; for there are countless peaks over twenty thousand feet offering excellent rock and snow climbing within the powers of the average climber, peaks that can be reached quickly and at no greater cost than that of a holiday of similar duration in the Alps.

The first essential for a short successful climbing holiday is good and reliable weather, an essential that at first sight appears unobtainable in Sikkim; for here the highest ranges approach within sixty miles of the Plains of India and receive the full blast of the monsoon. Yet behind this great barrier, and protected by it, are the high valleys of Lhonak⁽¹⁾. Here the monsoon, after its ceaseless struggle with the giant peaks, loses its ascendancy. While storms rage and clouds surge about the icy walls of Kangchenjunga, Siniolchu and Lama Anden, the snow-capped mountains of Lhonak sparkle coldly in the clear air. Small clouds, indeed, break from the battle and rush madly towards the Lhonak summits, but they soon surrender and melt into the unfathomable blue of the Tibetan sky.

The glowing account of this country brought back by the International Himalayan Expedition had impressed me so much that, when Mr. W. Eversden and I were fortunate in obtaining a month's leave in October 1930, we wasted no time in deciding where to go. To climb Lhonak peak was our main objective; but it was only one incident in a holiday as attractive and as full of interest as any lover of mountain scenery and high places could wish for.

The way to Lhonak as far as Lachen is well known; it is also well described in Percy Brown's *Tours in Sikkim*. There are

⁽¹⁾ Survey of India map 78A and 77D. See also sketch map at end of *Himalayan Journal*, vol. ii.

comfortable rest-houses at convenient stages and the path is suitable for riding-ponies and mule-transport. By motoring from the railway at Siliguri to Gangtok, Lachen (8800 feet) can be reached in five days from Calcutta. If time is very limited and the organization perfect, it is quite possible to reach there in three; but I personally do not acclimatize sufficiently quickly to enjoy this rate of progress on the outward journey.

Lachen is a compact little village lying in the curve of the steep hillside, with the rocky cone and snowy ridge of Lama Anden towering above it and the Lachen Chu, invisible but loudly audible, deep in the gorge below. The inhabitants are herdsmen of a Bhutanese-Tibetan stock, known as *Lopas*, who, during a great part of the year, are absent from their village and tending their yaks on the high pastures of Lhonak or the grazing-grounds by the upper Teesta. They are good-natured, reliable men who make excellent porters, but owing to their migratory habits it is advisable to let the headman know well in advance when porters are required. Potatoes, sheep and very good apples can also be purchased cheaply at Lachen, but for these also the headman should be given several days' notice. If asked to do so, the General Secretary to the Sikkim Durbar at Gangtok will issue the necessary instructions to the headman.

The obvious way into Lhonak is to leave the bridle-path after crossing the suspension bridge which spans the Zemu near its junction with the Lachen Chu, some two miles beyond the village, and to follow the Zemu as far as the stream that comes down from Lhonak. This stream is called the Zemu Chu and Lambo (Langpo) Chu on the Survey of India map, but Freshfield more aptly names it the Lhonak Chu and retains the Zemu for the stream issuing from the Zemu glacier; and I have followed his nomenclature. But short as this way is, and simple as it may appear from the map, it is not easy. The barrier which withstands the monsoon does not yield willingly to man's approach. The path consists of a series of mud-filled holes and leads through water-logged rhododendron thickets and over-fallen tree-trunks, rotting in the morass; it is so difficult for laden men that it is advisable to halt soon after crossing the Lhonak Chu and to pitch camp in a clearing near a herdman's hut where there is a small potato patch (11,000 feet). This stage is only six miles.

The next march, at first through water-logged forest, soon develops into a steep scramble up through breast-high vegetation by the side of the Lhonak Chu. The panting traveller then arrives on open slopes characteristic of the Lhonak country. He has only

progressed another six miles in as many hours when he will probably decide to halt (13,500 feet). Ahead the valley opens out and he can take almost any line he pleases, the rate of progress depending entirely on his degree of acclimatization.

Some time ago the Sikkim State laboriously constructed a path to Lhonak by this way, but by 1911 an essential bridge across the Lhonak Chu had been washed away and beyond the Zemu Chu no vestige of the path now remains. The rainfall is so heavy in these valleys that the cost of maintaining a track of any sort on the steep loose hillsides is prohibitive and it will be many years before the traveller is able to enter Lhonak with any facility by this direct valley-route.

There is, however, another way, by Thangu and the Lungnak La, which, though somewhat longer and rising to over 17,000 feet, is much more attractive than the direct route. After crossing the Zemu Chu at Zemu Ram, the bridle-path rises steadily beside the racing waters of the Lachen Chu, and, after ten beautiful miles, reaches Thangu (12,800 feet). Here the Jha Chu, rushing down from the southern glaciers of Kangchenjhaul, meets the Lachen river, and at the junction the valley widens. There is a small area of flat ground where villagers from as far away as Lachen have planted small plots of potatoes; on a shoulder of the hill above the fields is situated the rest-house; still higher is the *gompa*; but there is no village at all.

A mile beyond Thangu a fine glen leads westward into the snow-clad range, which, from the Zemu to Chomiomo on the Tibetan border, cuts off Lhonak from the Lachen valley. Up this glen, as far as Pogi, a halting-place on the way to summer pastures, is a rough path which becomes less and less conspicuous amongst the steepening rocks leading to the Lungnak La (17,300 feet). We crossed this pass on our homeward journey during a snow-storm and saw practically nothing, but there is no doubt in my mind that the scenery must be very grand. At first the descent on the west side of the pass is steep and it is hard to believe that yak and sheep habitually pass this way; then the valley slopes more gradually to the little Chabru Tso. The valley in the neighbourhood of this bleak tarn reminded me of a Highland glen; the red autumnal sheen of the dwarf rhododendron tinting the rocky hillsides with the rich tones of the heather and the blaeberry. At the foot of the valley, some seven hundred feet lower and two miles further, lies the camping-ground of Makotang, on the Naku Chu and on the edge of Lhonak proper.

By crossing the Lungnak La in one march, Lhonak can be reached as quickly as by the Zemu gorge, but to climb from 12,800 feet to 17,300 feet and down again to 14,000 in one day is a formidable task on the outward journey; it is much simpler on the return, for the traveller is presumably fitter and the ascent is twelve hundred feet less.

A short way below Makotang the Naku Chu joins the Lhonak Chu and here the routes by the Zemu and the Lungnak La re-unite. All Lhonak lies ahead. It is a country of long bare valleys rising gradually to the glaciers of the encircling snows. Though long and bare, these valleys are not devoid of interest, for here a small meadow speckled blue with gentians outrivals the sky; there framed in the angle of a tributary glen a vista of icy peaks, as yet untrod, forms a perfect picture.

As high as sixteen thousand feet there is sufficient juniper and dwarf rhododendron fuel and abundant water; the choice of a camping-site is particularly easy, the deciding factor being generally the wind, for unfortunately Lhonak does not escape the bitter blast that blows daily on the edge of the Tibetan plateau.

The journey up the valley from Makotang to Goma, which lies at the foot of the terminal moraine of the intricate glacier system formed by the meeting of the glaciers from the Jonsong, Lhonak and Dodang peaks, takes two days, but on the return journey this distance can be easily covered in one. Goma is at about 16,500 feet, and here we pitched our base-camp, obtaining what shelter we could from the wind by placing our Meade tent on the lee of a large rock on which was boldly emblazoned in red letters a large "E. S." After puzzling our brains for some time we concluded from the number of empty chocolate packets and fancy biscuit cartons in the neighbourhood that these were the initials of the young climber who with his companion camped here before brilliantly making the first ascent of the Dodang peak.

At the head of the Lhonak valley and immediately north of the Jonsong peak is an imposing snowy pyramid 21,460 feet high. This is Lhonak peak. Although the massive Jonsong peak to the south and the Dodang Nyima peak on the north (22,700 feet) had been conquered by the International Expedition, the summit of Lhonak peak was still untrodden. As we gazed at it from our camp on the morning after our arrival the wind was blowing the snow off the crest in great clouds, while from Jonsong peak a transparent fan-like film of mist was whirling thousands of feet into the air.

Northward the wind appeared less strong, so we decided to ascend the Choten Nyima La and attempt to climb the Choten Nyima peak by the plateau on its eastern flank. We camped for a night below the pass and then climbing the col turned west and pitched camp on snow at 19,000 feet. It was soon evident, however, that the eastern shoulder was not directly connected with the summit, and that a steep and narrow icy ridge was too difficult for us to negotiate, at any rate in our semi-acclimatized condition. Although we had failed to reach the top we returned to our base-camp much fitter to tackle Lhonak peak; we had also obtained an excellent view over the Kampa Dzong plain, while the ascent of the pass itself was most interesting. The crest of the Choten Nyima La is a narrow ridge of crumbling rock, reached from the south by several hundred feet of steep scree. On the Tibetan side there is a short steep slope to the glacier snow. Abruptly to the east rise the steep walls of the cone-shaped Sentinel Peak climbed by Dr. Kellas in 1910; high precipices protect the western flank.

On our return to Goma we made plans to attack Lhonak peak. We calculated that it would take us four days to reach the summit and return to the col at the foot of the south face. We decided to take food for five days, two Meade tents, and five porters, all of whom would go to our highest camp. Two additional porters were to make a double trip to our second camp with food and fuel for the return journey, and we carried a primus stove for use above our second camp; it functioned perfectly with petrol as fuel at 20,000 feet.

These arrangements made, we set off from our base-camp at 8-45 A.M. on the 9th October. Though short, it was a strenuous march over moraines consisting indiscriminately of boulders, gravel and sand. At 1-45 we pitched Camp I on a little mossy bank just large enough for our two tents. That night there was not a cloud in the sky and scarcely a breath of wind, though thick banks of cloud were sliding up the cleft of the Lachen valley. Our beds on the moss were soft and warm, but we both suffered from the height and I myself spent an unenviable night with my thoughts revolving in reasonless circles, almost driving me demented. Morning came at last and at 8-45 on the 10th October we started up the left bank of the Lhonak glacier. Before long we passed a small lake about two or three hundred yards wide, surrounded by tottering ice pinnacles and formed by the stream from the Jonsong glacier being dammed by the ice of the Lhonak glacier.

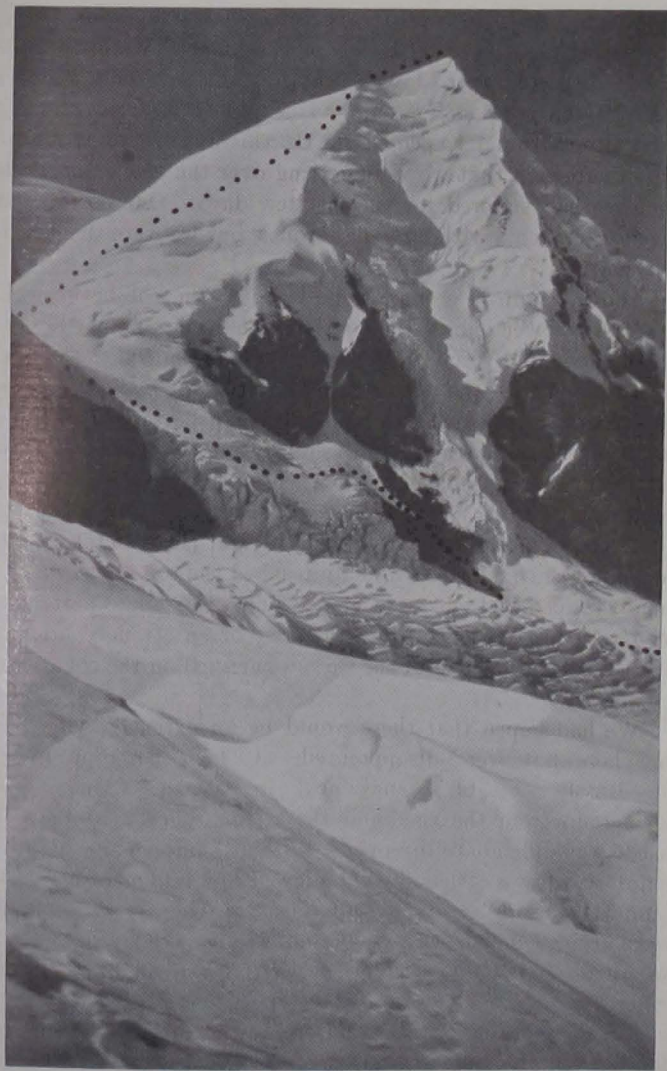
The going was again rough but the gorgeous scenery compensated us. The striking beauty of the Fluted Peak often called forth our admiration and it is indeed surprising that it has not been more prominently mentioned by Kellas or Freshfield. We pitched Camp II at 11-30 directly under Lhonak peak in a sheltered hollow on a stone-covered glacier, near some empty tins and an oxygen cylinder, relics of the International Expedition. On this day we ate a much larger tiffin, a sure sign that we were getting over the glacier lassitude from which we had suffered for the last few days. Our porters paved a space for our tents with large flat stones, but we were thankful for our cork mattresses.

Above Camp II a snow slope leads to the col between Lhonak peak and a lower one to the south which Kellas climbed. To reach this slope we had to climb two rocky pitches, so spent two hours of the afternoon with the porter Kippa preparing a way over the ice and fixing ropes on the rocks to help the laden porters in the morning. The night was warmer and slightly clouded when we put out our lights at six o'clock and when we awoke the sky was overcast.

We left Camp II at a quarter-past eight (11th October), and with the help of the fixed ropes quickly reached the top of the rock pitches. Then we roped and cut a few steps to help the laden porters, but the crevasses were either filled with snow or so strongly bridged that, with Lewa leading most of the way, we arrived on the col at a quarter to twelve.

We had hoped that there would be an extensive view westward from here but were disappointed. A high flat-topped mountain immediately west of Lhonak peak intervened. Clouds were now blowing up from the east and threatening snow; in the gathering mist it was difficult to discover a suitable camping-site higher on the mountain and we rather weakly allowed Lewa to persuade us to pitch Camp III on the broad back of the col. There was nothing to do in the afternoon as it was windy and cloudy; we lay in our tent none too warm, unhappily wondering whether we ought to have gone higher.

On the morning of the 12th October the outlook was unpromising. Clouds were creeping towards us from the valleys on the east and when we left at 7-15 a cloud-cap was already forming on the Jonsong peak. We took the porters Kippa and Nima with us and aimed to reach the summit and return to Camp III that evening. Within a few minutes of starting, however, we had to cut steps and it took



Photo, G. B. Gourlay.

LHONAK PEAK (*circ.* 21,260 FT.) FROM THE SOUTH-EAST.

us two-and-a-half hours to reach a small level shelf where we obviously ought to have spent the previous night.

Still cutting steps, now in freezing cloud, now in sunshine, we reached a second level shelf at half-past one. There was now little hope of reaching the summit at this pace, so we turned back and, as soon as possible, signalled to Lewa to move up. At 4-45 we had pitched Camp IV on a little level patch from which we intended to make a second attempt on the morrow. Kippa and Nima did excellent work on this day, cutting steps most of the time; the former finished up by returning to Camp III and bringing up a double load to the new camp.

We only had food and fuel enough for one more day on the mountain. We therefore intended to make an early start on the 13th, but on account of the intense cold and consequent difficulties of heating breakfast and thawing boots it was 7-35 before we were ready to start. The weather was far from encouraging; a thick blanket of cloud filled the Lhonak valley and dirty brown clouds were pouring over the Nepal peaks from the south-west. Lewa took Kippa's place and we set off steadily up the "soup-plates" hacked out by us the day before. We knew before we reached our previous turning-point that there would be no view, but plenty of wind-driven snow on the top, if we reached it.

We were soon into the clouds, but I do not think they were very dense, for a glimmer of warmth penetrated from above. Lewa led in a determined manner and cut steadily up the steep slope. When it eased off a little we were confronted by a huge crevasse which forced us to the right along its lower lip. Here Nima took the lead. Before long this crevasse narrowed and after crossing it we were confronted by another, far more formidable to look at, but easily avoided by traversing still further to the right. Finally we reached a forty-five-degree slope leading to the summit ridge along which we ploughed our way for fifteen minutes through soft deep snow to the top. We reached the summit at half-past twelve.

Except for an instant when the clouds parted and gave us a glimpse towards the flat-topped peak to the west, we had no view and we did not remain long owing to the cold. The steps cut for the ascent may have been larger than necessary, but we reaped the advantage now and were able to race down very fast. By two o'clock we were within hailing distance of our camp and shouted to our porters to strike it. After a cup of tea we pushed on to Camp II and reached it at 4-55 P.M., tired but thoroughly content. It was just unfortunate

that our ascent coincided with the only two cloudy days which occurred during the sixteen days we spent in Lhonak; but we were in a forgiving mood.

We were perturbed to find in the morning that Lewa was snow-blind in both eyes and Nima in one. Nima started off early by himself without a pack and when he arrived at the base-camp in the evening, he had already much recovered. Lewa, unfortunately, who was suffering intense pain, was unable to get very far by himself, although he bravely attempted to negotiate the rough moraine with the help of a stick; then the ever-cheerful Thesang came to his aid and carried him, no light weight, pickback all the way to camp. It was all I could do to keep up with this excellent Lachen porter who, not content with carrying one man heavier than himself, insisted on carrying me also dryshod over several glacier torrents.

We had two days to spare before setting off home. We wished to go southward and see the view from the high snowfields between the Lhonak and Zemu valleys, but Eversden's feet had been slightly frost-bitten during the climb and he wisely decided to move slowly down the valley with the main camp. Skirting the hillsides south of the Lhonak valley and passing several small lakes, I reached and camped in the Langpo valley. Next morning I set out southwards for the 19,000-foot snowfield which I hoped would overlook the Zemu valley. But as the sun rose, little wisps of cloud formed in that direction and though I raced upwards as fast as my lungs would allow, I arrived too late: a seething mass of cloud filled the valley ahead. For one instant the clouds parted and the fluted summit of Simiolchu loomed up. Westward and northward the air was clear. Along the horizon ranged the line of mighty peaks: Kangchenjunga, Kangbachen, the Langpo, Jonsong, Lhonak and Dodang Nyima peaks and those of the Dodang Nyima range as far as Choniomo vied with one another in shape and beauty.

I had no time to wait for clearer weather and hurried on to rejoin the main party in camp just below the Chabru Tso on the way to the Lungnak La. Snow fell lazily during the night and next morning; it was laborious work stamping a path through the fresh snow, which near the top of the pass was three or four feet deep. Falling snow filled the air and we could not see more than a few yards. The roar of an occasional avalanche reached us. East of the pass there was less snow, and by the time we reached Pogi there was none. There was now a visible track and everyone hurried on at his own pace to Thangu rest-house, in the comfort and warmth of which we remained

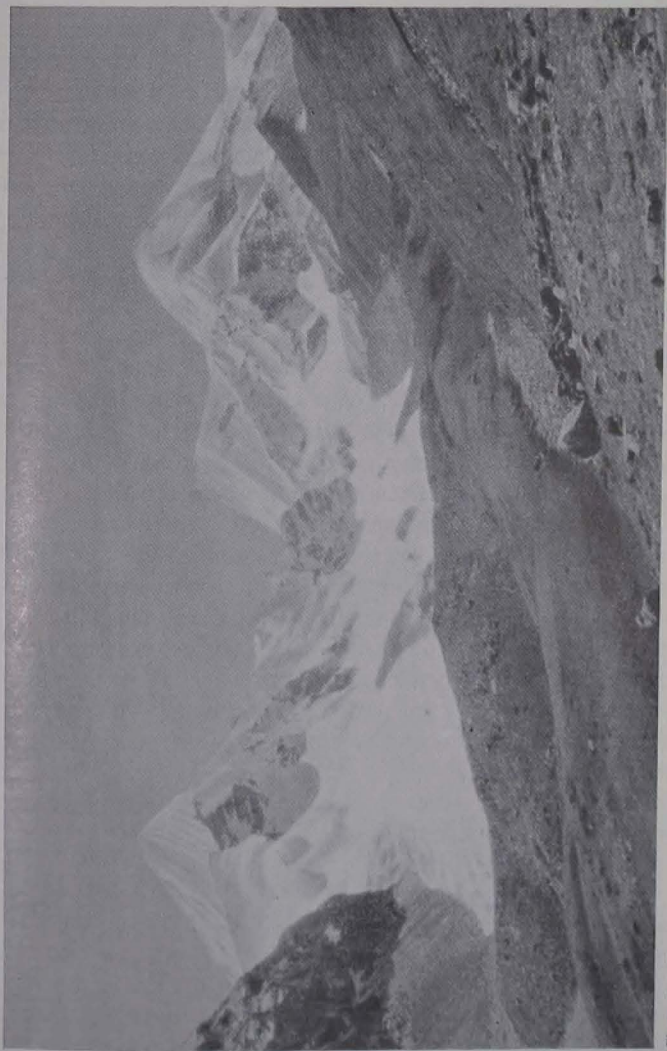


Photo. G. B. Gourlay.

FLUTED PEAK (20,540 FT.) AND LANGPO PEAK (22,805 FT.) FROM THE NORTH.

a day, before returning to Gangtok by normal stages, enjoying vastly the sense of perfect fitness and an enormous appetite.

We had done what we had set out to do and had had a wonderful holiday. With more experience we could have accomplished more, and I am therefore including some brief notes which may be useful to anyone contemplating a similar journey to Upper Sikkim.

APPENDIX 1.—TRANSPORT AND PORTERAGE.

Calcutta to Siliguri.—One night by train.

Siliguri to Gangtok.—Every year the cart road is being improved, and by the middle of September it is generally possible to go straight through to Gangtok by car in six to seven hours. The hire for the single journey is Rs. 45 to 60 according to the size of the car (*Agency* :—Pemba Hishey, Motor Agents, Kalimpong).

Gangtok—Lachen—Thangu.—The road is suitable for mule-transport, and this form of transport is the surest. Daily stage coolies are obtainable and are cheaper than mules, but if more than 6 or 8 are required per stage, there is apt to be delay in obtaining them. In either case application should be made to the General Secretary to the Sikkim Durbar, who should be given plenty of notice. *Notification* No. 4960/G published by the Sikkim Durbar giving full particulars of rates should be obtained from him.

To Lhonak.—Yak transport is obtainable at the villages between Lachen and Thangu and can be taken in and out of Lhonak by the Lungnak La up till the middle of September but later in the year this pass is closed. No animal transport is possible by the Zemu route.

Permanent Porters.—To avoid risks of delay it is advisable to engage a nucleus of porters for the whole time. These men are paid Re. 1/- a day. Some are obtainable in Gangtok but if any climbing is to be attempted trained Darjeeling men should be employed. The Local Secretary of the Himalayan Club is always in touch with these men and will make the necessary arrangements.

For general work in Upper Sikkim the Lachen yak-herdsmen are hard to beat; they are used to sleeping out up to heights of over 18,000 feet and carry heavier loads than the men from Darjeeling. In addition to this they will provide their own rations, thereby minimising porterage from Gangtok. Notice of requirements of Lachen men should be given to the Sikkim Durbar very early as the men have to come in from their herd camps in the hills.

APPENDIX 2.—PORTERS' RATIONS.

All porters who are taken for more than one day's march away from the ordinary stage routes must be provided with food in addition to their pay, except in the case of local men who will provide their own food for a daily allowance of six annas.

This food can be purchased in Gangtok from Jetmull Bhojraj, an efficient and obliging firm; there is a branch of the firm at Mangu which can generally supply the necessary items, but at considerably greater expense.

A suitable and sufficient scale of daily rations per man with the approximate cost in Gangtok is :—

1½ lb. Rice	@ Rs.	8-4-0	per maund.
8 oz. Atta	„	0-4-6	per seer.
4 „ Red Dhal	„	0-4-6	„
2 „ Ghee	„	2-0-0	„
½ „ Tea Dust (superior)	„	2-4-0	„
½ „ Spices	„	1-4-0	„
½ „ Salt	„	0-2-0	„
½ „ Sugar	„	0-5-6	„

2 lb. 4 oz. costing approximately seven and a half annas.

These rations should be packed in double gunny bags, each bag to contain so many days' food for a given number of men. If this is not done it is difficult to keep a check on the rate of consumption, which is very necessary. A third of a lb. of Champa, at 6 As. a seer, should be supplied when cooking is impossible.

APPENDIX 3.—EUROPEAN RATIONS.

Fresh Food.—Chickens, potatoes, vegetables, milk and eggs are obtainable in the villages between Gangtok and Lachen. In addition fresh meat can be obtained at Gangtok and probably also at Mungen. At Lachen potatoes (2 annas per seer), apples (6 annas per seer) and sheep (Rs. 7 each) are available, and it is advisable to give previous notice of requirements through the General Secretary at Gangtok.

One sheep will provide all the meat requirements for two people for ten or twelve days and above 13,000 feet it will remain good for longer than this. Lhonak after August is deserted and no provisions are then available, but when the herds are there yak milk and mutton can be obtained.

Stores.—The quantity and detail of stores vary largely according to personal taste. One of the greatest difficulties is to decide on the quantity of essentials such as sugar, butter, tea, etc., to be taken. If left in the hands of the cook or sirdar, there is no doubt that however much there is, it will prove insufficient, but if these stores are provided on the following scale and issued daily, there should be ample :—

Tea	½ oz.	per head	per day.
Sugar	3 „	„	„
Butter	1½ „	„	„
Bread	12 „	„	„
Bacon	3 „	„	„

In deciding the quantities of tinned provisions it is to be borne in mind that for the journey to and from Lachen ample fresh food is available. The following list of stores will serve as a guide to those planning a similar trip. The quantities stated were sufficient for two persons for 30 days, of which 14 days were spent on the bungalow route, where fresh food was available. The other 16 days were

spent in Lhonak and no fresh food was used except 2 sheep and an ample supply of potatoes and apples.

	lb.		lb.
Bacon	6	Jam	9
Bread	30	Lime Juice	6½
Biscuits	6½	Matches (Boxes)	12
Butter	5	Meat	16½
Cake	1½	Milk	12½
Candles	3	Pepper	½
Cheese	Pudding	1
Chocolate	5½	Raisins	2
Cocoa	½	Rum	1½
Coffee	½	Salt	2
Cream	¼	Sausages	3½
Custard Powder	½	Sauce	1½
Cigarettes Nos.	5,000	Soap	1½
Flour	6	Soup Maji	4½
Fish Sardines	1½	Sugar	12
„ misc.	7	Sago	1½
Fruit	16½	Tea	3
„ evaporated	1	Toilet Paper
Horlicks	Vegetables	8½

Total about 170 lb.

Bread.—Firpo's sandwich loaf or their round corrugated fancy loaf both keep exceptionally well if wrapped in cloth but not sealed up. After three weeks in the dry air of Lhonak bread becomes very hard but a good cook can remedy this.

Packing.—Ordinary packing cases of about the correct size are obtainable but if it is important to keep the weight down special light boxes weighing about 10 to 12 lb. can be made up at the cost of a few rupees.

If these boxes have a content of 2½ cub. ft. they will weigh about 80 lb. gross when filled.

All boxes should be looked and if different keys are used, they and the boxes to which they belong should be clearly numbered to match. By far the best lock obtainable in India is the Sparling lock made at Aligarh.

If more than one box of stores is necessary the contents of each should be very carefully considered and each box should contain all requirements for a specified number of days, so that as few boxes as possible have to be opened at each camp and a great deal of unnecessary packing and re-packing avoided. The contents of each box should be carefully listed and a record kept of all withdrawals. These instructions may seem to be unnecessarily elaborate, but when it comes to issuing stores in a freezing blast of wind and at a high altitude when the brain is sluggish and the tempo frayed, the preliminary trouble and care given to this matter will be very much appreciated.

Merchants are generally agreeable to give credit for unused tinned goods as long as the labels are unbroken. It is therefore a good plan to pack separately items that may be in excess. The tins should be wrapped separately in several

sheets of newspaper and very tightly jammed together in the box to minimize the chance of their becoming damaged.

APPENDIX 4. —SUMMARY OF EXPENSES (FOR 2 PERSONS).

	Rs.	As.	P.
I. Return Rail (2nd class) and car fares Calcutta to Gangtok, including incidental expenses	149	0	0
II. Bungalow Passes, Light and Fuel	65	11	0
III. Food Stores brought from Calcutta	149	9	0
IV. Food purchased <i>en route</i>	40	10	0
V. Porters' Food	114	10	0
VI. Porters' and Coolies' Wages	669	14	0
VII. Hire of equipment from Himalayan Club including 2 tents, canvas sheet, windproof suits, mattresses, rope, ice-axes, crampons, porters' rucksacks, primus stove, store boxes, tiffin-basket, cutlery, etc.	200	6	0
VIII. Miscellaneous equipment	81	11	0
IX. Porters' equipment consisting of blankets, jerseys, goggles, gloves and boots for six men	89	3	0
X. Medical Stores	11	13	0
	Rs. 1542	7	0

= per person Rs. 771 4 0

A large proportion of the cost of item VII and the whole of item IX were only necessary for an ascent of over 20,000 feet. The cost of a trip not including any high climbing would therefore be appreciably reduced.

No photographic expenses are included.

A JOURNEY IN UPPER KUMAUN AND GARHWAL

LIEUTENANT HUGH ROSE

ON THE 1st September, 1931, I left Baijnath in Kumaun, accompanied by Captain Richardson, R.A.M.C., and Lieutenant G. Chaldecott, R.A., for a two months' visit to upper Kumaun and Garhwal. Our object was to examine the complicated watershed system lying between the Anta Dhura pass in the south and Bara Hoti in the north; we also hoped to ascend some of the lesser-known passes situated along the British borderland of western Tibet; photographing, shooting and climbing were secondary objects, dependent on the time factor.

Between Baijnath and Milam it rained continuously, and we consequently found the river between Shama and Tejam unfordable; we lost three days by our detour through Berenag and Thall, where there is a good bridge. Ascending the Goriganga from Mansiari we reached Milam on the 12th September and exchanged our coolies for mules; we were unable to procure *jhubus*, owing to an outbreak of rinderpest. The mule-drivers proved to be a continuous source of trouble throughout the journey; indeed, all the inhabitants we met beyond "the outer line", which we crossed at Shama, were inclined to be a law unto themselves.

At Dung (13,720 feet), where we arrived on the 14th September, the Gori valley itself branches north-westwards to the Anta Dhura pass and eastwards to the upper Lessar Sira watershed. Leaving Dung two days later, Chaldecott and I ascended the latter branch, with the twofold object of visiting the glaciers at its head, and, if possible, of ascending the watershed and photographing the upper Lessar Sira valley.

At the head of this nullah, about four miles above Dung, we found the junction of three well-defined glaciers, whose general directions were from the north-east, east and south. Ascending the southerly one, which seemed to afford most hope of a col overlooking the Lessar Sira, we found that it swung eastwards about two miles above its snout and ended a mile further on at an ice-cliff about eight

hundred feet high. We circumvented the ice-cliff and climbing over soft snow reached an altitude of 18,000 feet ; we were finally stopped by deep crevasses and dangerous snow for which we were not equipped. There seems, however, to be a practicable col over the ridge at about 20,000 feet.

Our observations of the topography differ from that shown on the existing map, both in the location and shape of the glacier. The snout is located on the map only two miles above Dung and the glacier itself is shown as a single one running north and south. The old road into Tibet by this nullah, shown on the map, does not correspond to any practicable route on the ground. We decided that it must have traversed a col at about 20,000 feet at the head of the north-eastern glacier, and joined the main Tibetan road, just to the north of the Kungri-bingri La. It probably crossed the glacier at the head of the Charchin nullah* ; indeed, when crossing the Kungri-bingri La later, we noted an easy col at the head of this glacier just to the east of the pass. This old route was abandoned sixty years ago on account of deep crevasses ; it is now unknown to traders.

On the 17th September we crossed the Anta Dhura pass (17,590 feet), to Lauka ; there was a little snow on the summit and some fell on our way over, but we were struck by the lack of snow generally on the mountains north of this pass. The weather here, at this season, is often perfect and the passes usually remain open until the middle of October ; sudden blizzards, however, occur frequently and the danger of being caught by one is very real. The country between Lauka and Bara Hoti consists of deep gorges and open moorland valleys with a backbone of snowy ranges. It is crossed by numerous routes to Tibet from Milam in upper Kumaun, and Bompa Gamsali in upper Garhwal ; the scenery is often reminiscent of the west highlands of Scotland. The whole area actually consists of the basins of the Girthi river and its two main tributaries, the Rimkin or Young nullah and the Kiogad ; it is shut in to the north-east, north-west, south-west and south-east by snowy ranges, pierced by numerous passes. The Girthi gorge cuts through the mountains on the north-west and provides an outlet from this area, passable for coolie transport only.

* Charchin is spelt Chitichun on Survey of India Map 62 B.—*Ed.*

From Lauka we ascended a small peak of about 19,500 feet to the north-west of the Anta Dhura. There was no real climbing to be done and we made an eventless ascent over firm, freshly fallen snow, which here came down to about 17,500 feet.

On the 20th September we crossed the Jayanti La (18,500 feet) and the Kungri-bingri La (18,300 feet) in fine weather and descended to Charchin; both passes were practically clear of snow and visibility was perfect. From the summit of the Jayanti La we enjoyed a truly magnificent view of the mountains to the north-west of the Anta Dhura, and of the Girthi gorge; from the Kungri-bingri the Kailas mountains, in Tibet, backed by banks of cumulus, were plainly visible. There was no dust cloud north of this pass.

The peaks near these two passes are very rugged and are composed of a reddish rock; the approaches to both are gradual, except the southern ascent to the Kungri-bingri La, which is steep and difficult. The weather now was perfect and the few clouds that drifted over rapidly dissolved in the dry atmosphere of the Tibetan plateau.

On the 21st September we crossed the Charchin La (17,960 feet) which was also free of snow; on our way down to Kio we noticed a nullah with outcrops of bright green rock. The lack of snow lying in the Kiogad valley was remarkable, the snow-line here being at least at 20,000 feet.

At Kio Richardson was lucky to shoot a wild yak, which we had difficulty in recovering owing to the religious prejudices of the shikari. Descending the Kiogad, we travelled via Sangcha on the Balcha Dhura route, to Laphthal; here we were fortunate enough to shoot a 27-inch bhara! and to pick up three other good heads. The numerous camping-grounds along this route are decorated with bhara! heads, and at Sangcha we found a single ovis ammon horn. These had probably been obtained from beasts caught in snow-drifts and killed for their meat.

At Laphthal, where we halted for five days, the sky was generally overcast and we had some snow which drove the game down. Here Richardson got a badly poisoned knee from a thorn of a small bush, common in these parts. For a time there was a serious danger of gangrene setting in, but it answered to treatment, and he was at last able to proceed, mounted on a spare mule. While halted here, we picked up numerous ammonite fossils, which we also found in smaller quantities later at Rimkin and at the approaches to the Bala

Hoti pass*. Their presence would seem to indicate that we were near the junction of the sedimentary rocks and the gneissic mass of the northern Himalaya.

On the 29th September, from our camp at Shalshal (15,570 feet), I ascended the Shalshal pass (16,390 feet), accompanied by my Gurkha orderly. The pass is about two miles north of the camping-ground and the approaches are easy. The summit was snowless and the track well used. Between Choti Hoti, our next camp, and Rimkin, I again left the main party and ascended the Tun Jun La (16,700 feet), which lies at the head of the Rimkin nullah. The approaches to this pass are gradual and it is a much-used route to Dapa. On my way up I saw a Central Asian ass, grazing on the sunny moors to the south of the pass.

The presence of snow on this pass made me doubtful about the state of the Bala Hoti⁽¹⁾, over which we must return, if we were to avoid Tibetan territory, for it is not only a higher pass than the Tun Jun La by some eight hundred feet, but it is nearer the monsoon belt.

Leaving Rimkin on the 1st October we attempted to cross the Bala Hoti pass. By 5 p.m. we were still five hundred feet from the summit, moving over deep snow, into which the mules sank up to their girths. In spite of off-loading them, we were unable to cross that night and camped on the glacier at 17,000 feet, with no fuel and with no food for the servants, as we had expected to reach a village. At five o'clock the following morning we again attempted the last five hundred feet which separated us from the summit, hoping that the frozen surface would support the mules. In spite of man-handling them they broke through the crust and floundered hopelessly. We therefore abandoned the attempt to get the animals over and I crossed the pass myself and descended to Bompa Gamsali, sixteen miles away, in order to procure coolies. I was only able to obtain two, Lewa

* Mr. Hugh Rutledge, I.C.S., records that he found fossils, probably ammonites, at Charchin and on the summit of the Kungri-bingri La (*Geog. Journ.*, lxi, p. 438). I am indebted to Mr. D. N. Wadia, the palæontologist of the Geological Survey of India, for examining the fossils collected by Mr. Rose. He reports that the localities from which they come adjoin geologically surveyed ground near the Dhauli pass. Five pieces of black massive argillite or shale contained good impressions of Ammonites; these probably belong to *Macrocephalites* or other *Stephanoceratids* of later Jurassic age. A coral embedded in black limestone is provisionally identified as *Heliopora*. If this is correct, it would denote a Cretaceous age.—*Ed.*

(¹) The Bala Hoti pass is known locally as the Chor Hoti.

Singh and Kesar Singh, both of whom had worked for the Kamet expedition and who returned with me laden with *atta* and other stores*. Re-ascending the pass on the evening of the 3rd, I crossed the pass by bright moonlight and reached camp at dawn on the 4th ; camp was moved at once and we spent the night at Rimkin.

From Bara Hoti, there are two alternative routes to the Dhauli valley, one via the Silikank pass (17,450 feet) to Gildung†, and the other by the Marchauk pass (17,600 feet) to Niti. These we also found blocked and the only alternative was to escape from the Hoti area through Tibet.

The weather had now improved, and crossing the Tun Jun La‡, which we now found almost clear of snow, on the 5th October, we reached Sarkia in Tibet that night. Here our track joined the route from Garhwal into Tibet by the Niti pass. While ascending the Tun Jun La from the south we sighted a herd of ovis ammon on the summit, but were sorrowfully forced to leave them alone, owing to lack of time. These animals, for some unknown reason, are to be found in a small area in this neighbourhood, but nowhere else south of the Zaskar range.

From Sarkia we turned westwards up the Jindu nullah to Jindu, at the northern foot of the Niti or Kiunlung pass (16,600 feet), which we hoped to cross that day. The muleteers however refused to do this and ran away. It was only with the greatest difficulty that we persuaded them to return.

The Jindu nullah is about a quarter of a mile broad, with a sandstone escarpment rising about four hundred feet on its northern bank. Beyond its lip the rolling uplands of Tibet stretch to the snowy Kailas range. On the 7th October we crossed the Niti pass, which was nearly snowless, into upper Garhwal. From the flat summit we enjoyed a wonderful view across the uplands to the north and could see the hill which hides Dapa from sight, about twelve miles away. On the northern horizon a continuous line of snowy peaks stretched from the neighbourhood of Kailas in the east far away to the west. In the clear, dry atmosphere the purple and green tints of the hills were particularly beautiful.

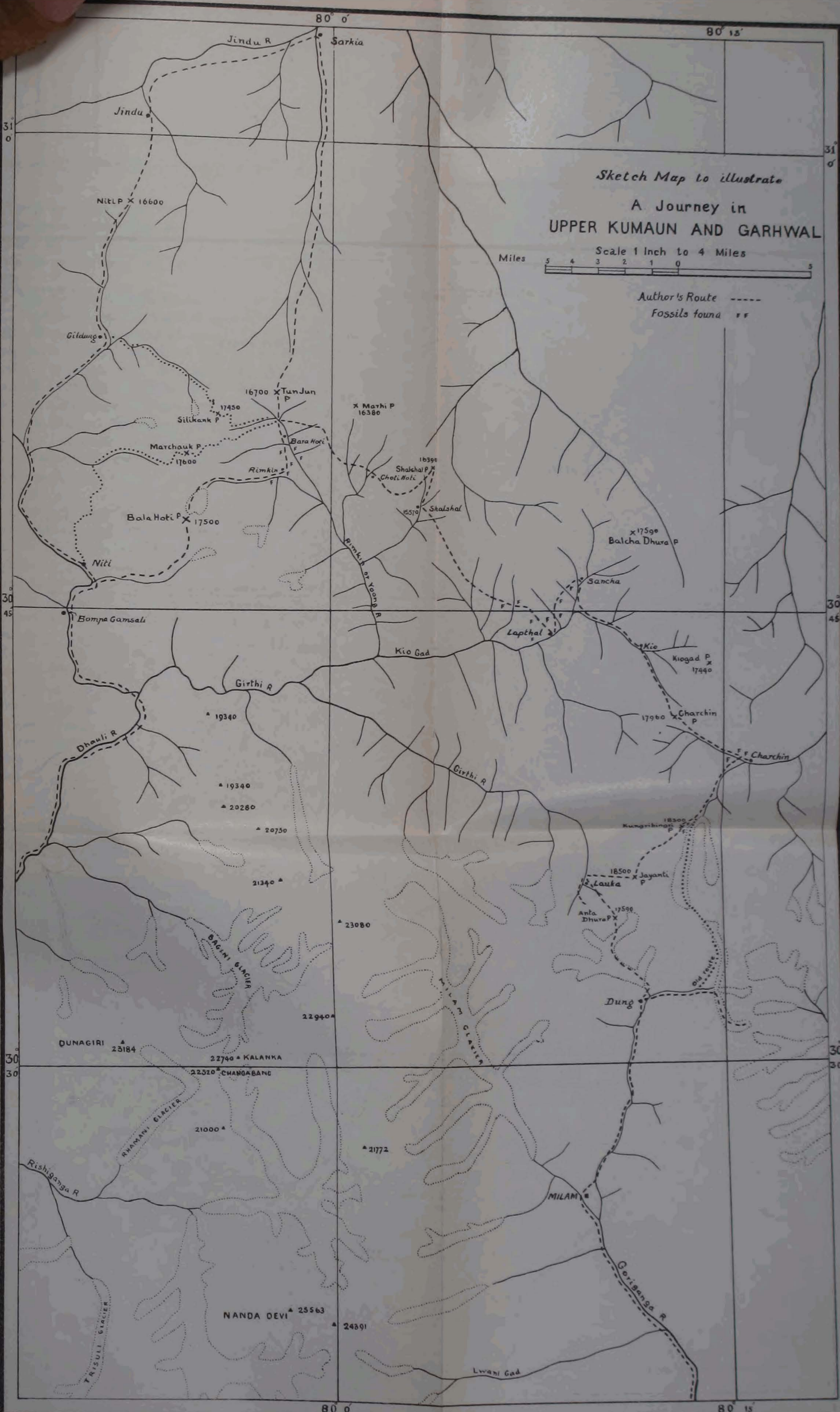
* There seems to be some error in the name of the first of these porters. Lewa was badly frostbitten on Kamet on the 21st June.—*Ed.*

† On Survey of India Map 53 N, Gwelding.—*Ed.*

‡ The Tun Jun La is not shown on Survey of India Map 53 N. It is about 3 miles west of the Marhi La (Map 62 B), and is much used. The route north of the pass follows a large nullah to Sarkia.—*Ed.*

We learnt from a passing caravan that the Dzongpön of Darjeeling was a tyrant, who had reduced the population of that place to twenty inhabitants by cruelty and extortion. He was reputed to be an ex-muleteer from Lhasa. On our return through upper Garhwal we again experienced much rain, especially when we crossed the Kuad pass (12,400 feet) on the 12th October. The people of upper Garhwal we found altogether pleasanter than those of upper Kumaun.

It may interest members of the Club to know that on our journey between Milam and Bompa Gamsali, fuel, grazing and water are plentiful, except at Rimkin, Charchin, Lauka and Jindu, where fuel and grass are scarce. Our journey cost us Rs. 400 per head per month including initial equipment, food and transport. We took no camp furniture, and our 60-lb. tent just accommodated our three sleeping bags.



Sketch Map to illustrate
**A Journey in
 UPPER KUMAUN AND GARHWAL**

Scale 1 Inch to 4 Miles

Author's Route - - - -
 Fossils found F F

EXPEDITIONS

SIR AUREL STEIN'S FOURTH EXPEDITION TO CENTRAL ASIA

1930-31

IT IS with very great regret that we have to record the abandonment by Sir Aurel Stein of his fourth archæological and geographical expedition to Central Asia, owing to continued obstruction by the Chinese authorities and the unjustified cancellation of his permits.

In May 1930 the Chinese Minister of Foreign Affairs at Nanking, Dr. C. T. Wang, upon the recommendation of Sir Miles Lampson, H.B.M.'s Minister, sanctioned Sir Aurel's passport authorizing him to investigate the ancient remains of Sinkiang Province and of Inner Mongolia. Sir Aurel, with his accustomed care, had submitted a memorandum through the British Minister giving the full programme of his intended labours, and these were explained personally by Sir Aurel to Dr. Wang. The passport also provided permission for such survey work as would be found necessary for the proposed tasks. Sir Aurel Stein at the same time expressed a wish to associate with his work competent Chinese scholars and topographers. Unfortunately none were forthcoming.

In order to take advantage of winter travel in the waterless Taklamakan and Lop deserts, when water can be carried in the form of ice, Sir Aurel hastened his departure from Kashmir. In spite of his passports, before half of the journey had been made towards Sinkiang, he learned that orders had been sent from Nanking to prevent him from entering Chinese territory. Two weeks were lost before the intercession of the British Minister was able to remove the obstacles, and Sir Aurel was asked to proceed to Kashgar, where arrangements would be made for his proposed work. On arrival at that city, the local Tao-tai was unprepared to make any such arrangements. After repeated telegraphic application to provincial headquarters, Sir Aurel was informed that he should proceed to Urumchi, where he could discuss arrangements personally with the Governor. This would have meant a caravan journey of at least six weeks, in a different direction to that of his proposed winter campaign, and would have entailed the loss of the whole winter.

Three more weeks passed before the Governor's assent was secured to Sir Aurel's proposal to proceed to Urumchi by a route which skirts the southern edge of the Taklamakan, and which would allow him to visit certain sites on the way. Captain Sherriff, H.B.M.'s Consul-General, obtained definite official assurance that Sir Aurel was to be allowed to work on the way, and a subordinate Chinese official was attached to assist him.

By the time the expedition reached the oasis of Domoko, where Sir Aurel had reason to look for ruins of Buddhist times, serious obstruction began to manifest itself. The anti-foreign magistrate of the Keriya district declared that he had been instructed to prohibit any digging or the making of any plans. He deliberately opposed any attempts by Sir Aurel to obtain labour or guidance, and threw into prison an old and faithful Turki follower of Sir Aurel, who merely went to call on the latter as the expedition passed his village.

In spite of these difficulties and obstructions, and though laid up by an attack of bronchitis at Keriya, Sir Aurel managed to revisit the ancient site in the desert beyond Niya, abandoned in the third century A.D., where it was possible to supplement his former investigations by useful surveys and finds.

By the middle of February the expedition had made its way across the succession of high sand-ridges and past another old site to the isolated oasis of Charchan. There news was received that the Nanking Government had cancelled Sir Aurel's passport and insisted on his return to India. The official communication reproduced a series of fantastic allegations concerning previous expeditions and unfounded statements about Sir Aurel's present aims. These ridiculous charges had been levelled by a body known as the "National Commission for the Preservation of Chinese Antiquities", a body of self-styled savants, obviously entirely ignorant of Sir Aurel's scholarly researches into the cultural past of their country; but since it was impossible to meet those charges from so great a distance, Sir Aurel had no option but to turn back towards Kashgar, with a view to preparing alternative plans of antiquarian exploration in other attractive fields.

Fortunately for his return, Sir Aurel was able to choose the longer route leading past the Lop tract and what was, until quite recently, the terminal course of the Tarim river. He was thus able to collect useful evidence regarding the hydrographical changes which have caused most of the Tarim river's waters to join the Konche-darya and thus flow into the Lop desert about the site of Lou-lan. Another

important result of this journey was that for a period of four months Khan Sahib Afraz Gul, in the face of serious difficulties, was able to make a complete chain of astronomical observations for longitude all round the Tarim basin, with the aid of wireless time-signals. By the close of April the circuit of the whole basin was completed, a distance of some two thousand miles.

When Sir Aurel reached Kucha, he learned that the representations of the British Legation had induced the Chinese Minister for Foreign Affairs to deny having cancelled the passport, or of having any intention of doing so. Sir Aurel was now requested to submit a detailed programme of his intentions *under his own signature*, for the purpose of *allaying the criticisms of certain learned bodies*. This was obviously merely another method of adding further obstruction, for under existing postal conditions it would take some months for a detailed programme under Sir Aurel's own signature to reach Nanking. Moreover his programme had already been submitted and discussed in Nanking by him personally before the start of the expedition, and the fantastic charges of the "learned bodies" had been fully exposed by Sir Aurel's friends in England. It was patent to Sir Aurel that the "learned bodies" were definitely prejudiced and obstructive to the interests they were presumed to preserve. To have carried on under such obstruction, disguised as it was under procrastinating tactics, would only have led to serious waste of time and money; and after waiting in vain a further three weeks under the hospitable roof of the Consulate-General at Kashgar for a reply to a wireless message promising to submit the desired programme provided permission could meanwhile be given to work in a specified portion of the T'ien Shan, Sir Aurel felt obliged to decide for a return to Kashmir.

The records of Sir Aurel's previous three great journeys of archaeological exploration into the waterless wastes of Central Asia are sufficient testimony of the sincerity of his motives. For over thirty years his reputation has been international. The veteran scholar and explorer has spent the greater part of his life in unveiling the remains of the ancient civilization which flourished in Central Asia during Buddhist times, largely under the cultural influence of China and under the beneficent control exercised by her great dynasties. In face of the studied discourtesy shown to Sir Aurel Stein, one can only assume that modern China is ashamed of her present or her past. At the same time one cannot but note that the obstructive methods now being adopted are curiously reminiscent of that old policy of rigid seclusion, which history shows to have been invariably

adopted by the Chinese during recurrent periods of such internal weakness as exists to-day.

KINGDON WARD'S IRRAWADDY EXPEDITION, 1930-31

Kingdon Ward and Lord Cranbrook left Myitkyina on the 30th November 1930 and reached Fort Hertz, the last outpost in Burma, on the western branch of the Irrawaddy, seventeen days later. Here coolies replaced mule-transport and the expedition finally left Fort Hertz and civilization on the 27th December. Owing to the large number of coolies required—seventy-six at the start—in this sparsely populated region progress was comparatively slow, but the Nam Tamai was reached on the 7th January. The Nam Tamai is the second largest headwater stream of the eastern Irrawaddy, and in this latitude is probably as big as the western Irrawaddy. Marching up the Tamai, the junction with the Seinghku was reached on the 23rd*. From here to the Tibetan and Daru village of Tahawndam, on the Adung river, as the main branch of the Tamai is called, is only four marches. Tahawndam, the last village in Burma, at 6000 feet, was reached on the 5th February, and here Kingdon Ward established his base (latitude 28° 10' N., longitude 97° 40' E.).

Since leaving Myitkyina, the collecting of natural history specimens, which was the main object of the expedition, had been methodically carried out. Cranbrook, the zoologist, had been particularly active. It being mid-winter, however, there were comparatively few flowers, even in the warm valleys, and Kingdon Ward, the botanist of the expedition, had been through this part of the country several times before. It is therefore all the more interesting to record that on this occasion a fine new *Cypripedium* was discovered. This orchid appears to have no close relative nearer than the Philippine Islands.

With the base camp established, collecting began in earnest. Here Cranbrook obtained a number of interesting small mammals and birds, supplementing this work with observations on the local migrants in particular. The base camp being situated at the junction of the sub-tropical and warm temperate floras, with the cool temperate and sub-alpine floras crowding close down to it, the region proved to be also a botanist's paradise. Amongst the most striking plants discovered were half-a-dozen new species of *Rhododendron*, two new

* It was up the Seinghku valley that Kingdon Ward travelled to the Lohit and Assam, via the Diphuk La in 1926. For his journey up the Adung valley in 1931, see the Survey of India Map 91 H/SE, scale one inch to 2 miles.

Primulas, a remarkable Barberry, and a carmine-flowered Prunus, beside which the pinkest Japanese Cherry would look washed out.

In May camp was moved some fourteen miles up the valley—nearly three days' march for coolies, so bad was the track—to a river junction at 8000 feet, most of the heavy baggage being left at the base. Giant Conifers, with lesser Maples, Oaks and Hollies formed the bulk of the forest. Masses of glorious Rhododendrons were in bloom. Here however the Adung river flows through a terrific gorge, so that less than a month was considered sufficient time to spend at this spot.

Early in June the expedition moved on two days' march up the main valley, rising about 4000 feet in 8 miles, to a boggy meadow, evidently a silted-up lake-basin; and here the worst of the summer was spent in an atmosphere heavy with mist and rain. Many high alpine plants and birds were collected, but the country proved comparatively poor in mammals. Blood-pheasants and a species of Tragopan were common; no big game was seen.

The Namni L'ka, 15,278 feet, at the head of the Adung valley is regularly used in the summer; but it proved unexpectedly difficult to obtain coolly transport for an unauthorized journey into Tibetan territory. However, on the 1st September, about a month later than the date originally contemplated, the collectors crossed the pass with ten coolies and reached the first Tibetan village on the 4th. The weather was bad and the view restricted. It was hoped to reach Ridong, three marches distant and so link up with Bailey's route from Menkong to Rima; but an embargo being laid on all transport by the Tibetan authorities, this proved to be impossible. Fifteen days were spent at Jite, but the weather was bad throughout. It may be remarked that the country on this side of the range, although politically part of Tibet, resembles the upper Adung valley so closely as to be inseparable from it. In other words, the whole Irrawaddy basin, as far north as latitude $28^{\circ} 30'$, excluding only a short stretch of the uppermost Taron valley, is one phyto-geographical and zoogeographical area, whatever its political divisions may be.

On the 24th September the expedition recrossed the Namni L'ka and returned to the summer camp; a month later this was finally evacuated. The base camp was reached on the 1st November, after six weeks intensive seed-collecting up the valley. Nearly three more weeks were spent collecting seeds of trees in the lower valley, after which the expedition started back on the 20th for Fort Hertz, which was reached on the 10th December.

In all, the expedition spent 328 days collecting in the head basin of the eastern Irrawaddy. Myitkyina was reached on New Year's Day 1932, the expedition having been away just over thirteen months. Some time must elapse before the full results are known. The collections include over twelve hundred plant numbers, embracing about a thousand species; some two hundred mammals, a hundred and fifty birds, a small but interesting collection of insects, and several reptiles. Many photographs of plants in situ were taken and seeds of some two hundred species of garden plants secured.

LIEUT.-COL. R. C. F. SCHOMBERG'S JOURNEY IN CHINESE
TURKISTAN, 1930-31

After a wearisome but unavoidable delay, Colonel Schomberg left Leh on the 9th September 1930 for another journey of exploration in the T'ien Shan. The Shyok river, in the absence of either bridge or boat, was easily forded on the 12th, and the Saser pass crossed without difficulty six days later. The weather was dry and cold in the neighbourhood of the Karakoram pass, but there was no snow on it when it was crossed on the 22nd September.

Avoiding Suget Karaul, which is almost always omitted by caravans passing to Central Asia in the autumn months, and taking the route by the Yangi and Topa Dawans, Schomberg reached Kok-yar on the 3rd October. He records that the casualties among the transport animals were very great and remarks that ponies and donkeys lightly laden and in good condition succumbed just as readily as those in poorer condition carrying sometimes heavier burdens. It is the absence of fodder, grass or *bhusa*, that causes the lamentable death-roll among the pack-transport, and Schomberg calls attention, as so many travellers in the past have done, to the litter of bones along the route. From the Shyok river at Saser Brangsa to Ak-tagh, a distance of a little over a hundred miles, there is scarcely ten yards of the track that is not marked by the mummified body or bones of some poor beast. Human bodies, too, are occasionally seen. It is regrettable that no serais exist on the British side of the border after passing the more or less derelict Saser Brangsa.

On reaching the plains of Turkistan and getting rid of the transport incubus, Schomberg intended to travel during the winter by the Lop Nor area to the north of the Tarim Basin. The political outlook was none too favourable, and it was not till the 26th May 1931 that he reached Kara-shahr after completing this programme. On the 1st June he left that dirty town and traversed the Yulduz. This

region lived up to its reputation for rain, wind, mist and other unpleasantnesses, and until Schomberg crossed the Narat Dawan and reached Aral Tepe, in the Kunges valley on the 15th June, he was unable to record a single fine day. From there he crossed the Koktassin Dawan and entered the Kash valley, when once more a week of foul weather set in.

From here Schomberg had intended to ascend the Kash river and continue his exploration of the Manas peaks, but the bad weather, and still more, the hopelessly unfordable state of the river caused him to abandon this plan, after the loss of much valuable time in a region where the travelling season is very short. He therefore descended the Kash valley and reached Kulja on the 6th July, from where, after a necessary halt to rest the animals, he started for the Central T'ien Shan on the 13th July.

Schomberg crossed the Tekkes river on the 18th and traversed a most interesting route across the main range. Seven major passes were crossed, and as apparently no European had previously followed this route, much new ground was covered. The constant rain of the T'ien Shan pursued the party, a really fine day being unknown. Travellers and surveyors in this range must bear this fact in mind when they make their preparations, as the rain interferes with all survey work and photography, and seriously limits travel, owing to the consumption of supplies during obligatory halts on account of the weather.

On the 10th August the small town of Bai was reached. Then, taking the main road by Aksu and Uch Turfan, Schomberg ascended the Taushkan or Hare river as far as the Biloti Dawan. Kashgar was reached on the 18th September and Gilgit on the 29th October.

LIEUT. OLIVER'S CLIMBS IN THE BASPA VALLEY, 1931

Lieut. P. R. Oliver was climbing near the Kanawar Kailas with a Dogra orderly during the spring of 1931. Having reached the Baspa valley towards the end of April they first ascended a small peak of about 16,000 feet, south-east of Sangla, to reconnoitre*. From here they were afforded fine views of the Kanawar Kailas, across the Baspa valley. Crossing to the north of the valley, they climbed, on the 5th May, a mountain (about 18,000 feet) on the southern ridge

* See Survey of India Map 53I, scale 1 inch to 4 miles. The sketch surveys of the area covered by Oliver are about seventy years old. See note in *Himalayan Journal*, vol. ii, p. 140.

of Snowy Peak 'h'. Oliver reports that the local name for this is *Noning Kailas*, and that it is about 20,000 feet high. From the summit reached, 18,000 feet, the eastern face of the Kanawar Kailas was most impressive.

On the 11th May they reached a point about 18,000 feet on a ridge south of the main watershed between the Baspa and the Todoong Gar, east of Peak 'h', and had an especially fine view of the peaks north of the Todoong Gar and of Snowy Peaks 'K', 'L' and 'n'. The weather then broke and no further climbing was possible till the 21st May, when an attempt was made on a summit of about 19,000 feet between Snowy Peak 'h' and the one climbed on the 5th May. They were forced back at about 18,500 feet by bad weather.

On the 26th May from a light camp at about 16,000 feet, pitched in deep snow below the Charang Ghati (pass, 17,600 feet), a mountain east of the pass was climbed in bad weather (about 19,000 feet). Oliver notes that it is the eastern faces of Snowy Peaks 'n', 'L' and 'K' that are seen from the pass and that they are separated by eight miles (as the crow flies) and two deep transverse valleys from the Kailas group. He does not agree with Mr. Glover's remark in *The Himalayan Journal*, vol. ii, p. 85, that there is a possible line of approach to the highest peaks of Kailas from here.

Altogether some useful mountain reconnaissance was carried out, but it is regrettable that the existing map is so old and on so small a scale. The mountains are interesting and afford good climbing, and the valleys are inhabited; they are easily accessible from Simla and beyond the Baspa are largely free from monsoon influences. In the spring Oliver records that the snow lay soft and deep as low as 14,000 feet, while drifts were found down to 10,000 feet; conditions later in the year should be easier. Oliver is willing to advise or assist any intending climbers with further information. We do not yet know the height of the Kanawar Kailas, but Raldang is 21,240 feet, and there are several others over 20,000 feet in the neighbourhood.

MR. G. B. GOURLAY'S JOURNEY IN SIKKIM, 1931

Messrs. G. A. R. Spence and G. B. Gourlay spent sixteen days in Sikkim from the 11th to the 26th October 1931. They had hoped to be able to get up to 20,000 feet within nine days of leaving Calcutta, but bad weather encountered at Thangu and the exceptionally early arrival of the winter snow precluded all chance of high climbing in the short time at their disposal. They accordingly decided to cross the Dongkya La and return thence to Thangu by

the little used Sebo La, which links the upper Lachen and Lachung valleys.

Deep fresh snow on the Dongkya did not satisfactorily explain the slow progress made by the porters, which necessitated camping on the north side of the pass some five hundred feet below the summit, but next morning five men, including four Sherpas who had all done well on Kamet, were down with influenza, which more than accounted for the difficulties of the previous day. Spence volunteered to return to Thangu with the sick men and had some trouble in getting them along, although he tied them on to the backs of yaks. Gourlay proceeded over the Dongkya with four men and camped at Mome Samdong. The next day (22nd October) he crossed the Sebo La and rejoined Spence at Thangu.

The Sebo La affords an entrancing high-level route equal in splendour to the route across the Lungnak La. The crossing of the pass involves no climbing difficulties but is a first-class scramble for a fit man; nevertheless a rope was used on the western slope and enabled the party to descend the glacier straight, thus saving a considerable amount of time.

In addition to two very excellent porters from Lachen the following Sherpas were employed: Kippa, Dorje, Nima, Ang-Nerbu, Nerbu and one other. From Thangu the return to Calcutta was accomplished in four days.

MR. L. R. FAWCUS' JOURNEY IN SIKKIM, 1931

(The following notes on a journey by Mr. and Mrs. J. M. Bottomley, Mr. A. J. Dash and Mr. L. R. Fawcus have been communicated by the latter)

Many members of the Eastern Section of the Himalayan Club find that their duties in the Plains limit their chances of a visit to the Himalaya to the period of the Durga Puja holidays—about ten days usually in October—with perhaps a day or two extra thrown in with the favour of the “powers that be”. They find then that, after a hot weather and rainy season in Calcutta, their keenness rather outruns their power to make arduous marches at a high altitude.

Our object in going up the Lachen valley in October 1931 was to ascertain whether the proposed site for a Club hut at Makotang in the Lhonak valley was accessible to such a party coming up from Calcutta. Our travels must therefore be considered rather “small beer” when compared with those usually chronicled in *The Himalayan Journal*, for we were on a well-known route almost the whole way and

attempted nothing more arduous than the ascent of the Lungnak La (about 17,200 feet), the pass which leads from the Lachen valley just above Thangu into Lhonak*.

Actually the ascent was harder than we had expected, for fresh snow had fallen and was lying in deepish drifts all over the route, effectually concealing the path and proving tiring to laden porters and quite impassable to yaks. By half-past two in the afternoon of the 17th October, we were still a thousand feet from the summit of the pass and more snow seemed to be threatening in the sky. We therefore left most of the porters to find a camping site and went up with two unladen men to the summit. This was reached in time to return just before dusk to a camp pitched on a snow-field; the weather was too misty for us to get more than fleeting glimpses of the peaks which border the Lhonak valley, but we made pretty sure that after the first heavy fall of snow in October a hut at Makotang would be of little use for the desired purpose.

We were rewarded in the morning when we emerged from our tent on to the hard-frozen snow to see dawn breaking over Chomiomo and Kangchenjau. Later, during the descent to Thangu we had good views of Chombu, the peak on whose shoulder lies the Sebu pass which leads from the Lachen valley to Mome Samdong in Lachung, and of Thangu, which gives its name to the valley below it.

On the following day some members of the party went up to Palong above the Thangu bungalow and returned after taking some excellent photographs of the northern Sikkim peaks from this point, which can be recommended as a fine view-point to any traveller in the Lachen valley.

A few observations of interest to the naturalist may be noted. Owing to the lateness of the season little high-altitude fauna was to be seen between Thangu and the Lungnak La. Fresh specimens of the Clouded Yellow (*Cotias Fieldi*) and a Fritillary (*Argynnis Lathonia*) were flying. The Red-billed Chough (*Pyrrhocorax Pyrrhocorax*) was abundant here as elsewhere at these altitudes in Sikkim, and it was interesting to see the Nepal Wren (*Anorthura Nepalensis*) creeping along the boulders of the mountain stream just below snow-level. On the return march I was able to get the dried skin of one of the high-altitude water-shrews from a villager. It appears to be the

* There is plenty of interest in small expeditions such as the one here described so briefly. I only wish more members would send in for publication their observations on such journeys.—Ed.

Himalayan Water-Shrew (*Chimarrogale Himalayica*), but will, I hope, be definitely identified by the Darjeeling Museum, where it has been deposited.

L. R. F.

MR. F. LUDLOW'S NATURAL HISTORY TOUR IN
KASHMIR, 1931

Mr. F. Ludlow and two friends from England carried out an interesting tour in Kashmir during the summer of 1931. With Messrs. W. and A. B. Duncan, he left Srinagar in mid-April, crossed the Sinthan pass on the 17th, and reached Kishtwar four days later. A month was spent on natural history and shikar mainly in the Gan and Bangar valleys. The party returned to Kishtwar towards the end of May, travelled up the Marau-Warwan valley to Inshan, and crossed the Margan pass on the 9th June. After a week's refit in Srinagar, they left for Ladakh on the 17th June, and following the Treaty Road reached Leh on the 30th. Mr. A. B. Duncan then left for Hanle, while Messrs. Ludlow and W. Duncan visited the Changchenmo. The party was re-united at Leh on the 14th August and set off a week later for Skardu, Mr. W. Duncan taking the Chorbat La and Khapalu route, the others the ordinary route by Kargil. From Skardu the return journey was made across the Deosai to Gurais, and thence by the Tilel valley and Gad Sar to Sonamarg. Srinagar was reached on the 5th October.

The objects of the journey were mainly to shoot big game and collect natural history specimens. The bag included black bear, red bear, goral, *ovis*, *ammon*, Tibetan antelope, Tibetan gazelle, bharal, shapu and ibex. The collections comprised approximately 60 specimens of small mammals, 600 bird-skins, 400 lepidoptera, 400 hymenoptera and 100 different species of high-altitude plants.

During the winter Mr. Ludlow was engaged in writing up the scientific results of his previous expedition to Sinkiang and the T'ien Shan. A paper on the birds of Sinkiang was being prepared for the *Ibis*.

THE HAARDT "MISSION À TRAVERS L'ASIE, 1931-32"

Though most of the members of the Himalayan Club prefer to wander through and enjoy the Himalaya on their flat feet, it may interest them to have a brief summary of M. Haardt's attempt to conquer the passes of Northern India with Citroën "caterpillars". As far as I am aware no official account has yet appeared in India,

and some of the short notices in the press have not been altogether fair, leading one, as they do, to suppose that the attempt was undertaken light-heartedly and without proper forethought.

The greater part of the backing was French, as well as most of the personnel, and it was given the status of a French Official Mission ; but a large part of its resources were derived from the National Geographical Society at Washington, which was represented in the party by Dr. Williams. It also had British support. General Sir Ernest Swinton, the prophet of war-planes long before these came into being, and one of the inventors of the armoured tank, who remained in England, and Colonel E. V. Gabriel, who accompanied the Mission, were the British representatives.

The expedition left Syria in April 1931 in seven Citroën caterpillar cars with trailers, and without untoward incident crossed Iraq, Persia and Afghanistan. It reached the Khyber in June and Peshawar on the 19th of that month. It was never intended that the seven caterpillars would make the whole journey across the mountains of northern India ; and long before Peshawar was reached a duplicate set of seven cars had been despatched to Peking to make the journey across Mongolia and the Gobi desert to pick up the party at Kashgar. Haardt and his companions intended to take the cars that had crossed from Syria as far as possible, then to traverse the intervening ground to Kashgar on foot, there to collect the Peking cars and continue the journey in them to Peking. From here it was intended to cross French Indo-China, Siam and Burma to India. The survivors of the fourteen cars were then, I believe, to transport the survivors of the expedition back to Syria by way of Persia and Arabia. At best this could happen in January 1932.

The most careful forethought was exercised and the most deliberate preparations were made ; it appears that no expense was spared. The cars were equipped with material for portable bridges up to a span of fifty metres, and with winches and various cable attachments for scaling cliffs and rounding corners, which would otherwise be too narrow for them.

The very serious floods in Kashmir, which were abnormal, caused much delay, and to avoid more dislocation of the normal functions of the Gilgit road than absolutely necessary, the expedition was broken up into two sections. The first party, consisting of four Frenchmen, left Bandapur on the 2nd July to reconnoitre and prepare the route. The second group, comprising twelve Europeans and including six mechanics, followed ten days later in two caterpillar cars. The other

five cars were presumably left in Srinagar. The second group, without serious difficulty accomplished one normal stage a day as far as the Burzil pass, which was still deep under snow. On the day the cars crossed the Burzil, they only reached Sardar Kothi in the darkness. Godhai, 23 miles further on, was reached at midnight the following day, and Astor, 17 miles on, was attained by 2 P.M. the next.

Beyond Astor the road had been washed down the khud and a day or two were lost in scratching a track out of the hillside. The cars left Astor on the 23rd July, to be eventually held up by a slip nearly a quarter of a mile long. A road could have been cut and the cars taken over under their own power, but it would have been a long business. Haardt therefore dismantled them and had them carried over this slip by coolies. They were re-assembled beyond this break, whence they pushed on happily to Doyan. A further bad break here was negotiated by means of winches and cables, and a day was spent crossing the Hatu Pir, the famous northern spur of Nanga Parbat. The road here ascends the spur face, an almost perpendicular cliff, by a series of steep zigzags, each section of the road being almost vertically over the one below. It is the Golgotha of the whole route and those who know it must marvel that any cars were taken over it. The difficulties were however surmounted and Gilgit was reached on the 4th August.

Haardt had been advised that the utmost limit he would be able to take his cars would be Nomal, one march of seventeen miles beyond Gilgit. The road here, though having a good surface and being well kept up as far as Baltit, is only a six-foot scratch across the harsh face of the mountain-side. Beyond Nomal is the very difficult Chaichar defile, where the Hunza river cuts a tortuous gorge through the southern Karakoram immediately west of Rakaposhi, a peak 25,550 feet above sea-level. This defile had already been ruled out as impracticable. But Haardt had made up his mind to reach Nomal with at least one caterpillar, and this he did. In fifteen hours the single car that attempted the journey covered the seventeen miles, the last three being completed in the dark. This car then turned round and started back for the plains of India, while the members proceeded, as had been intended, on foot.

The next check was at Misgar, caused by Chinese obstruction. Having already granted permission to the expedition to cross China the Chinese authorities as usual changed their mind, and some delay was caused while waiting for them to change it back again. The

Peking group also was detained at Urumchi, the capital of Sinkiang, and not allowed to proceed to Kashgar. We have no news whether the pedestrian party caught up the waiting cars, or whether the expedition has yet reached Peking, but there has been plenty of time for China to change her mind several times during the last few months. As yet in December 1931 there is in Burma no sign of the survivors arriving from Siam.

IN MEMORIAM

GENERAL SIR ALEXANDER STANHOPE COBBE, V.C.

1870-1931

GENERAL SIR ALEXANDER COBBE, V.C., G.C.B., K.C.S.I., D.S.O., A.D.C., who died after a short illness on the 29th June 1931, was the senior General of the Indian Army.

Born in June 1870 he was but 61 years of age at the time of his death and should therefore, perhaps, be accounted one of the many distinguished soldiers whose lives were definitely shortened by the strain, both mental and physical, endured during the Great War. It is possible that, in his case, the vital energy, that inward flame which we call the life of a man, had been burning away at "forced draught" long before the war of 1914-18; for few men have lived so strenuously, so eventfully and, it may be added, so uniformly successfully as had General Cobbe.

Educated at Wellington and the Royal Military College, Sandhurst, he was commissioned and joined the South Wales Borderers in 1889, transferring later to the Indian Army and the 32nd Sikh Pioneers. With only six years service he obtained his first experience of war in the operations for the relief of Chitral in 1895.

This was followed by service in Africa, where he served in one small war after another; in each successive campaign adding to his reputation for professional ability and personal gallantry. These services were recognized by the award of the V.C., D.S.O., the brevet of Lieut.-Colonel and no less than seven mentions in despatches.

In Ashanti he was severely wounded.

From Somaliland he went to the Staff College, Camberley.

During the Great War he served with distinction in various Staff appointments in France and later in command of the First Corps under Sir Stanley Maude and General Marshall in Mesopotamia. By the age of fifty he was a V.C., D.S.O., a K.C.S.I., and a Lieut.-General.

To many members of the Club he must have been known as G. O. C.-in-Chief of the Northern Command, which important Command he held from 1926 to 1930; and such was the value placed

upon his knowledge and opinions, the outcome of his natural intelligence and wide experience, that the Home authorities twice made use of his services as Secretary of the Military Department of the India Office. It was this important post which he was holding at the time of his death.

Enough has been said of General Cobbe's career as a distinguished soldier, but it would be a serious omission to fail to deal with one side of that career, the more personal side. Without such a reference the picture would be sadly incomplete, for he was a man who inspired in his subordinates feelings which were not merely those of respect for an able Commander, but which constituted real bonds of affection for one in whom they had absolute faith and confidence. Their implicit trust in him was based upon their knowledge of his personal interest in their welfare and the inherent kindness of the man, which, though not always apparent on the surface, was to those that knew him a guarantee of absolute justice, sympathy in time of trouble and unflinching support.

There must be many in the Army to-day and not a few amongst the members of the Himalayan Club, who have the happiest memories of this side of his personality.

General Cobbe's connection with the Himalayan Club is less well known, and less known than it deserves to be; for he took the keenest interest in the progress of the Club and was an ardent supporter of its inception. His own knowledge of the Himalaya must have dated back to 1895 at least, when serving in Gilgit he took part in Kelly's famous march to Chitral.

He was to the day of his death a good shot with a scatter gun and a keen fisherman, who had also shot a considerable amount of big game in his time.

To those whom he knew and who had similar tastes he would talk readily and happily of days fishing in Kashmir or of the pursuit of a certain big markhor in Buldar-Rakiot Nullah, the recollection of which he liked to share with any one who he felt would understand.

Though ever ready to encourage technical and scientific exploration, his strong support of the Club arose largely from a desire to encourage young officers to travel and shoot in the Himalaya so that they might in turn experience the joys which he himself had derived therefrom and might be led to spend their leave in a manner which he, rightly, felt was so much better for them than anything that the ordinary hill-stations could offer.

Finally it may be surmised that all those who, in addition to having the honour to serve under him, had known the zest with which he entered into a day's fishing or shooting would undoubtedly say of him : Whatsoever he found for his right hand to do, that he did with all his might.

H. L. HAUGHTON.

HENRY TREISE MORSHEAD
1882-1931

By the tragic death at Maymyo on the 17th May 1931 of Lieut.-Colonel Henry Treise Morshead, the Survey of India and the Himalayan Club lose a most distinguished traveller and geographer of Tibet. Those of us who were privileged to know him have lost a trusted and truly human friend.

Henry Morshead was born on the 23rd November 1882, the eldest son of the late Reginald Morshead, J.P., of Hurditch Court, Tavistock, Devon. He was educated at Winchester College, whence he passed direct to the "Shop", and received his commission on the 21st December 1901. After two years at Chatham he came to India and was posted to the Military Works Services, in which branch he served for nearly three years. He joined the Survey of India on the 3rd December 1906, and except for the War period, from 1914 to 1919, he served in this department until his death.

For nearly the whole of the first six years of his Survey service, Morshead was closely associated with Dehra Dun, the headquarters of the scientific and exploratory pursuits of the department, and there is no doubt that it was here that his inherited love of adventure was stimulated by the study of Himalayan exploration during the past century. During this period, though his official duties ranged from latitude to magnetic operations, and though he held successively charge of the Forest Map Office, the Computing Office and the Triangulation Party, he became an expert in the history of Himalayan, and, in particular, of Tibetan, exploration.

In the winter of 1911-12, came his first chance of proving himself a capable Himalayan explorer, when he accompanied the Survey detachment under Captain C. P. Gunter, R.E., on the Mishmi Mission. The country surveyed was most inhospitable and mountainous; the main ranges varying from 15,000 feet to 17,000 feet fall steeply to the level of the main valley at 4000 feet in four miles. Morshead impressed everyone with his extraordinary powers of endurance.

The following winter he was attached to the Mishmi Exploration Survey, again under Captain Gunter, and he was given charge of the triangulation of the Dibang valley and its tributaries. In spite of most unfavourable weather he completed a very large area of triangulation of previously unexplored country. Towards the end of the regular work of this expedition, in March 1913, the plan was formed by Morshead and Bailey, the Political Officer, to unravel the mystery of the "Tsangpo Falls" and of the actual course of the Tsangpo river, but the appalling weather rendered a dash over the Andra or Yonggyap pass into the Pemakoi-chen valley (Dihang river) quite impossible until the 26th May, when it was still under 20 feet of snow. The work carried out by Morshead on this expedition was extremely arduous; yet he not only triangulated the whole area, but he also completed the computation of almost every triangulated point within a few hours of observation so that the planetablers never lacked points by which to control their work.

The adventurous exploration with Bailey, in 1913, of the great bend of the Tsangpo, north-east of Namcha Barwa, the great peak of the Eastern Himalaya, 25,445 feet,—itself discovered by Morshead and Oakes the year before—brought Morshead's name into international prominence. The identity of the Tsangpo of Tibet with the Dihang tributary of the Brahmaputra was proved beyond doubt and the falls of Pemakochung correctly located. Morshead and Bailey had many difficulties to encounter, not only from the vile weather, but from the plagues of mosquitoes, *dandims*, leeches and gadflies as well. An amusing incident, which might have had a tragic ending, was the arrest of both travellers by Tibetans, on the suspicion of being Chinese spies. Morshead himself records the incident as follows :—

We reached Showa on June 25th and were kept prisoners in the travellers house for three days. Matters were eventually settled satisfactorily. though at the last minute their suspicions were again aroused, and the negotiations imperilled, at the sight of the Chinese writing on my tablet of Indian ink.

For his valuable contribution to our knowledge of this frontier Morshead received the thanks of the Government of India and of the Secretary of State, and was awarded the Macgregor Medal by the United Service Institution of India.

Morshead was promoted Captain on the 21st December 1911. and was on leave in England when the War broke out. He was recalled to India at once, only to leave again for England in October



H. T. MORSHEAD, 1882-1931.

to train the sappers of the new armies (16th South Irish Division). In February 1915 he was posted to command the 212th Field Company, R.E., 33rd Division, and joined them in the Vermeilles sector during the combats for the possession of the Hohenzollern Redoubt. He commanded this company throughout the Battle of the Somme (High Wood-Les Boeufs) and was promoted to the rank of Major on the 21st December 1916.

In January 1917 Morshead was transferred to the 46th Division to form and train a Pioneer Battalion, and having done this successfully returned to his old command of the 212th Field Company, then in the Quéant-Drocourt sector, in time for the Battle of Arras. Wounded on the 25th September during the Battle of Paschendaele, he was invalided to England, but returned to France in January 1918, to be posted as C. R. E. of the 46th Division. During the final operations he was largely instrumental in the very successful crossing of the Canal du Nord by his Division.

Those who had the privilege of serving under him in France will not forget his unflinching cheerfulness and courtesy, and that quality of moral and physical courage, which he possessed to so high a degree, and which he could inspire in others. He was mentioned twice in Sir Douglas Haig's despatches and received the D.S.O. in 1916.

On reverting to the Survey of India he found himself almost at once on active service again, in command of the Survey party with the Waziristan Field Force, in the early part of 1920. Later in the same year he joined the late Dr. A. M. Kellas, on an attempt to climb Kamet, the great peak of northern Garhwal, 25,447 feet above the sea. This was Morshead's first experience of technical mountaineering. Dr. Kellas was one of the most energetic mountaineers who have ever visited the Himalaya; with Morshead in his company they were too much for their Bhutia porters, who eventually broke down. It is typical of Morshead, who never had difficulties with his men, that he took on himself the entire blame for the failure of his men. "I have nothing but praise for the Bhutia coolies of the higher Himalaya", he writes. "On rock they climb like goats, while on ice they readily learn step-cutting. It appears very doubtful if the present-day expense of importing Alpine guides can ever justify their employment in future Himalayan exploration". Morshead and Kellas failed to reach the summit of Kamet mainly owing to the fact that the porters could not be induced to place a camp at Meade's Col at 23,500 feet, but the physiological results of this expedition were to

prove most valuable when organizing the Everest Expedition a year later.

Morshead concludes a narrative on the Kamet Expedition with these words :

It only remains to express my gratitude at being privileged to serve my apprenticeship in mountaineering under so experienced a hand as Dr. Kellas. Failure is often more instructive than success and I can only hope that this expedition, on which I shall always look back with feelings of pleasure, may be the prelude to other more successful future efforts in the same genial company.

Morshead already had in mind the possibility of an attempt to climb Mount Everest, and had already applied officially for permission to accompany the expedition while the project was in the air. He was in charge of the Survey of India detachment which was attached to the Reconnaissance of Everest in 1921 and which completed 12,000 square miles of totally unexplored country on the scale of four miles to an inch. During this expedition he climbed Kama Changri (21,300 feet) and to the Lakhpa La (22,350 feet), without feeling any inconvenience from the high altitude.

On the second expedition to Everest, in 1922, Morshead took leave to join the climbing members of the party, and with Mallory, Somervell and Norton took part in the first assault. He was with the first party to reach and camp at 25,000 feet, but the exertion of getting there, his complete disregard of cold and exhaustion, and his insistence on volunteering for far more than even his extraordinarily fit body could stand, prevented him from continuing the climb, when an altitude of 26,985 feet was attained. On this attempt Morshead was seriously frost-bitten and subsequently lost the top joints of three fingers of his right hand. Colonel Norton, in the *Alpine Journal* in November 1931, writes :—

This occurred at the 25,000-foot Camp V and meant that Mallory, Somervell and I had to get him down to Camp IV (23,000 feet) late on the evening of our first high climb ; I believe that it was Morshead's courage alone which enabled us to reach this camp by 11 p.m. and to descend next morning to Camp III through a foot of new snow, for he was barely able to walk ; yet he kept going doggedly without complaint and in spite of a bad fall on an ice slope, knowing that the safety of the whole party depended on his determination to 'stay the course'.

But it was the after effects of the frost-bite that he contracted on this occasion which gave us the opportunity of appreciating fully his indomitable courage. I remember a day when he had eaten lunch with us at the Base Camp and had borne at least his share of the conversation, apparently in the best of form ; after lunch I strolled, chatting, with him to our respective tents, but I had occasion immediately to look into his in order to borrow a theodolite : to my astonishment I found Morshead stretched on his back with his bandaged hands clutched above his head, groaning and with his face distorted with pain.

All those that were lucky enough to know him on that expedition will think of him as the ideal companion for such times—ideal in a tight place, ideal in the mess tent when the day's troubles were over.

Owing to this frost-bite, Morshead could not join the Third Expedition as a climber, but his knowledge of the Tibetan language and his sympathy with the Tibetan people and porters had been of such service on the first two attempts, that the Everest Committee pressed him to take part as transport and base camp officer. To his great disappointment, though he offered to take leave without pay, he was told by his superiors that his services could not be spared and he found himself stationed in the south of India, far away from the mountains he loved, at the time when the expedition started. Though he realized that he could not be of the party to reach the summit, his heart was set on being close up at the finish, and he was confident, perhaps the most confident of all the members of the Second Expedition, that the summit of Everest was attainable.

His restless spirit, however, survived these disappointments and, when on leave in England in 1927, he joined the Cambridge University Expedition to Spitsbergen—"the one old man of the party", as he put it—and on the conclusion of his leave returned to India via Constantinople and Baghdad.

He was appointed to the post of Director, Burma Circle, on the 14th May 1929 and immediately threw himself, with all his old energy, into his new charge. He began to study Burmese and learnt sufficient to make himself readily understood. His long tours of inspection—he could still cover on foot over thirty miles a day—are the talk of his old colleagues. Less than three weeks before his death he came back to Maymyo two days before he was expected, after inspecting a Survey party working near the Ruby Mines at Mogok. In order to avoid wasting one day waiting for a boat, he travelled direct across country, out-stripping his only native companion, carrying his own food, and sleeping out one night under the trees! His thoughts turned constantly to the Hills, and only a few days before his death he discussed with the writer of this note the possibility of organizing a survey expedition to triangulate Kungka Shan, a very high peak in China, a fortnight's march from the Burmese border.

The following extract from an appreciation which appeared in the *Times*, written by one who had an intimate knowledge of Morshead, gives a very vivid and true picture of him, and can hardly be improved upon.

The Survey of India has always been rich in adventure-loving officers whose explorations in the wilder regions of the Indian borderland have won them fame outside the Service to which they belonged. Morshead was one of this company. He was a West countryman, small and dark, hard as nails, and overflowing with energy. In the hot weather in India, when it is customary for the Survey officers to work out the results of the journeys they have made during the cold weather season, it was a common thing for him to go off at a week-end for a long tramp among the hills, and he would come back fresh and smiling after having covered perhaps seventy or eighty miles in a couple of days. As a traveller he was of the happy-go-lucky order, content with the lightest of equipment. Careless of personal comfort and blessed with the digestion of an ostrich, he seemed to thrive on the roughest fare, and could do with impunity things that would put most men on the sick list. The same qualities marked his work as a surveyor. He excelled, not so much as a great triangulator, but as a dogged pioneer who could be relied on to get things done.

Morshead was, however, more than the dogged pioneer. Owing to his careful study and sound knowledge of the Eastern Himalaya and Tibet, he had come to be looked upon as the leading authority on the nomenclature and geography of those regions. His opinions were always expressed modestly and without dogmatism; and he was so courteous in argument that he generally persuaded more obstinate men that he was right. And though perhaps not "excelling as a great triangulator", no one could be more patient, more conscientious, or more hardworking when actually engaged upon that work. For instance, Bailey tells me that he remembers Morshead on one occasion camped for three weeks alone in the cold and dripping forest, five hundred feet below the summit of his station of observation, and five hundred feet above the nearest water-supply, waiting for a few minutes of clear weather to get the required observations with his theodolite. Every morning during those three weeks he was on his hill before sunrise in the vain hope of a few minutes free from cloud.

Henry Morshead married, in 1917, Evelyn Templer, eldest daughter of Harry Widdicombe, of St. George's Square, London, and had four sons and one daughter, all of whom survive him. There never was a more united or devoted family. His wife and children were in England when he took his early morning ride on Sunday, the 17th May 1931. An hour and a half after he left his bungalow, his riderless pony galloped back to Maymyo. An intensive search of the jungles throughout Sunday was fruitless, and it was not till seven o'clock the following morning that his body was found, some four miles away. Death was caused by a gunshot wound in the chest,

inflicted at point-blank range. The Police were unable to trace any motive for the crime and failed to find the murderer; their theories were unsupported by any tangible evidence. It may be that he was a victim of the Rebellion. That one who had so many friends, and no enemies, and who had throughout his strenuous life passed through so many hardships and perils, should be foully murdered when on an ordinary Sunday morning ride in civilization is a terrible tragedy and mystery. The most profound sympathy is felt by his many friends for his bereaved family.

KENNETH MASON.

DR. EMIL TRINKLER

1896-1931

By the death, as the result of a motor car accident, of Dr. Emil Trinkler, Central Asian geography has lost one of its most capable and enthusiastic students.

Emil Trinkler was born in Bremen on the 19th May 1896. His studies, like those of many young men in Britain, were interrupted by the Great War and he was called to serve his country. Immediately the Armistice was signed he went to the University of Munich, where he graduated in 1921 as a Doctor of Philosophy, after specializing in the study of Central Asian problems. In the same year he published an important paper on Tibet⁽¹⁾, which won him a prize at the University, and which, though containing nothing definitely new, was a most valuable and concise summary of the work of others. This work was skilfully co-ordinated and the paper contained an extremely useful bibliography of over 350 publications.

In 1923 Dr. Trinkler was commissioned by an Afghan trading company to explore and examine the deposits of ore in Afghanistan. His sound knowledge of geology enabled him to profit by this exceptional opportunity, and an additional commission from King Amanullah to prospect for coal and iron in the Hindukush, led him to make a careful examination of the structure of these mountains, particularly in the neighbourhood of Bamian.

On his return to Germany, Trinkler settled in Berlin, where he wrote a popular account of his travels in Afghanistan⁽²⁾, and

⁽¹⁾ *Tibet: Sein geographisches Bild und seine Stellung im Asiatischen Kontinent.* Munich, 1922.

⁽²⁾ *Quer durch Afghanistan nach Indien.* Vowinkel, 1925. (English translation: *Through the Heart of Afghanistan.* Faber and Gwyer, London, 1928). See Review *Himalayan Journal*, vol. i, page 118.

a comprehensive scientific paper on its geology⁽³⁾. His spare time was devoted to an intensive study of Central Asia, its geography, geology, history and archæology, in order to prepare himself for further work in this region. In 1927, thanks to the assistance provided by the Notgemeinschaft der Deutschen Wissenschaft, by the Senate of Bremen, and by several private patrons, he started for Central Asia with his friend, Dr. Hellmut de Terra, where he spent the greater part of two years⁽⁴⁾.

Dr. Trinkler was not only a keen student of Central Asia, but he was a very active traveller with powers of sound observation and deduction. He spared no pains in his preparations and undertook no journey till he felt himself fully qualified to make it a success. To complete his equipment, he studied several European languages, including Russian and English, in order not to miss anything of importance that had been written about his subject, and he twice went to England where he stayed for several months in order to examine the books and photographs of the Royal Geographical Society's collection. To avoid having to rely on interpreters during his travels, he mastered Tibetan, Hindustani and Persian. At the time of his death he had just completed and sent to press the geographical account of his last journey, the proofs of which, as well as the geological and morphological sections, will now be published by Dr. de Terra. He also had already in view another journey, and was considering a proposal to reside in India for a period in order to be nearer his interests. His friends in India will regret that this intention has been frustrated. He was to have joined the Himalayan Club in 1931.

KENNETH MASON.

⁽³⁾ *Afghanistan: Eine Landeskundliche Studie*. Petermanns Mitteilungen. Erg. H. 196. Gotha: Justus Perthes, 1928.

⁽⁴⁾ For a brief account of this journey see *Himalayan Journal*, vol. i, p. 90. See also *Himalayan Journal*, vol. iii, p. 42 and p. 143; *Geog. Journ.*, vol. lxxv, pp. 225-32, and 505-17; *Journ. Cent. As. Soc.*, 1930, pp. 5-13. A fuller account without scientific details appears in his book, *Im Land der Stürme*, Leipzig: Brockhaus, 1929; and an English translation of this has appeared posthumously under the title, *The Stormswept Roof of Asia*: London: Seely, Service and Co. (see Review in this volume).

NOTES

THE EPHEDRA, THE HUM PLANT, AND THE SOMA

(Under the above title appears in the Bulletin of the School of Oriental Studies, Vol. vi, Part 2, 1931, a very interesting short paper by Sir Aurel Stein. I am indebted to Mr. C. W. Gurner, I.C.S., for the following summary and review of this paper)

SIR AUREL STEIN'S article deals with two detached aspects of problems associated with the Soma Plant of geographical interest. It should be briefly premised that the ancient 'Soma' plant, common both to Zoroastrian and Rigvedic ritual, is represented in the modern form of these rituals by two separate plants, the *Ephedra* in Zoroastrian ritual, and the *Sarcostemma*, one of the *Asclepiadæ*, in Rigvedic ritual. Neither of these two plants can, for conclusive reasons, be identified with the original 'Soma'.

In 1914, Sir Aurel found in tombs at an outpost in the Lop desert, dating from the 4th Century A.D., the twigs of the *Ephedra* plant. There is here no trace of ritualistic descent. The burial belonged to the ancient Lou-lan people who have nothing to do with Aryan descent, and the only interest at this point lies in the coincidence. The *Ephedra* seems to have assumed the functions of the 'Soma' in Zoroastrian ritual simply because of its prevalence in Persia and neighbouring parts.

If geographical considerations, however, account for a substitute, they may help to identify the original plant. Sir Aurel Stein quotes a passage from the Avesta bearing on the origin of the Soma plant in mountainous regions, which are identified by him with the ranges in the north-eastern portion of the present Afghanistan. Again from the Rigveda, he quotes well-known passages which, if we accept identifications of Rigvedic names with the Kurram, Gumal and Zhob rivers and the Hariob hill-tract, localize the Aryan community in the region of Waziristan. A plant which grows plentifully in this region is the wild rhubarb, the colour and physical characteristics of which agree well enough with the indications of those of the Soma given in the Rigveda. A missing link in the chain is that no intoxicating preparation from it is known, whereas its intoxicating capacity is an essential feature of the original Soma; there appears, however, to be no reason why such a preparation should not be made. The identification appears to have occurred casually to Dr. A. Regel, a Russian botanist, in 1884.

Based as it is ultimately on broad geographical considerations, the identification of the Soma with the wild rhubarb will be held in suspense by students of the Rigvedic literature ; but it merits careful testing on literary grounds, and, as presented by Sir Aurel Stein, it carries with it a good deal of probability.

C. W. G.

COLONEL H. H. GODWIN AUSTEN, F.R.S.

Mr. F. Ludlow informs me that during the summer of 1929 he and Mr. J. P. Gunn came across Colonel Godwin Austen's initials carved on a granite boulder by the roadside about three or four miles west of Dras. The inscription reads :

H. H. G. A.

1860-1-2.

It will be interesting to recall some details of the life of one of the most distinguished explorers and surveyors of the Himalaya, who died at the ripe age of ninety a few years before the founding of the Himalayan Club.

HENRY HAVERSHAM GODWIN AUSTEN, the eldest son of Professor R. A. C. Godwin Austen, F.R.S., of Shalford House, Surrey, was born at Teignmouth on the 6th July 1834. He went to the Royal Military College, Sandhurst, at the age of fourteen and studied there for three years. He was a contemporary at Sandhurst of Field-Marshal Earl Roberts, before the latter went on to Addiscombe. After receiving his commission in 1851, he joined the old 24th Foot (now the South Wales Borderers), and in 1852 first saw service during the second Burmese War, as A. D. C. to his kinsman General Godwin. It was in Burma that he first surveyed unknown ground, for he carried out a rapid reconnaissance survey of the Irrawaddy north of Rangoon and the regions bordering it. With General Godwin he went to the Punjab, whence he was transferred to Peshawar as A. D. C. to General Reed.

It was at Peshawar, on a certain day towards the end of 1856, that he dropped into Captain Peter Lumsden's bungalow for a chat. Lumsden⁽¹⁾, who was in the Q. M. G.'s department, had recently returned from a season's survey in Kashmir, having been lent to the

(¹) Afterwards General Sir Peter Lumsden, G.C.B., successively Quarter-master-General and Adjutant-General in India. When Lumsden was lent to the Survey of India the year before, his place was taken in Peshawar by Lord Roberts, then a subaltern in the Gunners. Roberts was also offered a post in the Survey of Kashmir, but after some hesitation declined it.

Great Trigonometrical Survey for six months, and was now struggling with a map of the Frontier. On Godwin Austen offering to help, Lumsden asked him to take it away and complete it. Godwin Austen, who even then was an artist of no mean talents, did so and a very beautiful brush-shaded map of the Frontier was finished a fortnight later. Shortly afterwards, Colonel Andrew Waugh, the Surveyor-General, applied to the Quartermaster-General for the services of two or three officers to assist with the survey of Kashmir, as had been done in 1856. No officers of the Q. M. G.'s department could however be spared, and on Lumsden's recommendation Godwin Austen was one of the officers appointed. Thus Godwin Austen commenced his career of exploration which was to bring him international fame.

Godwin Austen reported to Lieutenant T. G. Montgomerie, of the Great Trigonometrical Survey, on Manganwar hill, in Kashmir, early in 1857. From it Montgomerie pointed out the great snow peaks to the north that he had first observed the previous year, among them Nanga Parbat and K², which he surmised would prove to be one of the highest mountains of the earth, and which for a few moments one morning they could see in the far distance to the north-east. Little did Godwin Austen dream that a future Surveyor-General(?) would propose his name for that distant peak.

The year 1857 was a stormy one for India. When the Mutiny broke out, the local authorities were at first inclined to refuse all supplies to British surveyors, some of whom for a time were in considerable difficulties. Sir John Lawrence, however, advised Montgomerie that his surveyors should carry on with their work as long as possible in order to show the Maharaja that there was no fear in British minds as to the result of the Mutiny. Montgomerie received instructions to remain in Srinagar as political adviser to the aged ruler until the crisis passed and he remained on friendly terms with him throughout. When Maharaja Gulab Singh died on the 2nd August 1857 and was succeeded by his son Ranbir Singh, there was some apprehension that political relations might be complicated, but in spite of occasional alarms, often caused by marauding bands of rebels who attempted to make their way into Kashmir, work was carried on to the end of the season with little serious interruption. During these exciting events Godwin Austen was surveying the Kaj Nag range and the

(*) General J. T. Walker. Godwin Austen's name was not accepted on the principle that personal names are open to objection (See *Himalayan Journal*, vol. i, p. 104).

mountains on both sides of the Jhelum below Baramula. He was the first to put Gulmarg upon the map, and his sketches on this, his first season in the Great Trigonometrical Survey, showed the detail with great clearness and definition.

During 1858 and 1859 Godwin Austen was sketching the topography of the Marau Warwan and the northern parts of Jammu. Before the end of 1859 he left Kashmir to rejoin his regiment in England, but he could not have stayed there long—if indeed he ever left India—for he was back again in Kashmir in 1860.

In 1856 Montgomerie, from Haramukh, had first observed K²; two years later it was definitely fixed by Mr. Shelverton from the Indus valley series of triangulation; but as late as 1860 it was still uncertain whether the great mountain stood within the borders of India or not. Nor, indeed, is the matter yet decided for no frontier has yet been fixed in those inaccessible regions, though there appears to be no objection to travellers passing all round the mountain without leave from China. In 1860 Godwin Austen worked in the Shigar and lower Saltoro regions. The following year he crossed the Skoro La and discovered the Baltoro, the Punmah, the Biafo and the Hispar glaciers, together with the great snow basin at the head of the Biafo. He could therefore definitely claim to be the discoverer of this whole glacier system, the greatest outside sub-Polar regions.

Godwin Austen's artistic planetable surveys of those great ice-regions were beautiful examples of the surveyor's art of those days. Some fifty years afterwards when I remarked on the beauty of his 1861 surveys, he observed: "Surveying and military drawing were splendidly taught at Sandhurst in those days. The art had come down from the days of the old French Professors. Their beautiful drawings were our copies. One reason why my planetable of 1861 strikes you as being so good is that I tried to make the topography as accurate to nature as possible. I was always mapping with a geological eye and that makes a man look well at the country."

During the surveys in the more remote parts of Kashmir, the topographical surveyors were instructed not to waste time over uninhabited regions above 16,000 feet. Godwin Austen was however ideally built for this mountain work: slight and extremely hardy, with little to carry, and an intense enthusiasm; it was the combination of these qualities which set no altitude limit to his work; and subsequent travellers have remarked on the accuracy of Godwin Austen's surveys of the higher regions compared with those of some of his assistants.

In 1862 Godwin Austen sketched the upper Changchenmo and northern border of the Pangong district, including a small portion of the lake. Towards the end of the season he took up the topography of the higher parts of the Zaskar valleys, including the numerous glaciers on the northern side of the Sutlej-Zaskar watershed. It was presumably on his return from this work that he carved his initials on the rock near Dras. The following year, however, he must have passed the same way again, for in 1863 he completed the survey of the Pangong lake and district up to the Rudok frontier. His journal for this year, which was reprinted by the Government of India, gives a most interesting description of this lake and should be studied by those undertaking the morphology in that area to-day.

Before the end of the year his work here was completed and he hurried back from Kashmir in order to take part in a special mission to Bhutan. It was then that he proved what can be done by one expert surveyor, single-handed, with a planetable. His topographical surveys between Darjeeling and Punakha, and later with the Bhutan Field Force, when his assistant was, I believe, Lieutenant Holdich, were of the greatest value. He afterwards carried out much useful reconnaissance survey on the North-eastern Frontier among the wild tribes of the Khasi and Naga Hills and the then unvisited Dafflas.

Throughout his career in the Survey of India, Godwin Austen's inherited love of geological science was always predominant, and his work exhibited in a striking manner the most interesting geological detail, woven into the brush-drawings on his planetable. There was no better authority in his day on the structure of the Karakoram and he was the only scientific man of his time with first-hand knowledge of that region. He was also one of the first to exploit the rich storehouse of palæontological evidence which lay in the Siwaliks, the foothills of the Himalaya.

Fever contracted on survey work undermined his health and caused his premature retirement. He arrived in England a physical wreck. His interests sustained him; he recovered his health and set to work to study natural history in all its branches, and attained distinction in many of them. He was elected to the Royal Society, received the Founder's Gold Medal of the Royal Geographical Society, became President of the Geological Section of the British Association, of the Malacological Society and of the Conchological Society; and he published numerous scientific papers on his geographical, geological and ethnographical studies, besides important works on the mollusca and fauna of India. He died in 1924.

SEVENTEENTH CENTURY JESUIT MISSIONARIES IN THE
HIMALAYA

The exploration of the Arwa valley by the Smythe expedition rather naturally turns our thoughts to those intrepid Jesuit missionaries, who early in the seventeenth century were the first Europeans to traverse the Saraswati headwaters of the Alaknanda and to reach and cross the Mana pass. Largely owing to the fact that most of the accounts written by them lay buried among the archives of the Society of Jesus, until unearthed during the present century by Father Wessels, S.J., these old pioneers have received scant justice at the hands of European geographers during the last hundred years. The geographers can hardly be blamed for this, but it seems an appropriate moment to recall, at least briefly, their names and exploits⁽¹⁾.

It was on the 30th March 1624 that Father Antonio de Andrade and Brother Manuel Marques set out from Agra to search for the Christians who were reported to be living in Tibet. Their route lay through Srinagar (Garhwal) ⁽²⁾, and by Badrinath and the Mana pass. After some opposition to their departure from Srinagar, Andrade, with two Indian Christians, having left Marques behind at that place, made for the pass. This attempt, probably made at the beginning of June, failed. Andrade and his companions were overtaken by a blizzard and frostbitten⁽³⁾, but they eventually struggled back to the

(1) Antonio de Andrade's account of his mission first appeared at Lisbon in 1626, and since then has been well known. Owing to various critical summaries and the difficulty of access to the original document, as well as to geographical ignorance of the regions traversed, mistaken comments have been passed on from one writer to another, with the result that up to the twentieth century many people had come to throw discredit on the whole adventure of Andrade. For instance, because near the headwaters of the Saraswati Andrade mentioned that there was a lake, geographers, and among them an authority no less reliable than the great Rennell, attributed the source of this branch of the Ganges to Lake Manasarowar, partly in conformity with ancient Hindu writings. Andrade mentioned no Lake Manasarowar; and the small lake to which he referred is in existence to-day. To the Rev. A. H. Francke, the Moravian missionary at Leh, and to Mr. Mackworth Young, our Honorary Secretary, must be given the credit of first showing, in 1912, that Andrade's account was accurate. The publication, in 1924 by Father Wessels, S.J., of further documents in the possession of the Society of Jesus, more than confirms their conclusions.

(2) Srinagar, Garhwal, is on the Alaknanda, 77 miles north of Hardwar (Map 53 J/16). Because Andrade mentioned Srinagar, some commentators have confused it with the better-known capital of Kashmir; this error, too, has been the source of much confusion to those who made it.

(3) "Our feet were frozen and swollen, so much so that we did not feel it when later on they touched a piece of red-hot iron".

shelter of a cave near Mana, where they were joined by Marques. The second attempt, with guides from the Tibetan side, was successful, and the four eventually crossed the Mana pass (17,890 feet) at the end of July (?) and reached Tsaparang on the Sutlej, the capital of Guge, at that time a prosperous little kingdom in this part of Tibet, where they were well received by the Raja or "King".

After a very brief stay at this place, the two Portuguese returned to Agra, which they reached early in November, but they were back again at Tsaparang with a third missionary, Gonzales de Sousa, by July 1625. The foundation stone of the first Christian church in Tibet was laid at Tsaparang on the 12th April 1626, and for four years the mission flourished. The Alaknanda and the Saraswati, with the Mana pass, became the main line of communication for the several Jesuit missionaries who travelled to Tsaparang (4).

The favour shown to the missionaries and their religion by the king, who himself was willing to be baptized, led to a revolution in 1630(5). The king of Tsaparang and the two Jesuits at that time at the mission (probably Alano dos Anjos and Antonio da Fonseca)

(4) The following Jesuit missionaries are known to have crossed the Mana pass between 1624 and 1640.

Antonio de Andrade (of Oleiros, Portugal, b. 1580), crossed July (?) 1624, October 1624, July 1625, 1629 (?).

Manuel Marques (of Massao, b. 1596), crossed July (?) 1624, October 1624, July 1625, July 1631, August 1631, November 1635, July (?) 1640.

Gonzales de Sousa (of Mathozinhos, Portugal, b. 1580), crossed June 1625, 1626 (?).

John de Oliveira (of Daman, Surat, b. 1595), crossed June 1626.

Alano dos Anjos (Alain de la Beauchère, of Pont-à-Mousson, Lorraine, b. 1592), crossed June 1626, August 1635.

Francis Godinho (of Evora, Portugal, b. 1596), crossed June 1626, 1627.

Antonio Pereira (of Lixa, Portugal, b. 1596), crossed 1627, 1630.

Antonio da Fonseca (of Mourao, b. 1600), crossed 1629, August 1635.

Francisco de Azevedo (of Lisbon, b. 1578), crossed August 1631.

Nuno Coresma (of San Roman, Spain, b. 1600), crossed June 1635, November 1635.

Ambrosio Correa (of Aveiro, Portugal, b. 1606), crossed June 1635, August 1635.

Stanislaus Malpichi (of Catanzaro, Naples, b. 1600), crossed July (?) 1640.

(5) In 1909 and 1912, the Rev. A. H. Francke discovered two ancient inscriptions, at Horling and at Tabo, in Spiti. The first gives the name of the king, who according to Francke's calculations ruled at Tsaparang between 1600 and 1630; the second mentions the same king's name and refers to 'apostasy and darkness' at Tsaparang.

were carried off captive to Leh. The church and mission were sacked and most of the four hundred Christians were reduced to slavery⁽⁶⁾.

Francisco de Azevedo, who was appointed Visitor to the Tsaparang Mission after the revolution, arrived at Srinagar, Garhwal, in July 1631. Here he picked up Marques who had crossed the Mana pass for supplies. Azevedo, with Marques, reached Tsaparang in August⁽⁷⁾. He found the mission in a state of considerable dejection owing to the definite hostility of the governor who had been appointed by the king of Ladakh. He therefore undertook the journey to Leh, in order to obtain permission for the Fathers to carry on their work. With him went John de Oliveira who had been at Tsaparang for five years and who knew the language well. Their route lay across the high plateau north of the Sutlej through Shangtse, Hanle and Gya. Leh was reached on the 25th October. Thus the first recorded visit to the capital of Ladakh by Europeans was from the Tibetan side.

After obtaining the king's consent to carry on mission work in Tsaparang, Leh and Rudok, Azevedo and Oliveira left Leh in November, and, in order to avoid the journey by the bleak plateau back to Tsaparang and the dangerous crossing of the Mana pass in the depths of winter, they set out direct for India by the Tagalaung La (17,500 feet), Lachalung La (16,600 feet), Baralacha La (16,200 feet), the Rohtang pass (13,050 feet), and Kulu, this being the first time that this now well-known trade-route was traversed by Europeans; even to-day it is not considered open at the season of the year that Azevedo passed along it⁽⁸⁾.

Though Azevedo had managed to obtain permission for his Jesuit brethren to preach Christianity, there is little doubt that

⁽⁶⁾ In 1912 Mr. Mackworth Young reached Tsaparang and made a complete study of the ruins. It is believed that he is the first and only European to visit the place since the final abandonment of the mission in 1641.

⁽⁷⁾ Father H. Hosten, who has studied and knows more about the history of the old Jesuit missionaries than any man living, appears to be incorrect in saying that Father Stephen Cacella reached and died at Tsaparang after pioneering a very difficult route through Nepal (*Hakluyt Society*, LXI, App., p. 392). A letter written from Shigatse about July 1631 by Father John Cabral, which reached Francisco de Azevedo at Tsaparang about the end of August, states definitely that Cacella died at Shigatse on the 6th March 1630, seven days after his arrival there. Azevedo himself makes no mention of Cacella having reached Tsaparang.

⁽⁸⁾ For a modern description of the route, see *Routes in the Western Himalaya* vol. I, Route 55B.

obstacles were put in the way of the men on the spot. There appear to have been five missionaries in Tibet up till 1635, but it is not known whether they were all working at Tsaparang. It seems at least possible that two were either at Rudok or Leh⁽⁹⁾. Seven others set out from Goa the same year, but only two of them, Fathers Nuno Coresma and Ambrosio Correa, reached Tsaparang. Two died on the way and three arrived at Srinagar so ill that they could proceed no further. Correa, who had been sent to report on the Mission, seems to have been so thoroughly disheartened by his troubles on the journey and by the condition of affairs on his arrival, that after a brief stay of less than two months he decided to return to India and recommend the abandonment of the Mission. He left Tsaparang early in August and two others, dos Anjos and Fonseca, who had been in Tibet for nine and six years respectively, appear to have left either with him or about the same time. Only Coresma and Marques remained at Tsaparang, and they were driven out less than three months later.

Some four years afterwards a final effort was made to re-establish the Mission. In June 1840 four Jesuit Fathers, under the guidance once more of Brother Marques, were again at Srinagar, with the intention of accepting the invitation of the governor of Tsaparang. Suspicions seem to have been aroused as to the *bona fides* of the latter, and once more Marques, with Father Stanislaus Malpichi, ventured across the Mana pass, to ascertain the possibilities of a friendly reception. Both Jesuits were immediately seized; and though Malpichi managed to escape, Marques was made prisoner. With the return of Malpichi, the other Fathers came back to Agra, and though efforts were made to obtain the release of Marques, they were unsuccessful. He is known to have been alive at Tsaparang late in 1641, but his ultimate fate is unknown. Of the two founders of the Mission, Antonio de Andrade died on the 19th March 1634, before its abandonment, while Marques disappeared in Tibet at the end. He alone saw the founding of the Mission and its eclipse. It was not till the nineteenth century that the footsteps of these old travellers

(⁹) There is no tradition in Leh that any Jesuits established a mission there. Rudok, though it has been visited twice by British travellers during the present century, is still too little known for us to say whether one was formed there; but it seems at least more than possible. Sir Clements Markham was incorrect, according to our present knowledge, in saying that Andrade visited Rudok (*Narrative of the Mission of George Bogle to Tibet and of the Journey of Thomas Manning to Lhasa*, lvi).

across the Mana pass were followed, and not till the twentieth that Tsaparang itself has again been visited by a European.

What traces are left on the ground to-day? On the map published by the Survey of India in 1900, in very small type, is the word *Chab-rang Dzong*, beside a small stream entering the then unsurveyed Sotlej river. In the new map, published in 1930, Chabrang Dzong is shown more prominently. Mr. Mackworth Young, who examined the whole site in 1912 and made a study of the rise and fall of Guge, and its relations with Bashahr, found extensive remains, but no trace of church or Mission. Though many of the houses are well preserved, the only Christian relic that he could find—and that conjectural—was a weather-beaten cross of wood on the summit of an ancient chorten. The permanent population of Tsaparang then consisted of only four families, gathered at the foot of the hill on which stands the ancient fort, and among them remained no tradition of the noble effort of Father Andrade and Brother Marques⁽¹⁰⁾.

MOUNT EVEREST AND ITS "NATIVE" NAMES⁽¹⁾

It is to be sincerely hoped that with the publication of Sir Sidney Burrard's paper on *Mount Everest and its Tibetan Names*, geographers will accept once and for all this name for the highest mountain of our earth. Sir Sidney Burrard has for the last forty years seen most, if not all, of the various "native" names for the mountain proposed, and their champions routed. Some champions have transferred their allegiance from one name to another, others have suggested new ones. Sven Hedin is the last to enter the lists, and, though he applauds the defeat of others, he is no more successful than they, while Sir Sidney Burrard is as vigorous and convincing as ever on this subject. In studying the details of this last battle, I have noticed one or two points that support my old chief's arguments, which I cannot refrain from adding.

Tchoumou Lanema of D'Anville's map, as Sir Sidney Burrard shows, "is placed on the lowest ground (height 10,000 feet), in the

⁽¹⁰⁾ For a detailed account of the kingdom of Tsaparang and de Andrade's stay there as well as of his examination of the ruins, see G. M. Young: *A Journey to Toling and Tsaparang in Western Tibet*. *Journal of the Punjab Historical Society*, vol. vii (Calcutta, 1919). For a full and sympathetic account of the travels of these old Jesuits, based on records in the possession of the Society of Jesus, see C. J. Wessels, s.j.: *Early Jesuit Travellers in Central Asia, 1603-1721*, (*The Hague*: Martinus Nijhoff, 1924).

⁽¹⁾ See Review by Lieut.-Colonel F. M. Bailey in this volume, page 192.

angle between the two rivers Sun Kosi and Arun", some sixty miles south of Mount Everest. Had Sven Hedin's zeal for historical research carried him to the period of the Great Trigonometrical Survey, he would never have set himself out to belittle the work and the personality of the most honoured name and the most scientific geographer that the continent of Asia has ever seen. He might even have discovered that during the observations in 1859 a summit some 20 miles south of Mount Everest was observed and recorded as XIV, Mount Everest coming next in the round of observations as XV, and Makalu coming before it as XIII. In the efforts which the Great Trigonometrical Survey made to find native names for these three summits, they were given *Makalu* for XIII, *Chamlang* (which is sufficiently near the Chama Lung of the Everest passport and the *Tchoumou Lancma* of D'Anville's map as to make no difference in those days) for XIV, and no name for XV, that could be accepted. Hodgson's name *Devadhunga* and Schlagintweit's *Gaurishankar* were shown to be false. I have already pointed out (*Himalayan Journal*, vol. ii, p. 133) that Makalu is almost certainly derived from *Khamba Lung*, the adjoining *district* of Tibet, or *Kama Lung*, the valley which it overlooks. It now seems equally certain that Chamlang, which topographically is much closer to the *Tchoumou Lancma* of D'Anville's map than Mount Everest, has been derived from *Chama Lung*, the "southern *district* where birds are kept". Anyone with any experience of surveying in the Himalaya knows how often he is given a district name for a high nameless peak in that district. During the recent survey of Nepal, the height of Chamlang, 24,012 feet above sea-level, was confirmed and it was found to lie on the snowy range known in Nepal as the "Choyang Himal", while Mount Everest lies on the "Mahalangur Himal" (2).

To my mind there are two further very strong arguments against there being any native Tibetan name, used geographically for Mount

(2) When studying the travels of the old Jesuit missionaries recently, I noticed that John Grueber and Albert D'Orville in January 1662, and Ippolito Desideri in April 1721, who all three crossed the Great Himalaya into Nepal by the Bhotia Kosi defile, allude to the mountain range as "Langur". Commenting on this, Sylvain Lévy remarks as follows: "Langur is a class-noun meaning 'a mountain range' in the Parbatic language. In their ascent of the high mountain masses rising between Kutti and Lhasa, both Jesuits and Capuchins heard, on opposite sides, the very same cry from the lips of their guides: Langur! the mountains!" None, of course, allude to *Tchoumou Lancma*, or call attention to any outstanding mountain on the range.

Everest. I have not seen these recorded before. Sir Charles Bell has written as follows :—

“ When the Dalai Lama gave me the permission for the Mount Everest Expedition to take place, he handed me a paper on which was written in Tibetan, ‘ To the west of the *Five Treasuries of the Great Snow* (in the jurisdiction of *White Glass Fort*, near *Rocky Valley Inner Monastery*) is the *Southern District where birds are kept* ’ ”.

Now, whatever the original derivation of the word “ Kangchenjunga ”, there is no doubt whatever that its Tibetan name means *the Five Treasuries of the Great Snow*, and that this name has a definite geographical significance in Tibet. Why then should the Dalai Lama use this mountain as a reference point to indicate roughly the district in which Mount Everest lies? Why did he not write: “ In the jurisdiction of *White Glass Fort*, near *Rocky Valley Inner Monastery* is the mountain called *Chama Lung* ”? There can be only two reasons: either the mountain has no Tibetan name, or the Lhasan authorities do not know of one.

But hold! We are told that the Tsarong Shap-pe, one of the highest officials in Tibet, when taxed to find the Tibetan name for the mountain, explores the ancient writings. Why? Obviously because none is known to-day. And what does he find after much scholarly research? A fantastic allusion to a mountain called *Mi-ti Gu-ti Cha-pu Long-nga*, more correctly written *Mi-thik Dgu-thik Bya-phur Long-nga*, meaning, we are told, “ You cannot see the summit from near it, but you can see the summit from nine directions, and a bird that flies as high as the summit goes blind ”.

Surely no such awkward and inconvenient *description*, of whatever fantastic or religious significance, should ever be accepted as a geographical name, unless a convenient abbreviation of it is actually in use geographically.

One last point. In his paper Sir Sidney Burrard has shown what an eminent geodesist and scientific geographer Sir George Everest actually was. Sir George Everest found the maps of India in much the same state of accuracy as living explorers will find the maps of Tibet to-day. He originated the famous “ gridiron ” network of geodetic triangulation, which has placed the maps of India on a scientific framework. No geographer has done the same service for Tibet. So far from being, in the words of Sven Hedin, merely “ a conscientious officer, able but not outstanding ” Sir George Everest is still the most outstanding scientific geographer and geodesist that Asia has ever seen. His fame rests on his own scientific attainments

and on his own indomitable energy and will. So far from "becoming undying, by sheer accident and without a trace of want of breath", this great man, stricken with fever and paralysed⁽³⁾, carried through the herculean task which he had set himself, short of funds through official parsimony and short of men through sickness, to a triumphant conclusion. With him it was brains, not breath, that mattered.

SURVEYS IN CHITRAL AND GILGIT

With the summer of 1931 the Survey of India has brought to a close its programme in Dir, Swat, Chitral and the Gilgit Agency. Lower Swat, Buner and Dir were surveyed in 1926 and 1927 on the one-inch scale, Lower Chitral in 1928, on the same scale for the inhabited portions and on smaller scales (half and three-quarter-inch) for the north-western regions, including the Tirich Mir Group (*Himalayan Journal*, vol. ii, p. 68). During the winter of 1928-9, Lower Kagan, the Black Mountain and Nandihar territory were completed on the one-and-a-half-inch scale; and in the following summer, northern and eastern Chitral, to the boundaries at the Tui, Karumbar and Baroghil passes, and including the interesting mountain groups of Tui, Darkot, Garmush, Sad Ishtagh, Lunkho⁽¹⁾ and Ochili, as well as the western part of the Gilgit Agency (Ghizar), were surveyed chiefly on the half-inch scale, for publication on that scale. In 1930 the Kagan valley was completed up to the Babusar pass⁽²⁾. It was hoped also in that year to survey Allai and Swat Kohistan, the latter a well-wooded country with a delightful climate, but with a population distinctly treacherous. Unfortunately, and in spite of the efforts of Major J. W. Thompson-Glover, the Political Officer at the Malakand, and almost the only British Officer to penetrate Swat Kohistan, the survey of this region had to be abandoned at the last moment, owing to a change in the political situation; Allai was however completed the following season.

(3) "Everest himself was attacked with a severe fever and his limbs were paralysed. Still he resolutely persevered, lest, if he broke down, the establishment should be scattered and the trained men be lost, whom it would be impossible to replace. He was lowered into and hoisted out of his seat by two men when he observed with the zenith sector."—Clements Markham: *A Memoir on the Indian Surveys*. London: H. M. Sec. of State for India, 1878. 2nd Ed., p. 84.

(1) The name *Lunkho* was not identified during the detail survey, but I have retained it in this note for want of a better name.

(2) An account of the triangulation of the Kagan valley by Liout. J. B. P. Angwin appeared in *The Himalayan Journal*, vol. ii, p. 48.

Last year (1931) the survey of the remainder of the Gilgit Agency, less the States of Hunza and Nagar, was taken up and completed. The basins of the Astor, the Yarkhun and the Gilgit rivers (including Yasin and the Karumbar valley) have now been surveyed, as has the Indus valley in the Gilgit Agency down to below Chilas Fort. For parts of Tangir and Darel we are still dependent on the rapid surveys executed during Sir Aurel Stein's Third Expedition to Central Asia, when during the later lifetime of Raja Pakhtun Wali, these countries became accessible. Of particular importance to mountaineers is the detailed survey last year of the Nanga Parbat massif. The map of this, though only on the quarter-inch scale will be far in advance of any map so far produced.

The maps of all these regions will be looked forward to with interest by geographers, and they should be most valuable for determining the trends of the ranges of the Hindu Kush and their relation with those of the Himalaya and Karakoram. Lieut.-Colonel C. G. Lewis, who was in charge of the surveys almost throughout, is a keen mountaineer and enthusiastic glacier and mountain cartographer, while the Mehtar of Chitral took great interest in the survey of his country. A few minor mountaineering accidents occurred during the surveys, and some difficulties were experienced in persuading the inhabitants to "violate the haunts of the fairies", but there was a complete absence of any serious friction.

A few gaps remain. Parts of Tangir and Darel, Sazin, Kandia, Talkot, etc., comprising the Indus Kohistan, were politically closed. This country has not been entered since "the Mullah's" rapid explorations in 1876 and 1878. The whole of the northern slopes of the Rakaposhi group and the range extending east from it to the Hispar tributaries, in the State of Nagar, were not included in the programme. Beyond the Hispar tributaries we have the surveys of Sir Martin Conway and the Workmans. The northern side of the Hunza valley between Chalt and Baltit (Hunza) was also omitted from last year's programme, and there is therefore a considerable gap in the survey of this area; this gap is bounded on the west by the Karambar watershed, and on the north by the southern wall shutting off the Batura and Pasu glaciers. Here are to be found the Chaprot, the Daintar, the Tutu Uns and the Hasanabad valleys. The glacier complexes of the last two should be of considerable interest. The existing map of these parts is almost entirely guesswork, though the remainder of this sheet, comprising the surveys of Khan Sahib Afraz Gul and Surveyor Torabaz Khan, who were attached by the Surveyor-General

to the Vissers' expedition of 1925 and the Montagnier expedition of 1927, is a beautiful production.

While on the subject of gaps in the mountain survey of the Karakoram, it may be well to point out that much detailed modern survey remains to be done north of Skardu and between the Shigar and the Nubra, while immediately north of the middle Shyok, between the acute-angled bends of the Nubra and the upper Shyok, the details of the topography cannot be considered other than extremely rough. Within the last twenty-five years much has been done among the great glaciers at the heads of these two rivers, and the recent surveys by Khan Sahib Afraz Gul Khan and Muhammad Akram in 1928 and 1929, during the Visser expedition, have filled in large blanks in our knowledge; nevertheless, whatever may be said of the rest of the world, the survey and scientific study of the various ranges of the Karakoram cannot yet be said to be completed. Owing to retrenchment, it will not be possible for the Survey of India to fill these blanks for some years to come, and for better maps we shall have to hope that private expeditions will come to the rescue. It is to be hoped that it will still be possible to continue the policy of attaching trained Indian topographers to enterprising mountaineers who may be prepared to lead expeditions into some of these little-known regions.

MOUNTAIN-BUILDING

An extremely interesting paper by Mr. D. N. Wadia, of the Geological Survey of India, on the *Syntaxis of the North-West Himalaya; its Rocks, Tectonics, and Orogeny*, appears in the *Records* of his Department for September, 1931. Mr. Wadia has traversed almost all the ground he is describing, with the advantage of accurate one-inch maps in his hands, and in the second part of his paper lays bare "the anatomy of the syntaxial area" and describes "the course of the various inwardly looping folds right round the re-entrant" in considerable detail.

To quote from Mr. Wadia's introductory remarks: "The area comprised within this zone is characterized by a deeply-inflexed knee-bend in the geological strike of the North-West Himalaya, forming a unique feature in the orography. The inflexion affects some hundreds of miles' depth of the mountains, extending from the foot-hill zone to a considerable distance beyond the axis of the Great Himalayan Range. In width, however, the belt of mountains dealt with here is barely 30-50 miles from west to east; its general trend is in a N-S direction, but on either side of it the main Himalayan

strike rapidly diverges, in opposite directions, viz., to the south-east on the Kashmir side, and to the W. S. W. on the Hazara side. Northwards the same geniculate bend is perceived in the mountain system, beyond the central axis of the Great Himalaya, to as far north as the foot of the Pamirs (Lat. 37°N.).”

Mr. Wadia puts forward three hypotheses of origin of the depressed bay in the mountains of North-West India and suggests that the cause of it is the “reaction of the newly rising mountains under the stress of tangential pressures from the north against a tongue-like projection from the Archæan shield”, and that the Himalayan system of earth-folds has moulded itself on to this shield. The syntaxis is created, in his view, by pressure acting from the north, driving successive folds as they rise from the geo-synclinal belt against this northern promontory of the Gondwana foreland; this pressure being resolved into two components against the shoulders of a triangular horst, which has divided the orogenic wave-front into the two arcs which are so obvious to-day.

Another paper of very great interest which has appeared in 1931 is that on “Island Arcs and Mountain Building”, by Mr. Philip Lake in the *Geographical Journal* for August, in which the author expounded very clearly the geometry of the thrust-plane intersecting a sphere, in order to explain the circular form of certain mountain arcs. Both the paper itself and the discussion afterwards, especially the contribution of Mr. N. E. Odell, who spoke more particularly on the building of the Himalayan Arc, are most stimulating.

To some people Mr. Wadia’s “orogenic wave-front” will appear to be too fluid a conception of mountain-building; and it would be easy to reject his hypothesis by reading into it an analogy to ocean waves, which is certainly a misleading one; but Mr. Wadia does not mean this, and if he did it would not necessarily affect his contention⁽¹⁾. Mr. Lake’s conception of the Himalaya being pushed over the thrust-plane of the Gondwana foreland and being thickened by the folding and faulting which has accompanied the movement is still possible with the north-east component of Wadia’s northern pressure acting against the triangular horst, if the surface of the horst is a true plane

(1) This point was referred by me to Mr. Wadia, who has replied as follows: “My use of the terms *waves* and *wave-front* in orography is entirely in the conventional sense and does not imply analogy with waves in fluids. It is convenient to speak of an *earth-wave* for a strongly-marked folded belt of the earth’s crust—the mechanics of such folding being of course quite different from wave-motion in fluids.”

dipping towards the north-east. Mr. Lake does not explain the geological unity of the Himalayan Arc and the mountains west of the syntaxis, which do not form a truly circular arc, but he seems to infer that such arcs that are not truly circular may have been formed upon a thrust-plane and that there has been subsequent deformation. Again there is nothing fundamentally inconsistent in this general statement with Wadia's views, if the Gondwana foreland terminated in a true plane.

Mr. Lake and Mr. Wadia both write of the direction of the overthrust as the direction of movement. The former however distinctly states that he does this conventionally and that he believes the motion to be due to an underthrust in the opposite direction. He reasons that one land-mass cannot move *outwards* in two directions simultaneously and so form the Himalayan Arc at the same time as the series of island arcs east of the Asiatic continent. By most geologists the terms *overthrust* and *underthrust* are not used in a wholly exclusive sense, but to some extent in a mutually complementary sense, an overthrust from one direction implying a certain amount of underthrust from the opposite direction. In the region we are dealing with, the movement is certainly a relative one between the over-riding mass and the over-ridden. The two mountain arcs of the syntaxis of the North-West Himalaya have moved inwards. An underthrust from the south could produce the two components required by Mr. Wadia's hypothesis for the formation of the two arcs.

A study, on the same lines as those by Mr. Wadia, of the junction of the Burmese Arc (itself apparently a continuation of the East Indian Arc which was also dealt with by Mr. Lake) with the Himalayan Arc, seems now to be desirable. These two arcs are almost tangential at the point where the Brahmaputra breaks into the foreland. The ground here is, unfortunately, not mapped on the one-inch scale, and the inhabitants are not likely to take too kindly to the operations of a wandering geologist. But a detailed study of the foothills and foreland should not be impossible. Mr. Wadia would also like more geodetic observations in the area of his Archæan promontory, even though these may not give conclusive results, owing to the depth of the Tertiary covering.

There are some purely geographical points that are of interest in connection with these two ideas on mountain-building. They may or may not have some bearing on the questions. Mr. Lake quotes Professor Sollas as placing the pole of the Himalayan Arc at Lat. 42°N., Long. 90°E. This is very close to the extraordinary Turfan

depression, where the earth's surface sinks to a thousand feet below sea-level. Is this a coincidence ?

A point of some geographical similarity between the two ends of the Himalayan Arc is the behaviour of the mountain trends well beyond the existing ' bays ' in the mountains. Mr. Wadia postulates a *northward* projecting ' cape ' on the west ; on the east of the Himalayan foothills the ' bay ' penetrates into the mountains in a north-easterly direction. On the Pamirs there is a series of parallel ranges trending east and west⁽²⁾ ; in the far north-east of Burma and in China there are the parallel divides of the Salween, the Mekong and the Yangtse.

A point of minor geographical dissimilarity between the two ends seems to be that the two great rivers, the Indus and the Brahmaputra, do not behave in quite the same manner. The latter seems to cut into the foreland near the point of contact of the Burmese and Himalayan Arcs, and the ' bay ' is drained by the Brahmaputra ; the Indus seems to cut a gorge considerably to the west of the Himalayan Arc, and the ' bay ' here is drained not by the Indus, but by the Kunhar and the Jhelum below Domel.

After reading the discussion on " Problems of the Earth's Crust " held in Section E (Geography) of the British Association on the 28th September 1931 at the Royal Geographical Society's Hall, it seems almost sacrilegious to tread the holy ground of others. The mountain geographer, without necessarily concerning himself too deeply with Continental Drift and the Movement of the Poles, may however perhaps be permitted to interest himself in the structure of the mountains he climbs and traverses without becoming unduly hot and bothered.

THE KARUMBAR GLACIER

Dr. T. G. Longstaff has sent me an interesting note on his observations of the glaciers draining into the Karumbar valley in 1916. He crossed and recrossed three glaciers on his way up the valley through Ishkuman District to Sokhta Robat, between the 20th and 23rd October of that year. He states that, though there was no lake forming, the glaciers completely blocked the route, and he alludes to Mr. H. Todd's observations recorded in *The Himalayan Journal*, Vol. iii, p. 110, and my comments. He

⁽²⁾ The trend of the ranges across the Pamirs I have shown on the sketch to illustrate Sir Aurel Stein's paper *On Ancient Tracks across the Pamirs*, in this volume.

writes: "It took two hours to get my horses over the Karumbar glacier, under which the river tunnelled. The crossing of the Chillinji glacier next day was harder, but the distance less. See photo in *Alpine Journal*, November 1920, vol. xxxiii, p. 156. You give 1891-2, 1904-5, and 1929-30. Interpolate my date 1916 and you get your nice 12-13 year period!! For though the river was not *blocked*, all the glaciers were vigorously hanging their tongues out: it was a maximum period of advance all right!"

Dr. Longstaff also sends a photograph of the Wargot glacier, which came down on the true right bank of the Karumbar river, forcing them into the stream. The photograph shows the snout ice very active and in one place overhanging, an unusual occurrence in October unless the glacier is still advancing.

These observations are of importance, for we now have three complete cycles of periodic movement of the Karumbar glacier snout and the periodicity is shorter than that of any other glacier so far observed; so short that it can bear no relation whatever to Brückner cycles or any other known cycles of climate⁽¹⁾. We believe now that we can trace periodicity of advance and retreat in five glaciers of Asia, but at present there seems to be no connexion between them. The five are:

The Karumbar, max. advance 1891-92, 1904-5, 1916-17, 1929-30. Periods 13 years, 12 years, 13 years.

The Chong Kumdan, max. advance 1839, 1884, 1929. Periods 45 years, 45 years.

The Kichik Kumdan, max. advance 1863, 1908. Period 45 years.

The Aktash, max. advance 1852 (?), 1907. Period 55 years.

The Minapin, max. retreat 1889, max. advance 1913. Probable max. retreat about 1937 (?). Probable period about 48 years.

Nothing can at present be established from these figures; but the publication of them will, we hope, stimulate travellers to record the positions of the snouts of these glaciers whenever they pass them by. The great advantage of the Karumbar's period is its shortness; we may expect the next maximum advance in 1942-43. Some of us may not be in India in 1974, 1953 or 1962 to see the others, but they are well worth watching in the meanwhile.

⁽¹⁾ Major G. V. B. Gillan, who took over the appointment of Political Agent at Gilgit towards the end of 1931 from Mr. H. Todd, informs me that the Karumbar glacier is said to have retreated during 1931 and that he hopes to get up to Ishkuman in March when he will investigate. Captain W. R. F. Trevelyan hopes to examine the Hunza glaciers during the year.

THE KAILAS RANGE

We are glad to learn that the Surveyor-General of India has decided to drop the official use of the term "Kailas Range" north-west of longitude 79° (Pangong Lake neighbourhood). The application of this name as far west as Rakaposhi was advocated in *A Sketch of the Geography and Geology of the Himalaya Mountains and Tibet*, by Colonel S. G. Burrard and H. H. Hayden, which was published in 1907, but there have been many protests at the confusion caused by the use of this important name in a region where it is entirely unknown and where the mountains bear no structural identity or geographical connexion with the well-known Kailas peak in Tibet.

The region from which this name has now been excluded is almost universally considered to-day to be part of the Karakoram, and the next step would seem to be a careful study and grouping of the mountain massifs, geographically and geologically. A great amount of field work has been done in the Karakoram during the last twenty years; this should be co-ordinated and studied as a whole at leisure.

WAPITIS ON THE FLANK OF NANGA PARBAT

Squadron Leader S. B. Harris, Commanding No. 39(B) Squadron, R.A.F., has very kindly sent me the following notes on the flight of five Wapiti aircraft to Gilgit in 1931, together with the photograph of Nanga Parbat which is reproduced as the frontispiece to this volume.

The formation, led by Squadron Leader Harris, left Risalpur at 7 A.M. on the 30th March, and, climbing gently, proceeded *via* the Mahaban mountain and Baffa up the Kagan valley. The country on either side of the valley rises to from 13,000 to 17,000 feet above sea-level and being under snow at the time of the flight was remarkably beautiful. At 8-15 the formation passed over Kagan town at a height of 16,000 feet and the Batogah and Babusar passes lay right ahead towards the north-east. Twenty minutes later the Batogah pass (14,180 feet) was crossed at a height of 16,500 feet.

The ground between the Batogah and Babusar passes consists of a very large undulating plateau, and the views at this point were magnificent, with the pure white snow beneath, and the great peaks surrounding the formation on all sides. These included, to the north-east, Nanga Parbat, 26,620 feet above sea-level.

At 8-50 A.M., after some twenty minutes flying over this most impressive plateau, the Indus was crossed at Chilas and a course was set to pass west of point 15,808. This summit was rounded at five minutes past nine, Gilgit being sighted almost immediately. At 9-10 Gilgit was passed and landings were made some four miles east of that place ten minutes later.

The duration of the outward flight was 2 hours 15 minutes, the distance covered being 205 miles.

On the 31st March, the personnel of the Royal Air Force attended the Annual Durbar as the guests of Mr. H. Todd, the Political Agent, and were given the opportunity of meeting the local Chiefs. The following morning, at ten o'clock, the return flight was commenced and, in order to gain further experience, the Indus valley route was taken, instead of that by the Kagan valley.

At 10-45 A.M., after flying right round the bend of the Indus, Chilas was reached and the formation continued down the Indus valley, passing successively Poguch, Luruk, Kotgala and Jalkot. The flight was uneventful, but again remarkable for the beauty of the scenery. The Indus gorge was magnificent and in places narrowed to such an extent that the water of the river was white with foam.

At 11-35 Palae was reached and a course set for Risalpur. Five minutes later the formation left the Indus and, striking across country, landed at Risalpur at 12-30, having covered 248 miles in 2 hours and 30 minutes.

During both flights the weather was excellent, and, although on the return there was some cloud to be observed clinging to the mountain tops, this never interfered with progress.

REVIEWS

ACROSS ASIA'S SNOWS AND DESERTS.—BY WILLIAM J. MORDEN. *New York: London: G. P. Putnam's Sons, 1927.*
 $8\frac{1}{2} \times 5\frac{1}{2}$ inches; 413 pages; 70 illustrations; 21s.

THIS book is an account of a journey made by Messrs. W. J. Morden and J. L. Clark in the Russian Pamirs, Chinese Turkistan and Outer Mongolia in 1926. Their object was the collection of specimens for the American Museum of Natural History, New York,

and what they chiefly wished to obtain was a complete series of *Ovis Poli*. In this they were completely successful and, in addition to *Poli*, they obtained Yarkand gazelle and, from the T'ien Shan, a Littledale's sheep, ibex and roe-deer. The book is pleasantly written and eminently readable. Its style varies from the colloquial, with the frequent use of such terms as "chaps" and "snappy" to the almost lyrical. There is a particularly well-written description on page 266 of a part of the journey between Urumchi and Ku Cheng-tze. The travellers followed the Gilgit road from Kashmir and passed through Hunza to the Mingtaka pass. From Beyik (or Paik) they entered the Russian Pamirs where they secured their specimens of *Poli* without difficulty. They then returned to the Chinese Pamirs and travelled to Kashgar by the Gez defile. They went to the T'ien Shan by way of Aksu and the Muz-art pass and travelled thence to Kara-shahr by the Yulduz valley. From Kara-shahr they took the ordinary road to Urumchi and proposed to travel to Peking by way of Urga, collecting on the way. This proved impossible owing to the hostility of the local Mongols and they turned north-west to Kobdo and thence to the Russian railway at Biisk, from which place they went to Peking by train.

The author states in his introductory chapter that he went "into Asia to prove a theory" that *Ovis Poli* were not nearly extinct. Quite a number of people in Srinagar ought to have been able to tell him that, as he himself believed, they exist in large numbers on the Russian Pamirs, although they are not numerous in Chinese territory. One or more British officers from India usually visit the Chinese Pamirs in most years and bring back specimens. Although the largest head obtained by the party measured fifty-seven and a half inches, Colonel Schomberg, I believe, got one of sixty-one inches in 1926. But heads of much more than fifty inches are rare in Chinese territory.

The author and his companion were fortunate enough to obtain permission to hunt in the Russian Pamirs. Had they been British subjects, permission would certainly have been refused. The Russians regard the Pamirs as a military area and all British subjects are looked on with the greatest suspicion and rigidly excluded. As they were Americans with suitable introductions permission was readily accorded to Messrs. Morden and Clark and the account given of their travels

there is interesting. A large number of specimens of Poli were secured. The Poli is far from being extinct, as about sixteen hundred animals were seen, but the increase in the number of modern rifles in the hands of the local inhabitants is a potential danger.

Although some exaggeration of the adventurous aspect of the expedition is perhaps evident in the first chapter, it may be remarked that the book was written for the American public who seem to expect this kind of thing. It may be said at once that no trace of exaggeration is to be found elsewhere and that the journey is described modestly and with considerable quiet humour. The same cannot be said of the remarks on the dust-cover of the book, remarks for which the author is presumably not responsible. It is said that the expedition "rediscovered" the Ovis Poli and the whole trend of the remarks on the dust-cover is sensational. The Poli is not fabulously rare and the author nowhere states that it is. But it is surely the duty of authors to see that their publishers do not make such misleading statements. The book is a record of a natural history expedition and such a remark tends to shatter confidence in its scientific exactness.

A few remarks may be made on points of detail.

It is said that Chitral is technically within the Gilgit Agency. It is actually part of the Dir, Swat and Chitral Agency of the North-West Frontier Province.

It is surprising to learn that Nagar town is visible from anywhere near Hunza.

The statement that there are towns on the Taghdumbash Pamir is inaccurate. Tashkurghan, described as the 'largest town', is now a small village and the only other place where rough buildings exist in any number is the scattered hamlet of Dafdard some thirty miles to the south. The expedition, however, did not actually visit Tashkurghan, which fact may explain the mistake.

The "blackbirds about the size of crows but with red beaks" (page 74) were choughs and the unrecognized birds described on pages 98 and 99 were brahmini duck.

The travellers experienced a *buran* or dust storm in the lower Gez valley some twenty miles or more from the plain of Kashgaria. These 'burans' send fine dust very high into the air and Captain Sherriff, then British Vice-Consul at Kashgar, once

noticed the effects of one in a thick dust haze at a height of 16,000 feet.

The author observed that numerous roads and lanes near Kashgar were several feet below the level of the surrounding country. He suggests that this is due to the removal of earth from the roads for building purposes. It is doubtful whether this is often the case, as such sunken roads are frequently found far from any buildings. It may possibly be due to the accumulation during the course of centuries of sediment from irrigation water on the fields. Such water is not usually allowed in any quantity on the roads, where the sediment is therefore not deposited.

No Ovis Kareleni was secured in the foot-hills of the T'ien Shan near Aksu. These animals seem now to be very rare, though one was shot by Mrs. Gillan, wife of the British Consul-General at Kashgar, about 1926.

Are the Tartars (or Tatars) a separate race distinct from Turkis, Sarts, Kazaks, Kalmaks and Kirghiz? The author thinks so, although the term is a vague one which may be used to include most of these people and at least all of the last three. It is not everyone who would agree that the Sarikolis are a higher type than the others who were met.

There is a misprint on page 263 where it is stated that a *Li* in Sinkiang is three miles. It is of course a third of a mile.

The author's remarks about the Russo-Chinese boundary in the Pamirs are interesting. It is shown on the maps as a continuous range west of Muztagh Ata. Mr. Morden describes it as a country broken up by hills and valleys with nothing continuous about it. He is certainly right. The frontier, which is not demarcated, probably follows a watershed and not a range.

With the exception of the detour into the Russian Pamirs, the route followed as far as Urumchi is well known. Beyond Urumchi, however, the country described is little-known ground to English readers and this part of the book is of great interest. But the author's experiences and his descriptions of the country and of travel conditions are not likely to induce others to follow him. The party were arrested by an outpost of Mongols at Ji-Ji-ho on the Sinkiang frontier and had a most unpleasant time. Their hands were tightly tied together till the circulation stopped, presumably to cause them

temporarily to lose the use of them and to render any attempts at action or resistance impossible. This horrible experience is described with restraint.

The author is careful to thank everyone who assisted him in any way and says that he was most kindly received by British, Russians and Chinese. But his treatment by minor Russian officials in Siberia does not seem to have been particularly friendly. His highest praise is deservedly given to a Russian "Samuel Davidson" whom he calls "the good Samaritan of Kobdo". Kobdo was the first town of any size reached in Mongolia and, without Davidson's help with local Mongol officials, it seems doubtful whether the party would have been able to get out of Mongolia at all.

Place names are not spelt in accordance with any recognized system. For example

Haramok	for Haramukh.
Gulkoja	for Gulquaja.
Kain-Ya-lak	for Khan Yailak.
Kara Shar	for Kara-shahr.
Ish-palak	for Ishparlik.

It is helpful if authors check their names very carefully.

Some of the descriptive writing of places, people, manners and customs, is distinctly good. The descriptions of the Hunza gorges, of parts of the T'ien Shan and of the country between Urumchi and Ku Cheng-tze may be particularly mentioned.

Mr. Morden may like to know that his servant Muhammad Rahim was in Kashgar and was well in 1930.

The photographs are good and of a representative character. The maps are poor but sufficient to indicate the route followed.

F. WILLIAMSON.

HIGH TARTARY.—BY OWEN LATTIMORE. *Boston: Little, Brown and Co., 1930. 9½ × 6¼ inches; 370 + xiv pages; maps; illustrations. 21s.*

THIS is an outstanding book and ranks with Skrine's *Chinese Central Asia* as one of the best books on Sinkiang or Chinese Turkistan published in recent years.

The author is a young American who had been in business on the coast of China and had taken the trouble to learn the language thoroughly. He left Peking early in 1926, being then only twenty-six

years old, and travelled across the desert of Inner Mongolia. In his previous book *The Desert Road to Turkistan* he has described his journey as far as Ku Cheng-tze in the north-east of Sinkiang. The present book is a continuation and contains an account of his further travels through Sinkiang to India.

Mr. Lattimore is a close observer and has read widely. The book is no mere record of a journey but contains well-informed and intelligent digressions into history, politics and commercial matters. There seems to be little, if anything, regarding Sinkiang with which he has failed to make himself thoroughly acquainted either by study or observation, and everyone who has any interest in that outlying province of China should read the book and cannot fail to profit by doing so.

Mr. Lattimore's heart is obviously in the great deserts, far from civilization either eastern or western, and his favourite companions are the ordinary camel-pullers. He is, however, at home in any kind of Chinese society and his knowledge of the Chinese language and social customs was of the greatest use to him throughout his journey. Many a traveller's difficulties in Chinese Turkistan could be smoothed away by a knowledge and use of the right phrase at the right moment, and few travellers have the necessary knowledge.

The author deprecates the idea that his journey was anything remarkable. He had lost the illusion of "the adventurousness of travel—the great travellers' bluff" and makes some amusing remarks about people who seize every excuse for calling themselves "expeditions".

He travelled to Urumchi, the provincial capital, and thence to Chuguchak on the Siberian border where he met his wife. Mrs. Lattimore had been summoned from Peking by a wireless message sent from Urumchi, and had travelled to Semipalatinsk by train and thence to Chuguchak by sledge, no mean achievement for a woman in the depth of winter. The Lattimores then went back to Urumchi, paid a flying visit to Turfan and thence travelled to Kulja and the T'ien Shan. They crossed the Muz-art pass to Aksu and went south-west to Kashgar, then on to Yarkand and the Karakoram pass.

Parts of the book are very amusing and some passages are perhaps written even too facetiously for some tastes. The description of soldiering in Sinkiang as "the profession of those without enough address to beg or energy to work" is an apt one. The remarks on local history and politics are particularly interesting. In comparing

British methods in India with Chinese ones in Sinkiang, he remarks on "a most important basic instinct which, as I believe, the Chinese and British really have in common, whenever they are at their best—the pragmatic instinct for doing the best that can be done on the spot with the men and materials to hand".

Although Mr. Lattimore does not dwell on unpleasant episodes, he and his wife must have had a particularly trying time at Hsi Su, north of the T'ien Shan, when Mrs. Lattimore was pelted with mud by children and they were both jostled by a rough crowd. Almost invariably, however, they were very courteously treated.

It is interesting to learn that a mixed party at Turfan found that their only common language was Chinese. A similar thing might occur in the case of a mixed party in India, even if they were all Indians. English might well be the only language which they could all speak.

There is a whole chapter on the various breeds of horses and Mr. Lattimore may be interested to know that the reviewer eventually acquired the horse which he got from "Ma, the great man" at Shatta and that the British Vice-Consul at Kashgar now has it.

The author was accompanied by the faithful Moses, friend rather than servant, a Chinese who had served his father and therefore addressed him as "Shao-yeh" or "young master". This gave much face both to master and servant. Moses appears throughout the book, usually more or less amusingly.

There are some passages of fine writing but lack of space forbids the quotation of more than one.

"The moonlight was growing dim as we rode down from the hills into a stretch of bare gravel. Then a black bulk of trees rose out of the formless night; we splashed through running water, and by that token passed out of desert into oasis. We had ridden from before sunset until the dawn, for by the time we rode under the trees the birds were beginning to wake. On ahead, at one side of the road, was a deep grove of old elms, under which in the uncertain light showed the wry walls and sagging eaves of a temple of battered splendor. As the light grew stronger, we rode under a noble *p'ai-lou* or ceremonial arch, and saw the decaying mud walls of a fortified city. In the bazar that straggled at one side of it, not even a dog howled at us. We hammered on the toppling gates of a serai until a wan opium smoker opened them and we, almost as uncertain on our feet

with sleep as he, found ourselves a dark windowless cell in which to spread a blanket that I had brought rolled behind my saddle, and lay down to sleep, having attained Ching Ho, the town of the Pure River”.

The illustrations are good and more would have been welcome. The map is excellent. The author is scrupulously exact in his spelling of both place and personal names. He calls the grazing-ground on the north side of the Muz-art pass “Köhne Yailak”, “the old pasture”. It is usually considered to be “Khana Yailak” or “Khan Yailak”, “the lordly pasture”, but Mr. Lattimore may possibly be right. His “Tamgai Tash” south of the Muz-art is “Tamgha Tash”, the “seal stones”, from rock-markings which are supposed to resemble the impressions of seals. His Ladakhi servant “Tashi Serengh” was really “Tashi Tsering”.

He is a little hard on the British Aqsaqals in the south of the province, but he acknowledges that they are helpful to travellers, although this is only a very small part of their duties, which chiefly consist of helping the British Consul-General to protect the interests of the local British-Indian subjects.

The book closes on the Khardung pass before the arrival at Leh and no space is wasted on the well-known journey down to Srinagar.

The dedication is, fittingly enough, to Mr. Pan Tsi-lu who had been a friend of Mr. Lattimore in China and who has since held various official appointments in Sinkiang. Mr. Lattimore is not the only traveller who has had reason to thank Mr. Pan for assistance and advice.

F. WILLIAMSON.

MOUNT EVEREST AND ITS TIBETAN NAMES: A REVIEW OF SIR SVEN HEDIN'S BOOK.—BY COLONEL SIR SIDNEY BURRARD.
Dehra Dun: The Geodetic Branch Office, Survey of India, 1931.
9½ × 6 inches; 18 pages. 8 As. or 10d.

IN 1926 Dr. Sven Hedin, the Swedish explorer, published a book in German in which he drew attention to the fact that a range of mountains within sixty miles of Mount Everest had appeared on D'Anville's map, published in Paris in 1733, under the name of *Tchoumou Lancma*. He argues from this that the name “Mount Everest” which has been used for sixty years should now give way to the previous name entered on the French map. Sir Sidney Burrard has written this able paper critically examining Sven Hedin's

contention. In the correspondence with the Tibetan Government about the Mount Everest expeditions during the last decade, that government used the word Chama Lung or Chamo Lung. Allowing for the different systems of transliteration of names into French and English, there can be no doubt that this name is identical with that on the old French map.

The present writer has had an opportunity of seeing these letters from the Tibetan Government. The Tibetans were not very particular about the spelling of the middle syllable which is 'Ma' or 'Mo' indifferently; but there is never any doubt about the first one, 'Cha'. The letter used is that which means 'a bird'. This goes to support the probability that Sir Charles Bell's derivation of the name, which he was given in Lhasa by one of the Dalai Lama's secretaries, a man of exceptional knowledge and intelligence, is accurate. According to him, the word is short for *Cha-Dzi-ma-lung-pa*, and means "the district where birds are kept".

Furthermore the word *lung* in Tibetan means a valley or district, not a mountain. It therefore seems certain that this word *Chama* (or *Chamo*) *Lung* cannot refer to a mountain, but to a district. I know of no Tibetan mountain which is named *Lung*. Most mountains contain the words *Ri* (= mountain) or *Kang* (= snow).

The mountain was first observed from the plains of India in 1849. Three years later it was realized that this was the highest peak at that time known on the face of the earth, though there was every probability that still higher ones existed. As no local name was forthcoming, and after waiting till 1865, the Survey of India adopted the name Mount Everest. After this, on several occasions, native names were suggested. All these are now universally admitted to have been wrong. Had Hodgson's or Schlagintweit's names been adopted at the time they were proposed, one wonders whether Sven Hedin would have been so anxious to raise again this old controversy now. This consideration arises from the fact that Hedin has thought it necessary for his argument to decry the work of Colonel Sir George Everest after whom the mountain was named. This seems to be quite beside the point. At the time of the discovery, and for many years afterwards, no native name could be found. The name Mount Everest was therefore given and was accepted. Either this name stands for scientific reasons or it falls for scientific reasons. The eminence or otherwise of Sir George Everest does not seem to matter, though Sir Sidney Burrard has shown us what an eminent surveyor and mathematician he actually was.

At the time when the search for a name was in progress, it was never suggested that a name written along a range of mountains in an obscure corner of a little-known map more than a century earlier, was the name of the mountain which was being sought; a name, moreover, which even now should not be, for philological reasons, be applied to a snow mountain.

The name 'Mount Everest' was only chosen after all efforts to find a local name had failed. That name, which under such circumstances was chosen sixty-five years ago, should not now be displaced by another name, on which so much doubt can be cast as to its authenticity. We are under a debt to Sir Sidney Burrard for his excellent statement of the facts of the case.

F. M. BAILEY.

IM LAND DER STÜRME.—BY EMIL TRINKLER. *Leipzig: F. A. Brockhaus, 1930. 9 × 6 inches; 243 pages; 120 illustrations; sketch-map. 15 marks.*

THE STORMSWEEPED ROOF OF ASIA.—BY EMIL TRINKLER. Translated from the German by B. K. FEATHERSTONE. *London: Seeley Service and Co., Ltd., 1931. 8½ × 6 inches; 312 pages; 27 illustrations; sketch-map. 21s.*

THE first of these two books is the popular account in German of the late Dr. Emil Trinkler's notable journey into Central Asia during 1927 and 1928. The second is a free English translation of the same journey. It is not necessary here to give an account of the expedition, since a fairly full summary has already appeared in *The Himalayan Journal*, vol. i, pp. 90-93, while Dr. Trinkler has summarized his observations on the Ice-Age in Eastern Ladakh in *The Himalayan Journal*, vol. iii, pp. 42-50, and a brief review of his companion's morphological observations appeared in the latter volume, p. 143. It is sufficient to say that the expedition was of considerable importance, and the scientific results, when published in detail, should be of much interest.

The titles of both these books are appropriate, for the Lingzi-tang and the Akaai-chin are probably the most desolate and most wind-swept of all the plateaux of Asia, while there are few days along the desert edge of the Taklamakan free from violent sand-storms, which make travel extremely uncomfortable and almost impossible. The narrative of the expedition is therefore one of perseverance and a large amount of discomfort, cheerfully borne for the sake of science.

The English translation, though somewhat too free in some places, has been enthusiastically carried out. It is indeed most enterprising of both the translator and the publisher to give it to us. No attempt has been made in the German account to include any scientific results, except in a very brief and inadequate appendix, so none can be expected in the translation. Is it too much to expect Mr. Featherstone and Mr. Service, both of whom are Fellows of the Royal Geographical Society, to give us the scientific results in English, when Dr. de Terra completes the second volume in German? The first was fortunately sent to press by Dr. Trinkler before his tragic death.

A few minor slips and errors may be noted in the German account; these have rather naturally remained in the translation, since Mr. Featherstone is unacquainted with the ground. On page 34 of the German account (*translation*, p. 44) the peak referred to should be Pk. 26/52 J, instead of 26/52. The 'J' is important since practically none of these summits have any names, and the triangulated ones have been numbered by the Survey of India by areas bounded by each degree of latitude and longitude. There are sixteen degree sheets in map 52, and there may therefore be sixteen peaks numbered 26⁽¹⁾. Similarly, on page 48 of the translation the remark in parenthesis, "peak No. 1/52", which, by the way, I cannot find in the German on page 36, should probably be Pk. 1/52M. The traveller was then working on map 52N, but Pk. 1/52N is west of him, not north. Pk. 1/52M is some 50 miles to his north and near the western end of the Lokzung mountains. With a height of 21,040 feet it is a conspicuous summit from all over the Lingzi-tang⁽²⁾. There is a small slip on page 88 of the German (*translation*, p. 121), where the Mazar Tagh is said to be south of Khotan instead of north.

In order to translate a popular book of travel from German into English and to make it readable for the public, a certain amount of latitude and freedom is permissible. Great care should however be exercised so that the sense is not changed and that errors do not creep in. On page 58 Mr. Featherstone writes: "In the west rose a most impressive chain of peaks". The *Schneemassiv*, which is hardly a chain of peaks, with Lake Lighten north-east of it, lies to

(¹) A photograph of Pk. 26/52J appears in *The Himalayan Journal*, vol. iii, p. 44.

(²) An illustration of this remarkable peak, Pk. 1/52M, appears in Drew's book, *Jummoo and Kashmir Territories*, p. 343.

the east of the traveller's route both actually and in the German account (p. 44). On page 145 of the translation we read "We reached the main caravan route, which leads from Maralbashi south, after a five days' march and came to Chahar Chamba Bazar". I think the correct translation should be: "In a five days' march we reached Chahar Chamba Bazar on the great road leading from Maralbashi southwards". The two renderings are not quite the same, and since Dr. Trinkler was "relieved to see the last of Maralbashi", it is probable that he followed the main road for five days. There is a curious circumlocution on page 141 of the translation (page 111 of the German), where *grünlichen Porphyriten und schwarzen Andesiten* is rendered as "porphyrite and black trappoid rocks like basalt". Why not merely "greenish porphyrite and black andesite?"

A few inconsistencies occur which might have been avoided during the proof stage. The hard woody fuel generally known to travellers as *burtse* is spelt indifferently, *burtsar*, *burze*, and correctly. *Caravanbaschi* on page 253 is correctly spelt *caravanbashi* on page 274, where the expedition was travelling *down* the Thulanbuti Chu, not *up*. And is it not more usual to speak of "a herd of antelope and kiang", rather than "a herd of antelopes and kiangs". Most of these are very minor points, but taken together as a whole they do just mar the excellence of the book.

The German account is very fully illustrated by over a hundred photographs, mostly taken by M. Bosshard, and by beautiful reproductions of some exceedingly attractive water-colour sketches, drawn under exceptional difficulties by Dr. Trinkler. It is a pity that these illustrations have not been inserted in their correct order, and often nowhere near the text to which they refer. Doubtless for reasons of economy none of the water-colour reproductions and a large number of the other illustrations have been omitted from the English version. In these difficult times perhaps we ought not to complain; but would it not have been possible to borrow the blocks from Messrs. Brockhaus? And for books of travel such as these, when a good deal of new ground has been covered and new topographical surveys carried out, good maps are essential. On the map at the end of *Im Land der Stürme*, it certainly is just possible to follow the route; on that published in the English version, it most certainly is not possible to do so. Moreover it should not be necessary to have to turn the book through an angle of ninety degrees to read the map, such as it is.

KENNETH MASON.

THINGS SEEN IN KASHMIR.—BY DR. ERNEST F. NEVE.
London : Seeley, Service & Co., 1931. 6 × 3¼ inches ; 160 pages ; 32 illustrations ; 3s. 6d.

COUNTLESS books have been written on Kashmir in the English language and it might be thought that there was no necessity to add to their number. But when a publisher embarks on a series which contains such books as *Things seen in Switzerland*, *Things seen in Venice*, it is natural that such a series would be incomplete without a *Things seen in Kashmir*. It is still more natural that Dr. Ernest Neve should be chosen to write it, for no one knows the country better than he.

When Maharaja Gulab Singh said in 1854 : “ My subjects are very bad ; I am sure that no one can do them any harm and I am anxious to see whether the padre sahibs can do them any good ”, the Kashmir Medical Mission was founded by Robert Clark. Fifty years ago Dr. Arthur Neve went to Kashmir to take up his duties in that Mission ; four years later he was joined by his brother Ernest. Since the early 'eighties the two brothers have devoted their lives to the welfare of the people of the country. To-day as many as twelve major and forty minor operations may be performed in a single day, and the number of patients prescribed for in a year, if they stood in single file, would stretch for thirty-two miles.

None of these details are mentioned in the little book we are reviewing. But the unostentatious work of Dr. Ernest forms the raw material for it. Both his brother, up to the day when he died, and he have sought out their patients in their villages. In their brief ‘ holidays ’, taken when the work at headquarters permitted one of them to snatch a change of air, or when some violent outbreak of cholera has demanded their presence where the pestilence was most virulent, they have, between them, visited almost every corner of the State.

This unpretentious little book is therefore delightful. Many of the things seen may be seen by anyone who goes to Kashmir ; some are missed by most of us. All of them are charmingly told by one who loves the tarns and torrents, peaks and glaciers, temples and gardens and wild flowers. To me personally it brings back fascinating memories of days spent with Dr. Ernest on mountain sides twenty years ago, when he taught me to love the country and to understand its people.

KENNETH MASON.

CORRESPONDENCE

THE ORIGIN OF " KANGCHENJUNGA "

To

The Editor,

The Himalayan Journal.

DEAR SIR,

At the express desire of His Highness the Maharaja of Sikkim, I crave the hospitality of your valuable columns to attempt to clear the fog that at present surrounds the correct derivation of the name of the third highest mountain in the world, " Kangchenjunga ".

It may not be commonly known to the outside world that the mountain has a special religious sanctity for the Sikkimese Tibetans (as Mount Kailas, in Tibet known as Kang Tesi or Kang Rinpoche, has for the Hindus) and that their scriptures enjoin a special worship of the deity which embodies the eternal snows. A religious festival has been held annually in Kangchenjunga's honour in Sikkim for hundreds of years past. His Highness the Maharaja of Sikkim is always pleased to keep up this age-long tradition by celebrating the worship of the Snowy Range every year on the 15th day of the 7th Tibetan month, when these time-honoured religious dances by Lamas and laymen are held at Gangtok, the capital of the State.

The assertion of Dr. Hara Prasad Shastri, M.A., C.I.E., that the word *Kangchenjunga* is of Sanskrit origin and means " Golden Thigh " is based solely on information he secured at Khatmandu from the Nepalese. It is however common knowledge that the advent of the Aryan race of Nepalese into the Nepalese hills and that Sanskrit names and derivations in Nepal cannot claim any greater antiquity than the Tibetan scriptures of the famous saint, Padma Sambhawa. Kangchenjunga is essentially a Sikkim mountain and the Sikkimese, by race, are Tibetans living on the southern slopes of the Himalaya. Before its connection with the British Government in India, Sikkim was a Principality of Tibet and the Maharaja of Sikkim's ancestral home was in Tibet proper. His collateral relatives still reside in that country. There is thus little force in the argument that, " Kangchenjunga " being invisible from Tibet proper, its name could not be of

Tibetan derivation. The word Kangchenjunga in Tibetan, or to be more exact, in Sikkimese Tibetan dialect, is written as གང་ཙོང་མངོ་དང་ལྷ་ (Kangchen mdZod-lNga or Kang-chen Zod-nga), meaning: Snow (Kang), Big (Chen), Treasury (Zod), Five (Nga).

The word should be pronounced as “Kang-chen Zod-nga”. *Zod* being pronounced as “Z” and not as “J”. The letter “Z” in the plains of Bengal and Bihar is often pronounced as “J”, and sometimes in Roman spelling is even written as “J”, for instance, as in the word *Mojumdar*, which is derived from the Persian word *Mauzim*. It is not therefore a matter of surprise that the orthographists spelled it with a “J” on hearing the name of the mountain pronounced Kangchenjunga in Bengal and Bihar. Later on, the Sanskritists gave it a Sanskrit derivation by ascribing a Hindi meaning to the word *Jungha*, which in Tibetan is meaningless. The word *Nga* corresponds to the Sanskrit letter ञ and sounds like “ng”, as in the English word “song”.

The details of the five treasuries (*mdZod-lNga* or *Zod-nga*) of the large snow mountain (*Kangchen*) may be found in the Tibetan scriptures known as *Lama Gongpa Du-pa*, in twelve volumes. The first treasury is of *salt*, the second of *gold* and *turquoise*, the third of *holy books* and *wealth*, the fourth of *military weapons*, and the fifth of *crops* and *medicines*.

Even in very learned circles, unconnected with Tibet, a very mistaken notion, I fear, prevails that the Tibetans are not given to naming their mountains. I trust that it would not unduly burden this letter to give the Tibetan names of the twenty-one summits which surround the plateau of Tibet, the Roof of the World. They are :

- | | | |
|-------------------------|----|---------------------|
| (1) Tsa-ri Kang | .. | ཚ་རི་གང་ |
| (2) Bar-yul Kang | .. | བར་ཡུལ་གང་ |
| (3) Lachi Kang | .. | ལ་ཕྱེ་གང་ |
| (4) Gnot-jin Kang | .. | གནོད་རླུང་གང་ |
| (5) Gyal-ki Khenpa Lung | .. | གྱུ་གྱ་མི་ཁན་པ་ལུང་ |
| (6) Pal-ki Tabu Lung | .. | དཔལ་གྱི་གྱ་ལུང་ |
| (7) Pal-ki Jagma Lung | .. | དཔལ་གྱི་རེག་མ་ལུང་ |
| (8) Kyid-ki Troma Lung | .. | ལྷན་གྱི་ལྷ་མ་ལུང་ |
| (9) Pang-phug Kang | .. | ཕང་ཕུག་གང་ |

(10) Sal-je Kang	..	གསལ་ཇགང་
(11) Yu-lung Kang	..	གཡུ་ལུང་གང་
(12) Dong-za Kang	..	ངོང་ཟ་ཇགང་
(13) Bal-yul Kang	..	བལ་ཡུལ་གང་
(14) Jo-mo Kang	..	ཇོ་མོ་གང་
(15) Nye-wo Kang	..	ཉེ་ལོ་གང་
(16) Dza-yul Kang	..	ངེ་ཡུལ་གང་
(17) Na-nam Kang	..	ན་ནམ་གང་
(18) Shel-zang Kang	..	ཤེལ་བཟང་གང་
(19) Rong-tsen Kang	..	རོང་བཅོན་གང་
(20) Gham-po Kang	..	མ་པོ་གང་
(21) Lho-rong Kang	..	ལྷོ་རོང་གང་

These mountains are guarded by twenty-one deities called *Ge-nyen Nyi-shu Tsa-chig*. The details of these are to be found also in the Tibetan scriptures, *Lama Gong-pa Du-pa*.

THE PALACE,
GANGTOK, SIKKIM.
1st July, 1931.

Yours faithfully,
LOBZANG CHHODEN, RAI BAHADUR,
(*Private Secretary to His
Highness The Maharaja of Sikkim*).

To

The Editor,
The Himalayan Journal.

DEAR SIR,

I have seen with some astonishment the light-hearted way in which the Tibetan origin of the name "Kangchenjunga" has been brushed aside. I would support most strongly the argument in the note by you in the last volume of *The Himalayan Journal* that Tibetans do name mountains. Most mountains are locally named *Kang-Chen* (big snow) or *Kang-Ri* (snow mountain), but other special names are also frequently given to very conspicuous peaks.

I once spent six months at Kamba Dzong in Tibet, north of Kangchenjunga, where this mountain was a most prominent feature, and where the people called it *Kang-Chen*. The peasants here had certainly not been influenced by any Sanskrit-speaking people from India. As you state in your note, although the mountain is actually outside Tibetan territory, the inhabitants of the neighbouring valleys on the Sikkim side are Tibetan by race and language, and like their Tibetan relatives across the border they also use the name *Kang-Chen*. In many cases peaks known from India have both an Indian (Sanskrit) name and a Tibetan one, e.g., Kailas or Kang Rinpoche, Gurla Mandhata or Nyimo Namgyal.

There may also be an Indian name for Kangchenjunga. May it not be the Nepalese name, *Kumbhakaran Langur*? But let us leave *Kang-Chen* to the Tibetans.

SATNA,
28th August, 1931.

Yours faithfully,
F. M. BAILEY.

Note by Editor.

Rai Bahadur Lobzang Chhoden's letter is of great interest and should be conclusive. We very much regret that Dr. Hara Prasad Shastri died last year and no other competent Sanskritist seems prepared to argue for "the Golden Thigh" derivation⁽¹⁾. No one has yet found the word a hundred years old in Bengali writings, and I understand that Dr. Suniti Kumar Chatterji definitely considers the word has been imported into Bengali by English geography very recently. During the year no letters have been received supporting the Sanskrit derivation.

The last part of Rai Bahadur Lobzang Chhoden's letter is also important. Are these twenty-one names used geographically to-day and, if so, can they be placed on the map? Mr. J. Van Manen, the Secretary of the Asiatic Society of Bengal, has promised to investigate this point. Many names of mountains derived from the sacred books of Tibet, either in a corrupted or an abbreviated form, are used geographically by Tibetans to-day, as has been shown by the late Lieut.-Col. Morshead; but Mr. Van Manen informs me that there is rarely a sufficiently detailed description in the writings for exact identification; local topographical knowledge seems to be essential and our maps of Tibet are not yet good enough to place many of them, especially if they stand north of the Tibetan plateau.

There is also another point that requires elucidation. Seventeen of these summits terminate with the word *Kang*; but four end in *Lung*. Does this last fact controvert the statement made that a *mountain* cannot end with a *district* or *valley* termination? Or are these four summits named after neighbouring districts as "Makalu" and "Chamlang" appear to be⁽²⁾?

At the last moment, after going to press, I have received the following important communication on the subject from Mr. Van Manen.

(1) See *Himalayan Journal*, vol. iii, p. 154.

(2) See pages 175, 193.

KANGCHEN-DZÖNGA

To

*The Editor,
The Himalayan Journal.*

DEAR SIR,

Etymology or the science of the derivation of words is an exact science subject to exact rules and not subject to arbitrary guesses. Two of these rules have been formulated by Skeat, the Nestor of English etymology, as follows :—

- (1) Mere resemblance of form and apparent connection in sense between languages which have different phonetic laws or no necessary connection are commonly delusions and are not to be regarded.
- (2) Observe history and geography ; borrowings are due to actual contact.

If the name Kangchen-dzönga has to be explained these rules should be observed. This involves the following enquiries :—

- (1) First of all the history of the name in English literature has to be investigated. We have to trace its first occurrence there and date this appearance, and then have to record, again with dates, all variations of spellings from its first appearance to the present time.
- (2) We have to note the various explanations given for the name from time to time.
- (3) We have to examine the component parts of the name and the component parts of the words proposed in explanation.

After all this has been done valid conclusions may be drawn.

As to the history of the name we have not at present available the complete data. The earliest references I have found appear in a rare publication *Dorjé-ling*, by H. V. Bayley, Calcutta, 1838. On p. 9 this book spells Kunching Jinga, and in Appendix A, the Journal kept by H. Chapman, p. viii, there is an entry, dated December 5th, 1836, giving the spelling Kanxching-jinga. For present purposes we may start with Hooker's *Himalayan Journals* (1854) which spells the name as Kinchinjunga in the text but as Kangchan-junga on the maps. In the same year, 1854, Cunningham, *Ladák* (p. 57), spelled Kanchinjinga. After that a bewildering variety of spellings

occurs. In 1903 Freshfield stated that "the native name Kangchen-junga, meaning literally 'the five treasuries of greatest snow', given by the inhabitants of Sikkim to the five loftiest summits in which the range culminates, probably refers to the roof-like character of the peaks." Waddell, *Among the Himalayas*, 1899, gave the same explanation. In 1891 the same Tibetan scholar had already given this explanation in the *Journal of the Asiatic Society of Bengal*, Vol. LX (page 53). Graham Sandberg also gave the same explanation in his *Manual of the Sikkim Bhutia Language*, 1895. The Tibetan Dictionaries by Jaeschke (1881) and Desgodins (1899) did the same.

Waddell's explanation was embodied in the *Imperial Gazetteer of India* (1908). In 1849 Brian H. Hodgson published in the *Journal of the Asiatic Society of Bengal* an article 'On the physical geography of the Himalaya' (Vol. XVIII, Part II, p. 761). This was republished together with other articles of the great Himalayan scholar at least in 1857 and 1874, and perhaps oftener.

In this paper as well as on its accompanying map Hodgson mentions the "peak of Kangchan" and in the re-issue of 1857 added in a footnote:

"Kang 'snow'; chan 'abounding in', 'having', like the English suffix full in fearful."

From that moment the spelling Kangchan (with an *a* in the second syllable) enters into geographical literature. For instance Markham, *Narrative of the Mission of George Bogle to Tibet*, etc., 1876, refers in his preface, p. xxxvi, simply to "the Kangchan", whilst his maps spell Kanchinjinga.

I have not found evidence that before the publication of Hodgson's article the name was ever spelled other than with an *i* in the second syllable. Nevertheless Hodgson gave the first syllable correct as *kang*, not *kan*.

Now Hodgson's explanation was incorrect. In Tibetan there are two nearly similar forms Kangchen and Kangchan. The first means 'great snows', the second means 'snowy' or 'having snow'. Hooker's spelling Kangchan on his maps may be due to this early explanation, which is incorrect. Kangchan means simply Himavat or Himalaya and is applied to a region, not to a single mountain. It is one of the poetic names for Tibet as a whole. Kangchen, great snow, is never applied to Tibet as a whole.

In Tibetan books the name appears in the same spelling as that given by the Tibetan dictionaries. There is a little ritual book containing the form of "worship of the God of the

Darjeeling district". The Tibetan title is : *Rdo gling yul lhahi gsol mchod*.

In it I find the following sentence : *gangs chen mdzod lngahi lho sgo bsrung*. Translated this means : Protect the southern gate of Kangchen-dzönga.

The *hi* at the end of the name constitutes the genitive termination. It should be borne in mind that in Tibetan spelling and pronunciation differ greatly.

In another (printed) Tibetan work called *Dkon mchog spyi hdus*, containing various rituals, there is a prayer to Kangchen-dzönga (leaf 61, verso), in which the name is given twice in the abbreviated form of dzönga alone. This shows that "the five treasures" are intelligible by themselves and are not to be understood as a "leg" or "thigh" which, without context, would have no meaning.

In the second of the two passages the dzönga has the epithet *dam chan*, 'holy', attached to it, showing again that the dzönga may be described in various ways and need not be "golden" at all.

I owe both these Tibetan references to my friend Karma Samdhon Paul who, at my urgent request, managed to find the two works at the last moment in Darjeeling.

Thus the problem stood when suddenly, I think early in 1930, a Mr. H. Goshal wrote a letter to the *Times* saying that Kangchen-dzönga was a name derived from Sanskrit, its first part from *kāñchana*, golden, and its second part from *jañghā*, thigh. *Hinc illae lacrymae*.

In Sanskrit there is a verbal root *kan* meaning 'to shine'. Derived from it is an adjective *kanaka*, golden. An extended form of the above root is *kañch*, also 'to shine'. Derived from this is the substantive and adjective *kāñchana*, gold or golden. This is the first word alluded to in the above quoted letter to the *Times*.

The other Sanskrit word is *jañghā*, shank (from the ankle to the knee), but in the older use of the language perhaps also the upper part between knee and waist. This word has passed into several Indian vernaculars where its present-day meaning is not quite definite. Some Bengali dictionaries explain it both as thigh and shin or shank. A Punjabi friend tells me that he thinks that in Punjabi it means leg. In the modern vernaculars the word does not seem to be a very common one and its meaning not quite definite.

With the word *kāñchana* several geographical terms have been made up in Sanskrit. We find in the whole of the Mahābhārata

only the name of a river, Kāñchanākshī. We find further in other Sanskrit literature four names of towns, real or mythical, as follows :—

Kāñchanapura,
Kāñchanas'ṛṅga,
Kāñchanabhā,
Kāñchanaka.

There is further a word which might be applied to a mountain, Kāñchanāṅga, golden-bodied.

There are five compounds connected with mountains as follows :—

Kāñchanagiri, Kāñchanādri and Kāñchanāchala, three names for Mount Meru, and further, Kāñchanas'ṛṅgin, having gold peaks, and Kāñchanavapra, a hill or mound of gold.

Another word containing a Sanskrit form connected with the word for gold is the old city name of Kāñchīpura, modern Conjeeveram.

In the whole of the accessible mass of Sanskrit lexicographical literature no compound kāñchana-jaṅghā is on record.

Further, it is not on record that any mountain name should exhibit a descriptive element meaning thigh, shank, or leg. I find that there are many names that exhibit the element peak, point, top, head. We have therefore in the case of the proposed Sanskrit derivation to assign a meaning to the name which does not explain it whereas the Tibetan explanation is a logical one and thoroughly in consonance with the local mystical traditions concerning the mountain.

Now if the Sanskrit derivation were valid it stands to reason that the Sanskritic Indian vernaculars should all of necessity preserve the two elements contained in this derivation. If the word were on the contrary a modern adaptation, of the nature of popular etymology, then various vernaculars might have contrived to make different adaptations. The latter proves to be a fact and this fact is damning to the theory of a Sanskrit derivation. In Mahrati the name for Kangchen-dzōnga is not Kāñchanjaṅghā but Kāñchangāṅgā. The first of these two forms is entirely unknown in Mahrati.

At my request Prof. D. R. Bhandarkar has translated for me the entry under Kāñchangāṅgā in the Mahrati Encyclopædia edited by S. V. Ketkar (1924). Professor Bhandarkar's mother-tongue is Mahrati. The importance of this entry lies not so much in the fact that the author explains the name as a Tibetan word, which he has quite probably taken over from the *Imperial Gazetteer of India*, but in the fact that it shows that in another vernacular than Bengali the last part of the word Kangchen-dzōnga has been Sanskritised in an entirely different way from the way this has been done in

Bengali. This argument seems to be clinching. This conclusive argument is confirmed by equally strong evidence from Bengali.

In the *Encyclopædia Bengalica* (*Viśvakosha*), (written in Bengali) by Nagendra Nath Vasu and others, Calcutta, from 1885 onwards (Bengali Samvat 1292), there occurs a most significant passage concerning the name under the entry *Kāñchanjanḡhā*. After a description of the mountain a sentence closes the entry of which the following is the literal translation :—

“ At sunrise the peak looks as if golden—and perhaps that is the reason why it is called *Kāñchanjanḡhā*, or *Kāñchanjanḡha* or *Kāñchanjanḡga*, and according to some Sanskrit books *Kāñchanādri*.”

There could hardly be more conclusive evidence that the author here contrasts his three alternative Bengali forms with a single different Sanskrit one, and the latter a name which the Sanskrit dictionaries give as a name for Mount Meru and not for Kangchen-dzōnga.

For the rest I have asked Dr. S. K. Chatterji, an authoritative Bengali philologist and phonetician, to write a note on this subject which he has kindly done with great precision, learning, and in great detail. This note I communicate herewith. I have further submitted this note to three capable Bengali and Sanskrit scholars who entirely endorse it. They are :—

Prof. D. R. Bhandarkar, Carmichael Professor of Ancient Indian History and Culture, Calcutta University.

Mr. Amulya Charan Vidyabhusana, for many years Secretary, Bangiya Sahitya Parishad, Professor of Pali, Bengali, etc., Vidyasagar College, and Editor of *Pancapus'pa*.

Mr. Chintaharan Chakravarti, Joint Honorary Secretary, Bangiya Sahitya Parisad, Professor of Sanskrit.

I also add the transcript of Professor Bhandarkar's translation of the entry *Kāñchanganḡā* from the *Mahrati Encyclopædia*.

In view of all this material I have no hesitation in stating my conviction that the Sanskrit derivation of the name Kangchen-dzōnga has to be given up.

One investigation will also repay further enquiry namely that of the number of mountain names entered on the various maps of Tibet beginning with the element Kangchen. At one time or another I have noted I think about a dozen of these but here I will only refer to the Kangchenjhaul immediately near Kangchen-dzōnga.

In the above note the combination *ch* in Tibetan and Sanskrit words represents the single Sanskrit or Tibetan letter *c* as commonly

used in philological transcription, pronounced like ch in choke, churn, chill.

The letter ñ represents the sound *ny* in canyon or *ni* in Spaniard.

The letter ñ represents the *ng* sound in song.

The letter ʀ represents a sound more or less like the *er* in Londoner, onlooker, an unsounded *er*.

The letter ´ represents the *sh* sound.

The letter ö represents the German umlaut sound.

CALCUTTA,
February, 1932.

JOHAN VAN MANEN.

Extract from the Mahārāṣṭrīya Jñānakosh, or Mahrati Encyclopædia, edited by S. V. Ketkar (1924, Poona), Vol. 10, p. 235.

Kāñchangaṅgā—The second highest mountain peak in the world. This is a mountain peak in the eastern part of the Himalayan range and situated on the boundary between the two states of Sikkim and Nepal. From the station of Darjeeling the whole of this gigantic mountain can be seen from its foot to its snow-clad top. The summit of mount Kāñchangaṅgā is 28,146 feet high. Kāñchangaṅgā is a Tibetan name and signifies “the five groups of immense heaps of snow”.

Translated by Prof. D. R. BHANDARKAR, *Carmichael Professor of Ancient Indian History and Culture, Calcutta University.*

‘ KANCHENJUNGA ’

The name I do not consider to be of Sanskrit origin. Like a great many non-Sanskritic geographical names in tracts in and around India, this is the result of Sanskritisation—I should say unconscious Sanskritisation. Everybody in N. Bengal says *Tista*, which is of Tibeto-Burman origin, but an educated Hindu transformation of the word is *Tri-srotas* which is good Sanskrit—from books—for “Three Streams”. The Burmese word *Mran-mā* has given the Indian form *Brahma* as the name for Burma, through an intermediate pronunciation *Bramma*; here the Sanskritisation is from the Burmese direct. But when *Siam* is rendered by *Syāma* in Bengali and Hindi, it is the European form of the name that is Sanskritised, and this European (Portuguese > English) form itself is a corrupt rendering of a modern Burmese pronunciation of the old Burmese name for the *Shan* or *Tai* people of Siam—*Rhwam*, now pronounced something like *Sham*. So there is nothing to wonder at a modification of an English rendering

of a Tibetan name into something which is intelligible in Sanskrit. Sanskrit is the speech of the Gods—and the Himalaya is the abode of the Gods ; it would seem only natural for any Hindu, and specially for a cultured Hindu, that the names of the peaks of the Himalayas are from Sanskrit. This assumption can only be expected to have the tacit support—and even warm advocacy—from all educated Hindus.

If the word cannot be proved to be from Sanskrit, and if it is really Tibetan (as the evidence seems to prove it conclusively), then there is not much point in pressing for a compromise spelling on a Sanskrit basis. The only ground for retaining the spelling *Kanchenjunga* (without the *g* in the first syllable) is that it has got a prescriptive right through so many decades of use, and that in the sentiment of a great many educated Indians the word is Sanskrit, or rather, they would like the name to look like Sanskrit. But *Kangchanjunga* is the spelling in Hooker, as early as 1854. Personally I think that no educated Indian will break his heart if the first syllable is written *Kang*: the form *Kangchenjunga* will still be near enough to his Sanskrit and he will continue to please himself by writing it as a Sanskrit word (*Kāñchana-jāṅghā*) in his Bengali and Hindi and Nepali, and teach it as a Sanskrit name to the village boys in the villages in the plains at the foot of the Himalayas who come to the school to read their geography. Personally I have warned Bengali readers and writers in a note on the transliteration of geographical names which I contributed as a supplement to the biggest and most up-to-date Bengali dictionary (that by Jnanendra Mohan Das) that our Sanskrit name for this high peak is really Tibetan in origin. If the educated Indian really felt about these geographical orthographies, he felt more at *Gaurishankar* and *Deodunga* being dethroned by Everest rather than *Kāñchana-jāṅghā* being proved to be, not Sanskrit, and, Aryan (and so associated with the Gods and *rishis* and heroes of ancient India), but a parvenu in borrowed Sanskrit garb from the neighbouring land of Tibet.

CALCUTTA.

SUNITI KUMAR CHATTERJI.

ADDENDUM

Since writing my note on Kangchen-dzōnga I have found an English prototype for the Mahrati form *Kāñchangāṅgā* discussed in that note. It occurs in the form of *Kinchingunga* on p. 67 of J. Ware Elder's *Report on a visit to Sikhim and the Tibetan frontier*

in October, November and December, 1873. (Calcutta, 1874). It is therefore probable that all vernacular Indian forms except those which are entirely 'learned' reconstructions (such as Kāñchanaśṛṅga, 'golden peak', probably is) will ultimately be traced back to definite earlier English prototypes.

I may here also observe that in the Calcutta *Amrita Bazar Patrika*, dated March 1st, 1932, there is an article about the Dyhrenfurth expedition, containing an interview with Mrs. Dyhrenfurth. The article is to all appearances bodily quoted from the *New York Times*. Throughout the spelling is Kanchengunga.

One further observation may be recorded. I have come to the conclusion that the name of the mountain has only become generally known in English literature after the publications of Hooker and Hodgson, that is about the year 1850.

I am further of opinion that the name has been introduced into European literature through the reports of travellers who learned it on the spot, that is in or near Sikhim, from local inhabitants, and not through Sanskrit literary sources or previously current Aryan vernacular names in India.

Kangchen-dzōnga seems indeed a very young geographical name in the West. It is remarkable how rarely this name and the mountain itself are specifically mentioned in the older geographical literature. Early visitors to Darjeeling and Sikhim did evidently not realise that there was one definitely outstanding highest peak amongst the bewildering mass of snow-mountains on the sky line.

A typical example of this is furnished by the 'Narrative Account by Rinzin Nimgyal of his Exploration of the Country to the North and North-West of Kinchinjunga with notes by Col. H. C. B. Tanner and Mr. W. Robert.' This was originally published in the General Report of the Survey of India, 1884-85, (Calcutta, 1886) and subsequently (1915) republished in the *Records of the Survey of India*, Vol. viii, Part II, p. 359. The mountain itself is not discussed at all in this narrative, and only once quite casually mentioned: "The Jonsong Pass.....is a continuation of the Kinchinjunga range." The editors mention the name twice in their marginal notes, but in equally casual connections.

In the original, 1886, edition the name is spelled Kinchinjanga; in the second edition Kinchinjunga. In the first edition the traveller's name was only given by initials.

(In Dyhrenfurth's bibliography the reference to the article is wrong. It is attributed to the *Records of the Geological Survey of*

India; it should be to the *Records of the Survey of India*. The name of the author is further spelled Nimgyat instead of Nimgyal as in the original).

In the Index to the first eighteen volumes of the *Asiatic Researches*, 1788-1833, the name does not occur.

The earliest report about a visit to Sikkim which I have traced is a paper by Captain J. D. Herbert 'Particulars of a visit to the Siccim Hills', etc. (*Gleanings in Science*, vol. ii, p. 89, Calcutta, 1830). In this paper the name does not occur.

As a matter of fact in earlier literature there is mention of mountains and of snows, but rarely of their names. Besides, the literature is extremely scarce. In Dyhrenfurth's book on the International Himalaya Expedition (Berlin, 1931) there is a very full, though not entirely complete, bibliography on the Kangchen-dzönga region, enumerating 306 items. Amongst these only 3 are dated 1850 or earlier.

Paul Bauer gives in his *Im Kampf um den Himalaja*, 1931, a bibliography of three and a half printed pages in which no title of any work published before 1850 occurs.

Freshfield, *Round Kangchenjunga*, 1903, in his lists of books and maps consulted (5 printed pages) only quotes Turner and Hooker as dating from before 1850. Turner, it should be expressly remarked, does not mention the name.

In Gawler's *Sikkim, with hints on mountain and jungle warfare*, 1873, I have not found the name.

From the Index to Puini's *Il Tibet* (Rome, 1904) and the index to Markham's book on Bogle and Manning it would appear that the name was unknown to—is at least not mentioned by—the early Capucin missionaries in Lhasa and the three travellers: van de Putte, Bogle and Manning.

In C. Akanuma's recently published comprehensive *Dictionary of Buddhist Proper Names* (Nagoya, 1930) a name Kāñchanajāṅghā does not occur.

In d'Anville's Atlas, 7th sheet of Tibet, there is no name resembling Kangchen-dzönga at the approximate place of the mountain, but on the 6th sheet there appears an entry MM Oumoula Kentchong in the left hand lower corner. This is placed due south of Lhasa, 27°N. May this have been meant for Kangchen-dzönga? This same range appears on the Carte Generale du Thibet in the abbreviated form of Oumoula MM.

Even Hooker does not mention the Kangchen-dzönga in Part II of his *Notes of a Tour in the Plains of India, the Himala, and Borneo, being extracts from (his) private letters*, London, 1849, though his narrative ends with his arrival at Darjeeling.

I now add a few notes on variations in the spelling of the name.

An unusual spelling which I have noted is the one of Kinchijunga (which may be unintentional) in an article on Darjeeling in the *Calcutta Review*, vol. xxviii, 1857, p. 203.

Another curious spelling is used in the *Gazetteer of Sikkim*: Kanchinjingna. It is not a typographical error as it occurs throughout the volume, on pp. 4, 39, 42, 44, 99 and 102. On p. 100 there is, however, a Kanchanjingna, and on p. 58 a Kanchanjinga.

Colman Macaulay, in his *Report of a Mission to Sikkim and the Tibetan Frontier*, etc., Calcutta, 1885, writes mostly only Kinchin and rarely, in full, Kinchinjunga.

The Wereschagins in their *Reiseskizzen aus Indien*, Leipzig, 1882 (vol. i, p. 39), mention the name, so far as I have seen, only casually in the title of an illustration and write the "Kantschingaberg" (mount Kantschinga). In the Russian edition of the work, St. Petersburg, 1883 (p. 41), similarly: Gora Kanchinga.

A German version of a work by Paul Mantegazza, Munich, 1921, exhibits the title of *Der Kantschindschinga, Tagebuchblätter*.

Sven Hedin, in the 2nd German edition of his *Mount Everest*, Leipzig, 1926, writes Kantschindschanga.

Sir Richard Temple in his *Journals kept in Hyderabad, Kashmir, Sikkim and Nepal*, 1887, writes everywhere Kangchanjanga.

Count Goblet d'Alviella, *Inde et Himalaya*, 1877, spells Kinchin-chinga.

An early derivation of the name is to be found in an article by Capt. W. S. Sherwill entitled 'Notes upon a Tour in the Sikkim Himalayah Mountains, undertaken for the purpose of ascertaining the Geological Formation of Kunchinjunga, etc.' (*Journal A. S. B.*, vol. xxii, 1853, p. 540). He gives the following footnote when first mentioning Kunchinjunga:—

"For the derivation and meaning of this word I am indebted to Lieut. G. B. Mainwaring of the 16th Bengal Grenadiers, who, with a praiseworthy industry, has mastered the Lepcha language, and was, in 1852, engaged upon the study of the Tibetan. The word is Tibetan and means,

<i>English pronunciation.</i>	<i>Tibetan equivalents.</i>	<i>English.</i>
Kon	Khng-s	Snow.
Chin	Chhn	full or covered.
Jong	b'jongs	Coeval or equal to."

This note is obscure and incorrect. In the *Journal* the name of the mountain is added below this table in Tibetan [characters but these are misprinted, containing at least three mistakes, and do not correspond to the Tibetan equivalents. The note is worthless.

It is of interest to note that a namesake, Major J. L. Sherwill, published another 'Journal of a trip undertaken to explore the Glaciers of the Kanchunjingah Group in the Sikkim Himalaya, in November, 1861' (*J. A. S. B.*, vol. xxxi, 1862, p. 457). In this later article the name is written throughout as Kanchunjingah.

One further important argument must not be overlooked. Waddell has shown that Kangchen-dzönga as a god, that is the Spirit of the Mountain, is a local Sikhimese god. The Sikhimese are Tibetans by race and language, not Aryans.

Waddell has made a detailed study of the subject. In his *Buddhism of Tibet* he treats of the matter in full and shows how genuinely local a god Kangchen-dzönga is. The chief reference is on p. 370, and others occur on p. 430 and p. 511.

The same scholar has presented similar material in the section on Lamaism in Sikkim in the *Gazetteer of Sikkim*. On p. 263 Kangchen-dzönga is there called "the chief 'country-god of Sikkim'". Facing this page is a picture of the god. On p. 355 the worship of the god is described.

In his more popular book *Among the Himalayas*, Westminster, 1899, the same author uses the spellings Kanchen and Kanchen-junga, but gives on p. 386 the same explanation of the name as given in the two other works quoted above. On pp. 386-7 he adds explicitly: "The worship of the mountain-god, which dates back to long before the Buddhist period, is celebrated with great pomp every year throughout Sikkim".

The written and printed Tibetan form Gangs chen mdzod lnga has been quoted before from Tibetan literature.

In Risley's *Gazetteer of Sikkim* (Calcutta, 1894) there occurs an extract, pp. 1-2, of "a Sikkim paper, which recites various old works." Speaking of the boundaries of the country there is a passage as follows: "The 'mDsod-lNga' mountains and the spirit 'Phra-Man-dGe-Man' of Zar guard it on the north."

This passage shows again that the combination dzönga is used alone and intelligible as such.

Waddell, *The Buddhism of Tibet*, London, 1895, summarises on p. 47 *seq.* the life of Lha-tsun, the Patron Saint of Sikkim 'as extracted from the local histories'. On p. 49 the name as transcribed from

these books is given as Kañ-ch'en dsö-na, which in our transcription is the same as Kangchen-dzönga.

Sir Charles Bell has an important note in Dyhrenfurth's *Himalaya* (Berlin, 1931). On pp. 204-5 he states that the Tibetans call the whole of the Kangchen-dzönga group, from Jannu to Narsing 'Tak-tse-Kang', i.e. 'Tiger-mountain-snow', or 'Dzö-nga-Tak-tse', i.e. 'Treasury-five-tiger-mountain.' One more striking proof that dzönga is Tibetan and cannot mean thigh. See also the same author's significant note on p. 203 of the same work, s. v. Kabru, which similarly shows that Kangchen is a Tibetan name and cannot mean golden, whilst the Sikkhimese use it as the name for the peak called Kabru by Europeans. See also the note on p. 209.

In its section on Nomenclature of Places the *Gazetteer of Sikkim*, p. 44, gives the same spelling and meaning of the name as those endorsed by the Tibetan dictionaries and other authorities quoted in the beginning of my first note.

Concerning popular transformations of foreign names the following two remarks may be made as bearing on our subject.

To what extent Indian Pandits are capable of Sanskritisation is picturesquely shown by the name given to the late Max Müller: Moksha Mūla, "root of liberation", a perfectly correct Sanskrit combination.

In Darjeeling I have myself heard, amongst soldiers, the name Kitchenjungle, not meant as a joke or nickname, but seriously understood as a place where the vegetables for Darjeeling are grown. I am informed that a more common, but obscene, transformation of the name is also current.

It may finally be noted that Sir Charles Bell in his *People of Tibet*, 1928, in a footnote to the word Kinchinjunga (p. 297) says:

"The pronunciation usual among Europeans. The correct pronunciation is *Kang Chen Dzö Nga*", "The Five Treasuries of Great Snow."

I have now to close this lengthy note but before doing so I wish, for completeness' sake, to elaborate one point raised before. Skeat enjoins us to observe history when explaining words. For the history of the use of Himalayan names in European literature the early European geographical compilations are of the greatest value. They give clues concerning the dates when specific names have passed into general geographical literature as against their occurrence in reports of restricted circulation and of a specialist character.

An early general and comprehensive work in English is Hugh Murray's *Historical Account of Discoveries and Travels in Asia*, London,

1820. As far as I have been able to ascertain the name Kangchen-dzönga does not yet appear in it. It does not occur in the Index, or in the map to Vol. ii, nor in the sections dealing with Himalayan travel.

In German Carl Ritter's *Die Erdkunde von Asien* is a similar work, but on a larger—a gigantic—scale, encyclopedic in nature and containing an enormous number of exact references to early travellers and reports. I have only the second edition at my disposal for reference. In Band III, Part 4, Second Book (Berlin, 1834) the "territory of the Sikhim Raja" is described on p. 104 *et seq.* I do not find there any reference by name to our mountain. There is mention of "a very high mountain" but the details are vague and not sufficient for identification.

Another encyclopedic and famous German work is Christian Lassen's *Indische Alterthumskunde*. In Vol. i (2nd edition, Leipzig, 1867) there is on p. 78 (first edition p. 60) a section on Sikhim. It is curious to find that Mount Everest is there placed in Sikhim. Yet there are two passages of interest for us :

"The small principality of *Sikkim* or more rarely *Sikim*, which does not play any part in the history of India, has gained this significance for geography that in it gigantic mountains shoulder each other and that the highest mountain on earth rises there. This discovery has been made only recently. The highest mountain is called Kotivara by the Indians, that is the chief peak, but the English have baptised it with the name Mount Everest in honour of the Surveyor General..... The Kanchinjinga is 28,156 feet high.... The Sanskrit name of the Kanchinjinga might be Kānchanajinga. Kānchana means golden and jinga a plant. The shape of the mountain was probably compared to that of this plant. The adjective golden relates undoubtedly to the glow of its snow-covered summit."

We learn two important facts from this extract. First: Sikhim has not played any part in Indian history. Second: a specialist in the old history and Sanskrit literature of India did not know of any classical Sanskrit name for Kangchen-dzönga, and proposed as a probable theory that its second component part might mean, not thigh, but the name of a plant.

Lassen refers in a footnote to an article in *Petermann's Mittheilungen*, 1858, p. 491 *et seq.*, on "the latest English surveys in the central Himalaya". I have not been able to consult this article.

CLUB PROCEEDINGS

THE ANNUAL GENERAL MEETING OF THE HIMALAYAN CLUB was held at New Delhi at 9-30 A.M. on Monday, the 29th February 1932. Lieutenant-General Sir Kenneth Wigram took the chair.

The Report of the Honorary Secretary, Mr. G. Mackworth Young, which is printed below, was read and adopted. The Club accounts for the year 1931 were confirmed. The Officers, Members of the Committee and Additional Members of the Balloting Committee for 1932 were elected, and Messrs. A. F. Ferguson and Company were re-appointed as Auditors to the Club for the year 1932. Rule I of the Rules of the Club was altered to read "500 Ordinary Members" instead of "300 Members". It was unanimously decided that there should be no reduction in the Annual subscription.

REPORT ON THE WORK OF THE CLUB IN THE YEAR 1931

By the Honorary Secretary

Membership.—The Club is still growing, though the pace of growth has necessarily slowed down. 22 new members were elected during the year under report: and 5 more early in January, 1932. There have been six resignations and two deaths. In accordance with a decision of the committee, the names of 13 members who failed to pay their subscriptions for a period of two years or more have been finally removed from the roll of membership and will not appear in future lists. The statutory membership of the Club has had to be raised to a maximum of 500 members. The actual membership at the time of writing (January, 1932) is 345.

Obituary.—The Club mourns the passing of two very distinguished members in 1931; General Sir Alexander Cobbe, a founder member who took great interest in the founding of the Club, and was particularly anxious that information and assistance should be given to young officers who wished to travel for purposes of sport. Lieut.-Colonel Henry Morshead, foully murdered at Maymyo, Burma, came into prominence before the war for his exploration, with F. M. Bailey, of the Brahmaputra bend east of Namcha Barwa. He attempted Kamet with Dr. Kellas in 1920 and reached 23,500 feet; and he was on the first two Mount Everest Expeditions.

Dr. Emil Trinkler was not a member of the Club, but was on the point of being put up for election when he lost his life in a motor accident in Germany.

Obituary notices will appear in the next volume of the Journal.

Expeditions.—Last year has been a memorable one for Himalayan exploration and mountaineering. Perhaps the most important expedition, because of its success, was Mr. F. S. Smythe's to Kamet. Mr. Smythe joined the Club in 1930 during Professor Dyhrenfurth's international attempt on Kangchenjunga, so we may claim this perhaps as a Himalayan Club Expedition, more especially as his right-hand man, Captain E. St. J. Birnie, was the representative from India and was mainly responsible for the organization of the transport, on which success depended. Kamet, 25,447 feet, was climbed by two parties on separate days, and some important geographical exploration of the Great Himalaya, in the Badrinath section of the range, was carried out. The record of reaching the highest summit so far attained passes again into British hands, but there are at least 36 known summits that exceed Kamet, all within reach of India.

Second in importance, though unsuccessful, was the magnificent attempt on Kangchenjunga by Paul Bauer and his team of young Bavarians, mostly members of the Club. After a terrific struggle along the crest of the north-east spur, and when most of the difficulties appeared to have been passed, the party was brought up against an insurmountable wall of dangerous snow, which already showed several fissures. At such an altitude, about 25,700 feet, the clearing of the masses of snow would have been an impossible task and this small dangerous wall, not more than perhaps 600 feet high, brought the attempt to an end. There was no chance of the snow conditions improving at that time of year, and there is no doubt that, however hard to make, the right decision was made. We regret very much the tragic accident below Camp VIII, which appears to have been caused by a slip by the porter Pasang, who unfortunately dragged Herr Schaller out of his steps. In spite of this disaster the party persevered in the attempt till brought up by insuperable difficulties. It would be rash to declare that Kangchenjunga is unclimbable; but it will be a bold man who will succeed after last year's attempt.

As I mentioned in last year's report, Dr. Welzenbach postponed his attempt on Nanga Parbat. In the meanwhile, the Survey of

India has completed its programme of surveys in Chitral and the Gilgit Agency during the course of which, last year, the whole massif of Nanga Parbat has been surveyed. Owing to retrenchment in the Survey of India official mountain surveys will probably have to be discontinued, and it is to be hoped that expeditions will come to our assistance and improve the details of our maps. During the year, Mr. D. N. Wadia of the Geological Survey of India surveyed the Nanga Parbat massif geologically and prepared a small-scale geological map. While on the subject of Nanga Parbat, I may mention, though it hardly comes in the category of mountaineering, the successful flight of a squadron of Wapitis to Gilgit. The line taken passed about 16 miles to the west of Nanga Parbat.

I mentioned also last year that Sir Aurel Stein was on his fourth expedition to Central Asia. It is much to be regretted that the favourable attitude of the Chinese authorities towards this expedition lasted but a short time, and that obstructive tactics brought it to a premature close.

Similar reasons probably account for the difficulties experienced by the Haardt "Mission Scientifique à travers Asie". M. Haardt brought a fleet of seven Citroën "Caterpillars" across Syria, Iraq, Persia, and Afghanistan to India. A second fleet was disembarked in China and sent across Asia to meet him at Kashgar. M. Haardt succeeded in reaching Gilgit with two "Caterpillars", and with one of these persevered to Nomal. The expedition then proceeded on foot, and, after being delayed at the Chinese frontier, passed on to Kashgar. Our latest information is that the Chinese fleet of cars was held up at Urumchi, by orders of the Governor of Sinkiang.

Before leaving Central Asia, I must mention also the travels of Lieut.-Colonel Schomberg, who completed last year his exploration of the T'ien Shan, on which he has been engaged for some three years. We hope to have a full account of his journeys for publication in our Journal.

At the eastern end of our mountain borderland Mr. Kingdon Ward has been engaged on geographical work and plant-collecting in the Upper Adung Valley of the Burmese frontier. The last we heard of him was that he hoped to cross the pass at the head of this valley and make a traverse to Ridong on the upper Taron, to link up the official surveys with Lieut.-Colonel F. M. Bailey's route. It is probable that later details will be published in the Journal.

Of journeys less far afield, I may mention three. Two of these by Lieut.-Colonel Stockley and by Mr. F. Ludlow, were undertaken primarily for Natural History research. Stockley returned in October from the Tsarap valley in Eastern Lahul, which appears not to have been traversed to its head by any European since 1908 and very rarely prior to that. Ludlow carried out some investigations over a wide area in Kashmir. The third of these lesser journeys was undertaken by Captain C. E. C. Gregory. His intention was to cross the Aksai Chin from the Changchenmo, but once more, owing to delays in Nanking, the passport failed to arrive and the plan was changed to a journey by the ordinary Karakoram pass route. Gregory left Leh on the 23rd June, after arranging for his passport to be sent on from there by special runner. He visited and sent in an interesting report of the state of the Chong Kumdan (upper Shyok) dam, which is still blocking that river, and then waited at Daulat-Beg-öldi for his passport till his supplies gave out, when he was forced to return.

I have doubtless omitted a number of tours by officials on duty or on leave. There seems to be considerable reluctance on the part of British travellers to record their travels, a modesty perhaps which we may respect but can hardly approve.

There are rumours of further expeditions, but the world-wide depression makes explorers chary of definite plans. Foreigners seem intent on penetrating the seclusion of Tibet; we do what we can to assist them, but they must realize that when the Tibetan authorities refuse permission, we must accept their decision. There are still many areas well within British territory that have not been scientifically examined or surveyed in detail, innumerable summits yet unclimbed, many mountain massifs of which we know next to nothing, and much to be learnt of their geological past.

Eastern Section.—The questions which have mainly engaged the attention of the Eastern Section of the Himalayan Club during the past year have been the location of the proposed Club Hut, and the memorial tablet which it is proposed to place in Darjeeling.

As regards the Club Hut, alternative sites at Dzongri, at some point near the heads of the Lachen and Lachung valleys, and in Lhonak have been considered. The Eastern Section hopes to reach a final decision shortly.

The proposal for a memorial to Chettan the porter, who died on the slopes of Kangchenjunga last year, has developed into a scheme

for the erection of a large memorial tablet at Darjeeling to contain the names of all those mountaineers who have died in the Eastern Himalaya, and to be flanked by smaller individual tablets in special cases when it is desired to erect them. A suitable site facing the Kangchenjunga massif has been found in Darjeeling, on land which it is hoped that Government will be in a position to grant for the purpose. The form of the central memorial and flanking tablets is now under discussion.

At the request of Herr Bauer's expedition a suitable tablet inscribed with the names of Herr Schaller and the porter Pasang, who died during this year's attempt on Kangchenjunga, was prepared in Calcutta and despatched in time for the German expedition to erect it where the bodies lie.

The Eastern Section of course did everything in their power to help the Kangchenjunga expedition, mainly through Gourlay in Calcutta, and Tobin in Darjeeling. Shebbeare went up the Zemu valley ahead of it, to reconnoitre the route to the base camp through this particularly muddy and inhospitable part of semi-tropical Sikkim.

Three members of the successful Kamct expedition were entertained by the Club on their return at an informal dinner in the United Service Club at which many members of the Eastern Section were present*.

The necessity for a bridge over the Sevoke river in the Teesta valley is very keenly felt, and we may hope that funds will be forthcoming from the Road Fund or elsewhere for this purpose in the near future. The bridge would form an essential part of any through route from the rail-head to the Sikkim and Tibetan frontier; and, from the point of view of the Club, is a much-needed link in communications for parties of any considerable size proceeding to the north-eastern Himalaya. The Kangchenjunga expedition was badly held up at this spot.

Kashmir Hut.—It has not been so easy to decide upon a site for the proposed hut in Kashmir, but considerable progress has been made in the examination of this question, largely owing to the interest taken by Lieut.-Colonel Ogilvie, the late Resident who was kindly

* See below, p. 221.

acting as Local Secretary for us last year. The attitude of His Highness's Government has been very helpful. The alternative sites now under consideration are round about Nafron and Har Nag. It would greatly assist the Committee in coming to a decision on this question if any members who are likely to make use of the proposed hut for climbing or ski-ing, would communicate their views to the Honorary Secretary at this stage.

Himalayan Medical Zoology.—Dr. Strickland writes :—From the point of view of Himalayan " Medical Zoology " collections have been made, as opportunity has offered, of all sorts of creatures, and of information concerning them, and for much of this I have to thank various gentlemen.

I wish especially to mention Professor Percy Moore of Pennsylvania University, who has recently been in India studying the habits of the land-leeches.

I would like, too, to mention specially a collection of biting creatures, mainly ticks, kindly made for me by Mr. A. J. Dash when on a recent trek up the Lachen valley.

I have recently, through the kindness of many commentators, been able to give an account of some edible bugs, i.e., edible to some of the sub-Himalayan aborigines, like the Abors, and the notes thereon are to appear in the Club Journal*.

On a recent visit to Tibet, I obtained through the kindness of Captain Sinclair, I.M.S., Medical Officer to the British Trade Agency at Gyantse, a number of the indigenous herbs used by the local Galens. These are now being investigated by Colonel Chopra, I.M.S., at the School of Tropical Medicine.

A final matter to mention is the occurrence of a certain hare-disease in Tibet. This hare-disease was interesting, because there is a sort of typhus fever in India, particularly common in the Kumaun Himalaya, which General Megaw has concluded to be caused by tick-bite; and there was also certain evidence that the hare was the reservoir of the infection, like the rat in plague. I found a species of tick called *Dermacentor everestiana* which is a close relation to a species in the Rockies, which definitely carries a sort of typhus fever. For Tibetan folk-lore regarding hares being sick, I have been much

* See page 96.

helped by the learned scholar Dr. Van Manen of the Asiatic Society of Bengal.

You will be glad to learn that Major Mason has been appointed Professor of Geography at Oxford and will join the appointment in May. Fortunately for us, he is ready to continue editing the Himalayan Journal from Oxford.

In conclusion, I have to inform the meeting, with regret, of my inability to offer myself for re-election as Secretary, a post which I have now held for three years. I am going on long leave in April and my subsequent movements are too uncertain for me to undertake at present any duties connected with the Club.

(The following note has been received from the Local Honorary Secretary, Eastern Section).

CALCUTTA LOCAL DINNER.

On the 20th August the Calcutta members of the Club entertained at dinner at the United Service Club three members of the successful Kamet expedition, Dr. Raymond Greene, Mr. Holdsworth and Captain Birnie. After dinner Captain Birnie gave a short but interesting account of their experiences, which he illustrated with the aid of a Leitz projector and some of his photographs. The following members were present :

Captain E. St. J. Birnie, Messrs. J. M. Bottomley, A. J. Dash, L. R. Fawcus, Dr. L. L. Fermor, Mr. G. B. Gourlay, Dr. A. M. Heron, Mr. J. Latimer, Lieut.-Colonel C. G. Lewis, the Hon. Mr. A. Marr, Messrs. A. A. Marr, A. Moore, H. Newman, Captain G. H. Osmaston, Messrs. G. A. R. Spence, A. Stobart, J. D. Tyson, J. Van Manen and W. D. West.

CLUB NOTICES

I. APPOINTMENTS

The following have agreed to act as Local Secretaries, Correspondents, Assistant Editors, etc.

Local Secretaries.

Kashmir Dr. Ernest Neve, Srinagar, Kashmir.

Chamba	Dr. J. Hutchinson, Chamba, via Dalhousie, Punjab.
Kumaun	Captain C. J. Morris, 3rd Gurkha Rifles, Lansdowne.
Darjeeling	Lt.-Colonel H. W. Tobin, D.S.O., O.B.E., "The Glen", Darjeeling.
Calcutta	L. R. Fawcus, Esq., I.C.S., The United Service Club, Chowringhee, Calcutta.

Local Correspondents.

London	Lt.-Colonel E. L. Strutt, C.B.E., D.S.O., Secretary to The Alpine Club, 12, Somers Place, Hyde Park, London, W. 2.
Quetta	Captain J. S. Lethbridge, M.C., R.E., The Staff College, Quetta.
Central Europe	H. F. Montagnier, Esq., 90 Avenue Henri Martin, Paris XVI ^e , France.

Scientific and Technical Correspondents.

Archæology	Sir Aurel Stein, K.C.I.E., Ph.D., D.Litt., D.Sc., c/o Dr. P. S. Allen, Corpus Christi College, Oxford, England.
Botany	B. O. Coventry, Esq., Srinagar, Kashmir.
Fishing and Shooting	Lt.-Colonel H. G. Martin, D.S.O., O.B.E., The Staff College, Quetta.
Folklore	H. W. Emerson, Esq., C.I.E., C.B.E., I.C.S., Secretary to the Government of India, Home Department, Simla.
Geodesy and Geophysics	Dr. J. de Graaff Hunter, sc.D., Survey of India, Geodetic Branch, Dehra Dun, U. P.
Geology and Glaciology	Dr. L. L. Fermor, O.B.E., A.R.S.M., D.Sc., Director, Geological Survey of India, Calcutta.
Medical Zoology	Dr. C. Strickland, School of Tropical Medicine, Calcutta.
Meteorology	Dr. C. W. B. Normand, D.Sc., Director-General of Observatories, Poona.
Ornithology	H. Whistler, Esq., Caldbec House, Battle, Sussex, England.
Photography	Captain C. J. Morris, 3rd Q. A. O. Gurkha Rifles, Lansdowne, U. P.

- Survey and Maps .. Colonel R. H. Phillimore, D.S.O., Director,
Map Publication, 13, Wood Street,
Calcutta.
- Zoology .. Lt.-Colonel C. H. Stockley, D.S.O., O.B.E.,
M.C., c/o Messrs. Grindlay & Co.,
Bombay.

Honorary Assistant Editors.

- Himalayan Journal* .. Captain J. B. P. Angwin, R.E., Survey of
India, Quetta.
- The Pamirs and K'un Lun* C. P. Skrine, Esq., I.C.S., Political Agent
and Deputy Commissioner, Sibi, Balu-
chistan; and Captain G. Sherriff, R.A.,
"Carronvale", Larbert, Stirlingshire,
Scotland.
- Gilgit Agency* .. Major G. V. B. Gillan, Political Agent,
Gilgit, via Kashmir.
- Baltistan, Nubra, Ladakh
and Zaskar* Lt.-Colonel M. L. A. Gompertz, 3-10th
Baluch Regiment, Secunderabad.
- Kashmir* .. J. Kelly, Esq., M.A., Aitchison College,
Lahore.
- Punch, Jammu and
Kishtwar* H. L. Wright, Esq., Chief Conservator of
Forests, Jammu and Kashmir State,
P. O. Jammu, N. W. Rly.; and J.
Kelly, Esq., M.A., Aitchison College,
Lahore.
- Chamba* .. Dr. J. Hutchinson, Chamba, via Dalhousie,
Punjab.
- Kulu* .. Captain D. G. Lowndes, 2-18th Royal
Garhwal Rifles, Razmak.
- Lahul and Spiti* .. Captain J. S. Lethbridge, R.E., Staff
College, Quetta.
- Dharmasala Hills* .. Captain J. W. Rundall, 1-1st K. G. O.
Gurkha Rifles, Dharmasala.
- Bashahr* .. R. Maclagan Gorrie, Esq., I.F.S., Forest
Research Institute, Dehra Dun, U. P.
- Mandi State* .. H. L. Wright, Esq., Chief Conservator,
Forests, Jammu and Kashmir State,
Jammu, N. W. Rly.

<i>Everest Group</i>	..	Captain J. G. Bruce, M.C., 6th Gurkha Rifles, Abbottabad, N.W.F.P., The Grange, St. Hilary, Cowbridge, Glamorgan, Wales; and E. O. Shebbeare, Esq., c/o Forest Office, Darjeeling.
<i>Sikkim</i>	..	Lt.-Colonel H. W. Tobin, D.S.O., O.B.E., "The Glen", Darjeeling.
<i>Chumbi Valley and Eastern Tibet</i>		Lt.-Colonel J. L. R. Weir, Political Officer, The Residency, Gangtok, Sikkim.

II. THE HIMALAYAN JOURNAL, VOL. V, 1933.

It is hoped to publish the Fifth Volume of *The Himalayan Journal* in April 1933. All papers and other communications for publication must reach the Honorary Editor, Major Kenneth Mason, Hertford College, Oxford, England, by the 31st December 1932, and earlier, if possible. Sketch-maps should be sent to accompany articles for publication. Photographs for publication should be on glossy bromide and should show good contrast in light and shade. The late submission of promised papers causes extra expense to the Club.

III. PRESENTATION OF BOOKS TO THE LIBRARY.

Books presented to the library, including those sent for review, should be addressed to the Librarian, The Himalayan Club, Simla, and not to any official of the Club by name. The same applies to periodicals received from Societies, Clubs and other institutions in exchange for *The Himalayan Journal*.

IV. CLIMBING EQUIPMENT.

The Eastern Section of the Club keeps a *small* stock of equipment which may be hired by members on application to the Honorary Secretary, Calcutta. The following equipment is generally available: *Tents*, 4 or 5 Meade or Mummery tents, several old Meade tents suitable for porters, several light shelters, and a Mess Tent (about 8×8); *Ice-axes* (12); *Crampons* (12 pairs); *Cork Mattresses* (2); *Coolies' (old) Army Blankets*; *Nailed Coolies' Boots*; *Stores Boxes*; *Porters' Rucksacks* (2); *Primus Stoves* (2); *Rope* (one or two lengths); and miscellaneous equipment, such as cooking pans, plates, cutlery, snow-glasses, tricouni and clinker nails.

LIBRARY NOTICES

BOOKS ADDED TO THE LIBRARY

(1st February 1931—31st January 1932)

<i>Author.</i>	<i>Title.</i>	<i>Presented by</i>	<i>Classification.</i>
Borchers	Berge und Gletscher im Pamir	W. E. Buchanan	Central Asia.
Bosshard, Walter	Durch Tibet und Turkistan	F. and P. Deptt. Library	Do.
Burrard, Col. Sir S.	Mount Everest and Its Tibetan Names (Professional paper No. 26).	Survey of India	Survey of India.
Filchner, W.	Sturm uber Asien	F. and P. Deptt. Library	Tibet.
Filchner, W.	Die erdmagnetischen Beobachtungen.	Author	Geophysics.
Gerrard	Account of Kunawar	W. E. Buchanan	Central Himalaya.
Grove, F. C.	The Frosty Caucasus	Sir G. Corbett	Western Asia.
Lloyd, W.	Narrative of a Journey from Caunpoor to the Boorendo Pass in the Himalaya Mountains.	W. E. Buchanan	Central Himalaya.
Marsh, Capt. H. Cunliffe	A Ride through Islam.	Purchased from Central Asian Society, 77, Gros- venor Street, London.	Western Asia.
Trinkler, Emil	The Stormswept Roof of Asia	Major Kenneth Mason.	Central Asia.
Whymper, Edward	Travels amongst the Great Andes of the Equator.	Sir G. Corbett	World-Wide.
—	Fujiyama	Japanese Alpine Club	Eastern Asia.

Telephone No. 90 Darjeeling

Telegrams : " Snows "

DARJEELING
Hotel Mount Everest

125 BEDROOMS

125 MODERN SANITARY BATHROOMS

Open all the year

GRAND HOTEL ROCKVILLE

First Class Family Hotel. Excellent Cuisine

Apply Manager.

PINEWOOD HOTEL
SHILLONG

Open the whole year

A spacious and most comfortable
Hotel

Centrally situated

Best reputation. Terms moderate

Wires : " Pinewood," Shillong

The Himalayan Club



ACCOUNTS

FOR THE

YEAR ENDED

31st December, 1931



PRINTED BY

THACKER'S PRESS & DIRECTORIES, LTD.

6, Mangoe Lane, CALCUTTA

1932

The Himalayan

STATEMENT OF RECEIPTS AND

RECEIPTS.	Rs. A. P.	Rs. A. P.	£ s. d.
CASH WITH BANKERS AND IN HAND ON 31ST DECEMBER, 1930.			
Cash with Bankers on Current A/c.	11,578 11 8		35 10 10
Cash with Hon. Secretary . .	12 10 6		
Cash with Hon. Treasurer . .	28 8 0		
Cash with Hon. Librarian . .	21 4 6		
Cash with Hon. Editor . .	1 7 0	11,642 9 8	
LIFE SUBSCRIPTIONS.	414 0 1		
ANNUAL SUBSCRIPTIONS.			
Subscriptions to 1931 3,306 5 0			3 5 0
do. for 1932 172 0 0			0 5 0
do. for 1933 18 0 0	3,496 5 0		
SUSPENSE SUBSCRIPTIONS . .	375 0 0	4,285 5 1	
INTEREST ON FIXED DEPOSIT . .		49 12 0	
TOTAL .		15,977 10 9	39 0 10

We have examined the foregoing Cash Account with the Books and is accompanied by a statement of Assets and Liabilities and a schedule of

(1) Not

Club.

PAYMENTS for the year ended 31st December, 1931.

PAYMENTS.	Rs. A. P.	Rs. A. P.	£ s. d.
Journal Publications	1,599 14 6		
Establishment Charges	720 0 0		
Printing and Stationery	238 8 0		
Advance to Eastern Section	50 0 0		
Postage	134 1 9		
Bank Charges	6 15 0		0 2 7
Miscellaneous	82 4 0	2,831 11 3	
CASH WITH BANKERS AND IN HAND ON 31ST DECEMBER, 1931.			
Cash with Bankers :—			
On Current Account	3,033 13 0		38 18 3
On Fixed Deposit	10,000 0 0	13,033 13 0	
Cash with Hon. Secretary	90 1 9		
do. Hon. Treasurer	10 0 0		
do. Hon. Librarian	5 14 6		
do. Hon. Editor	6 2 3		
		112 2 6	
TOTAL		15,977 10 9	39 0 10

Vouchers produced and certify that it is in accordance therewith. This Account amounts outstanding against Members(1).

published.

A. F. FERGUSON & CO.,
Chartered Accountants, } Auditors.

DELHI :

10th February, 1932.

The Himalayan Club.

STATEMENT OF ASSETS AND LIABILITIES as at 31st December, 1931.

ASSETS.	Rs. A. P.	£ s. d.	LIABILITIES.	Rs. A. P.	£ s. d.
DUE BY MEMBERS—			DUE TO EASTERN SECTION—		
For 1928		0 10 0	Due on 1st January, 1930	2 8 6	
For 1929		0 10 0	<i>Add: Expenditure during the year:—</i>		
For 1930	20 0 0	1 0 0	Postage	39 15 3	
For 1931	1,226 0 0	2 5 0	Eastern Section Imprest	30 0 0	
CASH WITH BANKERS AND IN HAND	13,145 15 6	38 18 3	Equipment	50 0 0	
			Miscellaneous	7 6 0	
			Bank Charges	5 0 0	132 5 3
				134 13 9	
			<i>Less: Advance</i>	50 0 0	
TOTAL .	14,391 15 6	43 3 3	TOTAL .	84 13 9	

DELHI :
10th February, 1932.

A. F. FERGUSON & CO.